

**DRAFT FINAL**

## **Proposed Plan**

**Military Munitions Response Program**

**Kingman Range Munitions Response Site (AZHQ-006-R-01)**

**Kingman Range - No Further Action Area Munitions Response Site (AZHQ-006-R-02)**

**Mohave County, Arizona**

**JUNE 2021**



**Prepared For:**



**U.S. Army Corps of Engineers  
Army National Guard G-9**

Contract / Delivery Order:  
W912DR-15-D-0022/0001

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## ATTACHMENTS

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Attachment A Arizona Department of Environmental Quality Proposed Plan Review Letter

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## **ACRONYMS AND ABBREVIATIONS**

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ADEQ	Arizona Department of Environmental Quality
AGC	advanced geophysical classification
ARAR	Applicable or Relevant and Appropriate Requirements
ARNG G-9	Army National Guard G-9
AZARNG	Arizona Army National Guard
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CMUA	concentrated munitions use area
DGM	digital geophysical mapping
DMM	discarded military munitions
DoD	Department of Defense
DU	decision unit
ft.	feet/foot
FS	Feasibility Study
HAZWOPER	Hazardous Waste Operations and Emergency Response
HRR	Historical Records Review
in.	inches
ISM	incremental sampling methodology
J	the reported result is an estimated value
LTM	long-term management
LUC	land use control
MC	munitions constituents
MD	munitions debris
MEC	munitions and explosives of concern
mg/kg	milligrams per kilogram
mm	millimeter
MMRP	Military Munitions Response Program
MPPEH	material potentially presenting an explosive hazard
MRS	Munitions Response Site
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NDNODS	Non-Department of Defense, Non-Operational Defense Sites
NFA	no further action
NMRD	non-munitions related debris
PA	Preliminary Assessment
PP	Proposed Plan

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## **ACRONYMS AND ABBREVIATIONS (CONT.)**

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RAO	remedial action objective
RI	Remedial Investigation
ROD	Record of Decision
ROE	right-of-entry
SAA	small arms ammunition
SI	Site Inspection
TBC	to-be considered
U.S.	United States
USACE	United States Army Corps of Engineers
USC	United States Code
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
UU/UE	unlimited use/unrestricted exposure
UXO	unexploded ordnance
WESTON	Weston Solutions, Inc.

## 1.0 INTRODUCTION

This **Proposed Plan (PP)**<sup>1</sup> presents the United States (U.S.) Army National Guard G-9's (ARNG G-9) and the U.S. Army Corps of Engineers' (USACE) preferred remedial (cleanup) alternative for the 8.14-acre **Non-Department of Defense (DoD), Non-Operational Defense Site (NDNODS) Kingman Range Munitions Response Site (MRS)** (AZHQ-006-R-01). The area of contamination is described in the Final **Remedial Investigation (RI)/Feasibility Study (FS)** report (Weston Solutions, Inc., [WESTON], 2021). **Land Use Controls (LUCs)** is the preferred **remedial alternative** for the Kingman Range MRS. No further action (NFA) is recommended for the 25.29-acre Kingman Range – NFA Area MRS (AZHQ-006-R-02). The preferred remedial alternative presented in this PP is designed to protect people from encountering **munitions and explosives of concern (MEC)** at the 8.14-acre Kingman Range MRS.

NDNODS are sites that were exclusively used by the Army National Guard, but were never owned, leased, or otherwise possessed or used by the U.S. Army or another DoD component. The Kingman Range MRS was used by the Arizona Army National Guard (AZARNG) and is located on private property.

This document is being issued by ARNG G-9, the lead agency for NDNODS activities. The ARNG G-9, in coordination with the Arizona Department of Environmental Quality (ADEQ), will select the final remedy for the MRS after reviewing and considering all information submitted during the **public comment period** and the virtual public meeting (30 June 2021 – see box on right side of this page). The ARNG G-9 may modify the remedy preference or select another response action based on public comments, regulator comments, or other new information received after this PP is issued. The public is encouraged to review and comment on this PP.

The DoD's Military Munitions Response Program (MMRP), which began in 2001, addresses the potential explosives safety, health, and environmental issues resulting from past munitions use at current and former military training lands. In fulfilling its obligations under MMRP, the Army's priority is the protection of human health and the environment. The

## MARK YOUR CALENDARS!

### PUBLIC COMMENT PERIOD:

The public is invited to participate in the decision-making process by reviewing and commenting on the remedial alternative presented in this Proposed Plan for the 8.14-acre Kingman Range Munitions Response Site (AZHQ-006-R-01), located in Mohave County, Arizona, between **20 June 2021** and **20 July 2021**. Oral and written comments will be accepted during the public comment period. Written comments must be postmarked by the last day of the public comment period.

Comments should be submitted to the following:

LTC Donna Wu  
Cleanup Branch Chief (ARNG-IED-S)  
111 South George Mason Drive  
Arlington, VA 22204-1373  
(703) 607-2177  
donna.s.wu.mil@mail.mil

### INFORMATION REPOSITORY:

A copy of the Remedial Investigation Report/Feasibility Study, and Proposed Plan are available to the public for review at the following location:

Mohave County Library  
Kingman Branch  
P.O. Box 700  
3269 N. Burbank Street  
Kingman, AZ 86402-7000  
928-692-2665

Hours of Operation:  
Monday - Saturday 9:00 am – 5:00 pm;  
Sunday: Closed

### PUBLIC MEETING:

A virtual public meeting will be held on **30 June 2021 at 6 pm Mountain Standard Time** to discuss the remedial alternative presented in this Proposed Plan and to respond to questions. To attend the virtual meeting interested parties should go online to <https://global.gotomeeting.com/join/638272421> or dial in using a phone (Toll Free): 1-877-309-2073, Access Code: 638-272-421. Both oral and written comments will be accepted at the public meeting.

<sup>1</sup> **Boldfaced** terms are defined in Glossary, pages 17-19.

ARNG G-9 is required by the **Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)** §117(a) and **National Oil and Hazardous Substances Pollution Contingency Plan (NCP)** §300.430(f)(3)(i) to issue this PP and seek public participation and comment.

This PP summarizes the information that is detailed in the Kingman Range MRS RI/FS Report (WESTON, 2021) and other documents contained in the **Administrative Record** or the **information repository** at the Kingman Branch of the Mohave County Library (see box on first page). ARNG G-9, AZARNG, USACE, and ADEQ encourage the public to review these documents to gain a more comprehensive understanding of the Kingman Range MRS and investigation activities that have been conducted. ARNG G-9 will issue a **Record of Decision (ROD)** announcing the final remedy for the Kingman Range MRS after the comment period has closed and all stakeholder comments have been reviewed. The public's comments on this PP will be considered in the final selection process and will be discussed in the *Responsiveness Summary* of the ROD.

## 2.0 SITE DESCRIPTION

The former 33.43-acre Kingman Range MRS is located at 35° 12' 20" and 35° 12' 28" latitude and 114° 00' 15" and 114° 00' 41" longitude, approximately 150 miles west of Flagstaff in Kingman, Mohave County, Arizona (**Figure 1**). The MRS has been privately owned since 1968. A portion of the 33.43-acre MRS is a residential community (Kingman Park Estates). No visible surface water sources are located on the MRS.

There are no federally-designated critical habitats within the 33.43-acre MRS. There are no Designated Priority Habitat or Designated Habitat for Rare Species specifically within the MRS boundary, or Areas of Critical Environmental Concern.

There are no historic properties listed on the National Register of Historic Places, no National Historic Landmarks, and no National Historic Sites within the MRS boundaries. There are also no known pre-historic resources within the 33.43-acre MRS.

## 3.0 SITE HISTORY AND BACKGROUND

The Kingman Range MRS (33.43 acres) was used by

AZARNG as a small arms firing range from 1951 to early 1968. Munitions use was limited to small arms (.22-caliber, .30-caliber, and .45-caliber) and submachine gun practice, as well as mortar and 3.5-inch rocket target practice. The firing line was located along Eastern Street, with firing from west to east into targets with a natural bedrock escarpment backstop located 1,500 feet (ft.) away. A brief history of the MRS is presented in **Table 1**.

**Table 1: Historical Timeline**

Date	Activity
1951-1968	AZARNG used the 33.43-acre MRS for small arms and submachine gun practice, as well as mortar and 3.5-inch rocket target practice.
2008	<u>Site Inventory/Preliminary Assessment</u> . Access to the impact area of the 33.43-acre MRS was not obtained from the property owner, so the impact area was viewed from the nearest publicly accessible road. No military munitions or munitions debris was visible from the roadway.
2011	<u>Site Inspection</u> . Small arms ammunition debris (casings) projectiles, munitions debris consisting of a rifle clip, two mortar fuze fragments and debris from a 3.5-inch rocket were found. No metals concentrations exceeded human health or ecological risk-based screening levels and no explosive compounds were detected in the soil samples collected.
2019	<u>Remedial Investigation</u> . An expended M22 smoke grenade, 3.5-inch M29 practice rocket debris (tail fins, tail shroud, nose cone); 60-millimeter mortar fragments (tail boom) and unidentifiable fragments of munitions debris were identified. No concentrations of metals or explosive compounds were detected at levels greater than human health or ecological risk-based screening levels in the soil samples collected. ADEQ concurred with the RI Work Plan that concluded the residential area did not need to be investigated and would be considered for NFA at the end of the RI.

## 3.1 Site Inventory / Preliminary Assessment

A Final State / Territory Inventory Report for Arizona, also referred to as a **Preliminary Assessment (PA)**, was conducted at the Kingman Range MRS in 2008 (EA Engineering, Science, and





Figure 1: Site Location



Technology, Inc., 2008). According to the PA, the 25.3-acre MRS was used for training by the AZARNG from 1951 until 1968 for small arms and submachine gun practice. ARNG G-9 identified the MRS based on its inclusion in a 1966 memo entitled “Safety Inspection of Ranges” located at the National Archives and in an expired lease agreement between the previous owner of the Kingman Range MRS and the AZARNG. The PA indicated that the MRS was located on private property.

### 3.2 Historical Records Review

A Historical Records Review (HRR) and **Site Inspection (SI)** Work Plan were completed in 2011 (WESTON, 2011). Historical aerial photographs obtained from private archives depicted the extent of the historic range and the location of the firing points. As a result of evaluating these historical aerial photographs, the 25.3-acre size of the MRS was increased to 33.43 acres. No other changes were made to the characteristics of MRS during the development of the HRR (WESTON, 2011).

### 3.3 Site Inspection

A SI was conducted for the 33.43-acre Kingman Range MRS in 2011 to determine if **MEC** and **munitions constituents (MC)** were present at the MRS (WESTON, 2012). Only 8.14 acres on the eastern side of the MRS were investigated due to refusal by residents to sign right-of-entry (ROE) forms. However, these properties were not considered critical as they consisted of residential properties where it was assumed the construction development activities would have already identified any items. The ROEs that were obtained were in the target impact area.

During the SI, magnetometer-assisted visual surveys were conducted along a 3.6-mile-long meandering path. **Small arms ammunition (SAA)** projectiles and **munitions debris (MD)** (a rifle clip, two mortar fuze fragments and debris from a 3.5-inch rocket) were encountered (**Figure 2**). No MEC were found during the SI field activity. During the SI, surface soil samples were collected from 11 locations within the MRS. The samples were analyzed for select metals of concern (antimony, copper, lead, and zinc) and/or explosive compounds depending on the sampling location. No metals concentrations exceeded human health or ecological risk-based screening levels and

no explosives were detected in the collected soil samples.

Based on the results of the SI, the Kingman Range MRS (33.43 acres) was recommended to proceed to the RI phase (AZHQ-006-R-01) for MEC and MC (WESTON, 2012).

### 3.4 Remedial Investigation

A RI was conducted from 2017 to 2019 to characterize the nature and extent of MEC and MC potentially present on the 33.43-acre Kingman Range MRS, evaluate the hazards and risks to human health and the environment from MEC and MC, and determine whether the MRS warranted further response actions pursuant to CERCLA (WESTON, 2021).

#### *MEC Survey*

The geophysical survey design for the characterization of MEC at the 33.43-acre Kingman Range MRS included parallel **digital geophysical mapping (DGM)** and analog transect surveys, and intrusive investigation of **anomalies** within the transects and grids on the 8.14-acre impact area of the MRS. No work was conducted in the residential area for reasons stated during the SI summary. The ADEQ agreed to the field work strategy outlined in the RI Work Plan that included not investigating the residential area.

**Unexploded ordnance (UXO)** Technicians surveyed eight pre-planned, parallel DGM/analog transects and four full analog coverage grids (**Figure 3**). Analog transects were required in some areas due to steep slopes near the escarpment. Analog geophysical transects and grids were collected using White’s All Metal detectors to ensure complete coverage within a 5-ft.-wide lane for each instrument operator. The UXO Technicians covered a total of 1.47 miles (0.68 acres) of DGM/analog transects and a total of four 50-ft. by 50-ft. full analog coverage grids (0.23 acres) for a total of 0.91 acres of coverage within of the area of investigation (8.14 acres).

To identify potential **concentrated munitions use areas (CMUAs)**, a geostatistical spatial density analysis was performed on the results of the DGM/analog transects using Visual Sample Plan modeling software. No CMUAs were identified at the MRS. However, several areas of elevated anomaly density were identified, primarily within the



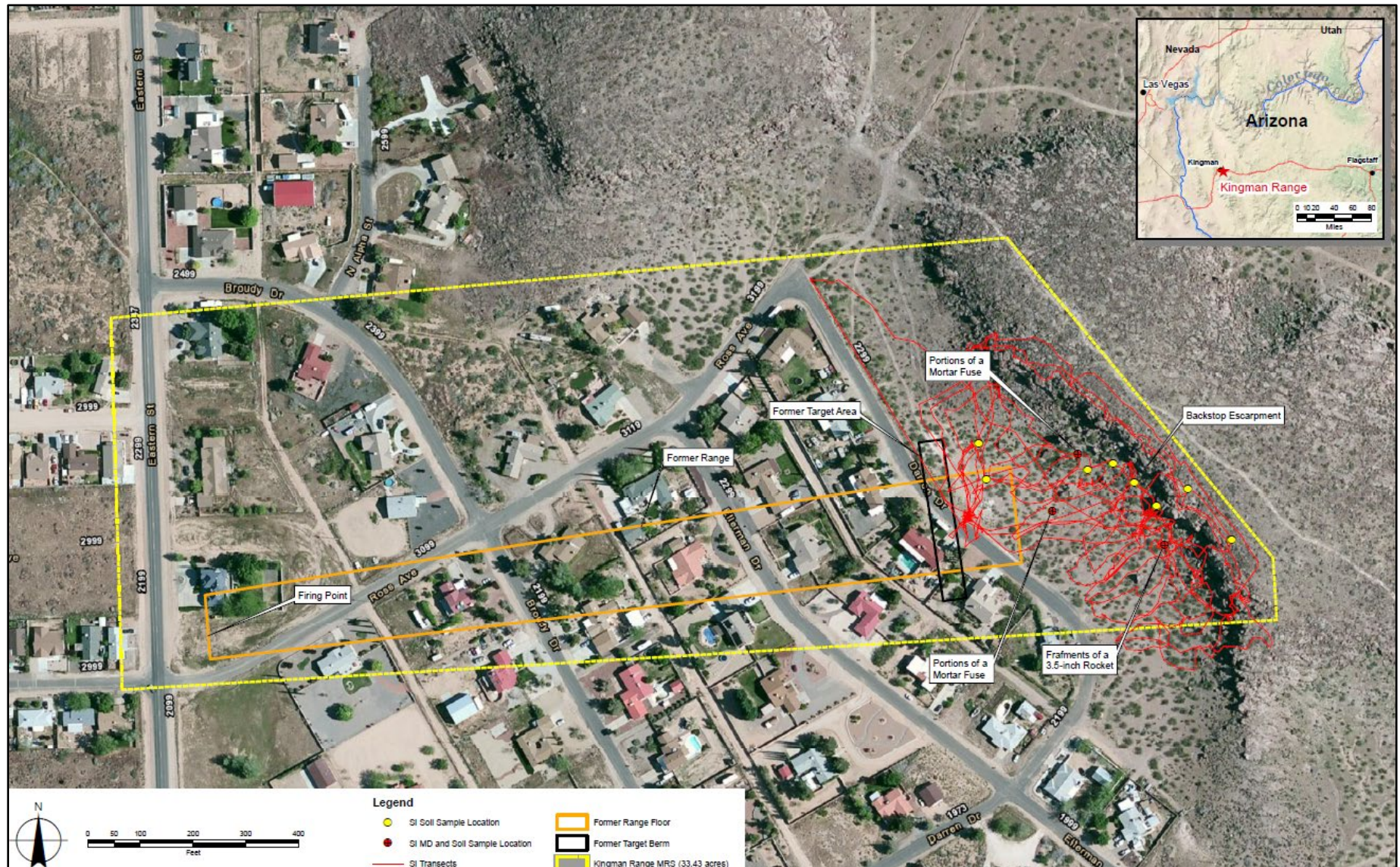


Figure 2: SI Investigation Results Map



southeastern portion of the MRS. Further investigation of these areas was performed during the investigation (i.e., 100% coverage) of four 50-ft. by 50-ft. grids using analog geophysical methods. A total of 88 anomalies were identified and investigated along the transects and grids, including 21 MD items, 23 SAA debris items, and 44 **non-munitions related debris (NMRD)** items (aluminum cans, scrap metal, wire, foil, and nails).

No MEC was discovered during the RI; however, MD items relating to M29 3.5-inch practice rocket (tail fins, tail shroud, nose cone), unidentified fragmentation debris, a M22 Rifle Grenade Smoke, and debris from a 60-millimeter (mm) mortar (tail boom) were identified.

The majority of MD was located to the east of the former target area, but not beyond the western slope of the natural escarpment backstop (**Figure 3**). All MD items were encountered at less than six inches (in.) below ground surface (bgs) and NMRD was encountered at a maximum depth of 12 in. bgs.

### **MC Sampling**

The MC sampling program was designed to determine the nature and extent of MC associated with the Kingman Range MRS. The MC sampling approach was based on historical information and the results of the intrusive investigation. Samples were collected at the former target berm since no MEC or material potentially presenting an explosive hazard (MPPEH) was identified during the RI.

Sampling for MC at the Kingman Range MRS took place on 16 and 17 October 2017. Two decision units (DUs) within the study area were identified to characterize the undeveloped area of the former target berm. Background sampling was conducted at a sampling unit located outside of the MRS to distinguish site-related contamination from naturally-occurring or other non-site-related levels of chemicals. MC characterization was performed using incremental sampling methodology (ISM). A total of seven ISM MC surface soil samples (one background sample, four MC samples and two quality control samples) were collected, prepared, shipped, and analyzed for explosive compounds (nitroaromatics and nitramines) using U.S. Environmental Protection Agency (USEPA) Method 8321B and select metals (antimony, copper, lead, and zinc) using USEPA

Method 6020A. Sample locations are presented on **Figure 3**.

No explosive compounds were detected in the ISM samples collected except for laboratory-estimated concentrations of nitroglycerin and 2,4-dinitrotoluene. Nitroglycerin was detected in the sample and its field replicate from DU01 (0.011 J [the reported result is an estimated value] milligrams per kilogram [mg/kg] and 0.034 J mg/kg, respectively); 2,4-dinitrotoluene was detected at 0.022 J mg/kg at DU02. Select metals (antimony, copper, lead, and zinc) were detected in all samples. Antimony concentrations ranged from 0.73 mg/kg to 0.96 mg/kg, copper concentrations ranged from 9.5 mg/kg to 18 J mg/kg, lead concentrations ranged from 42 mg/kg to 85 mg/kg, and zinc concentrations ranged from 29 mg/kg to 45 mg/kg. The analytical results of the background samples collected were used to calculate a 95% upper confidence limit. The results of the RI fieldwork indicated explosive compound concentrations did not exceed preliminary remediation goals, but metals concentrations exceeded background concentrations and ecological screening levels.

### **Residential Survey**

A survey of residents within the MRS was conducted to ensure that no residents had found munitions on their property. A questionnaire was sent out asking if residents had dug on their property (yes or no); if they had found any metal objects or munitions objects (yes or no; if yes, describe); and if they had heard of anyone in their community finding a munitions item (yes or no; if yes, describe). Letters were sent out for 41 properties and 14 responses were received. Only one response indicated they had found an item related to past AZARNG use, a single 50-caliber bullet, on their property. A virtual public meeting was held on 05 January 2021. One resident attended the meeting and had no questions or comments.

### **RI Recommendations**

The 33.43-acre Kingman Range MRS was divided into two MRSs: the 8.14-acre Kingman Range MRS (AZHQ-006-R-01) requiring further action for MEC and NFA for MC and the 25.29-acre Kingman Range –NFA Area MRS (AZHQ-006-R-02) requiring NFA for MEC and MC (**Figure 3**). The boundaries of the Kingman Range MRS correspond with the RI area of investigation (8.14 acres) and the boundaries of the Kingman Range – NFA Area MRS consist of the

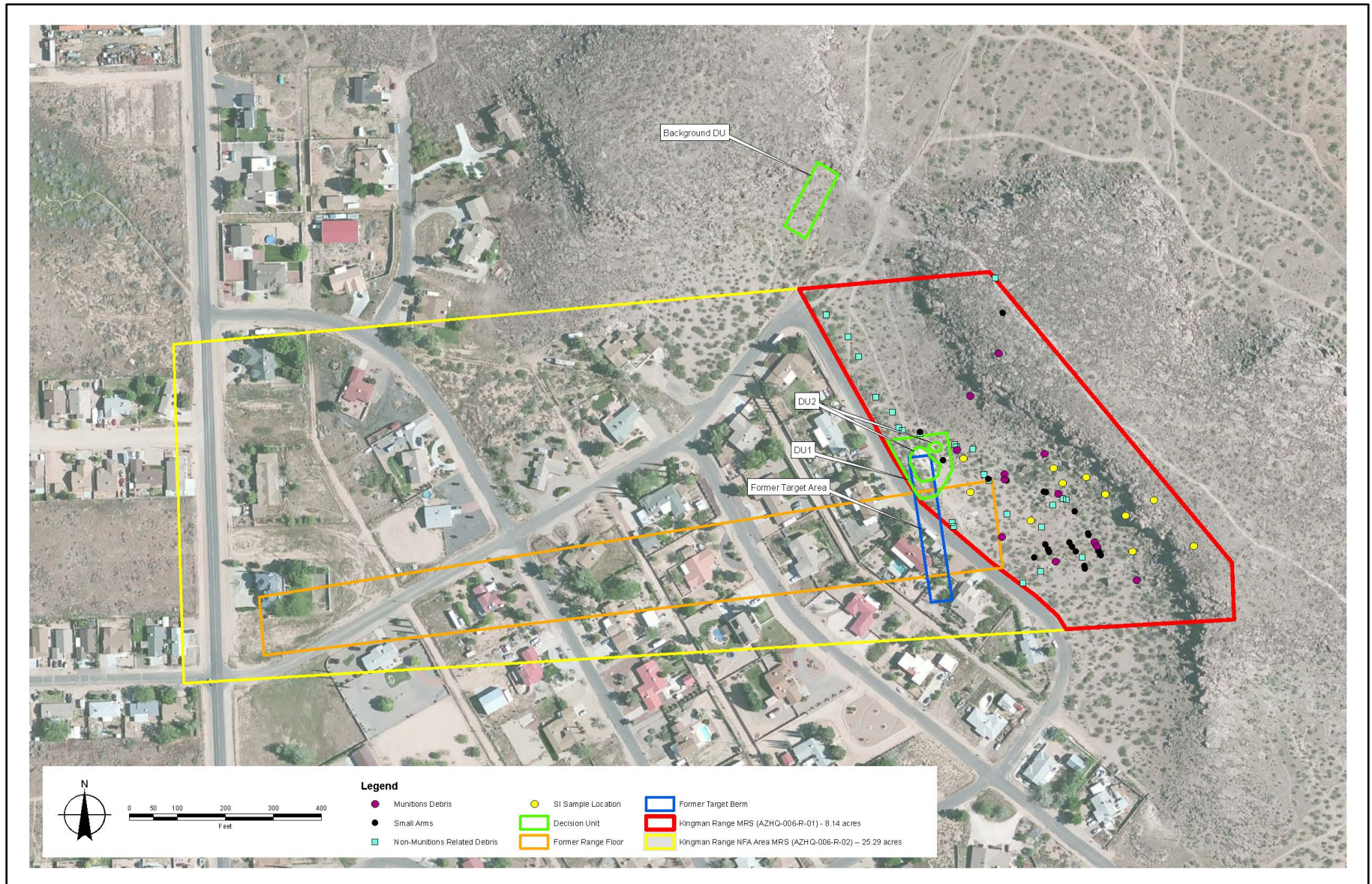


Figure 3: RI Investigation Results and Boundaries Map



developed and hardscaped (i.e., residential) portion of the MRS where no evidence of MEC or MD has been observed (25.29 acres) (WESTON, 2021). ADEQ concurred with NFA for the Kingman Range – NFA Area MRS.

### 3.5 Feasibility Study

A FS was completed in 2021 to evaluate potential remedial alternatives for the 8.14-acre Kingman Range MRS (AZHQ-006-R-01) (WESTON, 2021). Four remedial alternatives were identified as “reasonable measures” for protecting the public and the environment from potential exposure to MEC. They are described in the *Summary of Remedial Alternatives*.

## 4.0 SITE CHARACTERISTICS

The entire Kingman Range MRS encompasses 33.43 acres and is in the City of Kingman, Mohave County, Arizona, approximately 150 miles west of Flagstaff. The MRS has been developed and privately owned since 1968 and a portion of it is a residential community, Kingman Park Estates. There are multiple residential structures within the MRS boundary and the developed area equals 25.59 acres.

The western boundary of the MRS is generally coincident with the western side of Eastern Street. The northern, eastern, and southern sides of the MRS do not coincide with distinct anthropogenic features. The eastern boundary is along an exposed bedrock escarpment that increases in elevation to the east.

There is no known critical habitat within the MRS and there are no federal or state threatened, endangered, or candidate species known to exist on the MRS (U.S. Fish and Wildlife Service [USFWS], 2021).

### 4.1 Nature and Extent of MEC

UXO and/or discarded military munitions (DMM) were not discovered during the SI or RI. However, fragments of M29 3.5-inch practice rockets (tail fin, tail shroud, and nose cone) and 60mm mortar components (fuze, tail boom, and other debris) were identified. The MD associated with the 60mm mortars may have been associated with target practice rounds. The M29 3.5-inch practice rocket is a surface launched munition with a maximum range of approximately 500 ft. The 60mm mortar is a surface launched munition fired from a tube with large variation in range due to the ability to add and remove

augmenting charges.

An expended M22 Rifle Grenade Smoke was also identified during the RI. The M22 (Smoke) Rifle Grenade is used for signaling and consists of three basic parts: a steel stabilizer assembly, an integral fuze, and a body. The body is filled with a burning-type smoke charge which contains a dye to color the smoke. The M22 Rifle Grenade is a surface launched munition with a maximum range of ~650 ft.

The RI determined that there was physical evidence that high explosive munitions may have been used at the Kingman Range MRS (WESTON, 2021).

All MD items were discovered within the 8.14-acre impact area of the Kingman Range MRS. MD items from the SI and RI were found in the undeveloped area, but west of the natural escarpment backstop (**Figure 3**). All MD items were encountered at depths less than six in. bgs. The conceptual site model was updated to indicate that MEC exposure pathways are potentially complete for all receptors and all pathways (WESTON, 2021).

### 4.2 Nature and Extent of MC

Analytical results from the RI indicated concentrations of nitroglycerin and 2,4-dinitrotoluene were detected in three soil samples at levels less than their respective preliminary remediation goals (i.e., the most stringent human health and ecological screening levels). Antimony and lead concentrations in soil exceeded background concentrations and ecological screening levels. However, although these concentrations exceeded ecological screening levels, the area that they represent (the former target berm) is insufficient to support an ecology that can submit to ecological review. Therefore, the MC exposure pathways are incomplete for human receptors.



M22 Rifle Grenade recovered from Transect AT-01 at the Kingman Range MRS during the RI.



## 5.0 SCOPE AND ROLE OF THE RESPONSE ACTION

This PP addresses the preferred remedial alternative selected by ARNG G-9, USACE, AZARNG and the property owner to manage the risks posed by MEC at the 8.14-acre Kingman Range MRS.

## 6.0 SUMMARY OF SITE RISKS

Based on the RI findings (WESTON, 2020), the MEC and MC risks are summarized below.

### 6.1 MEC Risk Summary

Results of the SI and RI indicate that AZARNG training at the MRS included small arms (.22-caliber, .30-caliber, and .45-caliber ammunition), submachine gun, and 60mm mortar and 3.5-inch rocket target practice. However, the small quantity of MD items recovered indicate that training at the MRS was infrequent.

The methodology described in the Study Paper: *Decision Logic to Assess Risks Associated with Explosive Hazards, and to Develop Remedial action objectives for Munitions Response Sites* (USACE, 2020) was used to evaluate the risks associated with potential MEC present at the 8.14-acre Kingman Range MRS and the 25.29-acre Kingman Range - NFA Area MRS. Based on the evaluations, the Kingman Range MRS has a baseline risk of MEC that is “Unacceptable” and the Kingman Range - NFA Area MRS has a baseline risk of MEC that is “Acceptable”.

### 6.2 MC Risk Summary

Since samples collected during the RI did not detect explosives or metals concentrations greater than human health risk-based screening levels, a **Human Health Risk Assessment** was not conducted. The MC concentrations present in the soil do not pose a risk to human health.

A **Screening Level Ecological Risk Assessment** was conducted. Antimony and lead concentrations exceeded the screening level for some ecological receptors; however, the former target area would not support wildlife populations based on its size. Therefore, MC at the MRS does not pose a threat to the ecology.

## 7.0 REMEDIAL ACTION OBJECTIVE

**Remedial action objectives (RAOs)** are site-specific goals that are developed to protect human health and the environment against which remedial alternatives are screened. The RAO established for the 8.14-acre Kingman Range MRS is to prevent direct contact with surface and subsurface MEC to 18 in. bgs by current and future receptors, including recreational users (trespassers), site visitors, construction workers, and the private landowner.

During RAO development, potential **applicable or relevant and appropriate requirements (ARARs)** and to-be-considered (TBC) criteria were evaluated. The ARARs and TBCs for the MRS are provided in **Table 2**.

**Table 2: Applicable or Relevant and Appropriate Requirements**

Regulatory Authority	Characteristic Location	Requirement	Status	Applicability/Relevance <sup>1</sup>
<b>Location-Specific ARARs</b>				
Federal	U.S.	Resource Conservation and Recovery Act 40 Code of Federal Regulations (CFR) Part 264 Subpart X	ARAR	Relevant parts relate to the management of MEC that is recovered, including characterization as hazardous waste and requirements for treatment, storage, and transportation. Establishes actions required for the disposal of waste explosives by open burning or open detonation.  May be applicable if storage and transportation of recovered military munitions is performed during remedial actions. May also be applicable if disposal of explosives is performed during remedial actions.
Federal	U.S.	Management of Military Munitions - 40 CFR 266, Subpart M	ARAR	Describes when military munitions are exempt from being managed as solid or hazardous waste.

<sup>1</sup> These regulations apply to the extent that there is a cleanup standard, standard of control, or other requirement contained in the regulation that specifically addresses a hazardous substance, pollutant or contaminant, remedial action, location, or other circumstance found at a CERCLA site.

## 8.0 SUMMARY OF REMEDIAL ALTERNATIVES

ARNG G-9, USACE, AZARNG, and ADEQ are considering four different remedial alternatives for the 8.14-acre Kingman Range MRS. The remedial alternatives were evaluated against seven of the nine criteria required by CERCLA and the NCP (see criteria explanation in **Table 3**). Criteria 8 and 9 will be considered after the public comment period has ended.

The evaluated Response Action Alternatives in the RI/FS are as follows:

- Alternative 1: No Action.
- Alternative 2: LUCs.

- Alternative 3: Complete Surface and Subsurface (18 in. bgs) Removal of MEC Using DGM/advanced geophysical classification (AGC) and LUCs.
- Alternative 4: Complete Surface and Subsurface Removal of MEC down to Bedrock Using Excavation and Sifting and Analog Clearance of the Rock Escarpment.

**Table 4** provides a brief description of the remedial alternatives and their associated costs.

ARNG G-9 prefers Alternative 2 because it best meets the criteria for addressing the MEC-related risks to human health and the environment at the 8.14-acre Kingman Range MRS.

**Table 3: Evaluation Criteria**

<b>Threshold Criteria</b> – requirements that an alternative must meet or specifically waive for selection eligibility
<b>Overall Protection to Human Health and the Environment</b> – addresses how well an alternative protects people and the environment. This standard can be met by reducing or removing contamination or by reducing exposure to it.
<b>Compliance with ARARs or Other Requirements</b> – ensures that options comply with federal, state, and local laws.
<b>Balancing Criteria</b> – basis for comparing and contrasting alternatives that meet Threshold Criteria
<b>Long-term Effectiveness and Permanence</b> – evaluates how well an option will work over the long term, including how remaining contamination can be safely managed.
<b>Reduction of Toxicity, Mobility, or Volume through Treatment</b> – addresses how well an alternative reduces the danger, movement, and amount of contamination.
<b>Short-term Effectiveness</b> – compares how quickly an option could achieve cleanup goals and how much risk there would be to workers and members of the public while the alternative is being implemented.
<b>Implementability</b> – evaluates how feasible an alternative is to implement and whether materials and services are available in the area.
<b>Cost</b> – includes not only capital costs (for example, equipment, materials, and labor), but also the costs of maintaining the option for the life of the cleanup.
<b>Modifying Criteria</b> – additional factors that can influence acceptability of the alternative
<b>State Acceptance</b> – judges how well the state environmental agency accepts the alternative. This will be evaluated after receiving public comments.
<b>Community Acceptance</b> – judges how well the nearby residents and other members of the community accept the selected alternative. This will be evaluated after receiving public comments.

**Table 4: Remedial Alternative Summary**

<b>Alternative 1: No Action</b>	
<i>Estimated Present Value Cost</i>	\$0
<i>Alternative Description:</i>	
<ul style="list-style-type: none"> <li>• CERCLA requires that a “No Action” alternative be evaluated for the purpose of comparison to the other proposed alternatives.</li> <li>• For the No Action alternative, it is assumed that no change to the current land use of the MRS would occur.</li> </ul>	
<b>Alternative 2: LUCs</b>	
<i>Estimated Present Value Cost</i>	\$161,000

<i>Alternative Description:</i>	
<ul style="list-style-type: none"> <li>Alternative 2 includes the creation and distribution of a 3 Rs brochure, fact sheet, and public notice. A fact sheet and 3 Rs brochure would be prepared for the property owners. These documents would be distributed once to public officials, emergency management agencies, and neighborhood residents. The 3 Rs brochure would be distributed to the public upon request.</li> <li>Alternative 2 includes the development and documentation of steps necessary to manage the potential MEC remaining at the MRS. Two types of management plans may be required: long-term management (LTM) program plan and Environmental Hazard Management Plan.</li> <li>Alternative 2 includes costs associated with conducting Five-Year Reviews for 30-years (USEPA, 2001). Five -Year Reviews are a requirement because the alternative does not meet the requirements for <b>unlimited use/unrestricted exposure (UU/UE)</b>.</li> <li>Alternative 2 would protect human health from potential MEC that may remain because it would mitigate exposures through educational controls.</li> <li>Alternative 2 would protect the environment because no clearing, grubbing, or excavating would occur.</li> </ul>	
<b>Alternative 3 – Complete Surface and Subsurface (18 in. bgs) MEC Removal using DGM/AGC &amp; LUCs</b>	
<i>Estimated Present Value Cost</i>	\$1,677,000
<i>Alternative Description:</i>	
<ul style="list-style-type: none"> <li>Alternative 3 includes LUCs, as described in Alternative 2, plus six warning signs located at corners of the MRS and potential access points, fencing around the perimeter of the 8.14-acre Kingman Range MRS, and LTM including annual inspections. It also includes the removal of MEC in the subsurface (from the ground surface to a depth of 18 in. bgs) from approximately 80% of the MRS using geophysical techniques.</li> <li>Alternative 3 includes a surface clearance, DGM investigation, and cued interrogation surveys using an advanced Metal Mapper 2x2 sensor of 6.39 acres.</li> <li>Alternative 3 would protect human health by mitigating the threat posed to human health by potential MEC on the ground surface and in the subsurface.</li> <li>Alternative 3 would impact the environment during clearance activities. However, these activities would be performed with as little ground disturbance as possible and removal of MEC would also be protective of the environment.</li> </ul>	
<b>Alternative 4: Complete Surface and Subsurface Removal of MEC using Excavation and Sifting, and Analog Clearance of the Rock Escarpment</b>	
<i>Estimated Present Value Cost</i>	\$5,612,000
<i>Alternative Description:</i>	
<ul style="list-style-type: none"> <li>Alternative 4 includes removal (excavation and sifting) of soil from approximately 80% of the MRS in an effort to achieve UU/UE. The excavation would remove soil from the ground surface to bedrock (a depth of approximately three ft.). Because the escarpment area is steeply graded, it would be cleared using analog geophysical methods.</li> <li>Alternative 4 includes backfilling of the excavated areas and site restoration.</li> <li>Alternative 4 would protect human health by removing potential MEC hazards from the ground surface to bedrock and by clearing the rock escarpment with analog geophysical methods.</li> <li>Alternative 4 does not require LUCs.</li> <li>Alternative 4 would impact the environment because approximately 31,000 cubic ft. of soil would be excavated and sifted, and the area would be backfilled with native soil and restored. However, the removal of potential MEC would also be protective of the environment.</li> </ul>	

## 9.0 EVALUATION OF REMEDIAL ALTERNATIVES

Nine criteria are used to evaluate the different remedial alternatives individually and against each other to select a remedy.

1. Overall Protection of Human Health and the Environment.
2. Compliance with ARARs.
3. Long Term Effectiveness and Permanence.
4. Reduction of Toxicity, Mobility, or Volume through Treatment.
5. Short Term Effectiveness.

6. Implementability.
7. Cost.
8. State Acceptance.
9. Community Acceptance.

This section profiles the relative performance of each remedial alternative against the nine criteria, noting how it compares to the other options under consideration.

The final remedy is selected based on weighing the tradeoffs identified during analysis of the criteria, comments received during the public comment period, and any new information discovered after the

PP has been issued. **Table 3** presents the specific components of each of the nine criteria. The alternatives are summarized in **Table 4**. The evaluations of each of the remedial alternatives against the nine evaluation criteria are provided in the following paragraphs and summarized in **Table 5**. Additional detailed analysis of each remedial alternative can be found in the RI/FS (WESTON, 2021).

## **1. Overall Protection of Human Health and the Environment**

Alternative 1 would not eliminate, reduce, or control human exposures to surface and subsurface MEC/MD. Therefore, the potential exists for MEC to be handled by unqualified/untrained personnel and disposed of improperly. Alternative 2 would be protective of human health through educational controls that raise public awareness and mitigate exposure to potential MEC hazards. Together, these LUCs would be sufficient in meeting the RAO for the MRS. The exception being for potential future residents because MEC hazards may remain at the MRS and UU/UE would not be achieved.

Alternative 3 would be more protective of human health than Alternative 2 because MEC would be removed from the surface and subsurface (0-18 in. deep) across 80% of the MRS. This alternative includes LUCs (educational controls plus fencing and warning signs) and meets the RAO for the MRS.

Alternative 4 would be more protective of human health than Alternative 3 by removing potential MEC in the surface and subsurface (down to bedrock) and by conducting an analog clearance of the steeply sloping escarpment area. Alternative 4 is intended to meet UU/UE requirements.

Alternatives 1 and 2 would not damage the environment because clearing, grubbing, or excavating will not occur. Alternative 3 might cause damage to the environment. The extent of the damage is dependent upon the density and depth of the excavation and the extent to which vegetation will have to be cleared. Alternative 4 would damage the environment because all soil would be excavated and sifted. Alternative 4 would be the least protective alternative environmentally because it would cause the most damage to the MRS. However, the MRS would be backfilled with native soil and restored.

## **2. Compliance with ARARs**

ARARs are not applicable for Alternatives 1 and 2. Alternatives 3 and 4 would be performed in compliance with the ARARs (**Table 2**). Alternatives 3 and 4 would require more coordination and planning to avoid potential environmental impacts than Alternatives 1 and 2. If MPPEH or MEC items requiring a consolidated shot approach are identified during activities of Alternatives 3 or 4, 40 CFR Part 264, Subpart X and 40 CFR 266, Subpart M would become ARARs.

## **3. Long Term Effectiveness and Permanence**

Alternative 1 is not effective or permanent. Alternative 2 would be more effective and lasting than Alternative 1, assuming the cooperation and active participation of the existing powers and authorities of government agencies. The LUCs recommended under Alternative 2 would be designed to be effective for the long term: educational materials would be provided to the public and private landowners to mitigate exposures to potential MEC. Five-Year Reviews would be performed to ensure LUCs remain effective. Alternative 3 would be more effective and lasting than Alternative 2 because it would clear MEC to a depth of 18 in. bgs at 80% of the MRS and implement LUCs. Alternative 4 would be the most effective and lasting alternative because MEC would be cleared to bedrock and the escarpment would be cleared of MEC using analog technology.

## **4. Reduction of Toxicity, Mobility, or Volume through Treatment**

Alternatives 1 and 2 would not reduce the toxicity, mobility, or volume of MEC at the MRS. Alternative 3 would be more effective than Alternatives 1 and 2 because it would detect, recover, and recycle MEC from the MRS. Alternative 3 would remove detectable surface and subsurface MEC from the ground surface to a depth of 18 in. bgs.

Alternative 4 would be the most effective in reducing the toxicity, mobility, or volume of MEC because it would remove detectable items from the ground surface to bedrock (a depth of approximately 36 in. bgs). Alternatives 3 and 4 satisfy the statutory preference for treatment as a principal element of the remedy because MEC would be identified and removed from the MRS.

## 5. Short Term Effectiveness

Alternatives 1 and 2 would pose no short-term risk to the community or workers at the MRS. Alternative 3 would increase risk to the public and workers during clearance and treatment of suspect MEC or MPPEH. Alternative 4 would present an increased risk to workers during excavating and sifting of soil and would present an added risk to workers and the community due to increased heavy truck traffic during soil management operations. The traffic risk would be mitigated using engineering controls.

## 6. Implementability

Alternative 1 would be easy to implement because it requires no action. Alternative 2 would also be easily implementable as it requires minimal effort to produce and distribute the 3 Rs brochure, fact sheet, and public notice. However, the Five-Year Reviews required since UU/UE will not be achieved under the alternative may appear onerous to stakeholders. The property owner is supportive of Alternative 2. Clearance of MEC (not supported by the property owner) as required by Alternatives 3 and 4 is more difficult to implement than Alternatives 1 and 2. Alternatives 3 and 4 would require evacuation of residents during clearance operations. So, while

Alternatives 3 and 4 are technically feasible, they may not be administratively feasible if residents are unable or unwilling to evacuate and are not supported by the property owner. Alternative 4 would be more difficult to implement because of the heavy equipment operations, an increase in heavy truck traffic, and the implementation of erosion control measures.

## 7. Cost

Costs for the alternatives were estimated using the present-day value applied over a 30-year period. **Tables 4 and 5** provide estimated costs for the implementation of the four remedial alternatives. Alternative 4 is the costliest alternative to implement, followed by Alternative 3, and then Alternative 2. Alternative 1 is a no cost alternative.

## 8. State Acceptance

ADEQ does not concur with the proposed remedial alternative, Alternative 2, for the reasons stated in their letter included as Attachment A. Regulatory position will be documented in the ROD.

## 9. Community Acceptance

Solicitation of community involvement in the decision making of a final remedy is sought through

**Table 5: Evaluation of Remedial Alternatives**

Detailed Criteria	Alternative 1	Alternative 2	Alternative 3	Alternative 4
	No Action Alternative	LUCs	Surface and Subsurface (18 In. bgs) Removal Using DGM/AGC and LUCs	Complete Surface and Subsurface Removal Down to Bedrock Using Excavation and Sifting, and Analog Clearance of the Rock Escarpment.
Description	Per the NCP, the no action alternative is included for baseline comparison	Protecting receptors from risks posed by potential MEC by reducing potential exposure using educational controls.	Protecting receptors by removing potential MEC at the surface and subsurface and using educational controls and engineering controls.	Protecting receptors by removing potential MEC at the surface and subsurface down to bedrock and clearing the rock escarpment.
Overall Protectiveness of Human Health	○	●	●	●
Overall Protectiveness of the Environment	●	○	○	○
Compliance with ARARs	○	●	●	●
Long-Term Effectiveness and Permanence	○	○	○	●
Reduction of Toxicity, Mobility, or Volume through Treatment	○	○	○	●
Short-Term Effectiveness	●	●	○	○
Implementability	●	●	○	○
Cost (Total Present Value)	\$0	\$161,000	\$1,677,000	\$5,612,000

Note: ● Favorable (Yes for threshold criteria)    ○ Moderately Favorable    ○ Not Favorable (No for threshold criteria)



this PP and public comments will be documented in the ROD.

## 10.0 PREFERRED REMEDIAL ALTERNATIVE

Alternative 2 (LUCs) is the preferred remedial alternative (**Figure 4**) for the 8.14-acre Kingman Range MRS. Alternative 2 is recommended because it is protective of human health and the environment and meets the RAO through the implementation of LUCs. It is also the alternative supported by the property owner.

Based on information currently available, ARNG G-9, USACE, and AZARNG believe the preferred remedial alternative meets the threshold criteria and provides the best balance of tradeoffs in comparison with the other alternatives. ARNG G-9, USACE, and AZARNG expect the preferred remedial alternative to satisfy the following statutory requirements of CERCLA 121(b): 1) be protective of human health and the environment; 2) comply with ARARS; 3) be cost-effective; 4) utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and 5) satisfy the preference for treatment as a principal element or explain why the preference for treatment will not be met. ADEQ does not concur with Alternative 2 for the reasons stated in their letter included as Attachment A.

NFA is recommended for the 25.29-acre Kingman Range – NFA Area MRS.

## 11.0 COMMUNITY PARTICIPATION

Information regarding the implementation of Alternative 2 at the 8.14-acre NDNODS Kingman Range MRS is provided to the public through documents placed in the Administrative Record and information repository, as well as announcements published in local newspapers. The public is encouraged to refer to these sources of information to gain a better understanding of the 8.14-acre Kingman Range MRS and the activities that have been conducted to date.

In accordance with the NCP, an Administrative Record file has been established by the ARNG G-9.

The contents of the file include a variety of written materials, such as correspondence, data reports, assessments, plans, newspaper articles, notices, and fact sheets. The contents of the Administrative Record file are also housed at an information repository located at the Mohave County Library, in Kingman, Arizona.

The ARNG G-9 solicits input from the community on this PP. The comment period will extend from 20 June 2021 through 20 July 2021. Written comments must be postmarked by midnight on 20 July 2021.

A virtual public meeting will be held on 30 June 2021 during the comment period. The virtual public meeting will present the PP and provide answers to questions regarding the MRS.G-9 Comments or questions concerning this PP should also be addressed to LTC Donna Wu. Comments received on this PP and their responses will be summarized in the *Responsiveness Summary* section of the ROD which will present the final selected remedy for the MRS.

For additional information on the Kingman Range MRS, please contact the following individual:

**LTC Donna Wu**  
**Cleanup Branch Chief (ARNG-IED-S)**  
**111 South George Mason Drive**  
**Arlington, VA 22204-1373**  
**(703) 607-2177**  
[donna.s.wu.mil@mail.mil](mailto:donna.s.wu.mil@mail.mil)

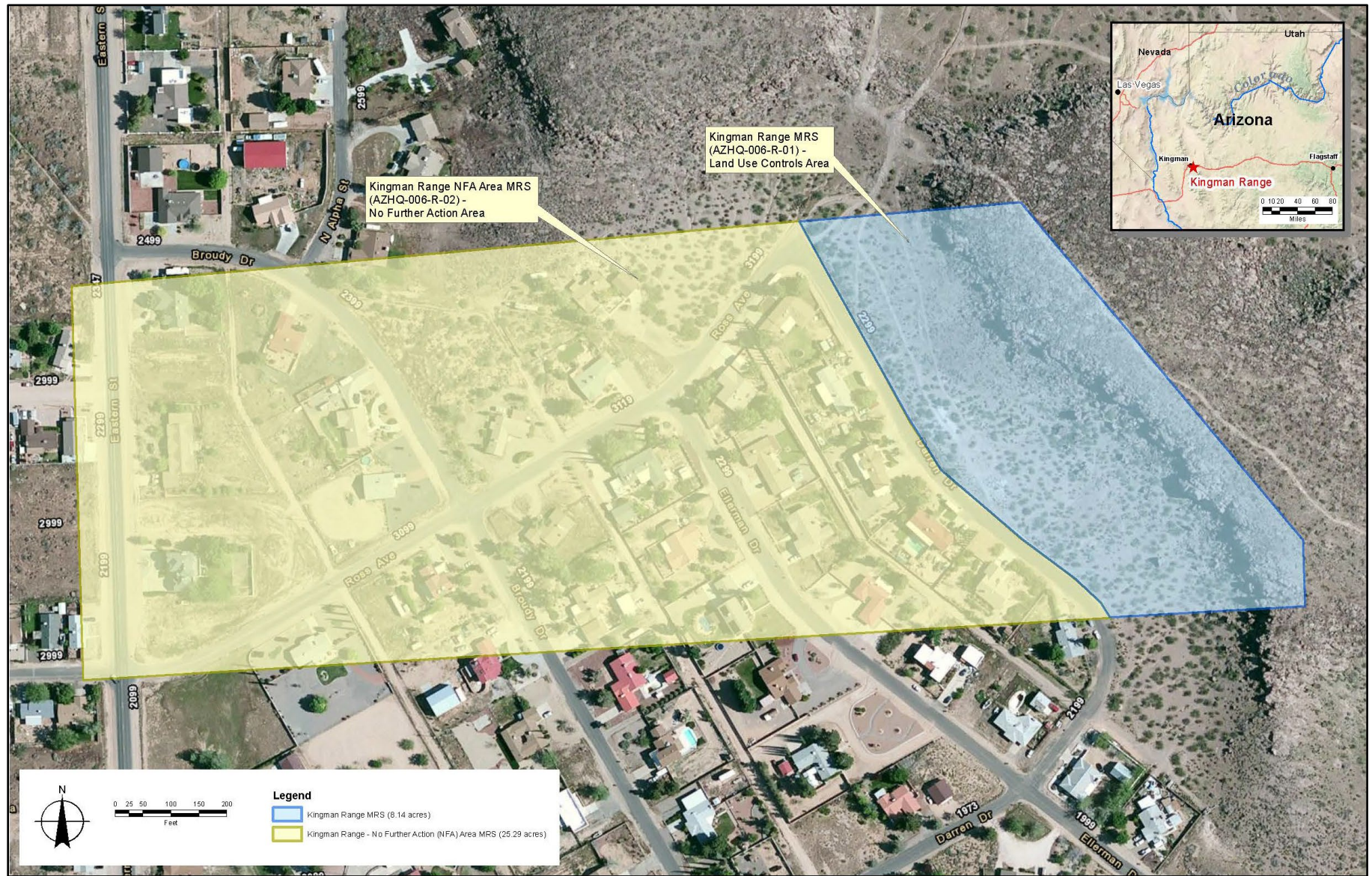
Or see the Information Repository at the following location:

**Mohave County Library**  
**Kingman Branch**  
**P.O. Box 7000**  
**3269 N. Burbank Street**  
**Kingman, AZ 86402-7000**  
**928-692-2665**

Hours of Operation:  
Monday - Saturday 9:00 am – 5:00 pm;  
Sunday: Closed

*A copy of the Proposed Plan can be viewed at the Mohave County Library. A copy can also be mailed via the U.S. Postal Service or an electronic version can be emailed to you.*







## 12.0 REFERENCES

- EA Engineering, Science, and Technology, Inc., 2008. *Final State/Territory Inventory Report, National Guard Bureau, Non-Department of Defense Owned Non-Operational Defense Sites Inventory, Arizona*. November.
- USACE, 2020. *Risk Management Methodology at Formerly Used Defense Sites (FUDS) Military Munitions Response Program (MMRP) Projects*. 7 February. (Note, only change from 2017 version is extending trial period).
- USEPA, 2001. *Comprehensive Five-Year Review Guidance*. United States Environmental Protection Agency. Office of Emergency Remedial Response. EPA 540-R-01-007. June.
- USFWS, 2021. IPaC Information for Planning and Consultation. Mohave County, Arizona. Accessed 10 March. <https://ecos.fws.gov/ipac/location/A2A7QB6LIZEVFDEQMZARNGWQTE/resources>.
- WESTON, 2011. *Final Historical Records Review / Site Inspection Work Plan for Arizona, Army National Guard Munitions Response Sites, Site Inspection Phase*. November.
- WESTON, 2012. *Final Site Inspection Report for Arizona, Army National Guard Munitions Response Sites, Site Inspection Phase*. October.
- WESTON, 2021. *Final Remedial Investigation / Feasibility Study Report, Military Munitions Response Program, Remedial Investigation / Feasibility Study, Kingman Range (AZHQ-006-R-01), Mohave County, Arizona*. January.

## 13.0 GLOSSARY OF TERMS

**Administrative Record file:** A compilation of all documents relied upon to select an alternative for a remedial action.

**Anomaly (or Anomalies):** Any item that is seen as a subsurface irregularity after geophysical investigation. This irregularity will deviate from the expected subsurface ferrous and non-ferrous material at a site (e.g., pipes, power lines).

**Applicable and Relevant and Appropriate Requirements (ARARs):** Cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA site. Only those state standards that are identified by a state in a timely manner and that are more stringent than federal requirements may be applicable (40 CFR 300.5).

**Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, otherwise known as Superfund):** A federal law that addresses the funding for and cleanup of abandoned or uncontrolled hazardous waste sites. This law also establishes criteria for the creation of decision documents.

**Concentrated Munitions Use Area (CMUA):** CMUAs are MRSs or areas within MRSs where there is a high likelihood of finding UXO or DMM and that have a high amount of MD within them as a result of historical munitions use and fragmentation. CMUAs are most commonly target areas on ranges; however, they also include explosion sites, open burn/open detonation areas, and potentially disposal sites where munitions have been disposed of over a relatively large area (i.e., not small, isolated burial pits).

**Digital Geophysical Mapping (DGM):** A method used to acquire geophysical data using self-recording instruments. The data acquired are post-processed to identify geophysical anomalies for further investigation.

**Feasibility Study (FS):** An investigation stage in the CERCLA cleanup process that identifies alternatives available to address contamination at a site, including an analysis of cost and how each alternative would protect human health and the environment.

**Human Health Risk Assessment:** An evaluation of the carcinogenic and non-carcinogenic risks presented by contaminants at a site for current and potential future property uses.

**Information Repository:** A record or file that contains all information used to make a decision on the selection of a response action under CERCLA.

**Land Use Controls (LUCs):** Restrictions such as zoning, fencing, and signage that prevent specific activities from occurring in specified areas to reduce or eliminate the potential for exposure.

**Munitions and Explosives of Concern (MEC):** This term, which distinguishes specific categories of military munitions that may pose unique explosives safety risks, means: (a) UXO, (b) DMM, or (c) explosive MC (e.g., trinitrotoluene) present in high enough concentrations to pose an explosive hazard.

**Munitions Constituents (MC):** Any materials originating from UXO, DMM, or other military munitions, including explosive and non-explosive materials, and emission, degradation, or breakdown elements of such ordnance or munitions.

**Munitions Debris (MD):** Remnants of munitions (e.g., penetrators, projectiles, shell casings, links, fins) remaining after munitions use, demilitarization, or disposal. MD is confirmed inert and free of explosive hazards by technically qualified personnel.

**Munitions Response Site (MRS):** A discrete location within a MRA 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 made up of one or more MRSs.

**National Oil and Hazardous Substances Pollution Contingency Plan (NCP):** Also referred to as the National Contingency Plan, it is a plan required by CERCLA and codified at 40 CFR Section 300 that provides a framework for responding to releases or threats of release of hazardous substances.

**Non-Department of Defense, Non-Operational Defense Sites (NDNODS):** Defense sites that were exclusively used by the Army National Guard and were never owned, leased, or otherwise possessed or

used by the U.S. Army or other Department of Defense component.

**Preliminary Assessment (PA)/Site Inspection (SI):**

A PA is a limited-scope investigation that collects readily available information about a project and its surrounding area. An SI is then performed if the PA results warrant further investigation. An SI includes activities implemented to determine whether there is a release or potential release and the nature of associated threats at a site.

**Public Comment Period:** A prescribed period during which the public may comment on various documents and actions taken by the government and regulatory agencies.

**Non-Munitions Related Debris (NMRD):** Debris found on operational ranges or MRSs that is not related to munitions or range operations, but which may be removed to facilitate a range clearance or munitions response. Such debris includes, but is not limited to rebar, household items (refrigerators, washing machines, etc.), automobile parts and automobiles that were not associated with range targets, fence posts, fence wire, nails, cans, horseshoes, magnetic rocks, etc.

**Proposed Plan (PP):** A plan that identifies the preferred remedial action for a site selected by the lead agency that best meets the requirements in §300.430(f)(1) and is made available to the public for comment.

**Record of Decision (ROD):** A ROD is used for the documentation of remedial response decisions. Concurrence on the ROD by USEPA or the state regulatory agency is sought, and the ARNG G-9 approves the document.

**Remedial Action Objective (RAO):** A site-specific objective developed based on evaluation of potential risks to human health and the environment for future protection of environmental resources.

**Remedial Alternative:** A technology or process option that represents a viable approach to remedial action for a site that has been evaluated in a screening stage.

**Remedial Investigation (RI):** An exploratory inspection conducted at a site to define the nature and extent of contamination present.

**Screening Level Ecological Risk Assessment:** A simplified ecological risk assessment used to provide an evaluation of the potential risks to ecological receptors posed by constituents of potential ecological concern. This assessment is used when there is limited site-specific information and, as a result, values are biased in the direction of overestimating risk. The need for conservatism is to provide a defensible conclusion that negligible ecological risk exists or that certain contaminants and exposure pathways can be eliminated from

consideration.

**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 material; and (c) remain unexploded either by malfunction, design, or any other cause.

**Unlimited Use/Unrestricted Exposure (UU/UE):** UU/UE generally is the level of cleanup at which all exposure pathways present an acceptable level of risk for all land uses.



*A field technician collects DGM data using an EM61 at the Kingman Range MRS during the RI.*



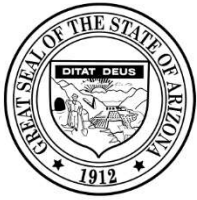


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**ATTACHMENT A**

**ARIZONA DEPARTMENT OF ENVIRONMENTAL  
QUALITY PROPOSED PLAN REVIEW LETTER**

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Douglas A. Ducey  
Governor

# ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY



Misael Cabrera  
Director

## VIA EMAIL

May 14, 2021  
FPU 21-278

Mr. James Lukasko  
Project Manager  
US Army Corps of Engineers  
Sacramento District CESP-K-PM-H  
1325 J Street  
Sacramento, CA 95814

Re: Kingman Range NDNODS – ADEQ backcheck review of Response to Agency comments and Revised *Stakeholder Draft Proposed Plan, Kingman Range Munitions Response Site (AZHQ-006-R-01), Kingman Range - No Further Action Area Munitions Response Site (AZHQ-006-R-02), Mohave County, Arizona*, prepared by Weston Solutions, dated April 2021.

Dear Mr. Lukasko:

The Arizona Department of Environmental Quality (ADEQ) Federal Projects Unit (FPU) provided review comments for the January 2021 Stakeholder Draft Proposed Plan (PP) on 19 February 2021. Prior to receiving the response to Agency comments, a Technical Project Planning (TPP) meeting was held on 9 April 2021 to discuss the PP for the site. During this meeting ADEQ was notified by the National Guard Bureau (NGB) the selected remedy, Alternative 2, would be modified in a revised PP. The modification discussed involved the removal of the engineering controls (fencing and signage). ADEQ is unable to comprehend why this information was not provided prior to the meeting since information sharing facilitates open discussion among all parties. Disclosure of potential modifications to an Alternative prior to the meeting would have given ADEQ time to evaluate and freely discuss with the US Army Corps of Engineers (USACE) and NGB representatives. It is ADEQ's view that discussions between the State Regulators and Lead Agencies have the greatest opportunity for success when all parties are adequately informed.

Additionally, the property owner (PO) was in attendance during the 9 April meeting, therefore ADEQ believes this meeting was an inappropriate venue for the agencies to dispute the PP modification. Furthermore, it was divulged during the meeting the NGB fully intends to continue with the selected remedy without State concurrence. Regardless of the NGB's intention, the lack of transparency of the PP modifications prior to a TPP meeting is not the partnership ADEQ has come to expect from NGB and USACE.

### Phoenix Office

1110 W. Washington St. • Phoenix, AZ 85007  
602-771-2300

### Southern Regional Office

400 W. Congress St. • Suite 433 • Tucson, AZ 85701  
520-628-6733

[azdeq.gov](http://azdeq.gov)

Nevertheless, ADEQ did agree Alternative 2 in the Feasibility Study (FS) would mitigate the hazard to an acceptable risk condition for the post remedy risk assessment. However, this agreement was based on the inclusion of fencing to prevent physical contact with any potential munition hazards, in addition to the use of warning signs, Land Use Controls (LUCs), and long-term monitoring with 5-year reviews. Without these engineering controls, the new Alternative 2 does not achieve the remedial action objective (RAO), to prevent direct contact with surface and subsurface Munitions and Explosives of Concern (MEC) to 18 inches below ground surface by current and future receptors, including recreational users (trespassers), site visitors, construction workers, and the private landowner.

Additionally, ADEQ's original PP review letter (FPU 21-186) did not agree Alternative 2 was the preferred remedy for this site because the selection does not meet the requirement under 40 CFR 300.430 (f)(1)(ii)(E) including: 1) Utilizing a permanent solution to the maximum extent possible and 2) Reduction of toxicity, mobility, or volume through treatment. The new Alternative 2 presented in the revised PP does not meet the overall protection of human health and the environment nor does it meet the RAO established for the 8.14-acre Kingman Range MRS (AZHQ-006-R-01). Due to the site's close proximity to a residential community and known recreational land use by trespassers as well as the current residential use zoning for the property, ADEQ cannot concur with the selected remedy for this site.

Accordingly, ADEQ understands AZHQ-006-R-01 has had minimal high explosive munitions use, but does not agree the risk is "miniscule" as stated in the response to agency comments. ADEQ also recognizes AZHQ-006-R-01 is privately owned and the PO has refused the placement of fencing and warning signs on the property. However, the baseline risk assessment summarized in the revised PP remains "unacceptable" for MEC and the established RAO is unachievable with the revised Alternative 2. Therefore, the other more conservative alternatives must be considered. ADEQ recommends the NGB amend the FS for the administrative record because the proposed alternatives, agreed upon by all parties, are no longer accurate and the alternatives should be reevaluated to meet the RAO. Otherwise the NGB should provide a complete explanation on how they plan to achieve the established RAO or why the RAO is unattainable at this site. Additionally, ADEQ requests the NGB and USACE fully inform the PO regarding the unacceptable munitions risk remaining on the property and potential liability associated with this risk when refusing risk reducing actions.

Please find ADEQ's full evaluation and comments in the attached Response to Comments Form.

Please do not hesitate to contact me by phone at (602) 771-0956 or e-mail at [romanoff.natalie@azdeq.gov](mailto:romanoff.natalie@azdeq.gov) should you have any questions regarding this correspondence.

Sincerely,

A handwritten signature in black ink, appearing to read 'N. Romanoff', with a stylized flourish at the end.

Natalie Romanoff

Project Manager, FPU  
Waste Programs Division, ADEQ

ATCH: 20210514-cmts-Kingman Range MRS-Adeq backcheck SH Draft PP RTC Form.xlsx

ec: Kim Birdsall, AZDEMA  
John Haines, ARNG  
Tim Trego, Weston Solutions, Inc.  
Natalie Quiet, Weston Solutions, Inc.  
Steve Willis, UXO Pro, Inc.  
Dan Haines, UXO Pro, Inc.  
Karin Harker, ADEQ FPU Manager

cc: ADEQ Project and Reading File



Comments for the Revised Draft Final Proposed Plan MMPR Munitions Response Services Army National Guard Bureau Kingman Range MRS (AZHQ-006-R-01), Arizona Contract No.: W912DR-19-D-0022 Delivery Order No. 0001									
Comment Number	Commenter	Page(s)	Section	Line(s)	Comment	Response Code	Response	ADEQ Backcheck Response	
TECHNICAL COMMENTS									
1	NR	1	Information Repository	67	A method for all to access the project information repository must be considered. Please provide an option for online/electronic access instead of only in person via the library.	NQ	Non-concur	The Proposed Plan can be requested from ARNG and ADEQ and then it can be e-mailed to the concerned individual. Furthermore, the Public can attend the proposed Virtual Meeting as well.	
2	NR	1	Public Meeting	80	Due to COVID-19 restrictions on travel and public health concerns, please revise the proposed plan to include a virtual online public meeting, instead of in person only.	NQ	Concur	Added "virtual" preceding instances of the public meeting on page 1, lines 33 and 81, and page 15 (lines 50, 51, 54).	
3	NR	PDF Pg. 13 Doc. Pg. 8	FS	9	Please update the date of completion for the Feasibility Study (FS) to be 2021.	NQ	Concur	Updated as requested.	
4	NR	PDF Pg. 14 Doc. Pg. 9	MEC Risk Summary	27-31	Please remove the reference to LU/LUE in three instances because it is a post-remedy classification/condition. The Kingman Range MRS has a baseline risk of MEC that is "Unacceptable" and the Kingman Range NFA Area MRS has a baseline risk of MEC that is "Acceptable" based on the lack of any evidence that MEC/MD is present.	NQ	Concur	Revised to state based on the evaluations, the Kingman Range MRS has a baseline risk of MEC that is "Unacceptable" and the Kingman Range - NFA Area MRS has a baseline risk of MEC that is "Acceptable" based on the lack of any evidence that MEC/MD is present.	
5	NR	PDF Pg. 16 Doc. Pg. 11	Summary of Remedial Alternatives	1-4	ADEQ does not agree that Alternative 2 is the remedy choice that best meets the criteria for addressing MEC risk to human health and the environment at the Kingman Range MRS.  Draft PP, page 13 (PDF page 18), line 10 states: "Alternative 3 would be more protective of human health than Alternative 2 because MEC would be removed from the surface and subsurface (0-18 inches deep) across 80% of the MRS and from the steeply sloping escarpment area. This alternative includes LUCs and meets the RAO for the MRS."  Additionally, line 70 states: "Alternatives 1 and 2 would not reduce the toxicity, mobility, or volume of MEC at the MRS. Alternative 3 would be more effective than Alternatives 1 and 2 because it would detect, recover, and recycle MEC from the MRS. Alternative 3 would remove detectable surface and subsurface MEC from the ground surface to a depth of 18 inches bgs."  ADEQ agrees that Alternative 2 results in an acceptable risk condition post remedy, but this requires landowner acceptance and fencing the site off for 30 years. However, Alternative 2 does not provide a permanent solution and does not reduce the contamination onsite. The 40 Code of Federal Regulations states that permanent solutions should be preferred and selected to the maximum extent practical. ADEQ shares this view when evaluating and balancing tradeoffs and criteria for each alternative.  40 CFR 300.430 (f)(1)(vi)(E) "Each remedial action shall utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. This requirement shall be fulfilled by selecting the alternative that satisfies paragraph (f)(1)(iv)(A) and (B) of this section and provides the best balance of trade-offs among alternatives in terms of the five primary balancing criteria noted in paragraph (f)(1)(v)(B) of this section. The balance shall emphasize long-term effectiveness and reduction of toxicity, mobility, or volume through treatment. The balancing shall also consider the preference for treatment as a principal element and the bias against off-site land disposal of untreated waste in making the determination under this paragraph. The modifying criteria of state acceptance and community acceptance described in paragraph (f)(1)(v)(C) of this section shall also be considered."  Alternative 2 with fence installation is dependent on the land owner's approval and agreement to not utilize or develop the land. Currently the land is zoned as low-density residential and depicted in the City of Kingman General Plan Update 2030. To date, ADEQ is not aware of (1) any written communication with the landowner besides the signed ROE discussing fencing with them; (2) The landowner understands the impacts to the landowner's future land use if Alternative 2 is selected and the future land use if Alternative 3 is selected. Please provide details/copies of written communication with the landowner demonstrating that the landowner is fully aware of the impacts and benefits of Alternatives 2 and 3.	NQ	Non-concur	Based on the TPP#5 call on 9 April 2021, this comment is no longer reflective of the proposed preferred alternative. However, a detailed explanation is provided in relation to the revised Alternative 2 (revised to include Public Notice, 3 Ra brochure, Fact Sheet, LTM and Five Year Reviews) for aid in understanding the rationale for the Army's preference for the revised Alternative 2. Respectfully, previous investigations included digital geophysical mapping (DGM/Vanasyr surveys and instrument-aided surface clearance with tightly spaced lanes/transects, which provided more than adequate coverage of the small MRS (95% confidence), and only 21 MD items were found within the 8.14-acre MRS. This equates to approximately 2.5 items per acre with the amount of debris comprising approximately only 1-2 potentially explosive munitions. Although Alternative 2 would not reduce the toxicity, mobility, or volume of MEC at the MRS, the density of potential MEC remaining at the MRS is negligible and likely only present within the inaccessible escarpment. The land owner does not plan to transfer the land or develop it for residential or commercial use. Therefore, the minuscule remaining risk does not support the cost of implementing a more intrusive remedial action, nor is one supported by the land owner. Alternative 2 (revised to include Public Notice, 3 Ra brochure, Fact Sheet, LTM and Five Year Reviews) would be sufficiently protective of human health through educational controls that raise public awareness and result in mitigation of exposure to potential MEC hazards. In conjunction with LTM and Five Year Reviews, these LUCs would be effective for the long-term, be a sufficient treatment to a practicable extent and a best balance given the post investigations site conditions and proposed future use for this MRS. Respectfully, no changes have been made.	
6	NR	PDF Pg. 19 Doc. Pg. 14	Evolution of Remedial Alternatives	Table 5	A closer review of the Alternative 3 costing from the FS has resulted in the determination that sign and fence installation and annual inspections and maintenance costs are not required as part of LUCs in Alternative 3. Additionally, the line items appear to be duplicate or inaccurate/unapplicable. For example, dynamic surveys with AGC are no longer required. An estimate of adjustments to the costing for Alternative 3 may reduce the price as much as \$60K. This would make the Alternative 3 cost a little over \$1M compared to Alternative 2 at \$764K. Please review the costing line items for Alternative 3 in the FS and update the costing and rating in the Table 5 accordingly.	NQ	Non-concur	LUCs including signage and fence installation, and annual inspections and maintenance costs are required under Alternative 3 as clearance of the escarpment would not be conducted and would therefore require LUCs. The known and accepted geophysical methods by the USACE and Army are presented. The dynamic surveys with AGC are still a valid and implemented technology and required for the MetaMapper 2d2 equipment that is proposed. Therefore, no changes have been made to the cost estimate regarding LUCs or the geophysical technology presented.	
7	NR	PDF Pg. 20 Doc. Pg. 15	Preferred Remedial Alternative	1-22	As stated previously, ADEQ does not agree that Alternative 2 is the remedial alternative that best meets the overall protection of human health and the environment and we believe that the trade-offs do not outweigh the benefits of Alternative 3. The selection of Alternative 2 does not meet the requirement for using a permanent solution to the maximum extent possible. Alternative 2 establishes a barrier around the contaminated site but does not perform any contamination reduction. Five-Year Reviews will evaluate the effectiveness of the barrier but, since MEC reduction or removal did not occur, the landowner, USACE and the state will need to determine an acceptable path forward or new remedy at the end of the programmed 30 years.	NQ	Non-concur	Non-Concur. See backcheck response to Comment # 8 above.	
NEW REVISED DRAFT FINAL PP COMMENTS						NEW REVISED DRAFT FINAL PP COMMENTS-General			
NEW REVISED DRAFT FINAL PP COMMENTS						NEW REVISED DRAFT FINAL PP COMMENTS-Page 6 Line 10			
NEW REVISED DRAFT FINAL PP COMMENTS						NEW REVISED DRAFT FINAL PP COMMENTS-Page 6 Line 54			
NEW REVISED DRAFT FINAL PP COMMENTS						NEW REVISED DRAFT FINAL PP COMMENTS-Page 17 Table 5 Evaluation of Remedial Alternatives			
NEW REVISED DRAFT FINAL PP COMMENTS						NEW REVISED DRAFT FINAL PP COMMENTS-Page 18 Line 13			
End of Comments									
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