

DRAFT
MRS-BLM UNIT 25
MUNITIONS AND EXPLOSIVES OF CONCERN
REMEDIAL ACTION REPORT
FORMER FORT ORD, CALIFORNIA

November 2018
Draft

Prepared For:



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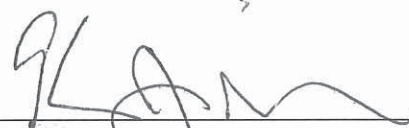


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Contract No. W912DY-10-D-0024
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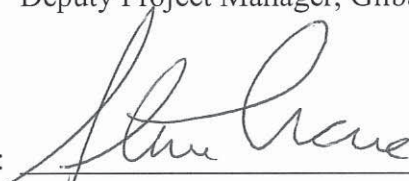
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Acronyms and Abbreviations

| | |
|--------|---|
| ARARs | applicable or relevant and appropriate requirements |
| Army | U.S. Department of the Army |
| ASCII | American Standard Code for Information Interchange |
| BLM | Bureau of Land Management |
| BO | Biological Opinion |
| BRAC | Base Realignment and Closure |
| CAR | corrective action request |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act of 1980 |
| cm | centimeter |
| CMC | central maritime chaparral |
| CQCSM | Contractor Quality Control Systems Manager |
| DDESB | Department of Defense Explosives Safety Board |
| DGM | Digital Geophysical Mapping |
| DMM | discarded military munitions |
| DTSC | Department of Toxic Substances Control |
| EPA | U.S. Environmental Protection Agency |
| FFA | Federal Facility Agreement |
| FS | feasibility study |
| FWV | Field Work Variance |
| GPS | global positioning system |
| HMP | Habitat Management Plan |
| KEMRON | KEMRON Environmental Services |
| LUC | Land Use Control |
| MC | munitions constituents |
| MD | munitions debris |
| MDAS | material documented as safe |
| MDEH | material documented as an explosive hazard |
| MEC | munitions and explosives of concern |
| mm | millimeter |
| MMRP | Military Munitions Response Program |
| MOUT | Military Operations in Urban Terrain |
| MPPEH | material potentially presenting an explosive hazard |
| MQO | measurement quality objective |
| MR | munitions response |
| MRA | munitions response area |
| MRS | munitions response site |
| OE | ordnance and explosives |
| OESS | ordnance and explosives safety specialist |
| QA | quality assurance |
| QC | quality control |

Acronyms and Abbreviations (continued)

| | |
|--------|--|
| RAO | remedial action objective |
| RAR | Remedial Action Report |
| RD/RA | Remedial Design/Remedial Action |
| RI | remedial investigation |
| ROD | Record of Decision |
| RRD | range-related debris |
| RTK | real-time kinematic |
| SSWP | Site-Specific Work Plan |
| SUXOS | Senior Unexploded Ordnance Supervisor |
| TM | Technical Memorandum |
| USACE | U.S. Army Corps of Engineers |
| USFWS | U.S. Fish and Wildlife Service |
| UXO | unexploded ordnance |
| UXOQCS | Unexploded Ordnance Quality Control Specialist |
| WERS | Worldwide Environmental Remediation Services |

Definitions

Construction Support: Assistance provided by DoD explosive ordnance disposal (EOD) or Unexploded Ordnance (UXO)-qualified personnel and/or by personnel trained and qualified for operations involving chemical agent (CA), regardless of configuration, during intrusive construction activities on property known or suspected to contain UXO, other munitions that may have experienced abnormal environments (e.g., Discarded Military Munitions (DMM)), or munitions constituents in high enough concentrations to pose an explosive hazard, or CA, regardless of configuration, to ensure the safety of personnel or resources from any potential explosive or CA hazards. Source: (7).

Discarded Military Munitions (DMM): Military munitions that have been abandoned without proper disposal or removed from storage in a military magazine or other storage area for the purpose of disposal. The term does not include unexploded ordnance, military munitions that are being held for future use or planned disposal, or military munitions that have been properly disposed of consistent with applicable environmental laws and regulations. (10 U.S.C. 2710 (e)(2)). For the purposes of the Military Munitions Response Program (MMRP) being conducted at the former Fort Ord, DMM does not include small arms ammunition.

Explosive Ordnance Disposal (EOD) Personnel: Military personnel who have graduated from the Naval School, Explosive Ordnance Disposal; are assigned to a military unit with a Service-defined EOD mission; and meet Service and assigned unit requirements to perform EOD duties. EOD personnel have received specialized training to address explosive and certain CA hazards during both peacetime and wartime. EOD personnel are trained and equipped to perform render safe procedures (RSP) on nuclear, biological, chemical, and conventional munitions, and on improvised explosive devices. Source: (7).

Expended: The state of munitions debris (MD) in which the main charge has been expended leaving the inert carrier. Source: (1).

Feasibility Study (FS): A study undertaken to develop and evaluate alternatives for remedial action. Source: (3).

Historical Impact Area: The impact area consists of approximately 8,000 acres in the southwestern portion of former Fort Ord, bordered by Eucalyptus Road to the north, Barloy Canyon Road to the east, South Boundary Road to the south, and General Jim Moore Boulevard to the west. Source: (1).

Institutional Control (IC): (a) Non-engineered instruments such as administrative and/or legal controls that minimize the potential for human exposure to contamination by limiting land or resource use; (b) are generally to be used in conjunction with, rather than in lieu of, engineering measures such as waste treatment or containment; (c) can be used during all stages of the cleanup process to accomplish various cleanup-related objectives; and (d) should be “layered” (i.e., use multiple ICs) or implemented in a series to provide overlapping assurances of protection from contamination. Source: (6).

Land Use Controls (LUCs): Physical, legal, or administrative mechanisms that restrict the use of, or limit access to, real property, to manage risks to human health and the environment. Physical mechanisms encompass a variety of engineered remedies to contain or reduce contamination, or physical barriers to limit access to real property, such as fences or signs. Source: (7).

Magnetometer: An instrument used to detect ferromagnetic (iron-containing) objects. Total field magnetometers measuring the strength of the earth’s natural magnetic field at the magnetic sensor location.

Gradient magnetometers, sensitive to smaller near-surface metal objects, use two sensors to measure the difference in magnetic field strength between the two sensor locations. Vertical or horizontal gradients can be measured. Source: (4).

Material Documented as Safe (MDAS): MPPEH that has been assessed and documented as not presenting an explosive hazard and for which the chain of custody has been established and maintained. This material is no longer considered to be MPPEH. Source: (7).

Material Documented as an Explosive Hazard (MDEH): MPPEH that cannot be documented as MDAS, that has been assessed and documented as to the maximum explosive hazards the material is known or suspected to present, and for which the chain of custody has been established and maintained. This material is no longer considered to be MPPEH. Source: (7).

Material Potentially Presenting an Explosive Hazard (MPPEH): Material that, prior to determination of its explosives safety status, potentially contains explosives or munitions (e.g., munitions containers and packaging material; munitions debris remaining after munitions use, demilitarization, or disposal; and range-related debris); or potentially contains a high enough concentration of explosives such that the material presents an explosive hazard (e.g., equipment, drainage systems, holding tanks, piping, or ventilation ducts that were associated with munitions production, demilitarization or disposal operations). Excluded from MPPEH are munitions within the DoD established munitions management system and other hazardous items that may present explosion hazards (e.g., gasoline cans, compressed gas cylinders) that are not munitions and are not intended for use as munitions. Source: (7).

Military Munitions: Military munitions means 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 DoD, the Coast Guard, the Department of Energy, and the National Guard. The term includes confined gaseous, liquid, and solid propellants, explosives, pyrotechnics, chemical and riot control agents, smokes, and incendiaries, including bulk explosives and chemical warfare agents, chemical munitions, rockets, guided and ballistic missiles, bombs, warheads, mortar rounds, artillery ammunition, small arms ammunition, grenades, mines, torpedoes, depth charges, cluster munitions and dispensers, demolition charges, and devices and components thereof. The term does not include wholly inert items, improvised explosive devices, or nuclear weapons, nuclear devices, and nuclear components, other than non-nuclear components of nuclear devices that are managed under the nuclear weapons program of the Department of Energy after all required sanitization operations under the Atomic Energy Act of 1954 (42 U.S.C. 2011 et seq.) have been completed. (10 U.S.C. 101(e)(4)).

Military Munitions Response Program (MMRP): The MMRP is a program under which munitions responses are conducted. Source: (1)

Mortar: Mortars typically range from approximately 1 inch to 11 inches in diameter or larger, and can be filled with explosives, toxic chemicals, white phosphorus or illumination flares. Mortars generally have thinner metal casing than projectiles but use the same types of fuzing and stabilization. Source: (2).

Munitions Debris (MD): Remnants of munitions (e.g., fragments, penetrators, projectiles, shell casings, links, fins) remaining after munitions use, demilitarization, or disposal. Source: (7).

Munitions and Explosives of Concern (MEC): A term distinguishing specific categories of military munitions that may pose unique explosives safety risks: UXO, as defined in 10 U.S.C. 101(e)(5); DMM, as defined in 10 U.S.C. 2710(e)(2)); or munitions constituents (e.g., TNT, cyclotrimethylenetrinitramine

[RDX]), as defined in 10 U.S.C. 2710(e)(3)), present in high enough concentrations to pose an explosive hazard. Source: (7). For the purposes of the MMRP being conducted for the former Fort Ord, MEC does not include small arms ammunition.

Munitions Response: Munitions response means response actions, including investigation, removal actions, and remedial actions, to address the explosives safety, human health, or environmental risks presented by UXO, discarded military munitions (DMM), or munitions constituents (MC), or to support a determination that no removal or remedial action is required. (32 CFR 179.3)

Munitions Response Area (MRA): Any area on a defense site that is known or suspected to contain UXO, DMM, or MC. Examples include former ranges and munitions burial areas. An MRA is comprised of one or more munitions response sites. Source: (7).

Munitions Response Site (MRS): A discrete location within an MRA that is known to require a munitions response. Source: (7).

Operating Grids: Typically, 100-foot by 100-foot parcels of land as determined by survey and recorded by global positioning system (GPS), marked at each corner with wooden stakes. Sites are divided into operating grids prior to the commencement of work by brush removal or MEC sweep teams. A single grid may be occupied by only one team at any time, and the grid system facilitates the maintenance of safe distances between teams. Source: (1).

Projectile: An object projected by an applied force and continuing in motion by its own inertia, such as a bullet, bomb, shell, or grenade. Also applied to rockets and to guided missiles. Source: (2).

Range-Related Debris: Debris, other than MD, collected from operational ranges or from former ranges (e.g., target debris, military munitions packaging and crating material). Source: (7).

Remedial Investigation (RI): Process undertaken to determine the nature and extent of the problem presented by a release which emphasizes data collection and site characterization. The RI is generally performed concurrently and in an interdependent fashion with the feasibility study. Source: (3).

Removal Depth: The depth below ground surface to which all ordnance and other detected items are removed. Source: (1).

Small Arms Ammunition: Ammunition, without projectiles that contain explosives (other than tracers), that is .50 caliber or smaller, or for shotguns. Source: (7).

Technology-Aided Surface MEC Removal: A removal of UXO, DMM, or CWM on the surface (i.e., the top of the soil layer) only, in which the detection process is primarily performed visually, but is augmented by technology aids (e.g., hand-held magnetometers or metal detectors) because vegetation, the weathering of UXO, DMM, or CWM, or other factors make visual detection difficult. Source: (7).

Unexploded Ordnance (UXO): Military munitions that: (A) Have been primed, fuzed, armed, or otherwise prepared for action; (B) Have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, installations, personnel, or materials; and (C) Remain unexploded, whether by malfunction, design, or any other cause. (10 U.S.C. 101 (e) (5)). For the purpose of the MMRP being conducted for the former Fort Ord, UXO does not include small arms ammunition.

UXO-Qualified Personnel: Personnel who have performed successfully in military EOD positions, or are qualified to perform in the following Department of Labor, Service Contract Act, Directory of Occupations,

contractor positions: UXO Technician II, UXO Technician III, UXO Safety Officer, UXO Quality Control Specialist, or Senior UXO Supervisor. Source: (7).

UXO Technician: Personnel who are qualified for and filling Department of Labor, Service Contract Act, Directory of Occupations, contractor positions of UXO Technician I, UXO Technician II, and UXO Technician III. Source: (7).

Sources of the Above Definitions:

(1) Non-standard definition developed to describe Fort Ord-specific items, conditions, procedures, principles, etc. as they apply to issues related to the MEC cleanup.

(2) "Unexploded Ordnance (UXO): An Overview", October 1996. DENIX.

(3) Technical Guidance for Military Munitions Response Actions, Engineer Manual 200-1-15, U.S. Army Corps of Engineers, dated October 30, 2015.

(4) Survey of Munitions Response Technologies, June 2006. ITRC (Interstate Technology and Regulatory Council) with ESTCP (Environmental Security and Technology Certification Program) and SERDP (Strategic Environmental Research and Development Program).

(5) Evaluation of Statistical Methodologies used in U.S. Army Ordnance and Explosive Work. September 1999. Ostrouchov, George, Zimmerman, Gregory P., Beauchamp, John J., Federov, Valerii V., and Downing, Darryl J. Prepared by Oak Ridge National Laboratory for the U.S Army Engineering and Support Center.

(6) Institutional Controls: A Site Managers' Guide to Identifying, Evaluating, and Selecting Institutional Controls at Superfund and RCRA Corrective Action Cleanups. US EPA Office of Solid Waste and Emergency Response (OSWER) 9355.0-74FS-P, EPA 540-F-00-005. September 2000.

(7) Department of Defense Manual Number DoDM 6055.09, Volume 8, February 29, 2008, Administratively Reissued August 4, 2010. Incorporating Change 2, Effective January 24, 2018.

1.0 Introduction

This Remedial Action Report (RAR) describes the work elements and results for the munitions and explosives of concern (MEC) remedial action conducted at Munitions Response Site (MRS) - Bureau of Land Management (BLM) Unit 25 (Unit 25) ([Figure 1](#)) at the former Fort Ord, California. The work in Unit 25 was performed by KEMRON Environmental Services (KEMRON) with Gilbane as a subcontractor for the U.S. Army Corps of Engineers (USACE) under the Worldwide Environmental Remediation Services (WERS) Contract # W912DY-10-D-0027, Task Order No. CM 01. The major event milestones of this remedial action are shown in [Table 1](#). This work has been completed in accordance with the:

- *Final Track 3 Record of Decision Impact Area Munitions Response Area Track 3 Munitions Response Site Former Fort Ord, California* (Track 3 ROD; U.S. Department of the Army [Army], 2008),
- *Final Work Plan Remedial Design/Remedial Action, Track 3 Impact Area Munitions Response Area Munitions and Explosives of Concern Removal Former Fort Ord, California* (Final RD/RA Work Plan; USACE, 2009),
- *Final Site-Specific Work Plan Munitions and Explosives of Concern Remedial Action MRS-BLM Unit 23 and in Support of Units 11 and 12 Prescribed Burns (includes portions of Units 5A, 9, 25, 28 and 31) Former Fort Ord, California* (Final Unit 23 SSWP; KEMRON, 2015a), and
- *Final Site-Specific Work Plan Munitions and Explosives of Concern Remedial Action MRS-BLM Units 25 and 31 Former Fort Ord, California* (Final Units 25/31 SSWP; KEMRON, 2016a).

Unit 25 vegetation clearance was initially intended to be performed by prescribed burning. Following a determination by the Fort Ord Prescribed Burn Team that the unit was unsafe to burn due to terrain concerns, Unit 25 was converted to a vegetation cut unit as detailed in [Appendix A](#). In this document, the "project area" does not include the permanent fuel breaks surrounding the unit.

1.1 Purpose and Scope

This RAR describes the remedial action conducted in MRS-BLM Unit 25, within the Impact Area Munitions Response Area (MRA). The general scope of the remedial action, as defined in the Track 3 ROD (Army, 2008), is to manage “the potential risk to future land users from MEC at the Impact Area MRA.”

Track 3 sites are areas at the former Fort Ord where MEC is known or suspected to be present, but MEC investigations have not yet been completed. The Track 3 site, known as the Impact Area MRA, consists of the 6,560-acre portion of the 8,000-acre historical Impact Area that is entirely within the natural resources management area described in the *Installation-Wide Multispecies Habitat Management Plan (HMP) for Former Fort Ord, California* (HMP; USACE, 1997) and is currently identified for transfer to the BLM. The Impact Area MRA is designated as a habitat reserve in the Fort Ord Reuse Authority Base Reuse Plan. The scope of this project, as defined in the Final Unit 23 SSWP (KEMRON, 2015a), Final Units 25/31 SSWP (KEMRON, 2016a) and approved field work variances (FWVs), entailed the following:

- Vegetation clearance (manual or mechanical cutting),
- Technology-aided surface MEC removal, and
- Digital Geophysical Mapping (DGM) surveys.

The site-specific work plans did not identify any subsurface MEC removal area within the Unit 25 project area. No additional MEC remediation was identified in the *MRS-BLM Unit 25 MEC Remedial Action Technical Memorandum Former Fort Ord, California* (Unit 25 TM; KEMRON, 2018a), which is provided in [Appendix F](#). A joint Army-BLM inspection summary is provided in [Appendix F](#). This summary describes areas such as erosion features that appear to have naturally stabilized, and currently do not require subsurface MEC removal. Figures detailing these areas are included as part of [Appendix F](#).

This RAR details the work completed as part of the MRS-BLM Unit 25 MEC remedial action and provides discussion of the following tasks:

- Mobilization and site setup,
- Vegetation clearance,
- MEC removal area grid and boundary survey,
- Technology-aided surface MEC removal,
- DGM, and
- Preparation of a TM.

1.2 *Approval Documents*

The work was conducted in accordance with the Final RD/RA Work Plan (USACE, 2009) governing the Track 3 Impact Area MRA. The Final Unit 23 SSWP (KEMRON, 2015a), and the Final Units 25/31 SSWP

(KEMRON, 2016a), detailed the scope and site-specific procedures for the MEC remedial action within the project area. Two FWVs are included as [Appendix A](#) and are described below:

- [006](#) (AR# OE-0880A.2) Documents that Unit 25 vegetation removal would be performed mechanically instead of prescribed burning as originally planned due to terrain negatively impacting firefighter's ability to control the fire. Additionally, documents an approximate eight acre area of difficult terrain in Unit 25 that precluded vegetation removal during prescribed burn containment line preparation.
- [011](#) (AR# OE-0880A.8) Documents area within Unit 25 where steep terrain precludes completion of surface MEC removal activities (approximately nine acres), and area within Unit 25 where steep terrain or dense oak tree stands preclude completion of DGM survey.

After completing MEC remediation and DGM in Unit 25, the Unit 25 TM (KEMRON, 2018a) was prepared providing an evaluation of the work completed. The TM is included in [Appendix F](#). No additional MEC remediation was identified in the Unit 25 TM.

1.3 Project Personnel and Subcontractors

MEC removal work was performed with qualified Unexploded Ordnance (UXO) technicians who met or exceeded the requirements of *Technical Paper 18, Minimum Qualifications for Personnel Conducting Munitions and Explosives of Concern Related Activities* (Department of Defense Explosives Safety Board [DDESB], 2015, 2016), which were the controlling documents at the different times the work was performed. The key personnel for this project were:

- Senior Unexploded Ordnance Supervisor (SUXOS): Brad Olson (KEMRON)
- UXO Quality Control (QC) Specialist (UXOQCS): Bruce McClain (KEMRON)
- UXO Safety Officer: Val Valdez (KEMRON)
- Contractor QC Systems Manager (CQCSM): Chuck Clyde (Gilbane)
- QC Geophysicist: Alex Kostera (NAEVA)
- Project Manager: Steve Crane (KEMRON)

- Deputy Project Manager: Erin Caruso (Gilbane)
- Task Manager: Kevin Siemann (Gilbane)
- Project Geophysicist: Andrew Gascho (Gilbane)

The following tasks were subcontracted:

- Mechanical vegetation clearance (Woolery Timber Management)
- Manual vegetation clearance (High Sierra Fire and Firestorm)
- Recycling of metallic target debris (A & S Metals)
- Disposal/recycling of munitions debris (MD) (Demil Metals)

1.4 Health and Safety

Work performed at the site was conducted and completed in accordance with the *Accident Prevention Plan – Munitions and Explosives of Concern Removal and Soil Remediation Project Former Fort Ord, California* (KEMRON, 2015b).

1.5 Report Organization

This RAR was prepared in accordance with the Track 3 RD/RA Work Plan (USACE, 2009) and is consistent with previous RARs for units within the Impact Area MRA at the former Fort Ord. The report also incorporates elements of U.S. Environmental Protection Agency (EPA) guidance for an RAR.

Sections of this RAR are organized as follows:

- Section 1.0 Introduction
- Section 2.0 Site Background
- Section 3.0 Overview of Remedial Action
- Section 4.0 Site Preparation
- Section 5.0 Analog MEC Removal
- Section 6.0 Digital Geophysical Mapping
- Section 7.0 Quality Control/Quality Assurance (QC/QA)
- Section 8.0 MEC and MD Removal
- Section 9.0 Munitions Constituents (MC) Characterization

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1.6 Applicable or Relevant and Appropriate Requirements

Applicable or relevant and appropriate requirements (ARARs) were outlined in the Track 3 ROD (Army, 2008). The performance of this remedial action was in compliance with the ARARs outlined in that document.

2.0 Site Background

2.1 Site Location

Fort Ord is a former military installation that comprises approximately 46 square miles in northwestern Monterey County, California and is located approximately 120 miles south of San Francisco. Monterey Bay forms the western boundary of the former Fort Ord, and the Santa Lucia Range bounds the former Fort Ord to the south. The cities of Marina, Seaside, and Salinas are northwest, southwest, and east of the former Fort Ord, respectively. [Figure 1](#) shows the location of the project area in the southeastern portion of the Impact Area MRA.

Unit 25 is approximately 95 acres and is located in the southeastern portion of the Impact Area MRA, within the MRS-BLM. Unit 25 lies to the east of Riso Ridge Road, west of Impossible Canyon Road, and north/northeast of Mercury Road. These roads are part of the permanent fuel break network and are not included as part of Unit 25. [Figure 2](#) shows road locations around Unit 25.

2.2 *Population, Proximity, and Access*

The project area is within the Impact Area MRA, which is currently enclosed by a four-strand barbed wire fence with concertina wire along critical locations. Access is restricted to authorized personnel only. The project area is located on land that is planned to be transferred to the BLM. Danger signs are posted at the perimeters of the Impact Area MRA. Existing access deterrents, such as fencing posted with warning signs approximately every 500 feet, discourage, but do not prevent, entry into the area. Personnel from the Fort Ord Base Realignment and Closure (BRAC) office and BLM routinely check the Impact Area MRA fences to ensure that they remain in good condition and to identify/complete needed repairs in a timely manner. The fences are maintained through a services support agreement with the BLM. Potential exposure to MEC by unauthorized persons could occur through intentional trespassing incidents. A *Munitions Response Site (MRS) Security Program Former Fort Ord, California* (Army, 2016) to mitigate such incidents is currently being implemented by the Army.

2.3 *Reuse*

The project area is currently designated for transfer to BLM as habitat reserve under the HMP (USACE, 1997) which describes special land restrictions and habitat management requirements within habitat reserve areas. Habitat reserve areas support special-status plant and animal species that require implementation of mitigation measures during Army cleanup activities as identified in the HMP (USACE, 1997). These mitigation measures ensure compliance with the Endangered Species Act and minimize potential adverse impacts to listed species during Army cleanup activities. Based on information provided by BLM, the reuse of the area as a habitat reserve is anticipated to include a variety of activities including:

- Road and trail management and maintenance,
- Habitat enhancement, including prescribed burning,
- Fuel break management,
- Use of administrative areas,
- Habitat monitoring and educational programs,
- Species-specific monitoring and habitat enhancement, and
- Recreational access on established routes.

2.3.1 *Vegetation and Habitat Type*

Central maritime chaparral (CMC) is the dominant habitat type within the project area. CMC is a dominant habitat type at Fort Ord and is identified as a protected plant community in the HMP (USACE, 1997). Additionally, limited areas of coast live oak woodland and grassland are present.

The dominant shrub species observed within the project area during the baseline monitoring include shaggy-barked manzanita (*Arctostaphylos tomentosa* ssp. *tomentosa*), and chamise (*Adenostoma fasciculata*) (Tetra Tech, Inc., 2015). These shrub species contribute most of the overall vegetative cover. HMP-listed shrub species present include Monterey manzanita (*Arctostaphylos montereyensis*), sandmat manzanita (*A. pumila*), Hooker's manzanita (*A. hookeri*), and Monterey ceanothus (*Ceanothus rigidus*) (Tetra Tech, Inc., 2015). Baseline surveys conducted for HMP herbaceous annual species identified populations of Monterey spineflower (*Chorizanthe pungens*) and sand gilia (*Gilia tenuiflora arenaria*) within openings in the CMC (Tetra Tech Inc., 2015). No Seaside bird's beak (*Cordylanthus rigidus littoralis*) was identified during the baseline surveys. Although not identified during baseline surveys, Yadon's piperia (*Piperia yadonii*), a federally endangered HMP species, was identified within Unit 25 along Hawkeye Road in 2016 by the Project Biologist.

The habitats within Unit 25 may also support special-status wildlife species identified in the HMP. Black legless lizards (*Anniella pulchra [nigra]*) could be encountered in any areas with sandy soils. Additionally, suitable upland and dispersal habitat for California tiger salamander (CTS; *Ambystoma californiense*) is present within Unit 25. No CTS breeding ponds are present within Unit 25; however, several are present in the vicinity, including Pond 16, located immediately adjacent within Unit 13.

Chapter 3 of the HMP (USACE, 1997) describes mitigation measures that must be implemented during MEC investigation and remediation. In addition to the HMP, base closure and reuse activities conducted at the former Fort Ord are required to follow specific protocols approved by the U.S. Fish and Wildlife Service (USFWS) as detailed in the *Programmatic Biological Opinion for Cleanup and Property Transfer Actions Conducted at the Former Fort Ord, Monterey County, California*. (PBO, USFWS, 2015). The PBO contains additional conservation measures and recommendations relating to environmental remediation at former Fort Ord cleanup sites which are described in further detail in [Section 10.0](#) of this RAR.

2.4 *Regulatory Status*

Since 1917 until base closure in 1994, Fort Ord primarily served as a training and staging facility for infantry troops. From 1947 to 1974, Fort Ord was a basic training center. The 7th Infantry Division was activated at Fort Ord on October 21, 1974 and was based at Fort Ord until base closure.

Fort Ord was placed on the National Priorities List of Superfund sites by the EPA on February 21, 1990, due to evidence of contaminated soil and groundwater. A Federal Facility Agreement (FFA) was signed by the Army, EPA, Department of Toxic Substances Control (DTSC), and the Regional Water Quality Control Board, a part of the California EPA. The FFA established procedures and schedules for conducting remedial investigations (RIs) and feasibility studies (FSs) and requires remedial actions be completed as expeditiously as possible. Fort Ord was selected in 1991 for BRAC under the Defense BRAC Act of 1990, and the base was officially closed in September 1994. The Army began investigating and removing MEC at the former Fort Ord after the BRAC listing, and a munitions response (MR) RI/FS began in 1998. In April 2000, an agreement was signed between the Army, EPA, and DTSC to evaluate MEC at the former Fort Ord subject to the provisions of the FFA.

Following completion of the *Final Track 3 Impact Area MRA Munitions Response Remedial Investigation/Feasibility Study Former Fort Ord, California* (MACTEC Engineering and Consulting, Inc., 2007), the Army prepared the Track 3 ROD (Army, 2008), which is the decision document presenting the selected remedial action for MEC in the Impact Area MRA. The remedy was selected following a 60-day public comment period for the *Superfund Proposed Plan Remedial Action is Proposed for Impact Area Munitions Response Area, Track 3 Munitions Response Remedial Investigation / Feasibility Study, Former Fort Ord, California* (Army, 2007). The remedy was selected in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986, and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan.

The decision documented in the Track 3 ROD (Army, 2008) is undertaken pursuant to the President's authority under CERCLA Section 104, as delegated to the Army in accordance with Executive Order 12580, and in compliance with the process set out in CERCLA Section 120. The selection of the remedy is authorized pursuant to CERCLA Section 104, and the selected remedy is being carried out in accordance with CERCLA Section 121. The Army and the EPA jointly selected the remedy. The California EPA, as represented by the DTSC, had an opportunity to review and comment on the Track 3 ROD.

2.5 Site Features and History of Military Munitions Use

The Army currently retains the Ord Military Community and the U.S. Army Reserve Center located at the former Fort Ord. The remainder of Fort Ord was identified for transfer to federal, state, and local government agencies and other organizations. Since the base was selected in 1991 for BRAC, site visits, historical and archival investigations, military munitions sampling, and removal actions have been performed and documented in preparation for transfer and reuse of the former Fort Ord property.

Since 1917 until base closure in 1994, portions of former Fort Ord were used by cavalry, field artillery, and infantry units for maneuvers, target ranges, and other purposes. Military munitions were fired and used on the facility, including artillery and mortar projectiles, rockets and guided missiles, rifle and hand grenades, land mines, pyrotechnics, bombs, and demolition materials.

Fort Ord was selected in 1991 for decommissioning, but troop reallocation was not completed until 1993, and the base was not officially closed until September 1994. The property remaining in the Army's possession was designated as the Presidio of Monterey Annex on October 1, 1994, and subsequently renamed the Ord Military Community. Although Army personnel still operate parts of the base, no active Army division is stationed at the former Fort Ord.

The Impact Area MRA is a complex of numerous former military ranges with a variety of historical uses, designs, and characteristics. Over the years, various types of munitions were used during training activities within the Impact Area MRA including artillery and mortar projectiles, rockets and guided missiles, rifle and hand grenades, land mines, pyrotechnics, bombs, and demolition materials. Select ranges were used for small arms training activities only, while other ranges were characterized as multi-use. In general, the firing points of the ranges were located near the perimeter of the MRA, and firing was directed toward the interior portion of the range complex. Training activities at the Impact Area MRA ceased after the closure of Fort Ord in 1994. The former ranges within the MRA contain expended munitions and MEC. The Impact Area MRA is fenced, warning signs are posted, and access is controlled by the Army. The perimeter of the Impact Area MRA is patrolled to detect and prevent trespassing.

The project area is located in the southeastern portion of the Impact Area MRA and MRS-BLM. Unit 25 does not include the 45-foot wide permanent fuel breaks surrounding the unit.

[Table 2](#) provides a list of former ranges which were identified in the Final Units 25/31 SSWP (KEMRON, 2016a) to be at least partially contained within, or overlap with, the project area.

2.6 Summary of MEC-Related Activities and Data Collected Prior to the Remedial Action

MEC investigation and removal work completed within the project area prior to the work addressed in this report resulted in the recovery of 119 MEC items. These items are shown in [Table 3](#). [Figure 2](#) shows MEC items recovered from within the project area prior to the remedial action.

3.0 *Overview of Remedial Action*

3.1 *Remedial Action Objective*

The remedial action objective (RAO) for the Track 3 remedy is to protect human health and the environment in a manner that complies with the ARARs. The RAO will be achieved by implementing the selected remedy of Technology-Aided Surface MEC Remediation, with Subsurface MEC Remediation in Selected Areas and Land Use Controls (LUCs). The selected remedy is designed to achieve both substantial risk reduction through MEC remediation and risk management through implementation of LUCs. The selected remedy best balances risk reduction and associated environmental impacts in supporting the anticipated future use of the site as a habitat reserve. The presence of MEC in the Impact Area MRA was not identified as a concern in terms of explosives safety risks to ecological receptors.

Further statements regarding the RAO are provided in the Final RD/RA Work Plan (USACE, 2009):

- “The selected remedy addresses current or potential explosives safety risks to human health and the environment from MEC within the Impact Area MRA.”
- “The most significant short term objective is to remove surface MEC and prevent public access until MEC removal is completed.”
- “The long-term objective is to make the property safe for required habitat management activities by supplementing the remedial action with appropriate institutional controls that will effectively manage risk from any potentially residual MEC after the remedial action is completed.”

The selected remedy for the Impact Area MRA identified in the Track 3 ROD (Army, 2008) includes the following components:

- Vegetation clearance, primarily by planned prescribed burning, to provide access for MEC remediation,
- Technology-aided surface MEC removal. The method consists of a technology-aided visual search to identify MEC at the ground surface. Technology aids include Schonstedt magnetometers to facilitate detection of surface MEC in areas where the ground surface is not visible. Recovered MEC would be detonated, using engineering controls,
- DGM to provide a record of anomalies to assist future property users in identifying areas where explosives safety support (e.g., onsite construction support) may be required for activities involving ground disturbance or intrusive work,

- Subsurface MEC removal in selected areas. Areas of subsurface MEC removal include regularly maintained fuel breaks and access roads, a minimum 100-foot buffer area between habitat and development areas, and other areas to address specific risk and/or land use needs. Examples include proposed future habitat restoration sites and areas where there are high density of anomalies associated with impact areas where military munitions with sensitive fuzes were fired. Recovered MEC would be detonated, using engineering controls,
- And, implementation of LUCs, including munitions recognition and safety training, construction support for ground disturbing or intrusive activities and UXO-qualified personnel support, access management measures including regular security patrols of the Impact Area MRA perimeter and maintenance of fences and signs, helicopter support for future prescribed burns in selected areas for future habitat management purposes, weed abatement support, and property transfer documentation that outlines land use restrictions, including prohibition of unrestricted land use.

3.2 *MEC Remedial Action*

3.2.1 *Remedial Action Chronology*

As outlined in the Final RD/RA Work Plan (USACE, 2009), Final Unit 23 SSWP (KEMRON, 2015a), and Final Units 25/31 SSWP (KEMRON, 2016a), the following field activities were conducted to implement the MEC remedial action within the project area:

- Vegetation clearance within the Unit,
- Grid and border survey,
- Technology-aided surface MEC removal,
- DGM survey,
- MEC detonation, and
- MD disposal.

[Table 1](#) provides a summary of major events associated with the remedial action within the project area.

3.2.2 *Variations from the Site-Specific Work Plan*

Two variances ([Appendix A](#)) to the planned methods and areas described in the Final Units 25/31 SSWP (KEMRON, 2016a) occurred in response to unanticipated conditions or to improve the efficiency of MEC remedial activities.

3.2.3 Summary of Remedial Action Methods

Vegetation clearance in the western portion of Unit 25, approximately 26 acres, to support planned prescribed burns in Units 11 and 12 began in June 2015 and was completed in September 2015. Vegetation clearance in the remainder of Unit 25, approximately 60 acres, was completed in August 2016. All but 24 acres of Unit 25 were cut to prepare for prescribed burns in Units 11, 12 and 25. Following a determination by the Fort Ord Prescribed Burn Team that Unit 25 was unsafe to burn due to terrain concerns, Unit 25 was converted to a vegetation cut unit as detailed in [Appendix A](#) (FWV 006).

Technology-aided surface MEC removal in the western portion of Unit 25 to support planned prescribed burns in Units 11 and 12 began in July 2015 and was completed in October 2015. Technology-aided surface MEC removal in the remainder of Unit 25 started in July 2016 and was completed in July 2017. [Figure 3](#) depicts the extent of technology-aided surface MEC removal performed in Unit 25.

DGM survey was conducted with vehicle-towed EM61-MK2A arrays starting in November 2015 (western portion of Unit 25 in support of prescribed burns planned for Units 11 and 12) and was completed in August 2017 (remainder of Unit 25). [Figure 4](#) depicts the DGM data collected in Unit 25.

4.0 Site Preparation

4.1 Vegetation Clearance

Vegetation clearance in the western portion of Unit 25, approximately 26 acres, to support planned prescribed burns in Units 11 and 12 began in June 2015 and was completed in September 2015. Vegetation clearance in the remainder of Unit 25, approximately 60 acres, was completed in August 2016. All but 24 acres of Unit 25 were cut to prepare for prescribed burns in Units 11, 12 and 25. Following a determination by the Fort Ord Prescribed Burn Team that the Unit 25 was unsafe to burn due to terrain concerns, Unit 25 was converted to a vegetation cut unit as detailed in [Appendix A](#) (FWV 006). Mechanical mastication was performed in all accessible areas, approximately 86 acres. In areas where mechanical mastication could not be performed, manual vegetation removal was performed in accessible areas. Due to extreme terrain, approximately eight acres did not receive vegetation removal. Approximately one acre within Unit 25, although inaccessible due to terrain, did not require vegetation clearance due to the lack of vegetation. Vegetation clearance teams, with escort support from UXO-qualified personnel, cut vegetation to a height of six inches or less. Where mechanical equipment was used in areas with dense vegetation that obscured visual inspection of the ground surface, a first cut was made to a height between 18 and 24 inches above the ground. After visual inspection for MEC by UXO-qualified personnel, a second cut was made to a

height of six inches or less above ground. In areas with medium-to-light vegetation where the ground surface could be observed before cutting, the vegetation was cut in one stage to a height of no more than six inches above ground. Manual tools (e.g., chain saws and trimmers) were used in areas where the mechanical cutter could not gain access and to trim tree branches.

Manually cut vegetation was either removed or chipped on site. Mechanically cut vegetation was left on site but was reduced to the maximum extent possible to minimize visual impairment of the ground surface. A representative photo of manual vegetation clearance operations is included as [Photograph 1](#).

UXO-qualified personnel provided UXO escort support during vegetation clearance, conducting a visual survey of the ground surface with the aid of Schonstedt magnetometers. When MD or suspected MEC was encountered, vegetation clearance personnel would stop operations until UXO-qualified personnel could determine if any hazard was associated with the item and remove the item if necessary.

4.2 Debris and Target Removal

During and after vegetation clearance activities, targets and other range-related debris (RRD) were removed from the project area. The quantity of recovered RRD was recorded on a per grid basis. Metal debris was recycled at a local recycler, and other debris was disposed of at a local municipal landfill.

4.3 Grid and Border Survey

UXO personnel, performing anomaly avoidance, established a 100-foot by 100-foot grid system across the project area. The grid system was tied into the Fort Ord Master Grid System. The grid nodes were marked with wooden stakes, and each was labeled with a unique identification marked on the southwestern corner stake.

5.0 Analog MEC Removal

Analog methods were used for surface MEC removal within the project area. [Tables 4](#) and [6](#) list the MEC items recovered during analog MEC surface removal.

5.1 Technology-Aided Surface MEC Removal

Technology-aided surface MEC removal in the western portion of Unit 25 to support planned prescribed burns in Units 11 and 12 began in July 2015 and was completed in October 2015. Technology-aided surface MEC removal in the remainder of Unit 25 started in July 2016 and was completed in July 2017. This technology-aided surface MEC removal included containment lines for the prescribed burn within Unit 25,

and the remainder of the unit when a determination was made to mechanically cut the remainder of the unit. Surface MEC removal operations are shown in [Photograph 2](#). Lanes approximately ten feet in width were placed across grids and UXO personnel used Schonstedt magnetometers to conduct technology-aided surface MEC removal. UXO personnel searched (swept) a five foot lane with magnetometers immediately adjacent to one rope marker, turned at the end of the 100-foot grid boundary, and searched a five foot lane immediately adjacent to the other rope marker. Prior to the RA, 119 MEC (UXO) items were recovered from within Unit 25 and are shown in [Table 3](#) and [Figure 2](#). During vegetation clearance and technology-aided surface MEC removal, 324 MEC items were recovered and are shown in [Tables 4](#) and [6](#) and [Figure 5](#).

Statistical results for the Unit 25 RA are shown in [Tables 5](#) and [7](#). Quality control/quality assurance (QC/QA) processes were implemented in accordance with the Final Unit 23 SSWP (KEMRON, 2015a), and Final Unit 25/31 SSWP (KEMRON, 2016a). Approximately nine acres of Unit 25 were determined by UXO safety personnel to be inaccessible to surface MEC removal due to extreme terrain (See [Figure 1](#) of [FWV 011](#)). The surface MEC removal grids are shown in [Figure 3](#). Representative photographs of surface MEC removed are included as [Photographs 3](#) through [7](#).

During technology-aided surface MEC removal, UXO teams utilized Schonstedt magnetometers in addition to visual survey in search for MEC. UXO personnel walked in 5-foot wide parallel lanes across the removal grid to achieve complete Schonstedt and visual coverage. In general, metallic debris greater than 2 inches in any dimension identified on the ground surface was removed from the project area. Material Potentially Presenting an Explosive Hazard (MPPEH) and MEC were treated in accordance with standard operating procedures. The easting and northing location of MPPEH was recorded from the southwest corner stake of the grid to acquire the geo-referenced location at which it was found. During technology-aided surface MEC removal operations in Unit 25, 324 MEC items were removed. These items are shown in [Tables 4](#) and [6](#) and [Figure 5](#). MD was tracked by weight on a grid-by-grid basis.

A total of 324 MEC items were found during vegetation clearance and surface MEC removal. All 324 MEC items were classified as UXO. All MEC items encountered and removed as part of the Unit 25 RA are summarized in [Tables 4](#) and [6](#).

5.2 Subsurface MEC Removal

Subsurface MEC removal was not conducted within Unit 25 as part of the work covered in this RAR. The site-specific work plans did not identify any subsurface MEC removal area within the Unit 25 project area. No additional MEC remediation was identified in the Unit 25 TM ([Appendix F](#)).

6.0 *Digital Geophysical Mapping*

DGM survey operations were conducted in all accessible areas within Unit 25. DGM survey was conducted with vehicle-towed EM61-MK2A arrays starting in November 2015 (western portion of Unit 25 in containment areas of prescribed burns planned for Units 11 and 12) and was completed in August 2017 (remainder of Unit 25). [Figure 4](#) depicts the DGM data collected in Unit 25. Cumulative results for the Unit 25 RA are shown in [Tables 5](#) and [7](#). Measurement quality objectives were met and QC/QA processes were implemented in accordance with the Final Unit 23 SSWP (KEMRON, 2015a), Final Units 25/31SSWP (KEMRON, 2016a) and the *Final, Quality Assurance Project Plan, Superfund Response Actions, Former Fort Ord, California, Volume II, Appendix A, Munitions and Explosives of Concern Remedial Action. Former Fort Ord, California* (MEC QAPP; KEMRON, 2016b). Measurement performance criteria were evaluated according to the standards specified in the MEC QAPP and the Final SSWPs. Specific criteria that were evaluated included Global Positioning System (GPS) accuracy, static background and response tests, dynamic background and response tests (IVS), velocity, minimum along track sampling and across track coverage, accurate detection of Blind Seeds with respect to both response and positioning, surveillance of field methods, and reprocessing of field data. Each of these criteria were evaluated separately with results recorded in the project database and subsequently reviewed by the QC Geophysicist. [Appendix F](#) includes the USACE DGM QA Approval and Discussion for Unit 25.

Due to extreme terrain within Unit 25, approximately 20 acres were inaccessible to DGM survey. These areas are shown on [Figure 4](#) and were documented in [FWV 011](#) included in [Appendix A](#) of this document. DGM survey operations are shown in [Photograph 8](#).

6.1 *DGM Surveys*

DGM surveys were used as the primary method to record the presence of subsurface anomalies within Unit 25. DGM surveys were conducted with vehicle-towed EM61-MK2A arrays starting in November 2015 (western portion of Unit 25 in containment areas of prescribed burns planned for Units 11 and 12) and were completed in August 2017 (remainder of Unit 25).

6.1.1 *Instrumentation*

As described in previous sections, EM61-MK2A sensors (towed array unit) were utilized to obtain DGM data at the project area. A Leica Real-Time Kinematic (RTK) GPS was used in conjunction with the EM61-MK2A sensors for navigation data.

6.1.1.1 EM61-MK2A

The EM61-MK2A is a four-channel, high-sensitivity time delay electro-magnetic sensor designed to detect shallow ferrous and nonferrous metallic objects with good spatial resolution and minimal interference from adjacent metallic features. The EM61-MK2A has two rectangular (1 x 0.5 meters) source/receiver coils vertically stacked 40 cm apart. A square wave electro-magnetic pulse is generated during “time on” (positive and negative) and “time off” cycles. This induces subsurface eddy currents with an associated secondary magnetic field. The decay of the secondary magnetic fields is measured during “time off” cycles and stored as a millivolt response. By measuring the decay at “late times,” the system can distinguish between natural earth materials and buried metal (ferrous and nonferrous) due to the slower rate of decay in the secondary field from metallic objects compared to that from earth materials. The EM61-MK2A can measure a differential, which is calculated as the voltage difference between the top and bottom coils. During this project, data were recorded at four time gates from the bottom coil. The responses at these four specified time gates are recorded and displayed by an integrated system data logger.

6.1.1.2 Leica GPS

RTK GPS requires known coordinates to establish a base station. Once the base station is established, it determines its location using satellites and applies a correction based on the offset from the known coordinates. The correction is used by a rover that is in direct communication with the base station through a radio link. RTK GPS is capable of taking survey-grade measurements in real time and providing immediate accuracy within 1 to 4 cm.

A permanent base station maintained by USACE and located in Ranges 43-48 was used for project area operations.

6.1.2 Data Collection Procedures

EM61-MK2A surveys utilized the four time gate readings from the bottom coil. Readings were sampled at a minimum rate of 10 readings per second. GPS readings were logged at a rate of 1 reading per second. All data collection activities were recorded in both field logs and personal digital assistants, and were later synchronized into the project database. The field notes were monitored by data processors and the QC Geophysicist, and they are included in the data delivery forms.

6.1.2.1 Towed Array

The towed array system consisted of three EM61-MK2A coils mounted on a wheeled platform. The three units were mounted in parallel, wide end forward, such that the center-to-center coil spacing was 2.0 feet,

and the bottoms of the coils were set at the standard Geonics height of 42 cm above the ground. The wheeled platform was pulled with a bulldozer. Survey lanes were marked using a biodegradable foam-marking system mounted to the bulldozer. The EM61-MK2A and GPS data were streamed together and recorded using Geometrics MagLogNT software. Data collection on the towed array was controlled remotely by a wireless transmitter from a remote computer. This allowed the tractor or bulldozer driver to concentrate on coverage. The remote computer was operated by a field geophysicist. The remote computer controlled the functions of the field computer mounted to the towed array system. The remote computer operator monitored the data collection.

6.1.2.2 Single Unit/Manual

A single EM61-MK2A unit was not required during DGM data collection in Unit 25.

6.1.2.3 Daily Functional QC Checks

To insure the instruments met project QC requirements, tests were performed daily. As described in project quality control documents, the following instrument tests were performed:

- Static Background Test
- Static Spike Test
- Personnel Test
- Cable Shake Test
- Repeat Data/Lag Line
- Static GPS Location Test
- Dynamic GPS Location Test (added)

On days that the instruments were in use, QC tests were performed at the beginning and the end of each day. If the instruments did not meet QC standards, the field crew would resolve the issue before commencing with the survey. In the event that the instrument was deemed faulty at the end of the day, QC Geophysicists were notified and proper steps were taken to verify survey data met QC standards.

In addition to the first six standard tests, two dynamic GPS location tests were conducted. One test consisted of placing a hitch-ball in the field area that was to be surveyed. The location of the hitch-ball was measured with GPS prior to obtaining data. The hitch-ball was run over by the EM61-MK2A system several times in one day. After the data were processed, the location was checked to verify that the location was within specification (2 feet).

6.1.3 Data Processing

Geophysical data were processed using Geosoft's Oasis Montaj and vendor-supplied software. Oasis Montaj processing included several steps:

1. Transforming raw data to American Standard Code for Information Interchange (ASCII) xyz files: Using vendor-supplied software, data were converted from the native file format to ASCII data files suitable for import into Oasis Montaj.
2. Initial data review: Once raw xyz files were imported into Oasis Montaj, the coordinates were converted to the project coordinate system. Data coverage and quality were assessed by the data processors. If it was determined that data quality and coverage were acceptable, then the data proceeded to the next step. If coverage and/or data quality objectives were not met, then field teams were sent to either fill in data gaps or re-collect data where necessary.
3. Correcting for instrument latency: Using the results of the daily repeat data test, geophysical data were shifted to account for the time lag inherent in the data logging system.
4. Leveling data: Data were leveled to the same background values removing the effects of instrument drift. The leveled data were added together to create the 4-channel sum.

Data processing procedures remained consistent for the project area. Data processing activities were logged in data processing forms. A detailed description of the processing steps was outlined in the project quality control documents.

6.1.4 Data Delivery

Survey data were broken down into separate grids and/or grid blocks prior to delivery. The delivery schedule was consistently met throughout the project. Any exceptions were noted on the processing forms, and the QA Geophysicist was informed. Raw and processed data were submitted as one package within five days of data collection. Raw data deliveries included the raw data in binary format, raw data in ASCII xyz format, and the field notes saved in portable document format form. Processed data included the processed data in ASCII xyz format, the final targets lists, and the appropriate data processing forms. Examples of the data forms included in the data delivery are contained in [Appendix C](#).

6.2 Measurement Quality Objectives

The DGM surveys for the project area were conducted with Category B MQOs based on the post-DGM activities planned for the site.

The following items were monitored throughout the project according to MQOs specified in the Final Unit 23 SSWP (KEMRON, 2015a), and the Final Units 25/31 SSWP (KEMRON, 2016a):

- Background noise
- Mean speed
- Along track spacing
- Across track spacing
- Instrument latency corrections
- Data leveling
- Systematic noise
- Anomaly selection
- Positioning errors
- Known location QC items
- Blind seed/QC items
- Reacquisition

According to the geophysical QC plan, the QC Geophysicist is required to monitor all MQOs. The QC Geophysicist reviewed every grid. If any aberrations were found within the MQOs, actions were taken to assure the specific metric was corrected before passing the grid. These actions were documented in weekly QC reports and sent to the USACE QA Geophysicist. During the project surveys, the USACE QA Geophysicist reviewed grids only after they passed geophysical QC. Any comments or concerns were addressed and issues were resolved between the Project Geophysicist and the USACE QA Geophysicist. The *Unit 25 Final Quality Assurance Report, Digital Geophysical Operations*, is included as an appendix to the Unit 25 TM (KEMRON, 2018a). The Unit 25 TM (KEMRON, 2018a) is provided in [Appendix F](#).

6.3 Subsurface MEC Removal

DGM-based subsurface MEC removal was not conducted within Unit 25 as part of the Final Unit 23 SSWP (KEMRON, 2015a) or Final Units 25/31 SSWP (KEMPRON, 2016a). The site-specific work plans did not identify any subsurface MEC removal area within the Unit 25 project area. No additional MEC remediation was identified in the Unit 25 TM.

7.0 Quality Control/Quality Assurance (QC/QA)

This section discusses the QC and QA procedures that were used at the project area.

7.1 QC

QC is conducted by the Contractor. All QC measures were conducted by the UXOQCS and by the QC Geophysicist. A discussion of the pertinent QC measures and procedures is included in the following sections.

7.1.1 Analog QC

7.1.1.1 Field Activities

During surface MEC removal operations in Unit 25, the UXOQCS was responsible for visually observing teams and conducting periodic spot checks to ensure grids were receiving complete coverage during the surface MEC removal phase. The UXOQCS performed analog QC survey of at least 10% of completed surface MEC removal grids. All grids passed 10% analog QC surveys performed by the UXOQCS.

Additionally, surface blind seeds were emplaced by the UXOQCS before and during technology-aided surface MEC removal field operations. All surface blind seeds were located in the field by the UXO teams.

7.1.1.2 Database Activities

The UXOQCS reviewed every entry received from personnel in the field during each phase of work prior to entry in the database. Each entry was reviewed for completion of field QC, MEC and MD nomenclature, completion of a given grid, and ultimate disposition of MEC items.

7.1.2 DGM QC

The DGM QC standards and procedures were outlined in the Final Unit 23 SSWP (KEMRON, 2015a), Final Units 25/31 SSWP (KEMRON, 2016a) and subsequent project quality documents.

The QC Geophysicist was responsible for planning and executing QC oversight of geophysical activities and ensuring compliance with geophysical QC requirements. Specifically, the QC Geophysicist was responsible for the following:

- Reviewing and approving the qualifications of geophysical staff,
- Planning and ensuring the acceptable performance and completion of all geophysical QC activities,
- Reviewing the geophysical QC and DGM data, target lists, and dig results as specified in the Final Unit 23 SSWP (KEMRON, 2015a), Final Units 25/31 SSWP (KEMRON, 2016a), and subsequent updates,
- Establishing the known and blind seed item and location control program,

- Identifying quality problems and verifying that appropriate corrective actions were implemented for geophysical activities, and
- Ensuring that the requisite geophysical QC records, including submittals, were generated and retained as prescribed.

In order to keep track of weekly events and statistics, a weekly QC report was delivered to the Project Geophysicist and the QA Geophysicist. This included all pertinent information for the week as well as cumulative information about the project including, but not limited to, information such as grids surveyed, personnel, average acreage per day, and QC blind seeds located.

The QC Geophysicist had daily access to all geophysical QC and DGM data and was on site intermittently as needed after the completion of the initial inspections for geophysical activities. The QC Geophysicist was also on site as needed for meetings and seeding, reported to the CQCSM and supported the UXOQCS.

7.2 Quality Assurance

QA is conducted by the USACE Ordnance and Explosives Safety Specialist (OESS) and the USACE QA Geophysicist.

7.2.1 Analog Quality Assurance

USACE Surface MEC Removal Quality Assurance Documentation is provided in [Appendix D](#). This appendix includes a table documenting when work grids in Unit 25 were subjected to surface MEC removal quality assurance surveys. The USACE OESS independently conducted analog survey of at least 10% of each completed surface MEC removal grid. All completed surface MEC removal grids passed QA surveys and were accepted by USACE.

7.2.2 DGM Quality Assurance

The TM for Unit 25 is provided in [Appendix F](#). The *Unit 25 Final Quality Assurance Report, Digital Geophysical Operations*, is included as an appendix to the TM for Unit 25. All DGM data for Unit 25 has been reviewed and approved by the USACE QA Geophysicist.

7.2.3 Corrective Action Requests

During the course of the project area field operations, the USACE issued no Corrective Action Requests (CARs).

8.0 MEC and MD Removal

This section provides summaries of the MEC and MD removed from the project area. [Table 3](#) provides data for MEC items recovered within the project area during previous investigations.

8.1 Remedial Action

Statistical information for the Unit 25 MEC remedial action was recorded, tracked, and reported by removal grid, individual item, and date.

The statistical results for the remedial action are provided in [Tables 5](#) and [7](#).

8.1.1 MEC Removal

MEC was recovered and subjected to detonation during the course of the project RA. As shown in [Table 4](#), a total of 324 MEC items were found and removed during vegetation clearance and surface MEC removal operations for the project area. A summary of the type and quantity of MEC recovered during the RA is provided in [Tables 4](#) and [6](#).

8.1.2 MD Removal

Recovered MD was characterized by weight on a grid-by-grid basis. [Figure 6](#) summarizes the estimated weight of MD removed from each removal grid. A total estimated quantity of MD removed during the RA is provided in [Table 5](#).

MD was initially classified as MPPEH. Following initial classification, the MPPEH was certified by the SUXOS, UXOQCS, and USACE OESS as either material documented as safe (MDAS) or material documented as an explosive hazard (MDEH). All MDEH was detonated as described further in [Section 8.1.3](#). MDAS was certified free from explosive material, and stored in lockable roll-off containers. MDAS was demilitarized as appropriate. MDAS was inspected, certified and transported to a recycling facility. DD Form 1348-1A documentation accompanied the MDAS. A DD Form 1348-1A for this project is provided in [Appendix B](#). Additional MDAS from other Fort Ord MEC sites is included in the total amount of MD documented in [Appendix B](#).

8.1.3 Detonation of Munitions and Explosives of Concern

During the course of the Unit 25 remedial action, 324 MEC items were destroyed by detonation. Explosives Accountability forms with dates of demolition operations are included in [Appendix E](#). All procedures for demolition operations included in the Final Unit 23 SSWP (KEMRON, 2015a) and Final Units 25/31 SSWP

(KEMRON, 2016a) were followed. All items were destroyed by detonation, and details, such as the date and result of this operation, have been reported in the Fort Ord Military Munitions Response Program database.

8.1.4 Disposition of Munitions Debris

The MDAS was transported to Demil Metals for smelting and eventual recycling. DD Form 1348-1A documentation accompanied the MDAS. A DD Form 1348-1A for this project is provided in [Appendix B](#).

8.2 Conceptual Site Model

The distribution of all MEC items found and removed as part of this remedial action within Unit 25 is shown on [Figure 5](#). The observed distribution of surface MEC throughout Unit 25 is consistent with the expected distribution within this unit based on historical information. Unit 25 includes a number of partial or complete range fans that were most likely used for mixed-use training. The MEC items found and removed from Unit 25 included MEC items that are consistent with the centralized location of Unit 25 within the main impact area of the former Fort Ord. Munitions with sensitive fuzes were expected in Unit 25. During the remedial action, seven munition items with sensitive fuzes (all M383 high explosive 40mm projectiles) were encountered and removed. MEC items with sensitive fuzes are shown in [Figure 7](#). All MEC items with sensitive fuzes removed in Unit 25 were located in the northern third of the unit, near the intersections of Steep Road and Hawkeye Road, and Riso Ridge and Hawkeye Road. The two boxed areas shown on [Figure 7](#) are identified as areas of concern in Unit 25 with regard to the potential for MEC items with sensitive fuzes to remain in the shallow subsurface. The area near the intersection of Riso Ridge and Hawkeye Road coincides with a relatively higher density of subsurface metal as shown on [Figure 4](#).

Surface MEC removal and DGM data were evaluated in the Unit 25 TM (KEMRON, 2018a) ([Appendix F](#)). No additional MEC remediation was identified in the Unit 25 TM (KEMRON, 2018a).

9.0 Munitions Constituents (MC) Characterization

9.1 Previous Site Characterization

Explosive ordnance target areas located within the Impact Area MRA were sampled as part of the Site 39 RI. Results are presented in the *Final Basewide Remedial Investigation/Feasibility Study Fort Ord, California* (Harding Lawson Associates [HLA], 1995). Based on the available information at that time, a biased sampling program was developed to focus on the target areas, which were the areas most likely to contain detectable amounts of ordnance-related chemical residues and metals. Soil remediation in specific areas within the Impact Area MRA identified in the Site 39 ROD Amendment occurred with appropriate

UXO support as described in the *Final Remedial Action Completion Report Site 39 Inland Ranges Habitat Reserve, former Fort Ord, California* (Gilbane, 2014).

9.2 Reconnaissance

Reconnaissance for Unit 25 was conducted in August 2017. Features mapped and recorded with a GPS as a general field practice across all site reconnaissance areas include targets, berms, craters or mounds, MD, trash pits, debris, and RRD. The data collected was evaluated to determine location of soil samples required to further characterize an area with possible soil contamination. The *Final Site Evaluation Results and Work Plan for Additional Investigation Basewide Range Assessment Investigation Units 25 and 28 Former Fort Ord, Monterey County, California* (KEMRON, 2018b) was prepared to identify the sample locations for Unit 25.

9.3 Site Characterization

Prior to the initiation of field operations, UXO field personnel were trained to recognize and report evidence of potential soil contamination. Any such evidence was noted within the project area and was incorporated into the Basewide Range Assessment evaluation of the units. Areas characterized for soil remediation include berms, craters, and areas with little or no vegetation.

9.4 Observations of Evidence of Potential Soil Contamination

Samples were collected from 12 locations in Unit 25. Laboratory analyses included evaluation of lead in samples from 5 locations in Unit 25 and evaluation of explosive residues (HMX, RDX and TNT) in samples from 12 locations in Unit 25. Explosives were not detected in any samples. Lead was detected in samples from all analyzed locations at concentrations ranging from 7.0 mg/kg to 16.3 mg/kg in Unit 25, which are below the threshold criterion of 225 mg/kg for lead specified in the *Final Record of Decision Amendment Site 39 Former Fort Ord, California* (Army, 2009).

10.0 Environmental Protection

10.1 Description of Impacts and Mitigation Measures

The project area is within the Natural Resource Management Area which is designated for transfer to BLM as undeveloped habitat reserve as described in the HMP (USACE, 1997). The HMP describes special land restrictions and habitat management requirements within habitat reserve areas. Habitat reserve areas support plant and animal species protected under the Endangered Species Act; implementation of mitigation measures identified in the HMP are required to minimize potential adverse impacts to listed species.

Vegetation in the project area consists primarily of CMC and contains numerous species listed as protected in the HMP. Please refer to Section 2.3.1 for a description of the vegetation and HMP species present within Unit 25.

Mitigation measures to reduce impacts to protected species during MEC remedial actions are described in the HMP (USACE, 1997) and the PBO (USFWS, 2015). Mitigation and other environmental protection measures that were implemented during this project are summarized below:

Minimize Disturbance Associated with MEC Removal: Disturbances were limited to those required for the above-mentioned activities. As required by the HMP, existing roads were used with the exception of where it was necessary to traverse the site using tracked vehicles in order to remove piles of debris, remove vegetation, and conduct the DGM portion of the field work. Access roads, staging areas, and other appurtenant facilities were sited to avoid impacts to HMP plant and wildlife species. Additionally, coast live oak trees (*Quercus agrifolia*) were avoided during vegetation removal activities.

Avoid Disturbance of HMP Annual Plant Populations: Populations of sand gilia and Monterey spineflower were identified within openings in the CMC in Unit 25 (Tetra Tech, Inc., 2015) (See Section 10.2 Biological Monitoring). Additionally, a population of Yadon's piperia was observed by the Project Biologist within Unit 25 in 2016. While MEC removal and DGM activities were necessary within the HMP annuals plant population areas, no equipment or personnel were permitted within these areas from March (approximate time of germination) through June (approximate time of seed-set) for Monterey spineflower, and sand gilia, and through approximately September for Yadon's piperia.

Conduct Employee Education Program: Training for all supervisors and field personnel was conducted by the Project Biologist. Any new personnel also received biological training prior to working on the site. Training included information on rare, threatened, and endangered species on the site, including a description of the species, their protected status, a list of measures to be implemented to avoid and reduce impacts to these species and their habitat, and contact information to report unforeseen impacts to HMP species. Additionally, a Habitat Checklist was prepared by the Project Biologist prior to each activity that outlined specific avoidance and minimization measures, which were communicated to the project supervisors prior to work initiation.

Minimize Impacts to Black Legless Lizard: Supervisors and field personnel were trained during the Employee Education Program to identify black legless lizard and were informed of the potential for this species to occur within the project site and the established protocol if any individuals were encountered. No black legless lizards were observed during the course of this work.

Minimize Impacts to California Linderiella, California Tiger Salamander, and California Red-legged frog: Supervisors and field personnel were trained during the Employee Education Program to identify CTS and California Red-legged frog, and were informed of the potential for these species to occur within the project site and the established protocol if any individuals were encountered. No CTS or California Red-legged frogs were observed during the course of this work. No habitat for California linderiella is present within Unit 25.

In order to reduce the spread of invasive weeds, existing roads were used to the greatest extent feasible. To reduce erosion concerns normal vehicle access was restricted to existing roads and established access routes. Tracked vehicles were used to conduct vegetation removal and DGM surveys over the site. KEMRON monitored the work site for potential erosion problems and a final inspection was conducted by the Project Biologist.

10.2 Biological Monitoring

Prior to the initiation of work, baseline studies were conducted within the project area to document the location and abundance of HMP shrub and annual plant species and habitats; the results of these surveys are presented in the *2014 Biological Monitoring Report for Units 25 and 31; Units 06, 07, 10, 33, WGBA and MOUT; Units 04, 11, 12 and 23N; Units 14 and 19; and MRS-16 Former Fort Ord* (Tetra Tech, Inc., 2015). Follow-up monitoring was conducted by Burleson Consulting in 2017; results of these surveys are presented in the *2017 Annual Report Biological Monitoring for Unit 17; Unit 25 and Units 13, 20, and 31 Containment Lines; Units 1 West, 2 West, and 3 West; Units 2 East and 3 East; and Units 14 and 19* (Burleson Consulting, 2018). Monitoring within these units will continue according to the 2017 Programmatic BO (USFWS, 2017) to document the recovery of HMP species and habitat.

11.0 Protectiveness Assessment

The protectiveness of the remedial action was evaluated against the requirements of the Track 3 ROD (Army, 2008). The remedial action performed in Unit 25 was consistent with the Final Unit 23 SSWP (KEMRON, 2015a), Final Units 25/31 SSWP (KEMRON, 2016a), and Track 3 RD/RA Work Plan (USACE, 2009), and no conditions contrary to these documents were encountered at the site.

The TM included in [Appendix F](#) applies to the project area of Unit 25. No additional MEC remediation was identified in the Unit 25 TM (KEMRON, 2018a). Regulatory agencies have reviewed the TM and approved the recommendations included. No additional MEC removal is recommended for Unit 25.

The DGM survey identified anomalies within the project area (Figure 4) which were not subject to reacquisition and subsurface MEC removal, suggesting the possible presence of subsurface MEC.

The MEC remedial action for the project area is complete. During the remedial action, 324 MEC items were encountered and removed. Seven MEC items with sensitive fuzes (all M383 high explosive 40mm projectiles) were encountered and removed. MEC items with sensitive fuzes are shown in Figure 7. All MEC items with sensitive fuzes removed in Unit 25 were located in the northern third of the unit, near the intersections of Steep Road and Hawkeye Road, and Riso Ridge and Hawkeye Road. The two boxed areas shown on Figure 7 are identified as areas of concern in Unit 25 with regard to the potential for MEC items with sensitive fuzes to remain in the shallow subsurface. The area near the intersection of Riso Ridge and Hawkeye Road coincides with a relatively higher density of subsurface metal as shown on Figure 4. DGM data collection in the vicinity of the intersection of Steep Road and Hawkeye Road was limited due to steep terrain.

The Army is currently conducting a field study designed to provide more information about how areas/grids where MEC of the type containing sensitive fuzes were recovered during surface MEC removal could be addressed in the future. A recommendation on this issue will be deferred until after the completion of the field study and the short term recommendations for the areas of concern in Unit 25 are as follows:

- Areas where MEC with sensitive fuzes were located will be monitored with enhanced procedures during annual surface area monitoring,
- All future MEC removal actions in the vicinity of these areas will be monitored for indications of subsurface MEC with sensitive fuzes,
- Authorized personnel entering Unit 25 will initially receive updated munitions recognition and safety training.

All surface MEC remediation areas passed QC/QA. Based on the Track 3 ROD (Army, 2008) and the Track 3 RD/RA Work Plan (USACE, 2009), the following actions will occur until all remedial actions within the Track 3 Impact Area MRA are complete:

- Annual inspection of surface MEC removal areas until the site is stabilized,
- Site security of the Impact Area MRA will be maintained,
- Unauthorized public access to or within the Impact Area MRA will continue to be prohibited,

- Munitions recognition and safety training as needed prior to property transfer and during the implementation of the remedial action,
- Provision of UXO-qualified personnel support for intrusive work, and
- Follow-up habitat monitoring.

At the completion of the remedial action within the Impact Area MRA, the Army will evaluate the work completed against planned reuse activities and the suitability of the LUCs that were selected as part of the remedy. The results of this evaluation will be included in a Remedial Action Completion Report. A detailed LUC implementation plan will also be developed prior to property transfer, in coordination with the future landowner and the regulatory agencies.

12.0 References

Burleson Consulting, 2018. *2017 Annual Report Biological Monitoring for Unit 17; Unit 25 and Units 13, 20, and 31 Containment Lines; Units 1 West, 2 West, and 3 West; Units 2 East and 3 East; and Units 14 and 19, Former Fort Ord.* (AR# BW-2845)

Department of Defense Explosives Safety Board (DDESB), 2015, 2016*. *Technical Paper 18, Minimum Qualifications for Personnel Conducting Munitions and Explosives of Concern Related Activities.*

Gilbane Building Company (Gilbane), 2014. *Final Remedial Action Completion Report Site 39 Inland Ranges Habitat Reserve Former Fort Ord, California.* (AR# RI-047C)

Harding Lawson Associates, (HLA), 1995. *Final Basewide Remedial Investigation/Feasibility Study, Fort Ord, California Volumes I through VI* (October, 1995). (AR# BW-1283A)

KEMRON Environmental Services (KEMRON), 2015a. *Final Site-Specific Work Plan Munitions and Explosives of Concern Remedial Action MRS-BLM Unit 23 and in Support of Units 11 and 12 Prescribed Burns (includes portions of Units 5A, 9, 25, 28 and 31) Former Fort Ord, California.* (AR# OE-0862B)

KEMRON, 2015b. *Accident Prevention Plan – Munitions and Explosives of Concern Removal and Soil Remediation Project, Former Fort Ord, California.*

KEMRON, 2016a. *Final Site-Specific Work Plan Munitions and Explosives of Concern Remedial Action MRS-BLM Units 25 and 31 Former Fort Ord, California.* (AR# OE-0880B)

KEMRON, 2016b. *Final, Quality Assurance Project Plan, Superfund Response Actions, Former Fort Ord, California, Volume II, Appendix A, Munitions and Explosives of Concern Remedial Action. Former Fort Ord, California.* (AR# OE-0884A)

KEMRON, 2018a. *MRS-BLM Unit 25 MEC Remedial Action Technical Memorandum Former Fort Ord, California.* (AR# OE-0915A)

KEMRON, 2018b. *Final Site Evaluation Results and Work Plan for Additional Investigation Basewide Range Assessment Investigation Units 25 and 28 Former Fort Ord, Monterey County, California.* (BW-2838B)

MACTEC Engineering and Consulting, Inc., 2007. *Final Track 3 Impact Area Munitions Response Area Munitions Response Remedial Investigation/Feasibility Study Former Fort Ord, California.* (AR# OE-0596R)

Tetra Tech, Inc., (Tetra Tech), 2015. *2014 Biological Monitoring Report for Units 25 and 31; Units 06, 07, 10, 33, WGBA and MOUT; Units 04, 11, 12 and 23N; Units 14 and 19; and MRS-16 Former Fort Ord.* (AR# BW-2739)

U.S. Army Corps of Engineers (USACE), 1997. *Installation-Wide Multispecies Habitat Management Plan for Former Fort Ord, California.* (AR# BW-1787)

USACE, 2009. *Final Work Plan Remedial Design/Remedial Action Track 3 Impact Area Munitions Response Area Munitions and Explosives of Concern Removal Former Fort Ord, California.* (AR# OE-0660K)

U.S. Department of the Army (Army), 2007. *Superfund Proposed Plan Remedial Action is Proposed for Impact Area Munitions Response Area, Track 3 Munitions Response Remedial Investigation / Feasibility Study, Former Fort Ord, California.* (AR# OE-0623)

Army, 2008. *Final Track 3 Record of Decision, Impact Area Munitions Response Area Track 3 Munitions Response Site Former Fort Ord, California.* (AR# OE-0647)

Army, 2009. *Final Record of Decision Amendment, Site 39 Inland Ranges Former Fort Ord, California.* (AR# RI-041E)

Army, 2016. *Munitions Response Site (MRS) Security Program Former Fort Ord, California.* (AR# OE-0422P)

U.S. Fish and Wildlife Services (USFWS), 2015. *Programmatic Biological Opinion for Cleanup and Property Transfer Actions Conducted at the Former Fort Ord, Monterey County, California*. (8-8-09-F-74). (AR# BW-2747)

USFWS, 2017. *Programmatic Biological Opinion*. (AR# BW-2747A)

Tables

Table 1
Major Event Milestones, Unit 25 Remedial Action

| Major Event | Date Started | Date Completed |
|---|---------------------|-----------------------|
| Signature of Track 3 Record of Decision | | May 2008 |
| Completion of Final Remedial Design/Remedial Action Work Plan | | August 2009 |
| Completion of Final Site Specific Work Plan (Units 25/31) | | November 2016 |
| Vegetation clearance, target and debris removal in Unit 25 | June 2015 | August 2016 |
| Grid and border survey in Unit 25 | July 2015 | August 2016 |
| Surface removal in Unit 25 | July 2015 | July 2017 |
| Digital geophysical survey in Unit 25 | November 2015 | August 2017 |
| Munitions and explosives of concern detonation | August 2015 | September 2017 |
| Technical Memorandum Unit 25 | | April 2018 |

Table 2
Ranges Associated with Unit 25

| Range | Military History and Training Activities |
|---|---|
| Range 68-Sub Machine Gun DSMTD (Dismounted) | Range is only shown on the July 1958 training map. The use of the range is unknown, but based on the size of the range it may have been used for small arms. |
| Range 70 – Small Arms Firing Course | Range only shown after the 1953 and 1958 training maps. Course is not shown on any other reviewed training maps. Initial visit by Harding Lawson Associates in March 1999 indicated small arms use in the area. |

Note: Source of information is the Basewide Range Assessment (BRA) report (BW-2300L).

Table 3

MEC Items Encountered and Removed Prior to Remedial Action Operations

| Date Found | Item Type | Quantity | Description | Depth (inches) | Unit |
|-------------------|------------------|-----------------|--|-----------------------|-------------|
| 11/10/1997 | UXO | 23 | Projectile, 81mm, mortar, high explosive, M43 series | 0 | 25 |
| 11/12/1997 | UXO | 24 | Projectile, 81mm, mortar, high explosive, M43 series | 0 | 25 |
| 2/18/1998 | UXO | 3 | Projectile, 81mm, mortar, high explosive, M43 series | 8 | 25 |
| 2/19/1998 | UXO | 2 | Projectile, 81mm, mortar, high explosive, M43 series | 10 | 25 |
| 1/27/1998 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | 18 | 25 |
| 1/27/1998 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | 0 | 25 |
| 1/27/1998 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | 16 | 25 |
| 1/27/1998 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | 14 | 25 |
| 1/27/1998 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | 0 | 25 |
| 1/27/1998 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | 0 | 25 |
| 1/27/1998 | UXO | 2 | Projectile, 81mm, mortar, high explosive, M43 series | 16 | 25 |
| 1/27/1998 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | 15 | 25 |
| 2/18/1998 | UXO | 6 | Projectile, 81mm, mortar, high explosive, M43 series | 8 | 25 |
| 2/18/1998 | UXO | 6 | Projectile, 81mm, mortar, high explosive, M43 series | 8 | 25 |
| 2/18/1998 | UXO | 13 | Projectile, 81mm, mortar, high explosive, M43 series | 8 | 25 |
| 2/18/1998 | UXO | 5 | Projectile, 81mm, mortar, high explosive, M43 series | 8 | 25 |
| 2/18/1998 | UXO | 3 | Projectile, 81mm, mortar, high explosive, M43 series | 8 | 25 |
| 2/18/1998 | UXO | 8 | Projectile, 81mm, mortar, high explosive, M43 series | 8 | 25 |
| 2/18/1998 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | 12 | 25 |
| 2/19/1998 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | 10 | 25 |
| 2/19/1998 | UXO | 3 | Projectile, 81mm, mortar, high explosive, M43 series | 10 | 25 |
| 2/19/1998 | UXO | 2 | Projectile, 81mm, mortar, high explosive, M43 series | 12 | 25 |
| 2/19/1998 | UXO | 3 | Projectile, 81mm, mortar, high explosive, M43 series | 12 | 25 |
| 11/27/2001 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | 0 | 25 |
| 11/27/2001 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | 0 | 25 |
| 11/27/2001 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | 0 | 25 |
| 11/28/2001 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | 0 | 25 |
| 11/28/2001 | UXO | 1 | Projectile, 40mm, high explosive, M381 | 0 | 25 |
| 11/28/2001 | UXO | 1 | Projectile, 75mm, shrapnel, MK I | 0 | 25 |
| 11/29/2001 | UXO | 1 | Projectile, 4.2inch, mortar, high explosive, M3 series | 0 | 25 |

Total = 119

Table 4
MEC Items Found During Surface Removal

| Description | Number of Items | |
|--|-----------------|----------|
| | Unit 25 | |
| | UXO | DMM |
| Grenade, rifle, smoke, M19A1 | 1 | 0 |
| Projectile, 105mm, high explosive, M1 | 1 | 0 |
| Projectile, 37mm, high explosive, MK II | 3 | 0 |
| Projectile, 37mm, low explosive, MK I | 36 | 0 |
| Projectile, 37mm, low explosive, MK II | 5 | 0 |
| Projectile, 4.2inch, mortar, high explosive, M3 series | 2 | 0 |
| Projectile, 4.2inch, mortar, smoke, white phosphorous, M328 series | 1 | 0 |
| Projectile, 40mm, high explosive, M383 | 8 | 0 |
| Projectile, 60mm, mortar, high explosive, M49 series | 11 | 0 |
| Projectile, 75mm, high explosive, M48 | 2 | 0 |
| Projectile, 75mm, high explosive, MK I | 5 | 0 |
| Projectile, 75mm, shrapnel, MK I | 8 | 0 |
| Projectile, 81mm, mortar, high explosive, M362 | 2 | 0 |
| Projectile, 81mm, mortar, high explosive, M43 series | 235 | 0 |
| Projectile, 81mm, mortar, illumination, M301 series | 1 | 0 |
| Rocket, 2.36inch, high explosive antitank, M6 | 1 | 0 |
| Rocket, 35mm, subcaliber, practice, M73 | 1 | 0 |
| Signal, illumination, ground parachute, M131 | 1 | 0 |
| | 324 | 0 |

DMM = Discarded Military Munitions

MEC = Munitions and Explosives of Concern

UXO = Unexploded Ordnance

Table 5
Statistical Results

| Parameter | Unit 25 |
|--|----------------|
| Surface removal acreage | 86 |
| DGM survey acreage | 75 |
| MEC items | 324 |
| Total estimated MD (lbs) for all areas | 58,091 |
| Total estimated RRD and OD (lbs) for all areas | 34,842 |

DGM = Digital Geophysical Mapping

MD = Munitions Debris

MEC = Munitions and Explosives of Concern

OD = Other Debris

RRD = Range-Related Debris

* Unit is 95 acres in total

Table 6
MEC Recovered During Remedial Action

| Date Found | Unit | Grid | Northing | Easting | Operation Type | Depth (in) | Item Type | Qty | Description |
|------------|------|--------|----------|---------|-----------------|------------|-----------|-----|--|
| 7/30/2015 | 25 | A3J5F5 | 2111595 | 5749910 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 8/5/2015 | 25 | B3B5B9 | 2113135 | 5750375 | Surface Removal | 0 | UXO | 1 | Projectile, 37mm, low explosive, MK I |
| 8/10/2015 | 25 | B3B5A8 | 2113035 | 5750215 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 8/17/2015 | 25 | A3J5I3 | 2111870 | 5749760 | Surface Removal | 0 | UXO | 1 | Signal, illumination, ground parachute, M131 |
| 8/18/2015 | 25 | A3J5I5 | 2111840 | 5749960 | Surface Removal | 0 | UXO | 1 | Projectile, 75mm, high explosive, MK I |
| 8/18/2015 | 25 | A3J5I5 | 2111880 | 5749985 | Surface Removal | 0 | UXO | 1 | Projectile, 37mm, high explosive, MK II |
| 8/18/2015 | 25 | A3J5I5 | 2111815 | 5749920 | Surface Removal | 0 | UXO | 1 | Projectile, 37mm, high explosive, MK II |
| 8/19/2015 | 25 | A3J5I6 | 2111810 | 5750020 | Surface Removal | 0 | UXO | 1 | Projectile, 37mm, low explosive, MK I |
| 8/19/2015 | 25 | A3J5I6 | 2111850 | 5750080 | Surface Removal | 0 | UXO | 1 | Projectile, 37mm, low explosive, MK I |
| 8/19/2015 | 25 | B3B5G6 | 2113682 | 5750073 | Surface Removal | 0 | UXO | 1 | Projectile, 37mm, low explosive, MK I |
| 8/20/2015 | 25 | B3B5G9 | 2113632 | 5750314 | Surface Removal | 0 | UXO | 1 | Projectile, 37mm, low explosive, MK I |
| 8/24/2015 | 25 | B3B5H8 | 2113778 | 5750277 | Surface Removal | 0 | UXO | 1 | Projectile, 37mm, low explosive, MK I |
| 8/24/2015 | 25 | B3B5H9 | 2113724 | 5750353 | Surface Removal | 0 | UXO | 1 | Projectile, 37mm, low explosive, MK I |
| 8/25/2015 | 25 | B3B5H6 | 2113711 | 5750075 | Surface Removal | 0 | UXO | 1 | Projectile, 75mm, Shrapnel, MK I |
| 8/25/2015 | 25 | B3B5H7 | 2113722 | 5750162 | Surface Removal | 0 | UXO | 1 | Projectile, 37mm, low explosive, MK II |
| 8/25/2015 | 25 | B3B5I6 | 2113806 | 5750039 | Surface Removal | 0 | UXO | 1 | Projectile, 75mm, high explosive, M48 |
| 8/26/2015 | 25 | B3B5I8 | 2113816 | 5750288 | Surface Removal | 0 | UXO | 1 | Projectile, 37mm, low explosive, MK I |
| 9/18/2015 | 25 | B3A5B8 | 2112160 | 5750255 | Surface Removal | 0 | UXO | 1 | Projectile, 37mm, low explosive, MK I |
| 9/18/2015 | 25 | B3A5H8 | 2112727 | 5750295 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 9/18/2015 | 25 | B3A5H9 | 2112780 | 5750361 | Surface Removal | 0 | UXO | 1 | Projectile, 75mm, high explosive, MK I |
| 9/18/2015 | 25 | B3A5H9 | 2112758 | 5750395 | Surface Removal | 0 | UXO | 1 | Projectile, 37mm, low explosive, MK I |
| 9/22/2015 | 25 | B3A5D0 | 2112312 | 5750475 | Surface Removal | 0 | UXO | 1 | Projectile, 37mm, low explosive, MK I |
| 9/22/2015 | 25 | B3A6I1 | 2112824 | 5750532 | Surface Removal | 0 | UXO | 1 | Projectile, 37mm, low explosive, MK I |
| 9/24/2015 | 25 | B3C5A7 | 2114062 | 5750150 | Surface Removal | 0 | UXO | 1 | Projectile, 37mm, low explosive, MK II |
| 9/25/2015 | 25 | B3A6G1 | 2112690 | 5750540 | Surface Removal | 0 | UXO | 1 | Projectile, 37mm, low explosive, MK II |
| 9/25/2015 | 25 | B3C5A8 | 2114086 | 5750239 | Surface Removal | 0 | UXO | 1 | Projectile, 37mm, low explosive, MK I |
| 9/25/2015 | 25 | B3C5B8 | 2114158 | 5750296 | Surface Removal | 0 | UXO | 1 | Projectile, 37mm, low explosive, MK I |
| 9/28/2015 | 25 | B3A5G9 | 2112615 | 5750370 | Surface Removal | 0 | UXO | 1 | Projectile, 37mm, low explosive, MK I |
| 9/28/2015 | 25 | B3A5G9 | 2112615 | 5750308 | Surface Removal | 0 | UXO | 1 | Projectile, 75mm, Shrapnel, MK I |
| 9/28/2015 | 25 | B3C5B6 | 2114124 | 5750052 | Surface Removal | 0 | UXO | 1 | Projectile, 40mm, high explosive, M383 |
| 9/29/2015 | 25 | B3C5C6 | 2114245 | 5750072 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 9/29/2015 | 25 | B3C5C6 | 2114287 | 5750080 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 9/29/2015 | 25 | B3C5C7 | 2114201 | 5750112 | Surface Removal | 0 | UXO | 1 | Projectile, 40mm, high explosive, M383 |
| 9/29/2015 | 25 | B3C5C7 | 2114234 | 5750117 | Surface Removal | 0 | UXO | 1 | Projectile, 37mm, low explosive, MK I |
| 10/1/2015 | 25 | B3C5D8 | 2114304 | 5750203 | Surface Removal | 0 | UXO | 1 | Projectile, 37mm, low explosive, MK I |
| 10/1/2015 | 25 | B3C5D8 | 2114361 | 5750252 | Surface Removal | 0 | UXO | 1 | Projectile, 37mm, low explosive, MK I |
| 10/2/2015 | 25 | B3C5D6 | 2114305 | 5750035 | Surface Removal | 0 | UXO | 1 | Projectile, 37mm, low explosive, MK I |
| 7/26/2016 | 25 | A3J5F7 | 2111595 | 5750123 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |

Table 6
MEC Recovered During Remedial Action

| Date Found | Unit | Grid | Northing | Easting | Operation Type | Depth (in) | Item Type | Qty | Description |
|------------|------|--------|----------|---------|-----------------|------------|-----------|-----|--|
| 7/26/2016 | 25 | A3J5G7 | 2111696 | 5750172 | Surface Removal | 0 | UXO | 1 | Projectile, 37mm, high explosive, MK II |
| 7/26/2016 | 25 | A3J5G7 | 2111655 | 5750144 | Surface Removal | 0 | UXO | 1 | Projectile, 75mm, high explosive, MK I |
| 7/27/2016 | 25 | A3J5H7 | 2111720 | 5750191 | Surface Removal | 0 | UXO | 1 | Projectile, 37mm, low explosive, MK I |
| 8/1/2016 | 25 | A3J5J8 | 2111927 | 5750279 | Surface Removal | 0 | UXO | 1 | Projectile, 37mm, low explosive, MK I |
| 8/3/2016 | 25 | A3I6E5 | 2110450 | 5750955 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 8/3/2016 | 25 | A3I6E5 | 2110420 | 5750914 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 8/4/2016 | 25 | A3I6F5 | 2110541 | 5750925 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 8/4/2016 | 25 | A3I6F5 | 2110577 | 5750967 | Surface Removal | 0 | UXO | 1 | Projectile, 37mm, low explosive, MK I |
| 8/8/2016 | 25 | A3I6G5 | 2110680 | 5750920 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 8/8/2016 | 25 | A3I6G5 | 2110670 | 5750950 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 8/8/2016 | 25 | A3I6G5 | 2110650 | 5750940 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 8/8/2016 | 25 | A3I6G5 | 2110670 | 5750940 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 8/8/2016 | 25 | A3I6G5 | 2110668 | 5750915 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 8/8/2016 | 25 | A3I6G5 | 2110623 | 5750981 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M362 |
| 8/8/2016 | 25 | A3I6G5 | 2110651 | 5750950 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 8/8/2016 | 25 | A3I6G5 | 2110690 | 5750950 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 8/8/2016 | 25 | A3I6G5 | 2110669 | 5750910 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 8/8/2016 | 25 | A3I6G5 | 2110630 | 5750960 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 8/9/2016 | 25 | A3I6G6 | 2110630 | 5751042 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 8/9/2016 | 25 | A3I6G6 | 2110679 | 5751032 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 8/9/2016 | 25 | A3I6G6 | 2110695 | 5751095 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 8/10/2016 | 25 | A3I6F6 | 2110596 | 5751007 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 8/10/2016 | 25 | A3I6F6 | 2110545 | 5751071 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 8/10/2016 | 25 | A3J7A1 | 2111050 | 5751515 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 8/10/2016 | 25 | A3J7C1 | 2111220 | 5751505 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 8/11/2016 | 25 | A3J7D1 | 2111380 | 5751515 | Surface Removal | 0 | UXO | 1 | Grenade, rifle, smoke, M19A1 |
| 8/15/2016 | 25 | A3I6D4 | 2110382 | 5750833 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 8/16/2016 | 25 | A3I6E3 | 2110453 | 5750783 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 8/16/2016 | 25 | A3I6F4 | 2110572 | 5750822 | Surface Removal | 0 | UXO | 1 | Projectile, 37mm, low explosive, MK I |
| 8/16/2016 | 25 | A3I6F4 | 2110532 | 5750883 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 8/16/2016 | 25 | A3I6F4 | 2110551 | 5750830 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 8/16/2016 | 25 | A3I6F4 | 2110563 | 5750872 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 8/16/2016 | 25 | A3I6I7 | 2110892 | 5751125 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 8/17/2016 | 25 | A3I6G3 | 2110674 | 5750723 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 8/17/2016 | 25 | A3I6G4 | 2110640 | 5750850 | Surface Removal | 0 | UXO | 1 | Projectile, 75mm, Shrapnel, MK I |
| 8/17/2016 | 25 | A3I6G4 | 2110645 | 5750825 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 8/17/2016 | 25 | A3I6G4 | 2110641 | 5750835 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 8/17/2016 | 25 | A3I6G4 | 2110623 | 5750868 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |

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| Date Found | Unit | Grid | Northing | Easting | Operation Type | Depth (in) | Item Type | Qty | Description |
|------------|------|--------|----------|---------|-----------------|------------|-----------|-----|--|
| 8/18/2016 | 25 | A3I6G2 | 2110640 | 5750610 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 8/18/2016 | 25 | A3I6H2 | 2110705 | 5750609 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 8/18/2016 | 25 | A3I6H2 | 2110778 | 5750612 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 8/18/2016 | 25 | A3I6H2 | 2110750 | 5750608 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 8/18/2016 | 25 | A3I6H9 | 2110795 | 5751306 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 8/18/2016 | 25 | A3I5D0 | 2111360 | 5750480 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 8/18/2016 | 25 | A3I5D0 | 2111370 | 5750400 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 8/22/2016 | 25 | A3I6H4 | 2110725 | 5750870 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 8/22/2016 | 25 | A3I6H4 | 2110735 | 5750874 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 8/22/2016 | 25 | A3I6H4 | 2110744 | 5750842 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 8/22/2016 | 25 | A3I6H7 | 2110785 | 5751180 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 8/22/2016 | 25 | A3I6H7 | 2110735 | 5751110 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 8/22/2016 | 25 | A3I6H7 | 2110762 | 5751170 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 8/22/2016 | 25 | A3I6H8 | 2110705 | 5751220 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 8/22/2016 | 25 | A3I6H8 | 2110732 | 5751245 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 8/22/2016 | 25 | A3I6H8 | 2110765 | 5751270 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 8/22/2016 | 25 | A3I6I4 | 2110847 | 5750850 | Surface Removal | 0 | UXO | 1 | Projectile, 75mm, Shrapnel, MK I |
| 8/23/2016 | 25 | A3I6I4 | 2110821 | 5750868 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 8/24/2016 | 25 | A3I6I3 | 2110855 | 5750774 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 8/25/2016 | 25 | A3I6F7 | 2110567 | 5751195 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 8/25/2016 | 25 | A3I6F9 | 2110575 | 5751332 | Surface Removal | 0 | UXO | 1 | Rocket, 35mm, subcaliber, practice, M73 |
| 8/25/2016 | 25 | A3I5I9 | 2111950 | 5750370 | Surface Removal | 0 | UXO | 1 | Projectile, 37mm, low explosive, MK I |
| 8/30/2016 | 25 | A3I5G9 | 2111680 | 5750390 | Surface Removal | 0 | UXO | 1 | Projectile, 105mm, high explosive, M1 |
| 9/1/2016 | 25 | A3I5C7 | 2111202 | 5750103 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 9/1/2016 | 25 | A3I5D8 | 2111310 | 5750280 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 9/1/2016 | 25 | A3I5D9 | 2111305 | 5750375 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 9/12/2016 | 25 | A3I6I3 | 2110895 | 5750705 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 9/12/2016 | 25 | B3A6J5 | 2112972 | 5750930 | Surface Removal | 0 | UXO | 1 | Projectile, 40mm, high explosive, M383 |
| 9/12/2016 | 25 | B3A6J6 | 2112980 | 5751030 | Surface Removal | 0 | UXO | 1 | Projectile, 40mm, high explosive, M383 |
| 9/12/2016 | 25 | B3A6J6 | 2112970 | 5751090 | Surface Removal | 0 | UXO | 1 | Projectile, 40mm, high explosive, M383 |
| 9/13/2016 | 25 | A3I6H5 | 2110704 | 5750990 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 9/13/2016 | 25 | A3I6H5 | 2110706 | 5750984 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 9/13/2016 | 25 | A3I6H5 | 2110703 | 5750989 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M362 |
| 9/13/2016 | 25 | B3A6J4 | 2112940 | 5750880 | Surface Removal | 0 | UXO | 1 | Projectile, 75mm, Shrapnel, MK I |
| 9/19/2016 | 25 | A3I6J6 | 2110932 | 5751012 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 9/19/2016 | 25 | A3I6F1 | 2111510 | 5750550 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 9/20/2016 | 25 | A3I6D8 | 2111315 | 5751230 | Surface Removal | 0 | UXO | 1 | Projectile, 60mm, mortar, high explosive, M49 series |
| 9/20/2016 | 25 | A3I6D8 | 2111345 | 5751210 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |

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| Date Found | Unit | Grid | Northing | Easting | Operation Type | Depth (in) | Item Type | Qty | Description |
|------------|------|--------|----------|---------|-----------------|------------|-----------|-----|--|
| 9/20/2016 | 25 | A3J6D9 | 2111350 | 5751330 | Surface Removal | 0 | UXO | 1 | Projectile, 4.2inch, mortar, smoke, white phosphorous, M328 series |
| 9/20/2016 | 25 | A3J6F2 | 2111550 | 5750625 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 9/21/2016 | 25 | A3J6C8 | 2111215 | 5751290 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 9/21/2016 | 25 | A3J6C8 | 2111255 | 5751250 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 9/21/2016 | 25 | A3J6C8 | 2111219 | 5751288 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 9/21/2016 | 25 | A3J6C8 | 2111233 | 5751285 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 9/21/2016 | 25 | A3J6D8 | 2111372 | 5751250 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 9/21/2016 | 25 | A3J6E3 | 2111420 | 5750775 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 9/21/2016 | 25 | A3J6E3 | 2111440 | 5750725 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 9/21/2016 | 25 | B3A6D0 | 2112302 | 5751405 | Surface Removal | 0 | UXO | 1 | Rocket, 2.36inch, high explosive antitank, M6 |
| 9/22/2016 | 25 | A3J6C8 | 2111218 | 5751293 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 9/22/2016 | 25 | A3J6C8 | 2111233 | 5751275 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 9/22/2016 | 25 | A3J6C8 | 2111258 | 5751245 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 9/22/2016 | 25 | A3J6C8 | 2111245 | 5751295 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 9/26/2016 | 25 | A3J6C9 | 2111208 | 5751392 | Surface Removal | 0 | UXO | 1 | Projectile, 60mm, mortar, high explosive, M49 series |
| 9/26/2016 | 25 | A3J6D1 | 2111330 | 5750520 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 9/26/2016 | 25 | A3J6D4 | 2111303 | 5750890 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 9/26/2016 | 25 | A3J6D4 | 2111305 | 5750835 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 9/26/2016 | 25 | A3J6D4 | 2111325 | 5750880 | Surface Removal | 0 | UXO | 1 | Projectile, 60mm, mortar, high explosive, M49 series |
| 9/27/2016 | 25 | A3J6B0 | 2111108 | 5751485 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 9/27/2016 | 25 | A3J6C1 | 2111210 | 5750525 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 9/27/2016 | 25 | A3J6D4 | 2111350 | 5750875 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 9/27/2016 | 25 | B3B6C2 | 2113270 | 5750640 | Surface Removal | 0 | UXO | 1 | Projectile, 37mm, low explosive, MK II |
| 9/28/2016 | 25 | A3J6A2 | 2111005 | 5750680 | Surface Removal | 0 | UXO | 1 | Projectile, 75mm, Shrapnel, MK I |
| 9/28/2016 | 25 | A3J6B9 | 2111105 | 5751395 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 9/28/2016 | 25 | A3J6B9 | 2111150 | 5751318 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 9/28/2016 | 25 | A3J6D5 | 2111311 | 5750955 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 9/28/2016 | 25 | A3J6D5 | 2111333 | 5750961 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 9/28/2016 | 25 | A3J6D5 | 2111310 | 5750978 | Surface Removal | 0 | UXO | 1 | Projectile, 60mm, mortar, high explosive, M49 series |
| 9/28/2016 | 25 | A3J6D5 | 2111333 | 5750959 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 9/28/2016 | 25 | A3J6D5 | 2111312 | 5750903 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 9/28/2016 | 25 | A3J6D5 | 2111339 | 5750951 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 9/28/2016 | 25 | A3J6D5 | 2111383 | 5750977 | Surface Removal | 0 | UXO | 1 | Projectile, 60mm, mortar, high explosive, M49 series |
| 9/29/2016 | 25 | A3J6B2 | 2111190 | 5750680 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 9/29/2016 | 25 | A3J6B8 | 2111148 | 5751265 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 9/29/2016 | 25 | A3J6B8 | 2111125 | 5751295 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 9/29/2016 | 25 | A3J6B8 | 2111148 | 5751235 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 9/29/2016 | 25 | A3J6B8 | 2111125 | 5751201 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |

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| Date Found | Unit | Grid | Northing | Easting | Operation Type | Depth (in) | Item Type | Qty | Description |
|------------|------|--------|----------|---------|-----------------|------------|-----------|-----|--|
| 9/29/2016 | 25 | A3J6B8 | 2111185 | 5751200 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 9/29/2016 | 25 | A3J6B8 | 2111165 | 5751245 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 9/29/2016 | 25 | A3J6C5 | 2111281 | 5750945 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 9/29/2016 | 25 | A3J6C5 | 2111249 | 5750901 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/3/2016 | 25 | A3J6C4 | 2111240 | 5750895 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/3/2016 | 25 | A3J6C4 | 2111245 | 5750890 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/3/2016 | 25 | A3J6C4 | 2111275 | 5750882 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/3/2016 | 25 | A3J6C4 | 2111275 | 5750855 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/3/2016 | 25 | A3J6C4 | 2111240 | 5750885 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/3/2016 | 25 | A3J6C4 | 2111280 | 5750885 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/3/2016 | 25 | A3J6C4 | 2111241 | 5750899 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/3/2016 | 25 | B3B6A5 | 2113050 | 5750970 | Surface Removal | 0 | UXO | 1 | Projectile, 40mm, high explosive, M383 |
| 10/3/2016 | 25 | B3B6A5 | 2113010 | 5750945 | Surface Removal | 0 | UXO | 1 | Projectile, 40mm, high explosive, M383 |
| 10/3/2016 | 25 | B3B6A6 | 2113010 | 5751060 | Surface Removal | 0 | UXO | 1 | Projectile, 40mm, high explosive, M383 |
| 10/4/2016 | 25 | A3J6A0 | 2111020 | 5751435 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/4/2016 | 25 | A3J6A5 | 2111090 | 5750910 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/4/2016 | 25 | A3J6A9 | 2111015 | 5751320 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/4/2016 | 25 | A3J6A9 | 2111095 | 5751375 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/4/2016 | 25 | A3J6A9 | 2111085 | 5751360 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/4/2016 | 25 | A3J6A9 | 2111050 | 5751375 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/4/2016 | 25 | A3J6A9 | 2111035 | 5751325 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/4/2016 | 25 | A3J6A9 | 2111040 | 5751335 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/4/2016 | 25 | A3J6C4 | 2111230 | 5750895 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/4/2016 | 25 | A3J6C4 | 2111225 | 5750830 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/4/2016 | 25 | A3J6C4 | 2111213 | 5750840 | Surface Removal | 0 | UXO | 1 | Projectile, 60mm, mortar, high explosive, M49 series |
| 10/4/2016 | 25 | A3J6C4 | 2111207 | 5750805 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/4/2016 | 25 | B3B5J9 | 2113925 | 5750370 | Surface Removal | 0 | UXO | 1 | Projectile, 37mm, low explosive, MK I |
| 10/5/2016 | 25 | A3J6A7 | 2111090 | 5751105 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/5/2016 | 25 | A3J6A7 | 2111075 | 5751190 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/5/2016 | 25 | A3J6A7 | 2111010 | 5751115 | Surface Removal | 0 | UXO | 1 | Projectile, 60mm, mortar, high explosive, M49 series |
| 10/5/2016 | 25 | A3J6A7 | 2111080 | 5751115 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/5/2016 | 25 | A3J6A7 | 2111035 | 5751185 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/5/2016 | 25 | A3J6B4 | 2111160 | 5750870 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/5/2016 | 25 | A3J6B4 | 2111150 | 5750820 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/5/2016 | 25 | A3J6B5 | 2111170 | 5750950 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/5/2016 | 25 | B3B5C0 | 2113280 | 5750465 | Surface Removal | 0 | UXO | 1 | Projectile, 37mm, low explosive, MK I |
| 10/5/2016 | 25 | B3B5D0 | 2113335 | 5750440 | Surface Removal | 0 | UXO | 1 | Projectile, 75mm, high explosive, MK I |
| 10/5/2016 | 25 | B3B6A1 | 2113035 | 5750570 | Surface Removal | 0 | UXO | 1 | Projectile, 37mm, low explosive, MK I |

Table 6
MEC Recovered During Remedial Action

| Date Found | Unit | Grid | Northing | Easting | Operation Type | Depth (in) | Item Type | Qty | Description |
|------------|------|--------|----------|---------|-----------------|------------|-----------|-----|--|
| 10/6/2016 | 25 | A3J6B3 | 2111180 | 5750720 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/6/2016 | 25 | A3J6E4 | 2111408 | 5750899 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/6/2016 | 25 | A3J6E4 | 2111442 | 5750832 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/6/2016 | 25 | A3J6E4 | 2111442 | 5750850 | Surface Removal | 0 | UXO | 1 | Projectile, 4.2inch, mortar, high explosive, M3 series |
| 10/6/2016 | 25 | A3J6E4 | 2111430 | 5750830 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/6/2016 | 25 | A3J6J8 | 2111930 | 5751257 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/6/2016 | 25 | B3B5E0 | 2113430 | 5750430 | Surface Removal | 0 | UXO | 1 | Projectile, 75mm, high explosive, MK I |
| 10/6/2016 | 25 | B3B5J0 | 2113985 | 5750415 | Surface Removal | 0 | UXO | 1 | Projectile, 37mm, low explosive, MK I |
| 10/11/2016 | 25 | A3J6D6 | 2111387 | 5751041 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/11/2016 | 25 | A3J6D6 | 2111396 | 5751020 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/11/2016 | 25 | A3J6E4 | 2111433 | 5750816 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/11/2016 | 25 | A3J6E4 | 2111415 | 5750860 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/11/2016 | 25 | B3C5A0 | 2114070 | 5750408 | Surface Removal | 0 | UXO | 1 | Projectile, 37mm, low explosive, MK I |
| 10/12/2016 | 25 | A3J6D6 | 2111350 | 5751028 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/12/2016 | 25 | A3J6D6 | 2111350 | 5751015 | Surface Removal | 0 | UXO | 1 | Projectile, 60mm, mortar, high explosive, M49 series |
| 10/12/2016 | 25 | A3J6D6 | 2111320 | 5751060 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/12/2016 | 25 | A3J6D6 | 2111301 | 5751050 | Surface Removal | 0 | UXO | 1 | Projectile, 60mm, mortar, high explosive, M49 series |
| 10/12/2016 | 25 | A3J6D6 | 2111395 | 5751095 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/12/2016 | 25 | B3B6F2 | 2113575 | 5750665 | Surface Removal | 0 | UXO | 1 | Projectile, 37mm, low explosive, MK I |
| 10/12/2016 | 25 | B3C5A9 | 2114065 | 5750306 | Surface Removal | 0 | UXO | 1 | Projectile, 37mm, low explosive, MK I |
| 10/13/2016 | 25 | A3J6D6 | 2111380 | 5751065 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/13/2016 | 25 | A3J6D6 | 2111352 | 5751064 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/13/2016 | 25 | A3J6D6 | 2111390 | 5751095 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/13/2016 | 25 | A3J6D6 | 2111345 | 5751087 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/13/2016 | 25 | A3J6D6 | 2111330 | 5751085 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/13/2016 | 25 | A3J6D6 | 2111356 | 5751065 | Surface Removal | 0 | UXO | 1 | Projectile, 60mm, mortar, high explosive, M49 series |
| 10/13/2016 | 25 | A3J6D6 | 2111350 | 5751070 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/13/2016 | 25 | A3J6D6 | 2111301 | 5751089 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/17/2016 | 25 | A3J6C5 | 2111273 | 5750960 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/17/2016 | 25 | A3J6C5 | 2111255 | 5750964 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/17/2016 | 25 | A3J6C5 | 2111230 | 5750932 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/17/2016 | 25 | A3J6C5 | 2111280 | 5750955 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/17/2016 | 25 | A3J6C5 | 2111268 | 5750948 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/17/2016 | 25 | A3J6C5 | 2111261 | 5750995 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/17/2016 | 25 | A3J6C5 | 2111282 | 5750925 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/24/2016 | 25 | A3J6C5 | 2111208 | 5750933 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/24/2016 | 25 | A3J6C5 | 2111205 | 5750930 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/24/2016 | 25 | A3J6C6 | 2111219 | 5751019 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |

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MEC Recovered During Remedial Action

| Date Found | Unit | Grid | Northing | Easting | Operation Type | Depth (in) | Item Type | Qty | Description |
|------------|------|--------|----------|---------|-----------------|------------|-----------|-----|--|
| 10/24/2016 | 25 | A3J6C6 | 2111280 | 5751008 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/24/2016 | 25 | A3J6C6 | 2111260 | 5751055 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/24/2016 | 25 | A3J6C6 | 2111266 | 5751065 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/24/2016 | 25 | A3J6C6 | 2111270 | 5751062 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/24/2016 | 25 | A3J6C6 | 2111248 | 5751025 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/24/2016 | 25 | A3J6C6 | 2111245 | 5751095 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/24/2016 | 25 | A3J6C6 | 2111255 | 5751050 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 10/25/2016 | 25 | B3B5G0 | 2113645 | 5750445 | Surface Removal | 0 | UXO | 1 | Projectile, 37mm, low explosive, MK I |
| 10/25/2016 | 25 | B3B5G0 | 2113630 | 5750460 | Surface Removal | 0 | UXO | 1 | Projectile, 37mm, low explosive, MK I |
| 10/27/2016 | 25 | B3A6I3 | 2112810 | 5750795 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 11/9/2016 | 25 | A3J6B6 | 2111144 | 5751026 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 11/9/2016 | 25 | A3J6B6 | 2111125 | 5751015 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 11/9/2016 | 25 | A3J6B6 | 2111160 | 5751090 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 11/9/2016 | 25 | A3J6B6 | 2111105 | 5751067 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 11/14/2016 | 25 | A3J6A6 | 2111075 | 5751087 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 11/14/2016 | 25 | A3J6A6 | 2111085 | 5751086 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 11/14/2016 | 25 | A3J6A6 | 2111070 | 5751068 | Surface Removal | 0 | UXO | 1 | Projectile, 4.2inch, mortar, high explosive, M3 series |
| 11/14/2016 | 25 | A3J6A6 | 2111070 | 5751095 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 11/21/2016 | 25 | A3J6B7 | 2111141 | 5751112 | Surface Removal | 0 | UXO | 1 | Projectile, 37mm, low explosive, MK I |
| 11/21/2016 | 25 | A3J6B7 | 2111182 | 5751156 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 11/21/2016 | 25 | A3J6B7 | 2111106 | 5751105 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 11/21/2016 | 25 | A3J6B7 | 2111132 | 5751168 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 11/21/2016 | 25 | A3J6B7 | 2111141 | 5751156 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, illumination, M301 series |
| 11/22/2016 | 25 | A3J6C7 | 2111250 | 5751178 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 11/22/2016 | 25 | A3J6C7 | 2111265 | 5751168 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 11/22/2016 | 25 | A3J6C7 | 2111205 | 5751125 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 11/22/2016 | 25 | A3J6C7 | 2111225 | 5751165 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 11/22/2016 | 25 | A3J6C7 | 2111290 | 5751125 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 11/28/2016 | 25 | A3J6D7 | 2111330 | 5751162 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 11/28/2016 | 25 | A3J6D7 | 2111362 | 5751170 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 11/28/2016 | 25 | A3J6D7 | 2111375 | 5751169 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 11/28/2016 | 25 | A3J6D7 | 2111380 | 5751167 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 11/28/2016 | 25 | A3J6D7 | 2111390 | 5751155 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 11/28/2016 | 25 | A3J6D7 | 2111365 | 5751162 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 11/28/2016 | 25 | A3J6D7 | 2111315 | 5751188 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 11/29/2016 | 25 | A3J6D7 | 2111325 | 5751118 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 11/29/2016 | 25 | A3J6D7 | 2111375 | 5751135 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 11/29/2016 | 25 | A3J6D7 | 2111360 | 5751105 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |

Table 6
MEC Recovered During Remedial Action

| Date Found | Unit | Grid | Northing | Easting | Operation Type | Depth (in) | Item Type | Qty | Description |
|------------|------|--------|----------|---------|-----------------|------------|-----------|-----|--|
| 11/29/2016 | 25 | A3J6D7 | 2111355 | 5751112 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 11/29/2016 | 25 | A3J6D7 | 2111355 | 5751146 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 11/29/2016 | 25 | A3J6D7 | 2111350 | 5751125 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 11/29/2016 | 25 | A3J6D7 | 2111380 | 5751131 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 11/29/2016 | 25 | A3J6D7 | 2111310 | 5751118 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 11/29/2016 | 25 | A3J6D7 | 2111370 | 5751110 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 11/29/2016 | 25 | A3J6D7 | 2111368 | 5751121 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 11/30/2016 | 25 | B3A6F4 | 2112570 | 5750810 | Surface Removal | 0 | UXO | 1 | Projectile, 75mm, high explosive, M48 |
| 12/6/2016 | 25 | B3A6E3 | 2112480 | 5750735 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 12/13/2016 | 25 | A3J6E6 | 2111415 | 5751020 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 12/13/2016 | 25 | A3J6E6 | 2111415 | 5751045 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 12/13/2016 | 25 | A3J6E6 | 2111420 | 5751095 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 12/13/2016 | 25 | A3J6E6 | 2111410 | 5751070 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 12/13/2016 | 25 | A3J6E6 | 2111490 | 5751030 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 12/13/2016 | 25 | A3J6E6 | 2111405 | 5751035 | Surface Removal | 0 | UXO | 1 | Projectile, 60mm, mortar, high explosive, M49 series |
| 12/14/2016 | 25 | A3J6E7 | 2111402 | 5751105 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 12/20/2016 | 25 | A3J6F7 | 2111541 | 5751116 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 12/27/2016 | 25 | A3J6G3 | 2111690 | 5750790 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 1/5/2017 | 25 | A3J6G7 | 2111698 | 5751150 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 1/17/2017 | 25 | A3J6I3 | 2111840 | 5750740 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 4/26/2017 | 25 | B3A5B0 | 2112163 | 5750412 | Surface Removal | 0 | UXO | 1 | Projectile, 37mm, low explosive, MK I |
| 4/26/2017 | 25 | B3A5B9 | 2112145 | 5750315 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 4/27/2017 | 25 | A3J6I1 | 2111820 | 5750515 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 4/27/2017 | 25 | B3A5A0 | 2112041 | 5750435 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 5/2/2017 | 25 | A3J6J1 | 2111955 | 5750505 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 5/4/2017 | 25 | B3A6B1 | 2112103 | 5750593 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 5/4/2017 | 25 | B3A6B1 | 2112165 | 5750578 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 5/4/2017 | 25 | B3A6B1 | 2112150 | 5750576 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 5/4/2017 | 25 | B3A6B1 | 2112168 | 5750577 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 5/4/2017 | 25 | B3A6B1 | 2112185 | 5750592 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 5/10/2017 | 25 | B3A6B2 | 2112108 | 5750678 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 5/10/2017 | 25 | B3A6B2 | 2112114 | 5750607 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 5/11/2017 | 25 | B3A6A2 | 2112085 | 5750660 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 5/11/2017 | 25 | B3A6A2 | 2112065 | 5750668 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 5/11/2017 | 25 | B3A6B2 | 2112132 | 5750635 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 5/11/2017 | 25 | B3A6B2 | 2112165 | 5750645 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 5/15/2017 | 25 | A3J6J2 | 2111980 | 5750649 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 5/15/2017 | 25 | A3J6J2 | 2111969 | 5750658 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |

Table 6
MEC Recovered During Remedial Action

| Date Found | Unit | Grid | Northing | Easting | Operation Type | Depth (in) | Item Type | Qty | Description |
|------------|------|--------|----------|---------|-----------------|------------|-----------|-----|--|
| 5/15/2017 | 25 | A3J6J3 | 2111945 | 5750775 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 5/16/2017 | 25 | A3J6J3 | 2111950 | 5750750 | Surface Removal | 0 | UXO | 1 | Projectile, 75mm, Shrapnel, MK I |
| 5/16/2017 | 25 | B3A6A3 | 2112007 | 5750704 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 5/16/2017 | 25 | B3A6A3 | 2112012 | 5750778 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 5/16/2017 | 25 | B3A6A3 | 2112050 | 5750712 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 5/16/2017 | 25 | B3A6A3 | 2112085 | 5750712 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 5/16/2017 | 25 | B3A6A3 | 2112009 | 5750725 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 5/16/2017 | 25 | B3A6A3 | 2112085 | 5750745 | Surface Removal | 0 | UXO | 1 | Projectile, 37mm, low explosive, MK II |
| 5/16/2017 | 25 | B3A6A3 | 2112041 | 5750765 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 5/16/2017 | 25 | B3A6A3 | 2112035 | 5750707 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 5/16/2017 | 25 | B3A6A3 | 2112035 | 5750712 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 5/16/2017 | 25 | B3A6A3 | 2112015 | 5750705 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 5/25/2017 | 25 | B3A6C5 | 2112236 | 5750929 | Surface Removal | 0 | UXO | 1 | Projectile, 75mm, Shrapnel, MK I |
| 6/7/2017 | 25 | B3A6A6 | 2112050 | 5751085 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 6/7/2017 | 25 | B3A6A6 | 2112008 | 5751095 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 6/7/2017 | 25 | B3A6A6 | 2112010 | 5751040 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 6/7/2017 | 25 | B3A6A6 | 2112080 | 5751055 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 6/13/2017 | 25 | A3J6G8 | 2111670 | 5751255 | Surface Removal | 0 | UXO | 1 | Projectile, 37mm, low explosive, MK I |
| 7/13/2017 | 25 | A3J6J7 | 2111950 | 5751150 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |
| 7/13/2017 | 25 | A3J6J7 | 2111950 | 5751120 | Surface Removal | 0 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series |

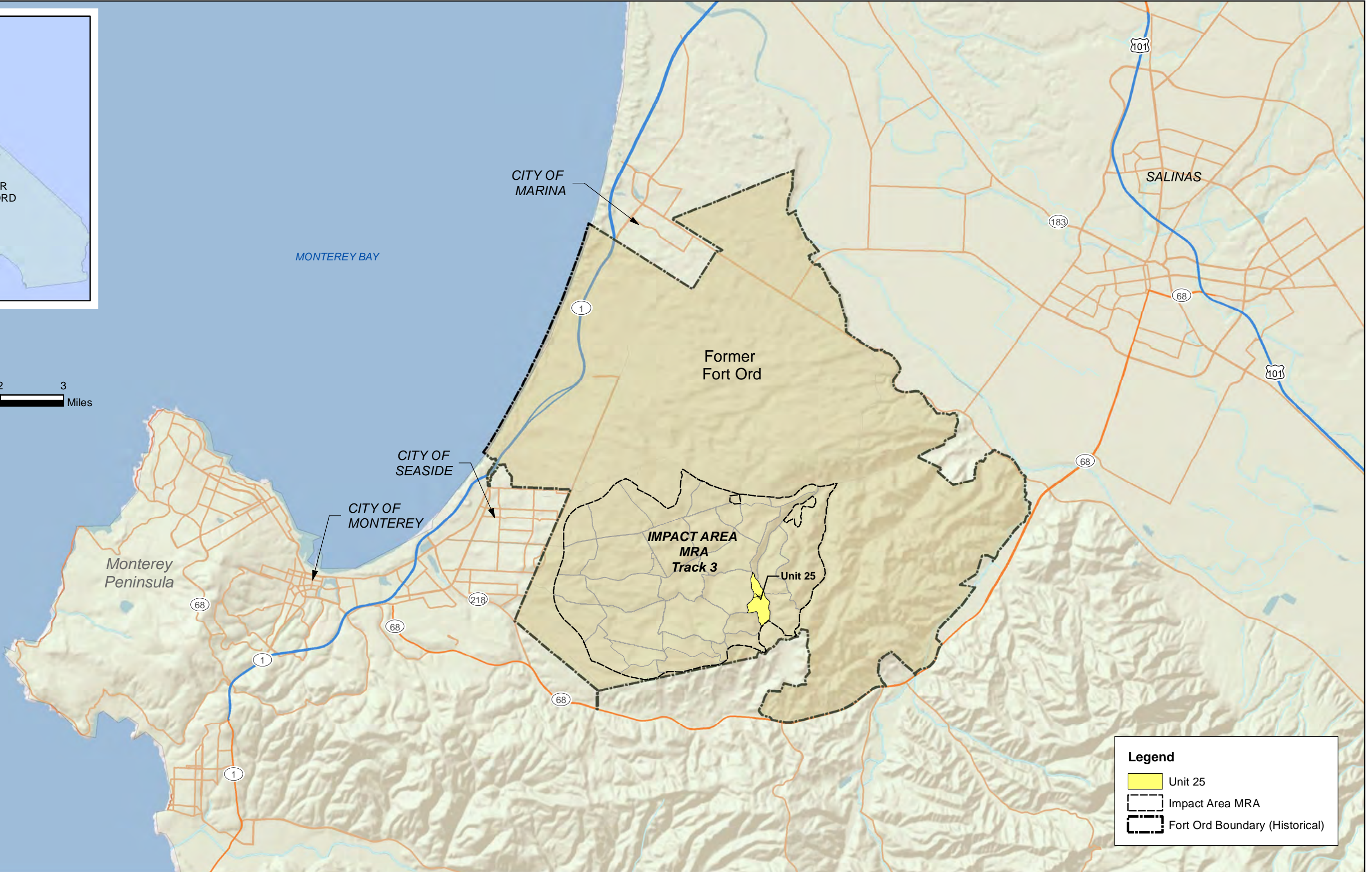
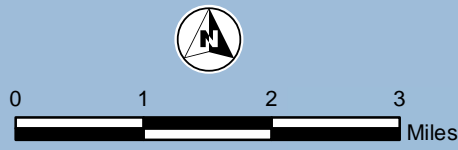
Total = 324

Table 7
Summary of Survey and Removal Methods by Grids

| Activity | Unit 25 Grids | % of Total Grids |
|-----------------|----------------------|-------------------------|
| Surface Removal | 521 | 100% |
| DGM Survey | 480 | 92% |

DGM = Digital Geophysical Mapping

Figures



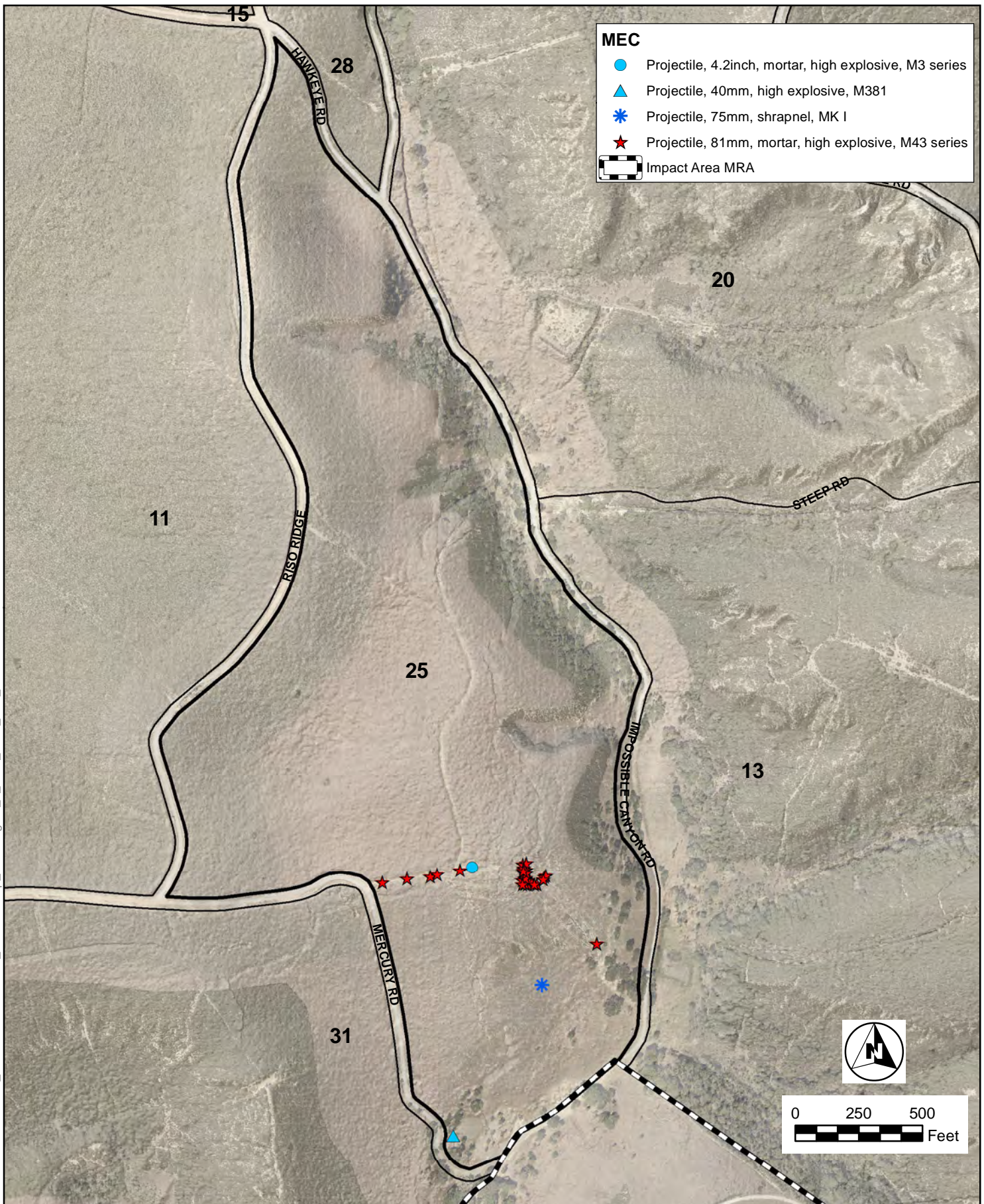
Legend

- Unit 25
- Impact Area MRA
- Fort Ord Boundary (Historical)



Remedial Action Report
 Unit 25
 Munitions and Explosives of Concern (MEC) Removal
 ImpactArea MRA
 Former Fort Ord, California

Figure 1
 Track 3 Impact Area MRA
 Regional Location Map

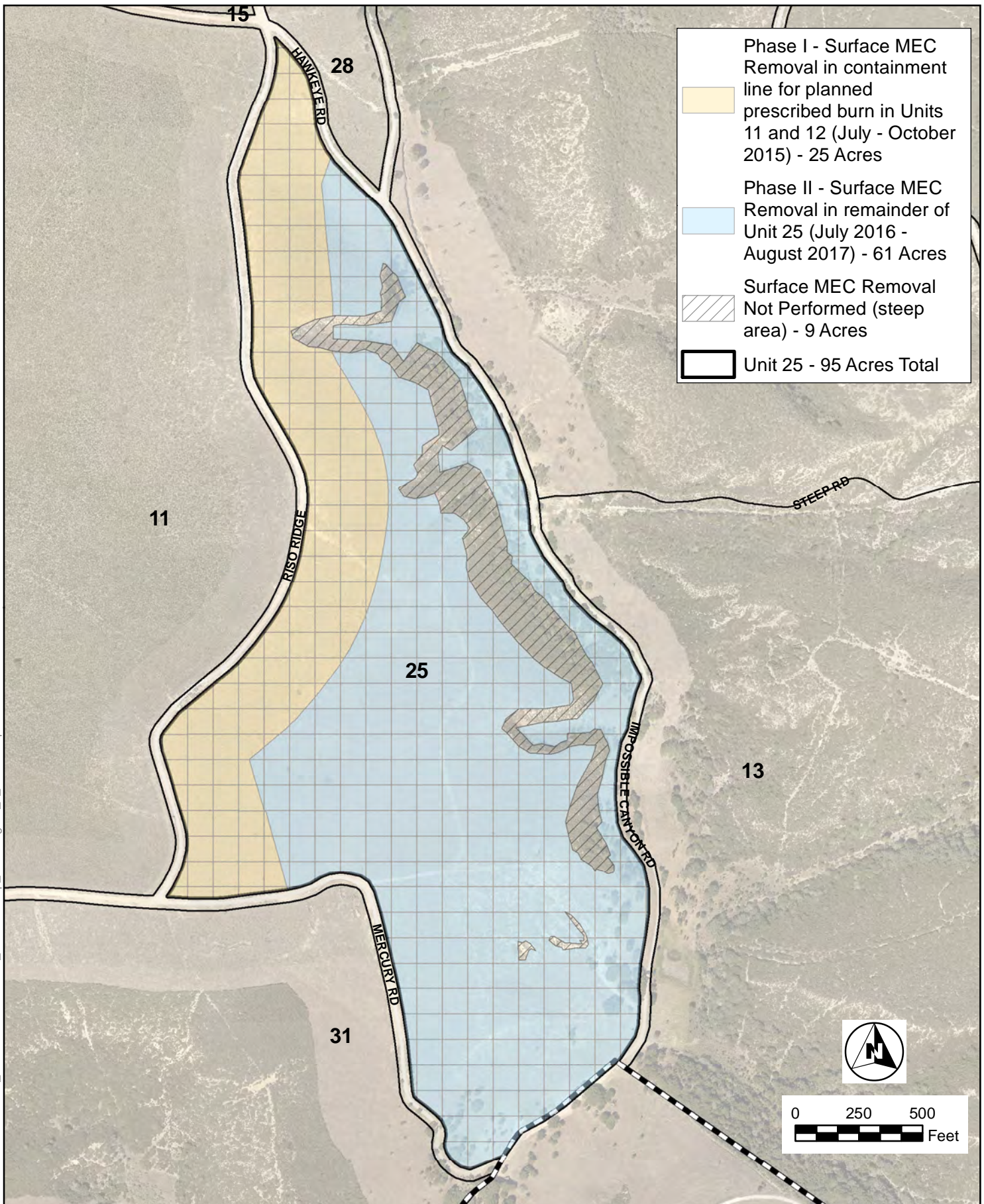


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Remedial Action Report
Unit 25
Munitions and Explosives of Concern
Former Fort Ord, California

Figure 2
MEC Finds Prior to
Remedial Action

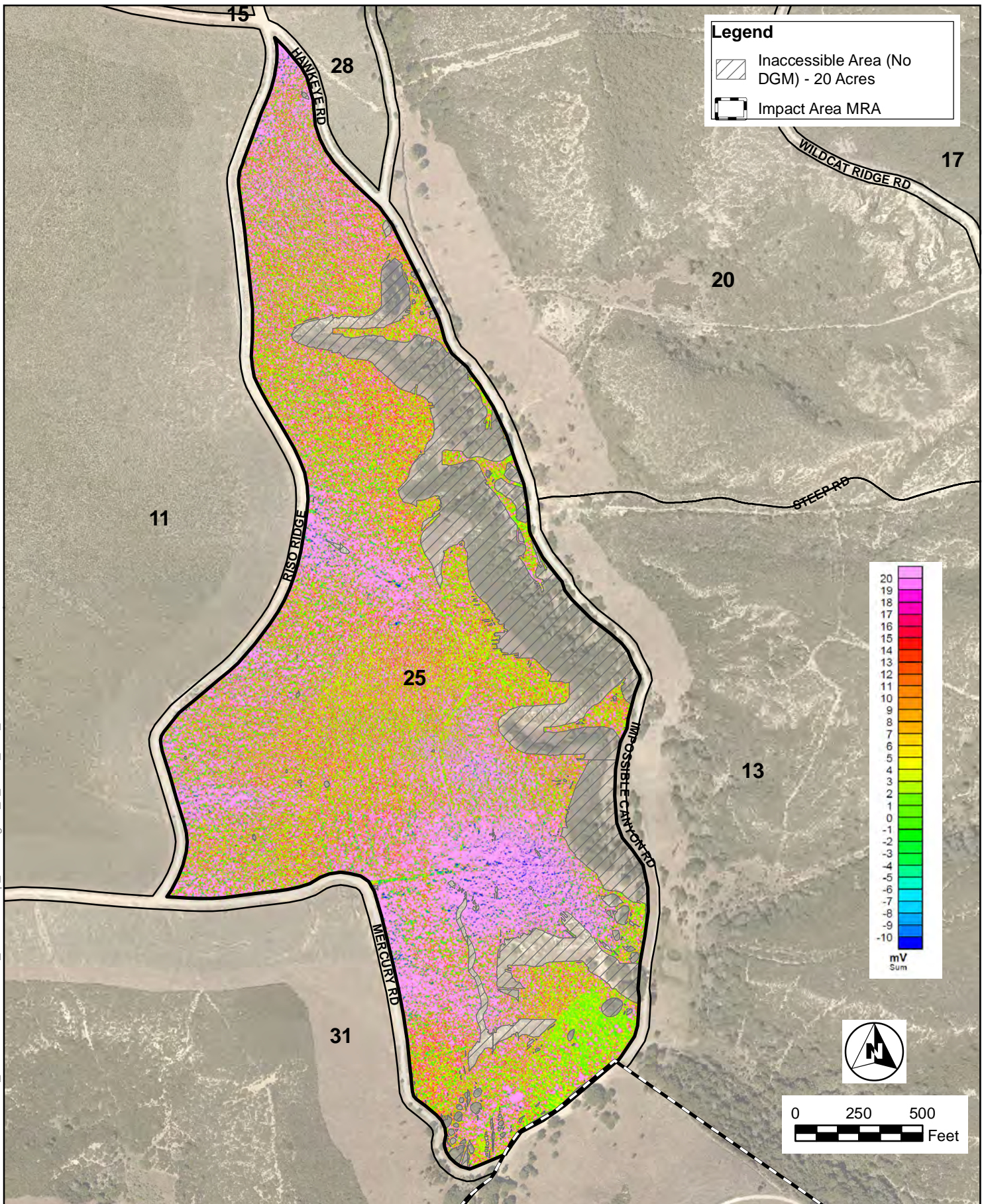


KEMRON
ENVIRONMENTAL SERVICES

Gilbane

Remedial Action Report
Unit 25
Munitions and Explosives of Concern
Former Fort Ord, California

Figure 3
Surface MEC Removal
Operations

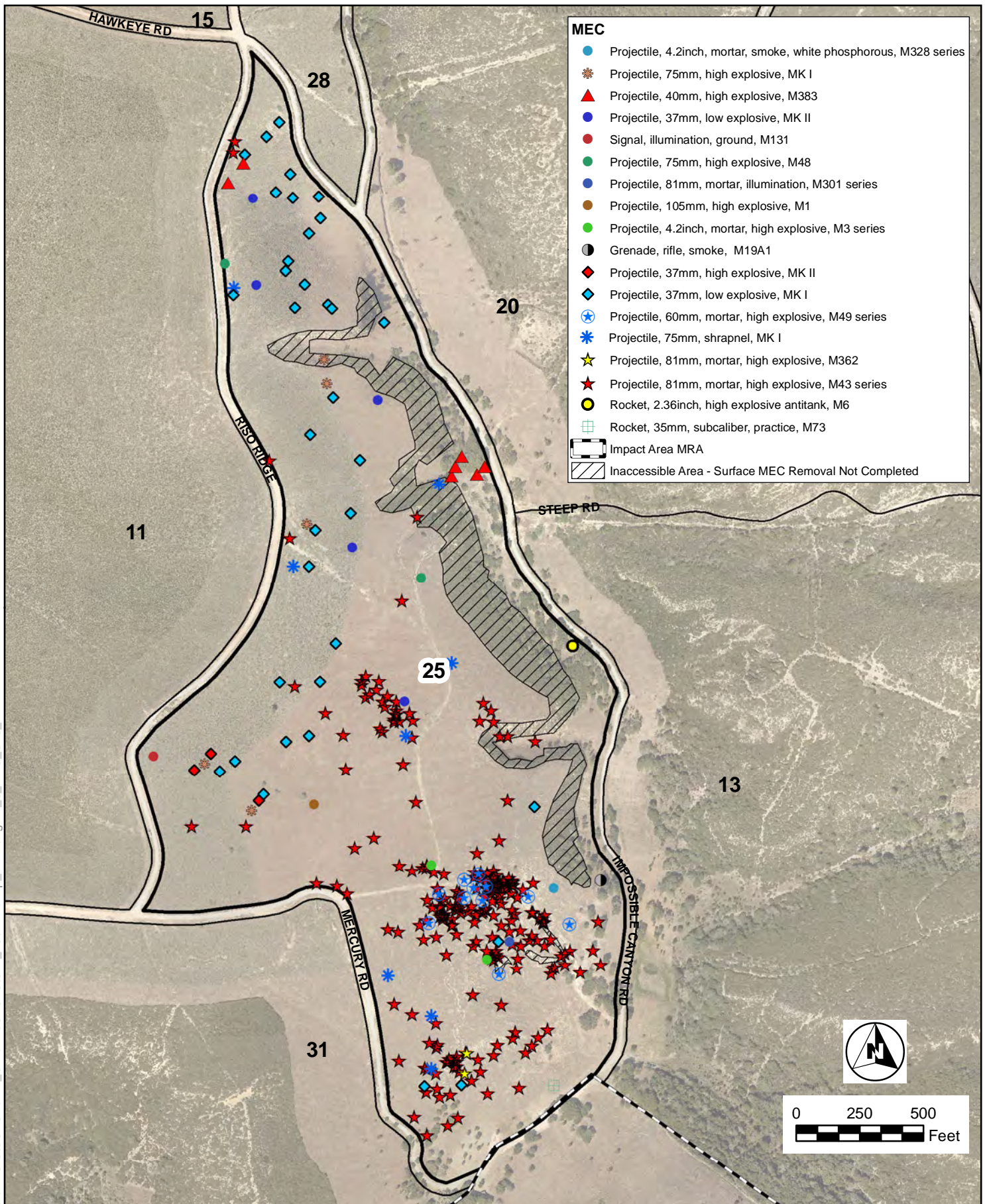


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ENVIRONMENTAL SERVICES

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Remedial Action Report
Unit 25
Munitions and Explosives of Concern
Former Fort Ord, California

Figure 4
Geophysical Data Map

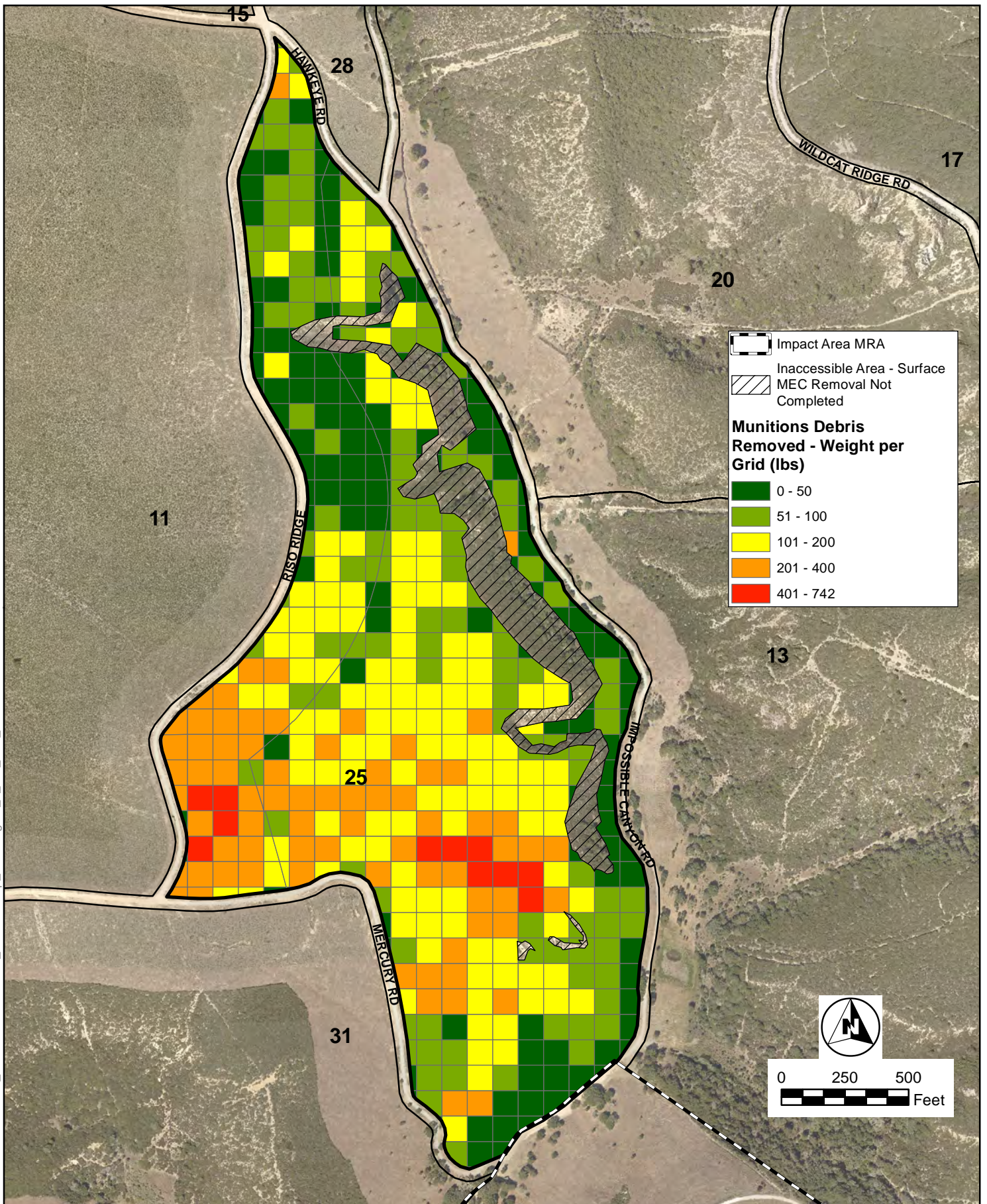


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Remedial Action Report
Unit 25
Munitions and Explosives of Concern
Former Fort Ord, California

Figure 5
MEC Removed During
Remedial Action

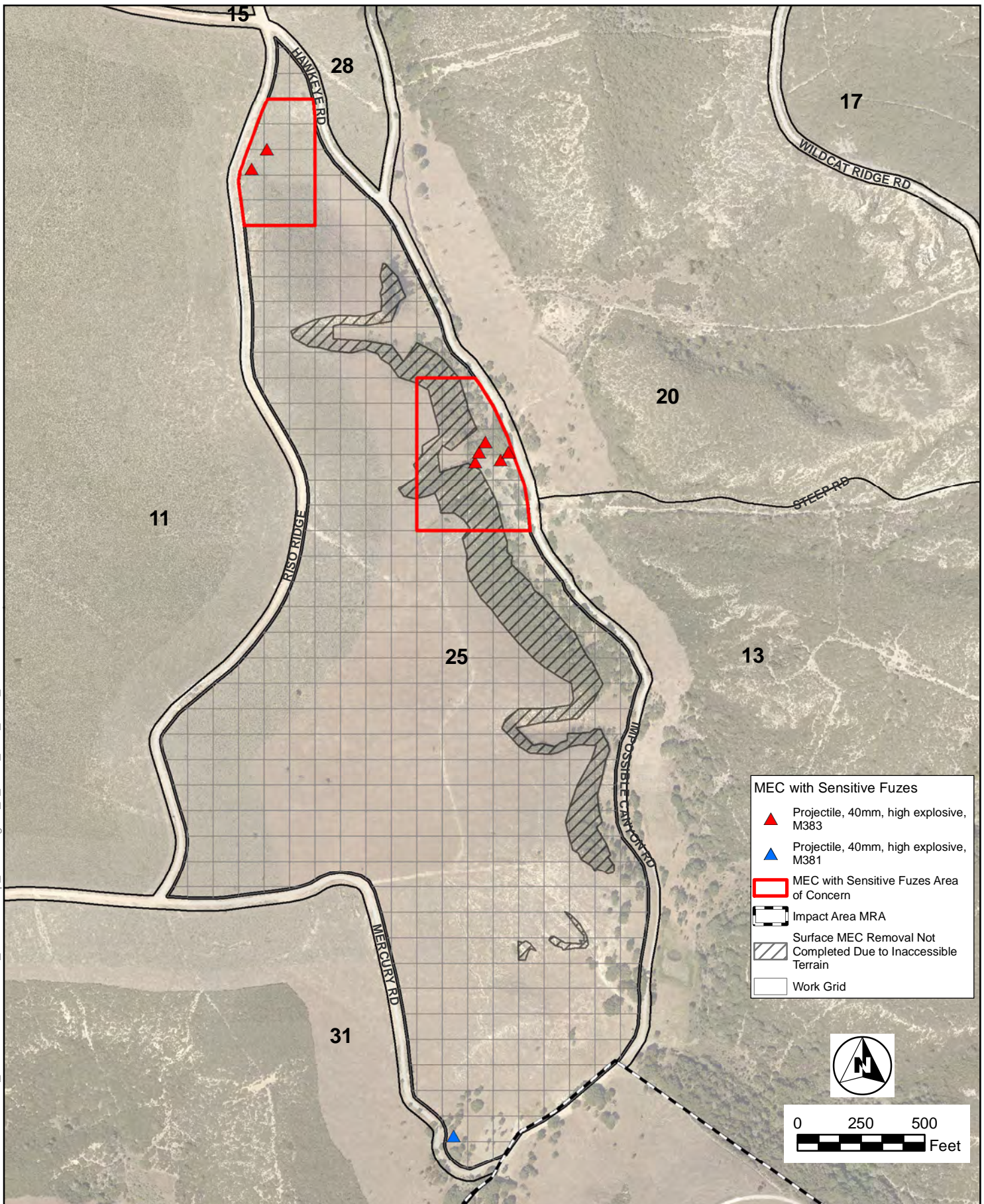


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Remedial Action Report
Unit 25
Munitions and Explosives of Concern
Former Fort Ord, California

Figure 6
Munitions Debris Removed



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Remedial Action Report
Unit 25
Munitions and Explosives of Concern
Former Fort Ord, California

Figure 7
MEC with Sensitive Fuzes
Removed

Photographs



Photograph 1 - Manual Vegetation Clearance Operations



Photograph 2 - Surface MEC Removal Operations



Photograph 5 - MK1 Low Explosive 37mm Projectile



Photograph 6 - Additional M43 81mm Mortars



Photograph 7 – M1 High Explosive 105mm Projectile



Photograph 8 – DGM Survey Operations

Appendices

Appendix A
Field Work Variances

FIELD WORK VARIANCE

| | | | |
|----------------------------|---|-------------|----------------|
| Project Name/Number | Fort Ord | WP | 8 |
| Applicable Document | Draft Final, Site-Specific Work Plan, Munitions and Explosives of Concern Remedial Action, Units 25 and 31, Former Fort Ord, California (KEMRON, 2016) (OE-0880A) | Date | August 8, 2016 |

Problem Description:

The Draft Final, Site-Specific Work Plan, Munitions and Explosives of Concern Remedial Action, Units 25 and 31, Former Fort Ord, California (KEMRON, 2016) (OE-0880A) identifies an approximate 24 acre area in the center of Unit 25 where prescribed burning is planned for vegetation removal. This area is also shown on the attached Figure 1. The planned vegetation cutting in Unit 25 was completed where accessible. Steep and difficult terrain exists in portions of the containment area (approximately 8 acres). Due to safety concerns vegetation cutting was not conducted in the areas of difficult terrain and surface MEC removal will not be conducted.

The terrain issues preclude firefighter's ability to control the fire from the perimeter of the unit. A determination was made that Unit 25 would be masticated instead of prescribed burned for vegetation removal.

Recommended solution:

Masticate the approximately 24 acre area within Unit 25 as shown on Figure 1 and perform MEC remediation activities in this area as outlined in the Draft Final, Site-Specific Work Plan, Munitions and Explosives of Concern Remedial Action, Units 25 and 31, Former Fort Ord, California (KEMRON, 2016) (OE-0880A).

Document the areas of difficult terrain (approximately 8 acres) in the Technical Memorandum.

Impact on present and completed work:

No impact on current or completed work.


Recommended solution/disposition:

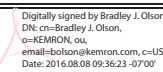
Incorporate this FWV as an appendix to the existing Draft Final Work Plan.

Clarification Minor Change Major Change


Affects Budget Yes No

Affects Schedule Yes No


Signature  Kevin J. Siemann Date _____
MEC Task Manager

Signature  Bradley J. Olson Date _____
SUXOS

Signature  Cheryl Ely Date _____
CQCSM

Signature  Bruce McClain Date _____
UXOQCS

Signature  Steve Crane Date _____
Project Manager

Signature  Erin K. Caruso Date _____
Deputy Project Manager



Field Work Variance No. 006

Page 2 of 3

USACE Approval: If Major Change:

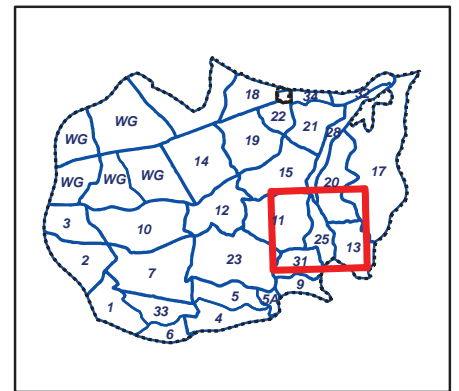
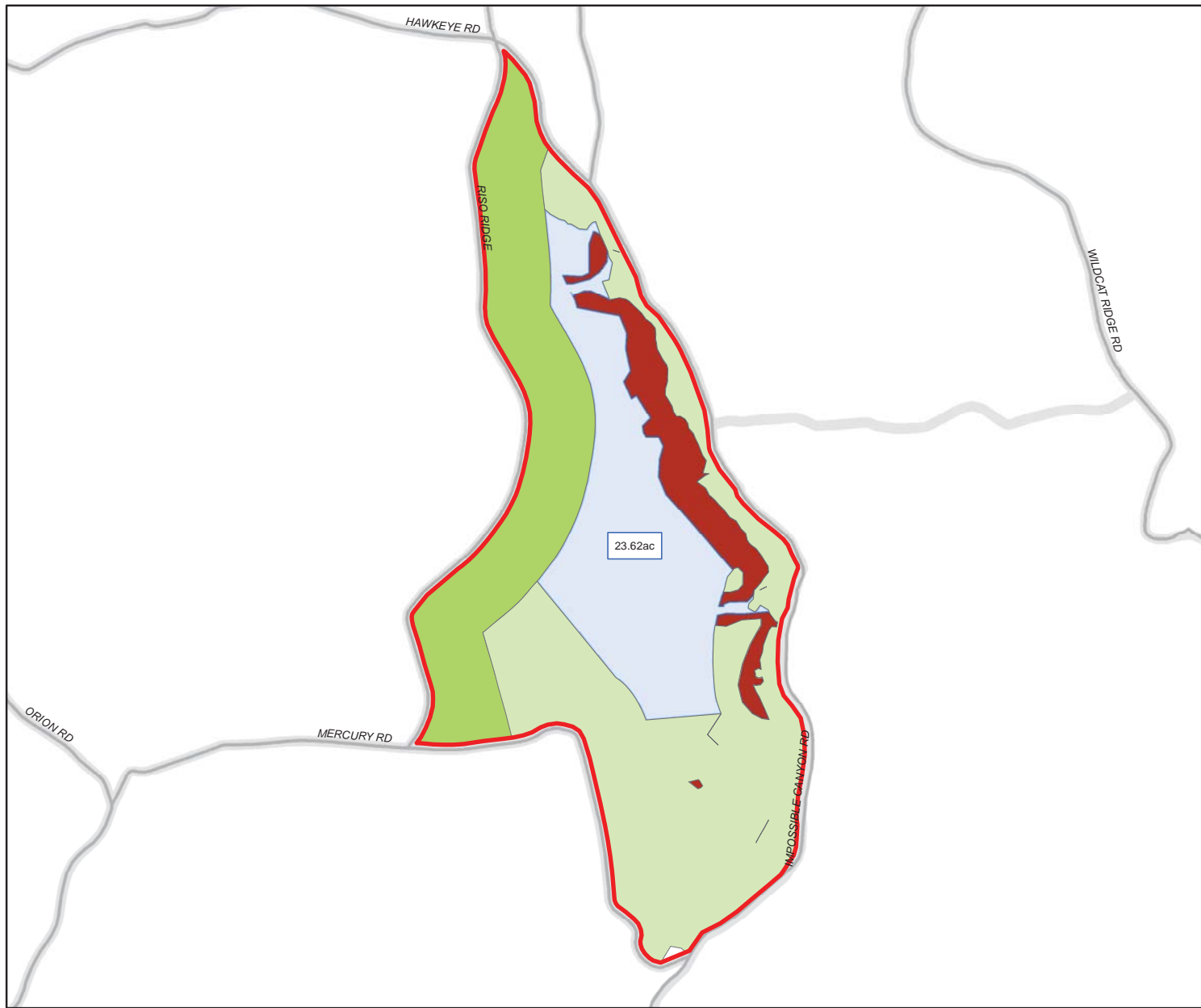
Signature MEEK.SHAWN.MIC
HAEI.1115801739
OE Safety Specialist
Date _____

Signature EISEN.DAVID.E.12319
85146
USACE COR
or TM
Date _____

Signature _____ Date _____
USACE Project
Geophysicist

Digitally signed by
MEEK.SHAWN.MICHAEL.1115801739
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI,
ou=USA, cn=MEEK.SHAWN.MICHAEL.1115801739
Date: 2016.08.23 16:41:22 -0700

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ou=USA, cn=EISEN.DAVID.E.1231985146
Date: 2016.08.23 16:41:22 -0700



Legend

- Planned Interior Mastication (23.62 Acres)
- Mastication Complete 2016 (56.18 Acres)
- Mastication Complete 2015 (25.28 Acres)
- No Cut Due to Steep Terrain (8.05 Acres)
- Roads
- Unit Boundary
- Fuel Breaks

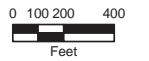


Figure 1

| |
|---|
| |
| <p>U.S. ARMY CORPS OF ENGINEERS SACRAMENTO DISTRICT</p> |
| <p>FORT ORD Unit 25 Mastication Status</p> |
| <p>Operations Completed Through: 07/28/2016</p> |



FIELD WORK VARIANCE

| | | | |
|----------------------------|---|-------------|-------------------|
| Project Name/Number | Fort Ord | WP | 07 |
| Applicable Document | Draft Final, Site-Specific Work Plan Munitions and Explosives of Concern Remedial Action, MRS-BLM Units 25 and 31, Former Fort Ord, California (OE- 0880) | Date | November 14, 2017 |

Problem Description:

The *Draft Final, Site-Specific Work Plan Munitions and Explosives of Concern Remedial Action, MRS-BLM Units 25 and 31, Former Fort Ord, California* (Kemron, 2016), specifies the following:

- Section 2.5.6, Technology-Aided Surface MEC Removal: “Due to the presence of some extremely steep terrain as shown on Figure 2 (not shown), some areas may not have technology-aided surface removal performed. The determination to not conduct technology-aided surface removal may result from personnel safety issues. Areas where technology-aided surface removal is not conducted will be documented and evaluated during the TM process for the potential for MEC items to be present on the surface.”
- Section 2.5.7, Digital Geophysical Mapping (DGM): “Following surface MEC removal, DGM survey will be conducted in accessible areas. Site conditions (e.g. difficult terrain) may prevent digital geophysical survey from being conducted in certain areas; these areas will be documented in the TM.”

Field Work Variance 006 (AR # OE-0880A.2) detailed approximately eight acres within Unit 25 where steep and difficult terrain precluded vegetation cutting. This area corresponds to the area where surface MEC removal was not performed due to extremely difficult terrain. Areas where surface MEC removal was and was not completed are shown on [Figure 1](#). Approximately nine acres of Unit 25 was determined by UXO safety personnel to be inaccessible to surface MEC removal due to extreme terrain. Approximately 20 acres of Unit 25 ([Figure 2](#)) was determined by UXO safety personnel to be inaccessible to DGM survey due to extreme terrain, or where dense oak tree stands precluded access.

Recommended solution:

Document these areas in the TM. Conduct an evaluation in the TM based on the results of the surface MEC removal and DGM data to determine the likelihood of surface MEC remaining in the 9 acres shown on [Figure 1](#).

Impact on present and completed work:

No impact on present and completed work.

Recommended solution/disposition:

Incorporate this FWV as an appendix to the existing Draft Final Work Plan.




Clarification Minor Change Major Change

Affects Budget Yes No

Affects Schedule Yes No


Signature  Digitally signed by Kevin J. Siemann
 DN: c=US, o=Gilbane Company, ou=Gilbane Company, cn=Kevin J. Siemann
 Date: 2017.11.14.10:36:02-0800' Date _____
 Task Manager

Signature  Digitally signed by Bradley Olson
 Date: 2017.11.14 10:43:17 -08'00' Date _____
 SUXOS

Signature  Date 11/14/17
 Project Manager

Signature  Digitally signed by c.clyde@gilbane.com
 DN: cn=c.clyde@gilbane.com Date: 2017.11.14 16:04:33 -08'00' Date _____
 CQCSM

Signature  Digitally signed by Erin K. Caruso
 DN: c=US, o=Federal Services, cn=Erin K. Caruso
 Reason: I am approving this document Date: 2017.11.16 09:05:18 -08'00' Date _____
 Deputy Project Manager

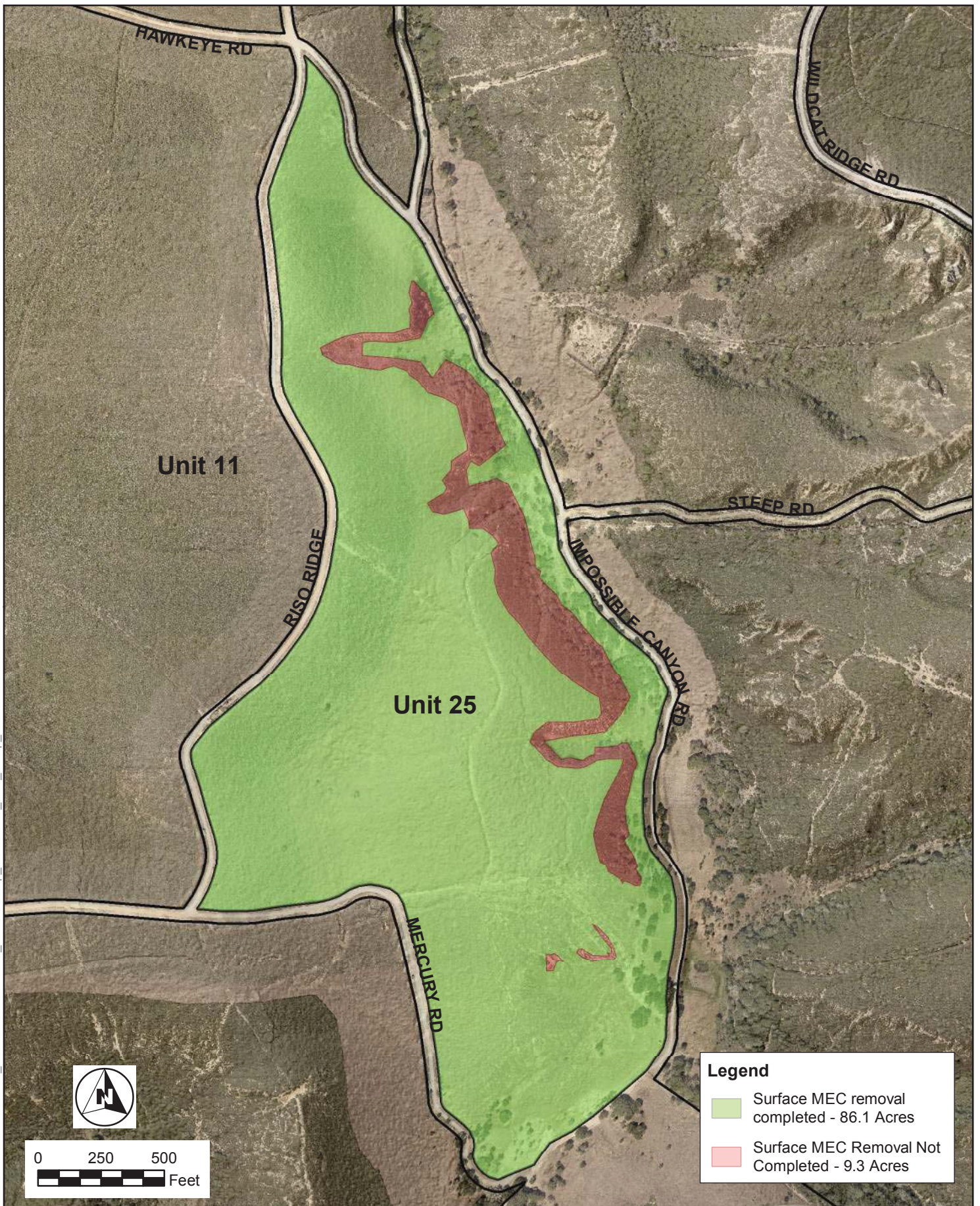
Signature  Digitally signed by Bruce McClain
 Date: 2017.11.14 16:20:24 -08'00' Date _____
 UXOQCS

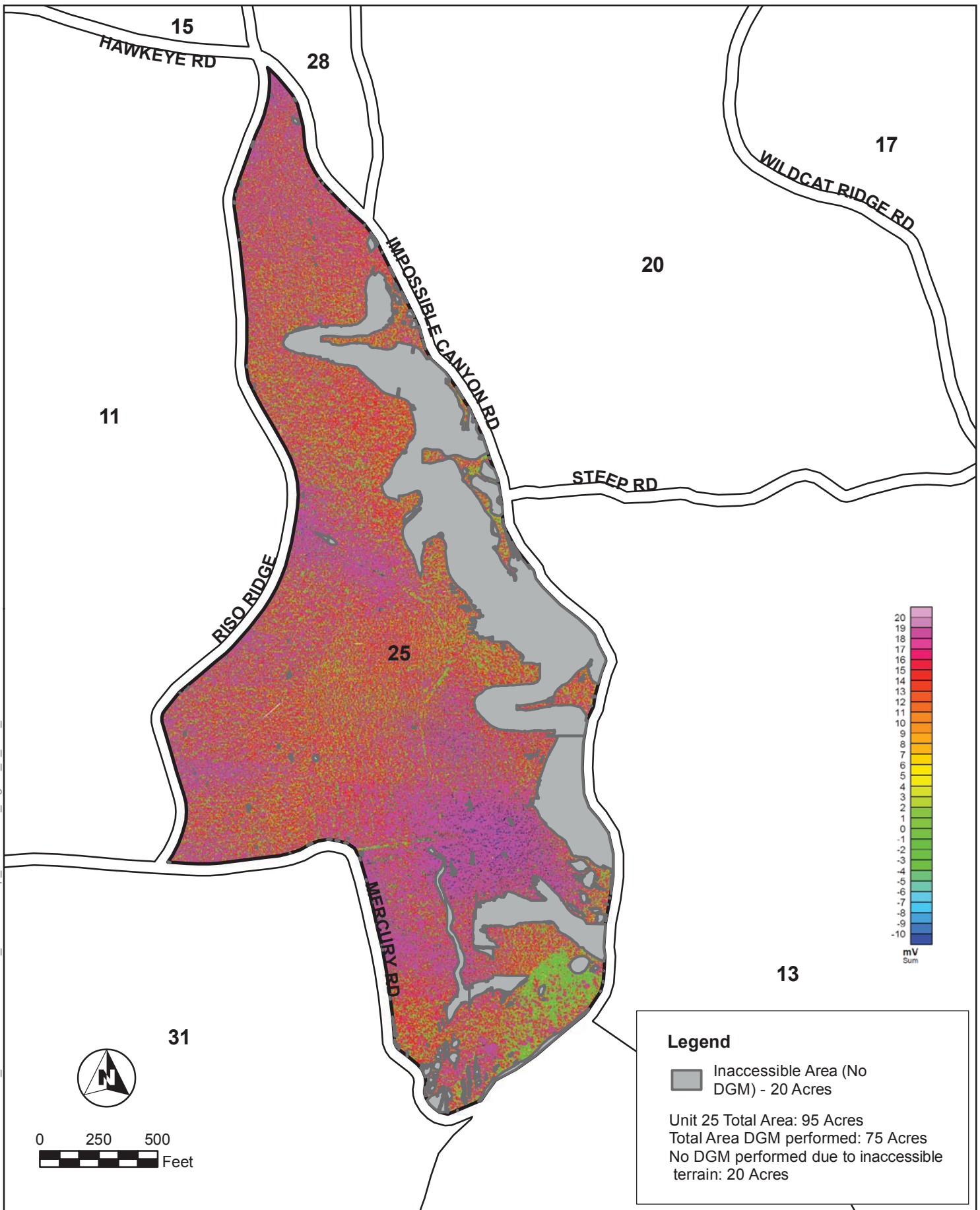
USACE Approval: If Major Change:

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 Date: 2017.11.16 13:45:16 -08'00' Date _____
 OE Safety Specialist

Signature EISEN.DAVID.E.1231985146 Digitally signed by EISEN.DAVID.E.1231985146
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 Date: 2017.11.20 10:20:37 -08'00' Date _____
 USACE COR or TM

Signature LINDSAY.KYLE.M.1529297226 Digitally signed by LINDSAY.KYLE.M.1529297226
 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=LINDSAY.KYLE.M.1529297226
 Date: 2017.11.19 20:19:15 -08'00' Date _____
 USACE Project Geophysicist





Distribution List: FWV 011, Draft Final, Site-Specific Work Plan Munitions and Explosives of Concern Remedial Action,
MRS-BLM Units 25 and 31, Former Fort Ord, California

| Email | Paper/CD | Name | Organization | Address | City, State | Zip |
|-------|----------|---------------------|--|-----------------------------------|-----------------------|-------|
| 1 | | Mr. Duane Balch | Department of the Army USACE | 1325 J Street | Sacramento, CA | 95814 |
| 1 | | Mr. Michael Wheeler | Department of the Army USACE | 1325 J Street | Sacramento, CA | 95814 |
| 1 | | Mr. John Jackson | Department of the Army USACE | 1325 J Street | Sacramento, CA | 95814 |
| 1 | | Mr. Kyle Lindsay | Department of the Army USACE | 1325 J Street | Sacramento, CA | 95814 |
| 1 | | Mr. Therman Franks | Department of the Army USACE | 4101 Jefferson Plaza NE | Albuquerque, NM | 87109 |
| 1 | | Mr. David Eisen | Department of the Army USACE | 4463 Gigling Road | Seaside, CA | 93955 |
| 1 | | Mr. James Britt | Department of the Army USACE | 4463 Gigling Road | Seaside, CA | 93955 |
| 1 | | Mr. William Collins | Department of the Army, Fort Ord BRAC | 4463 Gigling Road | Seaside, CA | 93955 |
| 1 | | Ms. Natalie Gordon | Chenega Corporation | 4463 Gigling Road | Seaside, CA | 93955 |
| 1 | | Ms. Chieko Nozaki | Chenega Corporation | 4463 Gigling Road | Seaside, CA | 93955 |
| 1 | | Mr. Eric Morgan | Bureau of Land Management, Fort Ord National Monument | 940 2 nd Avenue | Marina, CA | 93933 |
| 1 | | Ms. Maeve Clancy | U.S. Environmental Protection Agency, Region IX | 75 Hawthorne Street, Mail SFD-8-3 | San Francisco, CA | 94105 |
| 1 | | Mr. Tom Hall | Tech Law, Inc. | 7 Shore Point | North Little Rock, AR | 72116 |
| 1 | | Mr. Robert Young | Tech Law, Inc. | 235 Montgomery Street, Suite 717 | San Francisco, CA | 94104 |
| 1 | | Mr. Vlado Arsov | California Department of Toxic Substances Control (DTSC) | 8800 California Center Drive | Sacramento, CA | 95826 |
| 1 | | Mr. Steve Crane | KEMRON Environmental Services | 4522 Joe Lloyd Way | Monterey, CA | 93944 |
| 1 | 1 | Ms. Audrey Johnson | KEMRON Environmental Services | 4522 Joe Lloyd Way | Monterey, CA | 93944 |
| | 1 | Mr. Mike Weaver | Fort Ord Community Advisory Group (FOCAG) | 52 Corral De Tierra Road | Salinas, CA | 93908 |
| | 1 | Ms. LeVonne Stone | Fort Ord Environmental Justice Network (FOEJN) | P.O. Box 361 | Marina, CA | 93933 |
| 1 | 1 | Admin Record | Fort Ord BRAC | 4463 Gigling Road | Seaside, CA | 93955 |

Approved: 
 David Eisen
 USACE Project Manager

Appendix B
DD Form 1348-1A
(MD and Metal Debris Documentation)

| | | INERT / DEMILITARIZATION / CHAIN OF CUSTODY CERTIFICATION FOR NON-HAZARDOUS AEDA / RANGE RESIDUE SCRAP | | | Trailer Load No | |
|--|--|---|--|---|---|------------------------------|
| GENERAL | 1 Releasing Generators (RG) Name and Mailing Address KEMRON Environmental Services 4522 Joe Lloyd Way, Monterey, CA 93944 | | | 1a RG's Phone No 831.905.9960 | 2 RG's Site Manager Bradley J. Olson | |
| | 3 Releasing Generators (RG) Project Name and Location KEMRON - Fort Ord MEC Removal and Soil Remediation 4522 Joe Lloyd Way, Monterey, CA 93944 | | | 3a RG Project Phone No 831-824-2311 | 4 RG's SUXOS Bradley J. Olson | |
| | 5 Transporter Name and Mailing Address Magna Transport Solutions - Jakub Benebek 2704 W. Armitage Ave., Chicago, IL 60647, Suite 1 | | | 5a Transporter Phone No 312-724-5874 | 6 Dispatcher Name Jakub Benebek | |
| | 7 Processor / Recycler / Demilitarization - Qualified Recycler Demil Metals, Inc. 601 N. Skokie Blvd., #207, Northbrook, IL 60062 | | | 7a QR Phone 847-929-9650 | 8 QROC's Manager Mike Schaffer | |
| | 9 Trailer No 1GRAP0621GJ654847 | 10 Seal No's #162132 N/A N/A N/A N/A N/A | | 11 Gross Weight | 12 Tare Weight | 13 Net Weight 40,640 LBS. |
| 14 Description 22 Gaylord Boxes containing mixed steel. | | 15 Material Type Munitions Debris, Inert - Mixed steel. (Expended) | | 16 Units (Wt. Volume) 40,640 LBS. | | |
| Inert Certification: "I CERTIFY AND VERIFY THAT THE AEDA RESIDUE, RANGE RESIDUE AND/OR EXPLOSIVE CONTAMINATED PROPERTY LISTED HAS BEEN 100 PERCENT INSPECTED BY ME AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, ARE INERT AND/OR FREE OF EXPLOSIVES OR OTHER DANGEROUS MATERIALS" | | | | | | |
| RELEASING GENERATOR | 17 Inspector / Certifier Project UXO/QC Print/Type Name Bruce McClain | | | Signature | Month/Day/Year 8/9/2016 | |
| | 18 Inspector / Certifier Site Senior UXO Supervisor (SUXOS) Print/Type Name Bradley J. Olson | | | Signature | Month/Day/Year 8/9/2016 | |
| | 19 Material Released to the Transporter By RG's Site Manager RELEASED BY Print/Type Name Bradley J. Olson | | | Signature | Month/Day/Year 8/9/2016 | |
| | 20 Transporter I ACKNOWLEDGE THE RECEIPT OF MATERIAL (Receiving Signature Verifies that Seals are Intact) RECEIVED BY Print/Type Name / Company Jose L. Rosales | | | Signature | Month/Day/Year 8 / 11 / 16 | |
| | 21 Material Released to FACT CRRRT By Transporter RELEASED BY Print/Type Name / Company | | | Signature | Month/Day/Year | |
| | 22 Storage Manager I ACKNOWLEDGE THE RECEIPT OF MATERIAL (Receiving Signature Verifies that Seals are Intact) RECEIVED BY Print/Type Name / Company Rick McCloskey | | | Signature | Month/Day/Year 8 / 15 / 16 | |
| TRANSPORTER | 23 Material Released CRRRT to new CRRRT (if needed) RELEASED BY Print/Type Name | | | Signature | Month/Day/Year | |
| | 24 Current CRRRT I ACKNOWLEDGE THE RECEIPT OF MATERIAL RECEIVED BY Print/Type Name | | | Signature DEMIL METALS, INC P.O. BOX 126 GLENCOE, IL 60022 | | Month/Day/Year |
| | Demilitarization / Destruction Certification: "I CERTIFY THAT EACH ITEM OR ITEMS LISTED HEREON WERE DEMILITARIZED / DESTROYED, SO AS TO NO LONGER RESEMBLE AEDA / ORDNANCE, BEYOND THE REQUIREMENTS LISTED IN DoD 4160.21-M-1. | | | | | |
| RECEIVING PROCESSOR - RECYCLER | 25 Qualified Recycling Manager Print/Type Name Mike Schaffer | | | Signature | Month/Day/Year 8 / 22 / 16 | |
| | 26 List Discrepancy Indication Here | | | | | |

| | | | | | | | | | | | | | | | | | | | | | | | |
|---|------|------|----|----------|------|-------------|-------------|--------------|--------------------|---------|-----------|-------------|------------|---------|------|----------|------|----------|------------|----|-------------|---------------|--|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | |
| DATE | TIME | FROM | TO | QUANTITY | UNIT | DESCRIPTION | PROJ. TITLE | CONSTRUCTION | SUPPLIER'S ADDRESS | SHIP TO | SHIP FROM | TOTAL PRICE | UNIT PRICE | DOLLARS | CY'S | DOC DATE | RMFC | FRT RATE | TYPE CARGO | PS | RECEIVED BY | DATE RECEIVED | |
| 01 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | |
| <p>24 DOCUMENT NUMBER & SUFFIX (00-44)</p> <p>25 NATIONAL STOCK NO & ADD (R 23)</p> <p>26 R/C (4-9) U1 (23-28) OTY (25-29) CON CODE (71) D/S (65-68) U# (74-80)</p> <p>27 ADDITIONAL DATA</p> <p>28 NATIONAL STOCK NO & ADD (R 23)</p> <p>29 ITEM NOMENCLATURE</p> <p>30 Munitions Debris Inert - Mixed Steel</p> <p>31 TY CONT 15: RD CONT 40: G40 lbs MID</p> <p>32 RECEIVED BY: <i>Shawn Meek</i> 8/11/16</p> <p>33 DATE RECEIVED: 8/11/16</p> <p>34 DEMIL METALS, INC P.O. BOX 126 GLENCOE, IL 60022</p> <p>35 TRAILER INFO: 22 GAYLORD Boxes, 53 Ft. Box Body Trailer</p> <p>36 CERTIFIED BY: <i>Brad Olson</i> Brad Olson Senior UXO Supervisor - KEMRON MEC Removal and Soil Remediation Project Fort Ord, CA Phone 831-905-9960</p> <p>37 VERIFIED BY: <i>Shawn Meek</i> Shawn Meek USACE - Sacramento</p> <p>38 THIS CERTIFIES THAT THE MATERIAL LISTED HAS BEEN 100 PERCENT PROPERLY INSPECTED AND, TO THE BEST OF OUR KNOWLEDGE AND BELIEF, IS FREE OF EXPLOSIVE HAZARDS, ENGINE FLUIDS, ILLUMINATING DEBRIS AND OTHER VISIBLE LIQUID HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE MATERIALS.</p> | | | | | | | | | | | | | | | | | | | | | | | |

INERT / DEMILITARIZATION / CHAIN OF CUSTODY CERTIFICATION FOR NON-HAZARDOUS AEDA / RANGE RESIDUE SCRAP

Load No

5

GENERAL

| | | |
|---|--|---|
| <p>1. Releasing Generator (RG) Name and Mailing Address KEMRON Environmental Services 4522 Joe Lloyd Way, Monterey, CA 93944</p> | <p>1a. RG's Phone No 831-905-9960</p> | <p>2. RG's Site Mgr Bradley J Olson</p> |
| <p>3. Releasing Generator (RG) Project Name and Location KEMRON Environmental Services 4522 Joe Lloyd Way, Monterey, CA 93944</p> | <p>3a. RG Project Phone No 831-824-2311</p> | <p>4. RG's SUXOS Bradley J. Olson</p> |
| <p>5. Transporter Name and Mailing Address Magna Transport Solutions - Jakub Benebek 2704 W. Armitage Ave., Chicago, IL 60647, Suite 1</p> | <p>5a. Transporter Phone No 312-724-5874</p> | <p>6. Dispatcher Name Jakub Benebek</p> |

RELEASING GENERATOR

| | | | | | | | | | | | |
|--|---|--|-----|-----|-----|-----|-----|-----|-----|-----|---|
| <p>7. Processor / Recycler / Demilitarization - Qualified Recycler Demil Metals, Inc. 601 N. Skokie Blvd., #207, Northbrook, IL 60062</p> | <p>7a. QR Phone 847-929-9650</p> | <p>8. QRCC's Manager Mike Schaffer</p> | | | | | | | | | |
| <p>9. Box No 1UYVS253X7P224233</p> | <p>10. Seal No's</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">162138</td> <td style="width: 33%;">N/A</td> <td style="width: 33%;">N/A</td> </tr> <tr> <td>N/A</td> <td>N/A</td> <td>N/A</td> </tr> <tr> <td>N/A</td> <td>N/A</td> <td>N/A</td> </tr> </table> | 162138 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | <p>11. Gross Weight 40,640</p> <p>12. Tare Weight</p> <p>13. Net Weight</p> |
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| N/A | N/A | N/A | | | | | | | | | |
| N/A | N/A | N/A | | | | | | | | | |
| <p>14. Description 22 Gaylord Boxes containing mixed steel</p> | <p>15. Material Type Munitions Debris, Inert - Mixed Steel (Expended)</p> | <p>16. Units (W/ Volume)</p> | | | | | | | | | |

Inert Certification: "I CERTIFY AND VERIFY THAT THE AEDA RESIDUE, RANGE RESIDUE AND/OR EXPLOSIVE CONTAMINATED PROPERTY LISTED HAS BEEN 100 PERCENT INSPECTED BY ME AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, ARE INERT AND/OR FREE OF EXPLOSIVES OR OTHER DANGEROUS MATERIALS"

| | | |
|--|---|-----------------------------------|
| <p>Inspector / Certifier Christopher Light</p> | <p>Signature <i>[Signature]</i></p> | <p>Month/Day/Year 12/1/16</p> |
| <p>Inspector / Certifier Site Bradley J. Olson</p> | <p>Signature <i>[Signature]</i></p> | <p>Month/Day/Year 12/1/16</p> |
| <p>Material Released to the Transporter By Bradley J. Olson</p> | <p>Signature <i>[Signature]</i></p> | <p>Month/Day/Year 12/1/16</p> |

TRANSPORTER

| | | |
|--|--|-----------------------------------|
| <p>20. Transporter - ACKNOWLEDGE THE RECEIPT OF MATERIAL MESSILLA VALLEY SEPARATION</p> | <p>Receiving Signature Verifies that Seals are Intact <i>[Signature]</i></p> | <p>Month/Day/Year 12/1/16</p> |
| <p>21. Material Released to DEMIL Metals By Transporter Bradley J. Olson</p> | <p>Signature <i>[Signature]</i></p> | <p>Month/Day/Year 12/1/16</p> |

RECEIVING PROCESSOR - RECYCLER

| | | |
|--|--|-----------------------------------|
| <p>22. Storage Manager - ACKNOWLEDGE THE RECEIPT OF MATERIAL Rick McCloskey</p> | <p>Receiving Signature Verifies that Seals are Intact <i>[Signature]</i></p> | <p>Month/Day/Year 12/5/16</p> |
| <p>23. Material Released CRRRT to new CRRRT (if needed) Mike Schaffer</p> | <p>Signature <i>[Signature]</i></p> | <p>Month/Day/Year 1/1/16</p> |
| <p>24. Current CRRRT - ACKNOWLEDGE THE RECEIPT OF MATERIAL Mike Schaffer</p> | <p>Signature <i>[Signature]</i></p> | <p>Month/Day/Year 1/1/16</p> |

Demilitarization / Destruction Certification: "I CERTIFY THAT EACH ITEM OR ITEMS LISTED HEREON WERE DEMILITARIZED / DESTROYED, SO AS TO NO LONGER RESEMBLE AEDA / ORDNANCE, BEYOND THE REQUIREMENTS LISTED IN DoD 4160.21-M-1."

| | | |
|---|---|------------------------------------|
| <p>25. Qualified Recycling Manager Mike Schaffer</p> | <p>Signature <i>[Signature]</i></p> | <p>Month/Day/Year 12/12/16</p> |
|---|---|------------------------------------|

26. List Discrepancy Indication Here

DEMIL METALS, INC.
 P.O. BOX 125
 GLENCOE, IL 60022

INERT / DEMILITARIZATION / CHAIN OF CUSTODY CERTIFICATION FOR NON-HAZARDOUS AEDA / RANGE RESIDUE SCRAP

Trailer Load No
6


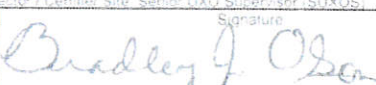
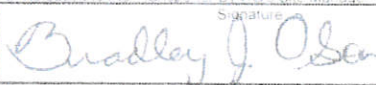
GENERAL

| | | | |
|--|--|---|---|
| 1. Releasing Generators (RG) Name and Mailing Address KEMRON Environmental Services 4522 Joe Lloyd Way, Monterey, CA 93944 | | 1a. RG's Phone No 831.905.9960 | 2. RG's Site Manager Bradley J. Olson |
| 3. Releasing Generators (RG) Project Name and Location KEMRON - Fort Ord MEC Removal and Soil Remediation 4522 Joe Lloyd Way, Monterey, CA 93944 | | 3a. RG Project Phone No 831-824-2311 | 4. RG's SUXOS Bradley J. Olson |
| 5. Transporter Name and Mailing Address Magna Transport Solutions - Jakub Benbenek 2704 W. Armitage Ave., Chicago, IL 60647, Suite 1 | | 5a. Transporter Phone No 312-724-5874 | 6. Dispatcher Name Jakub Benebek |


RELEASING GENERATOR

| | | | | |
|--|---|---|---|--|
| 7. Processor / Recycler / Demilitarization - Qualified Recycler Demil Metals, Inc. 601 N. Skokie Blvd., #207, Northbrook, IL 60062 | | 7a. QR Phone 847-929-9650 | 8. QRQC's Manager Mike Schaffer | |
| 9. Trailer No 1JV532W27L973536 | 10. Seal No's #162148 N/A N/A N/A N/A N/A | 11. Gross Weight | 12. Tare Weight | 13. Net Weight 40,690 LBS |
| 14. Description 22 Gaylord Boxes containing mixed steel. | | 15. Material Type Munitions Debris, Inert - Mixed steel. (Expended) | | 16. Units (Wt., Volume) 40,690 LBS |


Inert Certification: "I CERTIFY AND VERIFY THAT THE AEDA RESIDUE, RANGE RESIDUE AND/OR EXPLOSIVE CONTAMINATED PROPERTY LISTED HAS BEEN 100 PERCENT INSPECTED BY ME AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, ARE INERT AND/OR FREE OF EXPLOSIVES OR OTHER DANGEROUS MATERIALS"

| | | | |
|--|--|--|-------------------------------------|
| 17. Inspector / Certifier Project UOX/OC Bruce McClain | | Signature  | Month/Day/Year 12/20/2016 |
| 18. Inspector / Certifier Site, Senior UOX Supervisor (SUXOS) Bradley J. Olson | | Signature  | Month/Day/Year 12/20/2016 |
| 19. Material Released to the Transporter By RG's Site Manager Bradley J. Olson | | Signature  | Month/Day/Year 12/20/2016 |

TRANSPORTER

| | | | |
|--|--|--|---------------------------------------|
| 20. Transporter I ACKNOWLEDGE THE RECEIPT OF MATERIAL (Receiving Signature Verifies that Seals are Intact) RECEIVED BY: TERRY DUNLAP / mtr | | Signature  | Month/Day/Year 12 / 21 / 16 |
| 21. Material Released in FACT CRRRT By Transporter RECEIVED BY: | | Signature | Month/Day/Year |

RECEIVING PROCESSOR - RECYCLER

| | | | |
|--|--|--|-----------------------------------|
| 22. Storage Manager I ACKNOWLEDGE THE RECEIPT OF MATERIAL (Receiving Signature Verifies that Seals are Intact) RECEIVED BY: | | Signature | Month/Day/Year |
| 23. Material Released CRRRT to new CRRRT if needed RECEIVED BY: Jason Spears | | Signature  | Month/Day/Year 1, 2, 17 |
| 24. Current CRRRT I ACKNOWLEDGE THE RECEIPT OF MATERIAL RECEIVED BY: | | Signature | Month/Day/Year |

Demilitarization / Destruction Certification: "I CERTIFY THAT EACH ITEM OR ITEMS LISTED HEREON WERE DEMILITARIZED / DESTROYED, SO AS TO NO LONGER RESEMBLE AEDA / ORDNANCE, BEYOND THE REQUIREMENTS LISTED IN DoD 4160.21-M-1."

| | | | |
|---|--|---|-----------------------------------|
| 25. Qualified Recycling Manager Mike Schaffer | | Signature  | Month/Day/Year 1, 9, 17 |
|---|--|---|-----------------------------------|

26. List Discrepancy Indication Here

INERT / DEMILITARIZATION / CHAIN OF CUSTODY CERTIFICATION FOR NON-HAZARDOUS AEDA / RANGE RESIDUE SCRAP

Trailer Load No

7


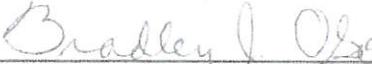
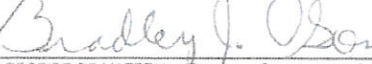
GENERAL

| | | | |
|---|--|---|---|
| 1 Releasing Generators (RG) Name and Mailing Address KEMRON Environmental Services 4522 Joe Lloyd Way, Monterey, CA 93944 | | 1a RG's Phone No 831.905.9960 | 2 RG's Site Manager Bradley J. Olson |
| 3 Releasing Generators (RG) Project Name and Location KEMRON - Fort Ord MEC Removal and Soil Remediation 4522 Joe Lloyd Way, Monterey, CA 93944 | | 3a RG Project Phone No 831-824-2311 | 4 RG's SUXOS Bradley J. Olson |
| 5 Transporter Name and Mailing Address Magna Transport Solutions - Jakub Benebek 2704 W. Armitage Ave., Chicago, IL 60647, Suite 1 | | 5a Transporter Phone No 312-724-5874 | 6 Dispatcher Name Jakub Benebek |


RELEASING GENERATOR

| | | | |
|---|---------------------------------------|--|---|
| 7 Processor / Recycler / Demilitarization - Qualified Recycler Demil Metals, Inc. 601 N. Skokie Blvd., #207, Northbrook, IL 60062 | | 7a QR Phone 847-929-9650 | 8 OROC's Manager Mike Schaffer |
| 9 Trailer No 1GRAP0623GJ654624 | 10 Seal No's #162144 N/A N/A | 11 Gross Weight | 12 Tare Weight 13 Net Weight 25,670 LBS |
| 14 Description 13 Gaylord Boxes containing mixed Aluminium. 4 ea 55 gal drums containing mixed small arms. | | 15 Material Type Munitions Debris, Inert - Mixed Aluminium. | 16 Units / Wt / Volume 25,670 LBS |

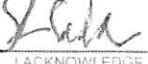
Inert Certification: "I CERTIFY AND VERIFY THAT THE AEDA RESIDUE, RANGE RESIDUE AND/OR EXPLOSIVE CONTAMINATED PROPERTY LISTED HAS BEEN 100 PERCENT INSPECTED BY ME AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, ARE INERT AND/OR FREE OF EXPLOSIVES OR OTHER DANGEROUS MATERIALS"

| | | | |
|---|--|---|---------------------------|
| 17 Inspector / Certifier Project UOX/OC Print/Type Name: Bruce McClain | | Signature:  | Month/Day/Year: 1/24/2017 |
| 18 Inspector / Certifier Site Senior UOX Supervisor (SUXOS) Print/Type Name: Bradley J. Olson | | Signature:  | Month/Day/Year: 1/24/2017 |
| 19 Material Released to the Transporter By RG's Site Manager RELEASED BY Print/Type Name: Bradley J. Olson | | Signature:  | Month/Day/Year: 1/24/2017 |

TRANSPORTER

| | | | |
|---|--|--|---------------------------|
| 20 Transporter I ACKNOWLEDGE THE RECEIPT OF MATERIAL (Receiving Signature Verifies that Seals are Intact) RECEIVED BY Print/Type Name / Company: Jose Luna / M/T | | Signature:  | Month/Day/Year: 1, 24, 17 |
| 21 Material Released to FACT CRRRT By Transporter RELEASED BY Print/Type Name / Company: | | Signature: | Month/Day/Year: |

RECEIVING PROCESSOR - RECYCLER

| | | | |
|---|--|--|---------------------------|
| 22 Storage Manager I ACKNOWLEDGE THE RECEIPT OF MATERIAL (Receiving Signature Verifies that Seals are Intact) RECEIVED BY Print/Type Name / Company: | | Signature: | Month/Day/Year: |
| 23 Material Released CRRRT to new CRRRT (if needed) RELEASED BY Print/Type Name: Steve CADKIN | | Signature:  | Month/Day/Year: 1, 30, 17 |
| 24 Current CRRRT I ACKNOWLEDGE THE RECEIPT OF MATERIAL RECEIVED BY Print/Type Name: | | Signature: DEMIL METALS, INC | Month/Day/Year: |

Demilitarization / Destruction Certification: "I CERTIFY THAT EACH ITEM OR ITEMS LISTED HEREON WERE DEMILITARIZED / DESTROYED, SO AS TO NO LONGER RESEMBLE AEDA / ORDNANCE, BEYOND THE REQUIREMENTS LISTED IN DoD 4160.21-M-1."

| | | | |
|--|--|---|---------------------------|
| 25 Qualified Recycling Manager Print/Type Name: Mike Schaffer | | Signature:  | Month/Day/Year: 1, 31, 17 |
| 26 List Discrepancy Indication Here | | | |

DD FORM 1348-1A, JUL 91 (EG) ISSUE RELEASE/RECEIPT DOCUMENT

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 00 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 00 |

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 00 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 00 |

FA00001

24 DOCUMENT NUMBER & SUFFIX (30-44)

25 NATIONAL STOCK NO. & ADD (18-22)

26 RIC (4-6)
U (23-24)
QTY (25-29)
CON CODE (71)
DIST (55-56)
LP (74-80)

TR1 Vin (GRA)P06236d654624 8311 Box Barb No NSN 53 Gal Dump 88802 UNACT Fort Ord CA KI MRON 0002
Seal # 162118

| | | | | |
|----------------------------|------------|-------------|-----------------|---------------|
| 17 ITEM NOMENCLATURE | 18 T/COUNT | 19 NO/COUNT | 20 TOTAL WEIGHT | 21 TOTAL CUBE |
| Misc Small Arms Ammunition | | | 500 lbs MID | |
| 22 RECEIVED BY | | | | |

DEMAIL METALS INC
P.O. BOX 126-24-1a
GLENCOE, IL 60022

27 ADDITIONAL DATA

This certifies and verifies that the material listed has been 100 percent inspected and to the best of our knowledge and belief contains only miscellaneous small arms ammunition 50 caliber and below related materiel.

certified by *Bradley Olson*
Senior UXO Supervisor - KI MRON
MHC Removal and Soil Remediation Project
Fort Ord CA Phone 831-824-2311

Verified by *James Boer*
OLSN
1 SACT - Sacramento
Phone 831-824-2324

DD FORM 1348-1A, JUL 91 (EG) ISSUE RELEASE/RECEIPT DOCUMENT

| | | | |
|--|---|--|--|
| 27 ADDITIONAL DATA | 26 R/C (4-6) U (23-24) QTY (25-29) CON CODE (71) DIST (65-68) UP (74-80) | 25 NATIONAL STOCK NO & ADD (6-22) | 24 DOCUMENT NUMBER & SUFFIX (30-44) |
| <p>This certifies and verifies that the material listed has been 100 percent inspected and to the best of our knowledge and belief contains only miscellaneous small arms ammunition 50 caliber and below related materials</p> <p>Certified by: <i>Bradley Olson</i> Senior I XO Supervisor - KAMRON MTC Removal and Soil Remediation Project Fort Ord, CA Phone: 834-824-2314</p> <p>Verified by: <i>James Hott</i> O/ISS I S A C I - Sacramento Phone: 834-824-2324</p> | <p>FBI, Van (GRAP) 023603624, S1 F1 Box Bnd, No SSN, 53 Gal Drum #0003, ENSAC/PORT ORD, CA, KAMRON/0003 Serial # 162114</p> | | |
| <p>1 ITEM NOMENCLATURE Misc Small Arms Ammunition</p> | <p>18 FR CONT 19 NO CONT 20 TOTAL WEIGHT 575 lbs SAA</p> | <p>21 TOTAL CUBE</p> | <p>22 DATE RECEIVED 1-24-17</p> |
| <p>10 QTY RECD 11 UNIT WEIGHT 12 UNIT CUBE 13 UFC 14 UFC 15 SL</p> | <p>16 FREIGHT CLASSIFICATION NOMENCLATURE</p> | <p>17 ITEM NOMENCLATURE</p> | <p>18 FR CONT 19 NO CONT 20 TOTAL WEIGHT 575 lbs SAA</p> |
| <p>1 UNIT PRICE 2 DOLLARS CTS 3 TOTAL PRICE</p> | <p>4 MARK FOR</p> | <p>5 DOC DATE 6 NMFC 7 FRT RATE 8 TYPE CARGO 9 PS</p> | <p>10 QTY RECD 11 UNIT WEIGHT 12 UNIT CUBE 13 UFC 14 UFC 15 SL</p> |
| <p>16 FREIGHT CLASSIFICATION NOMENCLATURE</p> | <p>17 ITEM NOMENCLATURE</p> | <p>18 FR CONT 19 NO CONT 20 TOTAL WEIGHT 575 lbs SAA</p> | <p>21 TOTAL CUBE</p> |
| <p>1 UNIT PRICE 2 DOLLARS CTS 3 TOTAL PRICE</p> | <p>4 MARK FOR</p> | <p>5 DOC DATE 6 NMFC 7 FRT RATE 8 TYPE CARGO 9 PS</p> | <p>10 QTY RECD 11 UNIT WEIGHT 12 UNIT CUBE 13 UFC 14 UFC 15 SL</p> |
| <p>1 UNIT PRICE 2 DOLLARS CTS 3 TOTAL PRICE</p> | <p>4 MARK FOR</p> | <p>5 DOC DATE 6 NMFC 7 FRT RATE 8 TYPE CARGO 9 PS</p> | <p>10 QTY RECD 11 UNIT WEIGHT 12 UNIT CUBE 13 UFC 14 UFC 15 SL</p> |

PREVIOUS EDITION MAY BE USED

DD FORM 1348-1A, JUL 91 (EG) ISSUE RELEASE/RECEIPT DOCUMENT

| | | | |
|--|--|--|--|
| 27 ADDITIONAL DATA | 26 RIC (4-6) UP (23-24) QTY (25-29) CON CODE (71) DIST (55-56) UP (74-80) | 25 NATIONAL STOCK NO. & ADD (8-22) | 24 DOCUMENT NUMBER & SUFFIX (30-44) |
| This certifies and verifies that the material listed has been 100 percent inspected and to the best of our knowledge and belief, contains only miscellaneous small arms ammunition so caliber and below related materials | IRI Van (OR) #1962363955421, 5311 Box Body Trailer No NSN 55 Gal Drum and 1 SACT Port Ord. CA KIRMIRON0004 Sect # 162146 | | |
| Certified By Bradley Olson Senior UNO Supervisor - KIRMIRON M/C Removal and Soil Remediation Project Port Ord. CA Phone 831-824-2311 | Verified By James Butt OJSS USACE - Sacramento Phone 831-824-2324 | | |
| 49 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 | 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 | D O D C E N | R I M F R O M & S I S |
| QUANTITY | 23 24 25 26 27 28 29 | S U P P L I E R M E N T A R Y G I N D A D D R E S S | S U P P L I E R M E N T A R Y G I N D A D D R E S S |
| DIS. TRI. BU. TION | DIS. TRI. BU. TION | F R O G T R I B U T I O N | F R O G T R I B U T I O N |
| R E C D A D V | R E C D A D V | R E C D A D V | R E C D A D V |
| O T C M L O G P N T D | O T C M L O G P N T D | O T C M L O G P N T D | O T C M L O G P N T D |
| 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 | 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 | 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 | 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 |
| 5 DOC DATE | 6 INFC | 7 FRT RATE | 8 TYPE CARGO |
| 9 PS | 10 QTY RECD | 11 UP | 12 UNIT WEIGHT |
| 13 UNIT CUBE | 14 UFC | 15 SI | 16 FREIGHT CLASSIFICATION/INDEMNIFICATION |
| 17 ITEM NOMENCLATURE | 18 TYSOFT | 19 NO COHT | 20 TOTAL WEIGHT |
| 21 TOTAL CUBE | 22 RECE | 23 DATE RECEIVED | 24 |
| Misc. Small Arms Ammunition | 690 Lbs SAA | 1-27-17 | |
| KIRMIRON Port Ord 4322 Joe Lloyd Way Marberry, CA 95944 II 60862 | Dental Metal, Inc 601 N Skokie Blvd #207 Northbrook, IL 60062 | 4 MARK FOR | |
| TOTAL PRIC | DOLLARS | CTS | |
| UNIT PRICE | DOLLARS | CTS | |
| DOLLARS CTS | | | |

DEMIL-METAL 125
P.O. BOX 1L 60022
SCIENCE, IL

| | | | | | | |
|--|--|--|---|-------------------------------------|-----------------------------------|--------------------------|
| RELEASING GENERATOR | 4522 Joe Lloyd Way, Monterey, CA 93944 | | 031-024-2311 | Bradley J. Olson | | |
| | 5. Transporter Name and Mailing Address Magna Transport Solutions - Jakub Benbenek 2704 W. Armitage Ave., Chicago, IL 60647, Suite 1 | | 5a. Transporter Phone No. 312-724-5874 | 6. Dispatcher Name Jakub Benebek | | |
| | 7. Processor / Recycler / Demilitarization - Qualified Recycler Demil Metals, Inc. 601 N. Skokie Blvd., #207, Northbrook, IL 60062 | | 7a. QR Phone 847-929-9650 | 8. QRQC's Manager Mike Schaffer | | |
| | 9. Trailer No. 1UYVS25364P179514 | 10. Seal No.'s #162145 N/A N/A N/A N/A N/A | | 11. Gross Weight | 12. Tare Weight | 13. Net Weight 38,820 |
| | 14. Description 22 Gaylord Boxes containing mixed steel. | | 15. Material Type Munitions Debris, Inert - Mixed steel. | | 16. Units (Wt., Volume) 38,820 | |
| | Inert Certification: "I CERTIFY AND VERIFY THAT THE AEDA RESIDUE, RANGE RESIDUE AND/OR EXPLOSIVE CONTAMINATED PROPERTY LISTED HAS BEEN 100 PERCENT INSPECTED BY ME AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, ARE INERT AND/OR FREE OF EXPLOSIVES OR OTHER DANGEROUS MATERIALS" | | | | | |
| | 17. Inspector / Certifier Project UXO/OC Print/Type Name: Bruce McClain | | Signature: <i>Bruce McClain</i> | | Month/Day/Year: 5/25/2017 | |
| | 18. Inspector / Certifier Site Senior UXO Supervisor (SUXOS) Print/Type Name: Bradley J. Olson | | Signature: <i>Bradley J. Olson</i> | | Month/Day/Year: 5/25/2017 | |
| | 19. Material Released to the Transporter By QRQC's Site Manager RELEASED BY: Print/Type Name: Bradley J. Olson | | Signature: <i>Bradley J. Olson</i> | | Month/Day/Year: 5/25/2017 | |
| | 20. Transporter I ACKNOWLEDGE THE RECEIPT OF MATERIAL (Receiving Signature Verifies that Seals are Intact) RECEIVED BY: Print/Type Name / Company: LAIS MORALET MVT | | Signature: <i>Lais Moralet</i> | | Month/Day/Year: 6, 12, 17 | |
| 21. Material Released to FACT CRRRT By Transporter RELEASED BY: Print/Type Name / Company | | Signature | | Month/Day/Year: 1, 1 | | |
| 22. Storage Manager I ACKNOWLEDGE THE RECEIPT OF MATERIAL (Receiving Signature Verifies that Seals are Intact) RECEIVED BY: Print/Type Name / Company | | Signature | | Month/Day/Year: 1, 1 | | |
| 23. Material Released CRRRT to new CRRRT (if needed) RELEASED BY: Print/Type Name: Mike Sclatan | | Signature: <i>Mike Sclatan</i> | | Month/Day/Year: 6, 16, 17 | | |
| 24. Demil/QRQC I ACKNOWLEDGE THE RECEIPT OF MATERIAL RECEIVED BY: Print/Type Name: P.O. BOX 126 GLENCOE, IL 60022 | | Signature | | Month/Day/Year: 1, 1 | | |
| Demilitarization / Destruction Certification: "I CERTIFY THAT EACH ITEM OR ITEMS LISTED HEREON WERE DEMILITARIZED / DESTROYED, SO AS TO NO LONGER RESEMBLE AEDA / ORDNANCE, BEYOND THE REQUIREMENTS LISTED IN DoD 4160.21-M-1. | | | | | | |
| 25. Qualified Recycling Manager Print/Type Name: Mike Sclatan | | Signature: <i>Mike Sclatan</i> | | Month/Day/Year: 6, 30, 17 | | |
| 26. List Discrepancy Indication Here | | | | | | |

Appendix C
Examples of DGM Data Forms



Grid Block Processing Report

Grid Block ID: **Grids Collected:**

| | | |
|--|--|---|
| Date of Survey: <input type="text" value="4/20/2017"/> | Survey Instrument: <input type="text" value="Array 2"/> | Re-Survey?: <input type="text" value="N"/> |
| Start Time: <input type="text" value="4/20/2017 9:30:00 AM"/> | Team ID: <input type="text" value="GEO_1"/> | QC Survey?: <input type="text" value="N"/> |
| End Time: <input type="text" value="4/20/2017 2:40:00 PM"/> | Unit ID: <input type="text" value="25"/> | Percent Covered in QC Survey: <input type="text" value="0"/> |

Processing Information

| | |
|--|---|
| Processing Date: <input type="text" value="5/1/2017"/> | Processing Operator: <input type="text" value="James Hayslett"/> |
| Processed with Oasis montaj <input type="text" value="Yes"/> | Geosoft Database Name <input type="text" value="A316E21.gdb"/> |
| Lag Correction Performed? <input type="text" value="Yes"/> | Lag Correction Value: <input type="text" value="5"/> |
| Drift Correction Performed? <input type="text" value="Yes"/> | Drift Correct Method: <input type="text" value="Windowed statistical leveling (Channel/High % texcluded/Low % excluded/Window length): Ch1/80/0/75-250, Ch2/75/0/75-250, Ch3/70/0/75-250, Ch4/65/0/75-250"/> |
| De-Spiking Performed? <input type="text" value="Yes"/> | De-Spiking Info: <input type="text" value="Performed as needed."/> |
| Line Breaking Performed? <input type="text" value="Yes"/> | Line Breaking Info: <input type="text" value="75-250"/> |
| Data Coordinates Translated? <input type="text" value="Yes"/> | Data Projection: <input type="text" value="NAD83 / California zone 4 (ftUS)"/> |

Processing Comments:

Sections of data without GPS RTK fix are DGPS and the positional data is useable. High levels of response across entire grid block. Saturated response areas present.

Data Package Files: **Header Added to Processed File?**

A316E2.gdb, A316E2.map, A316E2.pdf, A316E2.ply, A316E2.tif, A316E2_AOI.ply, A316E2_Ch_Sum.grd, A316E2_Processed.XYZ, Gaps_A316E2.cpg, Gaps_A316E2.dbf, Gaps_A316E2.prj, Gaps_A316E2.shp, Gaps_A316E2.shp.GeosoftMeta, Gaps_A316E2.shx, A316F2.gdb, A316F2.map, A316F2.pdf, A316F2.ply, A316F2.tif, A316F2_AOI.ply, A316F2_Ch_Sum.grd, A316F2_Processed.XYZ, Gaps_A316F2.cpg, Gaps_A316F2.dbf, Gaps_A316F2.prj, Gaps_A316F2.shp, Gaps_A316F2.shp.GeosoftMeta, Gaps_A316F2.shx, A316G2.gdb, A316G2.map, A316G2.pdf, A316G2.ply, A316G2.tif, A316G2_AOI.ply, A316G2_Ch_Sum.grd, A316G2_Processed.XYZ, Gaps_A316G2.cpg, Gaps_A316G2.dbf, Gaps_A316G2.prj, Gaps_A316G2.shp, Gaps_A316G2.shp.GeosoftMeta, Gaps_A316G2.shx, A316H2.gdb, A316H2.map, A316H2.pdf, A316H2.ply, A316H2.tif, A316H2_AOI.ply, A316H2_Ch_Sum.grd, A316H2_Processed.XYZ, Gaps_A316H2.cpg, Gaps_A316H2.dbf, Gaps_A316H2.prj, Gaps_A316H2.shp, Gaps_A316H2.shp.GeosoftMeta, Gaps_A316H2.shx, A316I2.gdb, A316I2.map, A316I2.pdf, A316I2.ply, A316I2.tif, A316I2_AOI.ply, A316I2_Ch_Sum.grd, A316I2_Processed.XYZ, Gaps_A316I2.cpg, Gaps_A316I2.dbf, Gaps_A316I2.prj, Gaps_A316I2.shp, Gaps_A316I2.shp.GeosoftMeta, Gaps_A316I2.shx, A316J2.gdb, A316J2.map, A316J2.pdf, A316J2.ply, A316J2.tif, A316J2_AOI.ply, A316J2_Ch_Sum.grd, A316J2_Processed.XYZ, Gaps_A316J2.cpg, Gaps_A316J2.dbf, Gaps_A316J2.prj, Gaps_A316J2.shp, Gaps_A316J2.shp.GeosoftMeta, Gaps_A316J2.shx, A3J5D0.gdb, A3J5D0.map, A3J5D0.pdf, A3J5D0.ply, A3J5D0.tif, A3J5D0_AOI.ply, A3J5D0_Ch_Sum.grd, A3J5D0_Processed.XYZ, Gaps_A3J5D0.cpg, Gaps_A3J5D0.dbf, Gaps_A3J5D0.prj, Gaps_A3J5D0.shp, Gaps_A3J5D0.shp.GeosoftMeta, Gaps_A3J5D0.shx, A3J5D9.gdb, A3J5D9.map, A3J5D9.pdf, A3J5D9.ply, A3J5D9.tif, A3J5D9_AOI.ply, A3J5D9_Ch_Sum.grd, A3J5D9_Processed.XYZ, Gaps_A3J5D9.cpg, Gaps_A3J5D9.dbf, Gaps_A3J5D9.prj, Gaps_A3J5D9.shp, Gaps_A3J5D9.shp.GeosoftMeta, Gaps_A3J5D9.shx, A3J5E0.gdb, A3J5E0.map, A3J5E0.pdf, A3J5E0.ply, A3J5E0.tif, A3J5E0_AOI.ply, A3J5E0_Ch_Sum.grd, A3J5E0_Processed.XYZ, A3J5E9.gdb, A3J5E9.map, A3J5E9.pdf, A3J5E9.ply, A3J5E9.tif, A3J5E9_AOI.ply, A3J5E9_Ch_Sum.grd, A3J5E9_Processed.XYZ, A3J6A1.gdb, A3J6A1.map, A3J6A1.pdf, A3J6A1.ply, A3J6A1.tif, A3J6A1_AOI.ply, A3J6A1_Ch_Sum.grd, A3J6A1_Processed.XYZ, Gaps_A3J6A1.cpg, Gaps_A3J6A1.dbf, Gaps_A3J6A1.prj, Gaps_A3J6A1.shp, Gaps_A3J6A1.shp.GeosoftMeta, Gaps_A3J6A1.shx, A3J6A2.gdb, A3J6A2.map, A3J6A2.pdf, A3J6A2.ply, A3J6A2.tif, A3J6A2_AOI.ply, A3J6A2_Ch_Sum.grd, A3J6A2_Processed.XYZ, A3J6B1.gdb, A3J6B1.map, A3J6B1.pdf, A3J6B1.ply, A3J6B1.tif, A3J6B1_AOI.ply, A3J6B1_Ch_Sum.grd, A3J6B1_Processed.XYZ, Gaps_A3J6B1.cpg, Gaps_A3J6B1.dbf, Gaps_A3J6B1.prj, Gaps_A3J6B1.shp, Gaps_A3J6B1.shp.GeosoftMeta, Gaps_A3J6B1.shx, A3J6B2.gdb, A3J6B2.map, A3J6B2.pdf, A3J6B2.ply, A3J6B2.tif, A3J6B2_AOI.ply, A3J6B2_Ch_Sum.grd, A3J6B2_Processed.XYZ, A3J6C1.gdb, A3J6C1.map, A3J6C1.pdf, A3J6C1.ply, A3J6C1.tif, A3J6C1_AOI.ply, A3J6C1_Ch_Sum.grd, A3J6C1_Processed.XYZ, Gaps_A3J6C1.cpg, Gaps_A3J6C1.dbf, Gaps_A3J6C1.prj, Gaps_A3J6C1.shp, Gaps_A3J6C1.shp.GeosoftMeta, Gaps_A3J6C1.shx, A3J6C2.gdb, A3J6C2.map, A3J6C2.pdf, A3J6C2.ply, A3J6C2.tif, A3J6C2_AOI.ply, A3J6C2_Ch_Sum.grd, A3J6C2_Processed.XYZ, A3J6D1.gdb, A3J6D1.map, A3J6D1.pdf, A3J6D1.ply, A3J6D1.tif, A3J6D1_AOI.ply,

A3J6D1_Ch_Sum.grd, A3J6D1_Processed.XYZ, Gaps_A3J6D1.cpg, Gaps_A3J6D1.dbf, Gaps_A3J6D1.prj, Gaps_A3J6D1.shp, Gaps_A3J6D1.shp.GeosoftMeta, Gaps_A3J6D1.shx, A3J6D2.gdb, A3J6D2.map, A3J6D2.pdf, A3J6D2.ply, A3J6D2.tif, A3J6D2_AOI.ply, A3J6D2_Ch_Sum.grd, A3J6D2_Processed.XYZ, A3J6E1.gdb, A3J6E1.map, A3J6E1.pdf, A3J6E1.ply, A3J6E1.tif, A3J6E1_AOI.ply, A3J6E1_Ch_Sum.grd, A3J6E1_Processed.XYZ, A3J6E2.gdb, A3J6E2.map, A3J6E2.pdf, A3J6E2.ply, A3J6E2.tif, A3J6E2_AOI.ply, A3J6E2_Ch_Sum.grd, A3J6E2_Processed.XYZ

Measurement Performance Criteria

| | | | | | | | | | | |
|------------------------------|------------------|-----------------|------|------------------------------|--------|--------------|-----|---------------------|-----|--------------|
| Coverage: Category: | Cat B TA | | | | | | | | | |
| Lane Spacing (ft): | 3 | Requirement (%) | 98 | % at Lane Spacing: | 100 | Status: Pass | | | | |
| Design Spacing (ft) | 2 | Requirement (%) | 95 | % at Project Design Spacing: | 99.22 | Status: Pass | | | | |
| Along Track Sampling: | 98 | % <= | 0.65 | ft | Mean : | 0.19 | ft | % within Tolerance: | 100 | Status: Pass |
| Velocity: | 95 | % not to exceed | 4 | mph | Mean: | 2.26 | mph | % within Tolerance: | 100 | Status: Pass |
| GPS Quality: | Percent RTK Fix: | 99.76 | | | | | | | | Status: Pass |
| Repeat Lines: | Line Numbers: | None | | | | | | | | Status: Pass |

Daily Measurement Performance Criteria

| | | | | |
|----------------------|-----------|-------------------------------------|---------------|--|
| Static | 98 | % of background readings within +/- | 2 | mV for ALL channels |
| | 98 | % of spike readings within +/- | 10 | % of expected baseline mV for ALL channels |
| Cable Shake | 98 | % of readings within +/- | 2 | mV for ALL channels |
| Personnel | 98 | % of readings within +/- | 2 | mV for ALL channels |
| Towed Vehicle | 98 | % of readings within +/- | 2 | mV for ALL channels |
| IVS | 98 | % of background readings within +/- | 3 | mV for ALL channels |
| | | Item response within +/- | 25 | % of expected value for ALL channels |
| | | Item position within | 0.8202 | ft of actual location |
| GPS Check | | GPS measurement within | 0.25 | ft of control point location |

DateCollected: 4/20/2017 Team ID: GEO_1 Survey Instrument: Array 2 Instrument Warm-up Time: 15
 Weather: fog;humid;overcast Static Tests File Name: 0420171QC1
 IVS Test File Name: 0420171IVS1 IVS Location: Unit 25 IVS Mod2 GPS Check File Name: 0420171GPS
 QC Survey Notes: 12.6/12.7/12.4

QC Tests

| | Response (mV) | | | | Percent in Tolerance | | | | Status | | | | | |
|-----------------------|---------------|---------|--------|--------|----------------------|-----|-----|-----|--------|-----|------|------|------|------|
| | Ch1 | Ch2 | Ch3 | Ch4 | Ch1 | Ch2 | Ch3 | Ch4 | Ch1 | Ch2 | Ch3 | Ch4 | | |
| Sensor ID: 1 | | | | | | | | | | | | | | |
| Static Pre-Line ID: | 0 | 0.33 | 0.16 | 0.08 | 0 | 100 | 100 | 100 | 100 | | | | | |
| Static Spike-Line ID: | 1 | 1175.33 | 843.07 | 516.3 | 255.43 | 100 | 100 | 100 | 100 | | | | | |
| Static Post-Line ID: | 2 | 0.72 | 0.29 | 0.13 | 0.02 | 100 | 100 | 100 | 100 | | | | | |
| Comments: | | | | | | | | | | | Pass | Pass | Pass | Pass |
| Sensor ID: 2 | | | | | | | | | | | | | | |
| Static Pre-Line ID: | 0.1 | 0.35 | 0.1 | 0.08 | 0.02 | 100 | 100 | 100 | 100 | | | | | |
| Static Spike-Line ID: | 1.1 | 1201.88 | 865.6 | 531.13 | 265.38 | 100 | 100 | 100 | 100 | | | | | |
| Static Post-Line ID: | 2.1 | 0.57 | 0.24 | 0.2 | 0.07 | 100 | 100 | 100 | 100 | | | | | |
| Comments: | | | | | | | | | | | Pass | Pass | Pass | Pass |
| Sensor ID: 3 | | | | | | | | | | | | | | |
| Static Pre-Line ID: | 0.2 | -0.19 | -0.14 | 0.01 | 0.06 | 100 | 100 | 100 | 100 | | | | | |
| Static Spike-Line ID: | 1.2 | 1224.58 | 875.66 | 536.14 | 266.03 | 100 | 100 | 100 | 100 | | | | | |
| Static Post-Line ID: | 2.2 | -0.18 | -0.51 | -0.31 | -0.29 | 100 | 100 | 100 | 100 | | | | | |
| Comments: | | | | | | | | | | | Pass | Pass | Pass | Pass |
| Sensor ID: 1 | | | | | | | | | | | | | | |
| Cable Shake Line ID: | 3 | 0.52 | 0.11 | 0.04 | -0.03 | 100 | 100 | 100 | 100 | | | | | |
| Comments: | | | | | | | | | | | Pass | Pass | Pass | Pass |
| Sensor ID: 2 | | | | | | | | | | | | | | |
| Cable Shake Line ID: | 3.1 | 0.69 | 0.21 | 0.18 | 0.04 | 100 | 100 | 100 | 100 | | | | | |
| Comments: | | | | | | | | | | | Pass | Pass | Pass | Pass |
| Sensor ID: 3 | | | | | | | | | | | | | | |
| Cable Shake Line ID: | 3.2 | -0.2 | -0.62 | -0.37 | -0.3 | 100 | 100 | 100 | 100 | | | | | |
| Comments: | | | | | | | | | | | Pass | Pass | Pass | Pass |

Sensor ID: 1

| | | | | | | | | | |
|-----------------------------|---|------|-------|-------|-------|-----|-----|-----|-----|
| Tow Vehicle Line ID: | 4 | 0.17 | -0.22 | -0.14 | -0.13 | 100 | 100 | 100 | 100 |
| Comments: | | | | | | | | | |

Pass Pass Pass Pass

Sensor ID: 2

| | | | | | | | | | |
|-----------------------------|-----|------|------|------|------|-----|-----|-----|-----|
| Tow Vehicle Line ID: | 4.1 | 0.61 | 0.16 | 0.22 | 0.05 | 100 | 100 | 100 | 100 |
| Comments: | | | | | | | | | |

Pass Pass Pass Pass

Sensor ID: 3

| | | | | | | | | | |
|-----------------------------|-----|-------|-------|-------|-------|-----|-----|-----|-----|
| Tow Vehicle Line ID: | 4.2 | -0.51 | -0.85 | -0.49 | -0.32 | 100 | 100 | 100 | 100 |
| Comments: | | | | | | | | | |

Pass Pass Pass Pass

IVS Tests

| | Response (mV) | | | | | | | | Percent in Tolerance | | | | Status | | | | |
|---------------------|---------------------|------|------|------|------|-----|-----|-----|----------------------|------|------|------|--------|-----|-----|-----|--|
| | Ch1 | Ch2 | Ch3 | Ch4 | Ch1 | Ch2 | Ch3 | Ch4 | Ch1 | Ch2 | Ch3 | Ch4 | Ch1 | Ch2 | Ch3 | Ch4 | |
| | Sensor ID: 1 | | | | | | | | | | | | | | | | |
| Background Line ID: | 1 | 2.58 | 1.05 | 0.53 | 0.39 | 100 | 100 | 100 | 100 | Pass | Pass | Pass | Pass | | | | |
| Comments: | | | | | | | | | | | | | | | | | |
| Sensor ID: 2 | | | | | | | | | | | | | | | | | |
| Background Line ID: | 1.1 | 1.09 | 0.54 | 0.25 | 0.26 | 100 | 100 | 100 | 100 | Pass | Pass | Pass | Pass | | | | |
| Comments: | | | | | | | | | | | | | | | | | |
| Sensor ID: 3 | | | | | | | | | | | | | | | | | |
| Background Line ID: | 1.2 | 6.35 | 3.28 | 1.43 | 0.56 | 100 | 100 | 100 | 100 | Pass | Pass | Pass | Pass | | | | |
| Comments: | | | | | | | | | | | | | | | | | |

| | Item Response (mV) | | | | Delta Response (%) | | | | Item Pos Offset | Status | | | | | |
|---------------------------|--------------------|--------|--------|-------|--------------------|-------|-------|-------|-----------------|--------|------|------|------|------|------|
| | Ch1 | Ch2 | Ch3 | Ch4 | Ch1 | Ch2 | Ch3 | Ch4 | | Ch1 | Ch2 | Ch3 | Ch4 | Pos | |
| Sensor ID: 1 | | | | | | | | | | | | | | | |
| Test Item: IVS25 Line ID: | 0 | 230.07 | 162.59 | 92.53 | 43.97 | 14.14 | 14.40 | 15.12 | 14.27 | 0.28 | Pass | Pass | Pass | Pass | Pass |
| Comments: | | | | | | | | | | | | | | | |
| Test Item: IVS28 Line ID: | 0 | 175.16 | 123.47 | 70.35 | 34.33 | 10.44 | 10.61 | 11.30 | 12.05 | 0.19 | Pass | Pass | Pass | Pass | Pass |
| Comments: | | | | | | | | | | | | | | | |
| Test Item: IVS31 Line ID: | 0 | 58.39 | 44.04 | 28.47 | 15.61 | 6.75 | 8.45 | 10.55 | 12.70 | 0.34 | Pass | Pass | Pass | Pass | Pass |
| Comments: | | | | | | | | | | | | | | | |
| Test Item: IVS36 Line ID: | 0 | 68.72 | 41.78 | 19.21 | 6.19 | 16.70 | 15.86 | 17.38 | 20.62 | 0.25 | Pass | Pass | Pass | Pass | Pass |
| Comments: | | | | | | | | | | | | | | | |
| Sensor ID: 2 | | | | | | | | | | | | | | | |
| Test Item: IVS27 Line ID: | 0.1 | 192.25 | 134.74 | 76.84 | 36.44 | 7.37 | 6.84 | 7.42 | 7.07 | 0.12 | Pass | Pass | Pass | Pass | Pass |
| Comments: | | | | | | | | | | | | | | | |
| Test Item: IVS30 Line ID: | 0.1 | 204.35 | 143.52 | 81.68 | 38.65 | 11.06 | 10.88 | 10.61 | 9.82 | 0.06 | Pass | Pass | Pass | Pass | Pass |
| Comments: | | | | | | | | | | | | | | | |
| Test Item: IVS33 Line ID: | 0.1 | 38.68 | 29.20 | 18.50 | 10.24 | 12.53 | 11.65 | 6.54 | 7.88 | 0.06 | Pass | Pass | Pass | Pass | Pass |
| Comments: | | | | | | | | | | | | | | | |
| Test Item: IVS34 Line ID: | 0.1 | 54.27 | 33.32 | 15.94 | 5.41 | 11.11 | 12.94 | 12.60 | 15.91 | 0.24 | Pass | Pass | Pass | Pass | Pass |
| Comments: | | | | | | | | | | | | | | | |
| Sensor ID: 3 | | | | | | | | | | | | | | | |
| Test Item: IVS26 Line ID: | 0.2 | 176.75 | 123.25 | 68.22 | 33.64 | 5.59 | 5.83 | 6.39 | 8.01 | 0.52 | Pass | Pass | Pass | Pass | Pass |
| Comments: | | | | | | | | | | | | | | | |
| Test Item: IVS29 Line ID: | 0.2 | 197.69 | 137.33 | 76.81 | 37.02 | 6.58 | 6.81 | 7.35 | 6.87 | 0.23 | Pass | Pass | Pass | Pass | Pass |
| Comments: | | | | | | | | | | | | | | | |
| Test Item: IVS32 Line ID: | 0.2 | 37.44 | 28.94 | 19.45 | 11.11 | 15.99 | 15.91 | 19.26 | 18.27 | 0.29 | Pass | Pass | Pass | Pass | Pass |
| Comments: | | | | | | | | | | | | | | | |
| Test Item: IVS35 Line ID: | 0.2 | 55.08 | 33.62 | 16.17 | 5.22 | 15.77 | 16.70 | 24.49 | 22.38 | 0.25 | Pass | Pass | Pass | Pass | Pass |
| Comments: | | | | | | | | | | | | | | | |

GPS Function Check

| | | | | | |
|--------------------|-------------|--------------------|---------|---------|------|
| Point Location ID: | Unit 25 IVS | Total Offset (ft): | 0.07086 | Status: | Pass |
| Comments: | | | | | |

DateCollected: 4/20/2017 Team ID: GEO_1 Survey Instrument: Array 2 Instrument Warm-up Time: 15

Weather: sunny;windy

Static Tests File Name: 0420171QC2

IVS Test File Name: 0420171IVS2

IVS Location: Unit 25 IVS Mod2 GPS Check File Name:

QC Survey Notes: 12.1/12.3/12.0

QC Tests

| | Response (mV) | | | | Percent in Tolerance | | | | Status | | | | |
|-----------------------|---------------|---------|--------|--------|----------------------|-----|-----|-----|--------|------|------|------|------|
| | Ch1 | Ch2 | Ch3 | Ch4 | Ch1 | Ch2 | Ch3 | Ch4 | Ch1 | Ch2 | Ch3 | Ch4 | |
| Sensor ID: 1 | | | | | | | | | | | | | |
| Static Pre-Line ID: | 0 | 0.2 | 0.05 | 0.02 | -0.01 | 100 | 100 | 100 | 100 | | | | |
| Static Spike-Line ID: | 1 | 1147.17 | 822.76 | 503.48 | 248.13 | 100 | 100 | 100 | 100 | | | | |
| Static Post-Line ID: | 2 | 0.89 | 0.29 | 0.02 | -0.03 | 100 | 100 | 100 | 100 | | | | |
| Comments: | | | | | | | | | | Pass | Pass | Pass | Pass |
| Sensor ID: 2 | | | | | | | | | | | | | |
| Static Pre-Line ID: | 0.1 | 0.09 | 0.08 | 0.03 | -0.03 | 100 | 100 | 100 | 100 | | | | |
| Static Spike-Line ID: | 1.1 | 1157.96 | 833.43 | 510.12 | 253.17 | 100 | 100 | 100 | 100 | | | | |
| Static Post-Line ID: | 2.1 | 0.4 | 0.2 | 0.07 | -0.09 | 100 | 100 | 100 | 100 | | | | |
| Comments: | | | | | | | | | | Pass | Pass | Pass | Pass |
| Sensor ID: 3 | | | | | | | | | | | | | |
| Static Pre-Line ID: | 0.2 | 0.14 | 0.08 | -0.01 | -0.02 | 100 | 100 | 100 | 100 | | | | |
| Static Spike-Line ID: | 1.2 | 1157.42 | 827.64 | 505.71 | 249.85 | 100 | 100 | 100 | 100 | | | | |
| Static Post-Line ID: | 2.2 | 0.75 | 0.36 | -0.01 | -0.01 | 100 | 100 | 100 | 100 | | | | |
| Comments: | | | | | | | | | | Pass | Pass | Pass | Pass |

IVS Tests

| | Response (mV) | | | | Percent in Tolerance | | | | Status | | | |
|--|---------------|-----|-----|-----|----------------------|-----|-----|-----|--------|-----|-----|-----|
| | Ch1 | Ch2 | Ch3 | Ch4 | Ch1 | Ch2 | Ch3 | Ch4 | Ch1 | Ch2 | Ch3 | Ch4 |

Sensor ID: 1

| | | | | | | | | | | | | | |
|---------------------|--|------|------|------|------|----|-----|-----|-----|------|------|------|------|
| Background Line ID: | 1 | 2.38 | 1.39 | 0.91 | 0.41 | 86 | 100 | 100 | 100 | Fail | Pass | Pass | Pass |
| Comments: | Channel 1 fails - readings exceed max allowed. | | | | | | | | | | | | |

Sensor ID: 2

| | | | | | | | | | | | | | |
|---------------------|-----|------|------|------|------|-----|-----|-----|-----|------|------|------|------|
| Background Line ID: | 1.1 | 0.78 | 0.43 | 0.41 | 0.16 | 100 | 100 | 100 | 100 | Pass | Pass | Pass | Pass |
| Comments: | | | | | | | | | | | | | |

Sensor ID: 3

| | | | | | | | | | | | | | |
|---------------------|--|------|------|------|------|-------|-----|-----|-----|------|------|------|------|
| Background Line ID: | 1.2 | 5.46 | 2.42 | 0.87 | 0.36 | 95.38 | 100 | 100 | 100 | Fail | Pass | Pass | Pass |
| Comments: | Channel 1 fails - readings exceed max allowed. | | | | | | | | | | | | |

| | Item Response (mV) | | | | Delta Response (%) | | | | Item Pos Offset | Status | | | |
|--|--------------------|-----|-----|-----|--------------------|-----|-----|-----|-----------------|--------|-----|-----|-----|
| | Ch1 | Ch2 | Ch3 | Ch4 | Ch1 | Ch2 | Ch3 | Ch4 | | Ch1 | Ch2 | Ch3 | Ch4 |

Sensor ID: 1

| | | | | | | | | | | | | | | | | |
|------------------|----------|---|--------|--------|-------|-------|--------|--------|-------|-------|------|------|------|------|------|------|
| Test Item: IVS25 | Line ID: | 0 | 186.62 | 132.95 | 75.76 | 36.04 | -7.41 | -6.45 | -5.74 | -6.33 | 0.25 | Pass | Pass | Pass | Pass | Pass |
| Comments: | | | | | | | | | | | | | | | | |
| Test Item: IVS28 | Line ID: | 0 | 144.50 | 102.19 | 58.49 | 28.43 | -8.89 | -8.45 | -7.47 | -7.20 | 0.28 | Pass | Pass | Pass | Pass | Pass |
| Comments: | | | | | | | | | | | | | | | | |
| Test Item: IVS31 | Line ID: | 0 | 48.77 | 36.51 | 23.44 | 12.61 | -10.84 | -10.11 | -8.98 | -8.95 | 0.44 | Pass | Pass | Pass | Pass | Pass |
| Comments: | | | | | | | | | | | | | | | | |
| Test Item: IVS36 | Line ID: | 0 | 57.23 | 34.64 | 16.26 | 5.42 | -2.82 | -3.92 | -0.67 | 5.63 | 0.36 | Pass | Pass | Pass | Pass | Pass |
| Comments: | | | | | | | | | | | | | | | | |

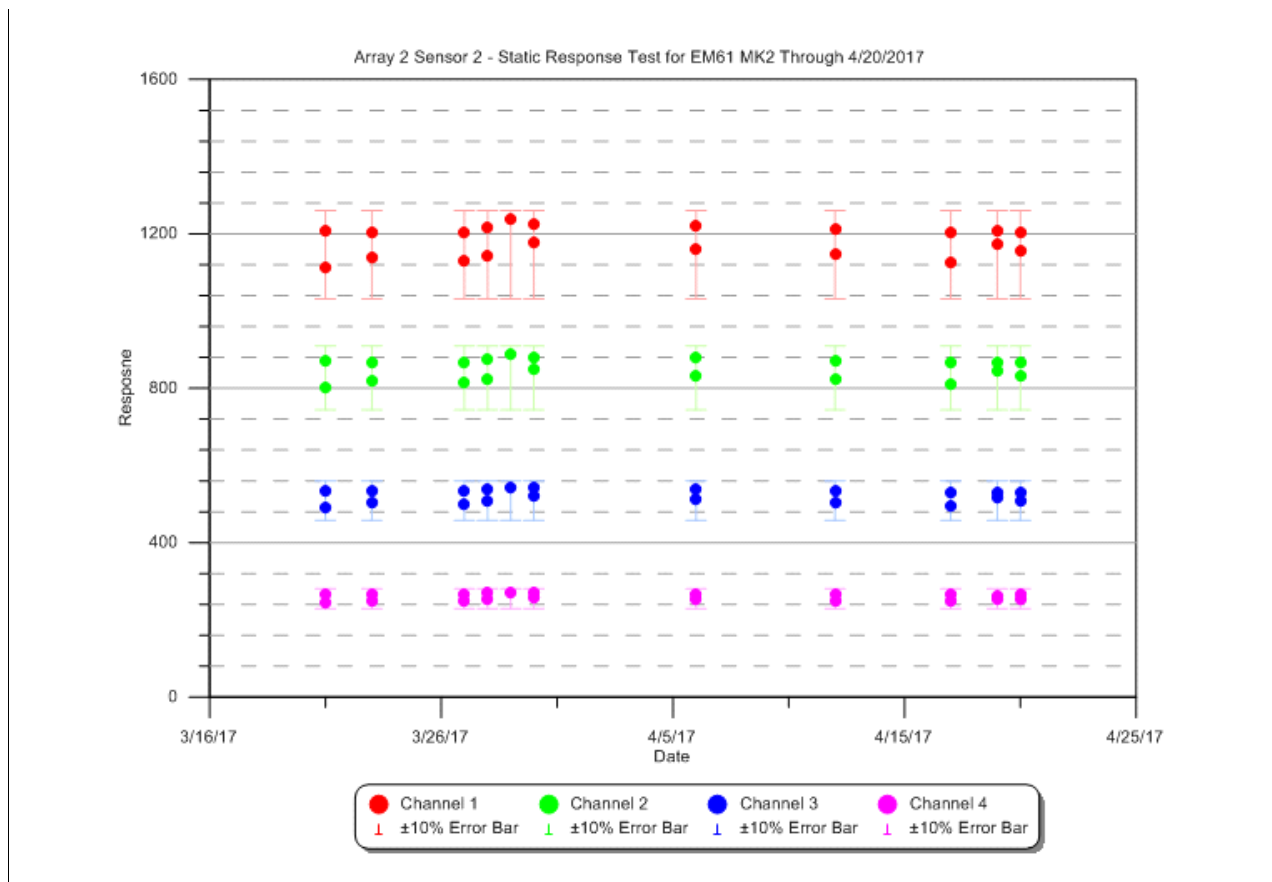
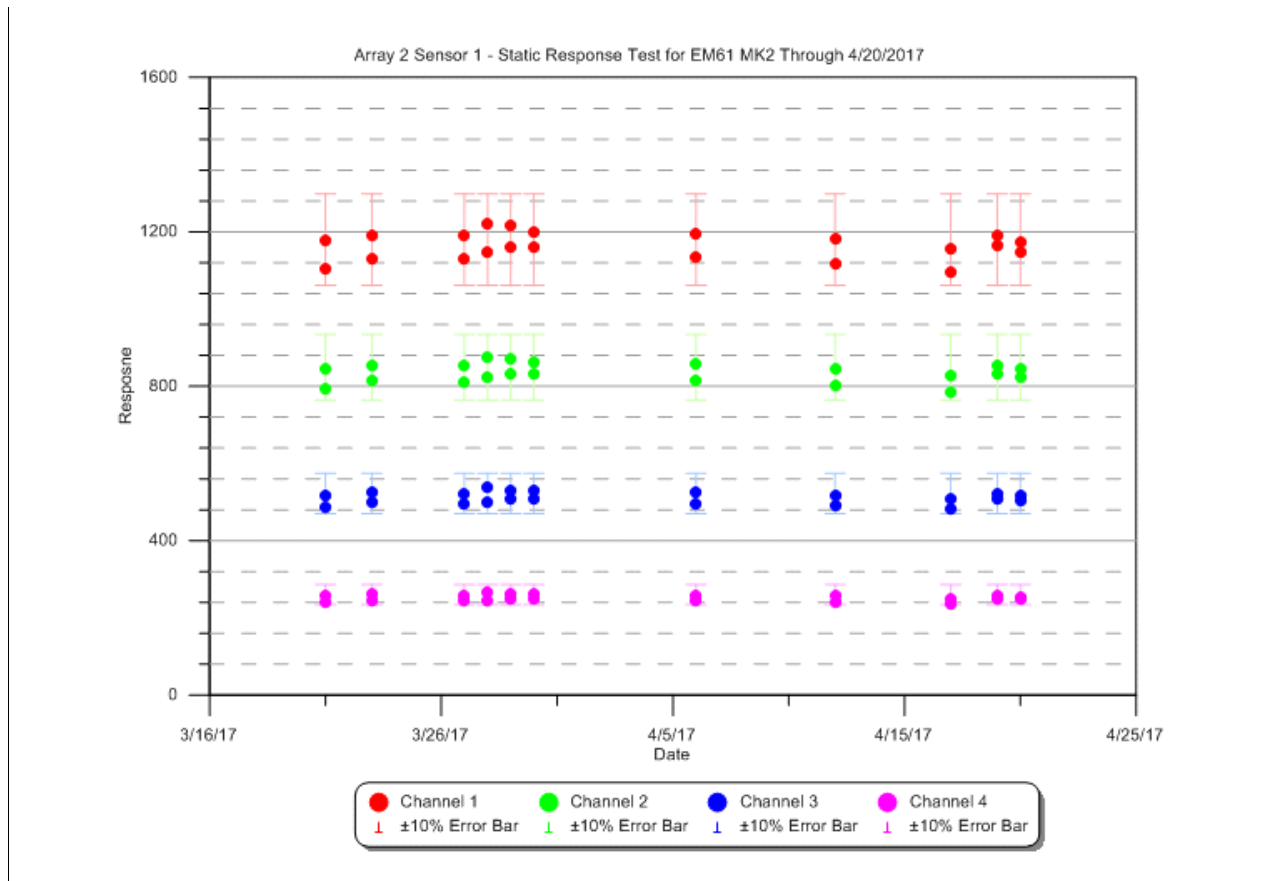
Sensor ID: 2

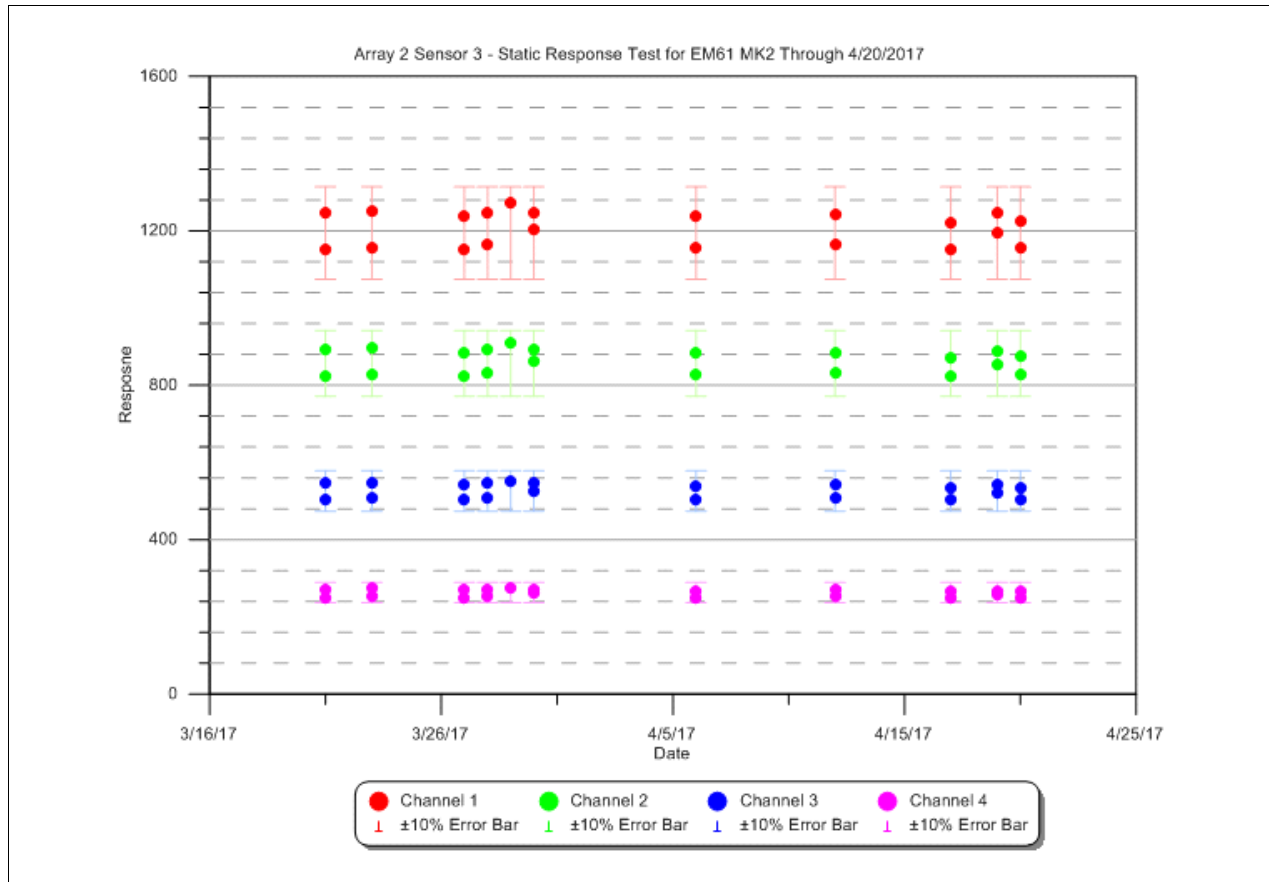
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|------------------|----------|-----|--------|--------|-------|-------|--------|--------|--------|--------|------|------|------|------|------|------|
| Test Item: IVS27 | Line ID: | 0.1 | 154.38 | 109.37 | 62.50 | 30.23 | -13.78 | -13.27 | -12.63 | -11.18 | 0.14 | Pass | Pass | Pass | Pass | Pass |
| Comments: | | | | | | | | | | | | | | | | |
| Test Item: IVS30 | Line ID: | 0.1 | 173.67 | 119.84 | 68.16 | 32.87 | -5.62 | -7.41 | -7.71 | -6.61 | 0.24 | Pass | Pass | Pass | Pass | Pass |
| Comments: | | | | | | | | | | | | | | | | |
| Test Item: IVS33 | Line ID: | 0.1 | 40.56 | 25.45 | 15.47 | 8.65 | 18.01 | -2.68 | -10.91 | -8.82 | 0.18 | Pass | Pass | Pass | Pass | Pass |
| Comments: | | | | | | | | | | | | | | | | |
| Test Item: IVS34 | Line ID: | 0.1 | 43.99 | 26.61 | 12.93 | 4.44 | -9.93 | -9.78 | -8.66 | -4.83 | 0.27 | Pass | Pass | Pass | Pass | Pass |
| Comments: | | | | | | | | | | | | | | | | |

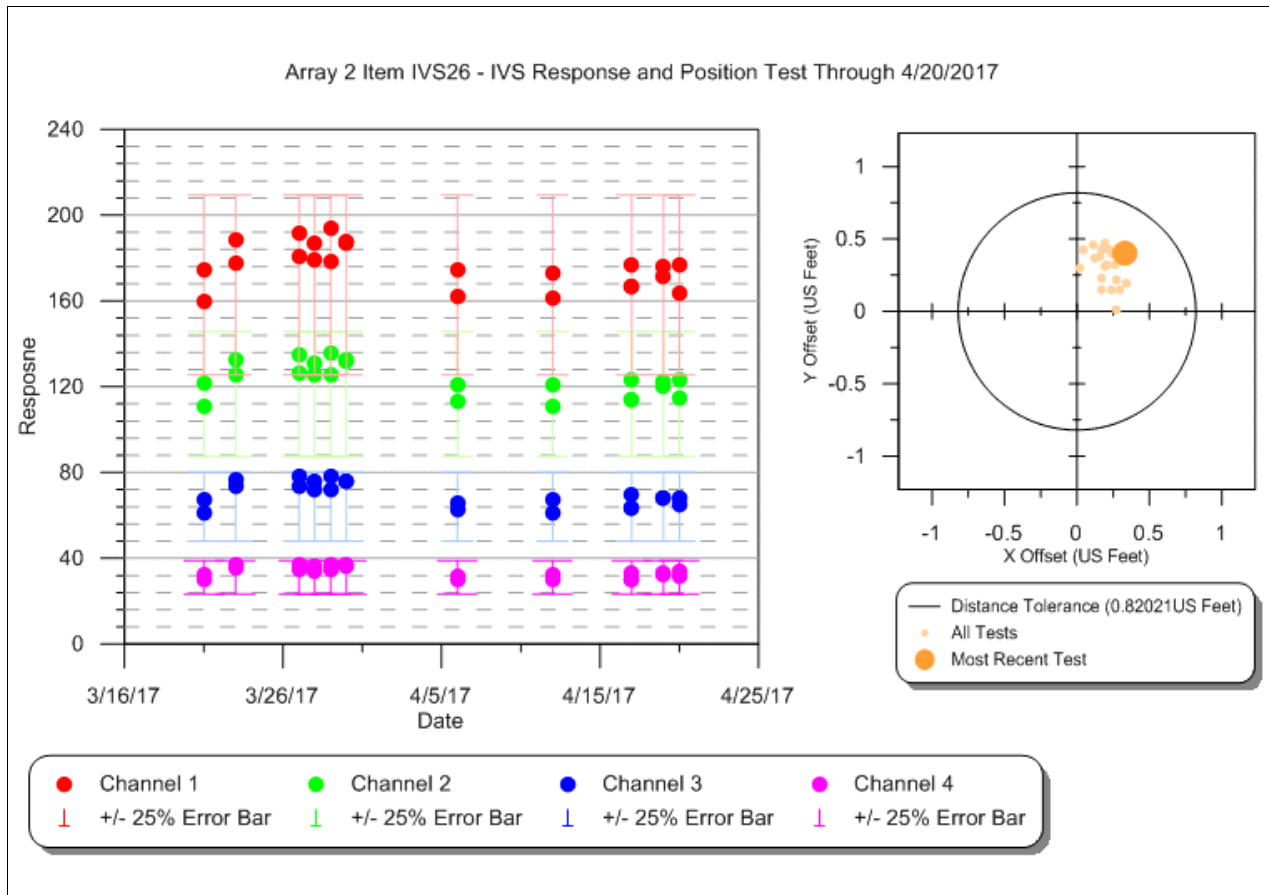
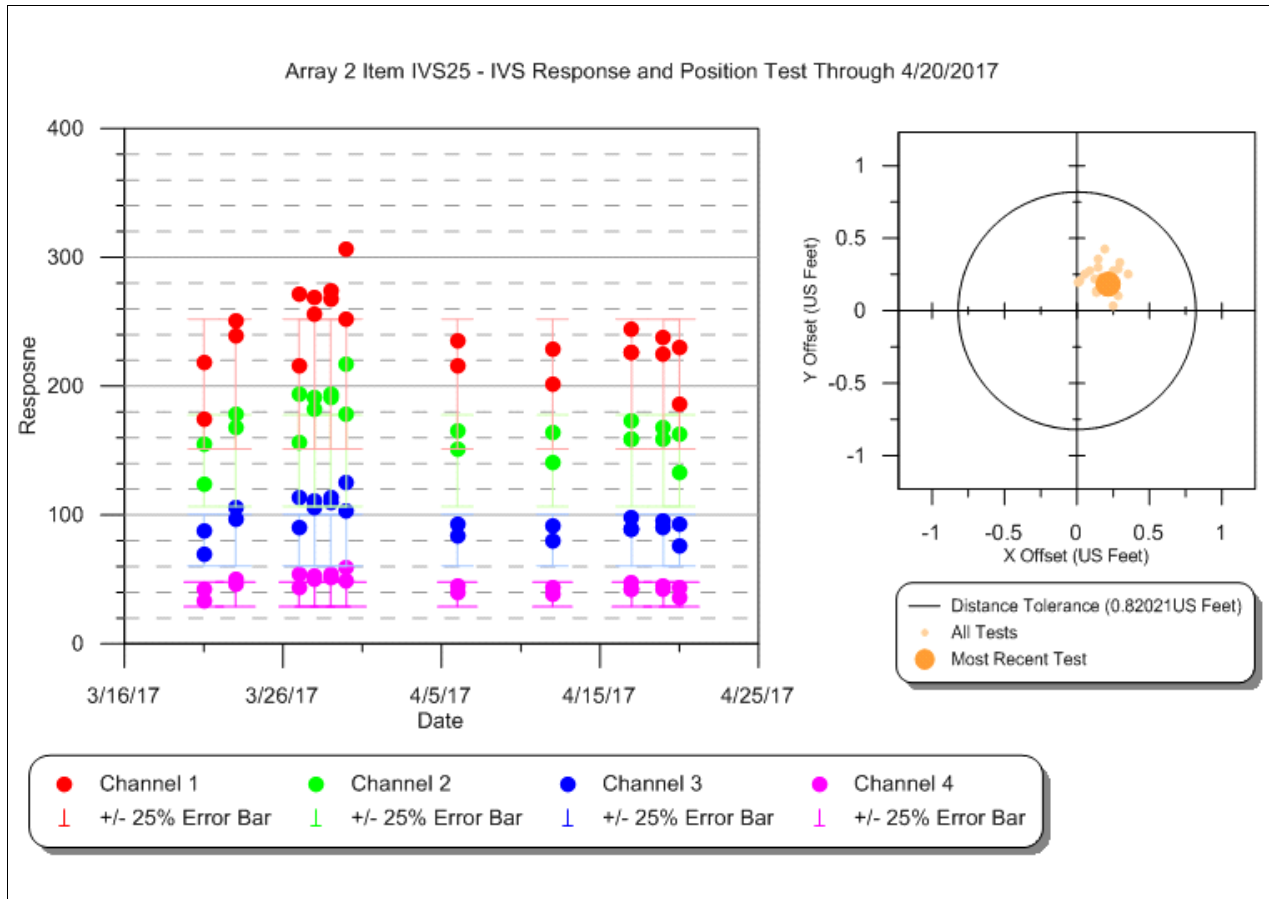
Sensor ID: 3

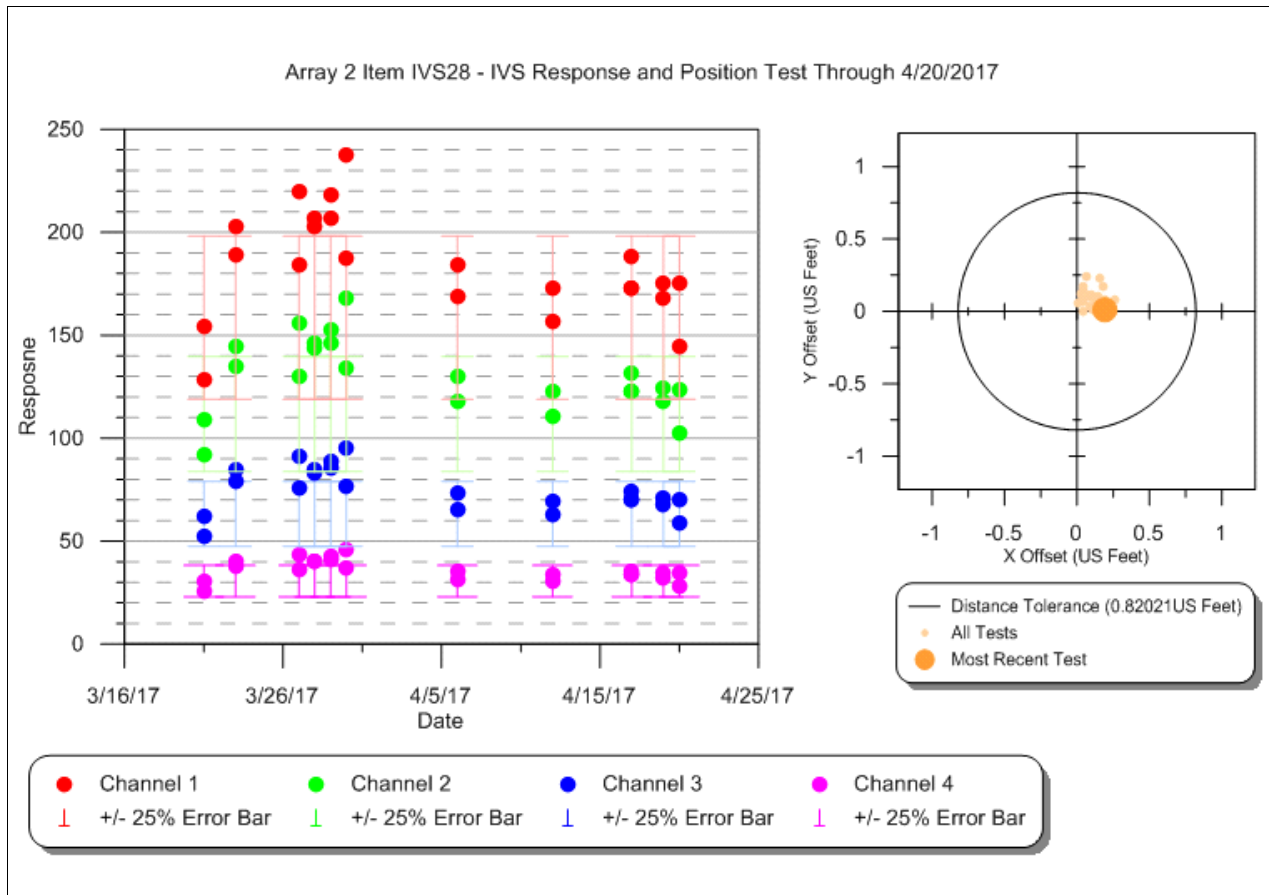
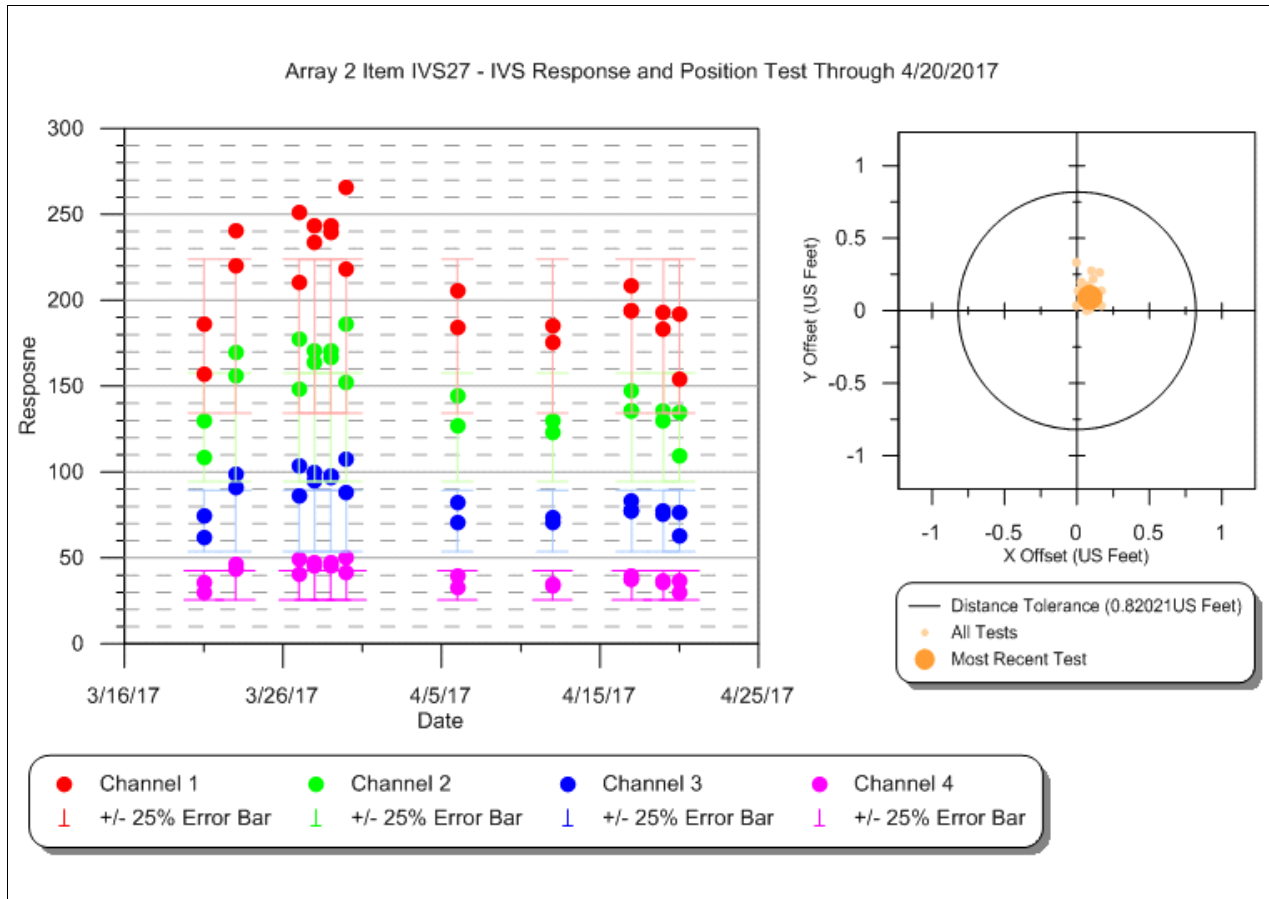
| | | | | | | | | | | | | | | | | |
|------------------|---|-----|--------|--------|-------|-------|-------|-------|-------|-------|------|------|------|------|------|------|
| Test Item: IVS26 | Line ID: | 0.2 | 163.27 | 114.75 | 64.67 | 31.61 | -2.46 | -1.47 | 0.85 | 1.49 | 0.27 | Pass | Pass | Pass | Pass | Pass |
| Comments: | | | | | | | | | | | | | | | | |
| Test Item: IVS29 | Line ID: | 0.2 | 184.19 | 127.77 | 71.08 | 34.25 | -0.70 | -0.63 | -0.65 | -1.11 | 0.23 | Pass | Pass | Pass | Pass | Pass |
| Comments: | | | | | | | | | | | | | | | | |
| Test Item: IVS32 | Line ID: | 0.2 | 37.81 | 27.87 | 18.14 | 10.89 | 17.13 | 11.62 | 11.26 | 15.98 | 0.47 | Pass | Pass | Pass | Pass | Pass |
| Comments: | | | | | | | | | | | | | | | | |
| Test Item: IVS35 | Line ID: | 0.2 | 55.84 | 33.14 | 15.97 | 5.62 | 17.36 | 15.03 | 22.92 | 31.89 | 0.26 | Pass | Pass | Pass | Fail | Pass |
| Comments: | Channel 4 fails - response exceeds tolerance. | | | | | | | | | | | | | | | |

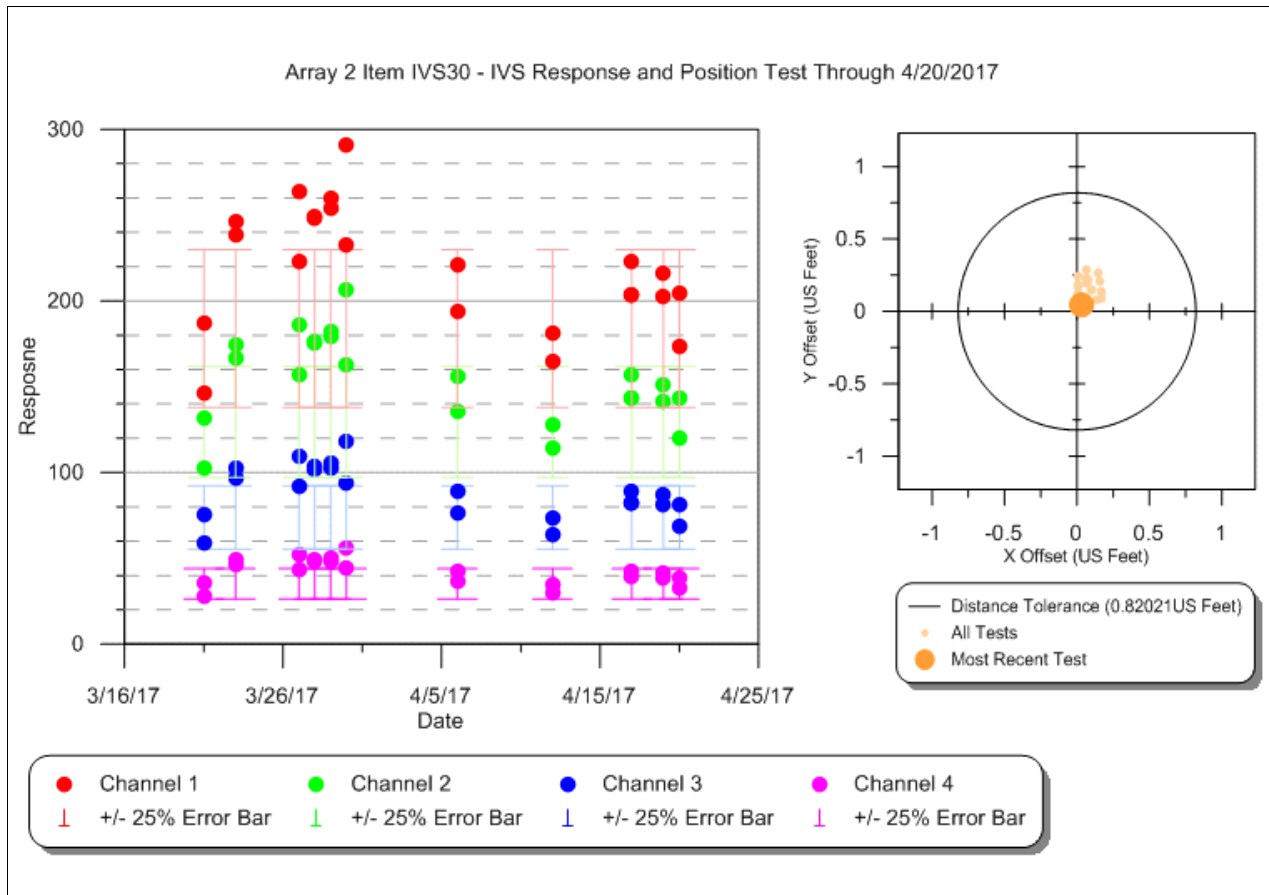
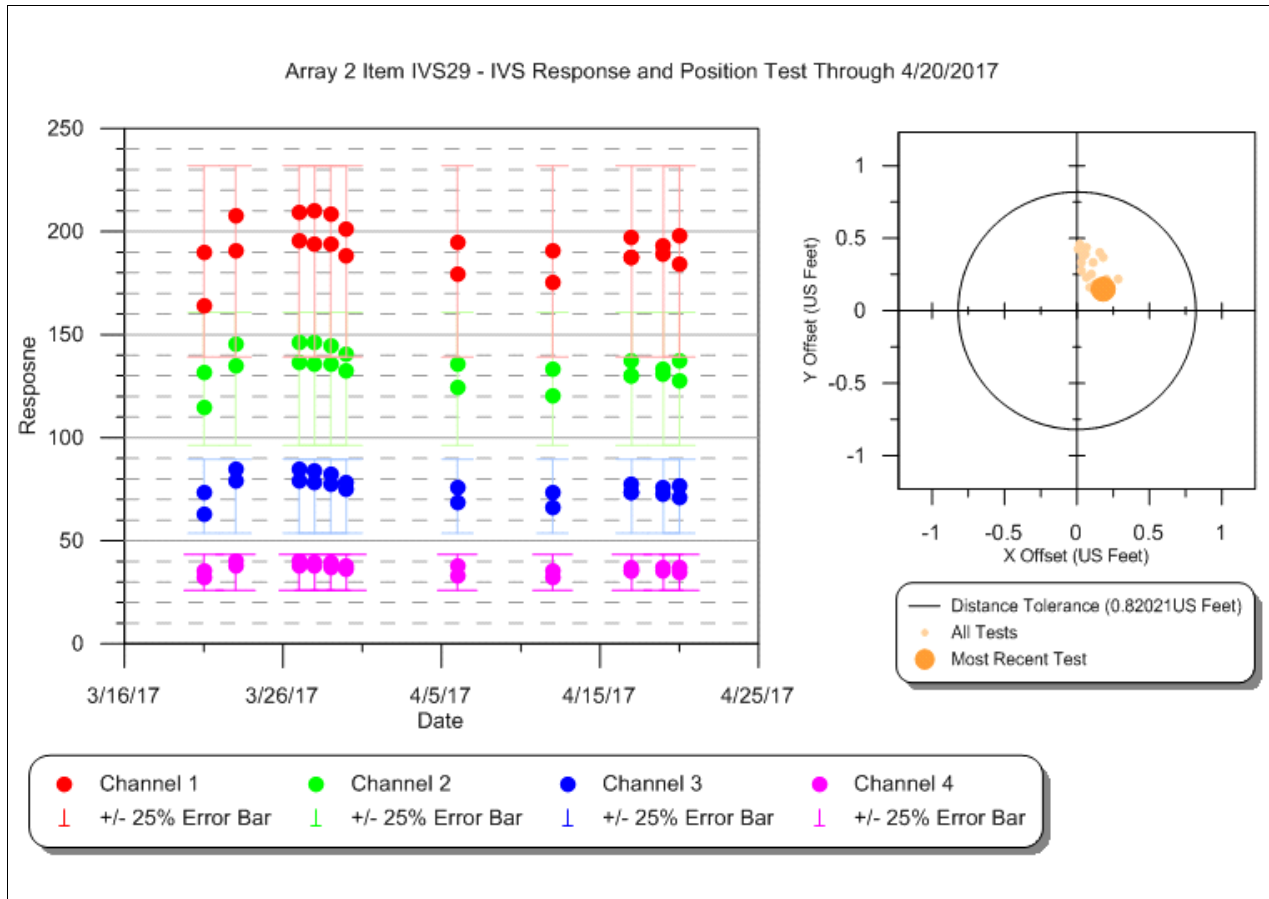
Cumulative Daily Measurement Performance Criteria

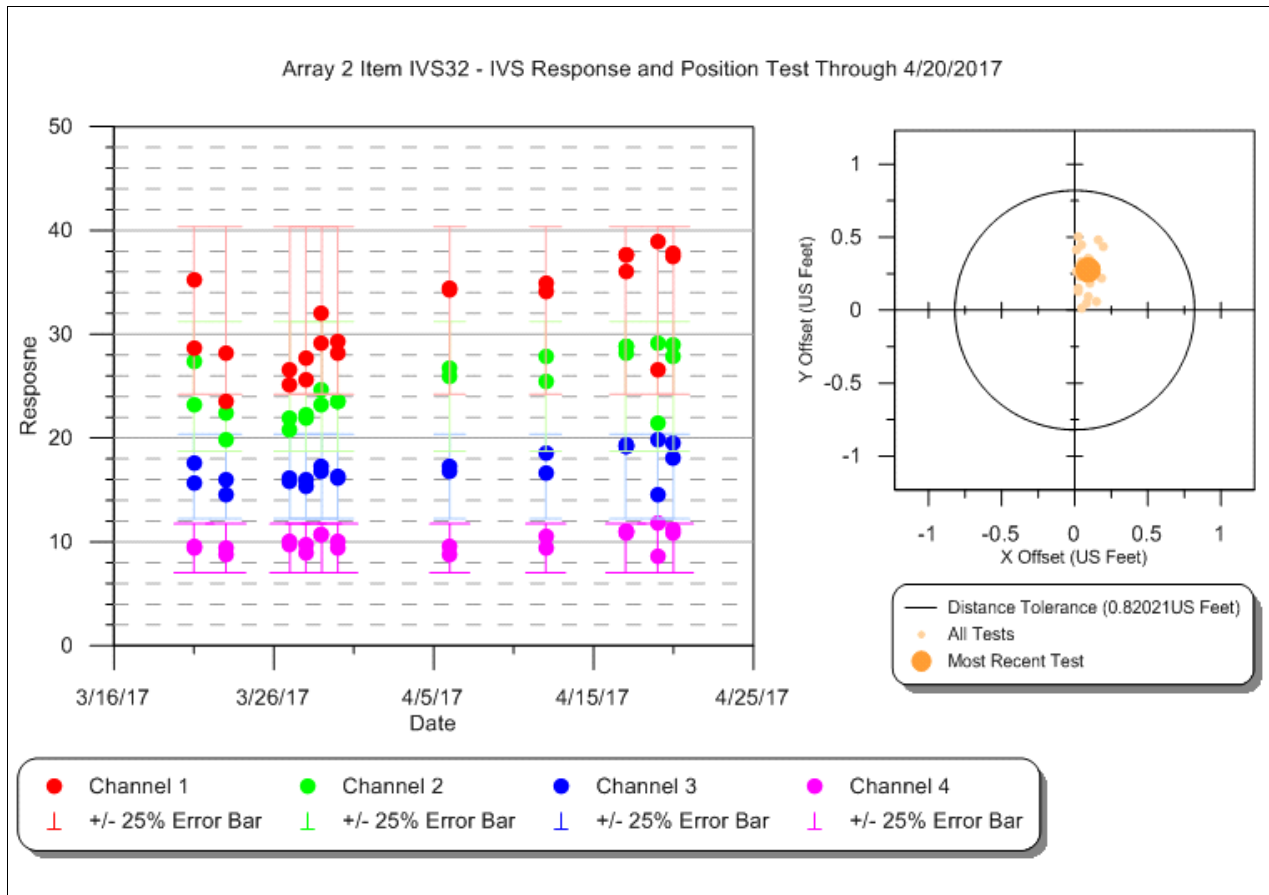
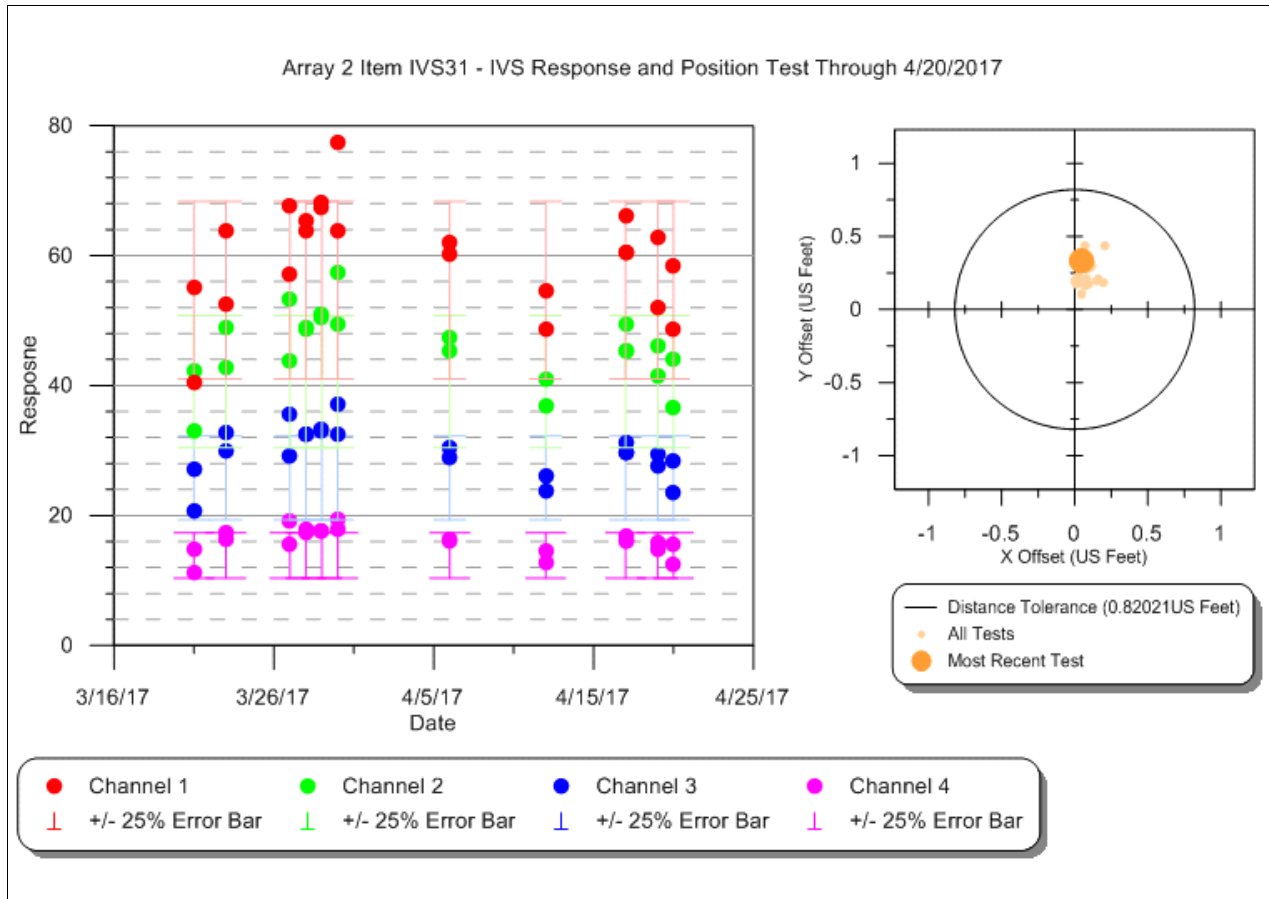


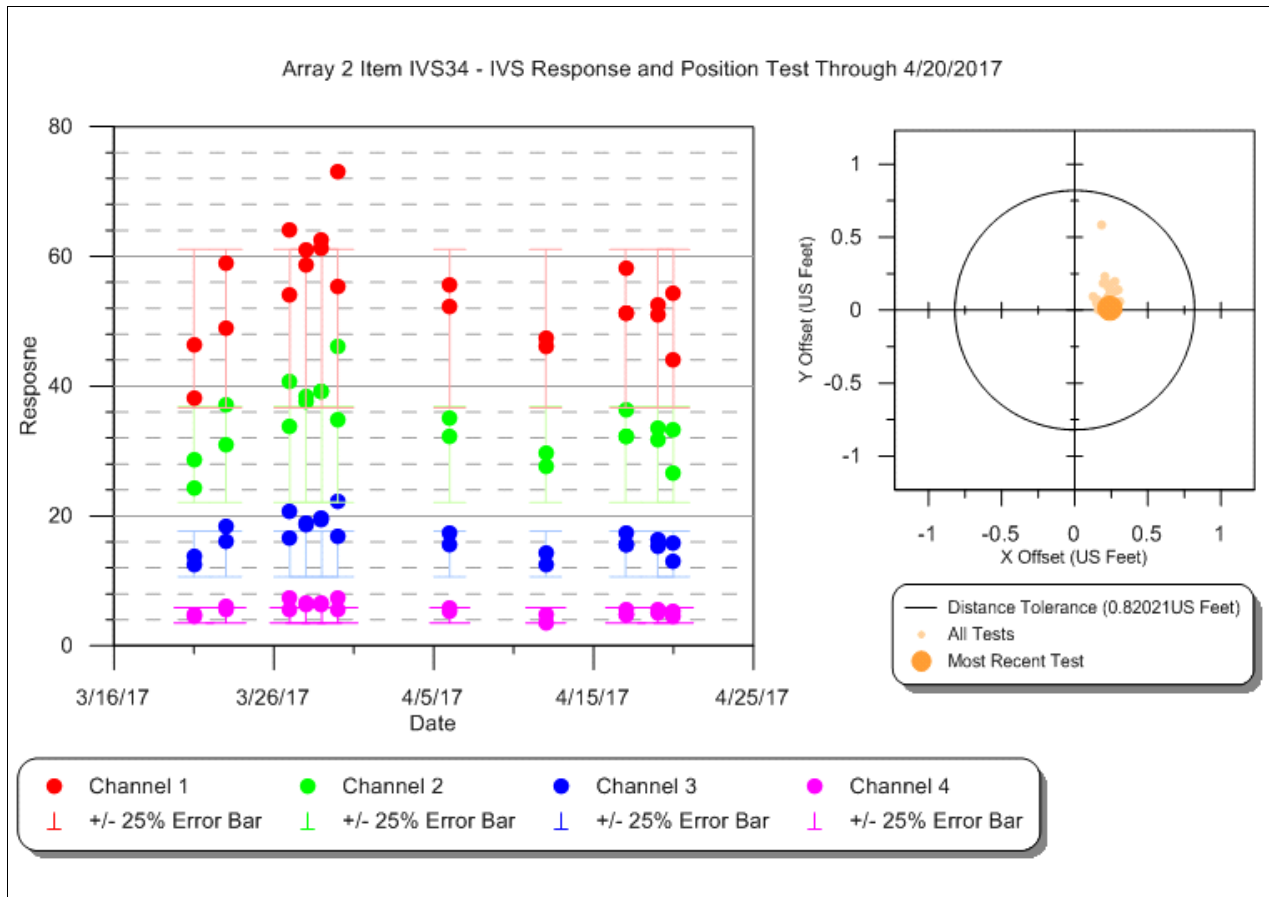
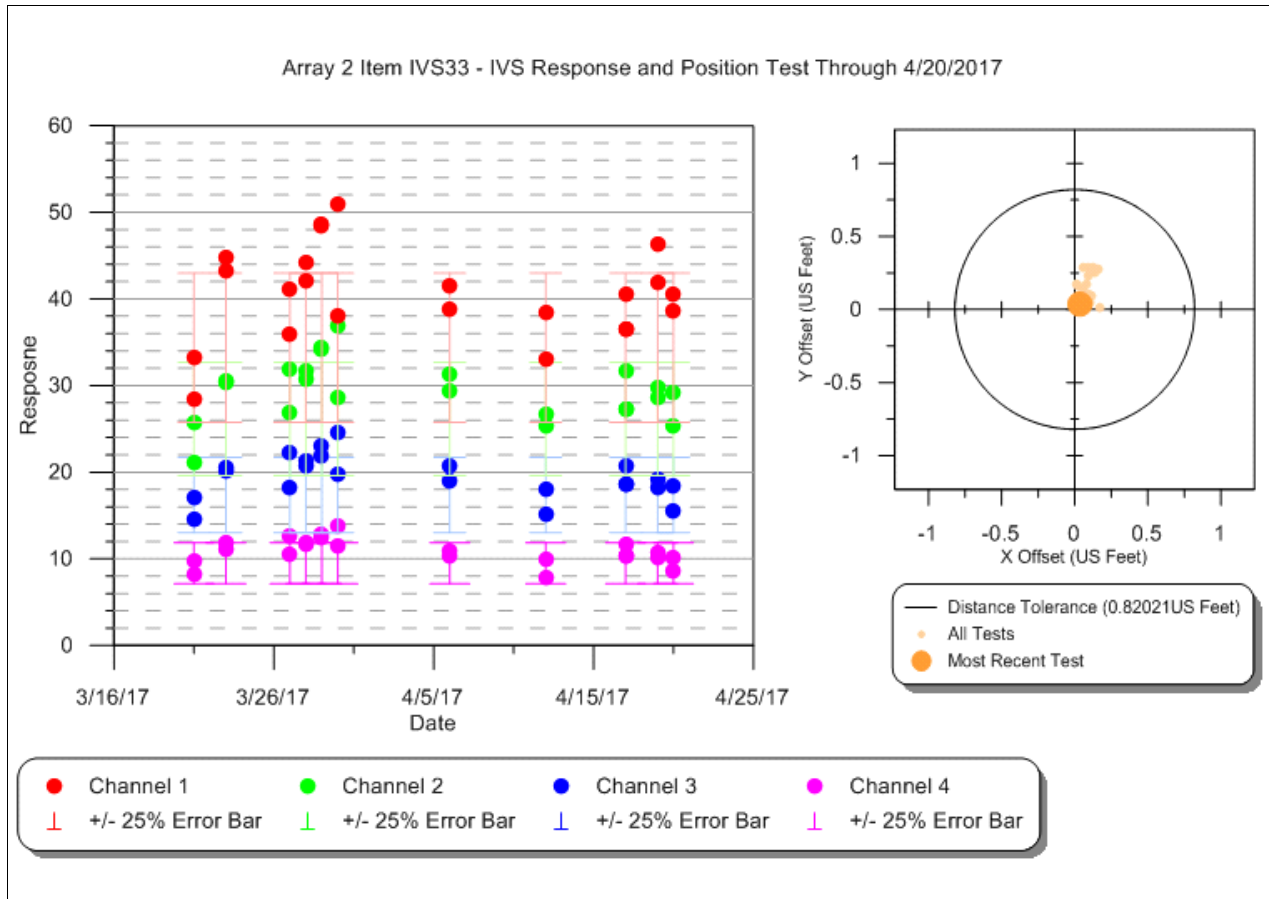


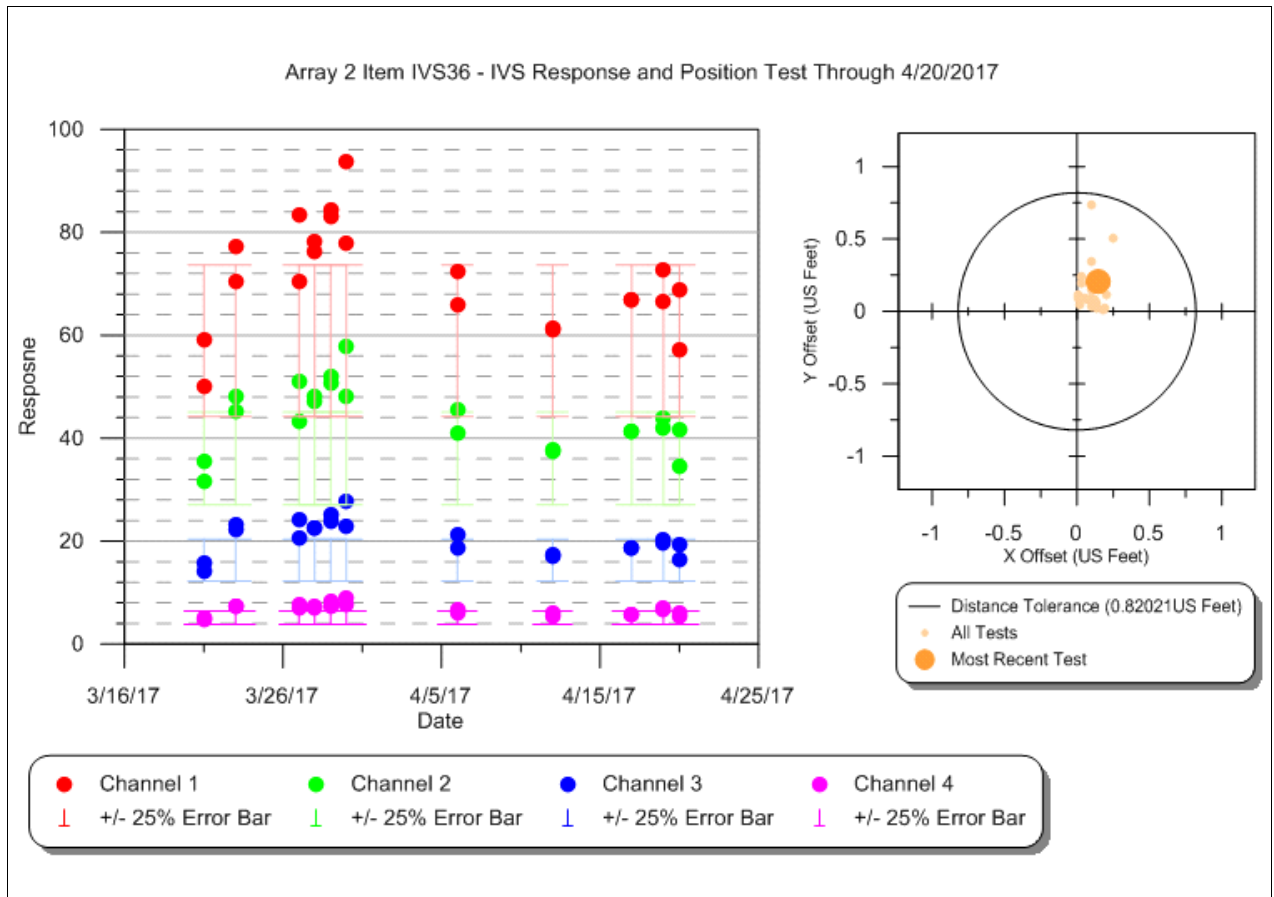
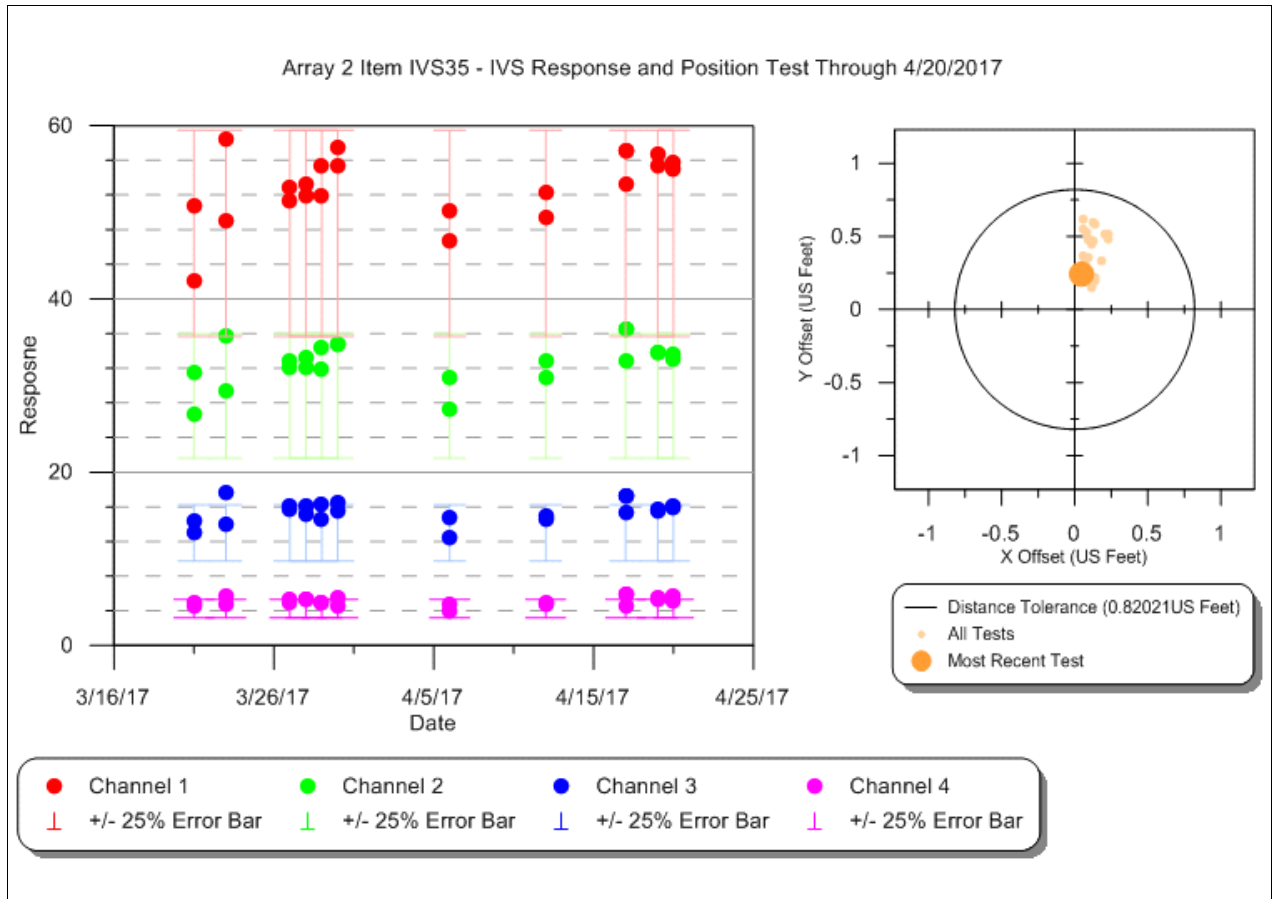












Appendix D
USACE Surface MEC Removal
Quality Assurance Documentation

USACE Surface MEC Removal Quality Assurance Documentation

| Unit ID | Grid Type | Grid ID | Acreage | Date QA Completed |
|---------|------------------|---------|---------|-------------------|
| 25 | Containment Line | A3J5C3 | 0.06 | 8/18/2015 |
| 25 | Containment Line | A3J5C4 | 0.10 | 8/18/2015 |
| 25 | Containment Line | A3J5C5 | 0.09 | 8/18/2015 |
| 25 | Containment Line | A3J5C6 | 0.06 | 8/18/2015 |
| 25 | Containment Line | A3J5C7 | 0.03 | 8/18/2015 |
| 25 | Containment Line | A3J5D3 | 0.08 | 8/18/2015 |
| 25 | Containment Line | A3J5D4 | 0.23 | 8/18/2015 |
| 25 | Containment Line | A3J5D5 | 0.23 | 8/18/2015 |
| 25 | Containment Line | A3J5D6 | 0.23 | 8/18/2015 |
| 25 | Containment Line | A3J5D7 | 0.17 | 8/18/2015 |
| 25 | Containment Line | A3J5E3 | 0.01 | 8/18/2015 |
| 25 | Containment Line | A3J5E4 | 0.23 | 8/18/2015 |
| 25 | Containment Line | A3J5E5 | 0.23 | 8/18/2015 |
| 25 | Containment Line | A3J5E6 | 0.23 | 8/18/2015 |
| 25 | Containment Line | A3J5E7 | 0.11 | 8/18/2015 |
| 25 | Containment Line | A3J5F3 | 0.03 | 8/18/2015 |
| 25 | Containment Line | A3J5F4 | 0.23 | 8/18/2015 |
| 25 | Containment Line | A3J5F5 | 0.23 | 8/18/2015 |
| 25 | Containment Line | A3J5F6 | 0.23 | 8/18/2015 |
| 25 | Containment Line | A3J5F7 | 0.04 | 8/18/2015 |
| 25 | Containment Line | B3B5A0 | 0.23 | 8/19/2015 |
| 25 | Containment Line | B3B5A7 | 0.01 | 8/19/2015 |
| 25 | Containment Line | B3B5A8 | 0.21 | 8/19/2015 |
| 25 | Containment Line | B3B5A9 | 0.23 | 8/19/2015 |
| 25 | Containment Line | B3B5B0 | 0.22 | 8/19/2015 |
| 25 | Containment Line | B3B5B7 | 0.12 | 8/19/2015 |
| 25 | Containment Line | B3B5B8 | 0.23 | 8/19/2015 |
| 25 | Containment Line | B3B5B9 | 0.23 | 8/19/2015 |
| 25 | Containment Line | B3B5C0 | 0.12 | 8/19/2015 |
| 25 | Containment Line | B3B5C6 | 0.03 | 8/19/2015 |
| 25 | Containment Line | B3B5C7 | 0.22 | 8/19/2015 |
| 25 | Containment Line | B3B5C8 | 0.23 | 8/19/2015 |
| 25 | Containment Line | B3B5C9 | 0.23 | 8/19/2015 |
| 25 | Containment Line | B3B5D0 | 0.01 | 8/19/2015 |
| 25 | Containment Line | B3B5D6 | 0.10 | 8/19/2015 |
| 25 | Containment Line | B3B5D7 | 0.23 | 8/19/2015 |
| 25 | Containment Line | B3B5D8 | 0.23 | 8/19/2015 |
| 25 | Containment Line | B3B5D9 | 0.21 | 8/19/2015 |
| 25 | Containment Line | B3B6A1 | 0.12 | 8/19/2015 |
| 25 | Containment Line | B3B6B1 | 0.02 | 8/19/2015 |
| 25 | Containment Line | A3J5G3 | 0.10 | 8/27/2015 |
| 25 | Containment Line | A3J5G4 | 0.23 | 8/27/2015 |
| 25 | Containment Line | A3J5G5 | 0.23 | 8/27/2015 |
| 25 | Containment Line | A3J5G6 | 0.20 | 8/27/2015 |
| 25 | Containment Line | A3J5H3 | 0.17 | 8/27/2015 |

| Unit ID | Grid Type | Grid ID | Acreage | Date QA Completed |
|---------|------------------|---------|---------|-------------------|
| 25 | Containment Line | A3J5H4 | 0.23 | 8/27/2015 |
| 25 | Containment Line | A3J5H5 | 0.23 | 8/27/2015 |
| 25 | Containment Line | A3J5H6 | 0.13 | 8/27/2015 |
| 25 | Containment Line | A3J5I2 | 0.01 | 8/27/2015 |
| 25 | Containment Line | A3J5I3 | 0.22 | 8/27/2015 |
| 25 | Containment Line | A3J5I4 | 0.23 | 8/27/2015 |
| 25 | Containment Line | A3J5I5 | 0.23 | 8/27/2015 |
| 25 | Containment Line | A3J5I6 | 0.19 | 8/27/2015 |
| 25 | Containment Line | A3J5I7 | 0.03 | 8/27/2015 |
| 25 | Containment Line | A3J5J3 | 0.14 | 8/27/2015 |
| 25 | Containment Line | A3J5J4 | 0.23 | 8/27/2015 |
| 25 | Containment Line | A3J5J5 | 0.23 | 8/27/2015 |
| 25 | Containment Line | A3J5J6 | 0.23 | 8/27/2015 |
| 25 | Containment Line | A3J5J7 | 0.21 | 8/27/2015 |
| 25 | Containment Line | A3J5J8 | 0.04 | 8/27/2015 |
| 25 | Containment Line | B3B5E6 | 0.11 | 9/3/2015 |
| 25 | Containment Line | B3B5E7 | 0.23 | 9/3/2015 |
| 25 | Containment Line | B3B5F6 | 0.11 | 9/3/2015 |
| 25 | Containment Line | B3B5F7 | 0.23 | 9/3/2015 |
| 25 | Containment Line | B3B5F8 | 0.23 | 9/3/2015 |
| 25 | Containment Line | B3B5F9 | 0.16 | 9/3/2015 |
| 25 | Containment Line | B3B5G6 | 0.12 | 9/3/2015 |
| 25 | Containment Line | B3B5G7 | 0.23 | 9/3/2015 |
| 25 | Containment Line | B3B5G8 | 0.23 | 9/3/2015 |
| 25 | Containment Line | B3B5G9 | 0.15 | 9/3/2015 |
| 25 | Containment Line | B3B5H6 | 0.14 | 9/3/2015 |
| 25 | Containment Line | B3B5H7 | 0.23 | 9/3/2015 |
| 25 | Containment Line | B3B5H8 | 0.23 | 9/3/2015 |
| 25 | Containment Line | B3B5H9 | 0.13 | 9/3/2015 |
| 25 | Containment Line | B3B5I6 | 0.17 | 9/3/2015 |
| 25 | Containment Line | B3B5I7 | 0.23 | 9/3/2015 |
| 25 | Containment Line | B3B5I8 | 0.23 | 9/3/2015 |
| 25 | Containment Line | B3B5I9 | 0.10 | 9/3/2015 |
| 25 | Containment Line | B3B5J6 | 0.20 | 9/3/2015 |
| 25 | Containment Line | B3B5J7 | 0.23 | 9/3/2015 |
| 25 | Containment Line | B3B5J8 | 0.23 | 9/3/2015 |
| 25 | Containment Line | B3B5J9 | 0.08 | 9/3/2015 |
| 25 | Containment Line | B3A5A3 | 0.00 | 9/28/2015 |
| 25 | Containment Line | B3A5A4 | 0.13 | 9/28/2015 |
| 25 | Containment Line | B3A5A5 | 0.23 | 9/28/2015 |
| 25 | Containment Line | B3A5A6 | 0.23 | 9/28/2015 |
| 25 | Containment Line | B3A5A7 | 0.23 | 9/28/2015 |
| 25 | Containment Line | B3A5A8 | 0.21 | 9/28/2015 |
| 25 | Containment Line | B3A5A9 | 0.03 | 9/28/2015 |
| 25 | Containment Line | B3A5B0 | 0.00 | 9/28/2015 |
| 25 | Containment Line | B3A5B5 | 0.09 | 9/28/2015 |

| Unit ID | Grid Type | Grid ID | Acreage | Date QA Completed |
|---------|------------------|---------|---------|-------------------|
| 25 | Containment Line | B3A5B6 | 0.23 | 9/28/2015 |
| 25 | Containment Line | B3A5B7 | 0.23 | 9/28/2015 |
| 25 | Containment Line | B3A5B8 | 0.23 | 9/28/2015 |
| 25 | Containment Line | B3A5B9 | 0.18 | 9/28/2015 |
| 25 | Containment Line | B3A5C0 | 0.10 | 9/28/2015 |
| 25 | Containment Line | B3A5C6 | 0.10 | 9/28/2015 |
| 25 | Containment Line | B3A5C7 | 0.23 | 9/28/2015 |
| 25 | Containment Line | B3A5C8 | 0.23 | 9/28/2015 |
| 25 | Containment Line | B3A5C9 | 0.23 | 9/28/2015 |
| 25 | Containment Line | B3A5H0 | 0.23 | 9/28/2015 |
| 25 | Containment Line | B3A5H8 | 0.08 | 9/28/2015 |
| 25 | Containment Line | B3A5H9 | 0.23 | 9/28/2015 |
| 25 | Containment Line | B3A5I0 | 0.23 | 9/28/2015 |
| 25 | Containment Line | B3A5I8 | 0.07 | 9/28/2015 |
| 25 | Containment Line | B3A5I9 | 0.23 | 9/28/2015 |
| 25 | Containment Line | B3A5J0 | 0.23 | 9/28/2015 |
| 25 | Containment Line | B3A5J8 | 0.11 | 9/28/2015 |
| 25 | Containment Line | B3A5J9 | 0.23 | 9/28/2015 |
| 25 | Containment Line | B3A6H1 | 0.19 | 9/28/2015 |
| 25 | Containment Line | B3A6I1 | 0.20 | 9/28/2015 |
| 25 | Containment Line | B3A6J1 | 0.18 | 9/28/2015 |
| 25 | Containment Line | B3B5E8 | 0.23 | 10/8/2015 |
| 25 | Containment Line | B3B5E9 | 0.16 | 10/8/2015 |
| 25 | Containment Line | B3A5D0 | 0.20 | 10/13/2015 |
| 25 | Containment Line | B3A5D6 | 0.00 | 10/13/2015 |
| 25 | Containment Line | B3A5D7 | 0.15 | 10/13/2015 |
| 25 | Containment Line | B3A5D8 | 0.23 | 10/13/2015 |
| 25 | Containment Line | B3A5D9 | 0.23 | 10/13/2015 |
| 25 | Containment Line | B3A5E0 | 0.23 | 10/13/2015 |
| 25 | Containment Line | B3A5E7 | 0.03 | 10/13/2015 |
| 25 | Containment Line | B3A5E8 | 0.23 | 10/13/2015 |
| 25 | Containment Line | B3A5E9 | 0.23 | 10/13/2015 |
| 25 | Containment Line | B3A5F0 | 0.23 | 10/13/2015 |
| 25 | Containment Line | B3A5F8 | 0.17 | 10/13/2015 |
| 25 | Containment Line | B3A5F9 | 0.23 | 10/13/2015 |
| 25 | Containment Line | B3A5G0 | 0.23 | 10/13/2015 |
| 25 | Containment Line | B3A5G8 | 0.12 | 10/13/2015 |
| 25 | Containment Line | B3A5G9 | 0.23 | 10/13/2015 |
| 25 | Containment Line | B3A6D1 | 0.00 | 10/13/2015 |
| 25 | Containment Line | B3A6E1 | 0.06 | 10/13/2015 |
| 25 | Containment Line | B3A6F1 | 0.12 | 10/13/2015 |
| 25 | Containment Line | B3A6G1 | 0.16 | 10/13/2015 |
| 25 | Containment Line | B3C5A6 | 0.22 | 10/13/2015 |
| 25 | Containment Line | B3C5A7 | 0.23 | 10/13/2015 |
| 25 | Containment Line | B3C5A8 | 0.23 | 10/13/2015 |
| 25 | Containment Line | B3C5A9 | 0.07 | 10/13/2015 |

| Unit ID | Grid Type | Grid ID | Acreage | Date QA Completed |
|---------|------------------|---------|---------|-------------------|
| 25 | Containment Line | B3C5B6 | 0.19 | 10/13/2015 |
| 25 | Containment Line | B3C5B7 | 0.23 | 10/13/2015 |
| 25 | Containment Line | B3C5B8 | 0.23 | 10/13/2015 |
| 25 | Containment Line | B3C5B9 | 0.11 | 10/13/2015 |
| 25 | Containment Line | B3C5C6 | 0.11 | 10/13/2015 |
| 25 | Containment Line | B3C5C7 | 0.23 | 10/13/2015 |
| 25 | Containment Line | B3C5C8 | 0.23 | 10/13/2015 |
| 25 | Containment Line | B3C5C9 | 0.04 | 10/13/2015 |
| 25 | Containment Line | B3C5D6 | 0.02 | 10/13/2015 |
| 25 | Containment Line | B3C5D7 | 0.23 | 10/13/2015 |
| 25 | Containment Line | B3C5D8 | 0.22 | 10/13/2015 |
| 25 | Containment Line | B3C5D9 | 0.00 | 10/13/2015 |
| 25 | Containment Line | B3C5E7 | 0.16 | 10/13/2015 |
| 25 | Containment Line | B3C5E8 | 0.18 | 10/13/2015 |
| 25 | Containment Line | B3C5F7 | 0.11 | 10/13/2015 |
| 25 | Containment Line | B3C5F8 | 0.06 | 10/13/2015 |
| 25 | Containment Line | B3C5G7 | 0.02 | 10/13/2015 |
| 25 | Interior | A3I6B4 | 0.00 | 8/24/2016 |
| 25 | Interior | A3I6B5 | 0.00 | 8/24/2016 |
| 25 | Interior | A3I6C4 | 0.16 | 8/24/2016 |
| 25 | Interior | A3I6C5 | 0.21 | 8/24/2016 |
| 25 | Interior | A3I6C6 | 0.09 | 8/24/2016 |
| 25 | Interior | A3I6D3 | 0.00 | 8/24/2016 |
| 25 | Interior | A3I6D4 | 0.21 | 8/24/2016 |
| 25 | Interior | A3I6D5 | 0.23 | 8/24/2016 |
| 25 | Interior | A3I6D6 | 0.23 | 8/24/2016 |
| 25 | Interior | A3I6E2 | 0.01 | 8/24/2016 |
| 25 | Interior | A3I6E3 | 0.17 | 8/24/2016 |
| 25 | Interior | A3I6E4 | 0.23 | 8/24/2016 |
| 25 | Interior | A3I6E5 | 0.23 | 8/24/2016 |
| 25 | Interior | A3I6E6 | 0.23 | 8/24/2016 |
| 25 | Interior | A3I6F2 | 0.05 | 8/24/2016 |
| 25 | Interior | A3I6F3 | 0.23 | 8/24/2016 |
| 25 | Interior | A3I6F4 | 0.23 | 8/24/2016 |
| 25 | Interior | A3I6F5 | 0.23 | 8/24/2016 |
| 25 | Interior | A3I6F6 | 0.23 | 8/24/2016 |
| 25 | Interior | A3I6G2 | 0.07 | 8/24/2016 |
| 25 | Interior | A3I6G3 | 0.23 | 8/24/2016 |
| 25 | Interior | A3I6G4 | 0.23 | 8/24/2016 |
| 25 | Interior | A3I6G5 | 0.23 | 8/24/2016 |
| 25 | Interior | A3I6G6 | 0.23 | 8/24/2016 |
| 25 | Interior | A3I6H0 | 0.23 | 8/29/2016 |
| 25 | Interior | A3I6H7 | 0.23 | 8/29/2016 |
| 25 | Interior | A3I6H8 | 0.23 | 8/29/2016 |
| 25 | Interior | A3I6H9 | 0.23 | 8/29/2016 |
| 25 | Interior | A3I6I0 | 0.23 | 8/29/2016 |

| Unit ID | Grid Type | Grid ID | Acreage | Date QA Completed |
|---------|-----------|---------|---------|-------------------|
| 25 | Interior | A3I6I7 | 0.23 | 8/29/2016 |
| 25 | Interior | A3I6I8 | 0.23 | 8/29/2016 |
| 25 | Interior | A3I6I9 | 0.23 | 8/29/2016 |
| 25 | Interior | A3I6J0 | 0.23 | 8/29/2016 |
| 25 | Interior | A3I6J7 | 0.23 | 8/29/2016 |
| 25 | Interior | A3I6J8 | 0.23 | 8/29/2016 |
| 25 | Interior | A3I6J9 | 0.23 | 8/29/2016 |
| 25 | Interior | A3I7H1 | 0.15 | 8/29/2016 |
| 25 | Interior | A3I7I1 | 0.17 | 8/29/2016 |
| 25 | Interior | A3I7J1 | 0.17 | 8/29/2016 |
| 25 | Interior | A3I6D7 | 0.10 | 9/8/2016 |
| 25 | Interior | A3I6D8 | 0.00 | 9/8/2016 |
| 25 | Interior | A3I6E7 | 0.23 | 9/8/2016 |
| 25 | Interior | A3I6E8 | 0.18 | 9/8/2016 |
| 25 | Interior | A3I6E9 | 0.03 | 9/8/2016 |
| 25 | Interior | A3I6F0 | 0.05 | 9/8/2016 |
| 25 | Interior | A3I6F7 | 0.23 | 9/8/2016 |
| 25 | Interior | A3I6F8 | 0.23 | 9/8/2016 |
| 25 | Interior | A3I6F9 | 0.21 | 9/8/2016 |
| 25 | Interior | A3I6G0 | 0.22 | 9/8/2016 |
| 25 | Interior | A3I6G7 | 0.23 | 9/8/2016 |
| 25 | Interior | A3I6G8 | 0.23 | 9/8/2016 |
| 25 | Interior | A3I6G9 | 0.23 | 9/8/2016 |
| 25 | Interior | A3I7G1 | 0.04 | 9/8/2016 |
| 25 | Interior | A3J5D0 | 0.12 | 9/13/2016 |
| 25 | Interior | A3J5D9 | 0.12 | 9/13/2016 |
| 25 | Interior | A3J5E0 | 0.23 | 9/13/2016 |
| 25 | Interior | A3J5E9 | 0.23 | 9/13/2016 |
| 25 | Interior | A3J5F0 | 0.23 | 9/13/2016 |
| 25 | Interior | A3J5F9 | 0.23 | 9/13/2016 |
| 25 | Interior | A3J5G0 | 0.23 | 9/13/2016 |
| 25 | Interior | A3J5G9 | 0.23 | 9/13/2016 |
| 25 | Interior | A3J5H0 | 0.23 | 9/13/2016 |
| 25 | Interior | A3J5H9 | 0.23 | 9/13/2016 |
| 25 | Interior | A3J5I0 | 0.23 | 9/13/2016 |
| 25 | Interior | A3J5I9 | 0.23 | 9/13/2016 |
| 25 | Interior | A3J5J0 | 0.23 | 9/13/2016 |
| 25 | Interior | A3J5J9 | 0.23 | 9/13/2016 |
| 25 | Interior | B3A5A9 | 0.20 | 9/13/2016 |
| 25 | Interior | A3J5C7 | 0.00 | 9/20/2016 |
| 25 | Interior | A3J5C8 | 0.00 | 9/20/2016 |
| 25 | Interior | A3J5D7 | 0.06 | 9/20/2016 |
| 25 | Interior | A3J5D8 | 0.21 | 9/20/2016 |
| 25 | Interior | A3J5E7 | 0.12 | 9/20/2016 |
| 25 | Interior | A3J5E8 | 0.23 | 9/20/2016 |
| 25 | Interior | A3J5F7 | 0.19 | 9/20/2016 |

| Unit ID | Grid Type | Grid ID | Acreage | Date QA Completed |
|---------|-----------|---------|---------|-------------------|
| 25 | Interior | A3J5F8 | 0.23 | 9/20/2016 |
| 25 | Interior | A3J5G6 | 0.03 | 9/20/2016 |
| 25 | Interior | A3J5G7 | 0.23 | 9/20/2016 |
| 25 | Interior | A3J5G8 | 0.23 | 9/20/2016 |
| 25 | Interior | A3J5H6 | 0.10 | 9/20/2016 |
| 25 | Interior | A3J5H7 | 0.23 | 9/20/2016 |
| 25 | Interior | A3J5H8 | 0.23 | 9/20/2016 |
| 25 | Interior | A3J5I6 | 0.04 | 9/20/2016 |
| 25 | Interior | A3J5I7 | 0.20 | 9/20/2016 |
| 25 | Interior | A3J5I8 | 0.23 | 9/20/2016 |
| 25 | Interior | A3J5J7 | 0.02 | 9/20/2016 |
| 25 | Interior | A3J5J8 | 0.18 | 9/20/2016 |
| 25 | Interior | B3A5A8 | 0.02 | 9/20/2016 |
| 25 | Interior | A3J6D0 | 0.23 | 9/22/2016 |
| 25 | Interior | A3J6D9 | 0.23 | 9/22/2016 |
| 25 | Interior | A3J6E0 | 0.23 | 9/22/2016 |
| 25 | Interior | A3J6E9 | 0.23 | 9/22/2016 |
| 25 | Interior | A3J6F0 | 0.21 | 9/22/2016 |
| 25 | Interior | A3J6G0 | 0.18 | 9/22/2016 |
| 25 | Interior | A3J6G9 | 0.23 | 9/22/2016 |
| 25 | Interior | A3J6H0 | 0.19 | 9/22/2016 |
| 25 | Interior | A3J6I0 | 0.22 | 9/22/2016 |
| 25 | Interior | A3J6J0 | 0.23 | 9/22/2016 |
| 25 | Interior | A3J6J9 | 0.23 | 9/22/2016 |
| 25 | Interior | A3J7D1 | 0.22 | 9/22/2016 |
| 25 | Interior | A3J7D2 | 0.00 | 9/22/2016 |
| 25 | Interior | A3J7E1 | 0.10 | 9/22/2016 |
| 25 | Interior | A3J7F1 | 0.00 | 9/22/2016 |
| 25 | Interior | A3J7I1 | 0.01 | 9/22/2016 |
| 25 | Interior | A3J7J1 | 0.07 | 9/22/2016 |
| 25 | Interior | B3A6J1 | 0.05 | 10/24/2016 |
| 25 | Interior | B3A6J2 | 0.23 | 10/24/2016 |
| 25 | Interior | B3A6J3 | 0.23 | 10/24/2016 |
| 25 | Interior | B3A6J4 | 0.23 | 10/24/2016 |
| 25 | Interior | B3A6J5 | 0.23 | 10/24/2016 |
| 25 | Interior | B3A6J6 | 0.22 | 10/24/2016 |
| 25 | Interior | B3A6J7 | 0.01 | 10/24/2016 |
| 25 | Interior | B3B5B0 | 0.01 | 10/24/2016 |
| 25 | Interior | B3B5C0 | 0.11 | 10/24/2016 |
| 25 | Interior | B3B5D0 | 0.22 | 10/24/2016 |
| 25 | Interior | B3B5D9 | 0.02 | 10/24/2016 |
| 25 | Interior | B3B5E0 | 0.23 | 10/24/2016 |
| 25 | Interior | B3B5E9 | 0.07 | 10/24/2016 |
| 25 | Interior | B3B5F0 | 0.23 | 10/24/2016 |
| 25 | Interior | B3B5F9 | 0.07 | 10/24/2016 |
| 25 | Interior | B3B5I0 | 0.23 | 10/24/2016 |

| Unit ID | Grid Type | Grid ID | Acreage | Date QA Completed |
|---------|-----------|---------|---------|-------------------|
| 25 | Interior | B3B5I9 | 0.13 | 10/24/2016 |
| 25 | Interior | B3B5J0 | 0.23 | 10/24/2016 |
| 25 | Interior | B3B5J9 | 0.15 | 10/24/2016 |
| 25 | Interior | B3B6A1 | 0.11 | 10/24/2016 |
| 25 | Interior | B3B6A2 | 0.23 | 10/24/2016 |
| 25 | Interior | B3B6A3 | 0.23 | 10/24/2016 |
| 25 | Interior | B3B6A4 | 0.23 | 10/24/2016 |
| 25 | Interior | B3B6A5 | 0.23 | 10/24/2016 |
| 25 | Interior | B3B6A6 | 0.14 | 10/24/2016 |
| 25 | Interior | B3B6B1 | 0.20 | 10/24/2016 |
| 25 | Interior | B3B6B2 | 0.23 | 10/24/2016 |
| 25 | Interior | B3B6B3 | 0.23 | 10/24/2016 |
| 25 | Interior | B3B6B4 | 0.23 | 10/24/2016 |
| 25 | Interior | B3B6B5 | 0.23 | 10/24/2016 |
| 25 | Interior | B3B6B6 | 0.04 | 10/24/2016 |
| 25 | Interior | B3B6C1 | 0.23 | 10/24/2016 |
| 25 | Interior | B3B6C2 | 0.23 | 10/24/2016 |
| 25 | Interior | B3B6C3 | 0.23 | 10/24/2016 |
| 25 | Interior | B3B6C4 | 0.23 | 10/24/2016 |
| 25 | Interior | B3B6C5 | 0.14 | 10/24/2016 |
| 25 | Interior | B3B6D1 | 0.23 | 10/24/2016 |
| 25 | Interior | B3B6D2 | 0.23 | 10/24/2016 |
| 25 | Interior | B3B6D3 | 0.23 | 10/24/2016 |
| 25 | Interior | B3B6D4 | 0.19 | 10/24/2016 |
| 25 | Interior | B3B6D5 | 0.01 | 10/24/2016 |
| 25 | Interior | B3B6E1 | 0.23 | 10/24/2016 |
| 25 | Interior | B3B6E2 | 0.23 | 10/24/2016 |
| 25 | Interior | B3B6E3 | 0.23 | 10/24/2016 |
| 25 | Interior | B3B6E4 | 0.03 | 10/24/2016 |
| 25 | Interior | B3B6F1 | 0.23 | 10/24/2016 |
| 25 | Interior | B3B6F2 | 0.23 | 10/24/2016 |
| 25 | Interior | B3B6F3 | 0.18 | 10/24/2016 |
| 25 | Interior | B3B6I1 | 0.23 | 10/24/2016 |
| 25 | Interior | B3B6I2 | 0.07 | 10/24/2016 |
| 25 | Interior | B3B6J1 | 0.16 | 10/24/2016 |
| 25 | Interior | B3B6J2 | 0.00 | 10/24/2016 |
| 25 | Interior | B3C5A0 | 0.16 | 10/24/2016 |
| 25 | Interior | B3C5A9 | 0.16 | 10/24/2016 |
| 25 | Interior | B3C5B0 | 0.01 | 10/24/2016 |
| 25 | Interior | B3C5B9 | 0.06 | 10/24/2016 |
| 25 | Interior | B3C6A1 | 0.01 | 10/24/2016 |
| 25 | Interior | A3I6H2 | 0.10 | 10/25/2016 |
| 25 | Interior | A3I6H3 | 0.23 | 10/25/2016 |
| 25 | Interior | A3I6H4 | 0.23 | 10/25/2016 |
| 25 | Interior | A3I6H5 | 0.23 | 10/25/2016 |
| 25 | Interior | A3I6H6 | 0.23 | 10/25/2016 |

| Unit ID | Grid Type | Grid ID | Acreage | Date QA Completed |
|---------|-----------|---------|---------|-------------------|
| 25 | Interior | A3I6I2 | 0.14 | 10/25/2016 |
| 25 | Interior | A3I6I3 | 0.23 | 10/25/2016 |
| 25 | Interior | A3I6I4 | 0.23 | 10/25/2016 |
| 25 | Interior | A3I6I5 | 0.23 | 10/25/2016 |
| 25 | Interior | A3I6I6 | 0.23 | 10/25/2016 |
| 25 | Interior | A3I6J2 | 0.19 | 10/25/2016 |
| 25 | Interior | A3I6J3 | 0.23 | 10/25/2016 |
| 25 | Interior | A3I6J4 | 0.23 | 10/25/2016 |
| 25 | Interior | A3I6J5 | 0.23 | 10/25/2016 |
| 25 | Interior | A3I6J6 | 0.23 | 10/25/2016 |
| 25 | Interior | A3J6A0 | 0.23 | 10/25/2016 |
| 25 | Interior | A3J6A1 | 0.01 | 10/25/2016 |
| 25 | Interior | A3J6A2 | 0.23 | 10/25/2016 |
| 25 | Interior | A3J6A3 | 0.23 | 10/25/2016 |
| 25 | Interior | A3J6A8 | 0.23 | 10/25/2016 |
| 25 | Interior | A3J6A9 | 0.23 | 10/25/2016 |
| 25 | Interior | A3J6B0 | 0.23 | 10/25/2016 |
| 25 | Interior | A3J6B1 | 0.07 | 10/25/2016 |
| 25 | Interior | A3J6B2 | 0.23 | 10/25/2016 |
| 25 | Interior | A3J6B3 | 0.23 | 10/25/2016 |
| 25 | Interior | A3J6B8 | 0.23 | 10/25/2016 |
| 25 | Interior | A3J6B9 | 0.23 | 10/25/2016 |
| 25 | Interior | A3J6C0 | 0.23 | 10/25/2016 |
| 25 | Interior | A3J6C1 | 0.13 | 10/25/2016 |
| 25 | Interior | A3J6C2 | 0.23 | 10/25/2016 |
| 25 | Interior | A3J6C3 | 0.23 | 10/25/2016 |
| 25 | Interior | A3J6C8 | 0.23 | 10/25/2016 |
| 25 | Interior | A3J6C9 | 0.23 | 10/25/2016 |
| 25 | Interior | A3J6D1 | 0.22 | 10/25/2016 |
| 25 | Interior | A3J6D2 | 0.23 | 10/25/2016 |
| 25 | Interior | A3J6D3 | 0.23 | 10/25/2016 |
| 25 | Interior | A3J6D8 | 0.23 | 10/25/2016 |
| 25 | Interior | A3J6E1 | 0.23 | 10/25/2016 |
| 25 | Interior | A3J6E2 | 0.23 | 10/25/2016 |
| 25 | Interior | A3J6E3 | 0.23 | 10/25/2016 |
| 25 | Interior | A3J6F1 | 0.23 | 10/25/2016 |
| 25 | Interior | A3J6F2 | 0.23 | 10/25/2016 |
| 25 | Interior | A3J6F3 | 0.23 | 10/25/2016 |
| 25 | Interior | A3J6G1 | 0.23 | 10/25/2016 |
| 25 | Interior | A3J6G2 | 0.23 | 10/25/2016 |
| 25 | Interior | A3J6H1 | 0.23 | 10/25/2016 |
| 25 | Interior | A3J7A1 | 0.20 | 10/25/2016 |
| 25 | Interior | A3J7B1 | 0.23 | 10/25/2016 |
| 25 | Interior | A3J7B2 | 0.01 | 10/25/2016 |
| 25 | Interior | A3J7C1 | 0.23 | 10/25/2016 |
| 25 | Interior | A3J7C2 | 0.02 | 10/25/2016 |

| Unit ID | Grid Type | Grid ID | Acreage | Date QA Completed |
|---------|-----------|---------|---------|-------------------|
| 25 | Interior | B3A6A0 | 0.23 | 10/25/2016 |
| 25 | Interior | B3A6A9 | 0.23 | 10/25/2016 |
| 25 | Interior | B3A6B0 | 0.23 | 10/25/2016 |
| 25 | Interior | B3A6B9 | 0.23 | 10/25/2016 |
| 25 | Interior | B3A6C0 | 0.21 | 10/25/2016 |
| 25 | Interior | B3A6C9 | 0.23 | 10/25/2016 |
| 25 | Interior | B3A6D0 | 0.03 | 10/25/2016 |
| 25 | Interior | B3A6D8 | 0.23 | 10/25/2016 |
| 25 | Interior | B3A6D9 | 0.19 | 10/25/2016 |
| 25 | Interior | B3A6E7 | 0.23 | 10/25/2016 |
| 25 | Interior | B3A6E8 | 0.21 | 10/25/2016 |
| 25 | Interior | B3A6E9 | 0.02 | 10/25/2016 |
| 25 | Interior | B3A6F6 | 0.23 | 10/25/2016 |
| 25 | Interior | B3A6F7 | 0.23 | 10/25/2016 |
| 25 | Interior | B3A6F8 | 0.07 | 10/25/2016 |
| 25 | Interior | B3A6G6 | 0.23 | 10/25/2016 |
| 25 | Interior | B3A6G7 | 0.15 | 10/25/2016 |
| 25 | Interior | B3A6H6 | 0.23 | 10/25/2016 |
| 25 | Interior | B3A6H7 | 0.09 | 10/25/2016 |
| 25 | Interior | B3A7A1 | 0.13 | 10/25/2016 |
| 25 | Interior | B3A7B1 | 0.15 | 10/25/2016 |
| 25 | Interior | B3A7C1 | 0.04 | 10/25/2016 |
| 25 | Interior | A3J6A4 | 0.23 | 10/26/2016 |
| 25 | Interior | A3J6A5 | 0.23 | 10/26/2016 |
| 25 | Interior | A3J6B4 | 0.23 | 10/26/2016 |
| 25 | Interior | A3J6B5 | 0.23 | 10/26/2016 |
| 25 | Interior | A3J6C4 | 0.23 | 10/26/2016 |
| 25 | Interior | A3J6C5 | 0.23 | 10/26/2016 |
| 25 | Interior | A3J6D4 | 0.23 | 10/26/2016 |
| 25 | Interior | A3J6D5 | 0.23 | 10/26/2016 |
| 25 | Interior | A3J6E4 | 0.23 | 10/26/2016 |
| 25 | Interior | B3B5G0 | 0.23 | 11/2/2016 |
| 25 | Interior | B3B5G9 | 0.08 | 11/2/2016 |
| 25 | Interior | B3B5H0 | 0.23 | 11/2/2016 |
| 25 | Interior | B3B5H9 | 0.10 | 11/2/2016 |
| 25 | Interior | B3B6G1 | 0.23 | 11/2/2016 |
| 25 | Interior | B3B6G2 | 0.23 | 11/2/2016 |
| 25 | Interior | B3B6G3 | 0.07 | 11/2/2016 |
| 25 | Interior | B3B6H1 | 0.23 | 11/2/2016 |
| 25 | Interior | B3B6H2 | 0.18 | 11/2/2016 |
| 25 | Interior | B3B6H3 | 0.00 | 11/2/2016 |
| 25 | Interior | B3A6F1 | 0.11 | 12/14/2016 |
| 25 | Interior | B3A6F2 | 0.23 | 12/14/2016 |
| 25 | Interior | B3A6F3 | 0.23 | 12/14/2016 |
| 25 | Interior | B3A6F4 | 0.23 | 12/14/2016 |
| 25 | Interior | B3A6F5 | 0.23 | 12/14/2016 |

| Unit ID | Grid Type | Grid ID | Acreage | Date QA Completed |
|---------|-----------|---------|---------|-------------------|
| 25 | Interior | B3A6G1 | 0.07 | 12/14/2016 |
| 25 | Interior | B3A6G2 | 0.23 | 12/14/2016 |
| 25 | Interior | B3A6G3 | 0.23 | 12/14/2016 |
| 25 | Interior | B3A6G4 | 0.23 | 12/14/2016 |
| 25 | Interior | B3A6G5 | 0.23 | 12/14/2016 |
| 25 | Interior | B3A6H1 | 0.04 | 12/14/2016 |
| 25 | Interior | B3A6H2 | 0.23 | 12/14/2016 |
| 25 | Interior | B3A6H3 | 0.23 | 12/14/2016 |
| 25 | Interior | B3A6H4 | 0.23 | 12/14/2016 |
| 25 | Interior | B3A6H5 | 0.23 | 12/14/2016 |
| 25 | Interior | B3A6I1 | 0.03 | 12/14/2016 |
| 25 | Interior | B3A6I2 | 0.23 | 12/14/2016 |
| 25 | Interior | B3A6I3 | 0.23 | 12/14/2016 |
| 25 | Interior | B3A6I4 | 0.23 | 12/14/2016 |
| 25 | Interior | B3A6I5 | 0.23 | 12/14/2016 |
| 25 | Interior | B3A6I6 | 0.23 | 12/14/2016 |
| 25 | Interior | B3A6I7 | 0.06 | 12/14/2016 |
| 25 | Interior | A3J6A6 | 0.23 | 12/22/2016 |
| 25 | Interior | A3J6A7 | 0.23 | 12/22/2016 |
| 25 | Interior | A3J6B6 | 0.23 | 12/22/2016 |
| 25 | Interior | A3J6B7 | 0.23 | 12/22/2016 |
| 25 | Interior | A3J6C6 | 0.23 | 12/22/2016 |
| 25 | Interior | A3J6C7 | 0.23 | 12/22/2016 |
| 25 | Interior | A3J6D6 | 0.23 | 12/22/2016 |
| 25 | Interior | A3J6D7 | 0.23 | 12/22/2016 |
| 25 | Interior | A3J6E5 | 0.23 | 12/22/2016 |
| 25 | Interior | A3J6E6 | 0.23 | 12/22/2016 |
| 25 | Interior | A3J6E7 | 0.23 | 12/22/2016 |
| 25 | Interior | A3J6E8 | 0.23 | 12/22/2016 |
| 25 | Interior | A3J6F4 | 0.23 | 12/22/2016 |
| 25 | Interior | A3J6F5 | 0.23 | 12/22/2016 |
| 25 | Interior | A3J6F6 | 0.23 | 12/22/2016 |
| 25 | Interior | A3J6F7 | 0.23 | 12/22/2016 |
| 25 | Interior | A3J6F8 | 0.23 | 12/22/2016 |
| 25 | Interior | A3J6F9 | 0.23 | 12/22/2016 |
| 25 | Interior | B3A5D0 | 0.03 | 3/2/2017 |
| 25 | Interior | B3A6D1 | 0.23 | 3/2/2017 |
| 25 | Interior | B3A6D2 | 0.23 | 3/2/2017 |
| 25 | Interior | B3A6D3 | 0.23 | 3/2/2017 |
| 25 | Interior | B3A6D4 | 0.23 | 3/2/2017 |
| 25 | Interior | B3A6D5 | 0.23 | 3/2/2017 |
| 25 | Interior | B3A6D6 | 0.23 | 3/2/2017 |
| 25 | Interior | B3A6D7 | 0.23 | 3/2/2017 |
| 25 | Interior | B3A6E1 | 0.17 | 3/2/2017 |
| 25 | Interior | B3A6E2 | 0.23 | 3/2/2017 |
| 25 | Interior | B3A6E3 | 0.23 | 3/2/2017 |

| Unit ID | Grid Type | Grid ID | Acreage | Date QA Completed |
|---------|-----------|---------|---------|-------------------|
| 25 | Interior | B3A6E4 | 0.23 | 3/2/2017 |
| 25 | Interior | B3A6E5 | 0.23 | 3/2/2017 |
| 25 | Interior | B3A6E6 | 0.23 | 3/2/2017 |
| 25 | Interior | A3J6G3 | 0.23 | 6/1/2017 |
| 25 | Interior | A3J6G4 | 0.23 | 6/1/2017 |
| 25 | Interior | A3J6G5 | 0.23 | 6/1/2017 |
| 25 | Interior | A3J6H2 | 0.23 | 6/1/2017 |
| 25 | Interior | A3J6H3 | 0.23 | 6/1/2017 |
| 25 | Interior | A3J6H4 | 0.23 | 6/1/2017 |
| 25 | Interior | A3J6H5 | 0.23 | 6/1/2017 |
| 25 | Interior | A3J6I1 | 0.23 | 6/1/2017 |
| 25 | Interior | A3J6I2 | 0.23 | 6/1/2017 |
| 25 | Interior | A3J6I3 | 0.23 | 6/1/2017 |
| 25 | Interior | A3J6I4 | 0.23 | 6/1/2017 |
| 25 | Interior | A3J6I5 | 0.23 | 6/1/2017 |
| 25 | Interior | A3J6J1 | 0.23 | 6/1/2017 |
| 25 | Interior | A3J6J2 | 0.23 | 6/1/2017 |
| 25 | Interior | A3J6J3 | 0.23 | 6/1/2017 |
| 25 | Interior | A3J6J4 | 0.23 | 6/1/2017 |
| 25 | Interior | A3J6J5 | 0.23 | 6/1/2017 |
| 25 | Interior | A3J6G6 | 0.23 | 7/24/2017 |
| 25 | Interior | A3J6G7 | 0.23 | 7/24/2017 |
| 25 | Interior | A3J6G8 | 0.23 | 7/24/2017 |
| 25 | Interior | A3J6H6 | 0.23 | 7/24/2017 |
| 25 | Interior | A3J6H7 | 0.23 | 7/24/2017 |
| 25 | Interior | A3J6H8 | 0.23 | 7/24/2017 |
| 25 | Interior | A3J6H9 | 0.23 | 7/24/2017 |
| 25 | Interior | A3J6I6 | 0.23 | 7/24/2017 |
| 25 | Interior | A3J6I7 | 0.23 | 7/24/2017 |
| 25 | Interior | A3J6I8 | 0.23 | 7/24/2017 |
| 25 | Interior | A3J6I9 | 0.23 | 7/24/2017 |
| 25 | Interior | A3J6J6 | 0.23 | 7/24/2017 |
| 25 | Interior | A3J6J7 | 0.23 | 7/24/2017 |
| 25 | Interior | A3J6J8 | 0.23 | 7/24/2017 |
| 25 | Interior | B3A6A6 | 0.23 | 7/24/2017 |
| 25 | Interior | B3A6A7 | 0.23 | 7/24/2017 |
| 25 | Interior | B3A6A8 | 0.23 | 7/24/2017 |
| 25 | Interior | B3A6B6 | 0.23 | 7/24/2017 |
| 25 | Interior | B3A6B7 | 0.23 | 7/24/2017 |
| 25 | Interior | B3A6B8 | 0.23 | 7/24/2017 |
| 25 | Interior | B3A6C6 | 0.23 | 7/24/2017 |
| 25 | Interior | B3A6C7 | 0.23 | 7/24/2017 |
| 25 | Interior | B3A6C8 | 0.23 | 7/24/2017 |
| 25 | Interior | B3A5A0 | 0.23 | 7/25/2017 |
| 25 | Interior | B3A5B0 | 0.23 | 7/25/2017 |
| 25 | Interior | B3A5B9 | 0.05 | 7/25/2017 |



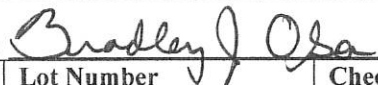
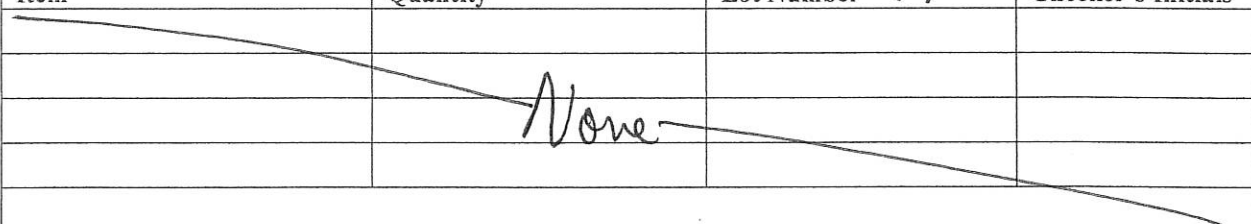
| Unit ID | Grid Type | Grid ID | Acreage | Date QA Completed |
|------------|-----------|---------|--------------|-------------------|
| 25 | Interior | B3A5C0 | 0.13 | 7/25/2017 |
| 25 | Interior | B3A6A1 | 0.23 | 7/25/2017 |
| 25 | Interior | B3A6A2 | 0.23 | 7/25/2017 |
| 25 | Interior | B3A6A3 | 0.23 | 7/25/2017 |
| 25 | Interior | B3A6A4 | 0.23 | 7/25/2017 |
| 25 | Interior | B3A6A5 | 0.23 | 7/25/2017 |
| 25 | Interior | B3A6B1 | 0.23 | 7/25/2017 |
| 25 | Interior | B3A6B2 | 0.23 | 7/25/2017 |
| 25 | Interior | B3A6B3 | 0.23 | 7/25/2017 |
| 25 | Interior | B3A6B4 | 0.23 | 7/25/2017 |
| 25 | Interior | B3A6B5 | 0.23 | 7/25/2017 |
| 25 | Interior | B3A6C1 | 0.23 | 7/25/2017 |
| 25 | Interior | B3A6C2 | 0.23 | 7/25/2017 |
| 25 | Interior | B3A6C3 | 0.23 | 7/25/2017 |
| 25 | Interior | B3A6C4 | 0.23 | 7/25/2017 |
| 25 | Interior | B3A6C5 | 0.23 | 7/25/2017 |
| 521 | | | 95.38 | |

Appendix E
Explosives Accountability

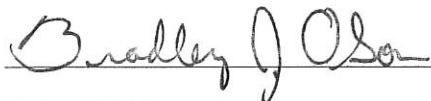
Form M-6

Team Number: UXO-3 Date: September 13, 2017

Team Leader: Sarabia Project: Fort Ord MMRP

| EXPLOSIVES ISSUED | | | |
|--|----------|------------|--|
| | | | Signature of Team Leader:  |
| Item | Quantity | Lot Number | Checker's Initials |
| Caps (Detonators) | 2 ea. | 26SE16X1 | NS |
| Nonel (2,500 ft.) | 2 roll | 07DE16G1 | NS |
| Det Cord – 100gr | 50 ft. | 15MY15B2 | NS |
| Det Cord – 50gr | 70 ft. | 11JY16B1 | NS |
| 19 g Perforators | 40 ea. | 30NOV16C1 | NS |
| EXPLOSIVES EXPENDED | | | |
| | | | Signature of Team Leader:  |
| Item | Quantity | Lot Number | Checker's Initials |
| Caps (Detonators) | 2 ea. | 26SE16X1 | NS |
| Nonel (2,500 ft.) | 2 roll | 07DE16G1 | NS |
| Det Cord – 100gr | 50 ft. | 15MY15B2 | NS |
| Det Cord – 50gr | 70 ft. | 11JY16B1 | NS |
| 19 g Perforators | 40 ea. | 30NOV16C1 | NS |
| EXPLOSIVES RETURNED | | | |
| | | | Signature of SUXOS:  |
| Item | Quantity | Lot Number | Checker's Initials |
|  | | | |
| None | | | |

I certify the explosives listed above were used for their intended purpose.



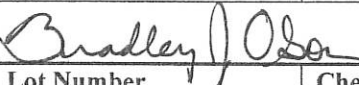

 Senior UXO Supervisor

Date: September 13, 2017

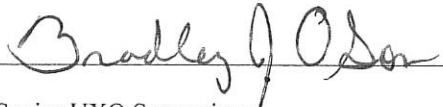
Form M-6

Team Number: UXO-3 Date: May 17, 2017

Team Leader: Sarabia Project: Fort Ord MMRP

| EXPLOSIVES ISSUED | | | |
|---------------------|----------|------------|--|
| | | | Signature of Team Leader:  |
| Item | Quantity | Lot Number | Checker's Initials |
| Caps (Detonators) | 2 ea. | 26SE16X1 | NS |
| Nonel (2,500 ft.) | 2 roll | 07DE16G1 | NS |
| Det Cord – 100gr | 150 ft. | 15MY15B2 | NS |
| Det Cord – 50gr | 120 ft. | 11JY16B1 | NS |
| 19 g Perforators | 66 ea. | 30NOV16C1 | NS |
| EXPLOSIVES EXPENDED | | | |
| | | | Signature of Team Leader:  |
| Item | Quantity | Lot Number | Checker's Initials |
| Caps (Detonators) | 2 ea. | 26SE16X1 | NS |
| Nonel (2,500 ft.) | 2 roll | 07DE16G1 | NS |
| Det Cord – 100gr | 150 ft. | 15MY15B2 | NS |
| Det Cord – 50gr | 120 ft. | 11JY16B1 | NS |
| 19 g Perforators | 66 ea. | 30NOV16C1 | NS |
| EXPLOSIVES RETURNED | | | |
| | | | Signature of SUXOS:  |
| Item | Quantity | Lot Number | Checker's Initials |
| <i>None</i> | | | |

I certify the explosives listed above were used for their intended purpose.



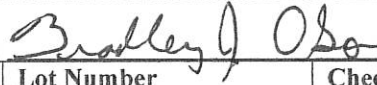

 Senior UXO Supervisor

Date: May 17, 2017

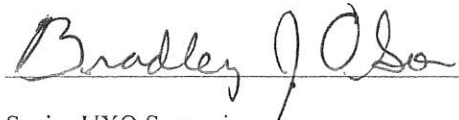
Form M-6

Team Number: UXO-3 Date: February 23, 2017

Team Leader: Sarabia Project: Fort Ord MMRP

| EXPLOSIVES ISSUED | | | |
|---------------------|----------|------------|--|
| | | | Signature of Team Leader:  |
| Item | Quantity | Lot Number | Checker's Initials |
| Caps (Detonators) | 2 ea. | 16MA15X1 | NS |
| Nonel (2,500 ft.) | 2 roll | 07DE16G1 | NS |
| Det Cord – 100gr | 100 ft. | 15MY15B2 | NS |
| Det Cord – 50gr | 180 ft. | 16MY14B1 | NS |
| 19 g Perforators | 115 ea. | 30NOV16C1 | NS |
| EXPLOSIVES EXPENDED | | | |
| | | | Signature of Team Leader:  |
| Item | Quantity | Lot Number | Checker's Initials |
| Caps (Detonators) | 2 ea. | 16MA15X1 | NS |
| Nonel (2,500 ft.) | 2 roll | 07DE16G1 | NS |
| Det Cord – 100gr | 100 ft. | 15MY15B2 | NS |
| Det Cord – 50gr | 180 ft. | 16MY14B1 | NS |
| 19 g Perforators | 115 ea. | 30NOV16C1 | NS |
| EXPLOSIVES RETURNED | | | |
| | | | Signature of SUXOS:  |
| Item | Quantity | Lot Number | Checker's Initials |
| None | | | |



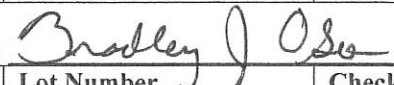
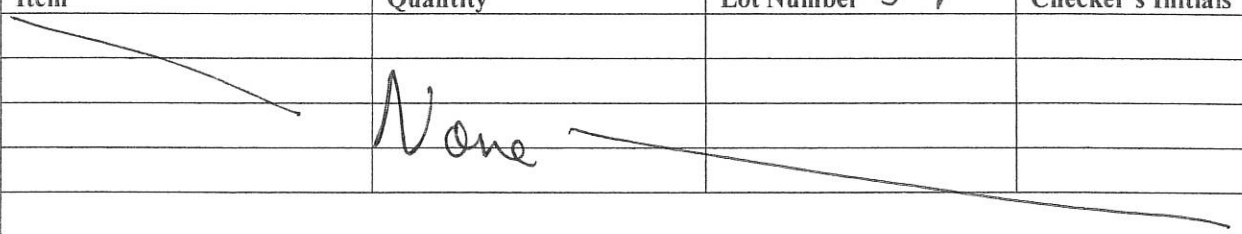
I certify the explosives listed above were used for their intended purpose.


Senior UXO Supervisor

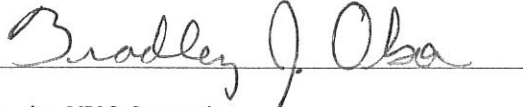
Date: February 23, 2017

Form M-6

Team Number: UXO-3 Date: February 22, 2017Team Leader: Sarabia Project: Fort Ord MMRP

| EXPLOSIVES ISSUED | | | |
|--|----------|------------|---|
| | | | Signature of Team Leader:  |
| Item | Quantity | Lot Number | Checker's Initials |
| Caps (Detonators) | 2 ea. | 16MA15X1 | NS |
| Nonel (2,500 ft.) | 2 roll | 07DE16G1 | NS |
| Det Cord – 100gr | 90 ft. | 15MY15B2 | NS |
| Det Cord – 50gr | 180 ft. | 16MY14B1 | NS |
| 19 g Perforators | 110 ea. | 30NOV16C1 | NS |
| EXPLOSIVES EXPENDED | | | |
| | | | Signature of Team Leader:  |
| Item | Quantity | Lot Number | Checker's Initials |
| Caps (Detonators) | 2 ea. | 16MA15X1 | NS |
| Nonel (2,500 ft.) | 2 roll | 07DE16G1 | NS |
| Det Cord – 100gr | 90 ft. | 15MY15B2 | NS |
| Det Cord – 50gr | 180 ft. | 16MY14B1 | NS |
| 19 g Perforators | 110 ea. | 30NOV16C1 | NS |
| EXPLOSIVES RETURNED | | | |
| | | | Signature of SUXOS:  |
| Item | Quantity | Lot Number | Checker's Initials |
|  | None | | |
| | | | |
| | | | |
| | | | |

I certify the explosives listed above were used for their intended purpose.



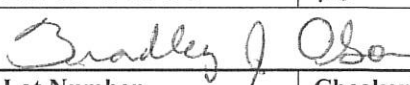
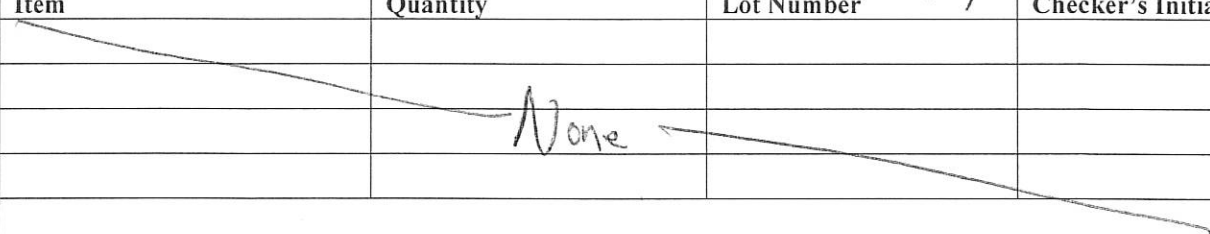

 Senior UXO Supervisor

Date: February 22, 2017

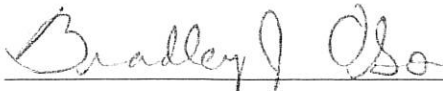
Form M-6

Team Number: UXO-3 Date: December 13, 2016

Team Leader: Sarabia Project: Fort Ord MMRP

| EXPLOSIVES ISSUED | | | |
|--|----------|------------|--|
| | | | Signature of Team Leader:  |
| Item | Quantity | Lot Number | Checker's Initials |
| Caps (Detonators) | 2 ea. | 16MA15X1 | NS |
| Nonel (2,500 ft.) | 2 roll | 07DE16G1 | NS |
| Det Cord – 100gr | 100 ft. | 15MY15B2 | NS |
| Det Cord – 50gr | 150 ft. | 16MY14B1 | NS |
| 19 g Perforators | 174 ea. | 24AUG16C1 | NS |
| EXPLOSIVES EXPENDED | | | |
| | | | Signature of Team Leader:  |
| Item | Quantity | Lot Number | Checker's Initials |
| Caps (Detonators) | 2 ea. | 16MA15X1 | NS |
| Nonel (2,500 ft.) | 2 roll | 07DE16G1 | NS |
| Det Cord – 100gr | 100 ft. | 15MY15B2 | NS |
| Det Cord – 50gr | 150 ft. | 16MY14B1 | NS |
| 19 g Perforators | 174 ea. | 24AUG16C1 | NS |
| EXPLOSIVES RETURNED | | | |
| | | | Signature of SUXOS:  |
| Item | Quantity | Lot Number | Checker's Initials |
|  None | | | |

I certify the explosives listed above were used for their intended purpose.



Date: December 13, 2016

Senior UXO Supervisor

Form M-6

Team Number: UXO-3 Date: November 30, 2016

Team Leader: Sarabia Project: Fort Ord MMRP

| EXPLOSIVES ISSUED | | | |
|---------------------|----------|------------|--|
| | | | Signature of Team Leader: <i>[Signature]</i> |
| Item | Quantity | Lot Number | Checker's Initials |
| Caps (Detonators) | 2 ea. | 16MA15X1 | NS |
| Nonel (2,500 ft.) | 2 roll | 07DE16G1 | NS |
| Det Cord – 100gr | 120 ft. | 15MY15B2 | NS |
| Det Cord – 50gr | 380 ft. | 16MY14B1 | NS |
| 19 g Perforators | 136 ea. | 24AUG16C1 | NS |
| EXPLOSIVES EXPENDED | | | |
| | | | Signature of Team Leader: <i>[Signature]</i> |
| Item | Quantity | Lot Number | Checker's Initials |
| Caps (Detonators) | 2 ea. | 16MA15X1 | NS |
| Nonel (2,500 ft.) | 2 roll | 07DE16G1 | NS |
| Det Cord – 100gr | 120 ft. | 15MY15B2 | NS |
| Det Cord – 50gr | 380 ft. | 16MY14B1 | NS |
| 19 g Perforators | 136 ea. | 24AUG16C1 | NS |
| EXPLOSIVES RETURNED | | | |
| | | | Signature of SUXOS: <i>Bradley J Olson</i> |
| Item | Quantity | Lot Number | Checker's Initials |
| <i>None</i> | | | |

I certify the explosives listed above were used for their intended purpose.

Bradley J Olson



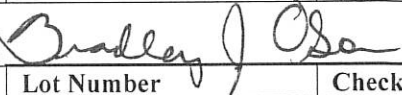
 Senior UXO Supervisor

Date: November 30, 2016


Form M-6

Team Number: UXO-3 Date: November 17, 2016

Team Leader: Sarabia Project: Fort Ord MMRP

| EXPLOSIVES ISSUED | | | |
|---------------------|----------|------------|--|
| | | | Signature of Team Leader:  |
| Item | Quantity | Lot Number | Checker's Initials |
| Caps (Detonators) | 2 ea. | 16MA15X1 | NS |
| Nonel (2,500 ft.) | 2 roll | 07DE16G1 | NS |
| Det Cord – 100gr | 100 ft. | 15MY15B2 | NS |
| Det Cord – 50gr | 200 ft. | 16MY14B1 | NS |
| 19 g Perforators | 113 ea. | 24AUG16C1 | NS |
| EXPLOSIVES EXPENDED | | | |
| | | | Signature of Team Leader:  |
| Item | Quantity | Lot Number | Checker's Initials |
| Caps (Detonators) | 2 ea. | 16MA15X1 | NS |
| Nonel (2,500 ft.) | 2 roll | 07DE16G1 | NS |
| Det Cord – 100gr | 100 ft. | 15MY15B2 | NS |
| Det Cord – 50gr | 200 ft. | 16MY14B1 | NS |
| 19 g Perforators | 113 ea. | 24AUG16C1 | NS |
| EXPLOSIVES RETURNED | | | |
| | | | Signature of SUXOS:  |
| Item | Quantity | Lot Number | Checker's Initials |
| None | | | |

I certify the explosives listed above were used for their intended purpose.



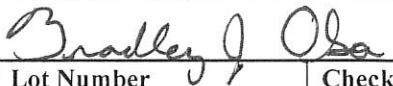

 Senior UXO Supervisor

Date: November 17, 2016

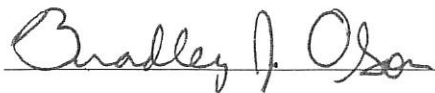
Form M-6

Team Number: UXO-3 Date: November 16, 2016

Team Leader: Sarabia Project: Fort Ord MMRP

| EXPLOSIVES ISSUED | | | |
|---------------------|----------|------------|--|
| | | | Signature of Team Leader:  |
| Item | Quantity | Lot Number | Checker's Initials |
| Caps (Detonators) | 2 ea. | 16MA15X1 | NS |
| Nonel (2,500 ft.) | 2 roll | 07DE16G1 | NS |
| Det Cord – 100gr | 85 ft. | 15MY15B2 | NS |
| Det Cord – 50gr | 190 ft. | 16MY14B1 | NS |
| 19 g Perforators | 26 ea. | 24AUG16C1 | NS |
| 19 g Perforators | 77 ea. | 31AUG15C1 | NS |
| EXPLOSIVES EXPENDED | | | |
| | | | Signature of Team Leader:  |
| Item | Quantity | Lot Number | Checker's Initials |
| Caps (Detonators) | 2 ea. | 16MA15X1 | NS |
| Nonel (2,500 ft.) | 2 roll | 07DE16G1 | NS |
| Det Cord – 100gr | 85 ft. | 15MY15B2 | NS |
| Det Cord – 50gr | 190 ft. | 16MY14B1 | NS |
| 19 g Perforators | 26 ea. | 24AUG16C1 | NS |
| 19 g Perforators | 77 ea. | 31AUG15C1 | NS |
| EXPLOSIVES RETURNED | | | |
| | | | Signature of SUXOS:  |
| Item | Quantity | Lot Number | Checker's Initials |
| <i>None</i> | | | |

I certify the explosives listed above were used for their intended purpose.





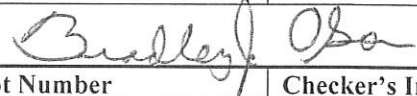
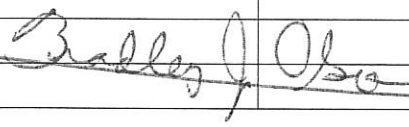
Date: November 16, 2016

Senior UXO Supervisor

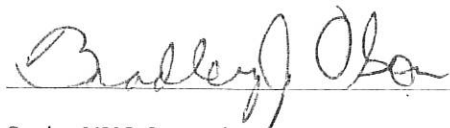
Form M-6

Team Number: UXO-3 Date: November 08, 2016

Team Leader: Sarabia Project: Fort Ord MMRP

| EXPLOSIVES ISSUED | | | |
|--|------------|------------|--------------------|
| Signature of Team Leader:  | | | |
| Item | Quantity | Lot Number | Checker's Initials |
| Caps (Detonators) | 2 each | 16MA15X1 | 3B |
| Nonel (2,500 ft.) | 2 roll | 27JY15W1 | 3B |
| Det Cord – 100gr | 60 feet | 15MY15B2 | 3B |
| Det Cord – 50gr | 150 feet | 16MY14B1 | 3B |
| 19 g Perforators | 80 each | 26AUG15C1 | 3B |
| EXPLOSIVES EXPENDED | | | |
| Signature of Team Leader:  | | | |
| Item | Quantity | Lot Number | Checker's Initials |
| Caps (Detonators) | 2 each | 16MA15X1 | 3B |
| Nonel (2,500 ft.) | 2 roll | 27JY15W1 | 3B |
| Det Cord – 100gr | 60 feet | 15MY15B2 | 3B |
| Det Cord – 50gr | 150 feet | 16MY14B1 | 3B |
| 19 g Perforators | 80 each | 26AUG15C1 | 3B |
| EXPLOSIVES RETURNED | | | |
| Signature of SUXOS:  | | | |
| Item | Quantity | Lot Number | Checker's Initials |
| Nonel | 1,200 feet | 27JY15W1 | 3B |
|  | | | |

I certify the explosives listed above were used for their intended purpose.





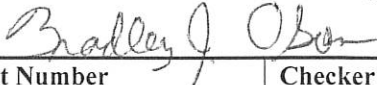
Date: November 08, 2016

Senior UXO Supervisor

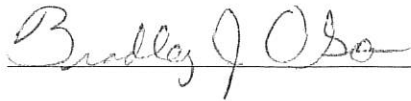
Form M-6

Team Number: UXO-3 Date: November 03, 2016

Team Leader: Sarabia Project: Fort Ord MMRP

| EXPLOSIVES ISSUED | | | |
|---------------------|----------|------------|--|
| | | | Signature of Team Leader:  |
| Item | Quantity | Lot Number | Checker's Initials |
| Caps (Detonators) | 2 each | 16MA15X1 | 301 |
| Nonel (2,500 ft.) | 2 roll | 27JY15W1 | 310 |
| Det Cord – 100gr | 60 feet | 15MY15B2 | 305 |
| Det Cord – 50gr | 150 feet | 16MY14B1 | 305 |
| 19 g Perforators | 80 each | 26AUG15C1 | 310 |
| EXPLOSIVES EXPENDED | | | |
| | | | Signature of Team Leader:  |
| Item | Quantity | Lot Number | Checker's Initials |
| Caps (Detonators) | 2 each | 16MA15X1 | 305 |
| Nonel (2,500 ft.) | 2 roll | 27JY15W1 | 310 |
| Det Cord – 100gr | 60 feet | 15MY15B2 | 305 |
| Det Cord – 50gr | 150 feet | 16MY14B1 | 310 |
| 19 g Perforators | 80 each | 26AUG15C1 | 310 |
| EXPLOSIVES RETURNED | | | |
| | | | Signature of SUXOS:  |
| Item | Quantity | Lot Number | Checker's Initials |
| <i>None</i> | | | |
| | | | |
| | | | |
| | | | |

I certify the explosives listed above were used for their intended purpose.



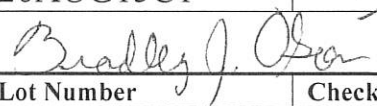


Date: November 03, 2016

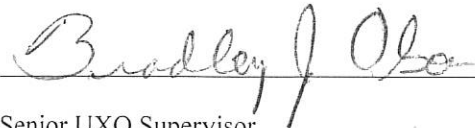
Senior UXO Supervisor

Form M-6

Team Number: UXO-3 Date: November 02, 2016Team Leader: Sarabia Project: Fort Ord MMRP

| EXPLOSIVES ISSUED | | | |
|---------------------|----------|------------|--|
| | | | Signature of Team Leader:  |
| Item | Quantity | Lot Number | Checker's Initials |
| Caps (Detonators) | 2 each | 16MA15X1 | B/O |
| Nonel (2,500 ft.) | 2 roll | 27JY15W1 | B/O |
| Det Cord – 100gr | 60 feet | 15MY15B2 | B/O |
| Det Cord – 50gr | 150 feet | 16MY14B1 | B/O |
| 19 g Perforators | 80 each | 26AUG15C1 | B/O |
| EXPLOSIVES EXPENDED | | | |
| | | | Signature of Team Leader:  |
| Item | Quantity | Lot Number | Checker's Initials |
| Caps (Detonators) | 2 each | 16MA15X1 | B/O |
| Nonel (2,500 ft.) | 2 roll | 27JY15W1 | B/O |
| Det Cord – 100gr | 60 feet | 15MY15B2 | B/O |
| Det Cord – 50gr | 150 feet | 16MY14B1 | B/O |
| 19 g Perforators | 80 each | 26AUG15C1 | B/O |
| EXPLOSIVES RETURNED | | | |
| | | | Signature of SUXOS:  |
| Item | Quantity | Lot Number | Checker's Initials |
| NONE | | | |
| | | | |
| | | | |
| | | | |

I certify the explosives listed above were used for their intended purpose.






Senior UXO Supervisor

Date: November 02, 2016

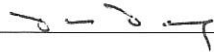
Form M-6

Team Number: UXO-3 Date: October 20, 2016

Team Leader: Sarabia Project: Fort Ord MMRP

| EXPLOSIVES ISSUED | | | |
|---------------------|----------|------------|--|
| | | | Signature of Team Leader:  |
| Item | Quantity | Lot Number | Checker's Initials |
| Caps (Detonators) | 2 ea. | 16MA15X1 | VB |
| Nonel (2,500 ft.) | 2 roll | 27JY15W1 | VB |
| Det Cord – 100gr | 80 feet | 15MY15B2 | VB |
| Det Cord – 50gr | 170 ft. | 16MY14B1 | VB |
| 19 g Perforators | 22 ea. | 26AUG15C1 | VB |
| 19 g Perforators | 61 ea | 31AUG15C1 | VB |
| EXPLOSIVES EXPENDED | | | |
| | | | Signature of Team Leader:  |
| Item | Quantity | Lot Number | Checker's Initials |
| Caps (Detonators) | 2 ea. | 16MA15X1 | VB |
| Nonel (2,500 ft.) | 2 roll | 27JY15W1 | VB |
| Det Cord – 100gr | 80 feet | 15MY15B2 | VB |
| Det Cord – 50gr | 170 ft. | 16MY14B1 | VB |
| 19 g Perforators | 22 ea. | 26AUG15C1 | VB |
| 19 g Perforators | 61 ea | 31AUG15C1 | VB |
| EXPLOSIVES RETURNED | | | |
| | | | Signature of SUXOS:  |
| Item | Quantity | Lot Number | Checker's Initials |
| <i>None</i> | | | |
| | | | |
| | | | |
| | | | |

I certify the explosives listed above were used for their intended purpose.




 Senior UXO Supervisor

Date: October 20, 2016

Form M-6

Team Number: UXO-3 Date: October 12, 2016

Team Leader: Sarabia Project: Fort Ord MMRP

| EXPLOSIVES ISSUED | | | |
|---------------------|----------|------------|--|
| | | | Signature of Team Leader:  |
| Item | Quantity | Lot Number | Checker's Initials |
| Caps (Detonators) | 4 ea. | 16MA15X1 | 30 |
| Nonel (2,500 ft.) | 2 roll | 27JY15W1 | 30 |
| Det Cord – 100gr | 300 feet | 15MY15B2 | 30 |
| Det Cord – 50gr | 440 ft. | 16MY14B1 | 30 |
| 19 g Perforators | 179 ea. | 26AUG15C1 | 30 |
| EXPLOSIVES EXPENDED | | | |
| | | | Signature of Team Leader:  |
| Item | Quantity | Lot Number | Checker's Initials |
| Caps (Detonators) | 4 ea. | 16MA15X1 | 30 |
| Nonel (2,500 ft.) | 2 roll | 27JY15W1 | 30 |
| Det Cord – 100gr | 300 feet | 15MY15B2 | 30 |
| Det Cord – 50gr | 440 ft. | 16MY14B1 | 30 |
| 19 g Perforators | 179 ea. | 26AUG15C1 | 30 |
| EXPLOSIVES RETURNED | | | |
| | | | Signature of SUXOS: <u>Bradley J. Obo</u> |
| Item | Quantity | Lot Number | Checker's Initials |
| <u>None</u> | | | |
| | | | |
| | | | |
| | | | |
| | | | |

I certify the explosives listed above were used for their intended purpose.

Bradley J. Obo
Senior UXO Supervisor

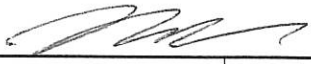
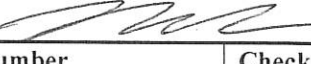
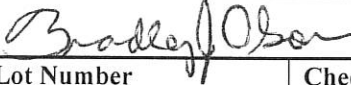
Date: October 12, 2016

101415-0001

Form M-6

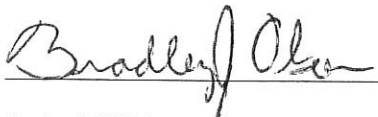
Team Number: UXO-3 Date: October 14, 2015

Team Leader: Sarabia Project: Fort Ord MMRP

| EXPLOSIVES ISSUED | | | |
|---------------------|----------|------------|--|
| | | | Signature of Team Leader:  |
| Item | Quantity | Lot Number | Checker's Initials |
| Caps (Detonators) | 2 Each | 12MA12X1 | 325 |
| Nonel (2,500 ft.) | 2 Roll | 27JY15W1 | 325 |
| Det Cord - 100gr | 60 Feet | 07MY14B1 | 325 |
| Det Cord - 50gr | 140 Feet | 16MY14B1 | 325 |
| 19 g Perforators | 88 Each | 17AUG15C1 | 325 |
| 19 g Perforators | 15 Each | 26AUG15C1 | 325 |
| EXPLOSIVES EXPENDED | | | |
| | | | Signature of Team Leader:  |
| Item | Quantity | Lot Number | Checker's Initials |
| Caps (Detonators) | 2 Each | 12MA12X1 | 325 |
| Nonel (2,500 ft.) | 2 Roll | 27JY15W1 | 325 |
| Det Cord - 100gr | 60 Feet | 07MY14B1 | 325 |
| Det Cord - 50gr | 140 Feet | 16MY14B1 | 325 |
| 19 g Perforators | 88 Each | 17AUG15C1 | 325 |
| 19 g Perforators | 15 Each | 26AUG15C1 | 325 |
| EXPLOSIVES RETURNED | | | |
| | | | Signature of SUXOS:  |
| Item | Quantity | Lot Number | Checker's Initials |
| <i>None</i> | | | |

n

I certify the explosives listed above were used for their intended purpose.





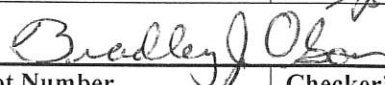
Date: October 14, 2015

Senior UXO Supervisor

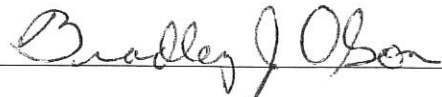
Form M-6

Team Number: UXO-3 Date: October 1, 2015

Team Leader: Sarabia Project: Fort Ord MMRP

| EXPLOSIVES ISSUED | | | |
|--|----------|------------|--------------------|
| Signature of Team Leader:  | | | |
| Item | Quantity | Lot Number | Checker's Initials |
| Caps (Detonators) | 6 Each | 12MA12X1 | 300 |
| Nonel (2,500 ft.) | 4 Roll | 27JY15W1 | 300 |
| Det Cord – 100gr | 110 Feet | 07MY14B1 | 300 |
| Det Cord – 50gr | 650 Feet | 16MY14B1 | 300 |
| 19 g Perforators | 40 Each | #6 | 300 |
| 19 g Perforators | 112 Each | 17AUG15C1 | 300 |
| EXPLOSIVES EXPENDED | | | |
| Signature of Team Leader:  | | | |
| Item | Quantity | Lot Number | Checker's Initials |
| Caps (Detonators) | 6 Each | 12MA12X1 | 300 |
| Nonel (2,500 ft.) | 4 Roll | 27JY15W1 | 300 |
| Det Cord – 100gr | 110 Feet | 07MY14B1 | 300 |
| Det Cord – 50gr | 650 Feet | 16MY14B1 | 300 |
| 19 g Perforators | 40 Each | #6 | 300 |
| 19 g Perforators | 112 Each | 17AUG15C1 | 300 |
| EXPLOSIVES RETURNED | | | |
| Signature of SUXOS:  | | | |
| Item | Quantity | Lot Number | Checker's Initials |
| None | | | |

I certify the explosives listed above were used for their intended purpose.


 Senior UXO Supervisor

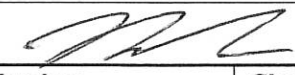

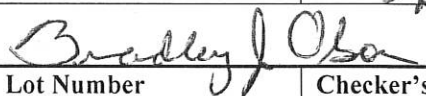
Date: October 1, 2015

Form M-6

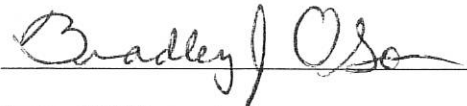
EXPLOSIVES USAGE RECORD

Team Number: UXO-3 Date: September 30, 2015

Team Leader: Sarabia Project: Fort Ord MMRP

| EXPLOSIVES ISSUED | | | |
|---------------------|----------|------------|--|
| | | | Signature of Team Leader:  |
| Item | Quantity | Lot Number | Checker's Initials |
| Caps (Detonators) | 4 Each | 12MA12X1 | 305 |
| Nonel (2,500 ft.) | 3 Roll | 27MY14IS1 | 305 |
| Det Cord – 100gr | 140 Feet | 07MY14B1 | 305 |
| Det Cord – 50gr | 400 Feet | 16MY14B1 | 300 |
| 19 g Perforators | 6 Each | #5 | 300 |
| 19 g Perforators | 210 Each | #6 | 300 |
| EXPLOSIVES EXPENDED | | | |
| | | | Signature of Team Leader:  |
| Item | Quantity | Lot Number | Checker's Initials |
| Caps (Detonators) | 4 Each | 12MA12X1 | 305 |
| Nonel (2,500 ft.) | 3 Roll | 27MY14IS1 | 305 |
| Det Cord – 100gr | 140 Feet | 07MY14B1 | 305 |
| Det Cord – 50gr | 400 Feet | 16MY14B1 | 305 |
| 19 g Perforators | 6 Each | #5 | 300 |
| 19 g Perforators | 210 Each | #6 | 305 |
| EXPLOSIVES RETURNED | | | |
| | | | Signature of SUXOS:  |
| Item | Quantity | Lot Number | Checker's Initials |
| <i>None</i> | | | |

I certify the explosives listed above were used for their intended purpose.


 Senior UXO Supervisor

Date: September 30, 2015

Form M-11

EXPLOSIVES USAGE RECORD

Team Number: UXO-5 Date: August 11, 2015

Team Leader: Light Project: Fort Ord MMRP

| EXPLOSIVES ISSUED | | | |
|---------------------|----------|------------|--|
| | | | Signature of Team Leader: <i>[Signature]</i> |
| Item | Quantity | Lot Number | Checker's Initials |
| Caps (Detonators) | 2 Each | 12MA12X1 | BAM |
| Nonel (2,500 ft.) | 2 Roll | 27MY14IS1 | BAM |
| Det Cord | 300 Feet | 12268424 | BAM |
| 19 g Perforators | 150 Each | #6 | BAM |
| 19 g Perforators | 10 Each | #5 | BAM |
| EXPLOSIVES EXPENDED | | | |
| | | | Signature of Team Leader: <i>[Signature]</i> |
| Item | Quantity | Lot Number | Checker's Initials |
| Caps (Detonators) | 2 Each | 12MA12X1 | BAM |
| Nonel (2,500 ft.) | 2 Roll | 27MY14IS1 | BAM |
| Det Cord | 300 Feet | 12268424 | BAM |
| 19 g Perforators | 150 Each | #6 | BAM |
| 19 g Perforators | 10 Each | #5 | BAM |
| EXPLOSIVES RETURNED | | | |
| | | | Signature of SUXOS: <i>[Signature]</i> |
| Item | Quantity | Lot Number | Checker's Initials |
| <i>None</i> | | | |

I certify the explosives listed above were used for their intended purpose.

Bradley J. Olson

Date: August 11, 2015

Senior UXO Supervisor

Appendix F
MRS-BLM Unit 25 MEC Remedial Action
Technical Memorandum
Former Fort Ord, California

MRS-BLM Unit 25 MEC Remedial Action Technical Memorandum Former Fort Ord, California

Prepared for:



**U.S. Army Corps of Engineers
Sacramento District
1325 J Street
Sacramento, California 95814-2922**

Prepared by:



**KEMRON Environmental Services, Inc.
1359A Ellsworth Industrial Blvd.
Atlanta, GA 30318
404-636-0928**

April 2018

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1.0 Introduction

This Technical Memorandum (TM) describes the munitions and explosives of concern (MEC) remedial action (RA) [surface MEC remediation and DGM survey] that was performed by KEMRON Environmental Services (KEMRON) with Gilbane as a subcontractor within Munitions Response Site (MRS) - Bureau of Land Management (BLM) Unit 25 ([Figure 1](#)). Field work at the site was initiated in June 2015 (vegetation mastication) and was completed in August 2017 (digital geophysical mapping [DGM]). This TM summarizes the work applicable to Unit 25 that was conducted in accordance with the *Final, Site-Specific Work Plan Munitions and Explosives of Concern Remedial Action, MRS-BLM Units 25 and 31, Former Fort Ord, California* (Final Units 25/31 SSWP; KEMRON, 2016a) and Field Work Variances (FWV) 006 and 011, which are described further in [Section 3.0](#).

Unit 25 vegetation clearance was initially intended to be performed by prescribed burning. Following a determination by the Fort Ord Prescribed Burn Team that the unit was unsafe to burn due to terrain concerns, Unit 25 was converted to a vegetation cut unit as detailed in [Appendix A](#). Work completed in the western portion of Unit 25 (26 acres) to support planned prescribed burns in Units 11 and 12 was conducted in accordance with the *Final Site-Specific Work Plan, Munitions and Explosives of Concern Remedial Action, MRS-BLM Unit 23 and in Support of Units 11 and 12 Prescribed Burns (includes portions of Units 5A, 9, 25, 28 and 31, Former Fort Ord, California* (Final Unit 23 SSWP; KEMRON, 2015). In this TM, the permanent fuel breaks surrounding the unit are not included as part of Unit 25.

1.1 Site Location

Unit 25 is approximately 95 acres and is located in the southeastern portion of the Impact Area Munitions Response Area (MRA), within the MRS-BLM. Unit 25 lies to the east of Riso Ridge Road, west of Impossible Canyon Road, and north/northeast of Mercury Road. These roads are part of the permanent fuel break network and are not included as part of Unit 25. [Figure 1](#) provides a location map of Unit 25.

1.2 Purpose

The *Final Work Plan, Remedial Design/Remedial Action (RD/RA), Track 3 Impact Area MRA, Former Fort Ord, California* (U.S. Army Corps of Engineers [USACE], 2009) specifies that the U.S. Department of the Army (Army) will prepare a TM for the U.S. Environmental Protection Agency (EPA) and California Department of Toxic Substances Control (DTSC) to present a review of the results of both the surface remediation and the DGM data.

The TM is to evaluate surface remediation and DGM information to determine if additional subsurface remediation is required, based on information gathered following completion of the Final SSWP (KEMRON, 2016a), or as requested by the future property recipient and identified in coordination with the Army. This TM provides the following information:

- Scope of Work ([Section 2.0](#)) for Unit 25;
- Remedial work completed at Unit 25, and reasons for remedial work modifications for Unit 25, if applicable;
- Summary of MEC and munitions debris (MD) ([Section 4.0](#)) removed from Unit 25 during technology-aided surface MEC removal activities;
- Observation of evidence of potential soil contamination for evaluation under the Site 39/Basewide Range Assessment (BRA) Program ([Section 5.0](#));
- Detail regarding recommendations for subsurface MEC remediation within Unit 25, either specific to portions of the site or as a whole;
- Conclusions/Summary of Recommendations ([Section 7.0](#)) for Unit 25, either specific to portions of the site or as a whole.

2.0 *Scope of Work*

The scope of work for the project addressed in this TM included vegetation clearance, technology-aided surface MEC removal, and DGM survey across Unit 25. Unit 25 totals approximately 95 acres.

[Figure 1](#) provides a general site layout of Unit 25.

2.1 *Vegetation Clearance*

Vegetation clearance in the western portion, approximately 26 acres, of Unit 25 to support planned prescribed burns began in June 2015 and was completed in September 2015. Vegetation clearance in the remainder, approximately 60 acres, of Unit 25 was completed in July 2016. All but 24 acres of Unit 25 were cut to prepare for prescribed burns in Units 11, 12 and 25. Following a determination by the Fort Ord Prescribed Burn Team that the Unit 25 was unsafe to burn due to terrain concerns, Unit 25 was converted to a vegetation cut unit as detailed in [Appendix A \(FWV 006\)](#). Mechanical mastication was performed in all accessible areas, approximately 86 acres. In areas where mechanical mastication could not be performed, manual vegetation removal was performed in accessible areas. Due to extreme terrain, approximately eight acres did not receive vegetation removal. Approximately one acre within Unit 25, although inaccessible due to terrain, did not require vegetation clearance due to the lack of vegetation.

2.2 *Technology-Aided Surface Munitions and Explosives of Concern Removal*

Technology-aided surface MEC removal in the western portion of Unit 25 to support planned prescribed burns in Units 11 and 12 began in July 2015 and was completed in October 2015. Technology-aided surface MEC removal in the remainder of Unit 25 restarted in July 2016 and was completed in July 2017. This technology-aided surface MEC removal includes containment lines for the prescribed burn within Unit 25, and the remainder of the unit when a determination was made to mechanically cut the remainder of the unit. Lanes approximately five feet in width were placed across grids and Schonstedt magnetometers were used by unexploded ordnance (UXO) personnel to conduct surface MEC removal. Prior to the RA, 119 MEC (UXO) items were recovered from Unit 25 and are shown in [Table 1](#) and [Figure 2](#). During the technology-aided surface MEC removal, 324 MEC items were recovered and are shown in [Tables 2 and 4](#) and [Figure 5](#). Cumulative results for the Unit 25 RA are shown in [Tables 3 and 5](#). Quality control/quality assurance (QC/QA) processes were implemented in accordance with the Final SSWP (KEMRON, 2016a) and the *Final Quality Assurance Project Plan, Volume II, Appendix A, Munitions and Explosives of Concern Remedial Action, Former Fort Ord, California* (MEC QAPP)

(KEMRON, 2016b). Approximately nine acres of Unit 25 has been determined by (UXO) safety personnel to be inaccessible to surface MEC removal due to extreme terrain (See [Figure 1](#) of [FWV 011](#)).

2.3 Digital Geophysical Mapping Survey

The DGM survey was conducted with vehicle-towed EM61-MK2A arrays starting in November 2015 (western portion of Unit 25 in support of prescribed burns planned for Units 11 and 12) and was completed in August 2017 (remainder of Unit 25). [Figure 3](#) depicts the DGM data collected in Unit 25. Cumulative results for the Unit 25 RA are shown in [Tables 3](#) and [5](#). Measurement quality objectives were met and QC/QA processes were implemented in accordance with the Final SSWP (KEMRON, 2016a) and the MEC QAPP (KEMRON, 2016b). Measurement performance criteria were evaluated according to the standards specified in the MEC QAPP and the Final SSWP. Specific criteria that were evaluated included GPS accuracy, static background and response tests, dynamic background and response tests (IVS), velocity, minimum along track sampling and across track coverage, accurate detection of Blind Seeds with respect to both response and positioning, surveillance of field methods, and reprocessing of field data. Each of these criteria were evaluated separately with results recorded in the project database and subsequently reviewed by the QC Geophysicist. [Appendix C](#) includes the USACE DGM QA Approval and Discussion for Unit 25.

Due to extreme terrain within Unit 25, approximately 20 acres were inaccessible to DGM survey. These areas are shown on [Figure 3](#). These areas were documented in [FWV 011](#) included in [Appendix A](#) of this document.

3.0 Approved Changes During Field Work

Unit 25 work was performed in accordance with the Final Unit 23 SSWP (KEMRON, 2015) and Final Units 25/31 SSWP (KEMRON, 2016a), with the following exceptions documented by the FWVs included in [Appendix A](#) and outlined below:

- **006** (AR# OE-0880A.2) Documents that Unit 25 vegetation removal would be performed mechanically instead of prescribed burning as originally planned due to terrain negatively impacting firefighter's ability to control the fire. Additionally, documents an approximate eight acre area of difficult terrain in Unit 25 that precluded vegetation removal during prescribed burn containment line preparation.
- **011** (AR# OE-0880A.8) Documents area within Unit 25 where steep terrain precludes completion of surface MEC removal activities (approximately nine acres), and area within Unit 25 where steep terrain or dense oak tree stands preclude completion of DGM survey.

4.0 Summary of MEC/MD Removed

One hundred and nineteen MEC (UXO) items were encountered and removed from Unit 25 as part of activities which occurred prior to the activities described in this TM. These activities are described in the *Final Technical Information Paper, Ordnance and Explosives (OE) Site OE-15 (Mortar Alley), Former Fort Ord, California* (Parsons, 2002). These items are also shown in [Table 1](#) and [Figure 2](#).

Three hundred and twenty four surface MEC items were encountered and removed as part of MEC remediation activities described in this TM. All MEC items removed as part of MEC remediation activities described in this TM are in [Tables 2](#) and [4](#). These MEC items are shown in [Figure 5](#).

The MD removed from Unit 25 as part of MEC remediation activities described in this TM was recorded based on weight per 100-foot by 100-foot grid. An estimated 58,091 pounds of MD were removed. Density of MD weights by grid is shown on [Figure 4](#).

Targets and target debris within Unit 25 were removed and recycled to allow surface MEC removal and DGM to be conducted. No latrine pits were documented as part of this RA. Range-Related Debris (RRD) and Other Debris (OD) removed as part of MEC remediation activities described in this TM was recorded based on weight per 100-foot by 100-foot grid. An estimated 34,842 pounds of RRD and OD were removed as part of MEC remediation activities.

5.0 Observations of Evidence of Potential Soil Contamination

During field operations, UXO field personnel noted the presence of features or items that might indicate small arms training, including, but not limited to, mounds and berms, structures, and concentrations of bullets, machine gun links and other munitions-related items. This information has been provided to BRA personnel and is being used as part of the BRA program. Reconnaissance and identification of potential sampling locations is complete. Development of a sampling plan is in progress.

6.0 Recommendations for Additional Subsurface MEC Remediation

The Track 3 Record of Decision (ROD) identifies the types of areas where additional work (e.g., subsurface MEC removal) would be conducted. Other than the network of fuel break roads and 100-foot buffers, subsurface MEC removals can be conducted in areas to address specific risk and/or land use needs, such as BLM restoration sites. These areas are to be identified in the TM and evaluated.

Factors that will be considered when determining whether additional actions are necessary include, but are not limited to: (1) explosive hazards associated with MEC recovered; (2) the proximity to potential receptors; (3) the density of MEC recovered; and (4) consistency with Applicable or Relevant and Appropriate Requirements (e.g., Habitat Management Plan and Biological Opinions).

Based on the Final Units 25/31 SSWP (KEMRON, 2016a), sensitive fuze type munitions were expected in Unit 25. During the RA described in this TM, eight MEC items with sensitive fuzes were encountered and removed. MEC items with sensitive fuzes are shown in [Figure 6](#). All MEC items with sensitive fuzes except one removed in Unit 25 were located in the northern third of the unit, near the intersections of Steep Road and Hawkeye Road, and Riso Ridge and Hawkeye Road. The single MEC item with a sensitive fuze not encountered and removed near these intersections occurred in the extreme southern end of Unit 25. The two boxed areas shown on [Figure 6](#) are identified as areas of concern in Unit 25 with regard to the potential for MEC items with sensitive fuzes to remain in the shallow subsurface. The area near the intersection of Riso Ridge and Hawkeye Road coincides with a relatively higher density of subsurface metal as shown on [Figure 3](#). DGM data collection in the vicinity of the intersection of Steep Road and Hawkeye Road was limited due to steep terrain.

The Army is currently conducting a field study designed to provide more information about how areas/grids where MEC of the type containing sensitive fuzes were recovered during surface removal could be addressed in the future. A recommendation on this issue will be deferred until after the completion of the field study and the short term recommendations for the areas of concern in Unit 25 are as follows:

- Areas where MEC with sensitive fuzes were located will be monitored with enhanced procedures during annual surface area monitoring,
- All future MEC removal actions in the vicinity of these areas will be monitored for indications of subsurface MEC with sensitive fuzes,

- Authorized personnel entering Unit 25 will initially receive updated MEC safety and recognition training.

A joint Army-BLM inspection summary is provided in [Appendix B](#). This summary describes areas such as erosion features that appear to have naturally stabilized, and currently do not require subsurface MEC removal. Figures detailing these areas are included as part of [Appendix B](#).

No additional subsurface MEC removal is recommended for Unit 25. This recommendation is based on the joint inspection described above between the Army and BLM and the future planned land reuse. Additionally, the Army is currently conducting a field study designed to provide more information about how risks from MEC items with sensitive fuzes that potentially remain in the subsurface of areas/grids could be addressed in the future. A recommendation on this issue will be deferred until after the completion of the field study.

Approximately nine acres of Unit 25 did not receive surface MEC removal. Based on the results of the surface MEC removal performed in adjacent areas and the limited DGM data collected in these same areas, the likelihood of MEC remaining in this acreage is considered low. The inaccessible areas are marked by extreme terrain that is highly eroded. Munitions items that may have impacted these areas during training activities most likely ended up at the bottom of the slopes. Items remaining on the surface at the bottom of the slope would have been removed during surface MEC removal activities ([Figure 5](#)).

7.0 Conclusions/Summary of Recommendations

Technology-aided surface MEC removal has been completed in all accessible grids within Unit 25. Areas where technology-aided surface MEC removal was and was not completed are shown on [Figure 4](#). Technology-aided surface MEC removal and DGM survey in Unit 25 occurred as intended within the scope of work. Areas where surface MEC removal and DGM survey were not completed are addressed in [FWV 011](#), included in [Appendix A](#). A summary of survey and removal methods completed by total grids for the Unit 25 RA is shown in [Table 5](#).

RA objectives have been met for this unit. No additional subsurface MEC remediation is recommended for Unit 25. Based on the results of the surface MEC removal performed in Unit 25, the likelihood of MEC remaining in the nine acre area where surface MEC removal was not performed is considered low. No additional surface MEC remediation is recommended for Unit 25.

8.0 References

KEMRON, 2015, *Final Site-Specific Work Plan, Munitions and Explosives of Concern Remedial Action, MRS-BLM Unit 23 and in Support of Units 11 and 12 Prescribed Burns (includes portions of Units 5A, 9, 25, 28 and 31, Former Fort Ord, California.* December. (AR# OE-0862B).

KEMRON, 2016a. *Final, Site-Specific Work Plan Munitions and Explosives of Concern Remedial Action, MRS-BLM Units 25 and 31, Former Fort Ord, California.* November. (AR# OE-0880B).

KEMRON, 2016b. *Field Work Variance No. 006 for Draft Final, Site-Specific Work Plan, Munitions and Explosives of Concern Remedial Action, Units 25 and 31, Former Fort Ord, California.* August. (AR# OE-0880A.2).

KEMRON, 2017. *Field Work Variance No. 011 for Draft Final, Site-Specific Work Plan, Munitions and Explosives of Concern Remedial Action, Units 25 and 31, Former Fort Ord, California.* November. (AR# OE-0880A.8).

Parsons, 2002. *Final Technical Information Paper, Ordnance and Explosives (OE) Site OE-15 (Mortar Alley), Former Fort Ord, California.* January. (AR# OE-0539).

U.S. Army Corps of Engineers (USACE), 2009, *Final Work Plan, Remedial Design/Remedial Action, Track 3 Impact Area Munitions Response Area, Former Fort Ord, California.* August. (AR# OE-0660K).

Tables

Table 1

MEC Items Encountered and Removed Prior to Remedial Action Operations

| Date Found | Item Type | Quantity | Description | Depth (inches) | Unit |
|------------|-----------|----------|--|----------------|------|
| 11/29/2001 | UXO | 1 | Projectile, 4.2inch, mortar, high explosive, M3 series | 0 | 25 |
| 11/28/2001 | UXO | 1 | Projectile, 40mm, high explosive, M381 | 0 | 25 |
| 11/28/2001 | UXO | 1 | Projectile, 75mm, shrapnel, MK I | 0 | 25 |
| 11/12/1997 | UXO | 24 | Projectile, 81mm, mortar, high explosive, M43 series | 0 | 25 |
| 11/10/1997 | UXO | 23 | Projectile, 81mm, mortar, high explosive, M43 series | 0 | 25 |
| 2/18/1998 | UXO | 3 | Projectile, 81mm, mortar, high explosive, M43 series | 8 | 25 |
| 2/19/1998 | UXO | 2 | Projectile, 81mm, mortar, high explosive, M43 series | 10 | 25 |
| 1/27/1998 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | 18 | 25 |
| 1/27/1998 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | 0 | 25 |
| 2/18/1998 | UXO | 6 | Projectile, 81mm, mortar, high explosive, M43 series | 8 | 25 |
| 2/19/1998 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | 10 | 25 |
| 2/19/1998 | UXO | 3 | Projectile, 81mm, mortar, high explosive, M43 series | 10 | 25 |
| 2/18/1998 | UXO | 6 | Projectile, 81mm, mortar, high explosive, M43 series | 8 | 25 |
| 2/18/1998 | UXO | 13 | Projectile, 81mm, mortar, high explosive, M43 series | 8 | 25 |
| 2/18/1998 | UXO | 5 | Projectile, 81mm, mortar, high explosive, M43 series | 8 | 25 |
| 1/27/1998 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | 16 | 25 |
| 2/18/1998 | UXO | 3 | Projectile, 81mm, mortar, high explosive, M43 series | 8 | 25 |
| 2/19/1998 | UXO | 2 | Projectile, 81mm, mortar, high explosive, M43 series | 12 | 25 |
| 1/27/1998 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | 14 | 25 |
| 1/27/1998 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | 0 | 25 |
| 1/27/1998 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | 0 | 25 |
| 2/18/1998 | UXO | 8 | Projectile, 81mm, mortar, high explosive, M43 series | 8 | 25 |
| 2/19/1998 | UXO | 3 | Projectile, 81mm, mortar, high explosive, M43 series | 12 | 25 |
| 1/27/1998 | UXO | 2 | Projectile, 81mm, mortar, high explosive, M43 series | 16 | 25 |
| 2/18/1998 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | 12 | 25 |
| 1/27/1998 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | 15 | 25 |
| 11/27/2001 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | 0 | 25 |
| 11/27/2001 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | 0 | 25 |
| 11/27/2001 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | 0 | 25 |
| 11/28/2001 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | 0 | 25 |

Total = 119

Table 2
MEC Items Encountered and Removed During Operations Covered in TM

| Date Found | Item Type | Qty | Description | Operation | Unit |
|------------|-----------|-----|--|-----------------|------|
| 7/30/2015 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 8/5/2015 | UXO | 1 | Projectile, 37mm, low explosive, MK I | Surface Removal | 25 |
| 8/10/2015 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 8/17/2015 | UXO | 1 | Signal, illumination, ground parachute, M131 | Surface Removal | 25 |
| 8/18/2015 | UXO | 1 | Projectile, 37mm, high explosive, MK II | Surface Removal | 25 |
| 8/18/2015 | UXO | 1 | Projectile, 37mm, high explosive, MK II | Surface Removal | 25 |
| 8/18/2015 | UXO | 1 | Projectile, 75mm, high explosive, MK I | Surface Removal | 25 |
| 8/19/2015 | UXO | 1 | Projectile, 37mm, low explosive, MK I | Surface Removal | 25 |
| 8/19/2015 | UXO | 1 | Projectile, 37mm, low explosive, MK I | Surface Removal | 25 |
| 8/19/2015 | UXO | 1 | Projectile, 37mm, low explosive, MK I | Surface Removal | 25 |
| 8/20/2015 | UXO | 1 | Projectile, 37mm, low explosive, MK I | Surface Removal | 25 |
| 8/24/2015 | UXO | 1 | Projectile, 37mm, low explosive, MK I | Surface Removal | 25 |
| 8/24/2015 | UXO | 1 | Projectile, 37mm, low explosive, MK I | Surface Removal | 25 |
| 8/25/2015 | UXO | 1 | Projectile, 75mm, Shrapnel, MK I | Surface Removal | 25 |
| 8/25/2015 | UXO | 1 | Projectile, 37mm, low explosive, MK II | Surface Removal | 25 |
| 8/25/2015 | UXO | 1 | Projectile, 75mm, high explosive, M48 | Surface Removal | 25 |
| 8/26/2015 | UXO | 1 | Projectile, 37mm, low explosive, MK I | Surface Removal | 25 |
| 9/18/2015 | UXO | 1 | Projectile, 37mm, low explosive, MK I | Surface Removal | 25 |
| 9/18/2015 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 9/18/2015 | UXO | 1 | Projectile, 37mm, low explosive, MK I | Surface Removal | 25 |
| 9/18/2015 | UXO | 1 | Projectile, 75mm, high explosive, MK I | Surface Removal | 25 |
| 9/22/2015 | UXO | 1 | Projectile, 37mm, low explosive, MK I | Surface Removal | 25 |
| 9/22/2015 | UXO | 1 | Projectile, 37mm, low explosive, MK I | Surface Removal | 25 |
| 9/24/2015 | UXO | 1 | Projectile, 37mm, low explosive, MK II | Surface Removal | 25 |
| 9/25/2015 | UXO | 1 | Projectile, 37mm, low explosive, MK II | Surface Removal | 25 |
| 9/25/2015 | UXO | 1 | Projectile, 37mm, low explosive, MK I | Surface Removal | 25 |
| 9/25/2015 | UXO | 1 | Projectile, 37mm, low explosive, MK I | Surface Removal | 25 |
| 9/28/2015 | UXO | 1 | Projectile, 75mm, Shrapnel, MK I | Surface Removal | 25 |
| 9/28/2015 | UXO | 1 | Projectile, 37mm, low explosive, MK I | Surface Removal | 25 |
| 9/28/2015 | UXO | 1 | Projectile, 40mm, high explosive, M383 | Surface Removal | 25 |
| 9/29/2015 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 9/29/2015 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 9/29/2015 | UXO | 1 | Projectile, 40mm, high explosive, M383 | Surface Removal | 25 |
| 9/29/2015 | UXO | 1 | Projectile, 37mm, low explosive, MK I | Surface Removal | 25 |
| 10/1/2015 | UXO | 1 | Projectile, 37mm, low explosive, MK I | Surface Removal | 25 |
| 10/1/2015 | UXO | 1 | Projectile, 37mm, low explosive, MK I | Surface Removal | 25 |
| 10/2/2015 | UXO | 1 | Projectile, 37mm, low explosive, MK I | Surface Removal | 25 |
| 7/26/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 7/26/2016 | UXO | 1 | Projectile, 37mm, high explosive, MK II | Surface Removal | 25 |
| 7/26/2016 | UXO | 1 | Projectile, 75mm, high explosive, MK I | Surface Removal | 25 |
| 7/27/2016 | UXO | 1 | Projectile, 37mm, low explosive, MK I | Surface Removal | 25 |
| 8/1/2016 | UXO | 1 | Projectile, 37mm, low explosive, MK I | Surface Removal | 25 |
| 8/3/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 8/3/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 8/4/2016 | UXO | 1 | Projectile, 37mm, low explosive, MK I | Surface Removal | 25 |
| 8/4/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 8/8/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 8/8/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 8/8/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 8/8/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |

Table 2
MEC Items Encountered and Removed During Operations Covered in TM

| Date Found | Item Type | Qty | Description | Operation | Unit |
|------------|-----------|-----|--|-----------------|------|
| 8/8/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M362 | Surface Removal | 25 |
| 8/8/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 8/8/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 8/8/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 8/8/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 8/8/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 8/9/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 8/9/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 8/9/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 8/10/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 8/10/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 8/10/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 8/10/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 8/11/2016 | UXO | 1 | Grenade, rifle, smoke, white phosphorous, M19A1 | Surface Removal | 25 |
| 8/15/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 8/16/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 8/16/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 8/16/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 8/16/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 8/16/2016 | UXO | 1 | Projectile, 37mm, low explosive, MK I | Surface Removal | 25 |
| 8/16/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 8/17/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 8/17/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 8/17/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 8/17/2016 | UXO | 1 | Projectile, 75mm, Shrapnel, MK I | Surface Removal | 25 |
| 8/17/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 8/18/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 8/18/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 8/18/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 8/18/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 8/18/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 8/18/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 8/18/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 8/22/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 8/22/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 8/22/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 8/22/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 8/22/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 8/22/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 8/22/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 8/22/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 8/22/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 8/22/2016 | UXO | 1 | Projectile, 75mm, Shrapnel, MK I | Surface Removal | 25 |
| 8/23/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 8/24/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 8/25/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 8/25/2016 | UXO | 1 | Rocket, 35mm, subcaliber, practice, M73 | Surface Removal | 25 |
| 8/25/2016 | UXO | 1 | Projectile, 37mm, low explosive, MK I | Surface Removal | 25 |
| 8/30/2016 | UXO | 1 | Projectile, 105mm, high explosive, M1 | Surface Removal | 25 |
| 9/1/2016 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |

Table 2
MEC Items Encountered and Removed During Operations Covered in TM

| Date Found | Item Type | Qty | Description | Operation | Unit |
|---------------|-----------|------------|--|-----------------|------|
| 5/11/2017 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 5/11/2017 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 5/15/2017 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 5/15/2017 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 5/15/2017 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 5/16/2017 | UXO | 1 | Projectile, 75mm, Shrapnel, MK I | Surface Removal | 25 |
| 5/16/2017 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 5/16/2017 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 5/16/2017 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 5/16/2017 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 5/16/2017 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 5/16/2017 | UXO | 1 | Projectile, 37mm, low explosive, MK II | Surface Removal | 25 |
| 5/16/2017 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 5/16/2017 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 5/16/2017 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 5/16/2017 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 5/25/2017 | UXO | 1 | Projectile, 75mm, Shrapnel, MK I | Surface Removal | 25 |
| 6/7/2017 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 6/7/2017 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 6/7/2017 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 6/7/2017 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 6/13/2017 | UXO | 1 | Projectile, 37mm, low explosive, MK I | Surface Removal | 25 |
| 7/13/2017 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| 7/13/2017 | UXO | 1 | Projectile, 81mm, mortar, high explosive, M43 series | Surface Removal | 25 |
| Totals | | 324 | | | |

Table 3
Cumulative Results of the Remedial Action

| Parameter | Unit 25 Totals |
|------------------------------------|-----------------------|
| Total unit acreage | 95 |
| Surface removal acreage | 86 |
| Analog subsurface removal acreage | 0 |
| Digital Subsurface removal acreage | 0 |
| DGM survey acreage | 75 |
| MEC items | 324 |
| Total Estimated MD Weight (lbs) | 58,091 |
| Total Estimated RRD and OD (lbs) | 34,842 |

DGM - Digital Geophysical Mapping
MEC - Munitions and Explosives of Concern
MD - Munitions Debris
RRD - Range Related Debris
OD - Other Debris

Table 4
MEC Recovered by Type During Remedial Action

| Description | Unit 25 |
|--|----------------|
| Grenade, rifle, smoke, white phosphorous, M19A1 | 1 |
| Projectile, 105mm, high explosive, M1 | 1 |
| Projectile, 37mm, high explosive, MK II | 3 |
| Projectile, 37mm, low explosive, MK I | 36 |
| Projectile, 37mm, low explosive, MK II | 5 |
| Projectile, 4.2inch, mortar, high explosive, M3 series | 2 |
| Projectile, 4.2inch, mortar, smoke, white phosphorous, M328 series | 1 |
| Projectile, 40mm, high explosive, M383 | 8 |
| Projectile, 60mm, mortar, high explosive, M49 series | 11 |
| Projectile, 75mm, high explosive, M48 | 2 |
| Projectile, 75mm, high explosive, MK I | 5 |
| Projectile, 75mm, shrapnel, MK I | 8 |
| Projectile, 81mm, mortar, high explosive, M362 | 2 |
| Projectile, 81mm, mortar, high explosive, M43 series | 235 |
| Projectile, 81mm, mortar, illumination, M301 series | 1 |
| Rocket, 2.36inch, high explosive antitank, M6 | 1 |
| Rocket, 35mm, subcaliber, practice, M73 | 1 |
| Signal, illumination, ground parachute, M131 | 1 |
| Totals | 324 |

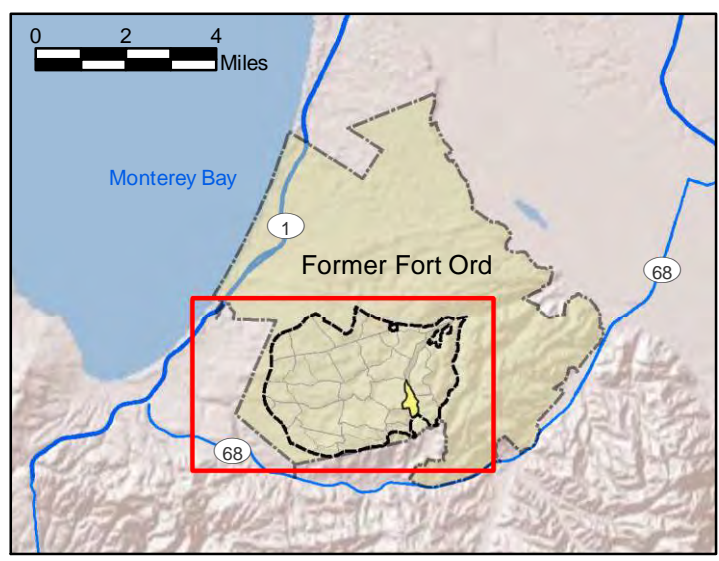
Table 5

Summary of Survey and Removal Methods by Grids

| Activity | Unit 25 Grids |
|----------------------------|----------------------|
| Surface Removal | 521 |
| Analog Subsurface Removal | 0 |
| Digital Subsurface Removal | 0 |
| DGM Survey | 480 |

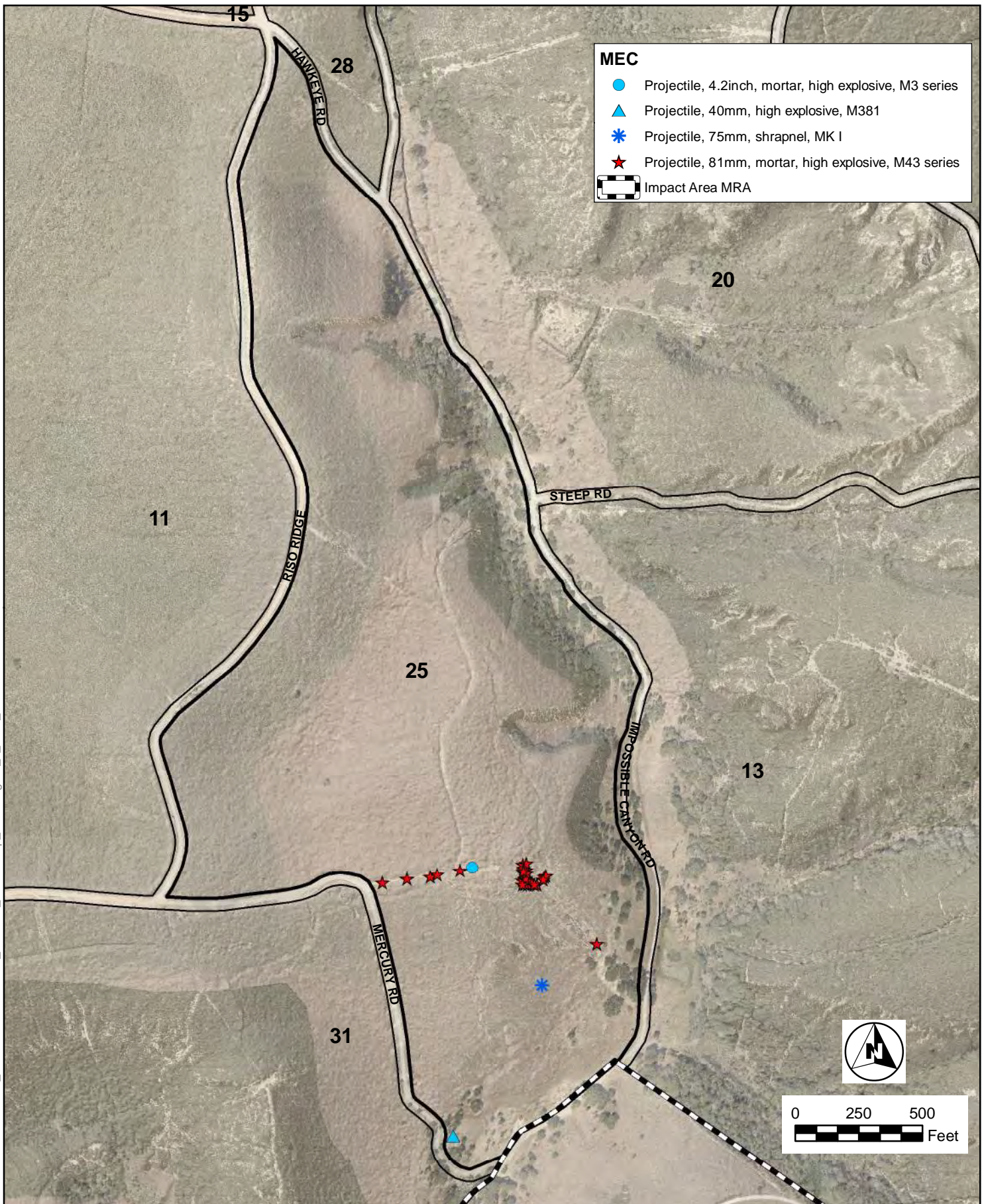
DGM - Digital Geophysical Mapping

Figures



MEC Remedial Action Unit 25
 Technical Memorandum
 Munitions and Explosives of Concern
 Former Fort Ord, California

Figure 1
 Unit 25 Location Map

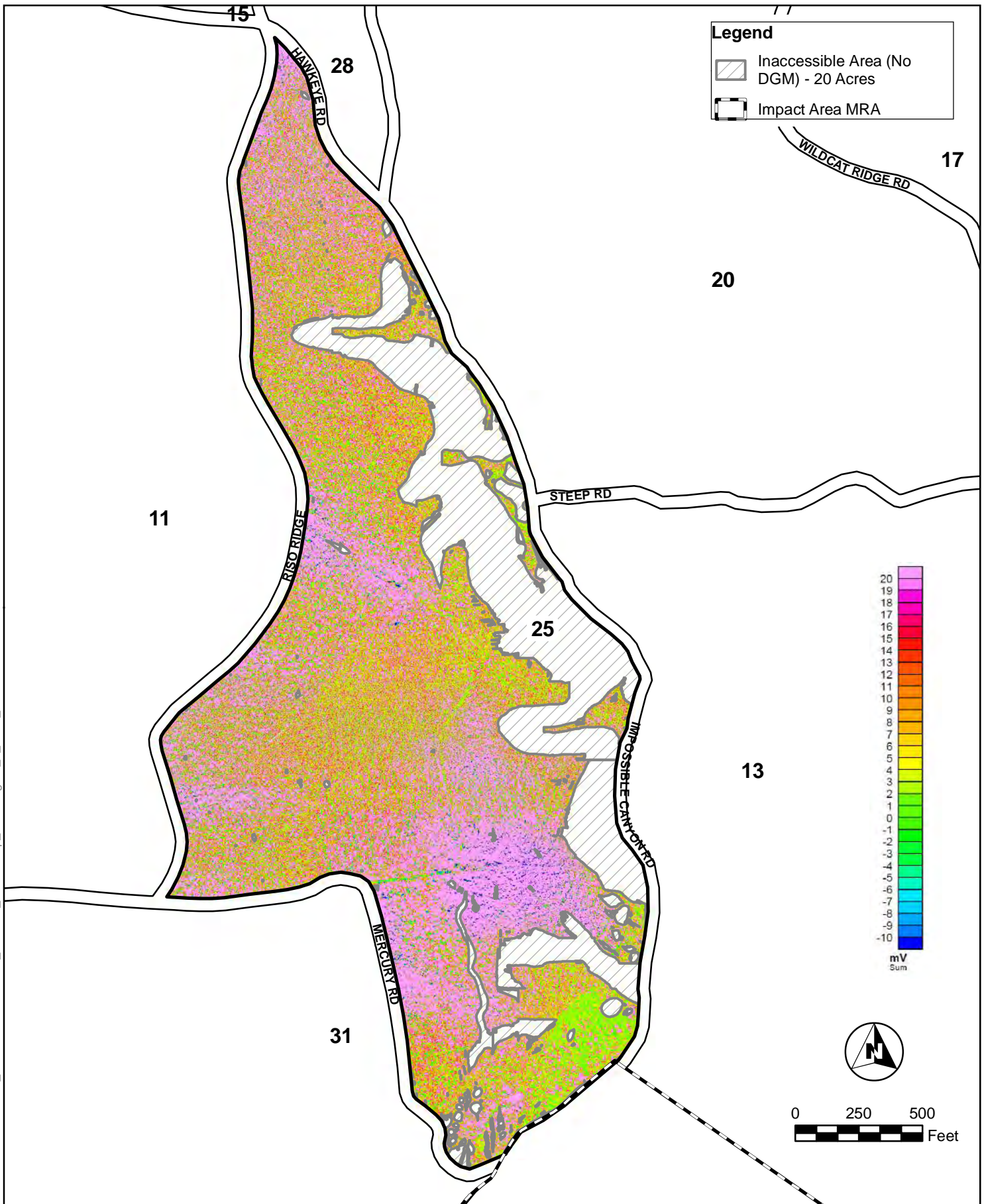


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**MEC Remedial Action Unit 25
Technical Memorandum
Munitions and Explosives of Concern
Former Fort Ord, California**

**Figure 2
MEC Finds Prior to
Remedial Action**

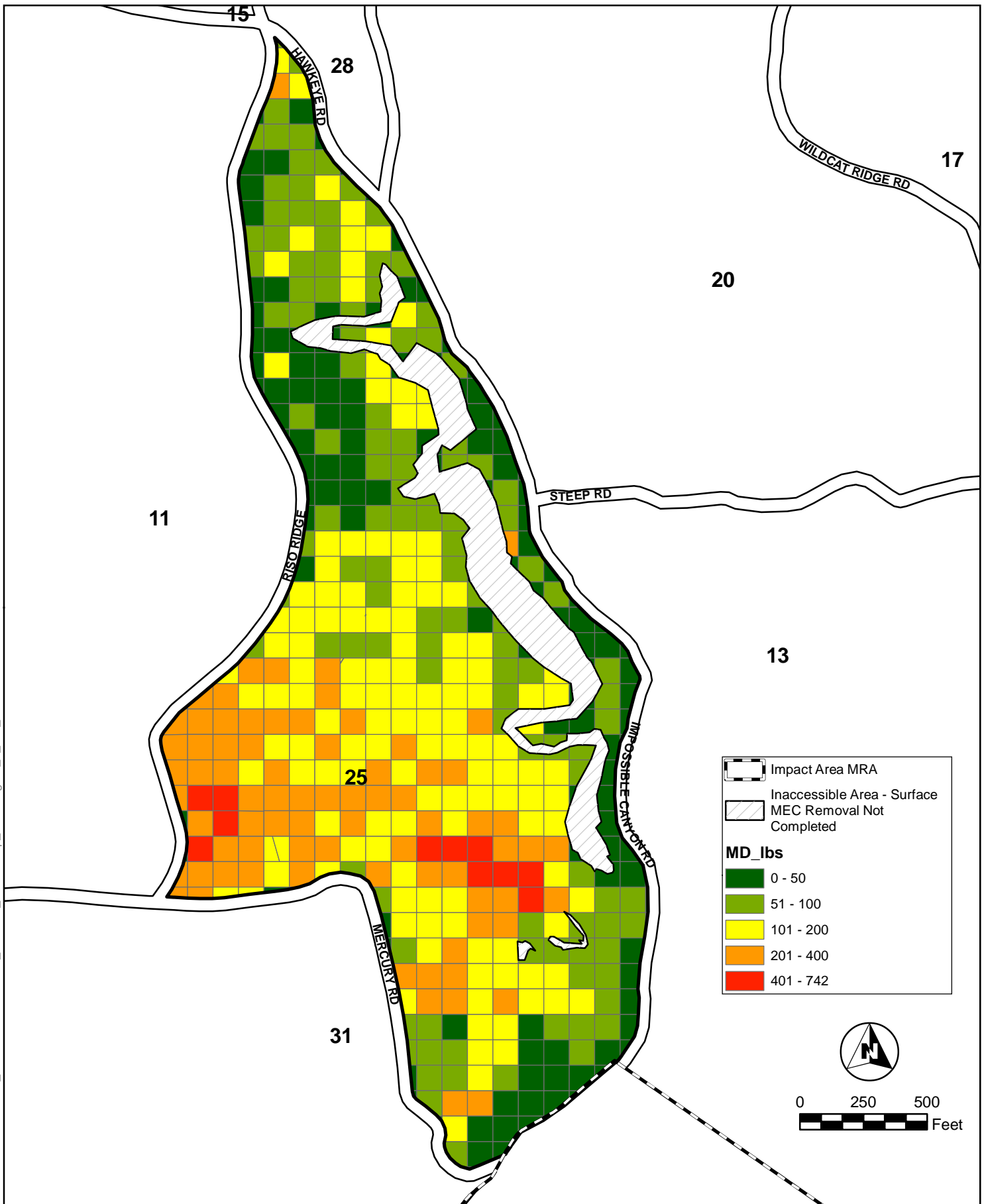


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MEC Remedial Action Unit 25
Technical Memorandum
Munitions and Explosives of Concern
Former Fort Ord, California

Figure 3
DGM Survey Area



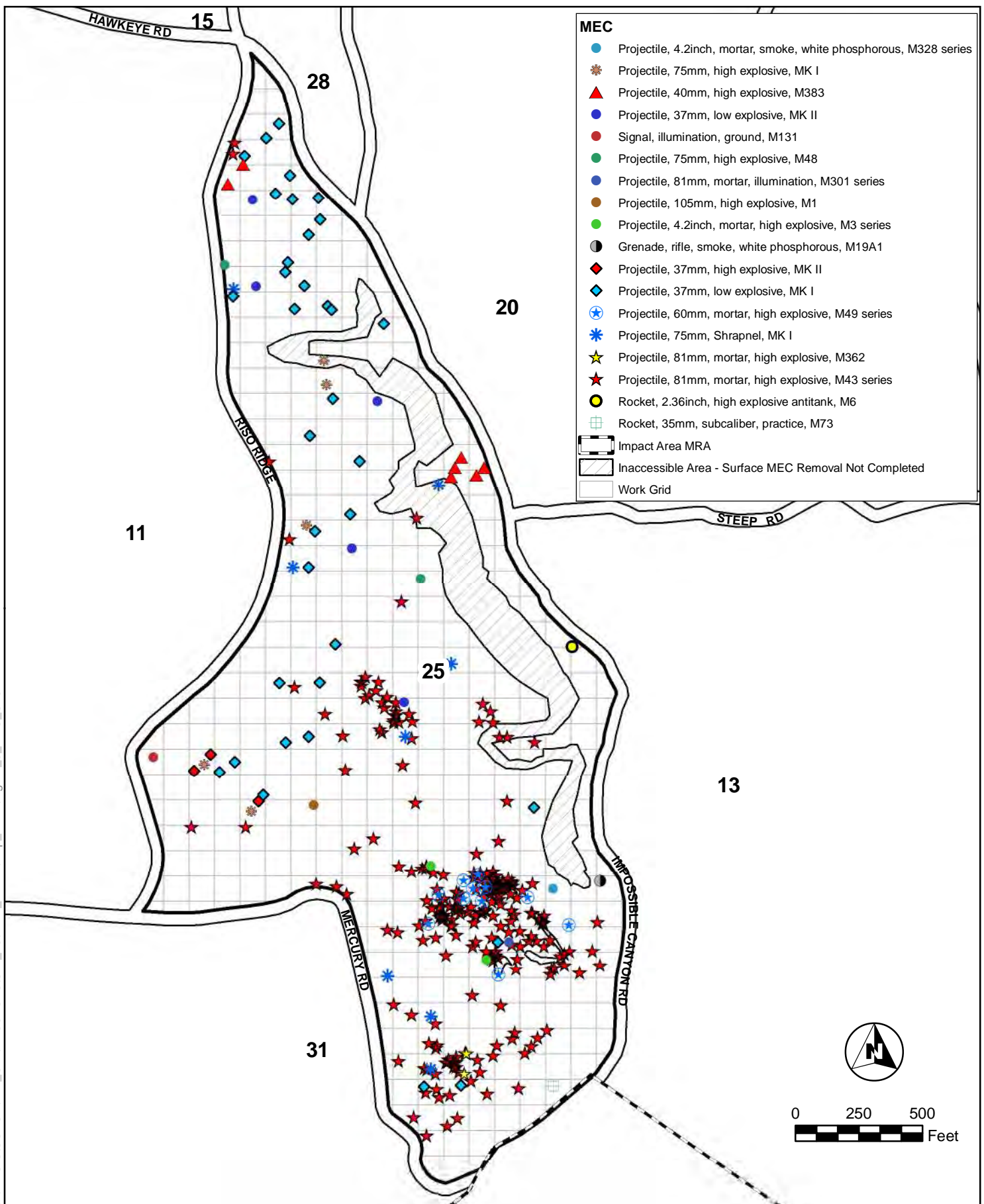
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**MEC Remedial Action Unit 25
Technical Memorandum
Munitions and Explosives of Concern
Former Fort Ord, California**

Figure 4

**Weight of Surface MD
Removed Per Grid**



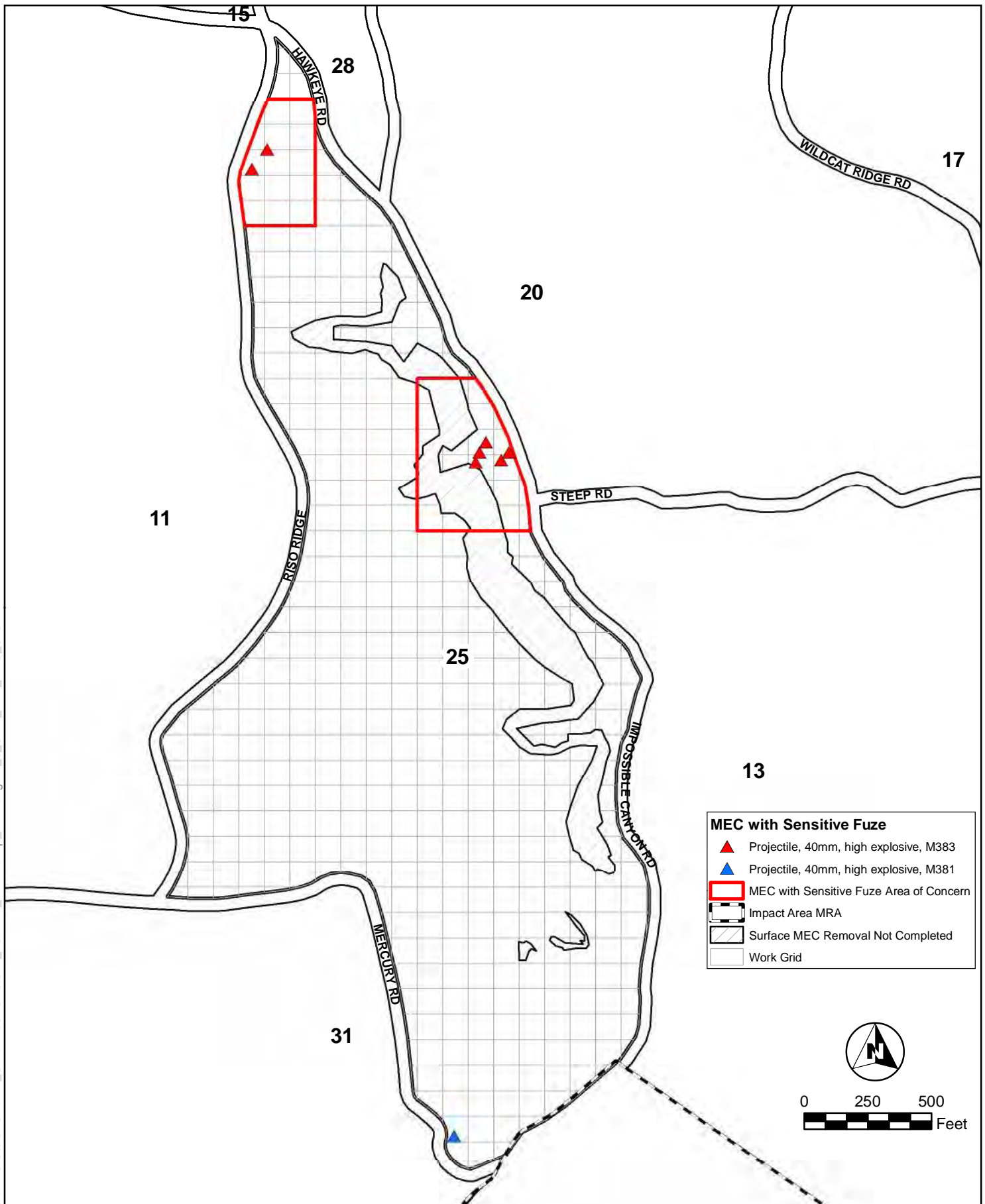
MEC Remedial Action Unit 25
Technical Memorandum
Munitions and Explosives of Concern
Former Fort Ord, California

Figure 5
MEC Finds During
Remedial Action



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Gilbane

**MEC Remedial Action Unit 25
Technical Memorandum
Munitions and Explosives of Concern
Former Fort Ord, California**

**Figure 6
Location of MEC with
Sensitive Fuzes**

Appendices

Appendix A
Field Work Variances



FIELD WORK VARIANCE

| | | | |
|----------------------------|---|-------------|----------------|
| Project Name/Number | Fort Ord | WP | 8 |
| Applicable Document | Draft Final, Site-Specific Work Plan, Munitions and Explosives of Concern Remedial Action, Units 25 and 31, Former Fort Ord, California (KEMRON, 2016) (OE-0880A) | Date | August 8, 2016 |

Problem Description:

The Draft Final, Site-Specific Work Plan, Munitions and Explosives of Concern Remedial Action, Units 25 and 31, Former Fort Ord, California (KEMRON, 2016) (OE-0880A) identifies an approximate 24 acre area in the center of Unit 25 where prescribed burning is planned for vegetation removal. This area is also shown on the attached Figure 1. The planned vegetation cutting in Unit 25 was completed where accessible. Steep and difficult terrain exists in portions of the containment area (approximately 8 acres). Due to safety concerns vegetation cutting was not conducted in the areas of difficult terrain and surface MEC removal will not be conducted.

The terrain issues preclude firefighter's ability to control the fire from the perimeter of the unit. A determination was made that Unit 25 would be masticated instead of prescribed burned for vegetation removal.

Recommended solution:

Masticate the approximately 24 acre area within Unit 25 as shown on Figure 1 and perform MEC remediation activities in this area as outlined in the Draft Final, Site-Specific Work Plan, Munitions and Explosives of Concern Remedial Action, Units 25 and 31, Former Fort Ord, California (KEMRON, 2016) (OE-0880A).

Document the areas of difficult terrain (approximately 8 acres) in the Technical Memorandum.

Impact on present and completed work:

No impact on current or completed work.


Recommended solution/disposition:

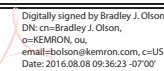
Incorporate this FWV as an appendix to the existing Draft Final Work Plan.

Clarification Minor Change Major Change


Affects Budget Yes No

Affects Schedule Yes No

Signature  Kevin J. Siemann Date _____
MEC Task Manager

Signature  Bradley J. Olson Date _____
SUXOS

Signature  Cheryl Ely Date _____
CQCSM

Signature  Bruce McClain Date _____
UXOQCS

Signature  Steve Crane Date _____
Project Manager

Signature  Erin K. Caruso Date _____
Deputy Project Manager



Field Work Variance No. 006

Page 2 of 3

USACE Approval: If Major Change:

Signature MEEK.SHAWN.MIC
HAEI.1115801739
OE Safety Specialist

Digitally signed by
MEEK.SHAWN.MICHAEL.1115801739
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI,
ou=USA, cn=MEEK.SHAWN.MICHAEL.1115801739
Date: 2016.08.23 16:41:27 -0700

Date _____

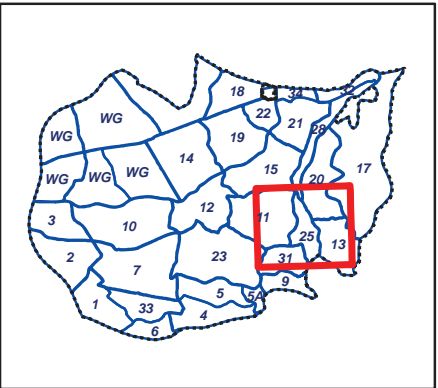
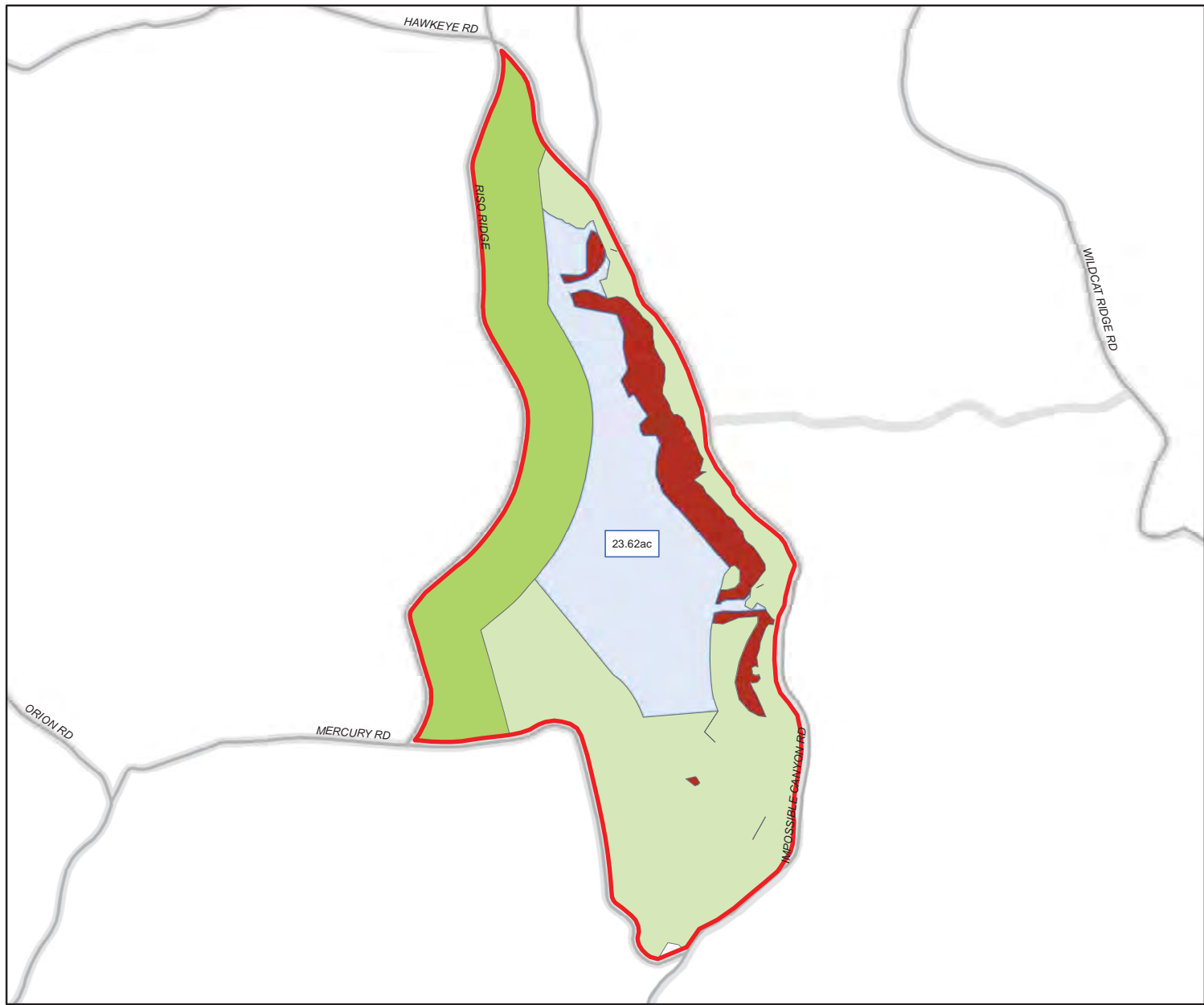
Signature EISEN.DAVID.E.12319
85146

Digitally signed by EISEN.DAVID.E.1231985146
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI,
ou=USA, cn=EISEN.DAVID.E.1231985146
Date: 2016.08.23 16:41:27 -0700

Date _____

USACE COR
or TM

Signature _____ Date _____
USACE Project
Geophysicist



Legend

- Planned Interior Mastication (23.62 Acres)
- Mastication Complete 2016 (56.18 Acres)
- Mastication Complete 2015 (25.28 Acres)
- No Cut Due to Steep Terrain (8.05 Acres)
- Roads
- Unit Boundary
- Fuel Breaks



Figure 1

| |
|--|
| |
| <p>U.S. ARMY CORPS OF ENGINEERS SACRAMENTO DISTRICT</p> |
| <p>FORT ORD Unit 25 Mastication Status</p> |
| <p>Operations Completed Through: 07/28/2016</p> |

FIELD WORK VARIANCE

| | | | |
|----------------------------|---|-------------|-------------------|
| Project Name/Number | Fort Ord | WP | 07 |
| Applicable Document | Draft Final, Site-Specific Work Plan Munitions and Explosives of Concern Remedial Action, MRS-BLM Units 25 and 31, Former Fort Ord, California (OE- 0880) | Date | November 14, 2017 |

Problem Description:

The *Draft Final, Site-Specific Work Plan Munitions and Explosives of Concern Remedial Action, MRS-BLM Units 25 and 31, Former Fort Ord, California* (Kemron, 2016), specifies the following:

- Section 2.5.6, Technology-Aided Surface MEC Removal: “Due to the presence of some extremely steep terrain as shown on Figure 2 (not shown), some areas may not have technology-aided surface removal performed. The determination to not conduct technology-aided surface removal may result from personnel safety issues. Areas where technology-aided surface removal is not conducted will be documented and evaluated during the TM process for the potential for MEC items to be present on the surface.”
- Section 2.5.7, Digital Geophysical Mapping (DGM): “Following surface MEC removal, DGM survey will be conducted in accessible areas. Site conditions (e.g. difficult terrain) may prevent digital geophysical survey from being conducted in certain areas; these areas will be documented in the TM.”

Field Work Variance 006 (AR # OE-0880A.2) detailed approximately eight acres within Unit 25 where steep and difficult terrain precluded vegetation cutting. This area corresponds to the area where surface MEC removal was not performed due to extremely difficult terrain. Areas where surface MEC removal was and was not completed are shown on [Figure 1](#). Approximately nine acres of Unit 25 was determined by UXO safety personnel to be inaccessible to surface MEC removal due to extreme terrain. Approximately 20 acres of Unit 25 ([Figure 2](#)) was determined by UXO safety personnel to be inaccessible to DGM survey due to extreme terrain, or where dense oak tree stands precluded access.

Recommended solution:

Document these areas in the TM. Conduct an evaluation in the TM based on the results of the surface MEC removal and DGM data to determine the likelihood of surface MEC remaining in the 9 acres shown on [Figure 1](#).

Impact on present and completed work:

No impact on present and completed work.

Recommended solution/disposition:

Incorporate this FWV as an appendix to the existing Draft Final Work Plan.



Clarification


Minor Change

Major Change

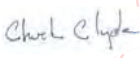
Affects Budget Yes No


Affects Schedule Yes No

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 Date: 2017.11.14.10:36:02-0800' _____
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Signature  Digitally signed by Bradley Olson
 Date: 2017.11.14 10:43:17 -08'00' _____
 SUXOS

Signature  Date 11/14/17
 Project Manager


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 CQCSM


Signature  Digitally signed by Erin K. Caruso
 DN: c=US, o=Federal Services, ou=Federal Services, cn=Erin K. Caruso
 Reason: I am approving this document.
 Date: 2017.11.16.09:05:18-0800' _____
 Deputy Project Manager

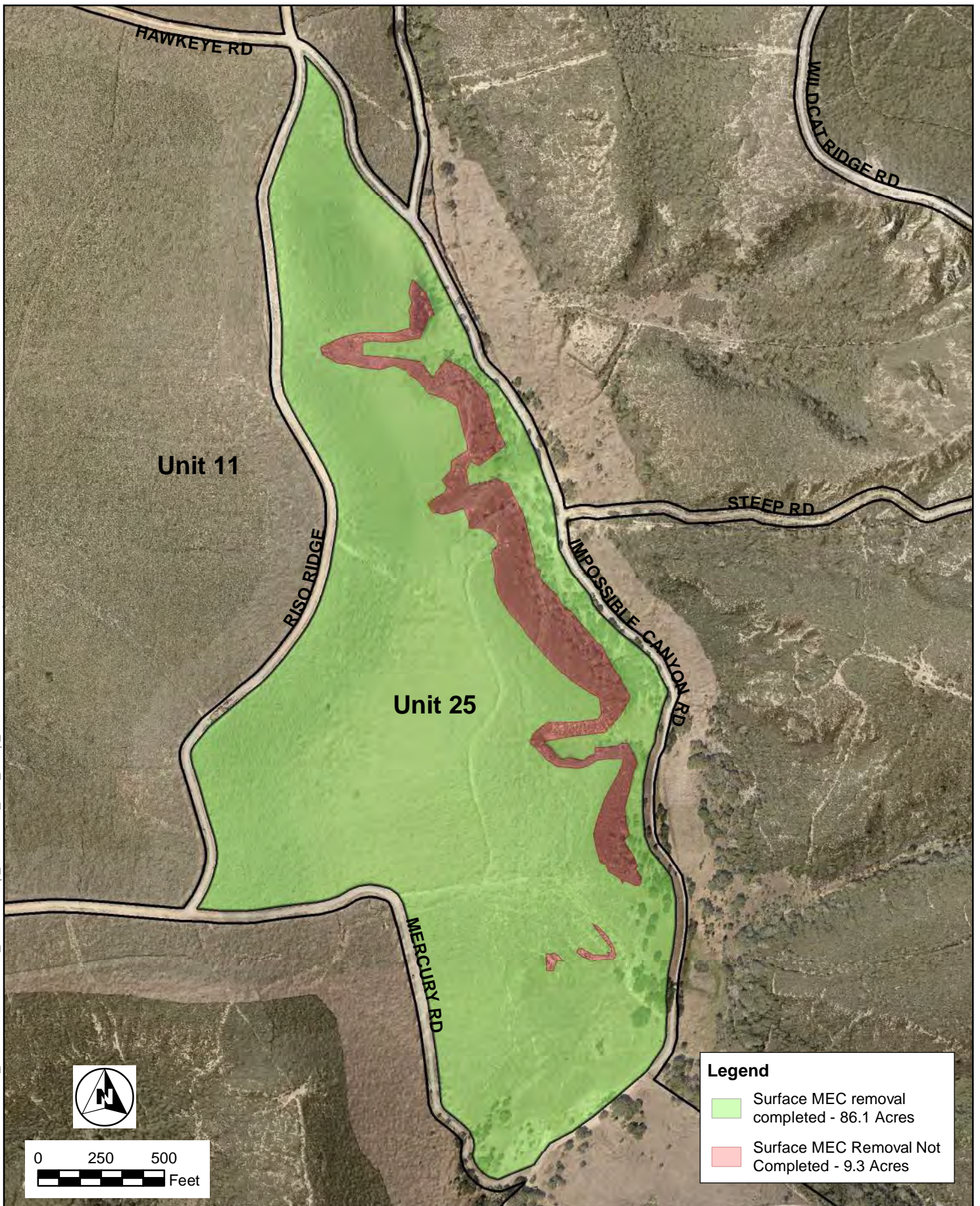
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 UXOQCS

USACE Approval: If Major Change:

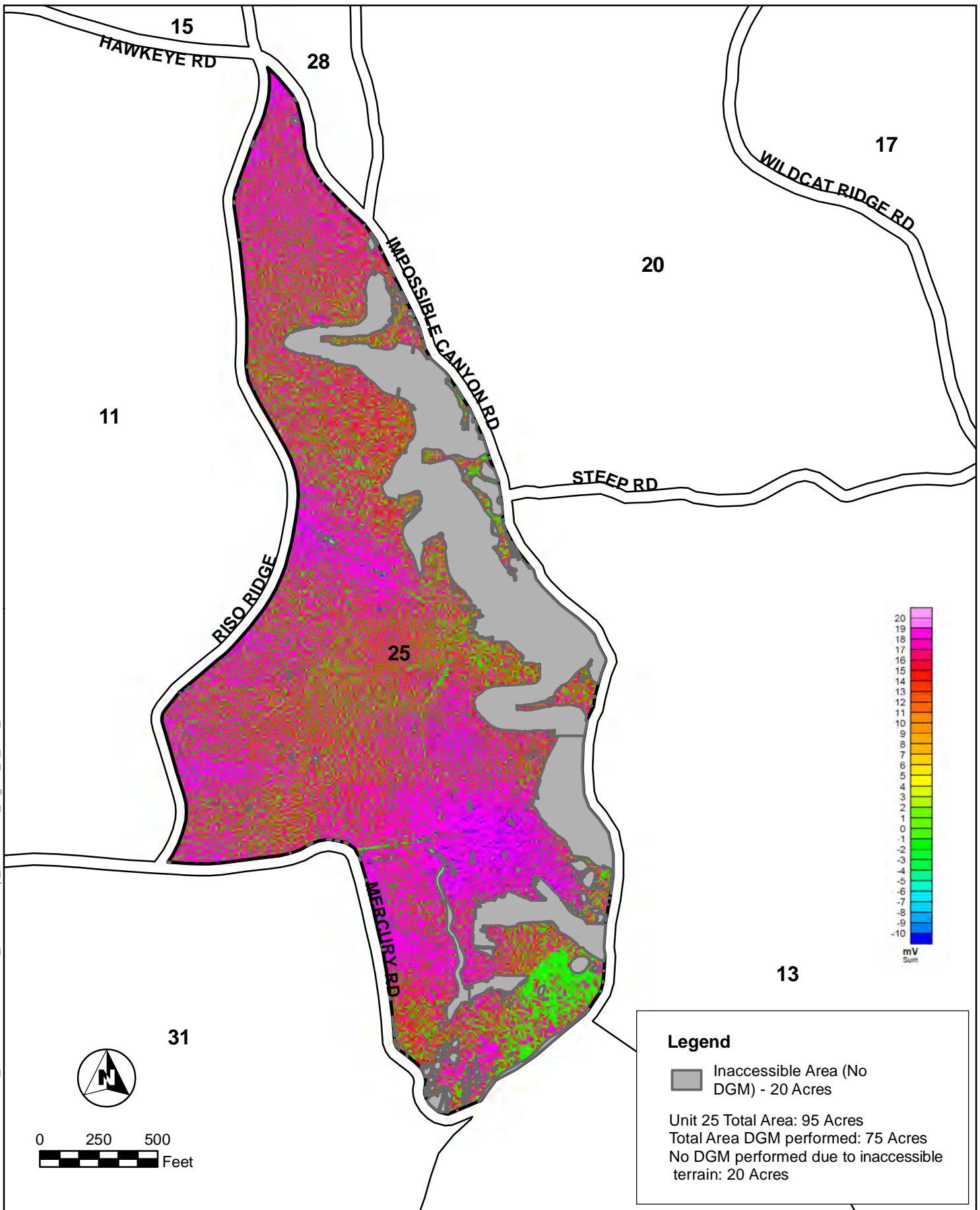
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 OE Safety Specialist

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 Date: 2017.11.19.20:19:15 -08'00' _____
 USACE Project Geophysicist



| Legend | |
|--------|---|
| | Surface MEC removal completed - 86.1 Acres |
| | Surface MEC Removal Not Completed - 9.3 Acres |



Legend

- Inaccessible Area (No DGM) - 20 Acres

Unit 25 Total Area: 95 Acres
Total Area DGM performed: 75 Acres
No DGM performed due to inaccessible terrain: 20 Acres

Appendix B

Army-BLM Joint Inspection Summary

Post-Remediation Inspection Summary

Subject: Joint Post-Remediation Inspection by the Army and Bureau of Land Management (BLM) of Munitions Response Site (MRS) – BLM Unit 25.

Area of Inspection: Unit 25

Date: 2 August 2017

Attendees: Eric Morgan, BLM; Dave Eisen - Program Manager, United States Army Corps of Engineers (USACE); Curtis Payton – Program Manager, USACE; Natalie Gordon, Chenega Support Services, Fort Ord Base Realignment and Closure (BRAC)

References:

1. *Final Site-Specific Work Plan, Munitions and Explosives of Concern Remedial Action, MRS-BLM Units 25 and 31, Former Fort Ord, CA (Kemron, 2016) (AR#OE-0880B).*
2. *Final Record of Decision (ROD), Impact Area Munitions Response Area (MRA), Track 3 Munitions Response Site (MRS), Former Fort Ord, California (United States Department of the Army [Army], 2008) (AR#OE-0647).*

Background: In accordance with the Track 3 ROD, the Army conducted surface MEC removal along with subsurface MEC removal in select areas and Digital Geophysical Mapping (DGM) of Unit 25 within the Impact Area. An inspection by the Army and BLM, the future property recipient and land manager, of Army's completed munitions and explosives of concern (MEC) removal action was conducted to determine areas that may require additional subsurface removal action, or future construction support, based on BLM's planned use (e.g. habitat restoration, erosion control measures, fuel break maintenance, etc).

It is an Army responsibility to conduct remedial actions that prepare the property for BLM's safe management and use. The Army will provide MEC removal and/or construction support for BLM's ground disturbing activities as jointly agreed upon prior to property transfer. It is anticipated that BLM will receive Unit 25 property upon completion of a suitable MEC remediation of all adjoining lands designated Munitions Response Site (MRS)-BLM (anticipated completion 2023). With the transfer of the property, responsibility for construction support of subsurface activities will be in accordance with the ROD.

No comments to the Unit 25 Site-Specific Work Plan (SSWP) were provided by BLM prior to the start of MEC removal actions. The Army has completed the actions described in the SSWP and subsequent Field Work Variance (FWV) for Unit 25. Additional subsurface MEC removal may be required as identified in the Technical Memorandum (TM).

Objective: This joint inspection provided an on-site assessment of Unit 25. The inspection included a visual assessment of the unit from the perimeter fuel breaks around the unit, and involved a discussion of the actions necessary to attain MEC safety conditions suitable for subsequent future use as described by the BLM. The current status of vegetation cover and evidence of the impacts of MEC removal operations on topographic features and habitat were also evaluated. BLM intended future use activities within the area, to include potential construction activities and a description of a likely schedule for those activities (pre or post-transfer), were all considered. The Army provided a preliminary assessment of the MEC safety requirements where appropriate for support of any subsurface activities proposed by BLM.

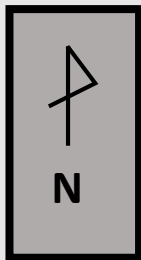
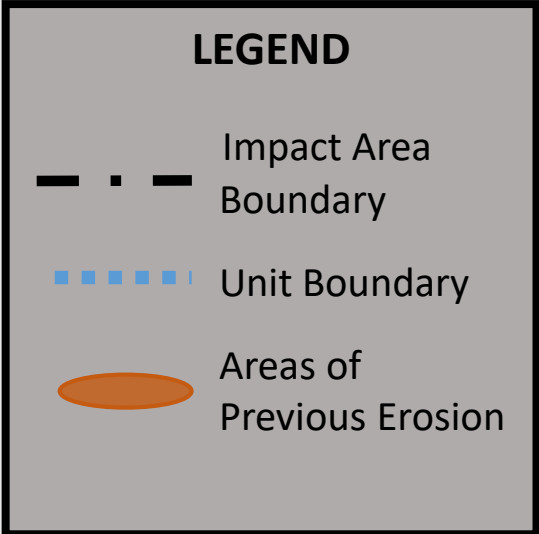
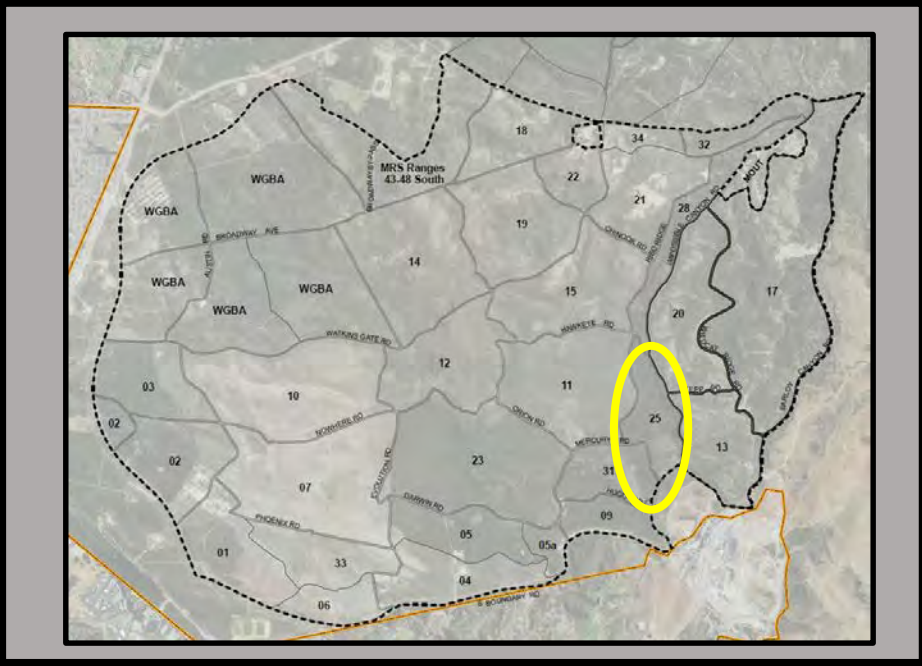
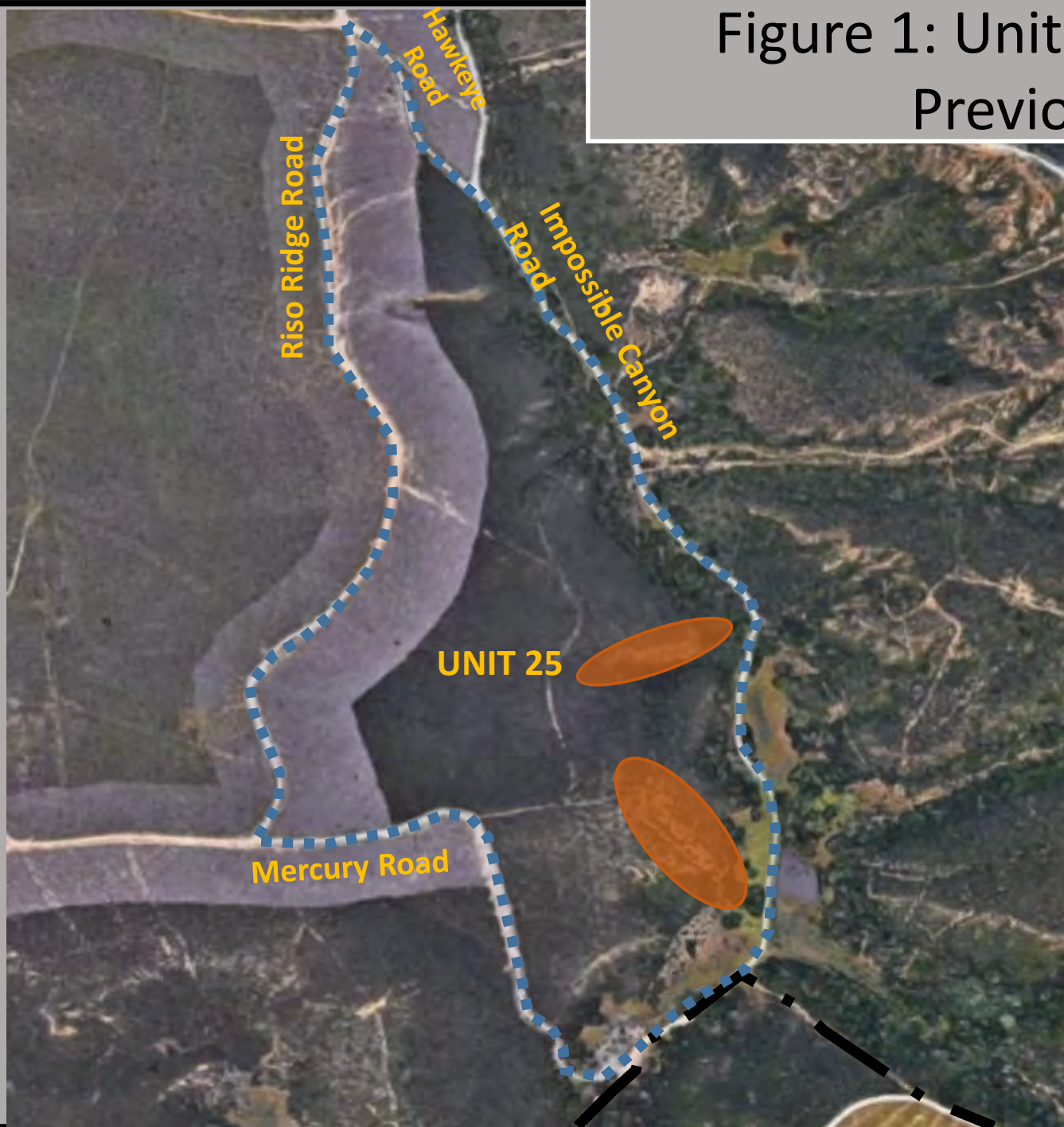
The inspection is intended to determine a mutually acceptable pre-transfer course of action to achieve a suitable MEC safety status for locations of concern within the unit. The Army will evaluate completed MEC removal work, DGM, and surface monitoring data for all comment locations to determine an appropriate level of MEC construction support required for future BLM activities in those areas. An interim determination will be included in the TM and the remedial action report for the subject area and a final determination of construction support requirements will be included in the Track 3 remedial action completion report.

Comments: There were no areas identified by BLM as requiring erosion control work, or fuel break or roadway maintenance. Two areas of previous erosion were identified west of Impossible Canyon Road on the steep slopes of the eastern third of Unit 25 (Figure 1). This erosion is believed to be the result of runoff from an old road that ran across the top of the hill in Unit 25; a road that has not been used for several years and from which runoff has been redirected. The erosion areas show there is evidence of soil stabilization and vegetation regrowth and no work on these areas is deemed necessary.

Photo 1: Example Area of Past Erosion (see figure 1)



Figure 1: Unit Map and Areas of Previous Erosion



Appendix C

DGM QA Approval and Discussion

**FORMER FORT ORD, CALIFORNIA
UNIT 25
QUALITY ASSURANCE REPORT:
DIGITAL GEOPHYSICAL OPERATIONS**



**PREPARED BY
GEOLOGY SECTION
SACRAMENTO DISTRICT
U.S. ARMY CORPS OF ENGINEERS**

**PREPARED FOR
FORT ORD BASE REALIGNMENT AND CLOSURE (BRAC) OFFICE**

MARCH 2018

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1.0 INTRODUCTION

This report covers the Quality Assurance (QA) processes conducted by the U.S. Army Corps of Engineers (USACE) with respect to the collection, processing, and evaluation of digital geophysical data collected by KEMRON Environmental Services, Inc (KEMRON). The field work was performed in Unit 25. Work was performed under WERS contract No. W912DY-10-D-0027, Site-Specific Work Plan, MRS-BLM Units 25 and 31. The field protocols, database management, and QA reviews were based on a combination of methods previously used in other units and described in the UFP-QAPP Volume II Appendix A, along with additional procedures necessary for ensuring compliance with the WERS MMRP contract and the standard operating procedures performed by KEMRON's subcontractors GILBANE and NAEVA. USACE QA verified that KEMRON had an adequate Quality Control (QC) program in place and that data collected in Unit 25 were in accordance with project Data Quality Objectives (DQOs) and Measurement Quality Objectives (MQOs), as established in the UFP-QAPP (KEMRON, 2016). Unit 25 did not include any areas recommended for subsurface removal and were collected in their entirety to meet Category B data.

1.1 Site details

Unit 25 is on the southeastern edge of the Impact Area Munitions Response Area that is planned to be transferred to BLM, as depicted in Figure 1. The area is bounded in the south by the Impact Area's southern boundary and by fuel breaks on the remaining sides. Unit 25 encompasses a total of approximately 95 acres. Due to steep terrain in the eastern portion of Unit 25 approximately 86 acres was accessible to surface clearance and approximately 75 acres was accessible to DGM operations.

Clean-up operations pertinent to DGM activities were initiated with a vegetation clearance followed by an instrument aided surface removal. Unit 25 DGM was collected using the Category B data protocols, as no subsurface removal is planned for this unit. During vegetation clearance and surface clearance, a total of 324 MEC items were removed.

According to the Installation-Wide Multispecies Habitat Management Plan (HMP) for Fort Ord (USACE 1997), the site will be transferred to BLM to be used as an undeveloped habitat reserve. The Impact Area is mostly covered by maritime chaparral and grassland habitats. The terrain in the Impact Area is dominated by rolling hills with elevations ranging from 720-900 ft. above sea level (ASL). These hills are composed of sand associated with Pleistocene aged sand dunes that may be as thick as 250 ft. The eastern edge of Unit 25 contains a number of steep cliffs and gullies that were inaccessible to the DGM survey team, shown in Figure 2.

2.0 QA ACTIVITIES

2.1 Data Collection Methods

Production geophysical data were collected using Geonics EM-61MKII electromagnetic sensors in a multi-coil configuration (towed array) throughout most of the site. The EM-

61MKII is a time-domain electromagnetic sensor that generates an electromagnetic pulse, inducing eddy currents within the subsurface. During the off period of the EM pulse, the eddy current decay produces secondary electromagnetic fields within both ferrous and non-ferrous metallic objects. These secondary electromagnetic fields are received and recorded over four averaged time gates per data collection interval (10Hz).

Data were collected either as individual grids or in grid blocks of variable size consisting of multiple grids. All data collected met the Category B line spacing requirements, with 98% not to exceed a lane spacing of 3 ft. As stated in the MEC Procedures Supplement, the purpose and objective for the Category B DGM surveys is to obtain high quality DGM data in order to characterize the site for overall anomaly distribution and density. Obstacles and issues with terrain precluded 100% coverage and approximately 20 acres of Unit 25 were determined by UXO Safety to be inaccessible to DGM survey due to extreme terrain. All data gaps were appropriately documented in the obstacle files submitted with DGM packages. Figure 2 of this QA report depicts the full DGM dataset for Unit 25.

2.2 Field Oversight

Field oversight was performed intermittently throughout the project by both the USACE Project Geophysicist and the OESS. Appropriate field procedures were reviewed and found to be in compliance. Under the new WERS Contract No. W912DY-10-D-0027, NAEVA is now subcontracted to collect the geophysical data. As there were no Category A areas, no USACE QA DGM data were collected.

2.3 Geophysical System Verification

Under the WERS contract, USACE and KEMRON fully incorporated the physics based Geophysical System Verification (GSV) approach as described in the July 2009 ESTCP report and supported by EM 200-1-15. GSV includes two methods for providing QA/QC: blind seeding and the instrument verification strip (IVS). IVS data results were recorded on daily QC submittals attached as PDF files to the grid blocks.. Data were reviewed by the QA Geophysicist to ensure all MQOs were achieved. The QA data review process is described in section 2.4 and a summary of MQOs for towed array DGM operations is given in Table 1. Further details regarding MQOs are provided in the UFP-QAPP (KEMRON, 2016).

Production data required the GSV blind seeds placed throughout Unit 25, as documented in the UFP-QAPP. By placing blind seeds at an average rate of one per day, the instrument functionality can be tested on a daily basis. Any failures to detect a blind seed could be indicative of an issue with data collection. All blind seeds were small industry standard objects buried at six inches below ground surface. The blind seeds were placed by the QC Geophysicist. All blind QC seeds were detected and both the responses and positioning were within the requirements of the MQOs and SOPs. Table 2 summarizes the QC seed results for Unit 25.

2.4 Digital Data Review

A review of digital geophysics data by the USACE was performed to monitor the effectiveness of data processing and consistency of data delivery. Issues that were reviewed in these data included:

- 1) Missing survey lines within a grid (interline gaps)
- 2) Point-to-point data gaps along survey lines
- 3) Bowing out of survey lines beyond 50% of survey line spacing, unless otherwise collected
- 4) Unreasonable data “spikes”
- 5) Data incongruity across survey grids (Data levels in one grid are not reasonably compatible with data levels in neighboring grids)
- 6) Inadequate data density along survey traverse
- 7) Lack of accurate, precise locations; survey line orientation
- 8) Inadequate/incomplete site survey coverage
- 9) Missing, incomplete, or noncompliant instrument standardization checks
- 10) Completeness of file header information and supporting documentation
- 11) Consistent IVS and GSV results supporting the data quality objectives

To accomplish this, all raw and processed data files were checked by the USACE to ensure that KEMRON followed an appropriate and informative naming convention reflecting the grids surveyed as outlined in the EM 200-1-15. The USACE checked that KEMRON managed the field and processed data in a professional manner, including organization, daily maintenance, and complete documentation. This focused on a review of header files on the pre-processed data (data that has been merged into a single file and synchronized with the GPS data) and processed data to verify that dates were consistent, systems and system sampling parameters were identified, project name and contractor was listed, and all column headers were included and defined. KEMRON also delivered supporting summary sheets that further documented field parameters and processing. All of the summary sheets were reviewed for completeness, verification of calibration data, and consistency to the electronic data file headers.

In order to make the above process more efficient, a grid tracking spreadsheet located in the Unit 25 folder on the FTP site was updated weekly and allowed for the QC Geophysicist and USACE QA Geophysicist to document their verification of each deliverable. Minor issues such as corrupt or incomplete zip files were addressed within the table, major issues were addressed as corrective action requests. The final excel file will be maintained within the Final Data Submittal QC folder on the Fort Ord server.

The procedure for reprocessing and projecting the pseudo-color maps of the DGM Category B data included starting with a 100% review of the data in Geosoft Oasis Montaj to include re-leveling and re-gridding. These digital data were imported into Geosoft for the generation of pseudo-color maps that were then exported as a georeferenced geotif.

Overall, the general QA digital data review consisted at a minimum of:

- 1) Creating a processed database
- 2) Importing XYZ data
- 3) Calculation of sum channel
- 4) Generating a grid (0.25 cell size and blanking distance of 2 ft.) of sum channel
- 5) Plotting the sum channel
- 6) Plotting a symbol cover for the track lines (view coverage)
- 7) Exporting the plots to geotifs
- 8) Importing the geotifs into a GIS

2.5 Corrective Action Request

No corrective action requests were issued for data collected in Unit 25; however one item is of note. IVS Test Items IVS 29, IVS 30, and IVS 31 did not meet the established MQOs for the Item Response and Positional tests on 07/20, 08/01, and 08/14-08/21. The issue was due to a database problem: anomalies picked from the IVS survey were being compared to the wrong IVS Test Items, resulting in the failed MPCs. The QC Geophysicist corrected the IVS item locations in the affected databases and the corrected data was re-submitted. The corrected data was reviewed by the QA geophysicist to confirm daily IVS test data passed established MQOs (Figure 3). As noted, the issue was only due to a database problem and not indicative of a data quality issue. No CAR was issued.

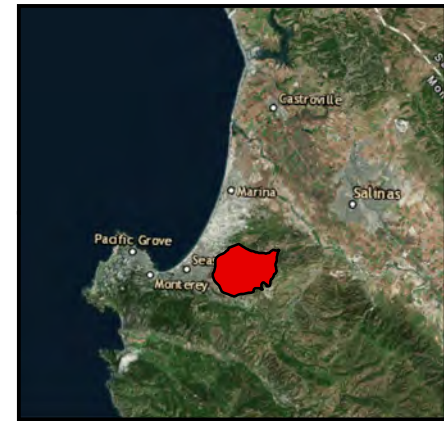
3.0 CONCLUSIONS

QA activities by the Government verified KEMRON had an adequate QC program in place and that data collected within Unit 25 are sufficient and in accordance with the project DQOs and MQOs.

4.0 REFERENCES


KEMRON, 2016. *Final, Quality Assurance Project Plan, Former Fort Ord, California, Volume II, Appendix A, Munitions and Explosives of Concern Remedial Action*. December. (OE-0884A)

5.0 FIGURES



Legend

- Impact Area
- Fuel Breaks
- Unit_25




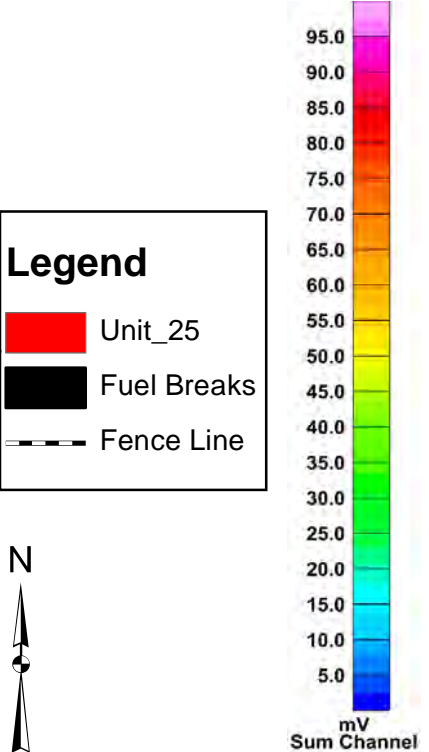
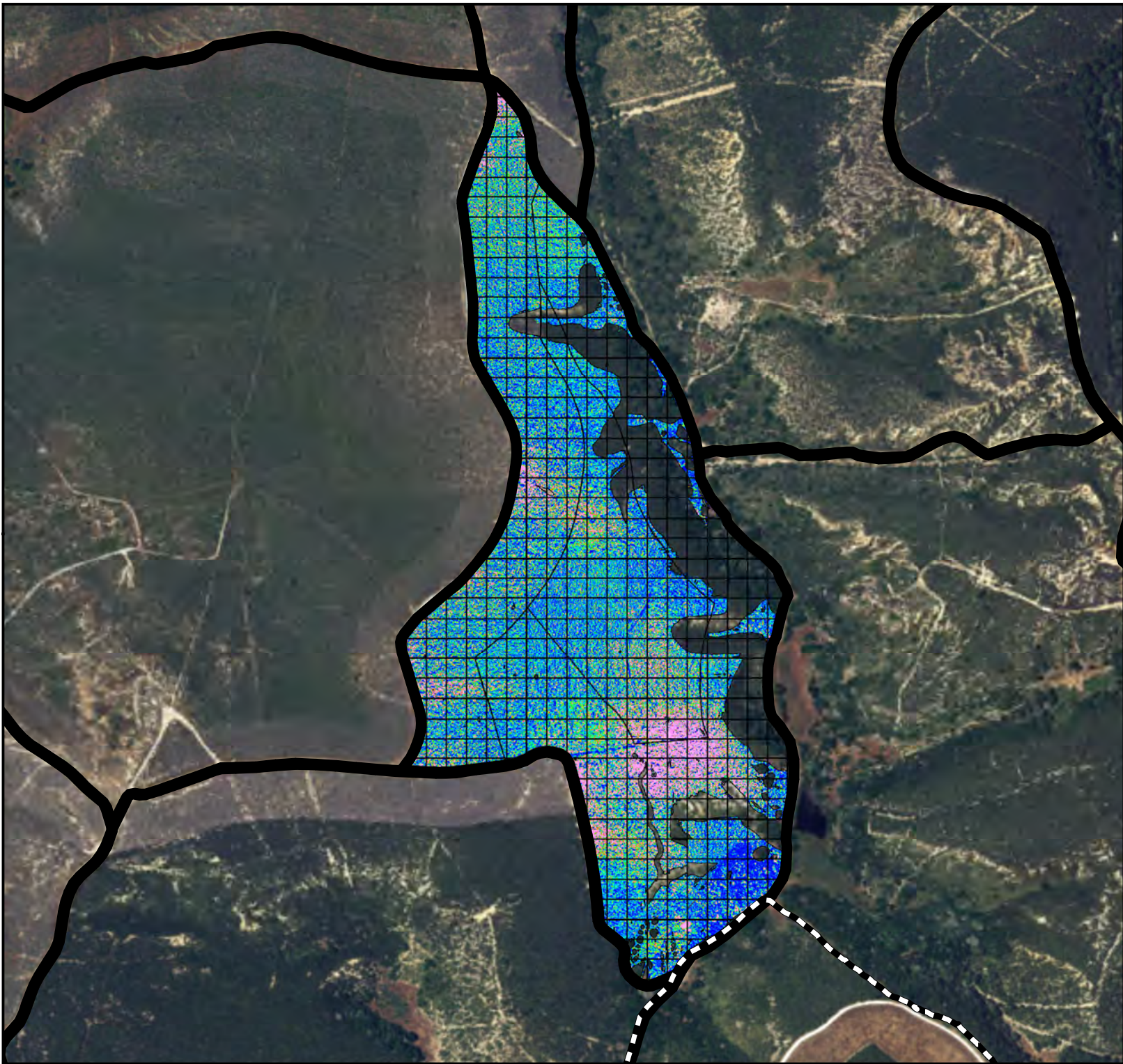
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Sacramento District

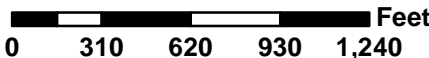
Figure 1

Unit 25
Former Fort Ord, CA



Legend

- Unit_25
- Fuel Breaks
- Fence Line



 U.S. Army Corps of Engineers
Sacramento District

Figure 2

Unit 25 DGM data
Former Fort Ord, CA

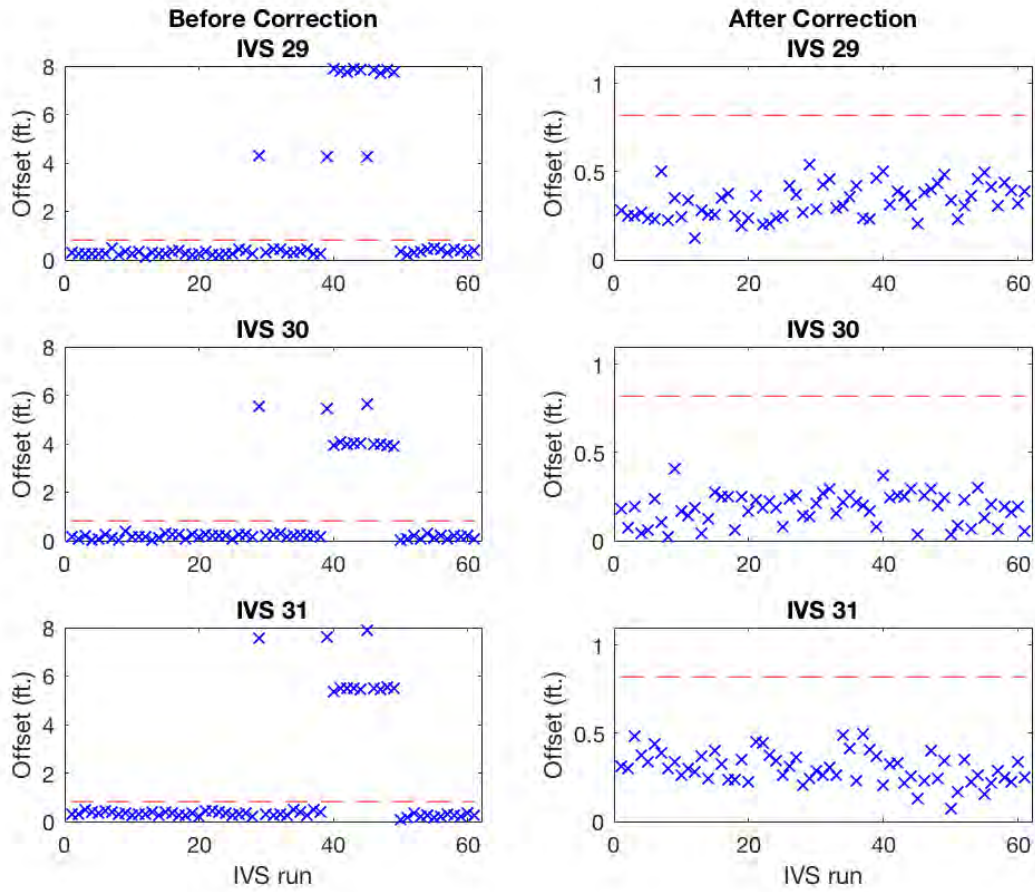


Figure 3. Blue 'x' shows calculated offset between picked DGM target and IVS item location, before and after database correction. Red dashed line shows maximum acceptable offset established in MPC.

6.0 TABLES

| Data Type | DQI | QC Sample and/or Activity to Assess Measurement Performance | MQO | Frequency | Consequence of Failure (a) |
|---|--------------------|---|--|---------------------|---|
| Cable Shake Test | Sensitivity | Instrument Response Tests at the IVS | Cable shake test: 98% of response values will not exceed +/- 2 mV when system cables are moved (for all EM61MK2 channels) | Once Daily (AM) | Do not proceed with DGM field activities until failure is resolved and cable shake test has passed. |
| Personnel Test | Sensitivity | Instrument Response Tests at the IVS | Personnel test (PP): 98% of response values (due to proximity of data collection personnel) will not exceed +/- 2 mV (for all EM61MK2 channels). | Once Daily (AM) | Do not proceed with DGM field activities until failure is resolved and personnel test has passed. |
| Tow Vehicle Test | Sensitivity | Instrument Response Tests at the IVS | Tow vehicle test (towed array): 98% of response values (due to elevated tow vehicle RPM) will not exceed +/- 2 mV (for all EM61MK2 channels). | Once Daily (AM) | Do not proceed with DGM field activities until failure is resolved and tow vehicle test has passed. |
| Static repeatability (instrument functionality) (b) | Accuracy/Precision | Instrument Response Tests at the IVS | <p>98% of the daily static background response values (no test object) will not exceed +/- 2 mV of expected baseline response (for all EM61MK2 channels). (d)</p> <p>98% of the response values to the standard spike test item (a small ISO fixed at an orientation and distance from the sensor to provide an approximately 100 mV response on channel 2 of the EM61MK2) will not exceed +/- 10% of the expected baseline response (for all EM61MK2 channels). (d)</p> | Twice Daily (AM/PM) | <p>If failure occurs during the AM static test, do not proceed with DGM field activities until failure is resolved and AM static test(s) have passed.</p> <p>If failure occurs during PM static test, the day's data fails unless BSI is mapped that day with repeatable anomaly characteristics (see dynamic detection repeatability (GSV blind seeding)).</p> |

| | | | | | |
|---|---|---|---|--|--|
| Along track sampling | Completeness | DGM Data Set or Grid | 98% <= 0.65 ft. (20 cm) | By grid or dataset (c) | Submittal fails. |
| Coverage | Completeness | DGM using GPS Positioning: DGM Data Set or Grid | <p>Category A (towed array): A lane spacing of 2 ft is to be used for the towed array. 95% (or greater) of the lane spacing is to be at the project design lane spacing of 2 ft. 100% of the lane spacing is to be at 3 ft. No unexplained data gaps.</p> <p>Category B (towed array): A lane spacing of 2 ft is to be used for the towed array. 95% (or greater) of the lane spacing is to be at the project design lane spacing of 2 ft. 98% (or greater) of the lane spacing is to be at 3 ft.</p> | By grid or dataset (c) | Data gaps must be filled in before submittal is accepted. |
| Dynamic detection repeatability (IVS) | Accuracy/Precision | Instrument Response Tests at the IVS | <p>98% of the dynamic background response values during the daily IVS survey will not exceed +/- 3 mV of expected baseline response (for all EM61MK2 channels). (d)</p> <p>Instrument response to each IVS item will be within +/- 25% or +/- 2 mV (whichever is greater) of the expected baseline response (for all EM61MK2 channels). The baseline response for each IVS item will be the average of the instrument responses to that item measured during the first week of IVS surveys. (d)</p> | Twice Daily (AM/PM) | <p>If failure occurs during the AM IVS test, do not proceed with DGM field activities until failure is resolved and AM dynamic IVS test(s) have passed.</p> <p>If failure occurs during PM IVS test, the day's data fails unless BSI is mapped that day with repeatable anomaly characteristics (see Dynamic Detection Repeatability (GSV blind seeding)).</p> |
| Dynamic detection repeatability (GSV blind seeding) | Sensitivity/Accuracy/Precision/Completeness | DGM Data Set or Grid | All BSIs must be located. Peak response >75% of maximum expected BSI response. (d) | 1 per day per team (# per acre to be based on production rate) | Submittal fails. |

| | | | | | |
|---|---|--------------------------------------|--|---|--|
| Dynamic positioning repeatability (IVS) | Accuracy/Precision | Instrument Response Tests at the IVS | Position offset of IVS targets < 25 cm. | Twice Daily (AM/PM) | <p>If failure occurs during the AM IVS test, do not proceed with DGM field activities until failure is resolved and AM dynamic IVS test(s) have passed.</p> <p>If failure occurs during PM IVS test, the day's data fails unless BSI is mapped that day with repeatable anomaly characteristics (see Dynamic Positioning Repeatability (GSV blind seeding)).</p> |
| Dynamic positioning repeatability (GSV blind seeding) | Sensitivity/Accuracy/Precision/Completeness | DGM Data Set or Grid | <p>90% positioning offset is ≤ 25 cm + 1/2 line/sensor spacing and 100% is ≤ 35 cm + 1/2 line/sensor spacing for digital positioning systems.</p> <p>For Towed Array DGM using 2 ft line spacing (Category A and Category B) and RTK-GPS: 90% ≤ 22 inches 100% ≤ 26 inches</p> | 1 per team per day (# per acre to be based on production rate - same as dynamic detection repeatability (GSV blind seeding)). | Submittal fails. |
| Velocity | Completeness | DGM Data Set or Grid | 95% of all geophysical measurements with the EM61MK2 will be collected at a speed not to exceed 4 miles per hour (1.8 meters per second) | By grid or dataset (c) | Submittal fails. |
| Target Selection | Completeness | DGM Data Set or Grid | All dig list targets are selected according to project design as detailed in the SSWP | By grid or dataset (c) | Submittal fails. |
| Geodetic equipment functionality | Accuracy/Precision | GPS Function check at IVS | GPS position checks will not exceed +/- 3 inches (7.6 cm) from the established baseline position. | Once Daily (AM) | Do not proceed with DGM field activities until failure is resolved and positional check has passed. |

| | | | | | |
|---------------------------|---|---|--|---|--|
| Geodetic accuracy | Accuracy/Precision | GPS Function Check of Positional monuments used for RTK-GPS base station(s) | Project control points that are used more than once must be repeatable to within 5 cm (e). | For points used more than once, occupation will be repeated (f) for each point used, either monthly (for frequently used points) or before re-use (if used infrequently) (g). | Reset points not located at original locations or resurvey point. |
| Verify Field Work Methods | Accuracy/Precision | QC Geophysicist will monitor field team work methods. | Verify work methods are being performed in accordance with MEC QAPP, SOPs, and SSWP. | Daily | Stop work. Generate an RCA, CAR, and CAP (as necessary). Implement corrective actions. |
| DGM Data Reprocessing | Sensitivity/Accuracy/Precision/Completeness | 10% of DGM Data Set or Grid | DGM data will be reprocessed by the QC Geophysicist in accordance with GEO SOP 8 (Geophysical QC). | Daily | Stop work. Generate an RCA, CAR, and CAP (as necessary). Implement corrective actions. |

Table 1. DGM MQO table for the towed array system.

- (a) All failures require an RCA.
- (b) Duration of data collection is 1 minute for background, 1 minute for spike and 1 minute for second background measurement. All static repeatability is to be compared to original readings to ensure instrument is consistent throughout the project.
- (c) The terms grid and dataset refer to logical groupings of data or data collection event. Logical groupings of data are contiguous areas mapped by the same instrument and in the same relative timeframe. These can be grids, acres, or some other unit of area. A data collection event is similar to logical groupings of data but refers to data collected over a contiguous timeframe, such as morning, afternoon, battery life, or some other measure of contiguous time.
- (d) For static background, the expected baseline mV response is to be based on an average of all the static background readings collected during the first four days (or first week). For static spike the expected baseline peak mV response is to be based on an average of all the static spike readings collected during the first four days (or first week). For the IVS background, the expected baseline mV response is to be based on an average of all the IVS background readings for the first four days (or first week). For the IVS spike, the expected baseline mV response is to be based on an average of all the IVS spike readings for the first four days (or first week). For GSV BSI items the baseline mV response will be determined by recording an additional survey line that is offset ½ of the planned survey line spacing (1 ft) from the center of the seeded IVS line. This offset line will be recorded twice daily (am/pm) during the first four days (or first week) of DGM operation with the PP system(s) and the baseline mV response to be used for BSIs (for PP and towed array systems) will then be calculated by averaging all of the peak readings for each ISO at this 1 ft offset. Note that separate baselines will be generated and used for the PP and towed-array system static and IVS tests.
- (e) GPS base station coordinates that are currently being used are provided by USACE/BRAC.
- (f) Repeat occupation means demonstrate the control points being used can be recovered and reoccupied and that they have not moved more than the requirement specification. This can be accomplished using the same methodology used to initially tie the local network to a HARN, CORS, OPUS, or other recognized network, or it can be accomplished by other means that achieve this requirement.

- (g) An example of frequently used control points would be points used as RTK DGPS base stations. Infrequently used points could be those used during GPS operations where the control point was used during mapping and then again at some later time for reacquisition and QC statistical sampling. Infrequently used points also could include grid corners; they are used for line and fiducial positioning and then reused for reacquisition or QC statistical sampling.

| Seed_ID | Grid | Reported Response | Response Passes? | Total Offset (in) | Positioning Passes? |
|---------|--------|-------------------|------------------|-------------------|---------------------|
| 25001G | A3J5F6 | 401.87 | Yes | 8.066631092 | Yes |
| 25003G | A3J5D4 | 229.48 | Yes | 9.465742548 | Yes |
| 25002G | A3J5E5 | 212.93 | Yes | 7.209632065 | Yes |
| 25012G | B3A5B8 | 339.00 | Yes | 5.39122981 | Yes |
| 25008G | B3B5B8 | 367.93 | Yes | 12.08490396 | Yes |
| 25007G | B3B5E8 | 253.14 | Yes | 3.750613002 | Yes |
| 25011G | B3A5D9 | 229.28 | Yes | 10.56831559 | Yes |
| 25009G | B3A5I9 | 322.11 | Yes | 14.7613516 | Yes |
| 25010G | B3A5G0 | 188.75 | Yes | 5.779481555 | Yes |
| 25004G | B3C5D7 | 201.42 | Yes | 12.1041416 | Yes |
| 25005G | B3C5A8 | 316.40 | Yes | 13.69699917 | Yes |
| 25006G | B3B5H7 | 367.69 | Yes | 19.91976326 | Yes |
| 25014G | A3J6C2 | 387.26 | Yes | 7.436370073 | Yes |
| 25013G | A3J6E1 | 499.11 | Yes | 6.908801342 | Yes |
| 25015G | A3J6B3 | 269.04 | Yes | 9.851875757 | Yes |
| 25020G | B3B5H0 | 309.07 | Yes | 7.308719178 | Yes |
| 25018G | B3B5J0 | 397.18 | Yes | 9.226158463 | Yes |
| 25019G | B3B6I1 | 284.09 | Yes | 10.21916787 | Yes |
| 25016G | A3J6A4 | 347.21 | Yes | 14.78189596 | Yes |
| 25021G | A3J5I9 | 252.12 | Yes | 10.28383197 | Yes |
| 25022G | A3J6J1 | 471.66 | Yes | 10.30573666 | Yes |
| 25025G | A3J6H7 | 637.16 | Yes | 5.557567809 | Yes |
| 25017G | A3I6J5 | 505.25 | Yes | 2.060823137 | Yes |
| 25023G | B3A6B3 | 625.06 | Yes | 12.76457661 | Yes |
| 25029G | A3I6I6 | 381.85 | Yes | 3.502725794 | Yes |
| 25027G | A3I6J8 | 365.32 | Yes | 9.841646202 | Yes |

Table 2. Blind QC seed response and positioning results.

Appendix D
Responses to Comments



RESPONSES TO COMMENTS

Document: MRS-BLM Unit 25 Munitions and Explosives of Concern (MEC)
Remedial Action Technical Memorandum, January 2018

Commenting Organization: United States Environmental Protection Agency (EPA)

Name: Judy C. Huang

Date of Comments: January 25, 2018

General Comment 1:

The MRS-BLM Unit 25 Munitions and Explosives of Concern (MEC) Remedial Action Technical Memorandum (hereinafter referred to as the "MRS-BLM Unit 25 MEC RA TM"), states in Section 6.0, Recommendations for Additional Subsurface MEC Remediation, and in Section 7.0, Conclusions/Summary of Recommendations, that "No additional subsurface MEC removal is recommended for Unit 25." No basis for this determination is provided in either section. Also, no qualifications are provided restricting this recommendation to existing or currently identified future uses for the area. Please expand the noted sections as necessary to correct these omissions.

Response to General Comment 1:

The following text has been added to the referenced statement in Section 6.0: "This recommendation is based on the joint inspection described above between the Army and BLM and the future planned land reuse. Additionally, the Army is currently conducting a field study designed to provide more information about how risks from MEC items with sensitive fuzes that potentially remain in the subsurface of areas/grids could be addressed in the future. A recommendation on this issue will be deferred until after the completion of the field study."

Specific Comment 1:

Section 1, Introduction, Page 1: This section does not state the type of remedial action (e.g., surface removal, subsurface removal to depth of detection, subsurface removal to a specific depth) that was conducted in MRS-BLM Unit 25. Please revise the cited section to include a description of the type of remedial action that was conducted at the noted location.

Response to Specific Comment 1:

Section 1 text has been revised as follows: "This Technical Memorandum (TM) describes the munitions and explosives of concern (MEC) remedial action (RA) [surface MEC remediation and



RESPONSES TO COMMENTS

DGM survey] that was performed by KEMRON Environmental Services (KEMRON) with Gilbane as a subcontractor within Munitions Response Site (MRS) - Bureau of Land Management (BLM) Unit 25 (Figure 1).”

Subsurface removal areas were not identified in Unit 25 during the development of the Site-Specific Work Plan.

Specific Comment 2:

Table 1, MEC Items Encountered and Removed Prior to Remedial Action Operations, Unnumbered Page: The nomenclature of the majority of the munitions listed in the table are missing the letter “s” found as the last letter in the formal nomenclature thereof. This is due to the current formatting of the “Description” column of the table. Please reformat the noted column of the table to allow the entire nomenclature of all listed munitions to be displayed.

Response to Specific Comment 2:

Changes to table formatting have been made to all affected tables.

Specific Comment 3:

Table 2, MEC Items Encountered and Removed During Operations Covered in TM, Page 3 of 7: The nomenclature of the munition listed on the ninth line of this page of the table should read “Projectile, 4.2inch, mortar, smoke, white phosphorous, M328 series.” However, as the table is currently formatted, the portion of the nomenclature that reads “8 series” is not visible. Please reformat the noted table or the munition nomenclature to allow the entire nomenclature to be displayed.

Response to Specific Comment 3:

Changes to table formatting have been made to all affected tables.

Specific Comment 4:

Table 2, MEC Items Encountered and Removed During Operations Covered in TM, Page 7 of 7: The table does not contain the total of the items contained therein. Please revise the noted table to include the total of the MEC items encountered and removed.

Response to Specific Comment 4:

A total has been added to the bottom of Table 2.

RESPONSES TO COMMENTS

Specific Comment 5:

Table 3, Cumulative Results, Page 1 of 1: The table title does not specify whether the results noted include those of previous actions on the site (Table 1) or are limited to the results of the remedial action covered by this Technical Memorandum (TM). Please revise the title of Table 3 to read “Cumulative Results of the Remedial Action Operations Addressed in this TM,” or provide a similar title that indicates that the results are only associated with the noted remedial action.

Response to Specific Comment 5:

Title to Table 3 has been changed to Cumulative Results of the Remedial Action. This table does not include items from Table 1.

Specific Comment 6:

Table 4, MEC Recovery Information, Page 1 of 1: The table title does not specify whether the results noted include those of previous actions on the site (Table 1) or are limited to the results of the remedial action covered by this TM. Also, the table contains a column labeled as “Unit 28.” This should read “Unit 25” instead. Please revise the title of Table 4 to read “Remedial Action MEC Recovery Information,” or provide a similar title that indicates that the results are only associated with the noted remedial action. Also, correct the noted mislabeling of the column in the table.

Response to Specific Comment 6:

Title to Table 4 has been changed to MEC Recovered by Type during Remedial Action. This table does not include items from Table 1. Unit identification has been changed to Unit 25.



RESPONSES TO COMMENTS

Document: MRS-BLM Unit 25 Munitions and Explosives of Concern (MEC)
Remedial Action Technical Memorandum, January 2018

Commenting Organization: Department of Toxic Substances Control (DTSC)

Name: Vlado Arsov

Date of Comments: February 15, 2018

Specific Comment 1:

Section 1.0, Middle of the paragraph: “Unit 25 vegetation clearance was initially intended to be performed by prescribed burning.”

Consider starting a new paragraph since this is a description of the vegetation clearance activities. Please include a short description of DGM survey since you described vegetation clearance earlier.

Response to Specific Comment 1:

A new paragraph was started for the description of the vegetation clearance activities. Digital geophysical mapping (DGM) survey is described in Section 2.3.

Specific Comment 2:

Section 2.3, First paragraph: “Appendix C includes the USACE DGM QA approval and Discussion for Unit 25.”

Please include a short discussion about objectives described in the QAPP and referenced in the Appendix C.

Response to Specific Comment 2:

The text of Section 2.2 has been revised as follows: “Quality control/quality assurance (QC/QA) processes were implemented in accordance with the Final SSWP (KEMRON, 2016a) and the Final Quality Assurance Project Plan, Volume II, Appendix A, Munitions and Explosives of Concern Remedial Action, Former Fort Ord, California (MEC QAPP) (KEMRON, 2016b).”

The text of Section 2.3 has been revised as follows: “Measurement quality objectives were met and QC/QA processes were implemented in accordance with the Final SSWP (KEMRON,

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2016a) and the MEC QAPP (KEMRON, 2016b). Measurement performance criteria were evaluated according to the standards specified in the QAPP and the Final SSWP. Specific criteria that were evaluated included GPS accuracy, static background and response tests, dynamic background and response tests (IVS), velocity, minimum along track sampling and across track coverage, accurate detection of Blind Seeds with respect to both response and positioning, surveillance of field methods, and reprocessing of field data. Each of these criteria were evaluated separately with results recorded in the project database and subsequently reviewed by the QC Geophysicist. Appendix C includes the USACE DGM QA Approval and Discussion for Unit 25.”

Specific Comment 3:

Section 6.0, Second paragraph: “Factors that will be considered when determining whether additional actions are necessary include...”

This Section 6.0 is about recommendations. Could you explain are you still working on considerations and they are not completed at this moment? Will you make recommendations in the new Section 6.0 once you are done with considerations?

Response to Specific Comment 3:

Recommendations for Unit 25 are not expected to change at the next stage of the TM. The text noted is a synopsis from the Track 3 ROD and is intended to describe factors that were considered in order to make recommendations.

Specific Comment 4:

Section 6.0, Fourth paragraph: “The Army is currently conducting a field study designed to provide more information about how areas/grids where MEC of the type containing sensitive fuzes were recovered during surface removal could be addressed in the future.”

Similar to comment #3. Will Section 6.0 be changed once the field study designed to provide more information is conducted?

Response to Specific Comment 4:

Recommendations for Unit 25 are not expected to change after the completion of the field study. If subsurface MEC removal is planned following completion of the field study, a separate work plan will be developed to conduct this work in Unit 25 and other units.

RESPONSES TO COMMENTS

Specific Comment 5:

Section 6.0, First bullet: “Areas where MEC with sensitive fuzes were located will be monitored with enhanced procedures during annual surface area monitoring.”

Please describe these "procedures"? Could you give examples of such procedures?

Response to Specific Comment 5:

Enhanced monitoring procedures involve observing more than 10 percent of the visible surface area within 100 feet of the location of UXO with sensitive fuzes that were previously removed. The procedure is described in reports of annual surface monitoring (the most recent report is for 2017, Administrative Record number: OE-0847H).

Specific Comment 6:

Section 6.0, Sixth and Seventh paragraph: “A joint Army-BLM inspection summary is provided in Appendix B. This summary describes areas such as erosion features that appear to have naturally stabilized, and currently do not require subsurface MEC removal...No additional subsurface MEC removal is recommended for Unit 25.”

Could you expand on findings included in the Appendix B and how they are related to any future MEC removals in this area since you do not recommend any action?

Include a description of how it was determined that this area is naturally stabilized.

Response to Specific Comment 6:

As described in the joint inspection summary, the Army and BLM conducted a joint inspection of the unit after technology-aided surface removal and DGM were completed, to determine if any areas may require subsurface removal action, or future construction support, based on BLM's planned use (e.g., erosion control measures.)

The determination was made during the inspection based on the amount of vegetation regrowth in the affected area, which had stopped or greatly reduced current erosion problems. In addition the concern that conducting subsurface removal to address erosion could enlarge the area affected in the short term.

RESPONSES TO COMMENTS

Specific Comment 7:

Table 1: Formatting. Make sure text can fit in the cell and all tables use same borders.

Response to Specific Comment 7:

Changes to cell size and table formatting has been made to all tables.

Specific Comment 8:

Table 2: Formatting. Make sure text can fit in the cell and all tables use same borders. You may consider grouping same MEC items that were discovered on the same day to make this table smaller.

Response to Specific Comment 8:

Changes to cell size and table formatting has been made to all tables.

Specific Comment 9:

Table 3:

“Cumulative Results

| | |
|---|-----|
| Analog subsurface removal acreage | 0 |
| Digital Subsurface removal acreage | 0 |
| DGM survey acreage | 75” |

Could you modify the title and clarify what significance is of Table 3?

Could you confirm that DGM surface removal was completed, but no Subsurface removal as required by ROD? Was Digital Subsurface removal technology same as DGM or is it different?
Formatting. Make sure all tables use same borders.

Response to Specific Comment 9:

Title to Table 3 has been changed to Cumulative Results of the Remedial Action. Table 3 is intended to provide a cumulative summary of remedial action data collected. Surface MEC removal was performed prior to DGM data collection (DGM survey). Subsurface removal areas were not identified in Unit 25 during the development of the SSWP, therefore, no DGM-based subsurface MEC removal (or analog-based subsurface MEC removal) was performed in Unit 25. Changes to table formatting has been made to all tables.

RESPONSES TO COMMENTS

Specific Comment 10:

Table 4:

“MEC Recovery Information
Unit 28”

Please clarify the title. Is this a total Recovered MEC items per type? Is this total obtained from all items in Tables 1 and 2? The significance of each table should be described in the narrative of the report.

Formatting. Make sure all tables use same borders. Typo, Unit 25.

Response to Specific Comment 10:

Title to Table 4 has been changed to MEC Recovered by Type during Remedial Action. This table does not include items from Table 1. Unit identification has been changed to Unit 25. Changes to table formatting has been made to all tables.

Specific Comment 11:

Table 5: Could you confirm that DGM surface removal was completed, but no Subsurface removal per ROD requirements?

Formatting. Make sure all tables use same borders.

Response to Specific Comment 11:

Surface MEC removal was performed prior to DGM data collection (DGM survey). No DGM-based subsurface MEC removal (or analog-based subsurface MEC removal) was performed in Unit 25.

Specific Comment 12:

Appendix C, Section 1.0, First paragraph: “USACE QA verified that KEMRON had an adequate Quality Control (QC) program in place and that data collected in Unit 25 were in accordance with project Data Quality Objectives (DQOs) and measurement Quality Objectives (MQOs), as established in the UFP-QAPP.”

Could you reference UFP QAPP in the main text and give a short description of what were the MQOs?

RESPONSES TO COMMENTS

Response to Specific Comment 12:

A reference to the QAPP and a brief text describing the quality objectives for the DGM operations were added to Section 2.3 of the QA report.

Specific Comment 13:

Appendix C, Section 3.0, First paragraph: “QA activities by the Government verified KEMRON had an adequate QC program in place and that data collected within Unit 25 are sufficient and in accordance with the project DQOs and MQOs.”

Please describe the DQOs and MQOs and explain how they were met? Please include a short paragraph about these in the main text?

Response to Specific Comment 13:

Project DQOs and MQOs are described in the QAPP. A reference to the QAPP and a brief text describing the quality objectives for the DGM operations were added to Section 2.3 of the QA report.

Specific Comment 14:

Figure 1 and 2 (Appendix C):

“Unit 25
Former Fort Ord, CA”

Please include titles for both figures.

Response to Specific Comment 14:

Titles were added to the two figures in the QA report.