2023 Webinar Series

National Association of Ordnance Contractors

Remedial Designs for Munitions Response Sites

Presented by:

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November 9th, 2023

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WHY WE ARE DISCUSSING THIS TOPIC

We're doing more Remedial Designs that involve field investigation

– So, we're writing more RD QAPPs

Problem

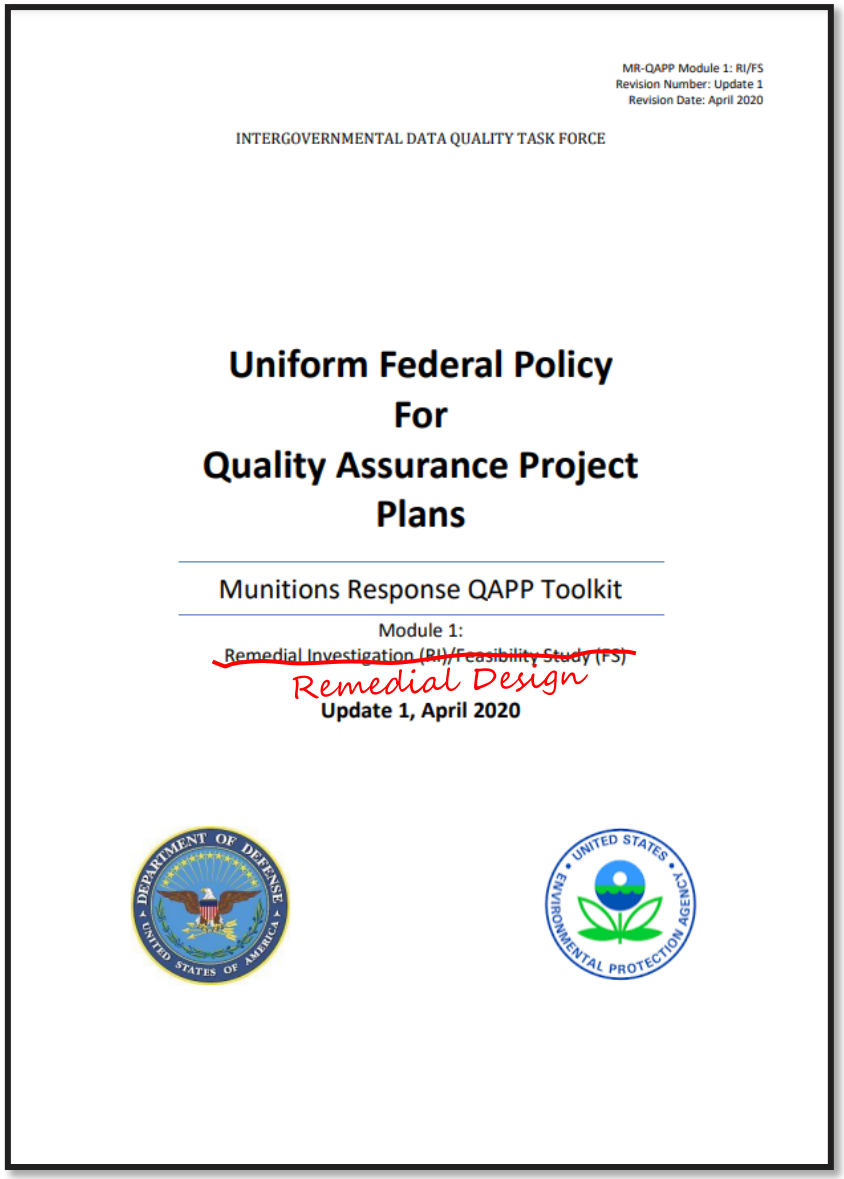
– Many RD QAPPs we see look a lot like RI QAPPs
  - Yes, we know USACE provides WS #10 and #11
  - We've all learned a lot

Possible root causes

– Some prior RIs have problematic data gaps
  - We *may* need to repeat some "RI-like" investigation during an RD

– There's no MR-QAPP Toolkit for an RD
  - There's no obvious format to copy

– RI and RD differences are not well understood


MR-QAPP Module 1: RI/FS
Revision Number: Update 1
Revision Date: April 2020

INTERGOVERNMENTAL DATA QUALITY TASK FORCE

Uniform Federal Policy For Quality Assurance Project Plans

Munitions Response QAPP Toolkit

Module 1:
~~Remedial Investigation (RI)/Feasibility Study (FS)~~
Remedial Design
Update 1, April 2020

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DISCLAIMER

There is currently no MMRP-specific guidance on Remedial Designs

– EM 200-1-15 mentions it briefly, but that's still in approval limbo

This presentation…

– Is an attempt to clarify some issues that have been causing confusion to help current and future projects

– Reflects my (and a few others') best judgment, based on experience and lessons learned

It is *not official guidance or policy*

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REMEDIAL DESIGN? IS IT JUST ANOTHER RI?

Uh, no…

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LET'S LOOK AT DEFINITIONS

Remedial Investigation

EPA

– "The Remedial Investigation (RI) serves as the mechanism for collecting data to characterize site conditions, determine the nature of the waste, assess risk to human health and the environment"

ER 200-3-1

– "characterize the nature and threat posed by the hazardous substance and/or military munitions, and gather data necessary to assess the extent to which the release poses a threat to human health, safety, or the environment"

So, basically…

– How bad is the contamination we think is there?

Remedial Design

EPA

– "Remedial Design (RD) is the phase in Superfund site cleanup where the technical specifications for cleanup remedies and technologies are designed"

ER 200-3-1

– "Detailed designs, plans, specifications, and bid documents for conducting the remedial action are developed during this phase"

So, basically…

– What is the ***detailed plan*** for cleaning up the contamination we know is there?

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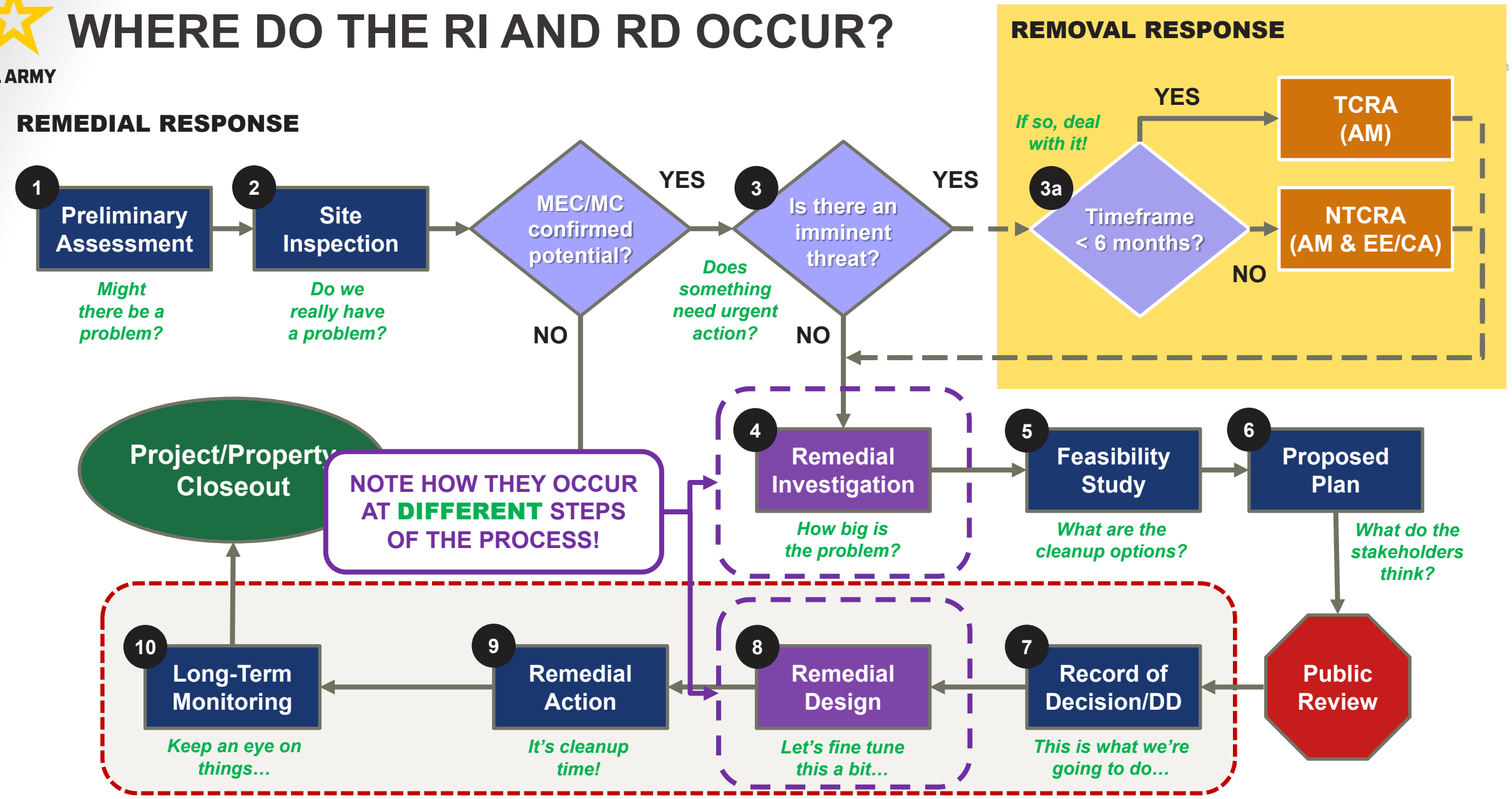
WHERE DO THE RI AND RD OCCUR?



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WHAT THIS MEANS…

Before the RI and FS…

We know

– MEC contamination is present
  • i.e., conclusions of the Site Inspection

We don't know

– Location or extent of contamination
– Whether it poses unacceptable risks
– Anomaly densities
  • Inc. presence and locations of saturated response areas (SRAs)
– If so, how it needs to be cleaned up
– Cost estimate for remediation

WHAT THIS MEANS…, CONT'D.

Before the RD…

We (*should*) know

- Types of MEC contamination present
- Location and extent of contamination
- General anomaly densities
  - Including possible presence of SRAs
- That MEC present poses unacceptable risks
- The general plan for cleaning it up
  - i.e., the Selected Remedy
- Decent cost estimate for remediation

We (*most likely*) don't know

- Comprehensive anomaly density data
- Locations of SRAs
- Detailed topography and vegetation
- Locations of biological and/or cultural resources
- Innovative/engineering methods to be used for RA
- More accurate cost estimate for remediation

What we need to know for the *detailed plan* (i.e., the RD)

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WHAT THIS MEANS…, CONT'D.

If we have sufficient data for the detailed plan, the RD **might** just involve writing the QAPP for the RA

– *Might* not need additional fieldwork

– But we will still need additional discussions with stakeholders

- Accessibility issues
- Biological/cultural resource issues
- Other site-specific concerns

But, *if we don't have sufficient data*, the RD must involve collecting data to **supplement** the RI

– i.e., NOT just doing the RI again

So, how do we deal with that?

This is a reason why pre-QAPP SPP meetings are SO IMPORTANT

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THE FIRST RD STEP – USE THE DQO PROCESS

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Remedial Investigation

Step 1 – State the Problem
- *We need to characterize the nature and extent of contamination*

Step 2 – Identify the decision to be made
- *Is action needed to address contamination? If so, what are our options for remediation?*

Step 3 – Identify the inputs to the decision
- What data are needed to answer the questions in Step 2?

Step 4 – Define the study boundaries
- What are the limits on data collection?

Step 5 – Decision Rules
- How will the decision in Step 2 be made?

Steps 6 and 7 – Technical Approach

Remedial Design

Step 1 – State the Problem
- *Detailed plan for implementing the selected remedy must be prepared*

Step 2 – Identify the decision to be made
- *Are there adequate data to plan and implement the selected remedy?*

Step 3 – Identify the inputs to the decision
- What data are needed to answer the question in Step 2?

Step 4 – Define the study boundaries
- What are the limits on data collection?

Step 5 – Decision Rules
- How will the decision in Step 2 be made?

Steps 6 and 7 – Technical Approach

Different Steps 1 and 2
call for different types of data in Step 3

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THE SECOND RD STEP – WRITE THE MR-QAPP

MR-QAPP Toolkits

- Module 1: RI/FS
- Module 2: Remedial Action
- But there's no Module 1.5 for Remedial Design!
  - And there isn't one in the works!

So, are we out of luck?

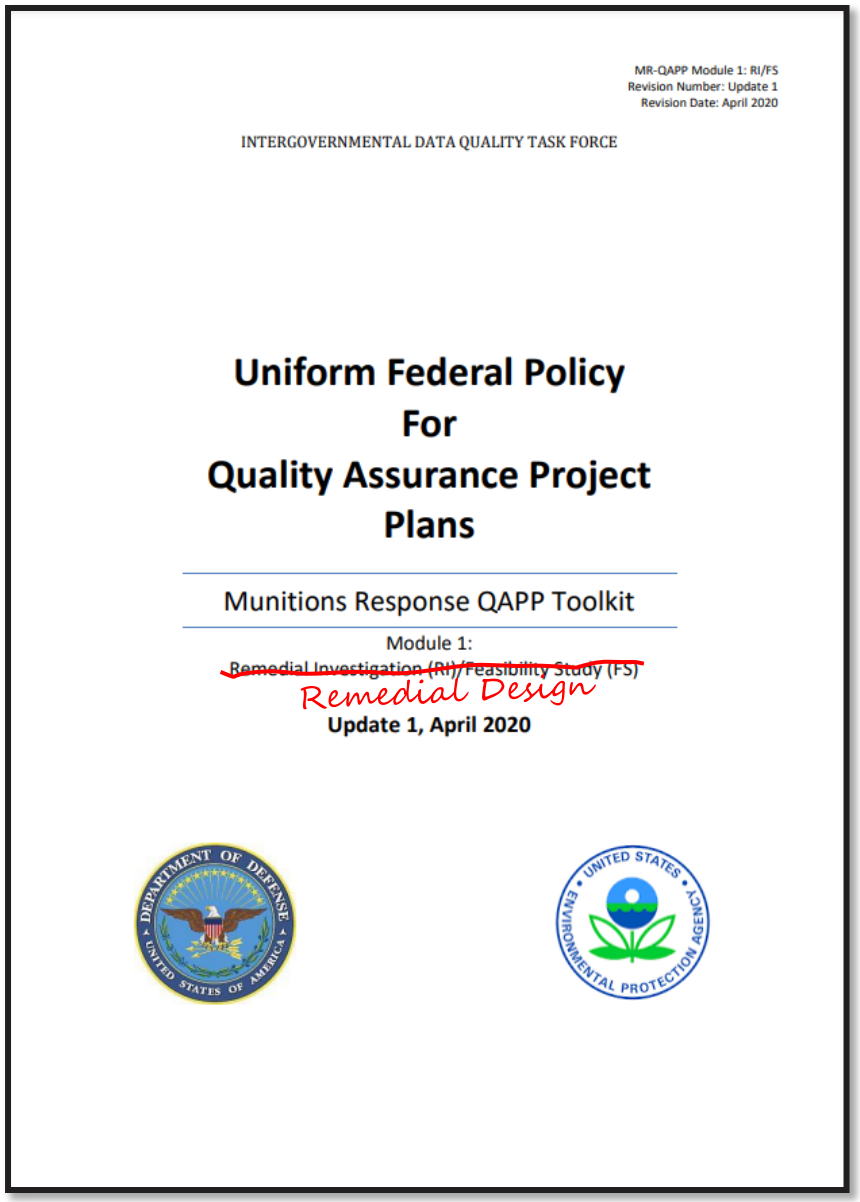
- **NO!**

Both MR-QAPP Toolkits follow a pattern

- Describe preliminary CSM
- Establish site-specific DQOs
- Develop site-specific data collection plan to achieve those DQOs
- Identify definable features of work (DFWs) for data collection

Apply ***that*** process to the RD

- Remember that these are toolkits, ***not templates***!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THE THIRD RD STEP – COLLECT THE DATA

Possible RD data needs

- Additional DGM/AGC surveys in and around remedial footprints
  - Comprehensive anomaly density data
  - Refining boundaries
  - Locations of SRAs
- More detailed land surveys
  - Topography and vegetation
  - Site accessibility for MEC removal
- Biological and cultural resource surveys
  - Locations of biological and/or cultural resources to identify exclusion areas
- Additional planning and estimating
  - Innovative/engineering methods to be used to implement the selected remedy
  - More accurate cost estimate for cleanup

NOT just another RI!

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THE LAST RD STEP – DEVELOP THE PLAN FOR THE RA

Detailed plan (RA QAPP) could include

– WS #10, #11, #12, and possibly parts of #17

- Which technologies are appropriate
  - And where are they appropriate
- Measures to address accessibility, vegetation, and topography
- Biological/cultural resource escort or monitoring requirements
- Suggested staging area locations
- Other site-specific concerns
  - Communication pathways
  - Delivery timeframes for data and reports to USACE and regulator
  - Coordination with 3rd party QA seed team

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A (SOMEWHAT OVERSIMPLIFIED) EXAMPLE

The selected remedy from the Record of Decision (ROD)

Selected Remedy components

- MEC removal
  - AGC
- LUCs
  - Signs
  - Pamphlets
  - Training

Remedial footprint

- See figure

2.4.2.1 Description of Selected Remedy

The selected remedy is completing a subsurface MEC clearance at the Mortar Range MRS and the implementation of LUCs. The footprint for the MEC clearance is shown in **Figure 2-4**. The clean-up goal for the MEC clearance component of the remedy is to detect and remove 60mm HE and practice mortars to 60cm bgs across the 46-acre clearance footprint with exceptions for inaccessible areas including under trees greater than 20cm in diameter ABH and under the existing building foundation. The removal of MEC from this volume of soil, with the addition of the LUCs described below, will protect site workers and the public under current and reasonably anticipated future conditions, based on continuing recreational land use. The LUCs component of the selected remedy will address [illegible] of the MEC clearance.

Subsurface MEC removal using AGC

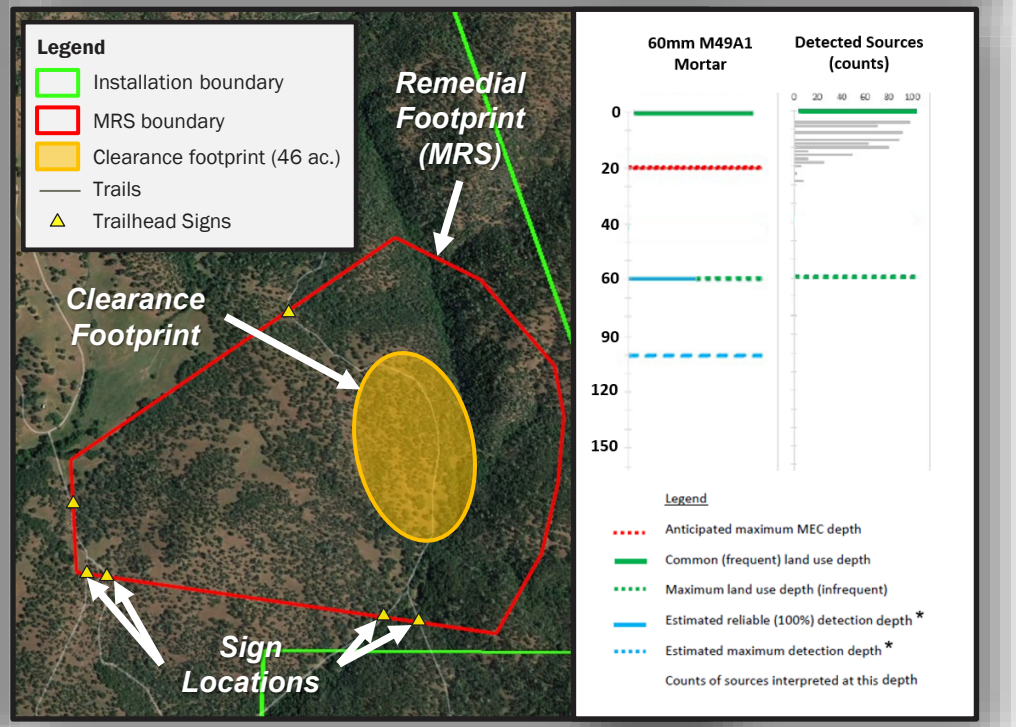
A subsurface MEC clearance will be completed by performing digital geophysical surveys across the 46-acre clearance footprint to detect and locate MEC to a minimum depth of 60cm bgs. The volume of soil in the clearance footprint will be searched for MEC using AGC sensors to detect and identify TOI that might indicate MEC. TOI deeper than 60cm will also be identified to the extent of the ability of the equipment used. AGC data will be collected, managed, and analyzed by qualified geophysical personnel working for a DAGCAP-accredited GCO. All identified TOI will be excavated by UXO-qualified personnel implementing safety protocols for public and worker protection. All MEC recovered will be treated onsite via thermal destruction. MPCs will be developed to achieve the clean-up goal as part of the RA QAPP, in compliance with EM 200-1-15. The effectiveness of MEC detection and removal will be evaluated against those MPCs and the MEC clearance will be considered complete once the MPCs have been achieved.

Following the MEC clearance, residual risks from MEC will be managed by implementing park worker training and hazard notification measures to keep park workers and the public informed about possible residual MEC hazards at the Mortar Range MRS. These notification measures will include warning signs at all trailheads and safety pamphlet distribution stations at all entry points to the park. The Army will provide safety pamphlets for these stations and for park personnel to hand out to cars arriving at the parking area. The Army will also provide annual training to park workers in conducting anomaly avoidance to mitigate possible residual hazards. Within one year from the signature date of this ROD, a LUCIP will be prepared to describe the specifics of hazard notification measures and worker training. Full implementation of the LUCs will follow finalization of the LUCIP and the [illegible] delivery of safety pamphlets, and (3) completion of the first annual training session.

Signs, pamphlets, and safety training

2.4.2.3 Expected Outcomes of Selected Remedy

Following implementation of the selected remedy, it is anticipated that all MEC within the 60cm volume of searched soil within the Mortar Range MRS will be treated via disposal. It is expected that the combination of this MEC source removal from this soil volume and the implementation of hazard notification measures and park worker training will prevent the potential for land users to interact with MEC. Because residual risks from explosive hazards will remain at the site following remedy implementation above levels that would allow UU/UE, five-year reviews will be required.



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A (SOMEWHAT OVERSIMPLIFIED) EXAMPLE, CONT'D.

Possible plan for a Remedial Design

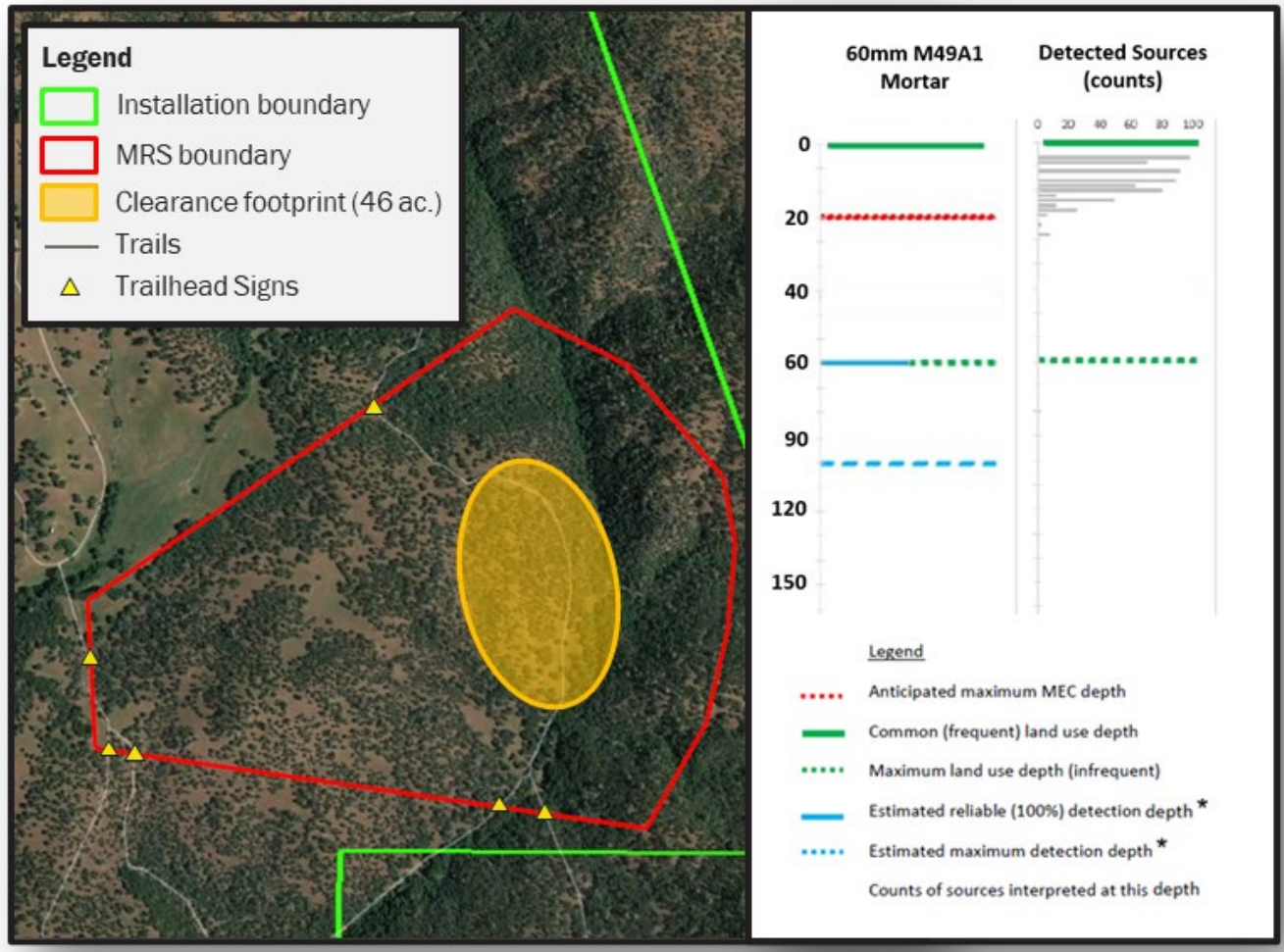
Additional AGC in clearance footprint
- Transects to get more accurate anomaly density and locate possible SRAs
  - Or perhaps even 100% to identify specific anomalies and find SRAs
- Note that transects across the whole MRS are pointless in this case
  - No need to repeat RI!

Evaluate topography and vegetation in clearance footprint
- Identify difficult-to-access areas

Conduct biological and cultural resource surveys in clearance footprint
- Identify "exception areas"

Confirm trailhead locations for sign installation
- Helps planning for locations and quantities

Prepare LUC Implementation Plan (LUCIP)
- Get ahead of the game



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FINAL REMEDIAL DESIGN THOUGHTS

The RD is **NOT** just a repeat RI

- It may use a lot of the same techniques and technologies, but the goals are different
- Different goals result in different DQOs
  - Don't copy DQOs from MR-QAPP Toolkits, Modules 1 and 2!
- Different DQOs drive different data needs
  - The data collected for an RD should be different to that collected for an RI
    - Though there may be some similarities
- Follow the MR-QAPP format
  - Remember they are toolkits, ***not templates***!
- The final major deliverable can be parts of the MR-QAPP for the remedial action
  - WS #10, #11, #12, and possibly parts of #17

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BONUS TOPIC: DESCRIBING “INACCESSIBILITY”

“Inaccessibility” has multiple causes, so it can mean different things

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WHY WE ARE DISCUSSING THIS TOPIC

Inaccessibility can be an issue for RIs, RDs, and RAs

- Prevents access to areas of a site
- Hinders data collection and remedy implementation
  - Restricts geophysical investigations
  - Limits sample collection

Can result from multiple valid causes

- Difficult terrain
  - Steep or uneven topography
  - Thick vegetation
- Safety considerations
- ROE refusal or other access restrictions

Definition of “inaccessibility” depends on the context

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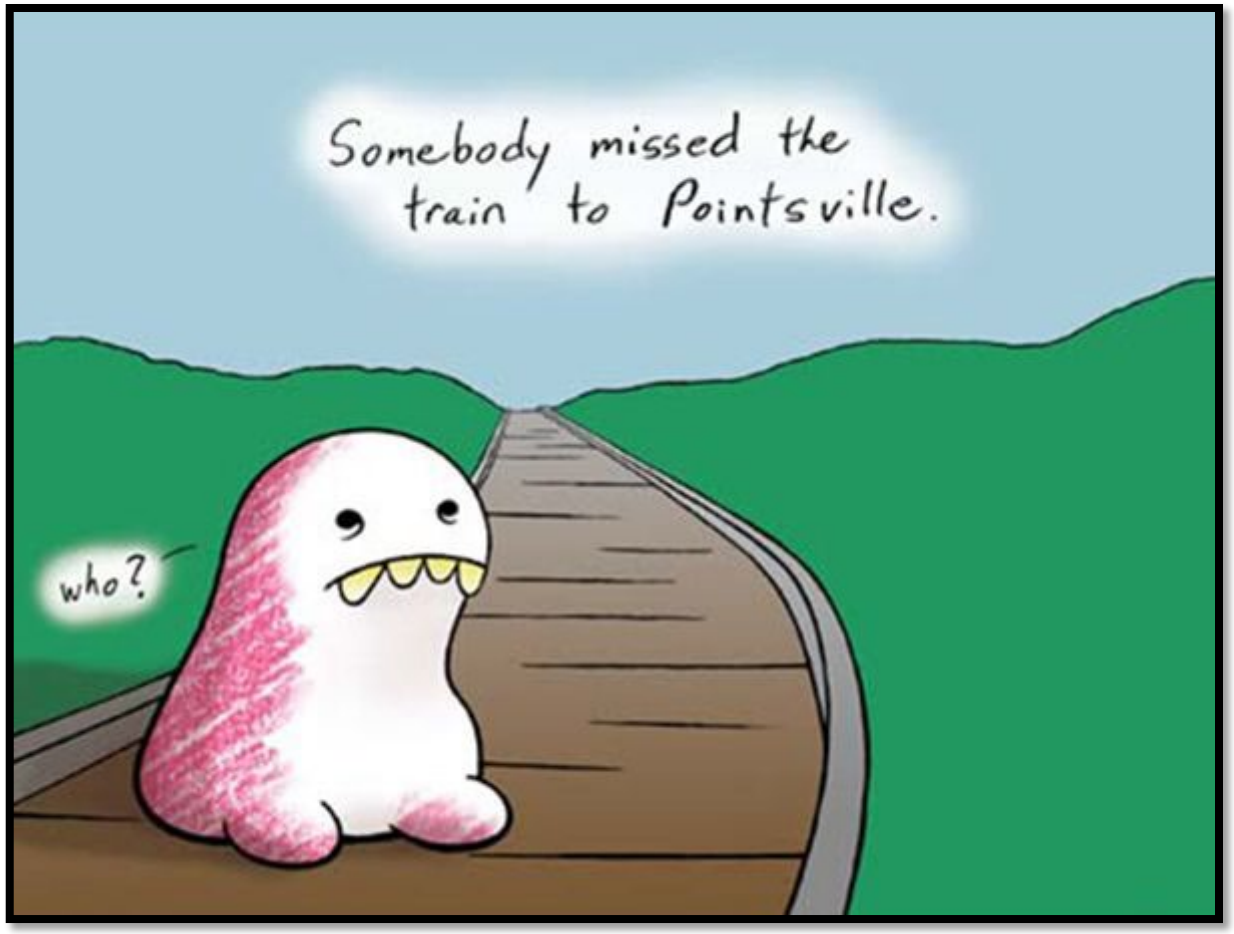
IMPORTANT CLARIFICATION

THIS discussion is focused on ***how we describe*** "inaccessibility" in QAPPs and reports

It does ***NOT*** attempt to address what terrain is or isn't accessible to various geophysical sensors

– Though that is a valid issue for future discussion, and USACE is aware of it

Please don't get sidetracked by that and miss the point of ***this*** discussion!



Don't be like this guy

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WHAT "INACCESSIBLE" **DOESN'T** MEAN

Because "inaccessibility" has multiple causes, it can mean different things

But being inaccessible to some, ***doesn't*** mean an area is inaccessible to **ALL**

- Just because some equipment cannot access an area doesn't mean no equipment can
  - May be able to use portable equipment rather than towed equipment
- Just because certain equipment cannot access an area doesn't mean no receptors will
  - May still be risks from exposure to contamination
- Just because a field crew cannot safely access an area doesn't mean no receptors will
  - May still be risks from exposure to contamination

If there are risks from exposure to contamination, the area must be discussed in the RI and addressed by the remedy

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DESCRIBING "INACCESSIBILITY"

When describing an "inaccessible" area, always make sure to include…

– To **WHAT** or **WHOM** the area is inaccessible

– **WHY** the area is inaccessible

For example…

– "*This area is inaccessible to human receptors due to very steep (>45°), shale-covered slopes.*"

- This means the area **IS NOT** accessible to human receptors (i.e., minimal risk of exposure to contaminants)

– "*This area is inaccessible to vehicle- or hand-towed geophysical sensors due to heavy vegetation and steep (>30°) slopes.*"

- This means the area **MIGHT BE** accessible to other geophysical sensors, and **IS** accessible to some human receptors

– "*This area was inaccessible to the field team due to ROE refusal.*"

- This means the area **IS** accessible to other human receptors

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QUESTIONS OR COMMENTS?

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