Camp Ravenna
Restoration Advisory Board Meeting

Military Munitions Response Program

Time Critical Removal Action at

RVAAP-004-R-01

Open Demolition Area #2 MRS

18 NOV 2015

US Army Corps of Engineers

BUILDING STRONG®

Agenda

- Introductions
- Important Terminology
- ODA2 Background Information
- Remedial Investigation Results
- Probability Assessment Results
- TCRA – Purpose and Scope
- Buried Explosion Module (BEM)
- Schedule

Important Terminology

- **MILITARY MUNITIONS RESPONSE PROGRAM (MMRP)**
  - Addresses MEC and MC in the environment
- **COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT (CERCLA)**
  - Federal law designed to clean up sites contaminated with hazardous substances as well as broadly defined "pollutants or contaminants".
  - Defense Environmental Restoration Program (DERP): DoD's Program for cleaning up legacy contamination under CERCLA
- **NATIONAL CONTINGENCY PLAN (NCP)**
  - Federal government's framework for responding to both oil spills and hazardous waste releases

Important Terminology (continued)

- **REMEDIAL INVESTIGATION/FEASIBILITY STUDY (RI/FS)**
  - RI - Mechanism for collecting data to characterize site conditions, determine nature of waste, assess potential risk to human health and the environment, and conduct treatability testing to evaluate the potential performance and cost of the treatment technologies that are being considered
  - FS - Mechanism for development, screening, and detailed evaluation of alternative remedial actions
- **TIME CRITICAL REMOVAL ACTION (TCRA)**
  - Interim action taken to address immediate risk or hazard to human health or the environment
  - Not a remedial action (final remedy)

Important Terminology (continued)

- **MUNITIONS AND EXPLOSIVES OF CONCERN (MEC)**
  - Unexploded Ordnance (UXO) –Military munitions that were
    a) primed, fused, armed, or otherwise prepared for action;
    b) fired, dropped, launched, projected, or placed; and
    c) remain unexploded whether by malfunction, design, or any other cause
  - Discarded Military Munitions (DMM) –Military munitions that were abandoned without proper disposal
  - Explosive compounds in high enough concentrations to pose an explosive hazard
- **MUNITIONS CONSTITUENTS (MC)**
  - Explosives and non-explosive materials originating from military munitions
  - Explosives and Metals

Important Terminology (continued)

- **MATERIAL POTENTIALLY PRESENTING AN EXPLOSIVE HAZARD (MPPEH)**
  - Material that prior to determination of its explosive safety status, potentially contains explosives or munitions or potentially contains a high enough concentration of explosives that the material presents an explosive hazard

- **MUNITIONS DEBRIS (MD)**
  - Remnants of munitions (e.g., fragments, penetrators, projectiles, shell casings, links, fins, etc.) remaining after munitions use, demilitarization, or disposal
  - *This is old terminology, replaced by MPPEH, MDEH, and MDAS.*

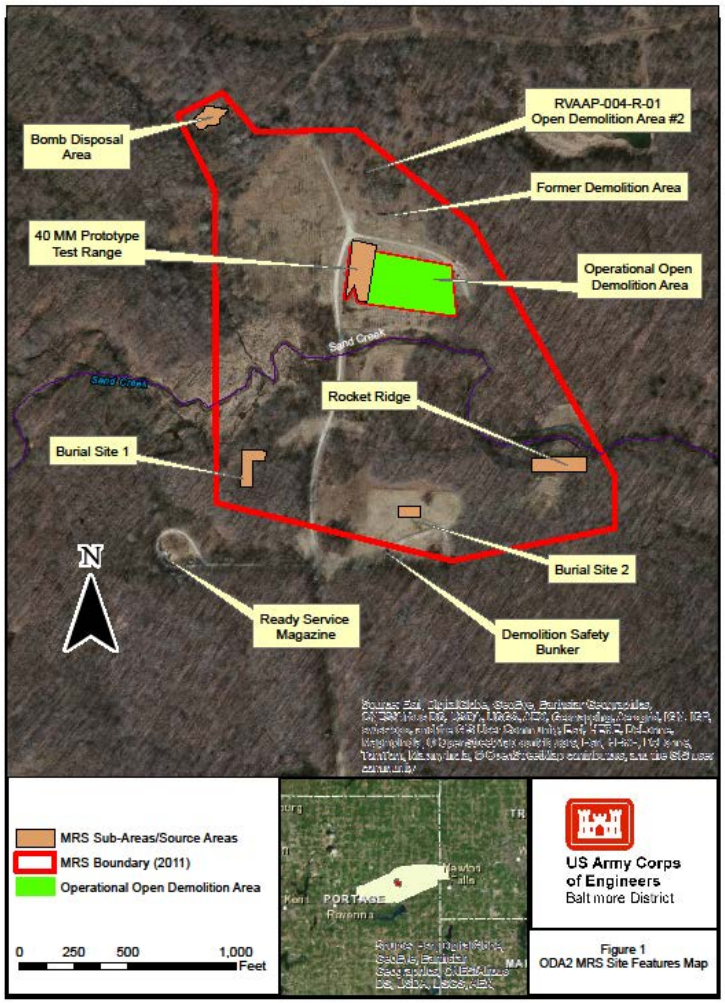
Important Terminology (continued)

- **MATERIAL DOCUMENTED AS SAFE (MDAS)**
  - MPPEH that has been assessed and documented as not presenting an explosive hazard and for which the chain of custody has been established and maintained. This material is no longer considered to be MPPEH.

Background

- **RVAAP-004-R-01 Open Demolition Area #2 MRS (ODA2 MRS)**
  - Historically used to destroy MEC/MPPEH using Open Burn / Open Detonation
  - The RCRA Disposal Unit is not part of the MRS
- **Remedial Investigation (RI) (2009 – 2015)**
  - In 2009, a contract was awarded to conduct RI on 35.4 acres
  - Large kick-out area discovered increased total acreage evaluated during fieldwork to 643 acres
  - Comprehensive nature and extent evaluation was performed
  - Release of MEC and MC identified at the site
  - Final RI Report (2015) modified the MRS boundary to 317.4 acres

Remedial Investigation



ODA#2 MRS - 2009

- Acreage – 35.4 acres (based on final SI Report)
- Localized areas of interest for disposal pits
- MRS does not include RCRA disposal unit on operational range (illustrated in green)

ODA#2 MRS

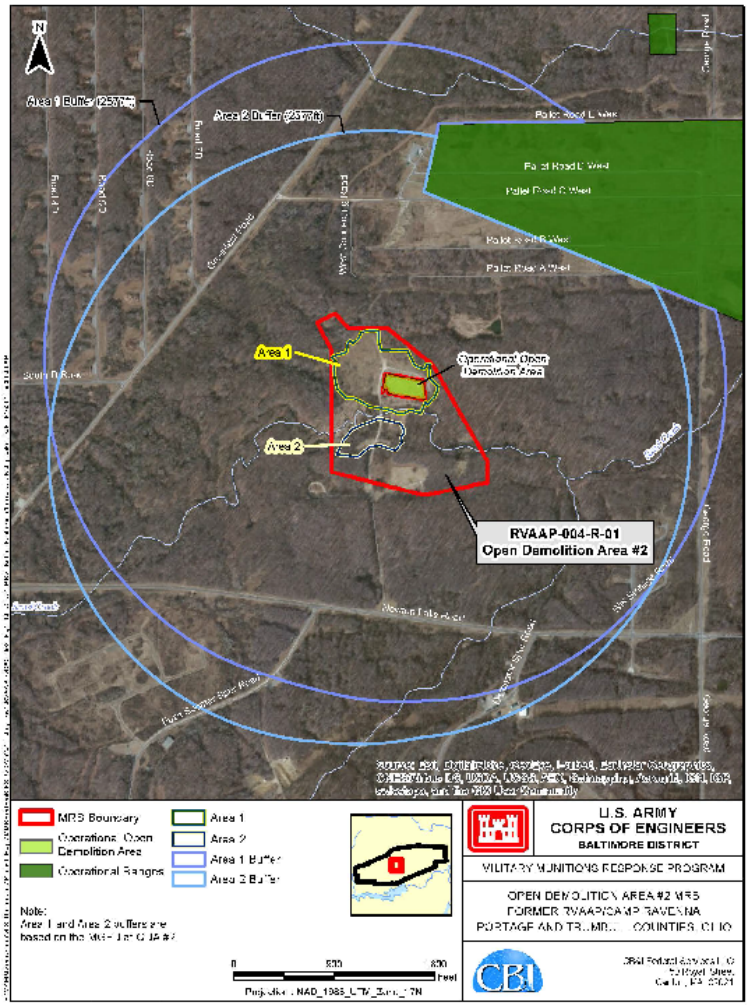


FIGURE 1-14 MRS BUFFER AREAS FEATURES MAP

ODA#2 MRS - fieldwork

- Large kick-out area discovered
- Calculated based on maximum probable munition and approved Net Explosive Weight for disposal operations
- Acreage expanded during fieldwork to 643 acres
- Two primary disposal areas

ODA#2 MRS – MEC Investigation

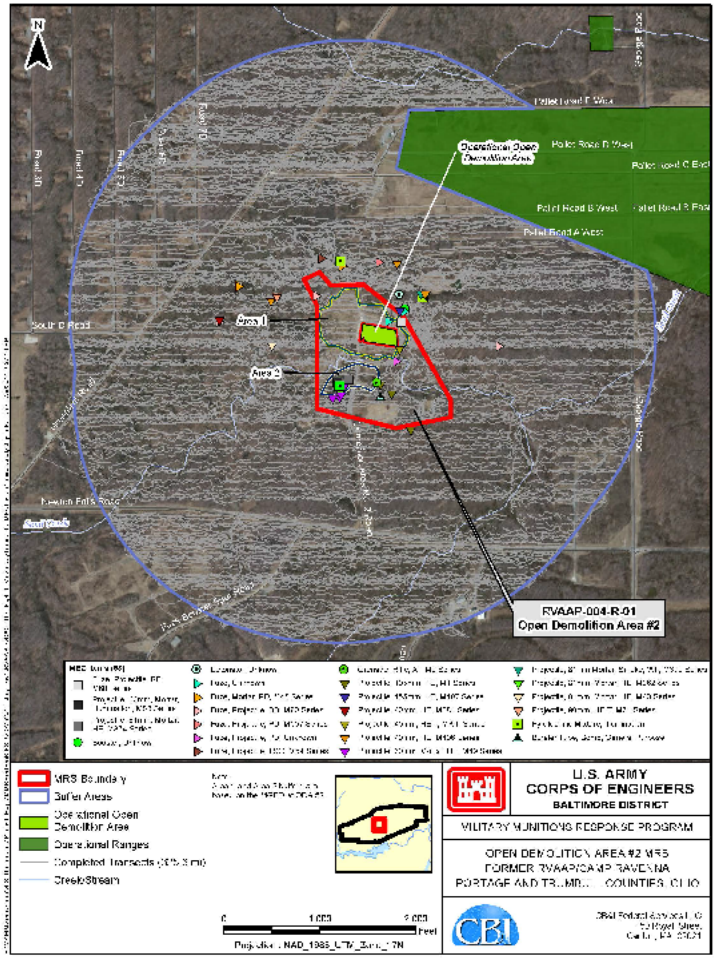


FIGURE 4-1 ACTUAL VISUAL SURVEY TRANSECTS AND MEC FINDINGS

ODA#2 MRS - fieldwork

- Subsurface Investigation (MRS 35 acres):
  - 12.53 acres of DGM
  - 1.6 acres mag and dig
  - 19 trenches
  - 3,507 MPPEH items
  - 22 MEC confirmed
- Visual Survey (buffer area 608 acres)
  - 308 line-miles of transects
  - 1,396 MPPEH items
  - 31 MEC confirmed

Material Documented as Safe

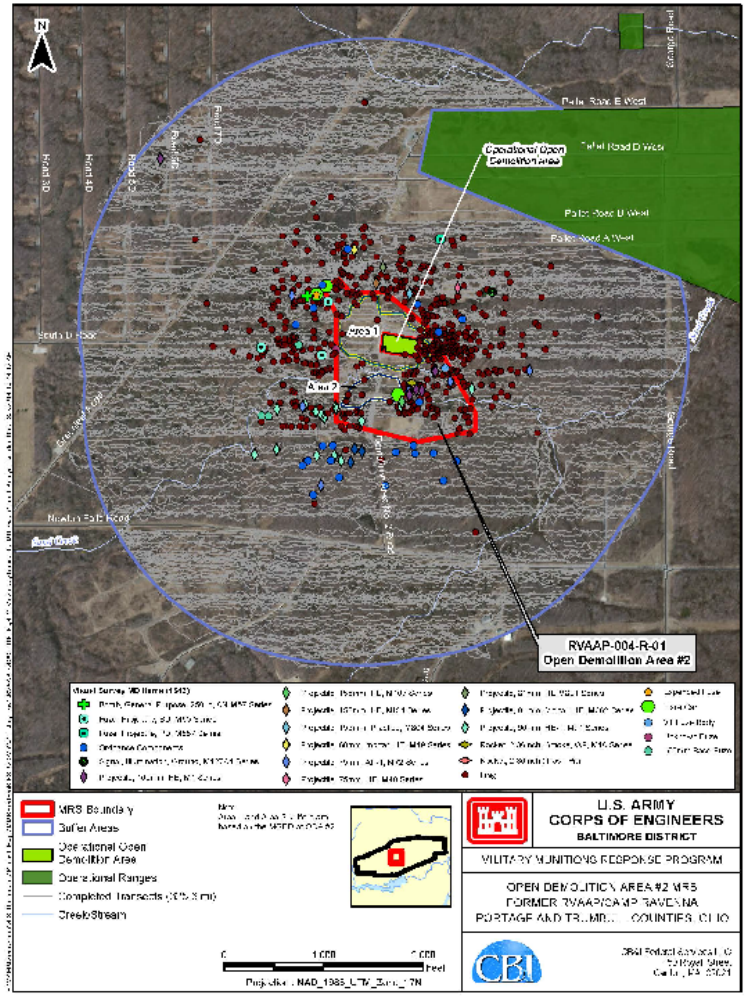


FIGURE 4-2 ACTUAL VISUAL SURVEY TRANSECTS AND MD FINDINGS

ODA#2 MRS - fieldwork

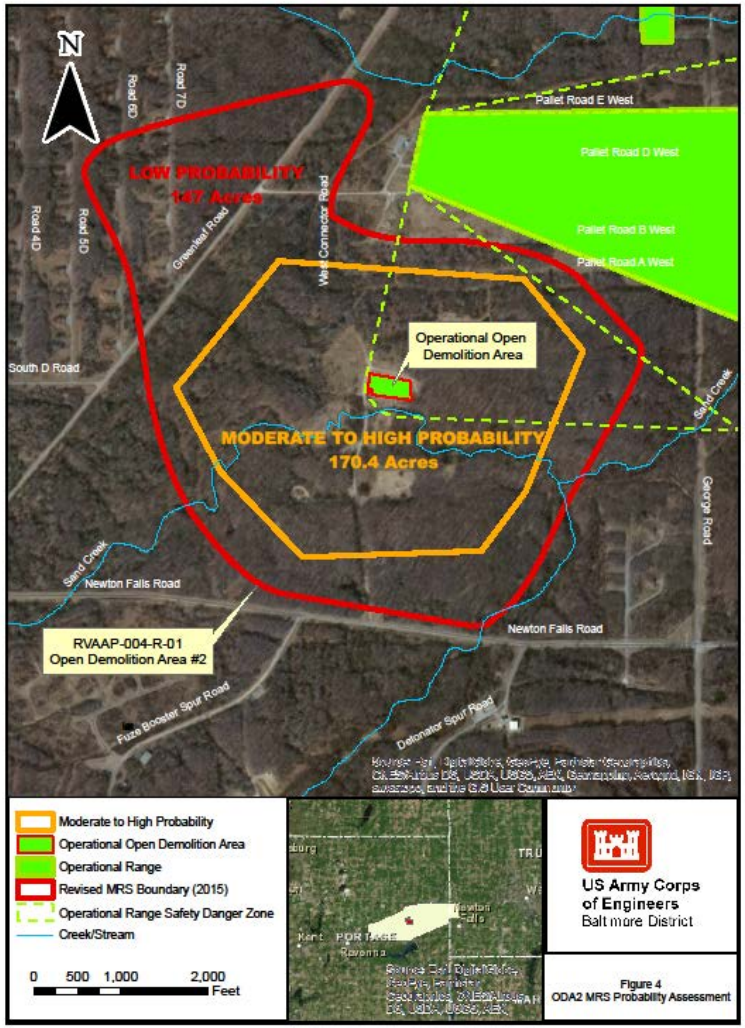
- All but 53 items were determined to be MDAS
- Disposal Pits: MEC/MPPEH as deep as 10 ft bgs
- Majority of MEC/MPPEH in kick-out area is at, or near surface
- No evidence of disposal pits in buffer area
- Mechanism for release in buffer: aerial dispersion.

Revised MRS Boundary

ODA#2 MRS - Results

- Area 1 and Area 2 disposal pits delineated
- MRS boundary revised to 317.4 acres
- MEC density estimated between 36.2 - 44.2 MEC/acre
- Translates to 1,281 -1,565 total possible MEC

Probability Assessment



ODA#2 MRS

- USACE Baltimore District conducted Probability Assessment to support interim cleanup action
- Findings for MEC:
  - 170.4 acres categorized as Moderate to High Probability
  - 140 acres: categorized as Low Probability
  - ~40 acres are inaccessible due to terrain/vegetation

Recommendations

- Conduct a Time Critical Removal Action to address MEC
- Low Probability Areas
  - Surface clearance to remove MEC/MPPEH
  - 10% surface area intrusive investigation to verify low probability
- Moderate to High Probability Areas
  - Subsurface Clearance to 4 feet below ground surface (bgs)
  - Clearance limited to 2 feet bgs in disposal pits
  - Confirm lateral extent of known and unknown disposal pits.
- Inaccessible Areas
  - Verify and delineate inaccessible areas
- Use Buried Explosion Module (BEM) to reduce potential for release of MC to environment during MEC/MPPEH demolition

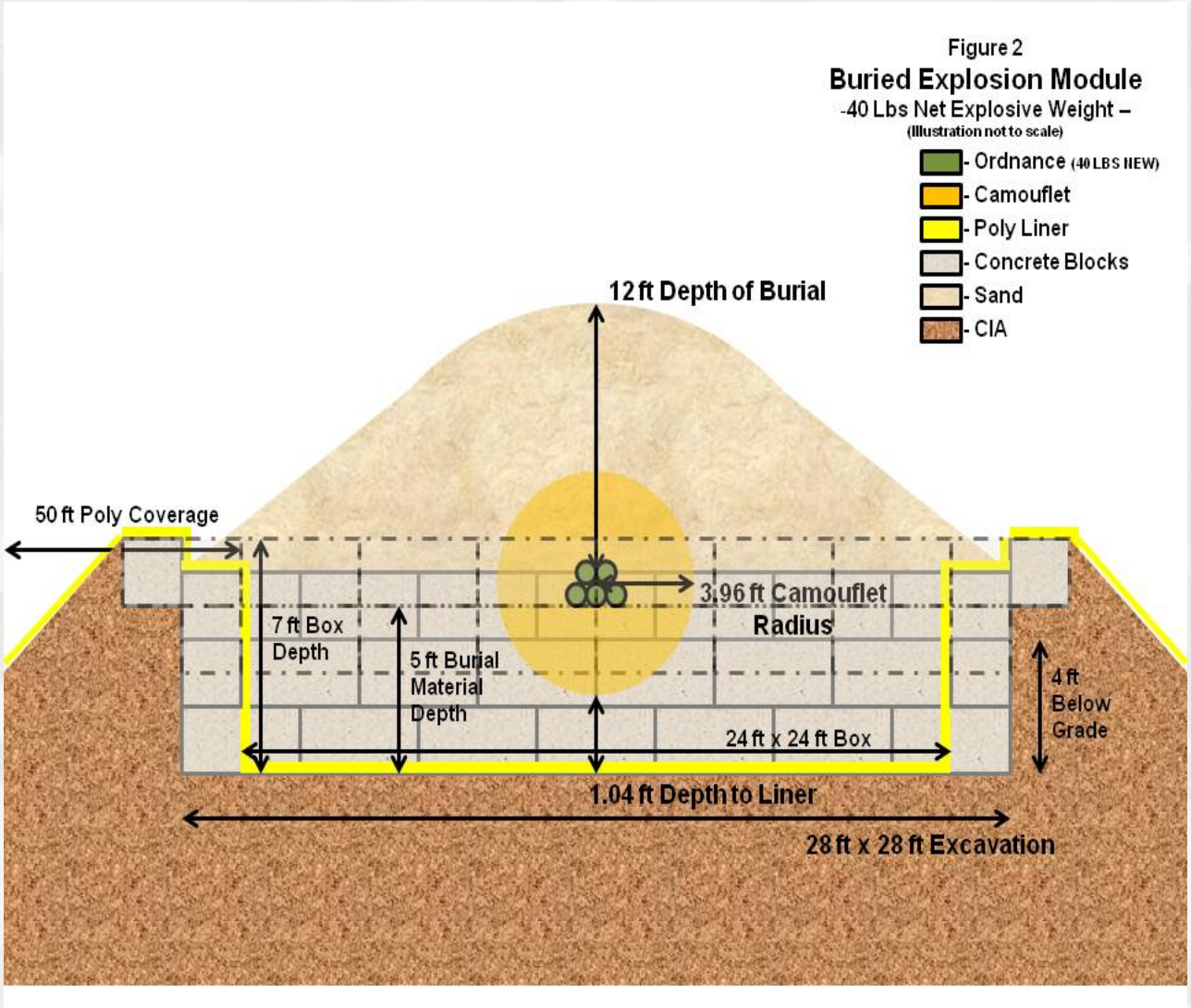
TCRA Objectives

- Action Memorandum coordinated with Ohio EPA and final submitted 4 NOV 2015 for approval
- This action is being taken to mitigate significant explosive safety hazards posed to personnel who may access ODA2 MRS due to exposure to MEC/MPPEH.
- Reduce explosive hazards in a timely manner
- Provide additional data for evaluation of final remedial alternatives in the *Feasibility Study*
- Execute using inhouse resources:
  - Cost effective
  - Timely response
- *This action will **significantly** reduce the amount of MEC and MPPEH at the site*

Buried Explosion Module (BEM)

- An authorized DoD Engineering Control to prevent fragmentation from traveling great distances and reducing the exclusion to zero feet
- Allows time critical work for essential personnel to continue when conducting disposal operation
- Reduces the energy release from rapidly venting into the atmosphere to limit the spread of residual explosives contamination
- Reduces noise of detonation
- Re-useable
- Being used for cleanup operations at Joint Base Cape Cod (aka Massachusetts Military Reservation)

BEM Design



- Capabilities
  - •Permanent
  - •40 lbs max Net Explosive Weight
  - •Reduce exclusion area to zero feet
  - •Reduce dispersion of secondary explosive residue
  - •Reusable burial material (sand)
  - •Poly Lined to prevent contamination of clean soil underneath and around site

BEM Design

- The BEM is engineered to contain the blast using the mass of the containment media

- Or put differently, it's a big heavy pile of sand!

BEM vs Traditional Demolition

Schedule

- Action Memorandum Approval: 18 December 2015
- Approval of Final TCRA Work Plan: March 2016
- Removal Action Fieldwork: April 2016 – October 2017
- After Action Reporting: November 2017 – August 2018

Questions?

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