

**ACTION MEMORANDUM FOR  
THE MILITARY MUNITIONS RESPONSE PROGRAM  
INTERIM REMOVAL ACTION**

**Volk Field Combat Readiness Training Center  
Camp Douglas, Wisconsin**

**FINAL**

*Prepared for:*

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&

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April 2015

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## **ACRONYMS AND ABBREVIATIONS**

AOC	Area of Contamination
ARAR	Applicable or Relevant and Appropriate Requirement
AM	Action Memorandum
ANG	Air National Guard
BIP	Blow In Place
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CSE	Comprehensive Site Evaluation
CWM	Chemical Warfare Materiel
cy	Cubic Yards
DC	Direct Contact
DERP	Defense Environmental Restoration Program
DGM	Digital Geophysical Mapping
DMM	Discarded Military Munition
DoD	Department of Defense
EA	EA Engineering, Science, and Technology, Inc., PBC
EBS	Environmental Baseline Study
EE/CA	Engineering Evaluation/Cost Analysis
EOD	Explosive Ordnance Disposal
EPA	United States Environmental Protection Agency
FIB #1	Former Firing-In-Buttress #1 (FR501)
Ft	feet or foot
HE	High Explosive
HRR	Historical Records Review
HRS	Hazard Ranking System
IRA	Interim Removal Action
MC	Munitions Constituents
MD	Munitions Debris
MDAS	Material Documented as Safe
MEC	Munitions and Explosives of Concern

### ACRONYMS AND ABBREVIATIONS (Continued)

mg/kg	Milligrams per kilogram
mm	Millimeter
MMRP	Military Munitions Response Program
MPPEH	Material Potentially Presenting an Explosive Hazard
MRA	Munitions Response Area
MRS	Munitions Response Site
msl	Mean Sea Level
NCP	National Oil and Hazardous Substance Pollution Contingency Plan
NMRD	Non-munitions Related Debris
NPL	National Priority List
NTCRA	Non-Time Critical Removal Action
PBC	Public Benefit Corporation
RA	Removal Action
RAO	Removal Action Objective
RCL	Residual Contaminant Level
RI	Remedial Investigation
RSL	Regional Screening Level
SAA	Small Arms Ammunition
SARA	Superfund Amendments and Reauthorization Act
sqft	Square Feet
TBC	To Be Considered
TCLP	Toxicity Characteristic Leaching Procedure
USACE	United States Army Corps of Engineers
USAF	United States Air Force
USC	United States Code
UXO	Unexploded Ordnance
Volk Field	Volk Field Combat Readiness Training Center, Camp Douglas, Wisconsin
WI	Wisconsin
WIANG	Wisconsin Air National Guard
XRF	X-Ray Fluorescence

## **1. PURPOSE**

EA Engineering, Science, and Technology, Inc., PBC (EA) under contract W9128F-10-D-0056, Deliver Order No. 0008 with USACE Omaha District has prepared this Action Memorandum (AM) in support of the Air National Guard (ANG) Military Munitions Response Program (MMRP) at Volk Field Combat Readiness Training Center, Camp Douglas, Wisconsin (Volk Field). The goal of the ANG MMRP is to make munitions response areas (MRAs) and munitions response sites (MRSs) safe for reuse and to protect human health and the environment in the process. The MMRP addresses issues related to Munitions and Explosives of Concern (MEC), chemical warfare materiel (CWM), and munitions constituents (MC) associated with MRAs, as well as related hazardous substances, pollutants, and potential contaminants of concern on other than operational ranges.

The AM presents the selected Interim Removal Action (IRA) for the following seven MRSs at Volk Field.:

- Former Firing-in-Buttress #1 (FIB #1) (MRS FR501),
- Former Rifle Range #1/Machine Gun Range (SR503),
- Former Rifle Range #5/Range #250 (SR503c),
- Former Small Arms Range #251 (SR504),
- Former Mortar/Artillery Range (MU505) (Excluding inaccessible areas),
- Former Small Arms Debris Area (SR506) (Excluding inaccessible areas), and
- Potential Civil War Era Impact Area (MU507) (Excluding inaccessible areas).

The purpose of the AM is to serve as the primary decision document that:

- determines the need for a Removal Action (RA), also referenced as IRA or Non-Time Critical Removal Action (NTCRA),
- requests and documents approval of the selected removal action described herein for the MRSs at Volk Field Combat Readiness Training Center, Camp Douglas, Wisconsin,
- authorizes the IRA,
- identifies the action and cleanup levels, and
- explains the rationale for the removal response.

The scope of the IRA is to remove MEC, MD, and lead contaminated soil above levels protective of human health for the most sensitive potential receptor (i.e., above EPA Regional Screening levels [RSLs] for residential soil) from the accessible areas of the seven MRSs addressed in this AM to allow for future residential land use. The State of Wisconsin owns Volk Field. The property is leased to the United States Air Force (USAF), licensed to ANG, and the ANG fully controls access to the installation and all MRSs.

The AM complies with the U.S. Environmental Protection Agency (EPA) guidance for AMs (EPA 2009). The AM represents ANG compliance with the Defense Environmental Restoration Program (DERP), which requires that environmental responses be performed by the Department

of Defense (DoD) consistent with the provisions of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA; 42 United States Code [USC] 9601) requirements for investigation and cleanup. Although Volk Field is not a National Priorities List site, work performed is to be consistent with EPA guidance (EPA 1993) under CERCLA, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP; 40 Code of Federal Regulations [CFR], Part 300). CERCLA has no special provisions for dealing with explosive safety, and therefore, the provisions in the DoD's Ammunition and Explosives Safety Standards (DoD 6055.09-M) and United States Army Corps of Engineers (USACE) EM385-1-97 must be adhered to.



## 2. SITE CONDITIONS AND BACKGROUND

### 2.1 Site Description

In support of the ANG MMRP at Volk Field, Phase I and II Comprehensive Site Evaluation (CSE) and Remedial Investigation (RI) activities were performed. The CSE Phase I Investigation was completed in 2010 and the CSE Phase II Desktop Report was completed in 2011 (Sky Research 2011). The CSE Phase I investigation identified MRSs at Volk Field where potential MEC, Munitions Debris (MD), and/or MC are present and required further evaluation and/or response. The CSE Phase II Desktop Report recommended that a RI be performed to address the potential presence of MEC at six of the MRSs and to address the potential presence of MC at the MRSs. The RI Report was completed in January 2015 (Bay West 2015). The RI identified seven MRSs where potential MEC, MD, and/or MC are present, and recommended completion of an NTCRA.

The following sections provide an overview of the seven MRSs' history and current characteristics. The seven MRSs addressed by this AM are shown in Figure 2-1.

#### 2.1.1 Removal Site Evaluation

##### 2.1.1.1 Former Firing-In-Buttress #1 (FR501)

FIB #1 was identified during the CSE Phase I on a topographic survey map titled *Topographic Survey of Firing Butt East of 932 (Aug, 1973)*. FIB #1 was constructed in 1956 and ground scarring from the construction activities is evident in 1957 aerial photos. The aircraft tie down and firing point for FIB #1 is currently used as the Power Check Pad along Taxiway A. FIB #1 target facility is located southeast of the aircraft tie down and firing point.

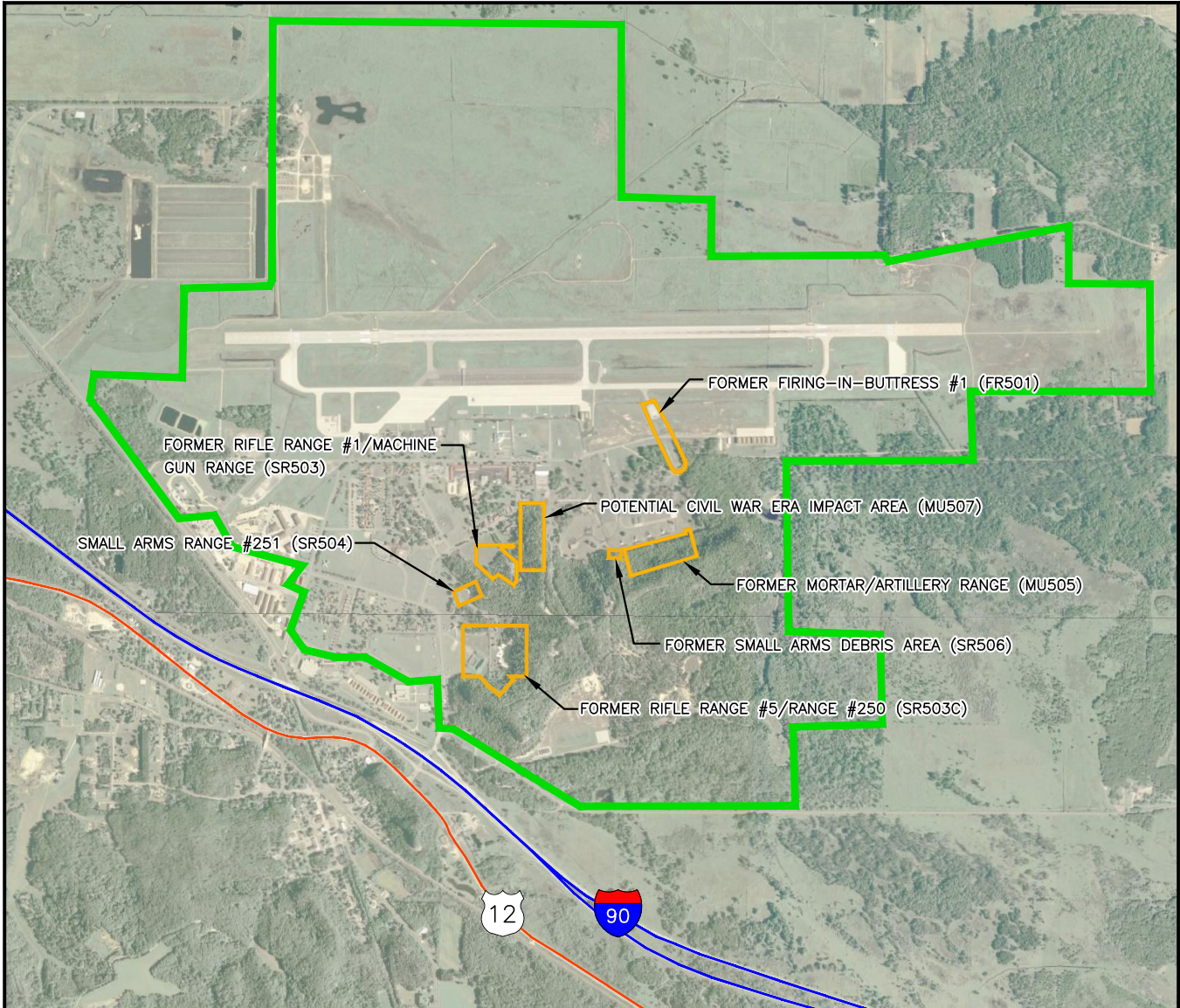
The primary aircraft using FIB #1 would have been P-51, F-84, F-86, F-100, and A-7 aircraft (Wiang 2007). Munitions historically used by these aircraft are what would have been fired into FIB #1, 0.50 caliber ammunition and 20 millimeter (mm) projectiles.

According to a 2007 Environmental Baseline Study (EBS), the range was reportedly used until the early 1970s and was taken off of the Installation's real property listing as of 1984. Results of the RI (Bay West 2015) indicate the key problems at this MRS are potential MEC and MD (see Section 2.1.4.1).

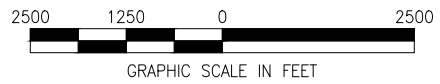
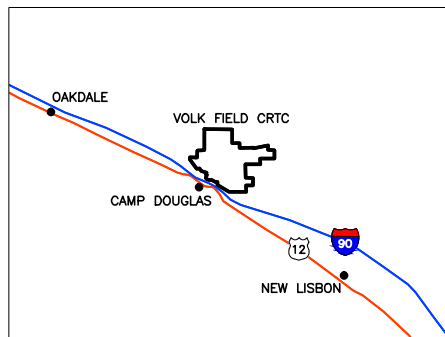
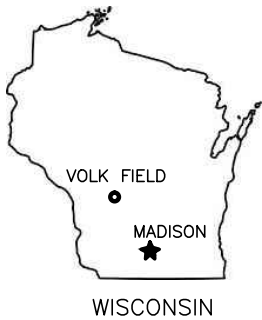
##### 2.1.1.2 Former Rifle/Small Arms Ranges – Multiple Sites (SR503 and SR503c)

Six original ranges, numbered Rifle Range #1 through Rifle Range #6, were orientated with the firing lines towards the sandstone bluff located on the southeastern portion of the installation and were constructed by the authority of the Adjutant General by the year 1894. Former Rifle Ranges #1 through #5 were interconnected, while Former Rifle Range #6 remained a separate range. The Former Rifle/Small Arms Ranges – Multiple Sites (SR503) MRA initially was comprised of 1,110.00 acres. However, the MRA was subdivided into MRS SR503 which included 110.00 acres and the remaining 1,000.00 acres were administratively closed out as MRS SR503a because there was no known or suspected hazard.

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AERIAL IMAGE SOURCE: GOOGLE EARTH. (10/12/13). USDA FARM SERVICE AGENCY. [JANUARY 2014]



**LEGEND**

- INSTALLATION BOUNDARY
- MRS BOUNDARY



VOLK FIELD CRTC  
 JUNEAU COUNTY, WISCONSIN

INTERIM REMOVAL ACTION  
 MRS LOCATION MAP

PROJECT MGR <b>JMR</b>	DESIGNED BY <b>JRB</b>	DRAWN BY <b>JRM</b>	CHECKED BY <b>TR</b>	SCALE <b>AS SHOWN</b>	DATE <b>FEB. 2015</b>	PROJECT NO <b>6246608</b>	FIGURE <b>2-1</b>
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The former rifle ranges were constructed in conjunction with training exercises performed by infantry, artillery, and cavalry units. The footprint of the former ranges has been extensively redeveloped and no evidence of the firing lines remains (Sky Research 2011).

Since development of Ranges #1 through #6, other small arms ranges were developed over portions of the footprints of the original rifle ranges. For example, a Machine Gun/Pistol Range, identified on a historic figure titled “*The Location of the Rifle and Machine Guns Ranges at Camp Williams*” was constructed over the southeastern footprint of former Rifle Range #1 and eastern portion of former Rifle Range #2 sometime in the 1930s (Sky Research 2011).

Small Arms Range #250 was constructed over portions of the former footprint of Rifle Ranges #4 and #5. Small Arms Range #250 first appears on a March 9, 1943 map entitled *Plat Camp Williams, Camp Douglas, Wisconsin* prepared for the Office of the Quartermaster by Henry C. Hengels. Small Arms Range #250 was reportedly used until the late 1980s. When Small Arms Range #250 was in use, Volk Field personnel barricaded Wisconsin Avenue where it cut through the Former Rifle Range #6 (Sky Research 2011).

Range #250 was used for small arms training by ANG personnel, law enforcement personnel, and at times, Civil War Era re-enactors. Documentation discussing the type or size of munitions used at these ranges was not identified. However, visual observations identified remnants of 40 mm grenades and extensive small arms debris (Sky Research 2011).

In November 2012, an RI was conducted at Volk Field which included the Former Rifle Range/Small Arms Ranges – Multiple Sites MRS (SR503). Based on the results of the RI it was recommended MRS SR503 be further subdivided into the following MRSs: the Former Rifle Range #1/Machine Gun Range (SR503) (2.50 acres), the Former Rifle Range #5/Former Range 250 (SR503c) (2.50 acres), and SR503b which included the remaining 105.00 acres recommended for administrative closeout. The RI (Bay West 2015) indicated the key problems at the Former Rifle Range #1/Machine Gun Range (SR503) are MC and Small Arms Ammunition (SAA) (see Section 2.1.4.2). Key problems at the Former Rifle Range #5/Former Range 250 (SR503c) are MEC, MC, and SAA (see Section 2.1.4.3).

#### **2.1.1.3 Former Small Arms Range #251 (SR504)**

Former Small Arms Range #251 was identified in a 2007 EBS (Sky Research 2011). The range was in use from 1954 until 1999 when the new, active small arms range (Facility #243) was constructed at the southeastern portion of former Small Arms Range #250.

Former Small Arms Range #251 (SR504) was located within the southeastern portion of the footprint of former Rifle Range #3. The sandstone bluff located to the east was used as the target impact area for range activities. No documentation was identified discussing the types of munitions that were used at this range (Sky Research 2011). The RI (Bay West 2015) indicated the key problems are MC and SAA (see Section 2.1.4.4).

#### **2.1.1.4 Former Mortar/Artillery Range (MU505)**

The former Mortar/Artillery Impact Area was identified on a 1902 map during the CSE Phase I field investigation. The map was obtained through the Wisconsin National Guard Museum and showed the vicinity of Camp Douglas and potential mortar firing lines. The heavily wooded area is located along a ridge south of the present day Munitions Storage Area igloos and extends south

into the bluff located on the southeastern portion of the installation (Sky Research 2011). The RI (Bay West 2015) indicated the key problem is MEC (see Section 2.1.4.5).

#### ***2.1.1.5 Former Small Arms Debris Area (SR506)***

A Small Arms Debris Area was reported by Volk Field personnel during the CSE Phase 1 interviews. The ground surface was reported to have a significant amount of small arms projectiles scattered over a small area. No information was available regarding use of the site or the time frame it was used was identified in the Historical Records Review (HRR) (Sky Research 2011).

This heavily wooded area is contiguous with the Former Mortar/Artillery Impact Area; however, no documentation regarding historical munitions activities in this area was identified and no munitions debris was identified in the CSE Phase II Desktop Report (Sky Research 2011). Accordingly, the Former Small Arms Debris Area was designated as a separate MRS during the RI. The RI (Bay West 2015) indicated the key problems are MEC and MC (see Section 2.1.4.6).

#### ***2.1.1.6 Potential Civil War Era Impact Area (MU507)***

Munitions debris from a Civil War Era projectile, a Hotchkiss 3 inch gun projectile, was identified in a heavily wooded area of the sandstone bluff during the CSE Phase I field investigation. While no documentation specifying the use of this area for artillery training was identified, it is known that artillery training did take place at Volk Field. No discernible features were identified during the historic aerial photograph review (Sky Research 2011). The RI (Bay West 2015) indicated the key problem is MEC (see Section 2.1.4.7).

### **2.1.2 Physical Location**

Volk Field is located approximately one mile northeast of the village of Camp Douglas (population 580) along Interstate 90/94 in Juneau County, Wisconsin (Figure 2-1), approximately 90 miles northwest of Madison, Wisconsin.

The property surrounding Volk Field is classified as rural and agricultural, consisting of small farms. In the immediate vicinity located southwest of the installation is Camp Douglas. The population of Camp Douglas is approximately 580. The City of New Lisbon, located approximately 10 miles southeast of Volk Field, has a population of 2,343 (Bay West 2015).

The MRSs do not contain sensitive natural resources (i.e., federally-listed as threatened or endangered species or federally-listed critical habitat) (Bay West 2012).

### **2.1.3 Site Characteristics**

#### ***2.1.3.1 Topography***

Volk Field lies in relatively flat to gently sloping topography with an elevation of approximately 905 feet (ft) above mean sea level (msl). A quartz-rich sandstone forested butte with elevation of 1,100 ft above msl occupies approximately 200 acres in the southeastern portion of the installation. This butte typifies the surrounding topography in the region as it is the result of an eroding escarpment located to the southwest. Otherwise, the area around the Volk Field is generally flat to gently sloping.

Volk Field is located within the drainage basin of the Lemonweir and Little Lemonweir Rivers. The Lemonweir River flows from northwest to southeast and is located approximately 3,700 ft northeast of the installation boundary. The Little Lemonweir River is approximately 2.5 miles south of the Volk Field boundary and flows from west to east. The Little Lemonweir River joins the Lemonweir River 4.5 miles southeast of Volk Field at the city of New Lisbon.

### **2.1.3.2 Land Use**

Volk Field covers approximately 2,230 acres controlled by the Wisconsin (WI) ANG. There are approximately 120 military and 70 permanent civilian employees assigned to Volk Field with approximately 130 additional employees associated with various tenant units. The base contains 143 buildings (WIANG 2007).

The Camp Williams Army National Guard facility, located within the southwest portion of Volk Field, is home to the 32nd Infantry Brigade, WI Army National Guard. Camp Williams is also home to the United States Property and Fiscal Office for the State of Wisconsin. Camp Williams has approximately 50 structures. There is no fence or physical boundary between Volk Field and Camp Williams.

Camp Williams, along with Volk Field operational, base housing, and administrative buildings supporting the mission are located within a one-mile radius. The Ammunition Storage Area and Munitions Storage Depot are located within a one-half-mile radius. Buildings supporting the flight line are in close proximity.

No changes to the current land use are anticipated.

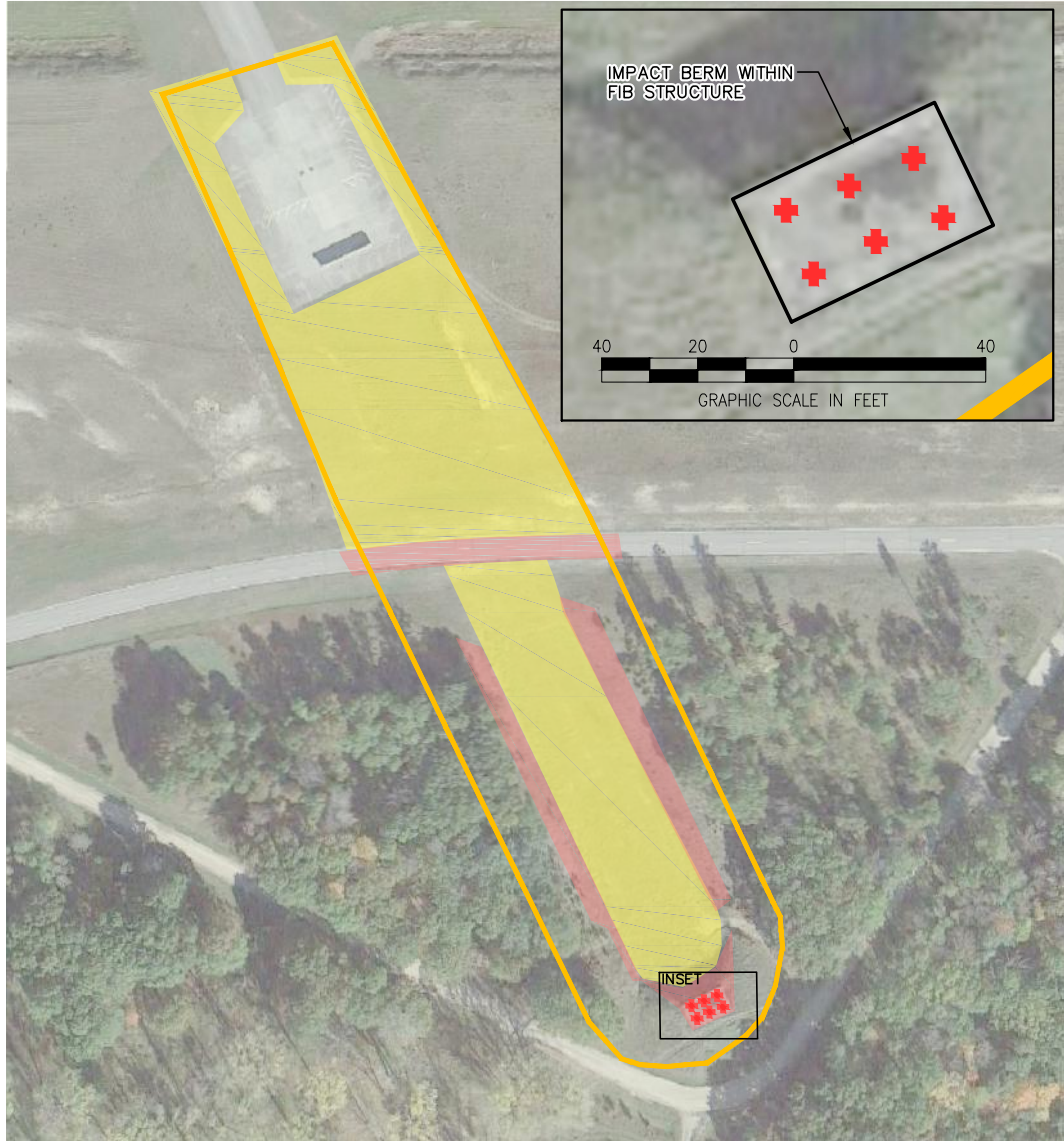
## **2.1.4 Release or Threatened Release into the Environment of a Hazardous Substance, or Pollutant or Contaminant**

### **2.1.4.1 Former Firing-In-Buttress #1 (FR501)**

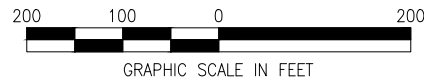
#### **MEC**

A surface clearance was performed prior to a 3.16 acre digital geophysical mapping (DGM) and 1.5 acre analog magnetic survey. 1,382 targets were intrusively investigated and remain with no MEC being encountered. Nine small test pits (Figure 2-2) were hand excavated inside the FIB #1 structure and the soil from the impact berm was screened for munitions related debris. The impact berm soil was inspected and determined to contain MD from 20 mm high explosive (HE) projectiles and also larger ordnance fragments. The larger ordnance fragments are believed to have been deposited as part of fill material during FIB construction. Based on the quantity of MD identified inside FIB #1 structure, it was estimated that there was average density of 14.3 projectiles per cubic foot of soil. This was compared to the estimated volume of soil from the impact berm (approximately 400 cubic yards [cy]), resulting in an estimate of 150,000 to 160,000 projectiles potentially remaining in the impact berm soil (Bay West 2015).







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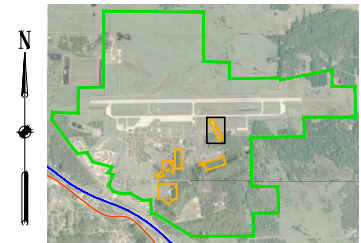


DATA SOURCE: BAY WEST RI, GIS FILES



**LEGEND**

-  MRS LOCATION
-  MRS BOUNDARY
-  INSTALLATION BOUNDARY
-  DGM AREA
-  ANALOG SURVEY AREA
-  TEST PIT LOCATIONS



AERIAL IMAGE SOURCE: GOOGLE EARTH, (10/12/13). USDA FARM SERVICE AGENCY. [JANUARY 2014]



VOLK FIELD CRTc  
 JUNEAU COUNTY, WISCONSIN

FORMER FIRING-IN-BUTTRESS #1 (FR501)  
 TEST PITS

PROJECT MGR <b>JMR</b>	DESIGNED BY <b>JRB</b>	DRAWN BY <b>JRM</b>	CHECKED BY <b>TR</b>	SCALE <b>AS SHOWN</b>	DATE <b>FEB. 2015</b>	PROJECT NO <b>6246608</b>	FIGURE <b>2-2</b>
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## **MC**

No MC above screening levels was identified.

### **2.1.4.2 Former Rifle Range #1/Machine Gun Range (SR503)**

## **MEC**

No MEC was identified.

## **MC**

Based on data in the RI (Bay West 2015) (Figure 2-3) lead concentrations in soil exceed the EPA Regional Screening Level (RSL) for residential soils (400 milligrams per kilogram [mg/kg]) in approximately 360 cy across approximately 12,200 square feet (sqft) of the MRS soil. Approximately 0.8 acres requires removal of SAA (EA 2014).

### **2.1.4.3 Former Rifle Range #5/Range #250 (SR503c)**

## **MEC**

An intact 40 mm grenade was identified at Former Range #250 (Figure 2-4) during a site tour performed in conjunction with the RI kickoff meeting. The grenade was brought to the attention of the Volk Field Safety Office. In turn, the Safety Office requested assistance from the Explosive Ordnance Disposal (EOD) unit at Fort McCoy, Wisconsin. The EOD unit responded and determined the grenade was a M407A1 training grenade. The EOD team performed a blow-in-place (BIP) on the grenade.

A visual sweep of the Range #250 area was conducted between the firing points and the impact berm. No additional MEC was identified on the surface, but approximately 80 pounds of MD, primarily expended 40 mm grenade debris, were recovered.

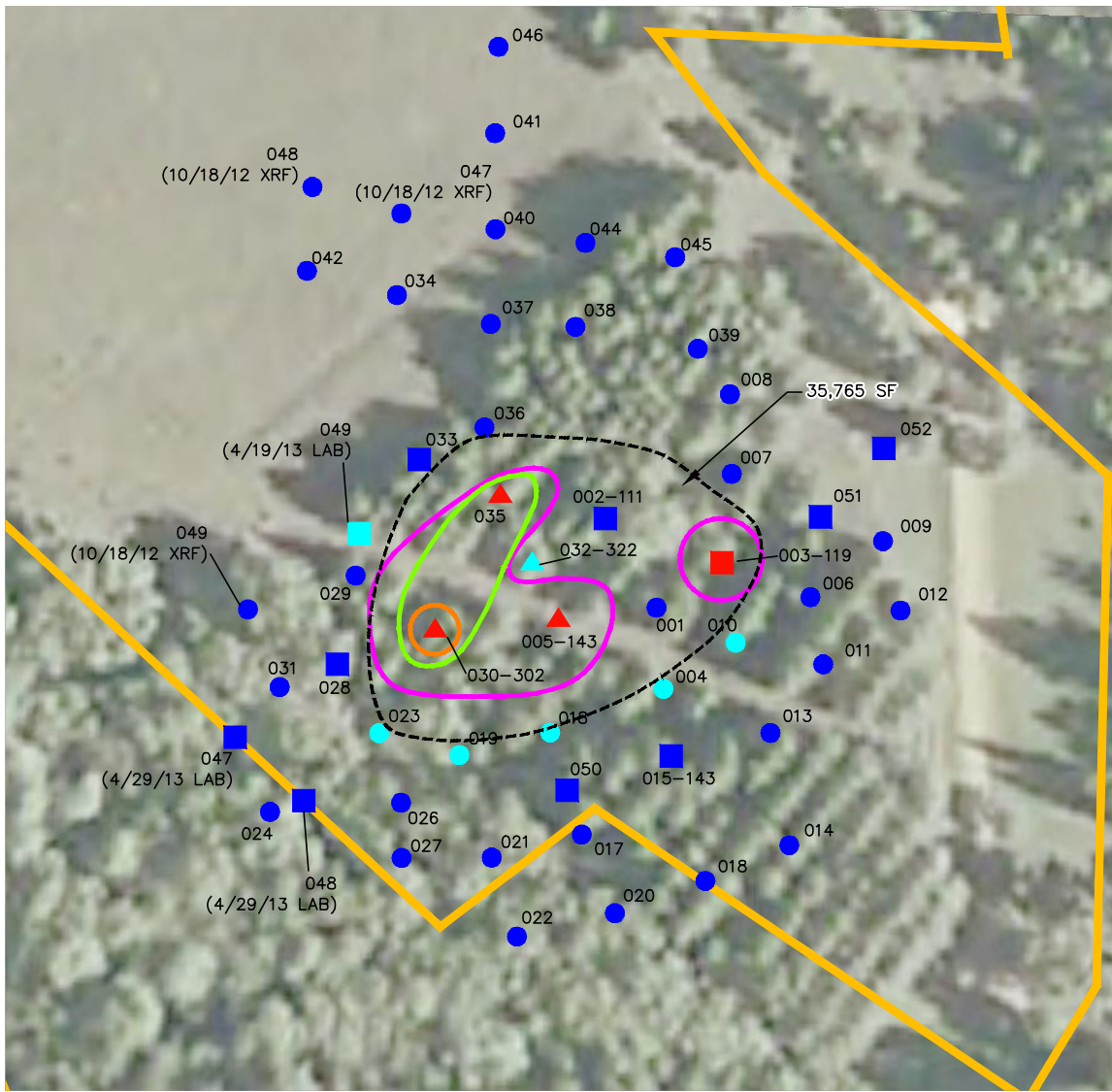
The impact area was littered with small arms projectiles such that identifying discrete targets was not possible. Therefore, no subsurface investigation was performed, and the potential exists for additional 40 mm grenades to remain in the subsurface. Based on information in the RI (Bay West 2015), approximately 1.1 acres requires removal of MEC, MD and/or SAA in the subgrade.

## **MC**

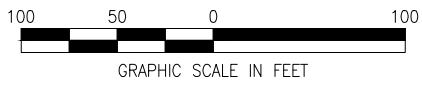
At Former Range #250, the ground is heavily littered with expended small arms debris and material potentially presenting an explosive hazard (MPPEH) from 40 mm grenades (Figure 2-4). Given the potential for 40 mm grenades to be present in the subsurface, an unexploded ordnance (UXO) technician performed anomaly avoidance at the selected sample locations. Only one location was identified as safe to sample in the primary impact area. At this location, lead concentrations in soil were not evaluated in the 0-6 inch interval, but were evaluated and detected at the following concentrations in deeper intervals: 1,100 mg/kg in the 6-12 inch interval, 460 mg/kg in the 6-24 inch interval, and 400 mg/kg in the 24-48 inch interval.

X-Ray Fluorescence (XRF) samples were collected along the perimeter of the impact area to determine if lead was migrating away from the impact area. The results were below the screening levels for residential soil.

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DATA SOURCE: BAY WEST RI, GIS FILES

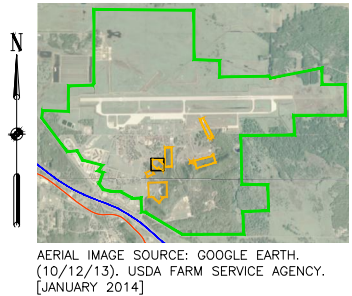


**LEGEND**

- MRS LOCATION
- MRS BOUNDARY
- INSTALLATION BOUNDARY
- SAA/MD EXTENT
- LEAD CONC. > 400 mg/kg -- 0-6 INCH
- LEAD CONC. > 400 mg/kg -- 6-12 INCH
- LEAD CONC. > 400 mg/kg -- 12-48 INCH

**XRF/ ANALYTICAL RESULTS  
LEAD CONCENTRATIONS IN mg/kg**

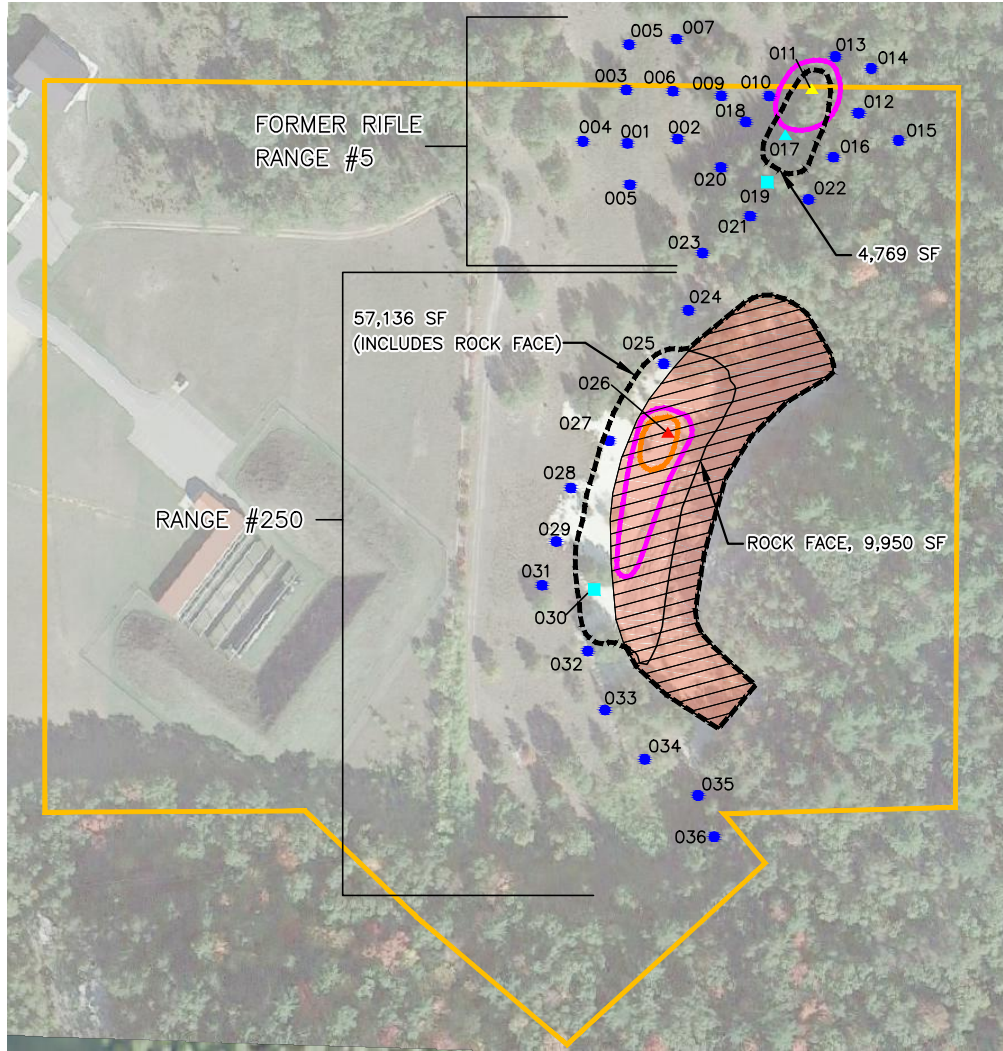
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- ▲ ■ 201 - 400
- ▲ ■ 401 - 600
- ▲ ■ 601 +
- XRF SAMPLE
- ▲ DIRECT PUSH TECHNOLOGY SAMPLE
- ANALYTICAL LAB RESULT
- 008 SAMPLE IDENTIFICATION (NOT CONCENTRATION)



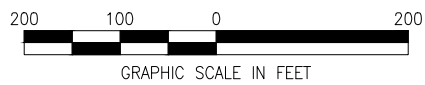
		<b>VOLK FIELD CRTc</b> JUNEAU COUNTY, WISCONSIN		<b>FORMER RIFLE RANGE #1/MACHINE GUN RANGE (SR503) SUMMARY OF RI RESULTS</b>											
				PROJECT MGR	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	DATE	PROJECT NO	FIGURE				
JMR		JRB		JRM		TR		AS SHOWN		FEB. 2015		6246608		2-3	



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 DATE: 02/18/2015 TIME: 09:59 DRAWN BY: jmather



DATA SOURCE: BAY WEST RI, GIS FILES



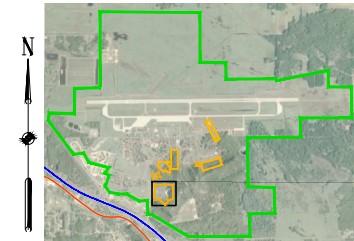
**LEGEND**

- MRS LOCATION
- MRS BOUNDARY
- INSTALLATION BOUNDARY
- EXPLOSIVE HAZARD AREA BOUNDARY (NOT FULLY INVESTIGATED DURING RI)
- SAA/MD EXTENT
- LEAD CONC. >400 mg/kg -- 0-6 inch

**XRF/ ANALYTICAL RESULTS**  
 LEAD CONCENTRATIONS IN mg/kg

- <LOD - 200
- 201 - 400
- 401 - 600
- 601 +
- XRF SAMPLE
- DIRECT PUSH TECHNOLOGY SAMPLE
- ANALYTICAL LAB RESULT
- 008 SAMPLE IDENTIFICATION (NOT CONCENTRATION)

NOTE: AN INTACT 40mm GRENADE WAS IDENTIFIED AT FORMER RANGE #250 DURING THE RI KICKOFF MEETING. THE EXACT LOCATION IS UNKNOWN.



AERIAL IMAGE SOURCE: GOOGLE EARTH. (10/12/13). USDA FARM SERVICE AGENCY. [JANUARY 2014]

**EA** EA ENGINEERING, SCIENCE, AND TECHNOLOGY, INC., PBC

VOLK FIELD CRTC  
 JUNEAU COUNTY, WISCONSIN

FORMER RIFLE RANGE #5/RANGE #250 (SR503C)  
 SUMMARY OF RI RESULTS

PROJECT MGR <b>JMR</b>	DESIGNED BY <b>JRB</b>	DRAWN BY <b>JRM</b>	CHECKED BY <b>TR</b>	SCALE <b>AS SHOWN</b>	DATE <b>FEB. 2015</b>	PROJECT NO <b>6246608</b>	FIGURE <b>2-4</b>
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Based on data in the RI (Bay West 2015) lead concentrations in soil exceed the EPA RSL for residential soils (400 mg/kg) in approximately 410 cy across approximately 10,700 sqft of the MRS soil.

#### **2.1.4.4 Former Small Arms Range #251 (SR504)**

##### **MEC**

A visual survey was performed between firing points and target berms. No MEC was identified during the visual survey. Based on information in the RI (Bay West 2013) (Figure 2-5), approximately 0.1 acres requires removal of SAA.

##### **MC**

Based on data in the RI (Bay West 2015) (Figure 2-5) lead concentrations in soil exceed the EPA RSL for residential soils (400 mg/kg) in approximately 130 cy across approximately 6,900 sqft of the MRS soil.

#### **2.1.4.5 Former Mortar/Artillery Range (MU505)**

##### **MEC**

During the RI, approximately 3.1 acres of the 9.20 acre MRS were determined inaccessible due to slopes in excess of 30 degrees, including the essentially vertical face of the sandstone bluff. Surface clearance and analog surveys (mag and flag) were conducted over 6.1 acres with 10,667 anomalies found and flagged (approximately 1,750 anomalies per acre). The analog survey target locations are presented in Figure 2-6. A total of 1,067 (10%) of the anomalies were intrusively investigated. Three items were classified as UXO:

- One 75 mm MK I projectile, confirmed to be HE
- One partial 75 mm projectile with pusher plate and expelling charge intact
- One 37 mm Mk II projectile, confirmed to be HE.

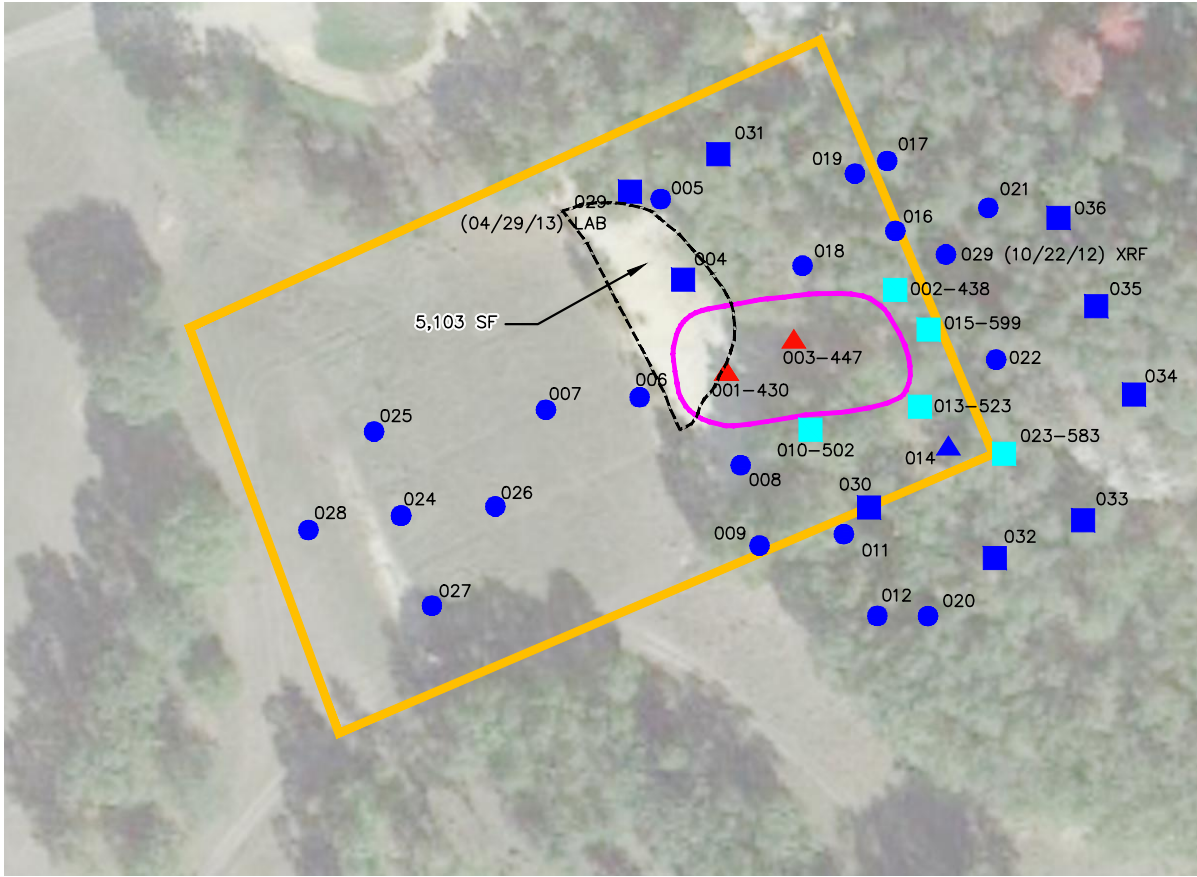
A total of 1,264 pounds of MD and 75 pounds of Non-munitions Related Debris (NMRD) were recovered. The MD was predominately fragments from munition items ranging from 37 mm to 155 mm projectiles. In the western end of the MRS, the MD was distributed with no apparent impact pattern. In the central and eastern portions of the MRS, distinct bands of MD were identified indicating the probable target line.

Based on information in the RI (Bay West 2015), approximately 6.1 acres requires subsurface clearance for MEC and MD.

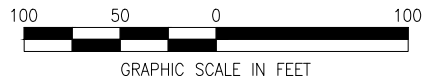
##### **MC**

No MC was identified.

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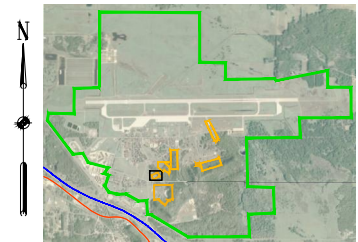


**LEGEND**

- MRS LOCATION
- MRS BOUNDARY
- INSTALLATION BOUNDARY
- SAA/MD EXTENT
- LEAD CONC. >400 mg/kg -- 0-6 inch

**XRF/ ANALYTICAL RESULTS**  
LEAD CONCENTRATIONS IN mg/kg

- ▲ ■ <LOD - 200
- XRF SAMPLE
- ▲ ■ 201 - 400
- ▲ DIRECT PUSH TECHNOLOGY SAMPLE
- ▲ ■ 401 - 600
- ANALYTICAL LAB RESULT
- ▲ ■ 601 +
- 008 SAMPLE IDENTIFICATION (NOT CONCENTRATION)



AERIAL IMAGE SOURCE: GOOGLE EARTH, (10/12/13). USDA FARM SERVICE AGENCY. [JANUARY 2014]

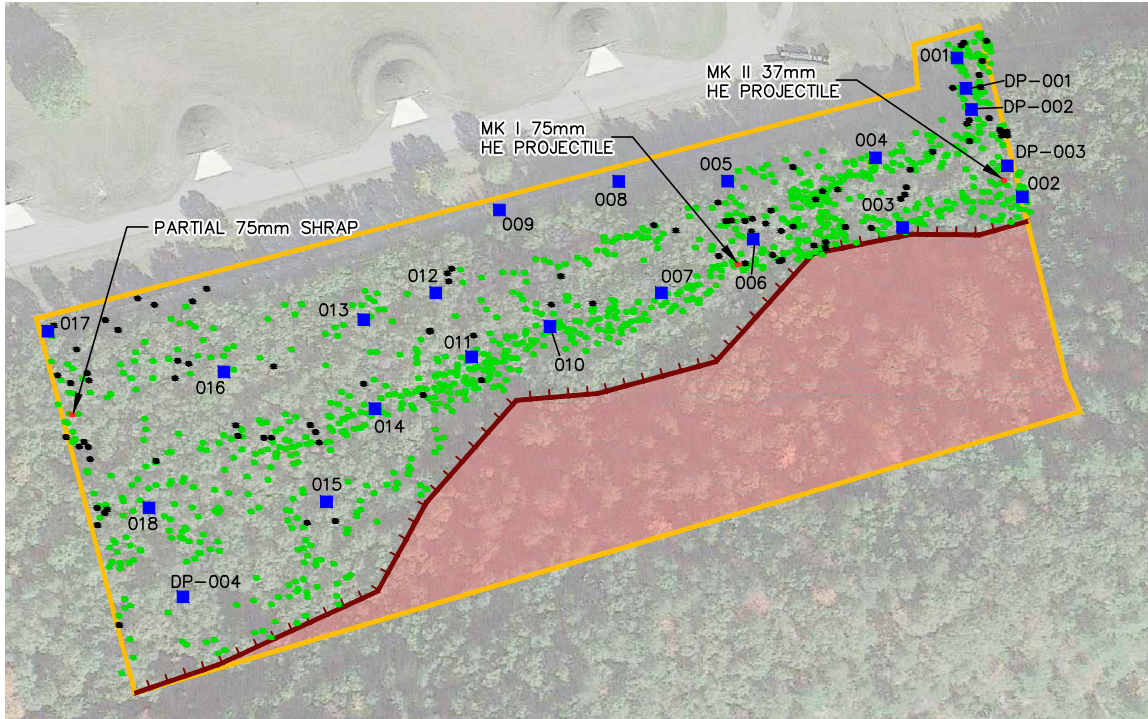
**EA** ENGINEERING, SCIENCE, AND TECHNOLOGY, INC., PBC

VOLK FIELD CRTC  
JUNEAU COUNTY, WISCONSIN

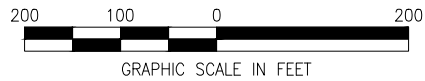
FORMER SMALL ARMS RANGE #251 (SR504)  
SUMMARY OF RI RESULTS

PROJECT MGR <b>JMR</b>	DESIGNED BY <b>JRB</b>	DRAWN BY <b>JRM</b>	CHECKED BY <b>TR</b>	SCALE <b>AS SHOWN</b>	DATE <b>FEB. 2015</b>	PROJECT NO <b>6246608</b>	FIGURE <b>2-5</b>
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DATE:02/18/2015 TIME:09:59 DRAWN BY: jmath



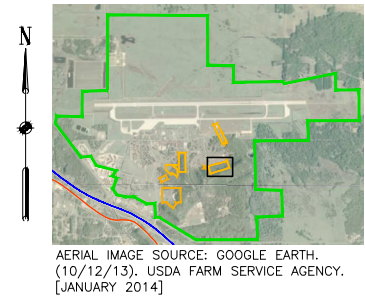
DATA SOURCE: BAY WEST RI, GIS FILES



**LEGEND**

- MRS LOCATION
- MRS BOUNDARY
- INSTALLATION BOUNDARY
- INACCESSIBLE AREA
- CLIFF FACE
- MD - MUNITIONS DEBRIS
- MEC - MUNITIONS & EXPLOSIVES OF CONCERN
- NMRD - NON MUNITIONS RELATED DEBRIS
- SOIL SAMPLE
- DP DEMOLITION PIT SAMPLE
- 008 SAMPLE IDENTIFICATION (NOT CONCENTRATION)

**NOTE:**  
NO SAMPLES IN THIS MRS CONTAINED LEAD CONCENTRATIONS GREATER THAN 400 mg/kg.



<b>EA ENGINEERING, SCIENCE, AND TECHNOLOGY, INC., PBC</b>			<b>VOLK FIELD CRTC</b> JUNEAU COUNTY, WISCONSIN			<b>FORMER MORTAR/ARTILLERY RANGE (MU505) ANALOG SURVEY RESULTS</b>		
PROJECT MGR	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	DATE	PROJECT NO	FIGURE	
JMR	JRB	JRM	TR	AS SHOWN	FEB. 2015	6246608	2-6	

#### **2.1.4.6 Former Small Arms Debris Area (SR506)**

##### **MEC**

The CSE Phase II Desktop Report indicated only SAA debris was present. A small quantity of SAA debris was identified, collected, and removed from the MRS, while a large amount of MD was identified during the visual survey. The RI was expanded to include a surface clearance and mag and flag survey of the accessible portion of the MRS. The Former Small Arms Debris Area is heavily forested with heavy leaf and duff cover prevalent throughout the MRS.

During the analog survey, a total of 684 subsurface anomalies were flagged, which equates to a density of approximately 1,800 anomalies per acre. A total of 69 anomalies (10%) were intrusively investigated. No MEC items were identified. However, 295 pounds of MD and 1 pound of NMRD was recovered. The MD was predominately fragments from 75 mm projectiles, but fragments from ordnance ranging from 37 mm up to 155 mm were also recovered. The MD was distributed across the entire MRS with no discernible impact patterns.

Based on information in the RI (Bay West 2015) (Figure 2-7), approximately 0.3 acres requires subsurface clearance for MEC and MD.

##### **MC**

Based on data in the RI (Bay West 2015), lead concentrations in soil exceed the EPA RSL for residential soils (400 mg/kg) in approximately 20 cy across approximately 1,100 sqft of the MRS soil.

#### **2.1.4.7 Potential Civil War Era Impact Area (MU507)**

##### **MEC**

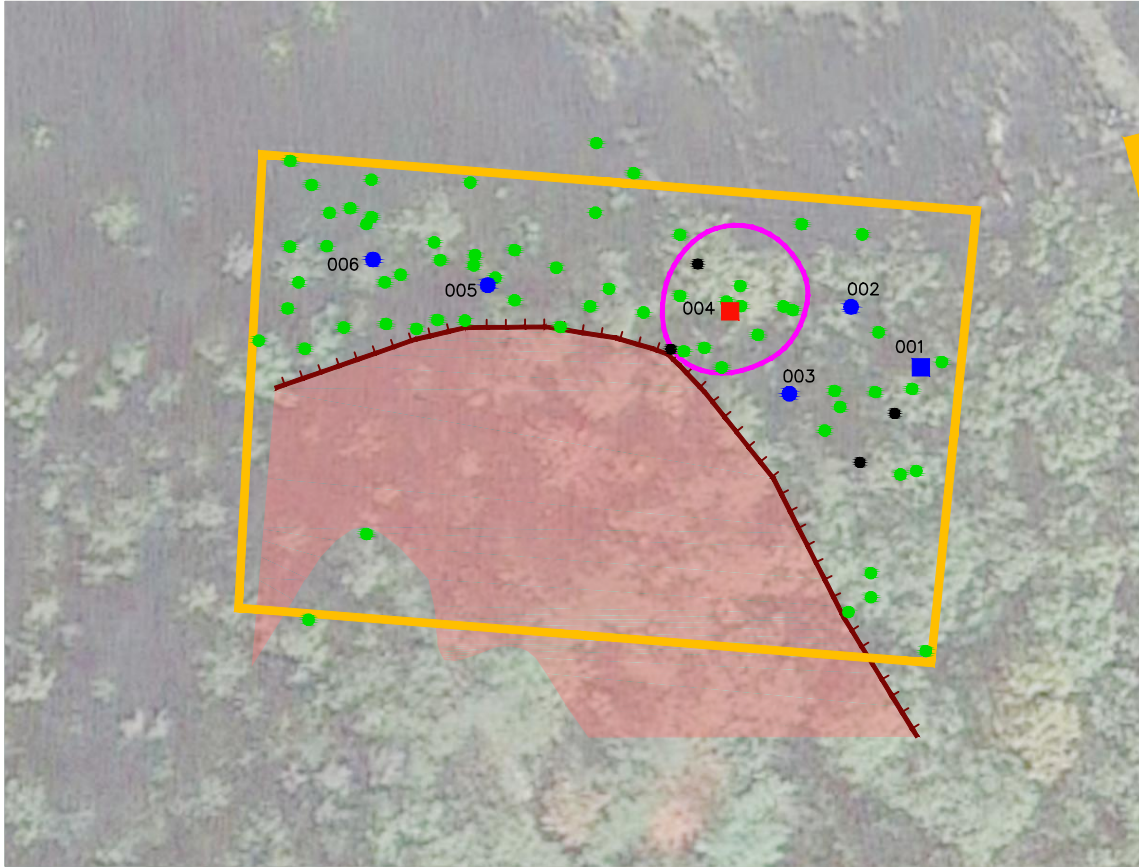
The Potential Civil War Era Impact Area is moderately heavy forest with moderate leaf and duff cover prevalent throughout the MRS. The terrain ranges from relatively flat to very steep.

An analog survey was conducted over approximately 8.1 acres with 5,038 anomalies flagged (approximately 620 anomalies per acre). A total of 504 (10%) anomalies were intrusively investigated. One potential MEC item was identified as an unfired Fuzed Practice 3-inch Stokes. After demolition, the item was confirmed to be a sand-filled practice round and was classified as discarded military munitions (DMM). In addition, 75 pounds of MD and 93 pounds of NMRD were removed from the MRS. The MD included fragments from ordnance items ranging from 75 mm to 155 mm projectiles. SAA debris and small MD items (i.e., grenade spoons) indicate the area was also used for small unit training exercises. The majority of the MD was clustered in distinct bands indicating possible target areas.

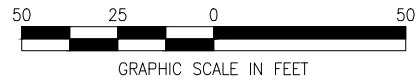
Except for the Hotchkiss projectile found during the CSE Phase I, no Civil War era munitions were encountered. No items or structures of historical significance have been identified.

Based on information in the RI (Bay West 2015) (Figure 2-8), approximately 8.1 acres requires subsurface clearance for MEC and MD.

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DATA SOURCE: BAY WEST RI, GIS FILES

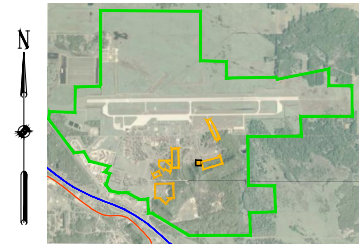


**LEGEND**

- MRS LOCATION
- MRS BOUNDARY
- INSTALLATION BOUNDARY
- INACCESSIBLE AREA
- CLIFF FACE
- MD - MUNITIONS DEBRIS
- NMRD - NON MUNITIONS RELATED DEBRIS
- LEAD CONC. >400 mg/kg (0-6 INCHES)

**XRF/ ANALYTICAL RESULTS**  
 LEAD CONCENTRATIONS IN mg/kg

- <LOD - 200
- 201 - 400
- 401 - 600
- 601 +
- XRF SAMPLE
- DIRECT PUSH TECHNOLOGY SAMPLE
- ANALYTICAL LAB RESULT
- 008 SAMPLE IDENTIFICATION (NOT CONCENTRATION)



AERIAL IMAGE SOURCE: GOOGLE EARTH. (10/12/13). USDA FARM SERVICE AGENCY. [JANUARY 2014]

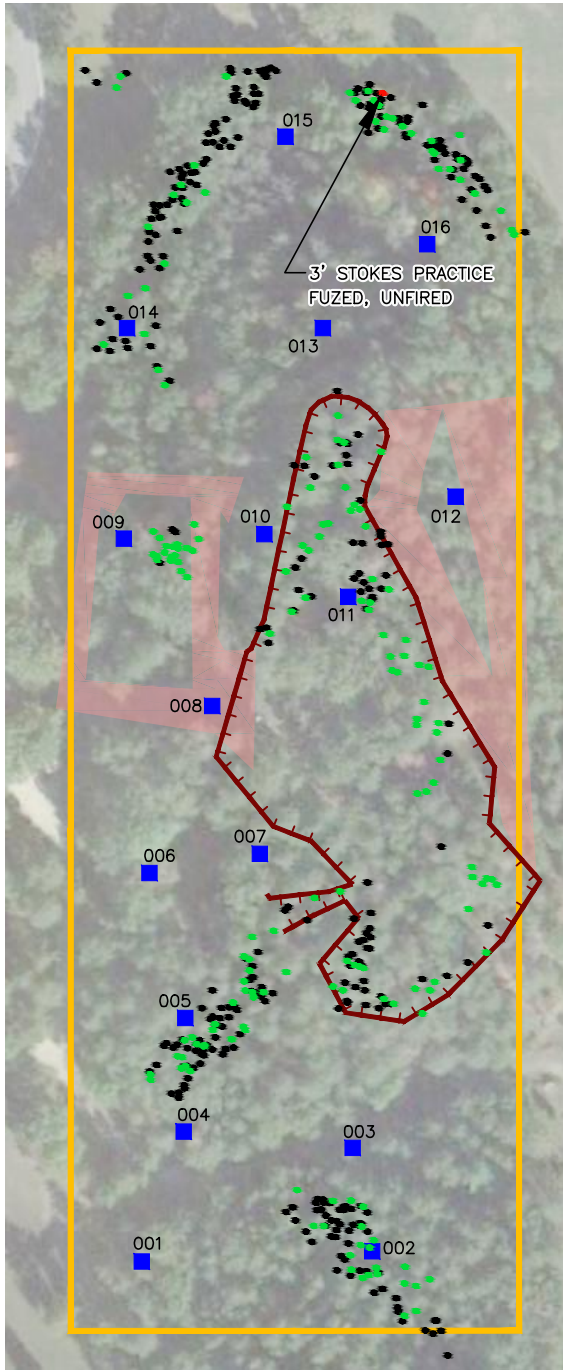


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 JUNEAU COUNTY, WISCONSIN

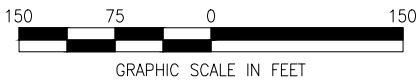
FORMER SMALL ARMS DEBRIS  
 AREA (SR506)  
 ANALOG SURVEY RESULTS

PROJECT MGR <b>JMR</b>	DESIGNED BY <b>JRB</b>	DRAWN BY <b>JRM</b>	CHECKED BY <b>TR</b>	SCALE <b>AS SHOWN</b>	DATE <b>FEB. 2015</b>	PROJECT NO <b>6246608</b>	FIGURE <b>2-7</b>
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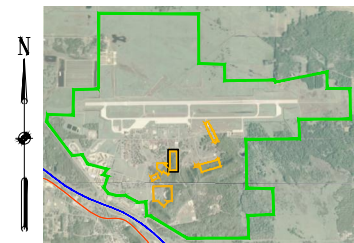


DATA SOURCE: BAY WEST RI, GIS FILES



**LEGEND**

- MRS LOCATION
- MRS BOUNDARY
- INSTALLATION BOUNDARY
- INACCESSIBLE AREA
- CLIFF FACE
- MD - MUNITIONS DEBRIS
- MEC - MUNITIONS & EXPLOSIVES OF CONCERN
- NMRD - NON MUNITIONS RELATED DEBRIS
- SOIL SAMPLE
- 008 SAMPLE IDENTIFICATION (NOT CONCENTRATION)



AERIAL IMAGE SOURCE: GOOGLE EARTH, (10/12/13), USDA FARM SERVICE AGENCY. [JANUARY 2014]



VOLK FIELD CRT  
 JUNEAU COUNTY, WISCONSIN

POTENTIAL CIVIL WAR ERA IMPACT  
 AREA (MU507)  
 ANALOG SURVEY RESULTS

PROJECT MGR <b>JMR</b>	DESIGNED BY <b>JRB</b>	DRAWN BY <b>JRM</b>	CHECKED BY <b>TR</b>	SCALE <b>AS SHOWN</b>	DATE <b>FEB. 2015</b>	PROJECT NO <b>6246608</b>	FIGURE <b>2-8</b>
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## **MC**

No MC was identified.

### **2.1.5 NPL Status**

The MRSs at Volk Field have not been proposed for the National Priority List (NPL), and a Hazard Ranking System (HRS) rating has not been calculated.

### **2.2 Other Actions to Date**

No other actions have been taken to date.

### **2.3 State and Local Authorities' Role**

None.

#### **2.3.1 State and Local Actions to Date**

None.

#### **2.3.2 Potential for Continued State/Local Response**

None.



### **3. THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES**

As required in EPA Guidance (EPA 2009) this section discusses only those threats that will be addressed by this IRA.

#### **3.1 Actual or Potential Exposure to Nearby Human Populations, Animals, or the Food Chain from Hazardous Substances or Pollutants or Contaminants**

Lead and MEC pose an exposure risk for construction workers, recreational users and future residential populations.

##### **3.1.1 MEC Exposure Conclusions**

A MEC investigation was performed during the RI. MEC was confirmed at the Former Rifle Range #5/Range #250 (SR503c) (40 mm grenade), Former Mortar/Artillery Range (MU505) (75-mm HE and 37 mm HE), and Potential Civil War Era Impact Area (MU507) (3-inch practice stokes). There is a complete MEC exposure pathway on the surface for all receptors (construction worker, trespasser, and future resident), a complete MEC exposure pathway in the subsurface for the construction worker and future resident, and an incomplete MEC exposure pathway in the subsurface for the recreational user at these MRSs.

Evidence of historical munitions use was identified at the Firing-in-Buttress #1 (FR501) and the Former Small Arms Debris Area (SR506). The MEC exposure pathway on the surface for all receptors is potentially complete at these MRSs. The MEC exposure pathway in the subsurface is potentially complete for the construction worker and future resident and incomplete for the recreational user at these MRSs.

No evidence of MEC was identified at the Former Machine Gun Range/Range #1 (SR503) and the Former Small Arms Range #251 (SR504) and therefore, the pathways for potential MEC exposure are considered incomplete for all receptors at these MRSs.

##### **3.1.2 MC Exposure Conclusions**

Lead concentrations in surface soil exceeding screening levels for residential soil were identified at Former Rifle Range #1/Machine Gun Range (SR503), Former Rifle Range #5/Range #250 (SR503c), Former Small Arms Range #251 (SR504), and Former Small Arms Debris Area (SR506). The exposure pathway is potentially complete for exposure to MC in surface soil for all receptors (construction worker, trespasser, future resident, and biota) at these MRSs.

No MC was detected at the Former Mortar/Artillery Range (MU505) and Potential Civil War Era Impact Area (MU507). However, MEC and MD have been identified at these MRSs and therefore, the pathway for MC exposure is considered potentially complete at these MRSs. During the IRA if compromised MEC is identified with exposed explosives or a high munitions use area is identified (i.e., a disposal pit), the soil immediately beneath the MEC or high use area will be sampled. In the event the MEC item is unacceptable to move, an MC soil sample will be collected following demolition, once the UXOSO has confirmed it is safe to sample.

**3.2 Actual or Potential Contamination of Drinking Water Supplies or Sensitive Ecosystems**

None.

**3.3 Hazardous Substances or Pollutants or Contaminants in Drums, Barrels, Tanks, or Other Bulk Storage Containers, That May Pose a Threat of a Release**

None.

**3.4 High Levels of Hazardous Substances or Pollutants or Contaminants in Soils Largely at or Near the Surface That May Migrate**

None.

**3.5 Weather Conditions That May Cause Hazardous Substances or Pollutants or Contaminants to Migrate or be Released**

Rainfall will contact the lead source contamination and potentially migrate through runoff.

Freeze and thaw cycles of the soil may cause MEC to migrate to the surface.

**3.6 Threat of Fire or Explosion**

Available information indicates the known presence or potential for MEC to be located at Former Firing-In-Buttress #1 (FR501), Former Rifle Range #5 / Range #250 (SR503), Former Small Arms Debris Area (SR506), Former Mortar/Artillery Range (MU505), and Potential Civil War Era Impact Area (MU507).

**3.7 The Availability of Other Appropriate Federal or State Response Mechanisms to Respond to the Release**

None.

**3.8 Other Situations or Factors That May Pose Threats to Public Health or Welfare of the United States or the Environment**

None.

#### **4. ENDANGERMENT DETERMINATION**

Not required for this response action under DoD authority.

## 5. PROPOSED ACTIONS AND ESTIMATED COSTS

The scope of this IRA is to remove MEC, MD, and lead contaminated soil from the accessible areas of the seven MRSs addressed in this AM to allow for future residential land use. MRS removal action objectives (RAOs) are summarized in Table 5-1.

**Table 5-1: Removal Action Objectives**

MRS	Total Acreage	RA Objective(s)
Firing-in-Buttress #1 (FR501)	5.00	<ul style="list-style-type: none"> <li>Remove potential MEC and MD by excavating and sifting soil from berm within structure (approximately 0.5 acres).</li> </ul>
Former Rifle Range #1/Machine Gun Range (SR503)	2.50	<ul style="list-style-type: none"> <li>Remove MD (including SAA) by excavating and sifting soil from the impact area (approximately 0.8 acres).</li> <li>Remove soil exceeding 400 mg/kg lead from the impact area.</li> </ul>
Former Rifle Range #5/Range #250 (SR503c)	2.50	<ul style="list-style-type: none"> <li>Remove MEC and MD (including SAA and MD from 40 mm grenades) via mag and dig (approximately 0.6 acres).</li> <li>Remove MEC and MD from the rock face by blowing it off with air or mechanically sweeping soil and debris off the bluff towards the impact area.</li> <li>Remove MEC and MD by excavating and sifting soil from the impact area (approximately 0.5 acres).</li> <li>Remove soil exceeding 400 mg/kg lead from the impact area (approximately 0.5 acres).</li> </ul>
Former Small Arms Range #251 (SR504)	13.20	<ul style="list-style-type: none"> <li>Remove MD (including SAA) from the impact area by excavating and sifting soil from the impact area (approximately 0.1 acres).</li> <li>Remove soil exceeding 400 mg/kg lead from the impact area.</li> </ul>
Former Mortar/Artillery Range (MU505) (Excluding inaccessible areas)	9.20 (accessible areas to include 6.1 acres)	<ul style="list-style-type: none"> <li>Remove surface and subsurface MEC and MD from accessible areas of the MRS via mag and dig.</li> </ul>

**Table 5-1: Removal Action Objectives (Continued)**

MRS	Total Acreage	RA Objective(s)
Former Small Arms Debris Area (SR506) (Excluding inaccessible areas)	0.48 (accessible areas to include 0.28 acres)	<ul style="list-style-type: none"> <li>• Remove potential surface and subsurface MEC and MD from accessible areas of the MRS via mag and dig.</li> <li>• Excavate and remove soil exceeding 400 mg/kg lead.</li> </ul>
Potential Civil War Era Impact Area (MU507) (Excluding inaccessible areas)	8.60 (accessible areas to include 8.1 acres)	<ul style="list-style-type: none"> <li>• Remove surface and subsurface MEC and MD from accessible areas of the MRS via mag and dig.</li> </ul>

## 5.1 Proposed Actions

The Engineering Evaluation/Cost Analysis (EE/CA) (EA 2015) recommended an IRA that will utilize standard soil excavation, armored soil excavation, sifting, stabilization, recycling and disposal operating procedures as the only feasible solution for mitigating threats posed by the situation.

### 5.1.1 Proposed Action Description

#### 5.1.1.1 Interim Removal Action Work Plan

An IRA Work Plan will be developed to describe the goals, methods, procedures, and personnel used for field activities. The work plan will be reviewed by the project team and stakeholders.

#### 5.1.1.2 Coordination of Removal Action

Before the removal action field activities commence, the project team will coordinate activities with Volk Field in order to minimize disruptions and/or impacts to ongoing activities.

#### 5.1.1.3 MEC

The IRA includes surface clearance, subsurface MEC/MD mag and dig removal, and subsurface MEC, MD, and/or SAA sifting removal. Figures 5-1 to 5-7 present the areas where the different types of removal actions will occur at each MRS.

If compromised MEC is identified with exposed explosives or a high munitions use area is identified (i.e., a disposal pit), the soil immediately beneath the MEC or high use area will be sampled. In the event the MEC item is unacceptable to move, an MC soil sample will be collected following demolition, once the UXOSO has confirmed it is safe to sample. If MEC requires demolition, following demolition one discrete soil sample will be collected from underlying surface soils (0 to 6 inches) within the center of the demolition area footprint, and analyzed for explosives using USEPA Method SW-846 8330B. Analytical results will be screened against USEPA residential soil Regional Screening Levels (RSLs) for explosives. If concentrations of explosives exceed screening values in the confirmation soil sample, then an

additional soil sample will be collected and analyzed for explosives. If the second sample concentrations still exceed screening values, then soil will be dug and sampled/analyzed in 6-inch depth intervals. This process will continue until concentrations of confirmation soil samples are below screening values. The removed soil will be containerized and disposed offsite as solid waste, in accordance with State regulations.

The IRA includes the following tasks for each MRS to address potential MEC contamination:

**Former Firing-in-Buttress #1 (FR501)**

- Excavation and subsurface sifting clearance of the impact berm in the FIB #1 structure (approximately 400 cy)
- MEC and/or MD will be removed from the soil in the berm via sifting
- FIB #1 Structure will remain.

**Former Rifle Range #1/Machine Gun Range (SR503)**

- Delineate impact area
- Clear trees as needed
- Visual surface clearance over 0.8 acres
- Excavation and subsurface sifting clearance over 0.8 acres
- MD (including SAA) will be removed via sifting.

**Former Rifle Range #5/Range #250 (SR503c)**

- Delineate impact area
- Clear trees as needed
- Blow soil and debris off rock face bluff towards the impact area for sifting
- Visual surface clearance over 0.5 acres
- Excavation and subsurface sifting clearance over 0.5 acres
- Subsurface mag and dig clearance over 0.6 acres
- MEC and/or MD (including SAA) will be removed via sifting.

**Former Small Arms Range #251 (SR504)**

- Delineate impact area
- Clear trees as needed
- Visual surface clearance over 0.3 acres
- Excavation and subsurface sifting clearance over 0.1 acres
- MD (including SAA) will be removed via sifting.

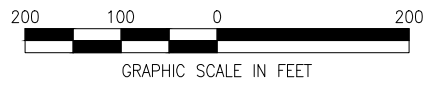
**Former Mortar/Artillery Range (MU505)**

- Surface and subsurface mag and dig clearance over 6.1 acres
- MEC and/or MD will be removed.





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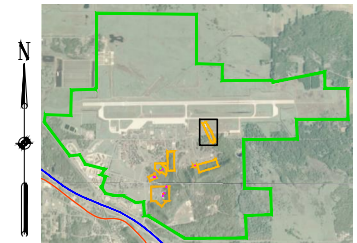


DATA SOURCE: BAY WEST RI, GIS FILES



**LEGEND**

-  MRS LOCATION
-  MRS BOUNDARY
-  INSTALLATION BOUNDARY
-  SOIL SIFTING AREA



AERIAL IMAGE SOURCE: GOOGLE EARTH, (10/12/13). USDA FARM SERVICE AGENCY. [JANUARY 2014]

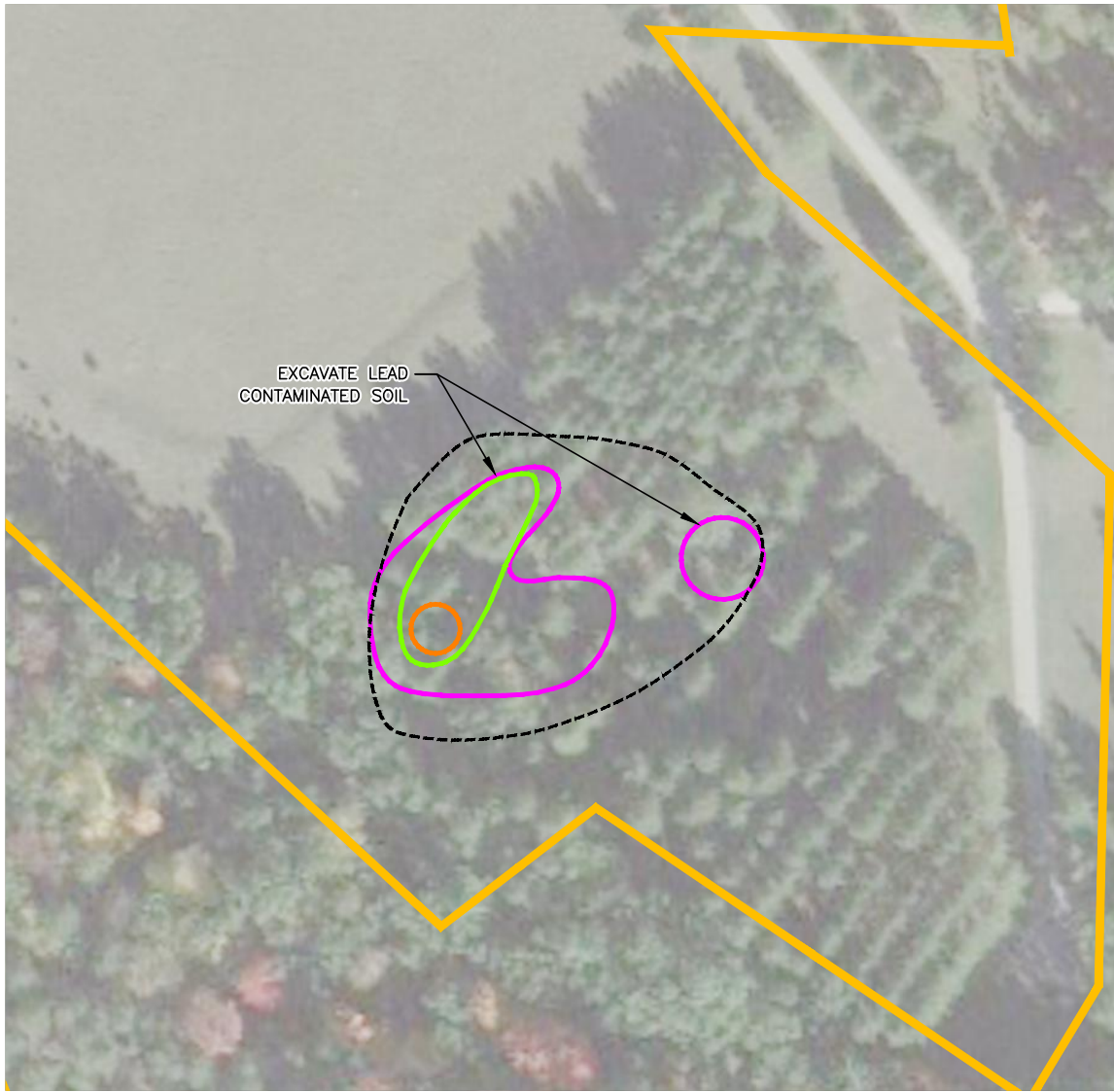


VOLK FIELD CRTS  
JUNEAU COUNTY, WISCONSIN

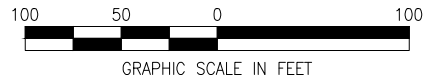
FORMER FIRING-IN-BUTRESS #1 (FR501)  
INTERIM REMOVAL ACTION

PROJECT MGR <b>JMR</b>	DESIGNED BY <b>JRB</b>	DRAWN BY <b>JRM</b>	CHECKED BY <b>TR</b>	SCALE <b>AS SHOWN</b>	DATE <b>FEB. 2015</b>	PROJECT NO <b>6246608</b>	FIGURE <b>5-1</b>
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DRAWING NAME: F:\Federal\DOT\USACE\PROJECTS\6246608 Volk Field IRA\C - Figures\CAD\Action Memo Figures.dwg  
DATE: 02/18/2015 TIME: 09:59 DRAWN BY: jmather

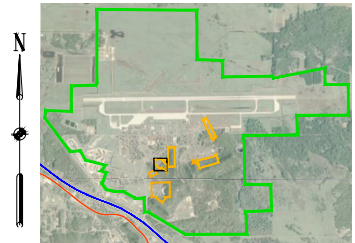


DATA SOURCE: BAY WEST RI, GIS FILES



**LEGEND**

- MRS LOCATION
- MRS BOUNDARY
- INSTALLATION BOUNDARY
- SOIL SIFTING AREA
- LEAD CONC. >400 mg/kg -- 0-6 INCH
- LEAD CONC. >400 mg/kg -- 6-12 INCH
- LEAD CONC. >400 mg/kg -- 12-48 INCH



AERIAL IMAGE SOURCE: GOOGLE EARTH, (10/12/13), USDA FARM SERVICE AGENCY. [JANUARY 2014]



**EA ENGINEERING,  
SCIENCE, AND  
TECHNOLOGY, INC., PBC**

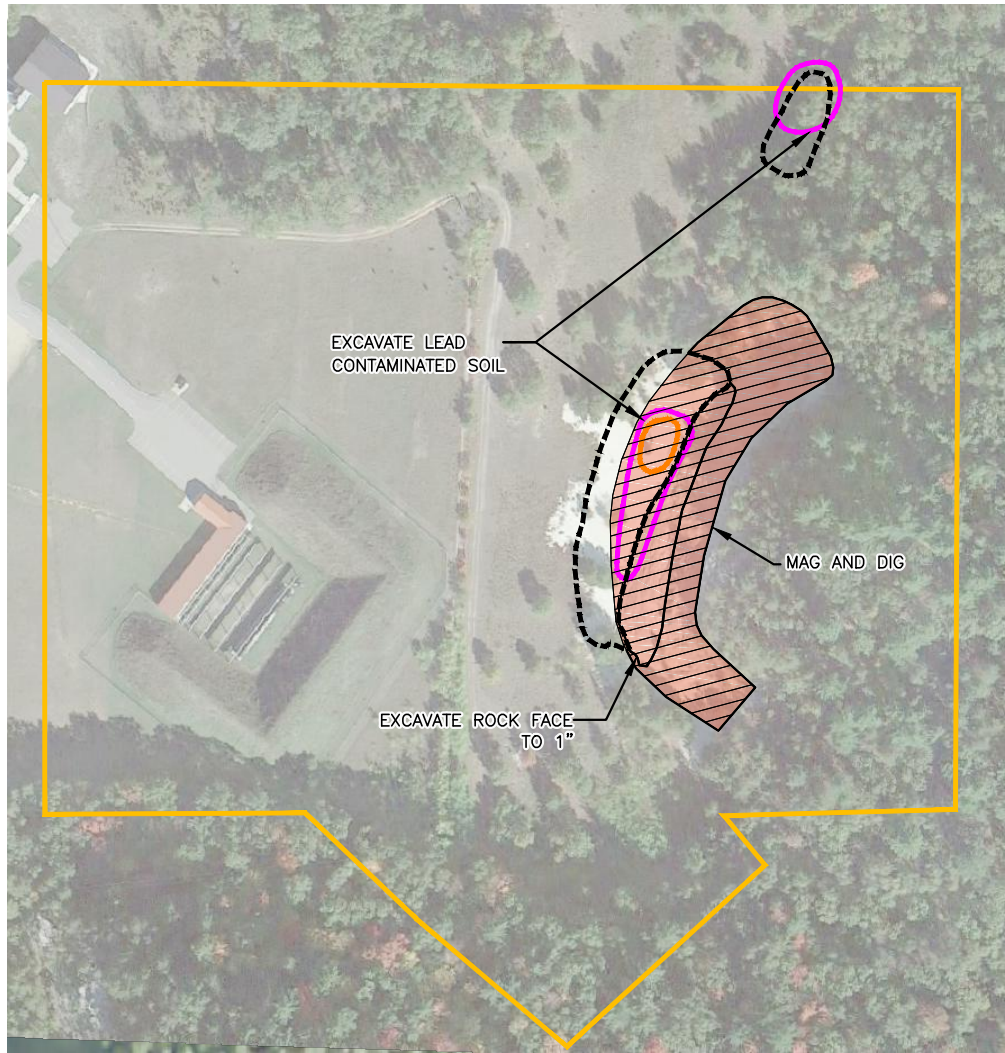
VOLK FIELD CRTC  
JUNEAU COUNTY, WISCONSIN

**FORMER RIFLE RANGE #1/MACHINE  
GUN RANGE (SR503)  
INTERIM REMOVAL ACTION**

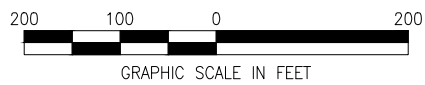
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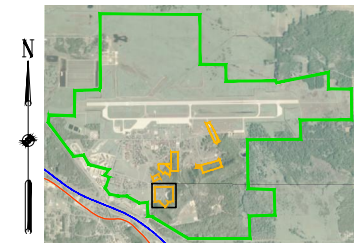


DATA SOURCE: BAY WEST RI, GIS FILES



**LEGEND**

- MRS LOCATION
- MRS BOUNDARY
- INSTALLATION BOUNDARY
- SOIL SIFTING AREA
- EXPLOSIVE HAZARD AREA BOUNDARY (NOT FULLY INVESTIGATED)
- LEAD CONC.>400 mg/kg -- 0-6 INCH
- LEAD CONC.>400 mg/kg -- 0-48 INCH



AERIAL IMAGE SOURCE: GOOGLE EARTH. (10/12/13). USDA FARM SERVICE AGENCY. [JANUARY 2014]



VOLK FIELD CRTC  
 JUNEAU COUNTY, WISCONSIN

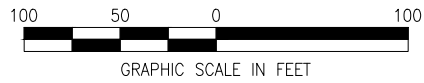
FORMER RIFLE RANGE #5/RANGE #250 (SR503C)  
 INTERIM REMOVAL ACTION

PROJECT MGR <b>JMR</b>	DESIGNED BY <b>JRB</b>	DRAWN BY <b>JRM</b>	CHECKED BY <b>TR</b>	SCALE <b>AS SHOWN</b>	DATE <b>FEB. 2015</b>	PROJECT NO <b>6246608</b>	FIGURE <b>5-3</b>
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DATE:02/18/2015 TIME:09:59 DRAWN BY: jmather

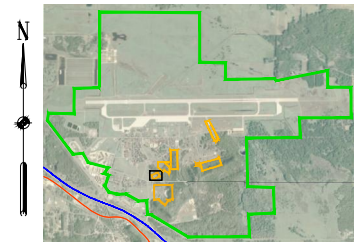


DATA SOURCE: BAY WEST RI, GIS FILES



**LEGEND**

- MRS LOCATION
- MRS BOUNDARY
- INSTALLATION BOUNDARY
- SOIL SIFTING AREA
- LEAD CONC.>400 mg/kg -- 0-6 INCH



AERIAL IMAGE SOURCE: GOOGLE EARTH.  
(10/12/13). USDA FARM SERVICE AGENCY.  
[JANUARY 2014]

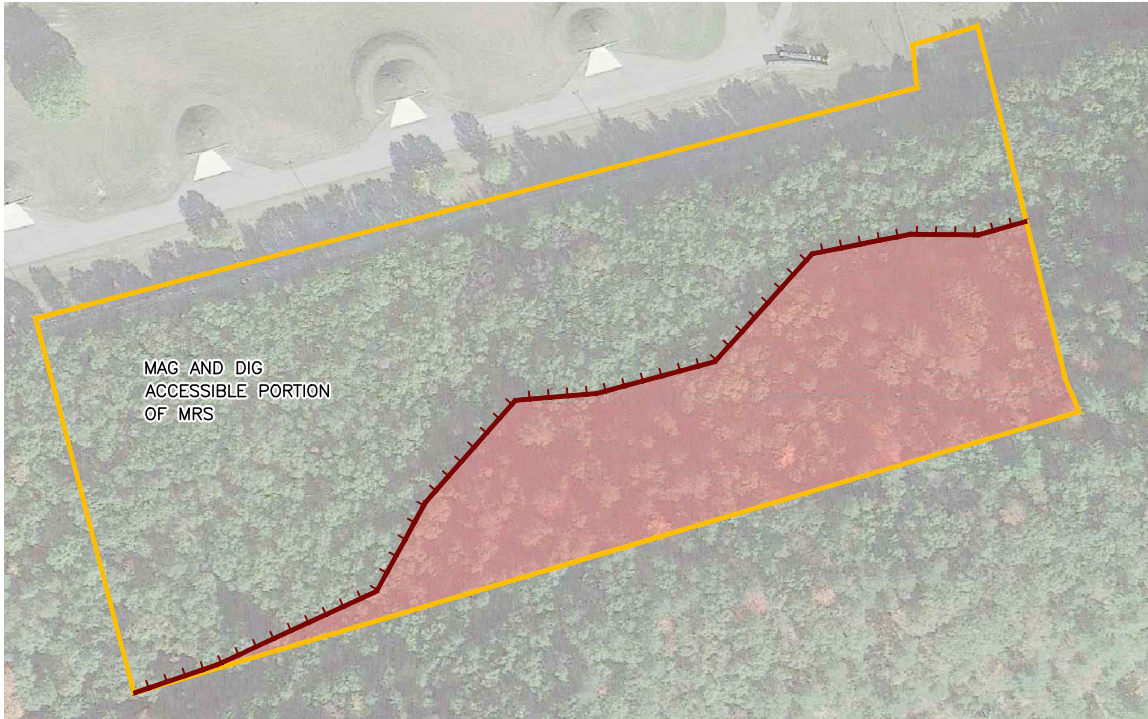


VOLK FIELD CRTC  
JUNEAU COUNTY, WISCONSIN

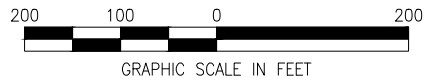
FORMER SMALL ARMS  
RANGE #251 (SR504)  
INTERIM REMOVAL ACTION

PROJECT MGR <b>JMR</b>	DESIGNED BY <b>JRB</b>	DRAWN BY <b>JRM</b>	CHECKED BY <b>TR</b>	SCALE <b>AS SHOWN</b>	DATE <b>FEB. 2015</b>	PROJECT NO <b>6246608</b>	FIGURE <b>5-4</b>
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 DATE:02/18/2015 TIME:09:59 DRAWN BY: jmath

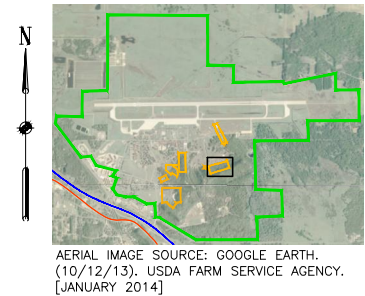


DATA SOURCE: BAY WEST RI, GIS FILES



**LEGEND**

-  MRS LOCATION
-  MRS BOUNDARY
-  INSTALLATION BOUNDARY
-  INACCESSIBLE AREA
-  CLIFF FACE

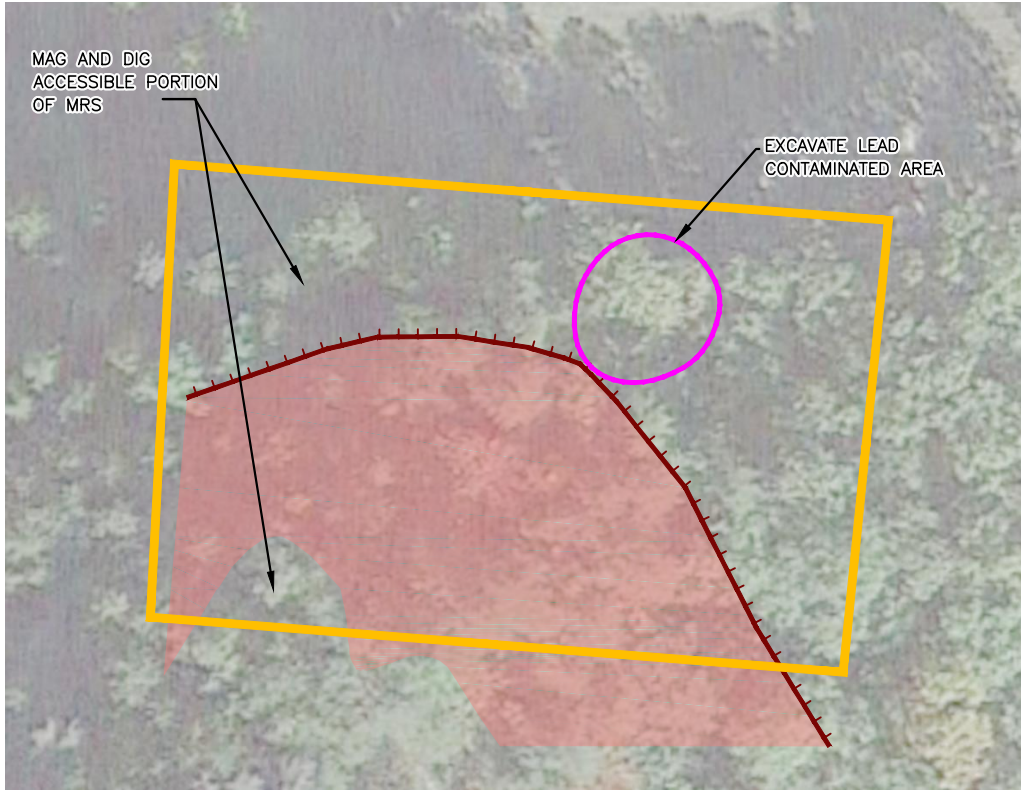


VOLK FIELD CRTC  
 JUNEAU COUNTY, WISCONSIN

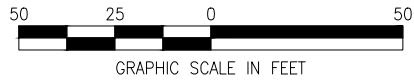
FORMER MORTAR/ARTILLERY  
 RANGE (MU505)  
 INTERIM REMOVAL ACTION

PROJECT MGR <b>JMR</b>	DESIGNED BY <b>JRB</b>	DRAWN BY <b>JRM</b>	CHECKED BY <b>TR</b>	SCALE <b>AS SHOWN</b>	DATE <b>FEB. 2015</b>	PROJECT NO <b>6246608</b>	FIGURE <b>5-5</b>
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





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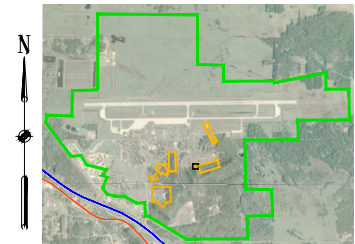


DATA SOURCE: BAY WEST RI, GIS FILES



**LEGEND**

-  MRS LOCATION
-  MRS BOUNDARY
-  INSTALLATION BOUNDARY
-  CLIFF FACE
-  INACCESSIBLE AREA
-  LEAD CONC. >400 mg/kg -- 0-6 INCH



AERIAL IMAGE SOURCE: GOOGLE EARTH. (10/12/13). USDA FARM SERVICE AGENCY. [JANUARY 2014]



VOLK FIELD CRTC  
 JUNEAU COUNTY, WISCONSIN

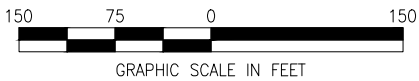
FORMER SMALL ARMS DEBRIS  
 AREA (SR506)  
 INTERIM REMOVAL ACTION

PROJECT MGR <b>JMR</b>	DESIGNED BY <b>JRB</b>	DRAWN BY <b>JRM</b>	CHECKED BY <b>TR</b>	SCALE <b>AS SHOWN</b>	DATE <b>FEB. 2015</b>	PROJECT NO <b>6246608</b>	FIGURE <b>5-6</b>
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




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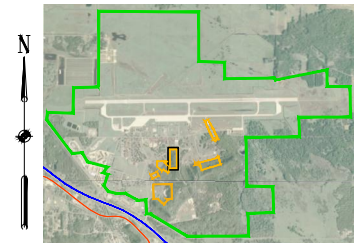


DATA SOURCE: BAY WEST RI, GIS FILES



**LEGEND**

-  MRS LOCATION
-  MRS BOUNDARY
-  INSTALLATION BOUNDARY
-  INACCESSIBLE AREA
-  CLIFF FACE



AERIAL IMAGE SOURCE: GOOGLE EARTH, (10/12/13), USDA FARM SERVICE AGENCY. [JANUARY 2014]



VOLK FIELD CRTC  
 JUNEAU COUNTY, WISCONSIN

POTENTIAL CIVIL WAR ERA IMPACT  
 AREA (MU507)  
 INTERIM REMOVAL ACTION

PROJECT MGR <b>JMR</b>	DESIGNED BY <b>JRB</b>	DRAWN BY <b>JRM</b>	CHECKED BY <b>TR</b>	SCALE <b>AS SHOWN</b>	DATE <b>FEB. 2015</b>	PROJECT NO <b>6246608</b>	FIGURE <b>5-7</b>
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### **Former Small Arms Debris Area (SR506)**

- Delineate impact area
- Clear trees as needed
- Surface and subsurface mag and dig clearance over 0.28 acres
- MEC and/or MD will be removed.

### **Potential Civil War Era Impact Area (MU507)**

- Surface and subsurface mag and dig clearance over 8.1 acres
- MEC and/or MD will be removed.

During the surface clearance, visible MPPEH will be inspected and removed from the ground surface, where feasible. If MEC is identified, it will be disposed of through open detonation on-site. MD will remain in place and will later be removed by sifting excavated soils during the subsurface sifting clearance, or during subsurface mag and dig clearance. MD will be moved to a central location, within the MRS, for shipping to a recycling facility.

Previous MEC investigations have not been conducted at Former Rifle Range #5/Range #250, due to the high volume of MEC anticipated in this MRS. At Former Rifle Range #5/Range #250, UXO Technicians will conduct an analog magnetometer assisted delineation to identify the limits of the impact area prior to removing MEC and/or MD.

The mag and dig approach will be used to conduct a subsurface clearance at Former Mortar/Artillery Range, Potential Civil War Era Impact Area, Former Rifle Range #5/Range #250, and the Former Small Arms Debris Area. If MEC is identified, it will be detonated on-site. Post-BIP sampling for MC explosives will be conducted. Inspected and certified MD will be moved to a central location, within the MRS, for shipping as Material Documented as Safe (MDAS) to a recycling facility.

Subsurface sifting clearance at FIB #1, Former Rifle Range #1/Machine Gun Range, Former Small Arms Range #251, and Former Rifle Range #5/Range #250 will be accomplished by excavating, and sifting to remove MEC and/or MD. If MEC is identified, it will be detonated on-site. After sifting at the Former Rifle Range #1/Machine Gun Range, Former Small Arms Range #251, and Former Rifle Range #5/Range #250, the soil will be consolidated within the MRS for further evaluation of lead contamination. After sifting at FIB #1, the soil will be consolidated within the MRS and left in place. Inspected and certified MD will be moved to a central location, within the MRS, for shipping as MDAS to a recycling facility.

#### **5.1.1.4 MC (Lead Contaminated Soil)**

After MEC and/or MD and/or SAA has been removed from Former Small Arms Debris Area, Former Rifle Range #5/Range #250, Former Rifle Range #1/Machine Gun Range, and Former Small Arms Range #251, these MRSs will undergo remediation for lead contaminated soil. Lead contaminated soil exceeding 400 mg/kg for total lead will be disposed of off-site after Toxicity Characteristic Leaching Procedure (TCLP) testing. Figures 5-2 to 5-5 present the proposed excavation areas and depths for each MRS prior to subsurface sifting clearances.

Based on previous lead sampling and analysis, limits of lead contamination will be identified and additional lead analysis may be conducted to refine the limits within the four MRSs requiring lead remediation. The lead contaminated soil will be excavated, stabilized (if needed to pass

TCLP), and disposed of at an off-site landfill. Excavated soil will be consolidated within the Area of Contamination (AOC). It is assumed that the contaminated soil will not be a characteristic hazardous waste (i.e., TCLP lead  $\leq 5.0$  mg/L) after stabilization within the AOC.

Where applicable, stabilization will be conducted using an industry accepted and proven stabilizer product for lead contaminated soils (a phosphate-based reagent or equivalent). The stabilizer will be blended into the soil piles using earth moving equipment (i.e. loader or excavator). Prior to on-site stabilization activities, testing of potential stabilization products will be conducted using samples of site soil to evaluate the effectiveness of the stabilizers and determine the appropriate product given the local soil conditions (i.e., soil type, lead concentrations, pH, etc.).

The IRA includes the following tasks for each MRS to address potential MC contamination:

**Former Rifle Range #1/Machine Gun Range (SR503)**

- Replace sifted soil with total lead concentrations less than 400 mg/kg
- Excavate ~360 cy from ~12,200 sqft of the MRS soil
- Stabilize (if needed), and dispose of soil with lead concentrations equal to or greater than 400 mg/kg.

**Former Rifle Range #5/Range #250 (SR503c)**

- Replace sifted soil with total lead concentrations less than 400 mg/kg
- Excavate ~410 cy from ~10,700 sqft of the MRS soil
- Stabilize (if needed), and dispose of soil with lead concentrations equal to or greater than 400 mg/kg.

**Former Small Arms Range #251(SR504)**

- Replace sifted soil with total lead concentrations less than 400 mg/kg
- Excavate ~130 cy from ~6,900 sqft of the MRS soil
- Stabilize (if needed), and dispose of soil with lead concentrations equal to or greater than 400 mg/kg.

**Former Small Arms Debris Area (SR506)**

- Replace soil with total lead concentrations less than 400 mg/kg
- Excavate ~20 cy from ~1,100 sqft of the MRS soil
- Stabilize (if needed), and dispose of soil with lead concentrations equal to or greater than 400 mg/kg.

Lead confirmation samples will be analyzed to verify excavation operations removed the lead contaminated soil exceeding the Wisconsin Not-to-Exceed Non-Industrial Direct Contact (DC) Residual Contaminant Level (RCL) of 400 mg/kg. Average excavation depths are minimal and range from 6 to 10 inches. Excavated areas will be blended to existing topography to the extent practical to minimize the need for backfill. If backfill is required where lead contaminated soil was excavated, clean fill from off-site sources will be used. Soil that is excavated from outside areas determined to have lead above 400 mg/kg and sifted to remove MD and SAA may be

returned to the excavations from which they originated, after laboratory testing confirmation. Disturbed areas will be restored to approximate pre-IRA conditions. Tree clearing is considered minimal and will not require reforestation.

### **5.1.2 Contribution to Remedial Performance**

#### **5.1.2.1 MEC**

No further action (at the accessible areas) is required if the proposed removal action achieves the removal action objectives (RAOs).

#### **5.1.2.2 MC**

No further action is required to remediate soil for residential use if the proposed removal action achieves the RAOs.

### **5.1.3 Engineering Evaluation/Cost Analysis**

An EE/CA was conducted to evaluate three alternative removal actions (EA 2015). A public comment period was advertised and held from 15 March 2015 through 15 April 2015. A copy of the EE/CA report was provided for public review at the Hatch Memorial Library in Mauston, WI; no comments were received. Alternative 3 was the recommended removal action in the EE/CA report and is discussed in Section 5.1.1. The remaining two Alternatives are summarized below.

#### **5.1.3.1 Alternative One: No Action**

Alternative 1 assumes no action would be implemented. This alternative is required by the NCP and serves as a baseline against which other alternatives are compared.

#### **5.1.3.2 Alternative Two: Land Use Controls**

Alternative 2 includes Land Use Controls (LUCs) to protect potential receptors by restricting future land use. LUCs are used to limit risk by controlling exposure to MEC, MD, and lead contaminated soil using institutional or engineering controls. These controls would include deed restrictions limiting the use of properties, fences, signs, or other physical barriers to limit access to a contaminated site; and maintenance agreements or advisories issued to the public notifying them of the risks associated with contacting contaminated media. As part of LUCs, five-year reviews would be performed to ensure the LUCs remain effective to protect potential receptors. It was assumed five-year reviews would be conducted for 30 years and minimal maintenance would be required on fencing.

### **5.1.4 Applicable or Relevant and Appropriate Requirements**

Applicable or Relevant and Appropriate Requirements (ARARs) require an analysis for applicability, relevance, and appropriateness. First, the requirement's applicability is determined. If the requirement is not applicable, an analysis is performed to determine whether it is both relevant and appropriate. When this analysis determines that a requirement is both relevant and appropriate, the requirement must be complied with to the same extent as if it were an applicable requirement.



Applicable requirements are those standards, and other substantive requirements, criteria, or limitations promulgated under federal environmental, state environmental, or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a site. Only standards that are identified by a state in a timely manner and that are more stringent than federal requirements may be applicable if they are consistently enforced.

The term “relevant and appropriate requirements” refers to standards, and other substantive requirements, criteria, or limitations promulgated under federal environmental, state environmental, or facility siting laws that, while not applicable to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site, such as a munitions response project, address problems or situations sufficiently similar to those encountered that their use is well suited to the particular site. Only standards that are identified by a state in a timely manner and that are more stringent than federal requirements may be relevant and appropriate.

To be considered (TBC) criteria are advisories, or guidance issued by federal or state governments that are not legally binding and do not have the status of potential ARARs. However, in many circumstances TBCs may be considered along with ARARs as part of the site risk assessment and may be used in determining the necessary level of cleanup for protection of human safety, human health, or the environment.

EPA identifies three basic types of ARARs. They include the following: chemical-specific, action-specific, and location-specific.

#### **5.1.4.1 Chemical-Specific ARARs**

Chemical-specific ARARs are based on health- or risk-based concentration limits or discharge limitations in environmental media (i.e., air, soil, or water) for specific hazardous chemicals. The requirements may be used to set cleanup levels for the chemicals of concern in the designated media, or to set a safe level of discharge (e.g., air emission or wastewater discharge) where a discharge occurs as a part of the remedial action.

#### **5.1.4.2 Location-Specific ARARs**

Location-specific ARARs are restrictions placed on the types of activities that may occur in particular locations. The location of a site may be an important characteristic in determining its impact on human health and the environment. Location-specific ARARs include federal requirements for wetlands protection and floodplain restrictions on management of hazardous waste.

#### **5.1.4.3 Action-Specific ARARs**

Action-specific ARARs generally set performance, design, or other similar operational controls or restrictions on particular activities related to management of hazardous substances or pollutants. These requirements address specific activities that are used to accomplish a remedy. Action-specific requirements do not in themselves determine the remedial action; rather, they indicate how a selected remedial action alternative must be designed, operated, or managed.

**Table 5-2 Potentially Applicable ARARs for the IRA at Volk Field**

<b>Chemical-Specific ARARs</b>	<b>Description</b>	<b>Comment</b>
State of Wisconsin Soil Cleanup Standards (NR 720)	Establishes soil cleanup standards, for the remediation of soil contamination, which result in restoration of the environment to the extent practicable, minimize harmful effects to the air, lands and waters of the state and are protective of public health, safety and welfare, and the environment	Applicable for determining appropriate lead concentration for soil removal for future residential land use.
EPA Regional Screening Levels	Establishes risk-based screening levels for human health.	To be considered.
<b>Location-Specific ARARs</b>	<b>Description</b>	<b>Comment</b>
NA	NA	NA
<b>Action-Specific ARARs</b>	<b>Description</b>	<b>Comment</b>
State of Wisconsin Management of Contaminated Soil or Solid Wastes Excavated During Response Actions (NR 718)	Establishes minimum standards for the storage, transportation, treatment and disposal of contaminated soil and certain other solid wastes excavated during response actions.	Applicable under NR 718.12 for the removal and replacement of on-site of soils with residual contamination.
State of Wisconsin Case Closure (NR 726)	Specifies the minimum requirements and conditions that shall be met before the department may determine that a case related to a discharge of hazardous substances or environmental pollution at a specific site or facility may be closed.	Applicable for case closure upon completion of response action.
Subpart X - Miscellaneous Units: 40 CFR 264.601 Environmental Performance Standards	Establishes provisions for an environmental protection plan while performing site activities.	Relevant and Appropriate if considering consolidated shots within an MRA/MRS.
<b>Note:</b> NA – Not applicable and not relevant and appropriate		

## **5.2 Project Schedule**

The IRA activities are anticipated to occur over an approximate 10-week period and begin in the Spring of 2015. Following the IRA activities, reports will be generated to document the IRA. A general schedule is provided as follows:

- Final Work Plan – April 2015
- IRA Activities – May 2015 to August 2015
- Final Site-Specific Final Reports – February 2016
- Final After Action Report – May 2016.

## **5.3 Estimated Costs**

The present value cost to complete Alternative 3 is approximately \$3.2 million. Costs include site work, erosion and sediment control, implementation of the IRA as described above, after action reporting, overhead costs, profit and contingency.

**6. EXPECTED CHANGE IN SITUATION SHOULD ACTION BE DELAYED OR NOT  
TAKEN**

If the actions outlined in this AM are delayed or not taken, the potential exists for continued and substantial endangerment to human health, welfare or the environment, as a result of remaining MEC and MC at the MRSs.

## **7. OUTSTANDING POLICY ISSUES**

None.

## **8. ENFORCEMENT**

Not applicable.

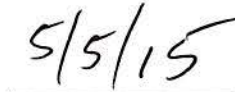
**9. RECOMMENDATION**

Conditions at the site meet the NCP Section 300.415(b) criteria for a removal and ANG approves the proposed removal action.

This document has been approved by the undersigned:



Benjamin Lawless  
A7O Division Chief



(Date)

## **10. REFERENCES**

- Bay West. 2012. Final Remedial Investigation/Feasibility Study Work Plan. Volk Field Combat Readiness Training Center Camp Douglas, Wisconsin. September.
- Bay West. 2015. Final Remedial Investigation Report, Volk Field Combat Readiness Training Center, Camp Douglas, Wisconsin. January.
- EA. 2015. Final Engineering Evaluation/Cost Analysis. Volk Field Combat Readiness Training Center Camp Douglas, Wisconsin. February.
- EPA. 2009. "Superfund Removal Guidance for Preparing Action Memoranda." Final. EPA/540/G 89/004. September.
- EPA. 1993. "Guidance on Conducting Non-Time-Critical Removal Actions Under CERCLA." EPA540-R93-057. August.
- Sky Research. 2011. Comprehensive Site Evaluation Phase II, Final CSE Phase II Desktop Report, Volk Field Combat Readiness Training Center, Wisconsin. February.
- WIANG. 2007. Volk Field Air National Guard Base Fact Sheet. May.