# Addendum to Final Work Plan

# MRS-BLM Units 1-5

# Munitions and Explosives of Concern Removal

# Former Fort Ord, California

# Unit 5

## FORT ORD MEC INTERIM SUPPORT SATOC

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*Prepared for*

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ENVIRONMENTAL SERVICES

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# Unit 5

**November 2021**

**Draft**

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# ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| AFB | Air Force Base |
| BCT | BRAC Cleanup Team |
| BGS | Below Ground Surface |
| BLM | Bureau of Land Management |
| BRAC | Base Realignment and Closure |
| CAR | Corrective Action Request |
| CMC | Central Maritime Chaparral |
| CTS | California Tiger Salamander |
| CWM | Chemical Warfare Materiel |
| DDESB | Department of Defense Explosive Safety Board |
| DGM | Digital Geophysical Mapping |
| EOD | Explosive Ordnance Disposal |
| ESA | Endangered Species Act |
| FWV | Field Work Variance |
| GIP | Geophysical Investigation Plan |
| GPO | Geophysical Prove Out |
| GPS | Global Positioning System |
| GSV | Geophysical System Verification |
| HA | Historical Area |
| HE | high explosive |
| HFD | highest fragmentation distance |
| HMP | Habitat Management Plan |
| IVS | Instrument Verification Strip |
| KEMRON | KEMRON Environmental Services, Inc |
| KO | Contracting Officer |
| MD | Munitions Debris |
| MEC | Munitions and Explosives of Concern |
| MFD-H | fragmentation distance-horizontal |
| MGFD | greatest fragmentation distance |
| MPPEH | Material Potentially Presenting an Explosive Hazard |
| MQO | Measurement Quality Objective |
| MRA | Munitions Response Area |
| MRS-BLM | Munitions Response Site - Bureau of Land Management |
| ODDS | Ordnance Detection and Discrimination Study |
| OESS | Ordnance and Explosives Safety Expert |
| PM | Project Manager |
| RA | Remedial Action |
| RAR | Remedial Action Report |
| RRD | Range-Related Debris |
| SOP | Standard Operating Procedure |
| SSWP | Site-Specific Work Plan |
| SUXOS | Senior Unexploded Ordnance Supervisor |
| TM | Technical Memorandum |

| | |
|---|---|
| USACE | United States Army Corps of Engineers |
| USFWS | United States Fish and Wildlife Service |
| UXO | Unexploded Ordnance |
| UXOQCS | UXO QC Specialist |
| UXOSO | Unexploded Ordnance Safety Officer |

# 1.0 INTRODUCTION

This Site-Specific Work Plan (SSWP) Addendum amends the *Final Work Plan MRS-BLM Units 1-5 Munitions and Explosives of Concern Remedial Action Former Fort Ord, California* [Units 1-5 Final Work Plan] (Shaw, 2008) and outlines the site-specific procedures for a munitions and explosives of concern (MEC) remedial action (RA) in Munitions Response Site – Bureau of Land Management (MRS-BLM) Unit 5. The Units 1-5 Final Work Plan (Shaw, 2008) was initially developed in 2008 and encompassed the planned RAs in five units. Since 2008, several procedures and guidance documents have been updated. This SSWP Addendum incorporates the updated procedures that will be utilized for the Unit 5 RA. Figure 1 provides a general site layout of Unit 5. All MEC RAs addressed in this SSWP Addendum are planned within the Impact Area Munitions Response Area (MRA) at the former Fort Ord, California. In compliance 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] (Army, 2008), surface MEC removal and digital geophysical mapping (DGM) are planned for Unit 5 and will be conducted in accordance with the *Final Work Plan, Remedial Design/Remedial Action, Track 3 Impact Area Munitions Response Area, Former Fort Ord* [Track 3 RD/RA WP] (USACE, 2009), and *Remedial Design (RD)/Remedial Action (RA) Work Plan Update, Track 3 Impact Area Munitions Response Area (MRA) Munitions and Explosives of Concern (MEC) Removal, Former Fort Ord, California* [Track 3 RD/RA WP Update] (KEMRON, 2018). This SSWP includes sections that require changes from the Units 1-5 Final Work Plan (Shaw, 2008) and apply to the Unit 5 RA.

## 1.1 Purpose

The overall scope of work for Unit 5 involves surface MEC removal, DGM, and subsurface MEC removal in selected areas. Due to the potential presence of large high explosive (HE) projectiles on the ground surface in Unit 5 and the close proximity of Unit 5 to populated areas, the Army in coordination with United States Fish and Wildlife Service (USFWS) deemed prescribed burning prior to surface MEC removal unsafe. Therefore, vegetation within Unit 5 will be removed manually and mechanically instead of through prescribed burning. Manual vegetation removal will be conducted for tree limbing and ground vegetation clearance in areas that are inaccessible to mechanical equipment or are inside designated California Tiger Salamander (CTS) protection buffers around vernal ponds.

This Unit 5 SSWP Addendum outlines procedures for:

- Manual and/or mechanical vegetation cutting
- Grid establishment
- Technology-aided surface MEC removal in accessible areas of Unit 5
- Geophysical anomaly investigation in Pond 21
- Digital geophysical mapping (DGM) in accessible areas of Unit 5

Section 2.4 lists the detailed MEC Standard Operating Procedures (SOPs) for the Unit 5 RA.

## 1.2 Site Location

Fort Ord is located in northwestern Monterey County, California, approximately 120 miles south of San Francisco. The Impact Area MRA consists of approximately 6,560 acres in the southwestern portion of the former Fort Ord. Unit 5 is approximately 129.5 acres and is in the southern portion of the MRA, within the MRS-BLM. Unit 5 is bounded by Darwin Road to the North, Nason Road and Unit 5A to the East, Vulcan Road and Unit 4 to the South, Unit 7 and Evolution Road to the West. Darwin Road and Evolution Road are regularly maintained fuel breaks. It should be noted that Vulcan Road and Nason Road are not part of the regularly maintained fuel break system. Figure 1 provides a regional location map and highlights the location and surrounding areas of Unit 5.

### 1.2.1 Military History

The Impact Area MRA includes a large number of ranges that have various historical uses, designs, and characteristics as described in the *Track 3 Impact Area MRA Remedial Investigation/ Feasibility Study* [Track 3 RI/FS] (MACTEC, 2007). Over the years, various types of munitions have been used during training activities within the Impact Area MRA, including hand grenades, mortars, rockets, mines, artillery projectiles, and small arms. Select ranges were used for small arms training activities only, while other ranges were characterized as multi-use. The firing ranges were located along the perimeter of the historical Impact Area such that weapons firing was generally directed toward the center of the historical Impact Area. The historical Impact Area encompassed an area bounded by Eucalyptus Road to the north, General Jim Moore Boulevard to the west, South Boundary Road to the south, and Barloy Canyon Road to the east. Training activities at the Impact Area MRA ceased after the closure of Fort Ord in 1994. Table 1 list the ranges associated with Unit 5.

### 1.2.2 Previous Remedial Actions

Previous RA activities have occurred in Unit 5, including DGM, surface and subsurface MEC removal, and soil remediation as described below:

- In 1997 and 1998, USA Environmental, Inc. (formerly CMS) conducted a four-foot removal over the roads and trails within the Impact Area. This activity was intended to allow for safe vehicular access within the Impact Area. This work is reported in the *Final 4' OE Removal After Action Report, Inland Range Contract, Former Fort Ord, California Site OE-15 (Roads and Trails)* (USA Environmental, Inc., 2001). Vulcan Road and Forrestal Road occur within Unit 5. One UXO item was recovered on Vulcan Road.
- In 1998, USA Environmental, Inc conducted a 100 percent grid sampling in areas within the Impact Area outside of the firing lines. This action was intended to gather characterization data for the Impact Area. This work is reported in the *Final After Action Report 100% Grid Sampling Inland Range Contract Former Ford Ord, California Site OE-15B* (USA Environmental, Inc., 2000). One of the sampling grids is located within Unit 5. One UXO item was recovered.
- In 2010, Shaw conducted a DGM survey and DGM digs after soil remediation in Historical Area (HA) -29 which is in the central part of the unit as described in the *Final Remedial Action*

*Completion Report, Site 39 Inland Ranges Habitat Reserve, Former Fort Ord, California* (Gilbane, 2014).

- In 2013, Shaw conducted a DGM survey, and Gilbane performed surface MEC removal in the southwestern corner of the unit for prescribed burn containment line preparation *MRS-BLM Units 7, 10, and 33 MEC Remedial Action, Technical Memorandum, Former Fort Ord, California* (Gilbane, 2015).
- In 2020, the United States Army Corps of Engineers (USACE) completed the DGM survey in Pond 21 as described in the *Final DGM Survey of Vernal Pond 21 at Former Fort Ord, Monterey, California* (USACE, 2021). KEMRON/USACE consider Pond 21 where DGM was conducted with an Unexploded Ordnance (UXO) escort to be surface MEC removal complete or not required.

Previously discovered MEC from Unit 5 are listed in Table 2 and shown on Figure 2. Table 3 provides the previous RAs, the Figure 2 legend description, the general location on Figure 2, the document where the RA is documented, and the document's administrative record number.

### 1.2.3 Reuse

Unit 5 is designated as habitat reserve under the *Installation-Wide Multispecies Habitat Management Plan for Former Fort Ord* [HMP] (USACE, 1997) and is currently designated for transfer to BLM. The HMP (USACE, 1997) describes special land restrictions and habitat management requirements within habitat reserve areas. Based on information provided by BLM and the Track 3 RI/FS (MACTEC, 2007), the reuse of the area as a habitat reserve is anticipated to include a variety of activities including:

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

### 1.2.4 Regulatory Status

Section 1.8 of the Units 1-5 Final Work Plan (Shaw, 2008) continues to apply for Unit 5 and provides additional regulatory status information. The MEC remedial activities will follow the requirements detailed in the Track 3 ROD (Army, 2008) and Track 3 RD/RA WP (USACE, 2009), and Track 3 RD/RA WP Update (KEMRON, 2018). Additional information regarding the regulatory status of the former Fort Ord is provided in the *Final Quality Assurance Project Plan Former Fort Ord, California Volume II Appendix A Munitions and Explosives of Concern Remedial Action* [MEC QAPP] (KEMRON, 2016).

## 1.3 Changes to Work Plan

This SSWP Addendum was prepared after careful evaluation and is based on the best available information. During execution of the work, however, unforeseen circumstances or events may arise that require modification to the procedures discussed herein. The following approach will be followed should the need arise to modify this SSWP:

- An initial assessment will be made by KEMRON Environmental Services, Inc (KEMRON) Project Manager (PM) who will discuss a potential modification with the USACE PM (and Contracting Officer (KO), if the change also requires a contract modification). The KEMRON PM (or his designee) will determine and document via memorandum to the USACE PM, KO (if applicable), and the Fort Ord Base Realignment and Closure (BRAC) Office whether the change is material or procedural and how it will be implemented. If the change is material, the Army will notify regulatory agencies.

- Under no circumstances will any change to this SSWP Addendum be executed unless specifically approved by the USACE PM and the KEMRON PM.

- If the circumstances requiring the change are material and involve a safety or quality concern, the KEMRON PM will immediately suspend work affected by the unforeseen condition or activity until the cause is investigated and approved procedures are in place. The KEMRON PM will also immediately notify the USACE PM and, if appropriate, the Fort Ord BRAC Office.

- KEMRON will develop and submit the required changes to USACE PM for review and approval/acceptance. Approved modifications will be incorporated into this SSWP and provided to the Fort Ord BRAC Office, regulatory agencies, and interested stakeholders prior to implementation.

- Changes to the SSWP Addendum will be identified through the use of a Field Work Variance (FWV). Signed FWVs will be provided to the Fort Ord BRAC Office, regulatory agencies, and interested stakeholders, regardless of whether the change is procedural or material.

## 1.4 Habitat

Baseline vegetation conditions for Unit 5 are documented in the *2015 Annual Monitoring Report and 2015 Annual Wetland Vegetation and Wildlife Monitoring Report Former Fort Ord* (Burleson Consulting Inc., 2016) and consist primarily of mature central maritime chaparral (CMC) stands and a large wet meadow (Pond 21). Small areas of coast live oak woodland and a potential additional small wet meadow are present. The dominant shrub species observed at Unit 5 occur in mature habitat that includes shaggy-barked manzanita, chamise, Monterey ceanothus, black sage, poison oak, and sandmat manzanita. CMC is inhabited by many rare, threatened, and endangered species at Fort Ord and is considered a rare and declining plant community by the California Department of Fish and Wildlife. Species that occur within CMC in Unit 5 are the HMP annual plant Monterey spineflower (*Chorizanthe p. pungens*), the perennial

Yadon's piperia (*Piperia yadonii*), and the shrub species Hooker's manzanita (*Arctostaphylos h. hookeri*), sandmat manzanita (*A. pumila*), Monterey manzanita (*A. montereyensis*), Monterey Ceanothus (*Ceanothus rigidus*), and Eastwood's golden bush (*Ericameria fasciculata*). Black legless lizards (*Anniella pulchra nigra*) could be encountered in any areas with sandy soils. CTS (*Ambystoma californiense)* may be encountered, as Ponds 21 and 49 (located immediately adjacent in Unit 4) are known CTS breeding habitat, and upland and dispersal habitat for the species occur within Unit 5.

# 2.0 TECHNICAL MANAGEMENT PLAN

## 2.1 Purpose and Scope

This Technical Management Plan identifies the general approach, methods, and operational procedures to be employed during the munitions response at Unit 5. The scope includes technology-aided surface MEC removal, subsurface MEC removal in specific areas, and DGM survey. Previous RA activities have occurred in Unit 5, including DGM, surface and subsurface MEC removal, and soil remediation. The previous RA work is discussed in detail in Section 1.2.2.

## 2.2 General Requirements

This section presents the general requirements for the RA in Unit 5.

### 2.2.1 Update to Regulatory Guidance

The Impact Area MRA was evaluated in the Track 3 RI/FS (MACTEC, 2007). Based on the RI/FS, the Track 3 remedy was selected and is documented in the Track 3 ROD (Army, 2008). The selected remedy includes (1) vegetation clearance via prescribed burning, (2) technology-aided surface MEC removal, (3) subsurface MEC removal in selected areas, (4) digital geophysical survey, and (5) land use controls. It should be noted that prescribed burning is no longer planned for Unit 5. The decision to not perform prescribed burning has been approved by the United States Fish and Wildlife Service (USFWS). The Track 3 RD/RA WP Update (KEMRON, 2018) summarized the RAs completed through November 2018 and military munitions response actions that applied to the remaining work under the Track 3 ROD (Army, 2008).

The work will be performed under the requirements outlined in the *Defense Explosives Safety Regulation*, 6055.09, Edition 1 (Regulation, 2019), *Safety and Health Manual, EM385-1-1* (USACE, 2014), the *Department of Defense Explosive Safety Board's Methodologies for Calculating Primary Fragment Characteristics Technical Paper 16, Revision 4* (DDESB, 2016), and the *Minimum Qualifications for Personnel Conducting Munitions and Explosives of Concern-Related Activities, Technical Paper 18, Revision 1* (DDESB, 2020). Additional applicable guidance, regulations, and policies are provided in the MEC QAPP (KEMRON, 2016).

### 2.2.2 Chemical Warfare Materiel Procedures

Chemical Warfare Materiel (CWM) is not expected to be encountered within Unit 5 or anywhere on former Fort Ord based on historical research and previous investigations. Procedures to be followed if CWM is encountered during work performed within Unit 5 are provided in UXO SOP 5 from the MEC QAPP (KEMRON, 2016). Further details regarding procedures to be followed in the event of the discovery of a suspect CWM item can be found in the *Recovered Chemical Warfare Material Response Process*, *Engineering Pamphlet 75-1-3* (USACE, 2004). In the unlikely event of encountering Chemical Agent Identification Set kits, they will be handled in accordance with the procedures included in *Policy Guidance – Chemical Agent Identification Sets Containing Dilute Agent (Except Dilute Nerve) and Industrial Chemicals* (Army, 2008a).

### 2.2.3 Procedures When MEC Cannot Be Disposed or Readily Identified

In the event that MEC or material potentially presenting an explosive hazard (MPPEH) is encountered that cannot be disposed or cannot be readily identified, the USACE Ordnance and Explosives Safety Specialist (OESS) will be notified. If the USACE OESS is unable to identify the MEC or suspect MEC item, the USACE OESS will notify the USACE PM immediately. Next, the USACE OESS will contact Travis Air Force Base Explosive Ordnance Disposal personnel or an equivalently trained local civilian bomb squad to begin an emergency response to verify the item is liquid filled and/or the need of a Comprehensive Addiction and Recovery Act Response in accordance with the *Safety and Health Manual, EM385-1-1* (USACE, 2014). The SUXOS will ensure that the area is secured until properly relieved by active duty Explosive Ordnance Disposal (EOD) personnel.

If an item with an unknown filler is encountered by the field team, the item will be marked using a GPS, covered with plastic, surrounded with sandbags, and plywood will be placed over the item. Security for these items will be in place when MEC teams are not working in Unit 5. KEMRON will immediately notify the Fort Ord BRAC Office, and the USACE OESS. The OESS will notify EOD and request mobilization to confirm liquid presence by means of X-ray. Upon confirmation of liquid filler, the BEC (or other appropriate BRAC-D government representative) will notify Chemical, Biological, Radiological, Nuclear, Explosives Command and request a mobilization to make a determination as to the type of liquid filler within the item.

### 2.2.4 Basewide Range Assessment

Surface MEC removal personnel will be trained to recognize and document evidence of potential soil contamination. Any indication of potential soil contamination will be documented and provided to personnel conducting site reconnaissance as part of the Basewide Range Assessment Program.

### 2.2.5 Project Personnel Organization and Reporting

KEMRON's organizational structure is described in the Unit 5 MEC QAPP Addendum for this RA. Section 2.3 of the Units 1-5 Final Work Plan (Shaw, 2008) describes the responsibilities, authorities, position qualification standards, and work and meeting schedule during RA in Unit 5.

## 2.3 Technical Scope

The activities to be performed within Unit 5 are in accordance with the Track 3 ROD (Army, 2008), Track 3 RD/RA WP (USACE, 2009), Track 3 RD/RA WP Update (KEMRON, 2018), and MEC QAPP (KEMRON, 2016). Figure 2 and Figure 4 show areas in Unit 5 where previous work is complete and planned work areas for 2021-22, respectively.

All site work for office and field personnel will adhere to health and safety regulations as described in KEMRON's Basewide Accident Prevention Plan for Fort Ord with 2021 amendments and Activity Hazard Analysis for COVID-19 risk mitigation. The work elements for this project are listed in this section. Details of these elements and processes planned for implementation to meet project objectives are provided in subsequent subsections.

The MEC remedial activities in this scope of work include:

- Manual and/or mechanical vegetation removal in accessible areas of Unit 5. Manual vegetation removal will be conducted in areas that are inaccessible to mechanical equipment or within the CTS protection buffer around vernal ponds and/or wet meadows. Manual cutting will also be required to limb trees up to 8 feet above ground surface in order to allow safe passage by surface MEC removal and DGM teams. Mechanical cutting will not occur in the 50-foot CTS protection buffer around three ponds, the southwest corner, and in HA-29 of the unit where vegetation cutting, DGM, and surface MEC clearance are complete. Figure 3 shows areas of mechanical and manual cutting.

- Technology-aided surface MEC removal in accessible areas of Unit 5 will occur over approximately 123 acres. This acreage excludes the southwest corner, HA- 29, Pond 21, and along Forrestal Road, a narrow dirt path which generally runs North to South through the center of Unit 5, where previous surface and/or subsurface removal occurred.

- DGM survey in the accessible acreage of Unit 5 that does not have completed DGM survey (Figure 2). Additionally, fill-in DGM survey will occur in the accessible areas of Pond 21.

- Geophysical anomaly investigation in Pond 21.

The project work elements include:

- Work Element 1- Work Planning. Refers to the preparation of this SSWP.
- Work Element 2- Mobilize and set up site. Mobilizations will occur for separate teams performing different phases of work when those work phases begin.
- Work Element 3- Manual and/or mechanical vegetation removal to provide access to conduct MEC remediation and DGM survey.
- Work Element 4- Perform a grid and border survey using the former Fort Ord Master Grid System and establish MEC removal area boundaries in areas where technology-aided surface MEC removal has not been performed.

- Work Element 5- Perform technology-aided surface MEC removal in areas where technology-aided surface MEC removal has not been performed.
- Work Element 6- Perform DGM survey in accessible areas and where DGM has not been performed in accordance with established Measurement Quality Objectives (MQOs).
- Work Element 7- Develop a Technical Memorandum (TM) following the DGM survey that details recommendations for additional subsurface removal, if any, based on DGM data results and surface MEC removal results.
- Work Element 8- Perform subsurface MEC removal as recommended by the TM and approved by the BCT. A geophysical anomaly investigation in Pond 21 is in the scope and shall be in conformance to the protocols established in *Fieldwork Variance No. 22* (KEMRON, 2018a). Anomalies shall be relocated using an EM61.
- Work Element 9- Perform site restoration and erosion control in areas with significant disturbance following MEC removal.
- Work Element 10- Demobilize after final Quality Control/Quality Assurance (QC/QA) inspections are completed.
- Work Element 11- Develop a Remedial Action Report.

### 2.3.1 Vegetation Clearance

Perform manual and/or mechanical vegetation removal to provide access to conduct MEC remediation and DGM survey. Vegetation removal may be impractical (unsafe for manual crews and/or unsafe for UXO teams) and/or site conditions that could exacerbate erosion potential that could destabilize the soil surface. The SUXOS and the Project Biologist will make determinations of areas where vegetation removal is deemed unsafe or has the potential to significantly exacerbate erosion potential, respectively. All vegetation removal activities will be done in accordance with the site-specific Habitat Checklist.

Exposed latrine vaults, if encountered, will be inspected for MEC/MPPEH and/or other hazardous materials and filled or crushed for safety, if the covering building is removed.

### 2.3.2 Grid and Border Survey

A GPS Technician accompanied by a UXO Technician II (minimum) escort performing anomaly avoidance will establish grids that tie to the Fort Ord Master Grid System. Grid sizes of 100 feet by 100 feet will be used in the field. The grid nodes will be marked with wooden stakes, and each will be labeled with a unique identification. Each grid will be identified by the identification labeled on its southwestern corner stake.

### 2.3.3 Technology-Aided Surface MEC Removal

Perform technology-aided surface MEC removal in areas where MEC remediation has not occurred. Surface MEC removal will be conducted following grid establishment and vegetation removal within these areas. The SUXOS, Unexploded Ordnance (UXO) Safety Officer (UXOSO), and the Project Biologist will make determinations of areas where surface MEC removal is deemed unsafe or has the possibility to exacerbate erosion.

Following vegetation mastication and completion of the grid and border survey, a technology-aided surface MEC removal will be conducted. The intent of the surface MEC removal is twofold: 1) to remove surface MPPEH and 2) to remove metallic debris, including munitions debris (MD), range-related debris (RRD), and other debris that could impact the DGM survey results.

Items that could be mistaken for MEC will be removed from the ground surface. Single expended small arms shell casings (small arms) will not be required to be picked up, since they do not pose an explosive hazard and will not interfere with DGM. Piles of expended shell casings will be removed. Location of any metallic object the size of an LE, MKI, 37mm projectile (without fuze) [1.47”x1.47”x3.5”] or larger will constitute a QC grid failure. The ground surface will be considered the extent of surface removal. There will be no scuffing of soil to find metallic items detected with magnetometers. If an item is partially visible on the surface, it will be removed as part of surface removal. Blind QC seeding will be conducted in accordance with GEO SOP 2 of the MEC QAPP (KEMRON, 2016), and QC and QA inspection of the technology-aided surface MEC removal will be conducted prior to the DGM survey.

During surface MEC removal, UXO teams will use magnetometers at all times to support visual identification of MEC/MPPEH/MD. UXO-qualified personnel will walk in parallel lines across each removal grid to provide complete visual coverage. Visual and magnetometer inspection will be conducted in 5-foot search lanes in all grids. Lanes will be delineated using rope. The UXO Team will investigate all magnetometer ring-offs on the exposed surface. If the surface is covered by vegetation, the UXO Technician will remove the overburden at the magnetometer ring-off to expose the soil surface.

MPPEH will be treated in accordance with the UXO SOP 5 of the MEC QAPP (KEMRON, 2016) . The location of MPPEH will be recorded with a GPS or from the southwest grid corner to acquire the geo-referenced location at which it was found. MD will be tracked by general item type and estimated weight on a grid-by-grid basis. The estimated weight of RRD per grid will be recorded. Recovered MD will be stored in lockable containers at a designated staging area for future disposal.

Surface MEC removal personnel will be trained to recognize and document evidence of potential soil contamination. Any indication of potential soil contamination will be documented and provided to personnel conducting site reconnaissance as part of the Basewide Range Assessment Program.

### 2.3.4 Digital Geophysical Mapping

Perform DGM survey following vegetation clearance, grid establishment, and surface MEC removal to provide a record of subsurface anomalies. This DGM survey is intended to assist future property owners in identifying where explosives safety support may be required for intrusive activities. The SUXOS, UXOSO, and the Project Biologist will make determinations of areas where DGM survey is deemed unsafe or has the potential to exacerbate erosion.

Based on expected future planned work, the standards by which geophysical mapping will be carried out can be classified as either Category A or Category B. In both cases, the objective is to map 100% of the area in question. Category A data are deemed complete and suitable for the selection of individual anomalies for subsurface MEC removal. Category B data are collected with slightly relaxed SOPs, with regard to line spacing. The SOPs are listed in Section 2.4 of this SSWP Addendum. In practice, though,

the only significant difference between Category A and B data is the possible existence of data gaps in Category B datasets. With fill-in of data gaps, Category B data is of high enough quality that it could be used for anomaly selection and investigation purposes. DGM survey procedures, including anomaly selection criteria and QC requirements, are provided GEO SOPS 4, 7, and 8 of the MEC QAPP (KEMRON, 2016). As necessary, reacquired anomalies will be investigated using excavation procedures outlined in UXO SOP 4.

### 2.3.5 Subsurface MEC Removal

Perform subsurface MEC remediation in selected areas for specific purposes to support reuse. Aside from the Pond 21 work in the scope, any other subsurface MEC remediation will be conducted if recommended in the TM and approved by the BRAC Cleanup Team (BCT). Additional subsurface MEC removal work, if required, will be conducted in accordance with UXO SOPs 3 and 4 of the MEC QAPP (KEMRON, 2016). Subsurface MEC removal may be analog-based or DGM-based, depending on site conditions. The following text outlines procedures for subsurface removal.

If DGM based subsurface MEC removal is performed, DGM data quality will be reviewed and brought to the Category A standards appropriate for anomaly selection and subsequent intrusive investigation. As required, anomalies identified during DGM activities will be intrusively investigated to identify the source. If the subsurface contact proves to be MD, RRD, or other debris, visible metal will be removed, and the excavation will be rechecked by the UXO team to verify that the area has been cleared. The vicinity around the excavation will also be checked to make sure that other anomalies were not masked by the recovered item. Both the excavation location and the immediate surrounding area will be checked by monitoring the response of the EM61-MK2A as it is moved over the area being tested. If a designated subsurface MEC remediation area is exhibiting a high density of subsurface anomalies in the DGM data, analog MEC removal (e.g., mag and dig) may be used to accomplish subsurface remediation.

During subsurface MEC removal operations, detected metal the size of an LE, MKI, 37mm projectile (without fuze) [1.47”x1.47”x3.5”] or larger will be removed from the excavation area. Each MEC/MPPEH item identified by the UXO teams will be tracked by item type, description, weight, and recovery depth (to the top of the item). The location of MEC/MPPEH will be recorded with a GPS or from the southwest grid corner to acquire the geo-referenced location at which it was found. The general type of MD items encountered per investigation location will be tracked by UXO teams.

## 2.4 Standard Operating Procedures

Applicable MEC standard procedures, protocols, and methodologies that are to be followed during the execution of MEC activities in Unit 5 are presented in Attachment B of the MEC QAPP (KEMRON, 2016) in the following SOPs:

KEMRON DATA SOP 1 – FIELD DATA MANAGEMENT

KEMRON DATA SOP 2 – GIS DATA MANAGEMENT

KEMRON DATA SOP 3 – MMRP DATA MANAGEMENT (Post Migration)

KEMRON DATA SOP 4 – DGM DATA TRANSFER TO BRAC

KEMRON FIELD SOP 1 – FIELD DOCUMENTATION

KEMRON FIELD SOP 2 – ENVIRONMENTAL PROTECTION

KEMRON FIELD SOP 3 – GRID AND BORDER SURVEY

KEMRON FIELD SOP 4 – VEGETATION REMOVAL

KEMRON GEO SOP 1 – IVS INSTALLATION AND USE

KEMRON GEO SOP 2 – BLIND SEED ITEM INSTALLATION

KEMRON GEO SOP 3 – DGM USING A PERSON-PORTABLE SYSTEM

KEMRON GEO SOP 4 – DGM USING A TOWED ARRAY SYSTEM

KEMRON GEO SOP 5 – DGM DATA PROCESSING FOR A PERSON-PORTABLE SYSTEM

KEMRON GEO SOP 6 – DGM DATA PROCESSING FOR A TOWED ARRAY SYSTEM

KEMRON GEO SOP 7 – DGM TARGET REACQUISITION USING A PERSON PORTABLE SYSTEM GEO SOP 8 – GEOPHYSICAL QUALITY CONTROL

KEMRON UXO SOP 1 – FCA INSTALLATION AND USE

KEMRON UXO SOP 2 – TECHNOLOGY-AIDED SURFACE MEC REMOVAL

KEMRON UXO SOP 3 – INTRUSIVE INVESTIGATION USING ANALOG METHODS

KEMRON UXO SOP 4 – INTRUSIVE INVESTIGATION OF DGM TARGETS

KEMRON UXO SOP 5 – MEC AND MPPEH MANAGEMENT

KEMRON UXO SOP 6 – DEMOLITION OF MEC AND MDEH

KEMRON UXO SOP 7 – EXPLOSIVES MANAGEMENT

KEMRON UXO SOP 8 – EXPLOSIVES SITING

KEMRON UXO SOP 9 – EXCLUSION ZONES

KEMRON UXO SOP 10 – QC OF MEC AND EXPLOSIVES RELATED OPERATIONS

## 2.5 Reporting

A TM will be developed following completion of the DGM survey to assess remaining site conditions using the results from the technology-aided surface MEC removal and DGM survey activities. The TM will discuss the residual anomaly densities existing in the subsurface following surface removals. The evaluation will include the type of MEC/MPPEH recovered during surface MEC removal to directly support further recommendations and assumptions related to subsurface MEC removal.

The TM will also identify any subsurface removal sections determined necessary for reuse of the area as a habitat reserve and identified in coordination between the Army and BLM. These identified subsurface removal areas will be documented in a BLM and U.S. Army Joint Inspection Report that will be attached to the TM.

A Remedial Action Report (RAR) specific to the Unit 5 RA will be prepared to summarize field operations and results generated from MEC remediation activities. Data acquired during these activities will be presented and used to support project conclusions.

# 3.0 EXPLOSIVES MANAGEMENT PLAN

The Explosives Management Plan follows KEMRON UXO SOP 7 of the MEC QAPP (KEMRON, 2016) and contains the Explosives Management Plan for the Unit 5 remediation activities.

# 4.0 EXPLOSIVES SITING PLAN

Explosives siting information for Unit 5 is included in the DDESB-approved Fort Ord Land Disposal Site Plan Amendment 5 and an administrative update as described below. The munition with greatest fragmentation distance (MGFD) is the Projectile, 75mm, HE, model Mk I due to the munition fragmentation distance-horizontal (MFD-H) of 1,873 feet as the largest distance of the applicable ordnances. The 4.5" Barrage Rocket, HE, Mk 3, highest fragmentation distance (HFD) of 315 feet and K40 distance of 75 feet will also be used, because these distances exceed the same distances of the 75mm projectiles per the Fragmentation Database. The field work will be conducted in such a manner that the public exclusion zone is not expected to extend outside the Impact Area MRA. A summary of the applicable ordnance items below for Unit 5 shows the basis for selection:

| **Munitions Model** | **MFD-H (ft)** | **HFD (ft)** | **K40 (ft)** |
|---|---|---|---|
| 4.5" Barrage Rocket Mk 3 | 1,759 | 315 | 75 |
| 75mm Projectile, HE, M48 | 1,794 | 224 | 44 |
| 75mm Projectile, HE, Mk I | 1,873 | 239 | 47 |
| 2.36” Rocket, HE, M6A3 | 790 | 144 | 38 |

Should a munition with a greater than the 75mm, Projectile, HE, Mk I be encountered, an amendment to the approved safety submission will be prepared and submitted through USACE, United States Army Technical Center for Explosives Safety, United States Army Technical Center for Explosives Safety, and DDESB.

# 5.0 GEOPHYSICAL SYSTEM VERIFICATION

KEMRON uses the geophysical system verification (GSV) process to verify and demonstrate the integrity of the geophysical mapping system. The collected data will also help to quantify site-specific geophysical characteristics that determine the detectability of items of interest. Digital geophysical instrument performance will be verified prior to field use and throughout the project duration. GSV has two components, the first component of GSV is performed prior to system use and consists of operating DGM equipment over an instrument verification strip (IVS), and the second component is blind seeding. Detailed procedures for IVS construction/use and blind seeding are found in the MEC QAPP (KEMRON, 2016) attachments KEMRON GEO SOP 1 IVS Installation and Use, and KEMRON GEO SOP 2 Blind Seed Item Installation (KEMRON, 2016).

# 6.0 GEOPHYSICAL INVESTIGATION PLAN

Section 6 details the Geophysical Investigation Plan (GIP) for DGM activities planned in accessible areas of Unit 5 where vegetation has been removed and DGM has not previous been performed. This site-specific GIP is intended to be used in addition to the various SOPs listed in Section 2.4.

## 6.1 Geophysical Investigation Objectives

Following surface MEC removal activities, DGM surveys will be conducted in areas where vegetation has been removed and DGM survey has not been previously performed. The results of the DGM survey will be used to:

- Evaluate subsurface conditions after completion of DGM to support recommendations in the TM
- Serve as a record of anomalies left in place
- Direct subsurface removal, if required, as recommended in the TM

A geophysical anomaly investigation is currently planned in Pond 21 only.

## 6.2 MEC Detection

Site-specific MEC detection capability has been previously demonstrated through the Ordnance Detection and Discrimination Study (ODDS). In the ODDS investigation, five plots were cleared in the portion of Unit 11 known as Badger Flats, two of which were subsequently seeded with inert munitions items with locations known to the contractor. Geophysical prove out (GPO) investigations using the ODDS plots have demonstrated that these items are generally detectable with the EM61-MK2A to performance depths 11 times the diameter of the target as described in the *Final MRS-16 Geophysical Prove-Out Report, Former Fort Ord, California* (Shaw, 2007). For example, a MKII grenade was detected at 6 inches and 12 inches below ground Surface (BGS); a 35mm M73 was detected at 24 inches BGS; a 37mm was detected at 18 inches BGS; an 81mm mortar M43 was detected at 36 inches BGS; and a 3-inch stokes mortar was detected at 40 inches BGS. The DGM data that will be collected in Unit 5 will be used to support identifying geophysical anomalies if an area is later identified for remedial action and/or target reacquisition. Previously discovered MEC in Unit 5 is listed in Table 2 and shown in Figure 2.

## 6.3 Personnel

Personnel duties can be found in the MEC QAPP (KEMRON, 2016), and specific personnel for the Unit 5 RA work are profiled in the Unit 5 MEC QAPP Addendum. It is anticipated that field teams consisting of one geophysicist and one equipment operator per team will execute the DGM survey. The DGM teams will report to the Project Geophysicist, who is responsible for the execution of DGM fieldwork. DGM data will be processed and analyzed offsite by geophysicists. All DGM survey activities will be managed by the Project Geophysicist.

## 6.4 Geophysical Survey

Geophysical survey will be performed in accordance with MEC QAPP (KEMRON, 2016), specifically:

- KEMRON GEO SOP 3 – DGM Using a Person-Portable System
- KEMRON GEO SOP 4 – DGM Using a Towed Array System
- KEMRON Field SOP 3 – Grid and Border Survey

## 6.5 Data Processing

Data processing procedures will be performed in accordance with the MEC QAPP (KEMRON, 2016), specifically:

- KEMRON Data SOP 1 – Field Data Management
- KEMRON Data SOP 4 – DGM Data Transfer to BRAC
- KEMRON GEO SOP 5 – DGM Data Processing for a Person-Portable System
- KEMRON GEO SOP 6 – DGM Data Processing for a Towed Array System
- KEMRON GEO SOP 8 – Geophysical Quality Control

## 6.6 Anomaly Selection

In areas of planned subsurface removal, anomalies potentially representing subsurface MEC will be identified and selected. Target selections will initially be made using automated selection routines, based on the sum of the four response channels recorded by the EM61-MK2A using a selection threshold of 14 millivolt (mV). The target anomaly selection threshold of 14mV is based on the 37mm projectile. Further discussion of the basis for the 14mV initial selection threshold is included in the MEC QAPP (KEMRON, 2016). Selected targets will be checked for validity and position, and additional characteristics, including anomaly footprint size and shape, signal to noise ratio, and decay-time constants, previous GPO and IVS results, blind seed information, and presence of surrounding anomalies, may be used to refine the anomaly selection process. Targets found to be invalid or incorrectly located will be adjusted or removed, and additional anomalies not selected by the automated routine, yet deemed to represent potential MEC sources, will be manually selected. A more detailed discussion of the interpretation and target selection process is presented in the MEC QAPP (KEMRON, 2016).

A geophysical anomaly investigation will occur in Pond 21 and possibly other areas, based on recommendations in the TM. Pond 21 anomaly selection will occur based on the fieldwork performed in March 2021 and presented in the *Final DGM Survey of Vernal Pond 21 at Former Fort Ord, Monterey, California* (USACE, 2021). Field personnel shall reacquire and confirm anomalies using the EM61-MK2A system.

## 6.7 Anomaly Reacquisition

Per the Performance Work Statement, anomaly reacquisition for this RA, field personnel shall reacquire and confirm anomalies using the EM61 system. Specific procedures for anomaly reacquisition are described in the MEC QAPP (KEMRON, 2016), GEO SOP 7 – DGM Target Reacquisition using a person portable system.

## 6.8 Intrusive Target Investigation and Verification

UXO Teams will intrusively investigate reacquired anomalies using procedures described in UXO SOP 4. Verification of intrusive anomaly investigation results is detailed in GEO SOP 8.

### 6.8.1 Vernal Pond Geophysical Anomaly Investigation

The potential exists to negatively impact the ability of the vernal pond to retain water if anomaly investigation techniques do not maintain the integrity of the clay soil layer at the bottom of the vernal pond. The width of excavation will be limited to what is needed to acquire the target. KEMRON will review the completed and documented work in the *Final DGM Survey of Vernal Pond 21 at Former Fort Ord, Monterey, California* (USACE, 2021) by USACE, conduct fill-in DGM survey as necessary, and select targets to intrusively investigate. The selected targets will be presented to USACE for review and approval before intrusive investigation commences.

If no target is contacted during the intrusive investigation, then the investigation will terminate at 18 inches depth. For each excavated target, soil will be stockpiled separately to allow for replacement that

mirrors preexisting conditions after operations are complete, to the extent feasible. Soil disturbance activities will be conducted when the vernal pools are dry, as determined by the project biologist. Each excavated target will be backfilled with stockpiled soil immediately after the target is acquired.

Various photographs will be taken during the anomaly investigation steps described below. These photographs will be provided to USACE within 30 days of completing the intrusive investigation. The soil and vegetation handling process for each anomaly investigation will be conducted as follows:

1. For each target, prior to any work, a digital photograph will be taken of the target location with an engineer's ruler, and a whiteboard with the following information:

- Date
- Pond number
- Unique target ID

2. Manual vegetation removal will be performed in a case where the location of the target is overgrown with vegetation. The removed vegetation will be set aside in a pile.

3. During anomaly excavation, the top 6 inches of topsoil layer will be removed first and set aside. Subsequent soil layers will be removed at 6-inch intervals down to the target item, but not further than 18 inches. Soils will be separated into piles at 6-inch intervals and managed for easy transfer back into to the excavated area.

4. After acquisition of the target item is complete, a digital photograph will be taken of the excavated area with an engineer's ruler placed in the X and Y axis for estimation of the excavated area. The photograph will also include a whiteboard with the following information:

- Date
- Pond number
- Unique target ID
- Depth of excavation

5. A digital photograph will be taken of the separate soil piles or their samples for each target.

6. The excavated area will be backfilled using soils in the reverse order that were excavated and were set aside. Each layer will be returned to its original position. During backfilling, the soil will be compacted at 6-inch intervals to help preserve the impermeability of the disturbed soil. Use enough water to moisten the soil, but not saturate it to ensure even compaction. Placement of hard chips may require breaking the large fragments of clay into smaller, more readily compacted pieces before placement. Use a compaction and breaker bar to compact the filled area uniformly, by dropping the bar 20 times from 1-foot height across the excavated area with the flat end. The final layer must be the top 6 inches saved from the surface. If vegetation was removed the clippings will be placed back on top of the excavation area.

7. After backfilling of the excavated area is complete, a digital photograph will be taken of the backfilled area with an engineer's ruler placed approximately in the same position as in No. 4 above. The photograph will also include a whiteboard with the following information:

- Date
- Pond number
- Unique target ID
- Depth of excavation

## 6.9 DGM Quality Control

DGM QC will be performed in accordance with the MEC QAPP (KEMRON, 2016), KEMRON GEO SOP 8 – Geophysical Quality Control.

# 7.0 GEOSPATIAL INFORMATION AND ELECTRONIC SUBMITTALS

Geospatial Information and electronic submittals will be performed in accordance with the MEC QAPP (KEMRON, 2016), specifically:

- KEMRON Data SOP 2 – GIS Data Management

# 8.0 WORK, DATA, AND COST MANAGEMENT

The Work, Data, and Cost Management Plan for all work addressed by this SSWP is provided in the MEC QAPP Section 6 (KEMRON, 2016), and KEMRON SOPs specifically:

- KEMRON Data SOP 1 – Field Data Management
- KEMRON Data SOP 2 – GIS Data Management
- KEMRON Data SOP 3 – MMRP Data Management
- KEMRON Data SOP 4 – DGM Data Transfer to BRAC

KEMRON will provide a bi-weekly MMRP progress report to the USACE and the Fort Ord BRAC Office. The report will outline the activities in progress and completed during the last two weeks, the activities anticipated in the next two weeks, habitat issues, schedule percent complete/metrics update, QA/QC update, and documents. This report will clearly display changes within the metrics. KEMRON will support these changes with a brief explanation for the shift and the anticipated metrics for the remaining portion of fieldwork.

# 9.0 PROPERTY MANAGEMENT PLAN

Property management will be in accordance with Federal Acquisition Regulation Part 45 – Government Property. The following equipment and facilities are expected to be required for the project:

- RTK-GPS Systems
- Personal Digital Assistants
- EM61–MK2A Systems

- Towed arrays
- Schonstedt GA-52CXs
- Whites (DFX 300)
- Various manual brush clearing equipment
- Radios for UXO and DGM crews

KEMRON will follow USACE policy in checking out and signing for government equipment at Fort Ord that will be used for this project. Crew cab 4x4 pickups, standard 4x4 pickups, portable toilets, and bulldozer will also be required and obtained from an outside party.

# 10.0 QUALITY CONTROL AND QUALITY ASSURANCE

UXO SOP 10 and GEO SOP 8 of the MEC QAPP (KEMRON, 2016) describe the general project procedures to be implemented for analog and DGM QC tasks during MEC remedial actions. The following activities will be implemented with the three-phase inspection process:

- Perform vegetation removal as shown on Figure 4
- Grid and border survey
- QC seeding program
- Technology-aided surface MEC removal
- DGM survey
- 10% analog QC inspection
- Subsurface MEC removal
- MEC/MPPEH detonation
- MPPEH, MD, and scrap segregation, reporting, and disposition
- Site restoration and erosion control

The QC Geophysicist and UXO QC Specialist (UXOQCS) will independently verify that inspections are effectively implemented. The UXOQCS will also plan, perform, and document preparatory meetings, preparatory inspections, initial inspections, follow-up inspections, and completion inspections and completion inspections in coordination with the Government QA representative.

## 10.1 Quality Control Process

### 10.1.1 Detection Performance Goals

A QC survey will be performed by the UXOQCS following the completion of surface and subsurface removal grids. The location of any MEC or MD item that could be mistaken for MEC will constitute a QC grid failure. Location of any metallic object the size of an LE, MK1, 37mm projectile (without fuze) [1.47” x 1.47” x 3.5"] or larger will constitute a QC grid failure.

Following DGM in surface removal areas, a sample of detected anomalies will be checked in the field to verify that the DGM anomalies have subsurface sources and are not actually related to surface items. This work will be conducted by KEMRON and the results presented to USACE.

A Corrective Action Request (CAR) will be promptly developed if a grid QC failure occurs to investigate the grid failure root cause. Corrective action may include a grid re-inspection process. Actions to prevent future recurrence will be based on the root cause but may include additional procedure controls, more rigorous UXOQCS field surveillance, and additional training. Corrective measures processes are provided in the MEC QAPP (KEMRON, 2016).

### 10.1.2 Analog Quality Control Inspection

As MEC removal activities are completed in each removal grid, KEMRON's UXOQCS will conduct a QC survey with a Schonstedt GA-52CX magnetometer over a minimum of 10% of each removal grid. Within areas where surface MEC removals were conducted, the UXOQCS will perform technology-aided visual surface surveys as part of the inspection. Within areas where subsurface MEC removal activities were conducted, the UXOQCS will intrusively investigate anomalies if detected during the 10% QC sweep. Results of these investigations will be provided in the QC daily log. Analog QC procedures are provided in UXO SOP 10 of the MEC QAPP (KEMRON, 2016).

### 10.1.3 Measurement Quality Objective

As part of the DGM QC program, MQOs will be monitored during the course of mapping activities. These MQOs provide a means to quantify the quality of the data collected during DGM surveys. These MQOs were initially developed for areas in and adjacent to the Impact Area MRA. Metrics associated with the MQOs are provided in Section 6 of this SSWP Addendum. If these metrics are exceeded, a root-cause analysis will be developed, and a CAR submitted.

### 10.1.4 Instrument Standardization

Daily standardization procedures and functional checks will be performed on all geophysical instruments and monitored as described in Section 6 of this SSWP Addendum and the MEC QAPP (KEMRON, 2016).

### 10.1.5 Quality Control Seeding Program

A QC seeding program will be implemented for both analog and DGM surveys. QC seed items will be placed in areas where technology-aided surface MEC removal, subsurface MEC removal and DGM survey are planned. QC seed items will be placed such that each team encounters, on average, at least one seed item per day of data collection. The seed item density will be increased to an average of two seed items encountered per day in areas where DGM surveys will be conducted utilizing fiducial positioning methods. QC seed items will be placed on the surface and in the subsurface based on project objectives and will be representative of items expected within the project area. QC seed item characteristics will be specified prior to placement. All seeds will be located using GPS.

Further details, including MQOs for blind seed item detection and identification, are provided in Section 6 of this SSWP and in GEO SOP 2 of the MEC QAPP (KEMRON, 2016).

## 10.2 Quality Assurance Operations

QA will be provided by the USACE to assure that KEMRON's QC system is functioning as stated. Areas of QA include:

- Monitor contractor field practices, including announced and extemporaneous, unobtrusive observations.
- Review and observe field ground control and GPS procedures. This is meant to avoid geo-referencing incompatibilities between KEMRON and the USACE.
- Independently examine data files and anomaly maps. The USACE OESS will check the database against Team Leader grid sheets to ensure all anomalies flagged were excavated.
- Independently conduct technology-aided surface MEC surveys over a minimum of 10% of each of the grids where technology-aided surface MEC removal is conducted.
- Independently conduct analog QA over a minimum 10% of each of the grids where an analog subsurface removal is performed.
- Independently conduct DGM QA, which may include 3% to 5% digital resurvey. May also include QA seeding and/or QA digs.

## 10.3 Demobilization

Demobilization will occur when the project is completed with appropriate QA/QC checks performed. During demobilization, personnel will be retained only as long as necessary. If personnel are not required at other former Fort Ord MEC projects, they will be demobilized from the site. The following will occur prior to demobilization:

- Verification that all areas to be investigated/remediated are completed to the requirements of the Project Work Statement, including verification that QC and QA requirements have been met.
- Identification of all areas that could not be investigated/remediated.
- Verification that site restoration has been performed to requirements.
- Documentation that ultimate disposition of property used during the project has been performed.

# 11.0 ENVIRONMENTAL PROTECTION PLAN

This section describes the procedures to be employed to protect natural resources during the field evaluation activities in Unit 5. It includes a description of the natural resources present, and a list of mitigation measures appropriate to the type of work activity and the habitat types, that will be implemented to reduce impacts to these resources whenever possible. Field SOP 2 of the MEC QAPP (KEMRON, 2016) also describes general project procedures to be implemented for environmental protection.

Unit 5 is within the Natural Resource Management Area which is designated for transfer to BLM as undeveloped habitat reserve. The Installation-Wide HMP describes special land restrictions and habitat management requirements within habitat reserve areas (USACE, 1997). Habitat reserve areas support plant and animal species protected under the Endangered Species Act (ESA); implementation of mitigation measures identified in the HMP are required to minimize potential adverse impacts to listed species.

Chapter 3 of the HMP describes mitigation measures that must be implemented during MPPEH investigation and remediation. In addition, the *Reinitiation of Formal Consultation for Cleanup and Property Transfer Actions Conducted at the Former Fort Ord* [Programmatic Biological Opinion] (USFWS, 2017) and *Changes to Vegetation Clearance Activities Under the Programmatic Biological Opinion for Cleanup and Property Transfer Actions Conducted at Former Fort Ord, Monterey County, California* (USFWS, 2019) contain terms and conditions and reasonable and prudent measures that need to be implemented during MPPEH activities to minimize and reduce impacts to listed species.

### 11.1.1 Description of Site and Natural Resources

Central maritime chaparral habitat is a dominant habitat type at Fort Ord and is identified as a protected plant community in the HMP (USACE, 1997). This habitat supports approximately 50 to 85 percent of the total distribution of several rare, threatened, and endangered plants occurring at Fort Ord, which are designated as protected under the HMP. HMP shrub species present within Unit 5 include Hooker's manzanita, Sandmat manzanita, Toro manzanita, Monterey ceanothus, and Eastwood's golden bush. The HMP-listed annual plant species Monterey Spineflower is also present in the southeastern portion of Unit 5. Yadon's piperia has been found in the northeast and southwest corners of Unit 5 as well as along the southern boundary of the unit. Other habitats present include areas of coast live oak woodland and wet meadows.

The habitats within the Unit 5 may also support special-status wildlife species identified in the HMP. Black legless lizards could be encountered in any areas with sandy soils. CTS could be encountered in areas near known breeding ponds (Ponds 21 and 49) or in upland habitat.

### 11.1.2 Protection of Natural Resources

Measures to reduce impacts to natural resources will be implemented in accordance with the HMP and Programmatic Biological Opinion (USFWS, 2017) and *Changes to Vegetation Clearance Activities Under the Programmatic Biological Opinion for Cleanup and Property Transfer Actions Conducted at Former Fort Ord, Monterey County, California* (USFWS, 2019). These measures are described in Field SOP 2 of the MEC QAPP (KEMRON, 2016). Additional efforts to reduce impact to HMP plants and habitats include:

- Protection and preservation of mature Toro manzanita,
- Avoiding Monterey spineflower populations when chipping vegetation,
- Restricting the use of heavy equipment within vernal ponds,
- Avoiding work in vernal ponds when saturated or inundated,
- Employee environmental training,
- Preparation of habitat checklists,
- Avoiding and reducing impacts to HMP plants and habitats,
- Avoiding impacts to CTS and black legless lizards,
- Avoiding impacts to restoration areas,

- Replacement of topsoil when feasible,
- Implementation of best management practices to reduce the spread of invasive weeds,
- Restricted vehicle access, and
- Monitoring of erosion and invasive weeds during and after remedial activities.

Mature Toro manzanitas that provide an important seed source for the species in Unit 5 shall be retained. In areas where the density of Toro manzanita is high, individuals 10 feet or taller and shorter individuals with a very wide canopy cover shall be retained. In areas where the density of Toro manzanita is low, the largest, most mature individuals in that area shall be retained. The individuals to be retained shall be evaluated by the Project Biologist prior to vegetation removal. Additionally, masticator operators shall receive additional training from the Project Biologist in Toro manzanita identification and shall cut around the large individuals. If necessary, the remaining Toro manzanitas may be limbed up to 8 feet to allow access beneath the individuals for future surface clearance.

# 12.0 REFERENCES

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

Army. (2008a). *Policy Guidance-Chemical Agent Identification Sets Containing Dilute Nerve Agent (Except Dilute Nerve) and Industrial Chemicals.*

Burleson Consulting Inc. (2016). *2015 Annual Monitoring Report.* Monterey, California (BW-2795).

DDESB. (2016). *Methodologies for Calculating Primary Fragment Characteristics Technical Paper 16, Revision 4.*

DDESB. (2020). *Minimum Qualifications for Personnel Conducting Munitions and Explosives of Concern-Related Activities, Technical Paper 18, Revision 1.*

Defense Explosives Safety Regulation. (2019). *Defense Explosives Safety Regulation, 6055.09, Edition 1.*

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

Gilbane. (2015). *MRS-BLM Units 7, 10, and 33 MEC Remedial Action, Technical Memorandum, Former Fort Ord, California.* (OE-0842).

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

KEMRON. (2018). *Remedial Design (RD)/Remedial Action (RA) Work Plan Update, Track 3 Impact Area Munitions Response Area (MRA) Munitions and Explosives of Concern (MEC) Removal, Former Fort Ord, California.* (OE-0929B).

KEMRON. (2018a). *Fieldwork Variance No. 22.* (OE-0685D.15).

MACTEC. (2007). *Track 3 Impact Area MRA Remedial Investigation/ Feasibiity Study (RI/FS).* (OE-0596R).

Shaw. (2007). *Final MRS-16 Geophysical Prove-Out Report, Former Fort Ord, California.* (OE-0601F).

Shaw. (2008). *Final Work Plan MRS-BLM Units 1-5 Munitions and Explosives of Concern Removal Former Fort Ord, California.* (OE-0626L).

USA Environmental, Inc. (2000). *Final After Action Report 100% Grid Sampling Inland Range Contract Former Fort Ord, California Site OE-15B.* (OE-0287A).

USA Environmental, Inc. (2001). *Final 4' OE Removal After Action Report, Inland Range Contract, Former Fort Ord, California Site OE-15 (Roads and Trails).* (OE-0316).

USACE. (1997). *Installation-Wide Multi-Species Habitat Management Plan for Former Fort Ord, California.* (BW-1787).

USACE. (2004). *Recovered Chemical Warfare Materiel (CWM) Response Process, Engineering Pamphlet (EP) 75-1-3.*

USACE. (2009). *Final Work Plan, RD/RA, Track 3 Impact Area Munitions Response Area, Former Fort Ord.* (OE-0660K).

USACE. (2014). *Safety and Health Manual EM385-1-1.* Washington, DC: Department of the Army, U.S. Army Corps of Engineers.

USACE. (2021). *Final DGM Survey of Vernal Pond 21 at Former Fort Ord, Monterey, California.* (OE-1003).

USFWS. (2017). *Reinitiation of Formal Consultation for Cleanup and Property Transfer Actions Conducted at the Former Fort Ord, Monterey County, California.* (BW-2747A).

USFWS. (2019). *Vegetation Clearance Activities Under the Programmatic Biological Opinion for Cleanup and Property Transfer Actions Conducted at Former Fort Ord, Monterey County, California.* (BW-2747A.2).

Table 1 Unit 5 Military History

| Table 1. Unit 5 Military History | | | | |
|---|---|---|---|---|
| **Historical Area** | **Range/Site Number** | **Range/Site Name(s)** | **Range Type** | **Comments** |
| HA-28 | 28 | Technique of Fire Range, Rifle Squad Tactical Range, Automatic Rifle and ARTEP Range | Mixed Use | This range was used from at least 1964 through early 1990s. The range was labeled as a Rifle Squad Tactical Range in 1964 and was labeled as Automatic Rifle and Army Training and Evaluation Program (ARTEP) Range (Def) in Standard Operating Procedures (SOPs) from 1973 through 1991. The area may have been used in the mid-1950s as indicated by presence of a Carbine Range shown on the 1956 training map. According to range control records, the range was used for day and nighttime activities. |
| HA-29 | 29 | Machine Gun Assault Range, Squad Battle Drill and Assault Range, 10m Machine Gun, 25m Zero, M-3 Machine Gun | Mixed Use | This range was used from at least 1961 through 1975 as a Machine Gun Assault Range. It was reactivated in 1984, and a portion of the range was set up for mortar firing. In 1991 the machine gun assault course was converted to a 10m/25m range. SOP for the mortar range indicated 60mm, 81mm, and 4.2 inch mortars were authorized for firing. The 1956 Training Map showed a range in the same area as Range 29 labeled as a 57mm RR range, so the range may have been used as early as the mid-50s. |
| HA-30 | 30/30A | Rifle Squad Tactical Ranges, Technique of Fire Ranges, Squad Defense, ARTEP | Mixed Use | This range was constructed in 1964 and used for Basic Combat Training until 1975. The range was reactivated in 1983 and deactivated in 1989. The range was listed as a Technique of Fire Range on the 1973 SOP, as a Military Operations Built Up Areas range in 1982 with blank ammo only, and as a Squad Defense ARTEP range in 1984. The range was not listed in the 1991 and 1992 SOPs. The area may have been used as a range in the 1950s, based on the 1956 training map that shows a Submachine gun range in the area. |
| HA-66 | NA | Carbine Table XI | Small Arms | This range is shown on the 1956 range construction priority map but is not shown on the 1958 and 1961 training maps, and it is not evident on the 1965 air photo mosaic. It is not known if this range was ever constructed. |
| HA-68 | NA | Sub Mach Gun Dismounted | Small Arms | This range is only shown on the July 1956 Training Map. The use of the range is unknown, but based on the title of the range, it may have been used for small arms. |

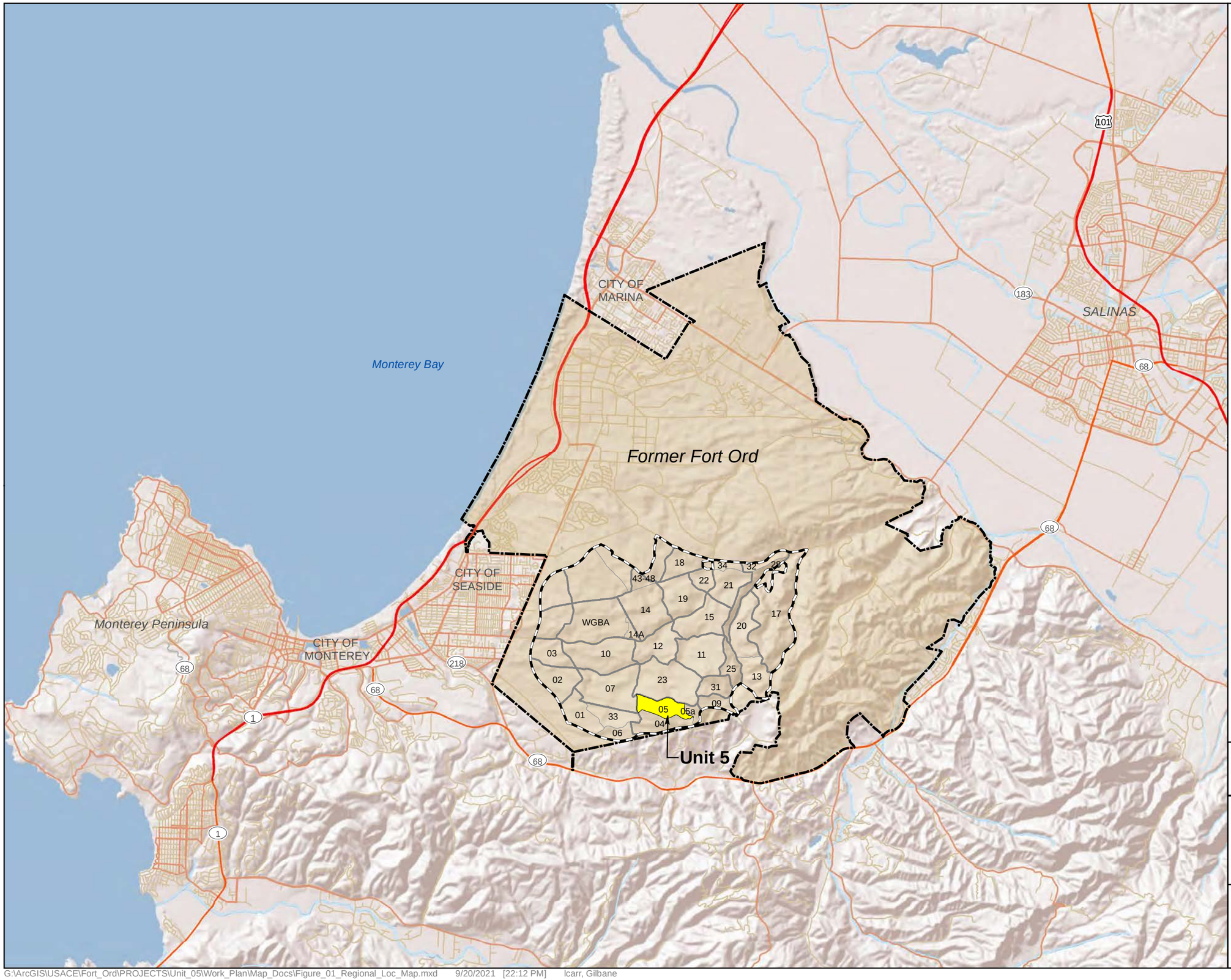
Table 2 Unit 5 Previously Recovered MEC

| Table 2. Unit 5 Previously Recovered MEC | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Model Description** | **Date Found** | **Depth (in)** | **QTY** | **MM Type** | **Grid ID** | **Unique ID** | **Contractor** |
| Projectile, 75mm, high explosive, M48 | 11/6/1997 | 0 | 1 | UXO | MRS-15_VULCAN ROAD25-27 | 77800 | USA |
| Fuze, projectile, combination, M1907 | 1/27/1998 | 0 | 1 | UXO | MRS-15B_G 04 | 77903 | USA |
| Rocket, 35mm, subcaliber, practice, M73 | 7/17/2013 | 0 | 1 | UXO | A2G8B3 | 814777 | Gilbane |
| Rocket, 35mm, subcaliber, practice, M73 | 7/17/2013 | 0 | 1 | UXO | A2G8B4 | 814780 | Gilbane |
| Rocket, 35mm, subcaliber, practice, M73 | 7/17/2013 | 0 | 1 | UXO | A2G8B4 | 814781 | Gilbane |
| Rocket, 35mm, subcaliber, practice, M73 | 7/17/2013 | 0 | 1 | UXO | A2G8D3 | 814788 | Gilbane |

Table 3 Unit 5 Previous Remedial Actions

| Table 3. Unit 5 Previous Remedial Actions | | | |
|---|---|---|---|
| **Figure 2 Legend Description** | **Location on Figure** | **Document Title** | **AR #** |
| Surface Removal - 2013 (Gilbane) | SW corner of unit | MRS-BLM Units 7, 10, and 33 MEC Remedial Action, Technical Memorandum Former Fort Ord, California | OE-0842 |
| DGM Survey - 2013 (Shaw) | SW corner of unit | MRS-BLM Units 7, 10, and 33 MEC Remedial Action, Technical Memorandum Former Fort Ord, California | OE-0842 |
| DGM Survey - 2010 (Shaw)<br>DGM Dig - 2010 (Shaw) | HA-29, south-central part of unit | Final Remedial Action Completion Report Site 39 Inland Ranges Habitat Reserve Former Fort Ord California | RI-047C |
| Subsurface Removal (4 ft) - 1997 (USA) | Forrestal Rd (north-south road in center of unit), and Vulcan Rd (south boundary in western half of unit) | Final 4' OE Removal Action Report Inland Range Contract Site OE-15 (Roads and Trails) | OE-0316 |
| OE Sampling 1998 (USA) | Middle of unit | Final After Action Report 100% Grid Sampling, Inland Range Contract, Former Fort Ord, California Site OE-15B | OE-0287A |
| DGM Survey – 2020 (USACE)[1] | Pond 21, central-north portion of unit | Final DGM Survey of Vernal Pond 21 at Former Fort Ord, Monterey, California | OE-1003 |

[1] KEMRON/USACE consider Pond 21 (where DGM has been conducted with UXO escort) to be surface removal complete or not required.





Unit 5
Unit Boundary
Former Fort Ord Boundary
Impact Area MRA Boundary

N

2 0 Miles

KEMRON ENVIRONMENTAL SERVICES

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

**Figure 1**

Regional Location Map

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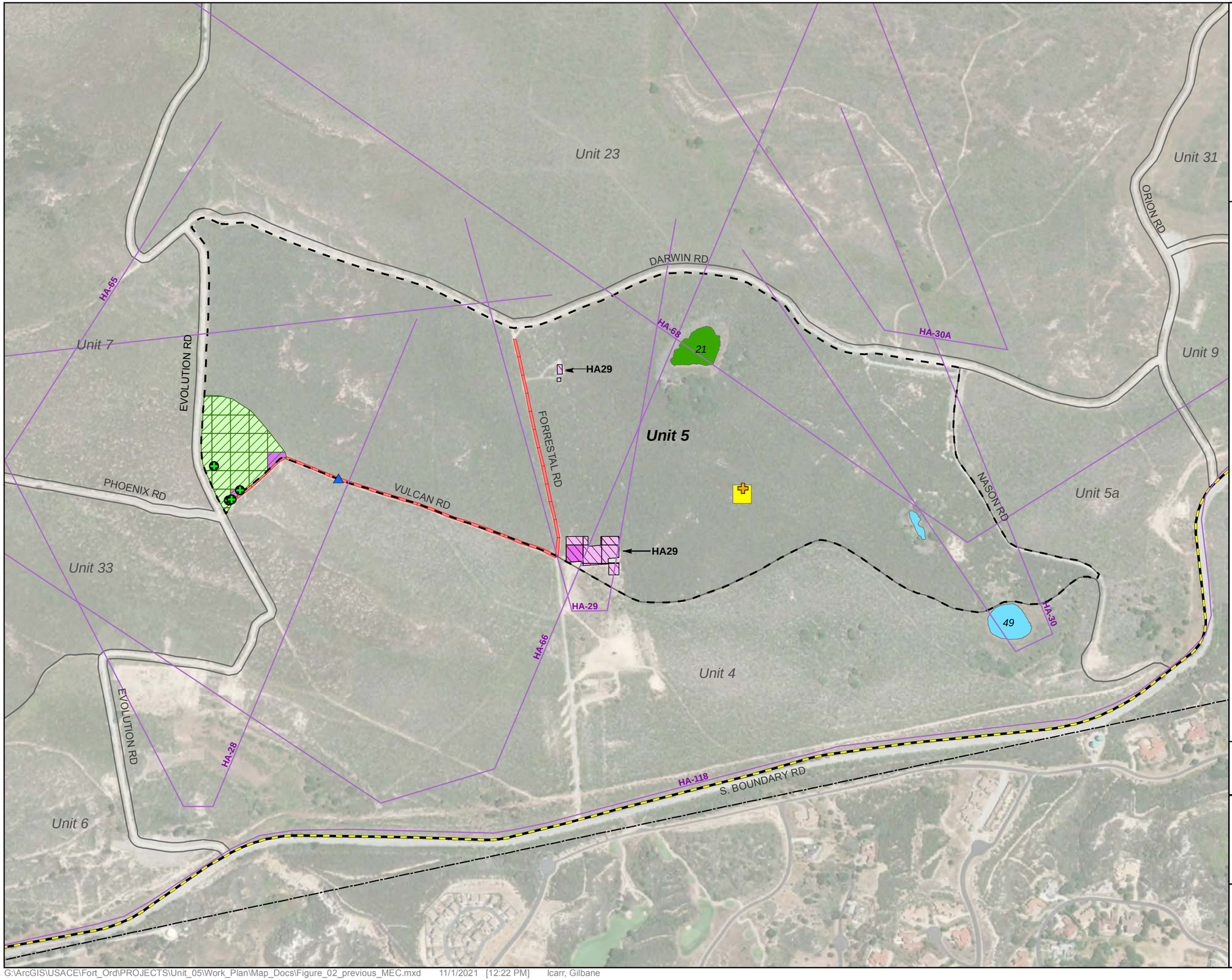


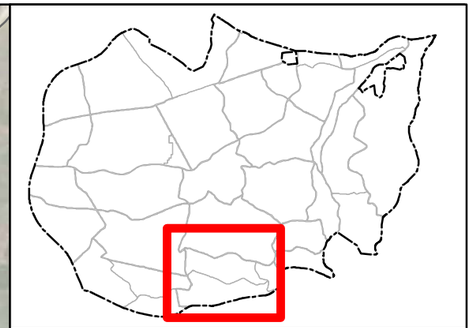

*Legend*

**Previously Recovered MEC**

- Fuze, projectile, combination, M1907
- Projectile, 75mm, high explosive, M48
- Rocket, 35mm, subcaliber, practice, M73

**Previous Work (MR operations)**

- Surface Removal - 2013 (Gilbane) AR# OE-0842
- DGM Survey - 2013 (Shaw) AR# OE-0867
- DGM Survey - 2012 (Shaw) AR# RI-047C
- DGM Survey - 2010 (Shaw) AR# RI-047C
- DGM Dig - 2010 (Shaw) AR# RI-047C
- Subsurface Removal (4FT) - 1991 (USA) AR# OE-0316
- OE Sampling, 100% (mag and dig, 4FT) - 1998 (USA) AR# OE-0287A
- DGM Survey – 2020 (USACE)*
- Range Fan
- Unit 5 Boundary
- Pond
- Impact Area MRA Boundary
- Former Fort Ord Boundary

Note:
*Kemron/USACE consider Pond 21
(where DGM has been conducted with UXO escort)
to be surface removal complete or not required.

N

0 250 500 1,000 Feet

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**Figure 2**
Previously Recovered MEC
and MR Operations

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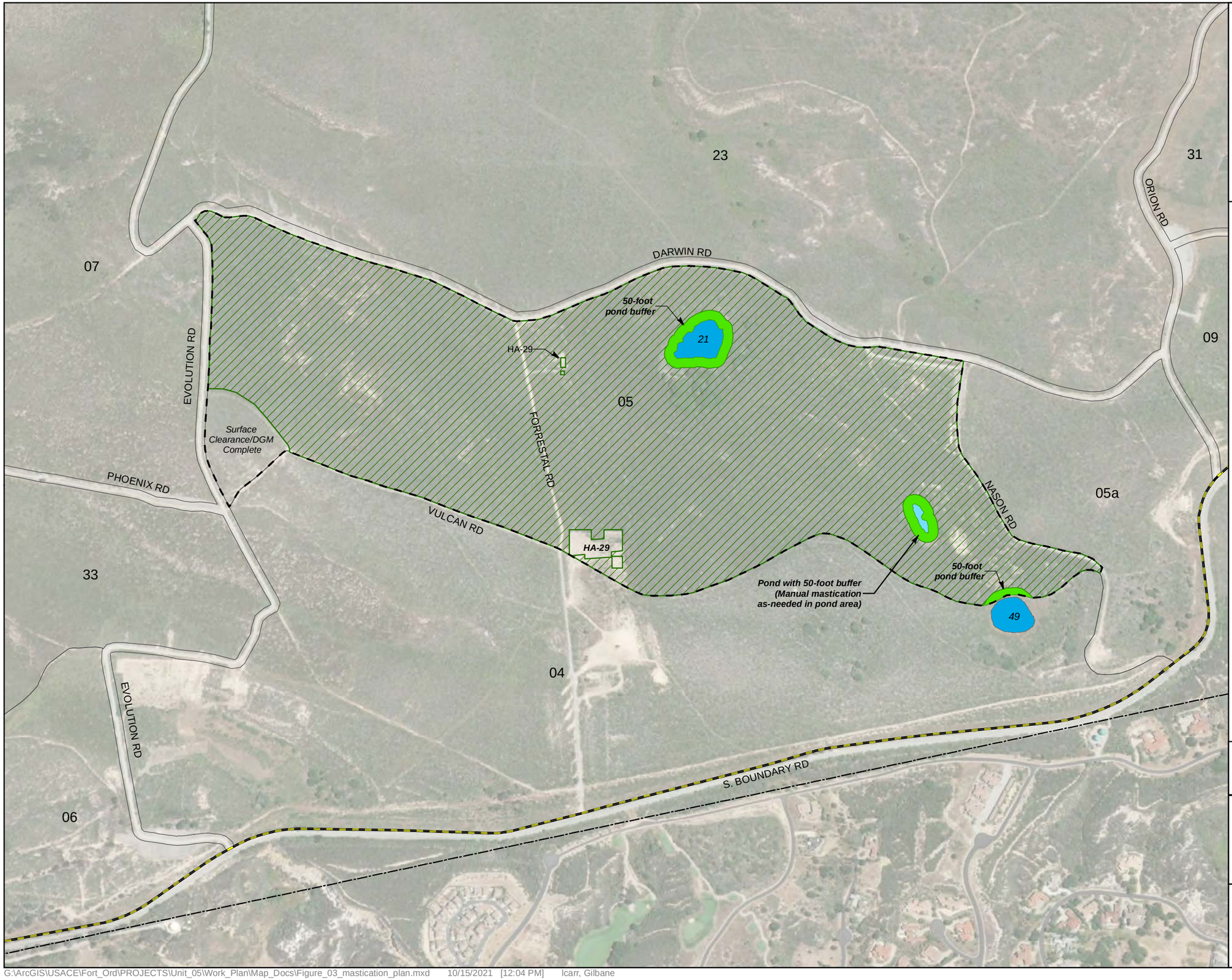


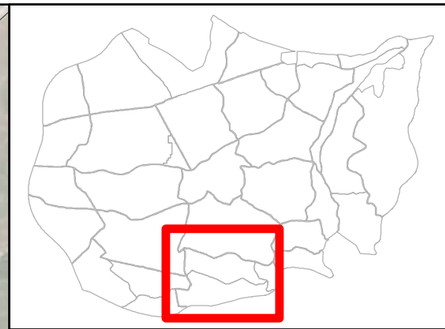

*Legend*

- Mechanical Mastication (~122 acres)
- Manual Mastication (~2 acres)
- Pond (manual mastication as-needed)
- Pond (no mastication needed)
- Unit 5 Boundary
- Impact Area MRA Boundary
- Former Fort Ord Boundary

N

0 250 500 1,000 Feet

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**Figure 3**

Mastication Plan

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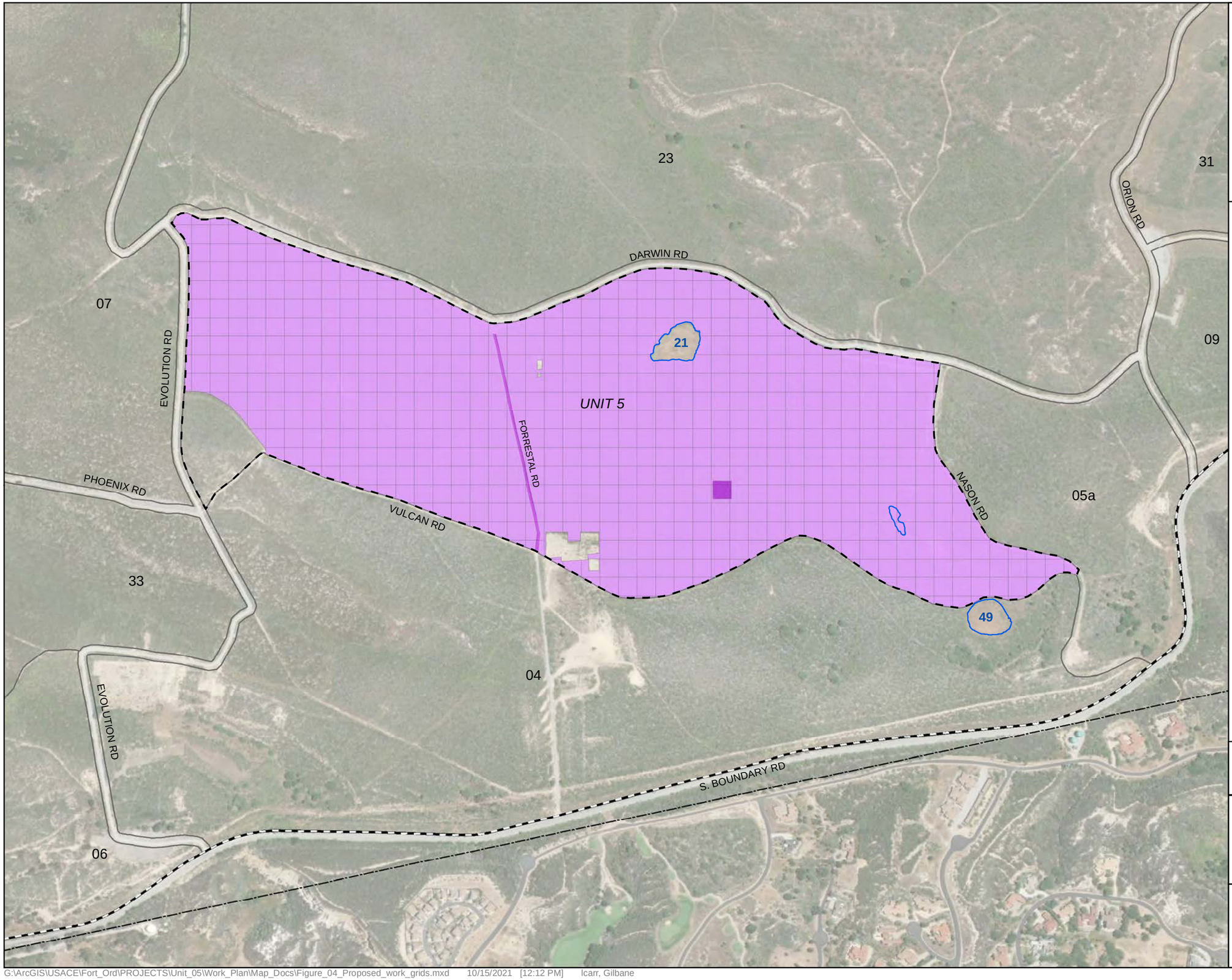


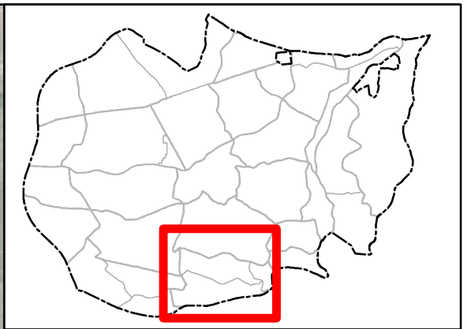

*Legend*

- Work Grid: Surface Clearance and DGM Survey
- Work Grid: DGM Survey Only
- Pond
- Unit 5 Boundary
- Impact Area MRA Boundary
- Former Fort Ord Boundary

N

0 250 500 1,000 Feet

KEMRON ENVIRONMENTAL SERVICES

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**Figure 4**

Proposed Work Grids

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