

**Watkins Gate Burn Area Mortar Pits  
MEC Remedial Action  
Technical Information Paper  
Former Fort Ord, California**

**January 2020**

*Prepared For:*



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## *List of Acronyms*

Army	United States Department of the Army
BLM	Bureau of Land Management
DGM	Digital Geophysical Mapping
KEMRON	KEMRON Environmental Services, Inc.
MD	Munitions Debris
MEC	Munitions and Explosives of Concern
MRA	Munitions Response Area
MRS	Munitions Response Site
TM	Technical Memorandum
UXO	Unexploded Ordnance
WGBA	Watkins Gate Burn Area

## 1 INTRODUCTION

### 1.1 Site Location

The Watkins Gate Burn Area (WGBA) is located in the northwestern section of the Impact Area Munitions Response Area (MRA). The WGBA is bounded by Blue Line Road to the west and north, Evolution Road to the east, and Watkins Gate Road to the south.

The Mortar Pits site encompasses approximately 1.5 acres of former military infrastructure (berms, pits, mounds, roads) that are intended to be returned to a natural landscape. The portions of the site identified for remediation consist of separate earth mounds, each approximately 8 feet high and ranging from 75 to 200 feet long.

WGBA and the WGBA Mortar Pits site location are shown on [Figure 1](#).

### 1.2 Background and Purpose

Surface Munitions and Explosives of Concern (MEC) removal and digital geophysical mapping (DGM) were conducted previously in the WGBA. Further detail is included in the *MRS-BLM Watkins Gate Burn Area MEC Remedial Action, Technical Memorandum, Former Fort Ord, California* [WGBA TM; KEMRON Environmental Services, Inc. (KEMRON), 2015].

The "Mortar Pits" site was identified through a joint inspection of the WGBA by the United States Department of the Army (Army) and the Bureau of Land Management (BLM). This joint inspection was conducted in 2014 and documented in the WGBA TM (KEMRON, 2015). The joint inspection summary stated that the "Mortar Pits" area contained "10 mortar pits constructed with a frontal berm and asphalt surface." The work described in this Technical Information Paper addressed the entire "Mortar Pits" area that was identified during the joint inspection for future BLM recontouring.

The intent of the field work at the Mortar Pits site was to provide subsurface MEC remediation of the mounds and to remove any asphalt covering, so that the mounds can be graded to a more natural topography by the BLM at a later date. The 'mortar pits' were locations from which mortars were fired into the Impact Area. The seven work grids shown on [Figure 2](#) were specifically designed to encompass all ten of the mortar pits. Minor modifications to Stinger Road and Austin Road were

completed in order to access the mounds. Previously collected DGM data was evaluated to determine if the mounds would be remediated by investigating DGM targets, through analog (mag and dig) methods, or a combination of the two. A survey team was employed to establish the extent of the remediation area to aid in the clearance effort.

## 2 SCOPE OF WORK

### 2.1 *Vegetation Clearance*

Vegetation coverage at this site was minimal and did not pose a significant obstacle to the planned operations. Where needed, field teams employed manual vegetation clearance equipment to conduct planned MEC remediation activities effectively.

### 2.2 *Analog MEC Remediation (Mag and Dig)*

Following an evaluation of previously collected DGM data within the WGBA Mortar Pits site, a determination was made that the mounds would be remediated through analog (mag and dig) methods. This field work was conducted in November and December of 2018. [Tables 1](#) and [2](#) detail the results of the analog MEC remediation. Standard procedures and quality control processes outlined in the *Final Quality Assurance Project Plan, Former Fort Ord, California, Volume II Appendix A, Munitions and Explosives of Concern Remedial Action* (KEMRON, 2016) were followed.

### 2.3 *Site Restoration Activities*

After the analog MEC remediation was completed, asphalt from the WGBA Mortar Pits was broken into small pieces and used to repair sections of Austin Road between Stinger Road and the Blue Line Road. Unexploded Ordnance (UXO) personnel were present during this phase of work to ensure no MEC items were present in the asphalt removed from the WGBA Mortar Pits. Site restoration was completed using a combination of barley seed, blown straw, and installation of wattle and silt fencing.

### ***3 SUMMARY OF MEC/MD REMOVED***

No MEC items were encountered during the field operations described above. A total of 26 pounds of munitions debris (MD) was removed during field operations. MD weights are shown on [Figure 2](#) and are further detailed in [Table 3](#).



#### ***4 CONCLUSIONS/RECOMMENDATIONS***

Analog MEC remediation operations have been completed within the footprint of the WGBA Mortar Pits site (the seven work grids displayed on [Figure 2](#)). The mounds can be graded to a more natural topography by the BLM at a later time when equipment and personnel are available. Construction support is not required for this planned grading operation within the seven grids of the WGBA Mortar Pits site.

## 5 REFERENCES

KEMRON Environmental Services, Inc. (KEMRON), 2015. *MRS-BLM Watkins Gate Burn Area MEC Remedial Action, Technical Memorandum, Former Fort Ord, California*. [Administrative Record (AR)# OE-0832A]

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

## *Tables*

**Table 1**  
**Cumulative Results**

Parameter	WGBA Mortar Pits Totals
Surface removal acreage	0
Analog subsurface removal acreage	1.49
Digital Subsurface removal acreage	0
DGM survey acreage	0
MEC items	0
Total Estimated MD Weight (lbs)	26
Total Estimated RRD and OD (lbs)	2,209

DGM - Digital Geophysical Mapping

MEC - Munitions and Explosives of Concern

MD - Munitions Debris

RRD - Range Related Debris

OD - Other Debris

**Table 2**  
**Summary of Removal Methods**

Activity	WGBA Mortar Pits Grids
Surface Removal	0
Analog Subsurface Removal	7
Digital Subsurface Removal	0
DGM Survey	0

DGM - Digital Geophysical Mapping

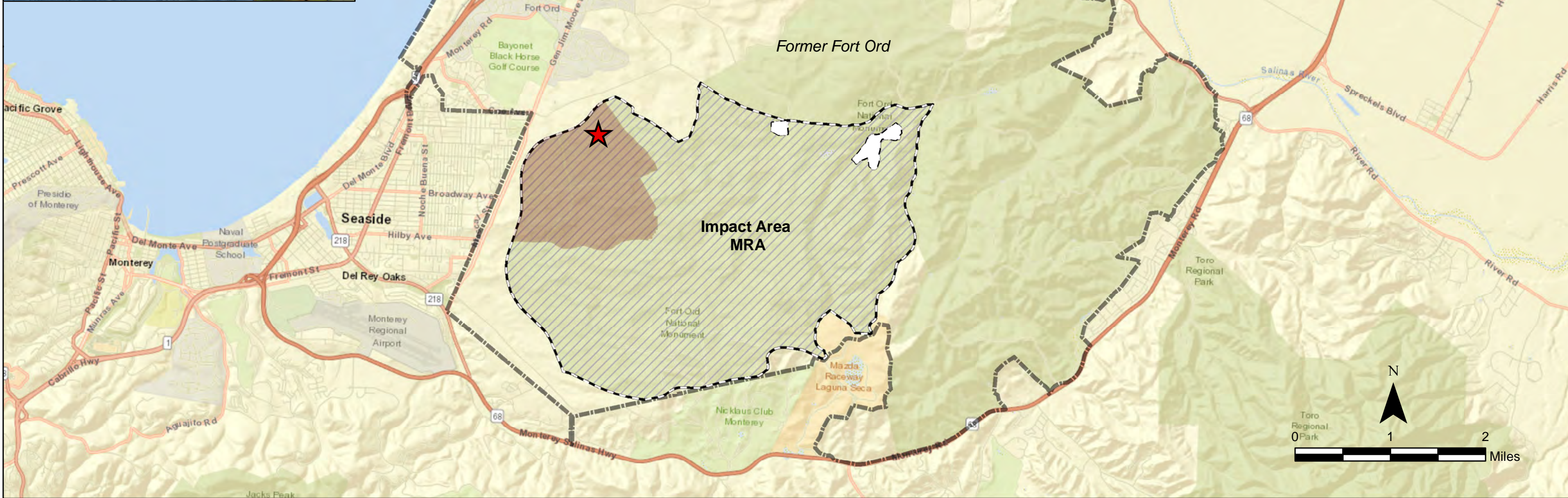
**Table 3**





**Summary of Survey and Removal Methods by Grids**

Operation Type	Date Completed	Grid ID	MD Weight (lbs)
Mag and Dig	11/27/2018	MP01A	4
Mag and Dig	11/29/2018	MP01B	2
Mag and Dig	12/4/2018	MP02A	8
Mag and Dig	12/10/2018	MP02B	3
Mag and Dig	12/11/2018	MP03	0
Mag and Dig	12/17/2018	MP04	0
Mag and Dig	12/26/2018	MP05	9

Total = 26

## *Figures*



-  WGBA Mortar Pits
-  Watkins Gate Burn Area
-  Impact Area MRA
-  Former Fort Ord Boundary



**WGBA Mortar Pits  
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**Figure 1  
Location**

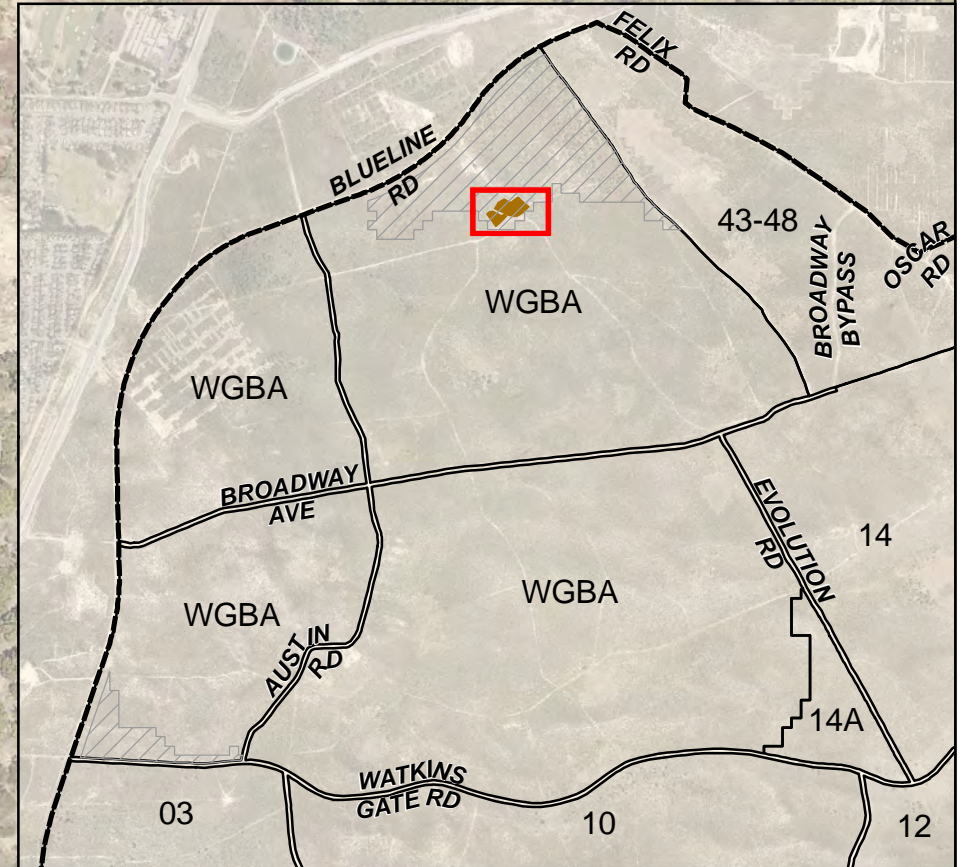
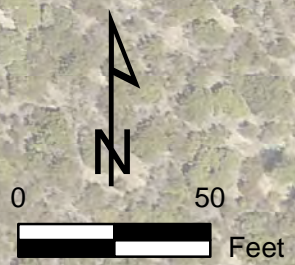
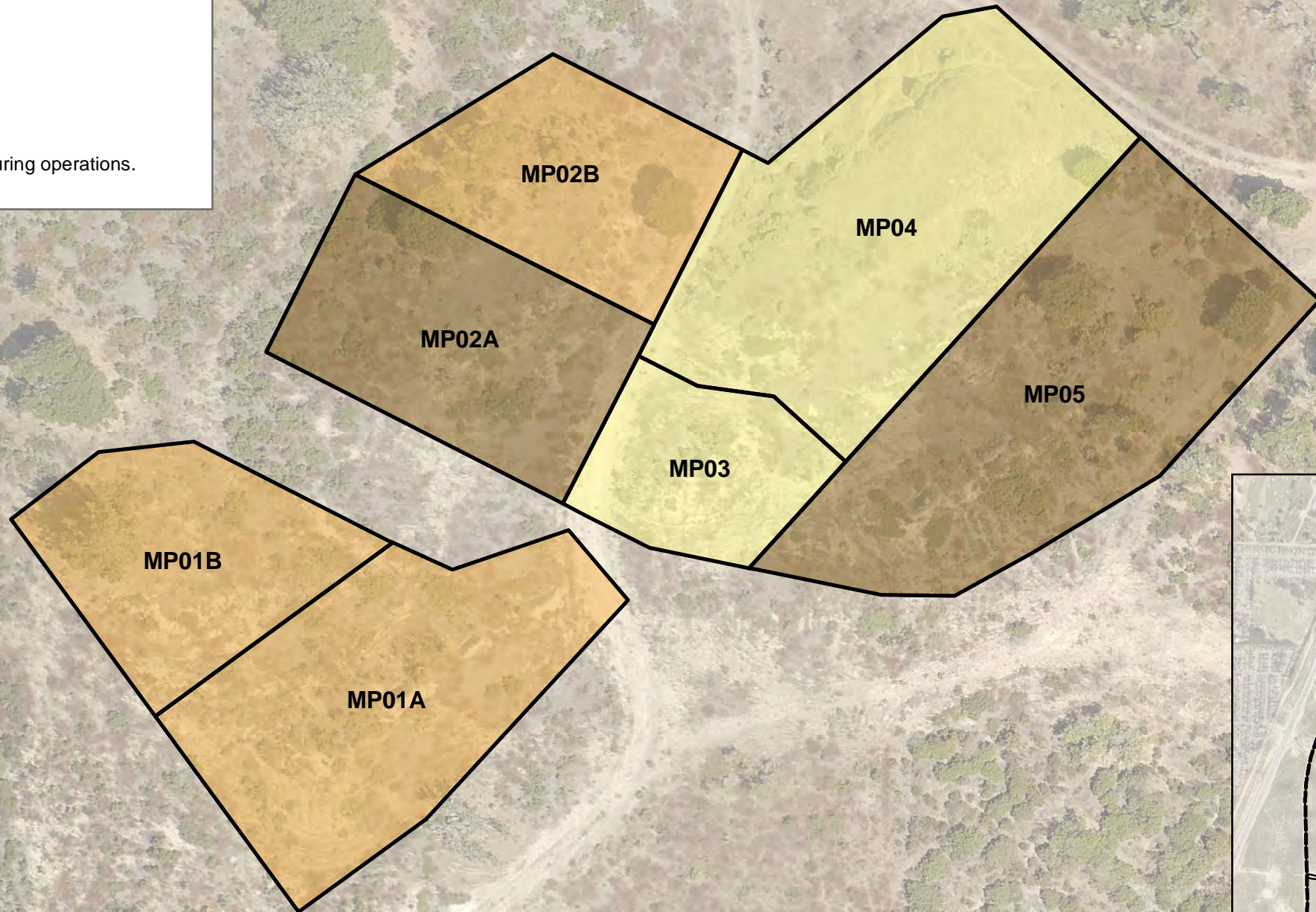


**MP04** WGBA Mortar Pits Work Grids (~1.5 acres)

**MD weight per grid**

- No MD
- 1 - 5 lbs
- 6 - 10 lbs

No MEC items were encountered during operations.



**WGBA Mortar Pits  
MEC Remedial Action  
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**Figure 2**  
WGBA Mortar Pits

## *Appendix A*



## RESPONSES TO COMMENTS

Document: Watkins Gate Burn Area Mortar Pits MEC Remedial Action, Technical Information Paper, Former Fort Ord, California, August 2019

Commenting Organization: United States Environmental Protection Agency Region IX (EPA)

Name: Maeve Clancy

Date of Comments: November 11, 2019

### **Cover Letter Comment:**

The fact that no MEC and only a small quantity of munitions debris (26 pounds) were removed from the site is indicative of an area that was not used as a munitions impact area.

The conclusion that the mounds that are present on the site may be graded to a more natural topography by the Bureau of Land Management is logical, and no safety concerns should be present if the action is performed in accordance with existing procedures and confined to the area of the grids.

No explanation of the purpose of the "Mortar Pits" is provided in the TIP. This term may not be well understood by the general public. In addition, although there were ten mortar pits discovered during the joint inspection of the WGBA, the TIP does not specify the precise location of the pits in the seven work grids displayed on the site figures. This should be provided in the succeeding version of the TIP.

### **Response to Cover Letter Comment:**

These comments are acknowledged. Clarifications will be added to Section 1.2. Please also see response to General Comment 1.

### **General Comment 1:**

The Watkins Gate Burn Area (WGBA) Mortar Pits (MP) Munitions and Explosives of Concern (MEC) Remedial Action (RA) Technical Information Paper (TIP), dated August 2019, notes that there were ten "mortar pits" found in the "Mortar Pit" area during the joint inspection of the site by the United States Department of the Army and the Bureau of Land Management. Only the general location of these pits as being somewhere in the seven work grids displayed on the site figures is provided. Also, the purpose of the "mortar pits" is not identified. It is assumed that they were mortar firing points where mortars were fired into the impact area, but this is not stated. Please

## RESPONSES TO COMMENTS

revise the WGBA MP MEC RA TIP to provide the locations of the ten mortar pits within the seven work grids. Also, please identify the purpose of the “mortar pits” in an appropriate section.

### **Response to General Comment 1:**

The work grids shown on Figure 2 were specifically designed to include the ten mortar pits. Specific locations of the pits were not delineated. The following text has been added to Section 1.2, third paragraph: “The ‘mortar pits’ were locations from which mortars were fired into the Impact Area. The seven work grids shown on [Figure 2](#) were specifically designed to encompass all ten of the mortar pits.”

### **Specific Comment 1:**

**Section 4, Conclusions/Recommendations, Page 5:** This section states that, “Construction support is not required for this planned grading operation within the footprint of the WGBA Mortar Pits site.” This statement is correct, provided that the “footprint of the WGBA Mortar Pits site” is defined as the area comprising the seven work grids displayed on Figure 2 of the WGBA MP MEC RA TIP. Please revise the section to define the footprint and to indicate that construction support would be required if intrusive work is done outside of the area comprising the noted seven work grids, or if any items that could be MEC are discovered.

### **Response to Specific Comment 1:**

As noted in the comment, the recommendation applies to the planned grading activities within the seven work grids where subsurface removal was conducted. Section 4 has been revised as follows: “Analog MEC remediation operations have been completed within the footprint of the WGBA Mortar Pits site (the seven work grids displayed on [Figure 2](#)). The mounds can be graded to a more natural topography by the BLM at a later time when equipment and personnel are available. Construction support is not required for this planned grading operation within the ~~footprint~~ seven grids of the WGBA Mortar Pits site.”



## RESPONSES TO COMMENTS

Document: Watkins Gate Burn Area Mortar Pits MEC Remedial Action, Technical Information Paper, Former Fort Ord, California, August 2019

Commenting Organization: Fort Ord Community Advisory Group (FOCAG)

Name: Mike Weaver

Date of Comments: October 4, 2019

### Comment 1:

“The FOCAG has the following questions;

- 1) What is the size of the Watkins Gate Burn Area? (Northwest section of Impact Area)
- 2) What dates was it burned?”

### Response to Comment 1:

Watkins Gate Burn Area (WGBA) is approximately 1,000 acres. A portion of WGBA burned most recently as part of a prescribed burn conducted in MRS Ranges 43-48 in October 2003 that escaped a containment line.

### Comment 2:

- “3) When was the Mortar Pits area comprising approximately 1.5 acres burned?
- 4) What is the estimate of amounts of ordnance exploding in the Mortar Pits area during the burn?”

### Response to Comment 2:

The Mortar Pits addressed in the *Watkins Gate Burn Area Mortar Pits MEC Remedial Action, Technical Information Paper, Former Fort Ord, California* was just to the north of the area within WGBA that burned in October 2003. The area noted as including the mortar pits was a firing location for mortars towards Range 48 and the interior of the impact area, not an impact area for mortar projectiles.

### Comment 3:

- “5) What was the purpose of the 8 foot high separate earth mounds? Were these ‘backstops’ for mortars? Ordnance?
- 6) How many separate mounds from 75 feet to 200 feet long are there?”

## RESPONSES TO COMMENTS

### Response to Comment 3:

The earth mounds served as a barrier between mortar firing points. They were intended to provide a level of safety to the mortar crews if a mortar misfired in the mortar tube. They did not serve as backstops. As described in Section 1.2 of the document, there were a total of ten mortar pits (firing locations) each with an associated frontal berm.

### Comment 4:

“7) The paper states there were ten mortar pits covered with asphalt? What was the Army purpose of covering the pits with asphalt? Were these burial pits for ordnance?

8) To what depth were these mortar pits inspected for ordnance?

9) To what depth were areas in front the earthen berms excavated and searched for ordnance?”

### Response to Comment 4:

The frontal berms were covered in asphalt, presumably to prevent erosion of the berms. As noted in the response to Comment 3, they were intended to provide a level of safety to the mortar crews if a mortar misfired in the mortar tube. The berms and firing locations were investigated to the depth of detection of the equipment used in the removal.

### Comment 5:

“10) Page 3 tells us that ‘Vegetation coverage at this site was minimal and did not pose a significant obstacle to the planned operation.’ ..... The FOCAG asks, Was residual chemical contamination the cause of minimal vegetation coverage at this site?

11) Was soil surrounding the mounds and pits tested for chemical contamination?”

### Response to Comment 5:

The minimal vegetation coverage was most likely as a result of the mechanical disturbance required to build and maintain these areas for mortar firing training.

WGBA was previously evaluated under the BRA as HA-202, and no further action was recommended. Further detail is included in the *Final Comprehensive Basewide Range Assessment Report, Former Fort Ord, California, Revision 2* (BW-2300L). The two unburned areas in the northern and southern portions of WGBA (which include the area of the mortar pits) were evaluated after surface MEC removal was completed in 2014. Soil sampling was conducted. Results were all below the cleanup threshold. Further detail is included in the *Final Units 1, 2, 3, 7, 10, 33, and Watkins Gate Burn Area North and South (WGBA) Sampling Work Plan Former Fort Ord, California* (BW-2751B) and the *Addendum to the Final Units 1, 2, 3, 7, 10, 33, and Watkins Gate Burn Area North and South (WGBA) Sampling Work Plan Former Fort Ord, California* (BW-2751B.2).

## RESPONSES TO COMMENTS

### Comment 6:

“12) Who made the determination to use analog (mag and dig) methodology on the mortar pits?  
13) Why wasn’t the newer Navy technology used to explore for underground ordnance?”

### Response to Comment 6:

After surface MEC removal was completed in 2014 in the northern and southern portions of WGBA (which include the area of the mortar pits), Digital Geophysical Mapping (DGM) utilizing EM-61 MK2A was conducted. The DGM data was evaluated. It appeared that terrain features of the protective berms had precluded DGM data from being collected in portions of the area. It was determined to employ the analog (mag and dig) method to complete the subsurface removal. The determination was made jointly by the U.S. Army Corps of Engineers (USACE) Ordnance and Explosives Safety Specialist (OESS) and the KEMRON Senior Unexploded Ordnance Supervisor (SUXOS). Due to the expected low likelihood of encountering MEC, a determination was made that advanced geophysical classification equipment was not required to conduct a removal in this area.

### Comment 7:

“14) To what depths were the digs performed at the Mortar Pits area? How many digs?”

### Response to Comment 7:

Digs within the Mortar Pits area were conducted to the depth of instrument detection. An exact record of the number of digs conducted is not collected as part of analog removal operations.

### Comment 8:

“15) Page 5 ‘Conclusions’ states ‘Construction support is not required for planned grading operation within the footprint of the WGBA Mortar Pits site.’

16) Regarding this no construction support required; Who determined this? The FOCAG cannot find it in this Technical Information Paper.

17) Is this a first? How many other places in the Impact Area have been previously signed off as No Construction Support Required?”

### Response to Comment 8:

The level of construction support is determined on a case-by-case basis based on area- and activity-specific information. Section 4 discussed a grading activity in this area planned by Bureau of Land Management (BLM) to be conducted in the future. As a result of no MEC being found, and the limited MD found and removed from the area during the removal operation, a



## RESPONSES TO COMMENTS

determination to not require construction support for this planned grading operation was made jointly by the USACE OEES and the KEMRON SUXOS.