No Further Action Proposed Plans for

Load Line #1A, Firestone Test Facility, Sand Creek Dump, and Water Works #4 Dump Munitions Response Sites

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Presentation Agenda

- Summary of MMRP.
- The presentation for each MRS will include the following:
  - Historical Operations and Investigations
  - Current Conditions
  - Remedial Investigations and Results
  - Recommendations and Rationale for NFA
- Questions at end of presentation please.

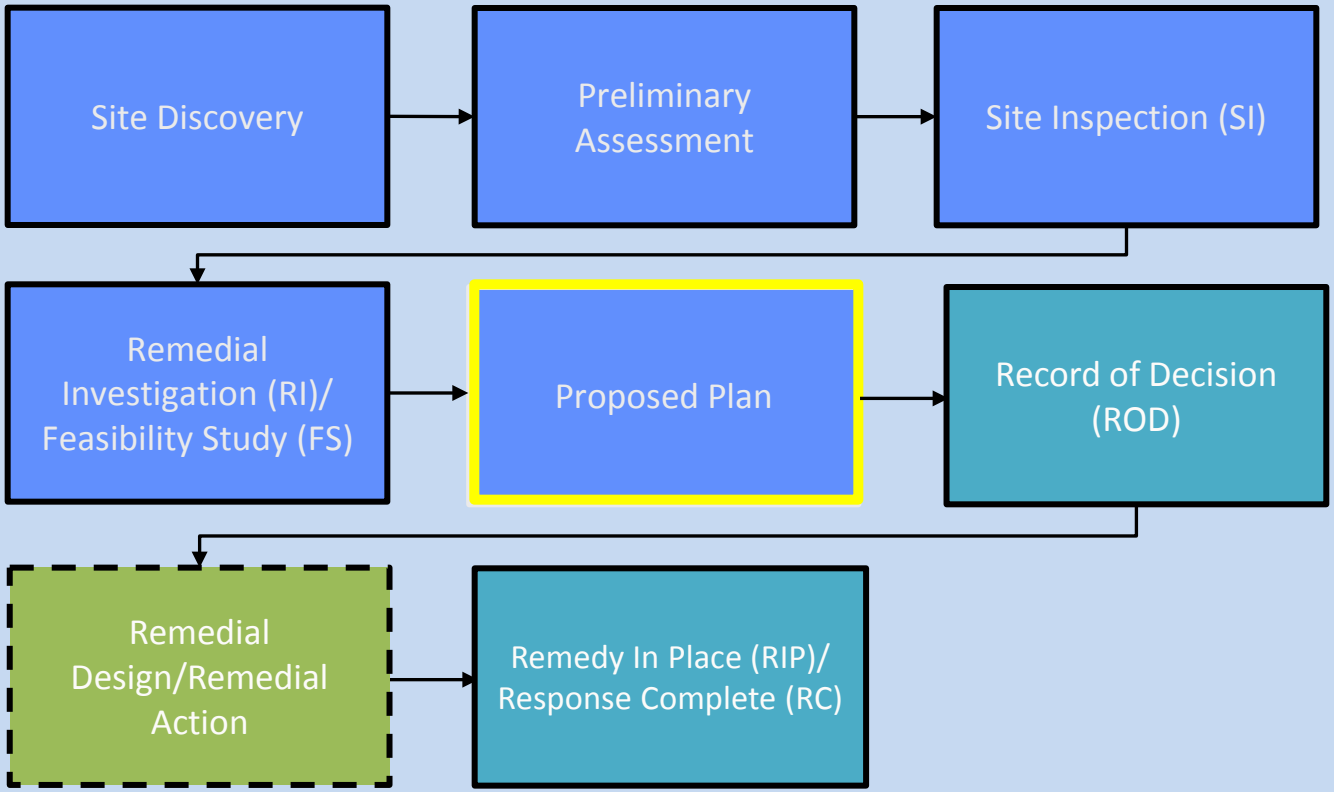
Acronym Cheat Sheet

AOC = Area of Concern
CERCLA = Comprehensive Environmental, Response, Compensation and Liability Act
COC = Chemical of Concern
COPEC = Chemical of Potential Ecological Concern
DGM = Digital Geophysical Mapping
DQO = Data Quality Objectives
IRP = Installation Response Program
ISM = Incremental Sampling Methodology
MAMMS = Multiple Award Military Munitions Services
MC = Munitions Constituents
MDAS = Materiel Documented as Safe
MDEH = Materiel Documented as an Explosive Hazard
MD = Munitions Debris
MEC = Munitions and Explosives of Concern
MMRP = Military Munitions Response Program
MRS = Munitions Response Site
PBA = Performance Based Acquisition
RI = Remedial Investigation
RIP = Remedy in Place
SI = Site Inspection

General Information

- CB&I Federal Services (Formerly Shaw) was issued a Performance Based Acquisition (PBA) in May 2009.
- PBA was issued through the USACE-Baltimore Multiple Award Military Munitions Services (MAMMS) Contract.
- Work is being conducted under the Military Munitions Response Program (MMRP).
- The MMRP follows the CERCLA process.
- CB&I was tasked with completing Remedial Investigations (RIs) at 14 MRSs.
- Required to achieve Remedy in Place (RIP) at 4 MRSs.

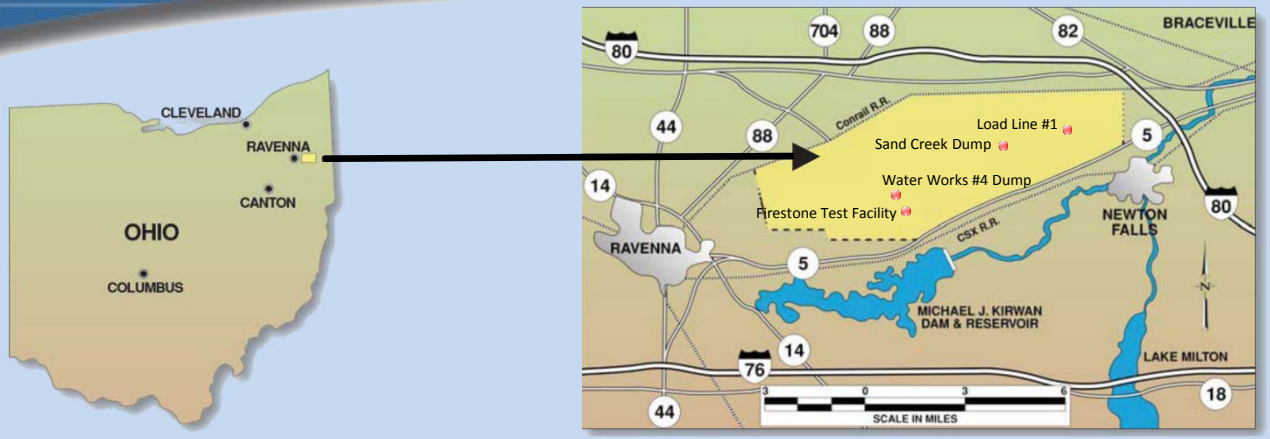
MMRP Project Stages

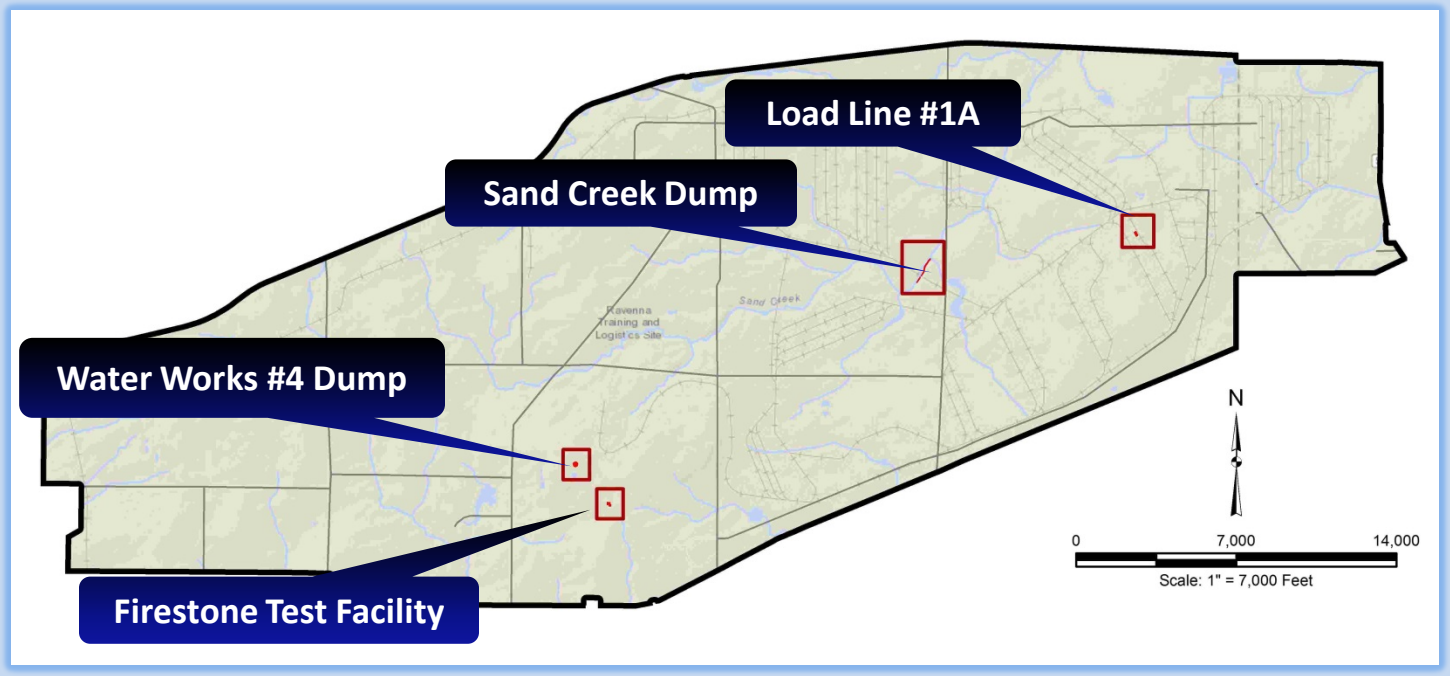


Understanding the MMRP

- The MMRP addresses non-operational range lands that are suspected or known to contain MEC or MC contamination.
- MEC may be present as a result of former munitions-related activities:
  - Live fire training and testing,
  - Munitions manufacturing or maintenance, and/or
  - Munitions demilitarization and disposal.
- MC may be generated by munitions-related activities.
- MC may be considered MEC at concentrations high enough to present an explosive hazard (i.e., red/pink water).

Locations of MRSs





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Load Line #1A MRS

LL1A
Historical Background

- Load Line #1 (164 acres) was used to melt and load TNT and Composition B explosives into large caliber shells.
- Packing and shipping of munitions was conducted at the northern portion of Load Line #1 near the Load Line #1A MRS.
- The demilitarization of primers containing propellants were conducted in the former popping furnace near the MRS.
- Previous investigations have identified residual propellant pellets on the ground surface at the Load Line #1A MRS.
- Principle source of propellants - accidental release or spilling during the munitions loading/shipping activities.

LL1A
Current Conditions

- LL1A MRS is 0.41 acres in area.
- The MRS is co-located with an IRP AOC (Load Line #1)
- No significant cultural features.
- Topography is flat with little change in elevation.
- No surface water features or nearby drainage ways.
- Vegetation consists mostly of shrub species.
- Current activities - maintenance and natural resource management.

FIGURE 3 SITE MAP

LL1A
Historical Investigations

- Archives Search Report completed by Army in 2004.
- Historical Records Review completed by e^{2}M in 2007.
- e^{2}M conducted Site Inspection (SI) field work in 2007.
- SI Report completed by e^{2}M in 2008.
- SI Report results/recommendations for LL1A MRS:
  - One triple-based residual propellant pellet on ground surface soil.
  - Elevated lead and low explosives concentrations in surface soil.
  - The MRS area was reduced from 4.63 to 0.41 acres.
  - Further characterization for MEC and MC was recommended at the revised MRS.

LL1A
Remedial Investigation

- MMRP RI was conducted at LL1A between April and August 2011.
- LL1A RI field work:
  - Instrument-assisted visual surveys over 100% of the MRS.
  - Collect for MC samples as pre-determined in the Work Plan.
    - 2 ISM samples for MC over 100% of the MRS.
  - Analyze MC samples for lead, explosives, and propellants.

LL1A
Remedial Investigation Results

- No MEC was found during visual surveys.
- MC results for lead and nitroguanidine were below the risk-based screening levels for human and environmental receptors.
- Conclusions: No risks associated with exposures to MEC or MC at the LL1A MRS.
- Final RI Report issued/approved by Ohio EPA in August 2014.

Scope and Role of LL1A Response Action

- The RI addresses surface soil at the LL1A MRS where the release of residual propellant pellets onto the ground surface occurred.
- There are no surface water features at the MRS where sediment or surface water may become impacted.
- Groundwater is monitored under the facility-wide groundwater monitoring program.
- Response actions associated with non-munitions related hazards are being addressed under the IRP.

LL1A Recommendations

LL1A MRS – No Further Action

- Future Land Use – Military Training
- Intended Land User – National Guard Trainee.
- No MEC found; therefore, no explosive safety hazards present.
- No MC above Facility-Wide Cleanup Goals for human receptors, including Unrestricted Land Use.
- No future actions recommended at LL1A MRS under the MMRP.

Firestone Test Facility MRS

FTF
Historical Background

- The FTF was an approximately 1-acre area.
- FTF consisted of three buildings and a former test pond located on the southwest side of the Load Line #6.
- Two of the buildings were used as a test chamber for tube-launched, optically-tracked, wire-guided missiles and Dragon missiles.
- Shaped charges were tested under water at the pond.
- There is little available information regarding the activities that occurred or how the tests were conducted.
- All three buildings have been removed and the areas have been cleared of surface construction debris.

FTF
Current Conditions

- The MRS is 0.41 acres in size and is the location of the former building and area around the former test pond.
- MRS is co-located with an IRP AOC (Load Line #6).
- No significant cultural features remain.
- Topography gently slopes to east.
- Drainage is towards ditch and pond.
- Vegetation consists mostly of grass and shrub species.
- Current activities - maintenance and natural resource management

FIGURE 3 SITE FEATURES MAP

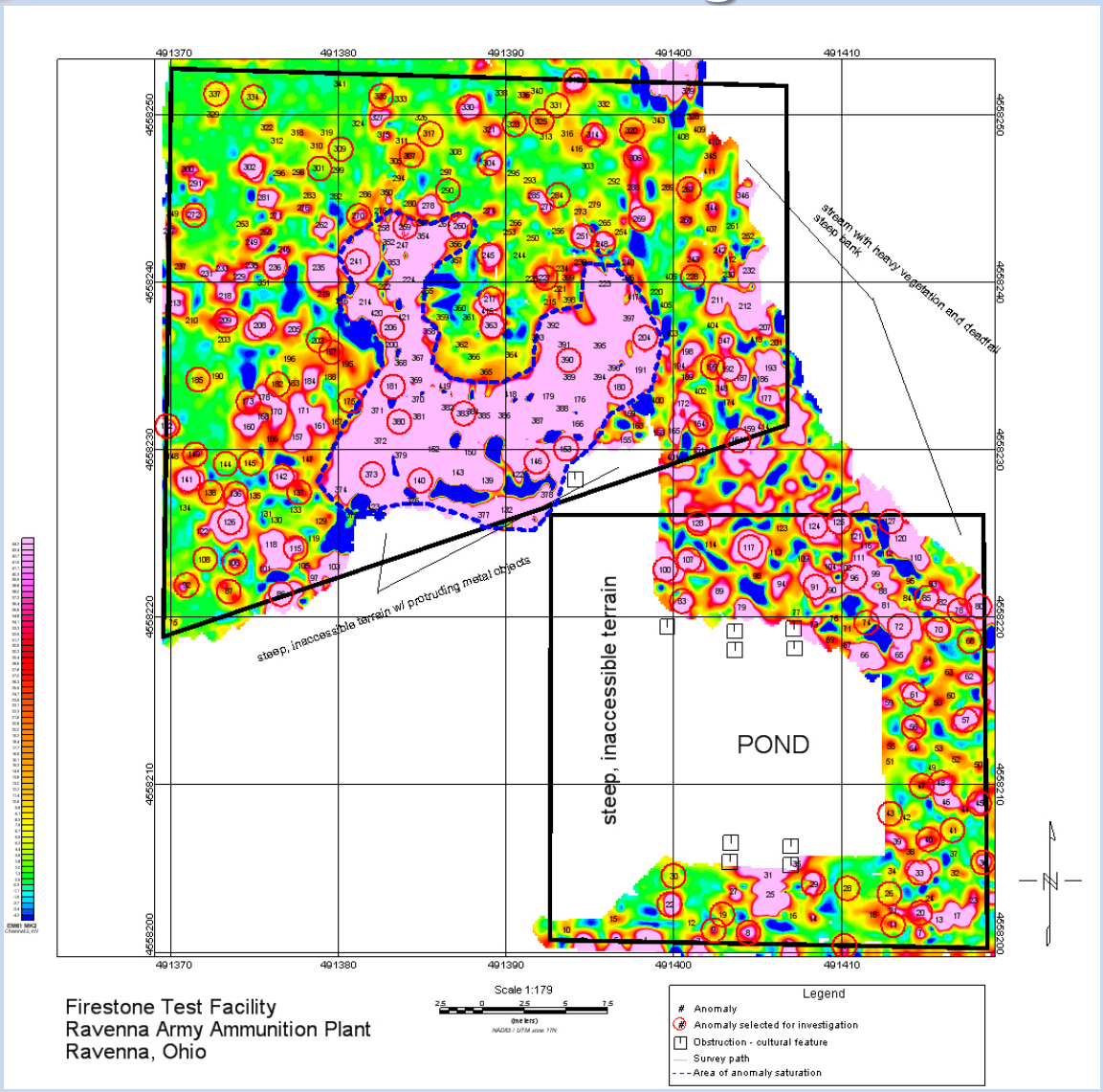
FTF
Historical Investigations

- Archives Search Report completed by Army in 2004.
- Historical Records Review completed by e^2M in 2007.
- e^2M conducted SI field work in 2007.
- SI Report completed by e^2M in 2008.
- SI Report results/recommendations for FTF MRS:
  - MEC potentially present in pond and buried at former test chamber building.
  - No MC detected in surface soil sample above screening criteria.
  - Further characterization for MEC at the 0.41 acre MRS was recommended.

FTF
Remedial Investigation

- MMRP RI was conducted at FTF from May to August 2011
- FTF RI field work:
  - DGM over 100% of accessible areas at the MRS.
  - Intrusive subsurface anomaly investigation at selected targets.
  - 100% underwater investigation.
  - Collect MC samples as pre-determined locations in the Work Plan:
    - 1 ISM surface soil sample around pond,
    - 2 grab sediment samples within pond,
    - 1 surface water sample from pond.

FTF
Remedial Investigation



Firestone Test Facility
Ravenna Army Ammunition Plant
Ravenna, Ohio

US Army Corps of Engineers®

FTF
Remedial Investigation Results

- 105 of 423 anomalies identified from DGM selected for intrusive investigation (25% of anomalies).
- No MEC was found during the land-based intrusive investigation or underwater tactile investigation.
- MC results in surface soil, surface water, and sediment were below the risk-based screening levels for human and environmental receptors.
- Conclusions: No risks associated with exposures to MEC or MC at the FTF MRS.
- Final RI Report issued/approved by Ohio EPA in August 2014.

Scope and Role of FTF Response Action

- The RI addresses surface soil, sediment, and surface water at the FTF MRS where release of MEC and MC from shaped charges testing may have occurred.
- Groundwater is monitored under the facility-wide groundwater monitoring program.
- Response actions associated with non-munitions related hazards are being addressed under the IRP.

FTF Recommendations

FTF MRS – No Further Action

- Future Land Use – Military Training
- Intended Land Users – National Guard Trainee and Engineering School Instructor
- No MEC found; therefore, no explosive safety hazards present.
- No MC above Facility-Wide Cleanup Goals for human receptors, including Unrestricted Land Use.
- No future actions recommended at FTF MRS under the MMRP.

Water Works #4 Dump MRS

WW4D
Historical Background

- WW4 Dump MRS is located at the southern portion of former RVAAP.
- MRS area was originally 6.15 acres.
- Reportedly used for intentional dumping of non-explosive metal parts from large-caliber ordnance rounds.
- Dumping activities reportedly occurred between 1941-1949.
- Large-caliber casings and ogives have been found on the ground surface and partially buried throughout wooded area north of dump area (155mm projectiles).
- No explosive safety hazards identified.

WW4D
Current Conditions

- The MRS is now 0.77 acres in size - open clearing where the dump is located.
- No significant cultural features.
- Topography trends to southeast.
- No nearby surface water features.
- Vegetation consists of grass and small brush.
- Current activities - maintenance and natural resource management.

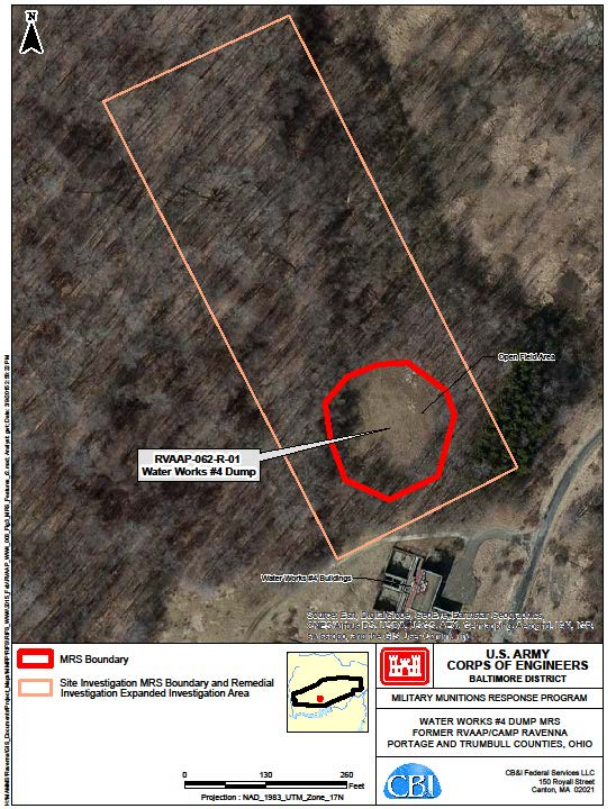


FIGURE 3 SITE FEATURES MAP

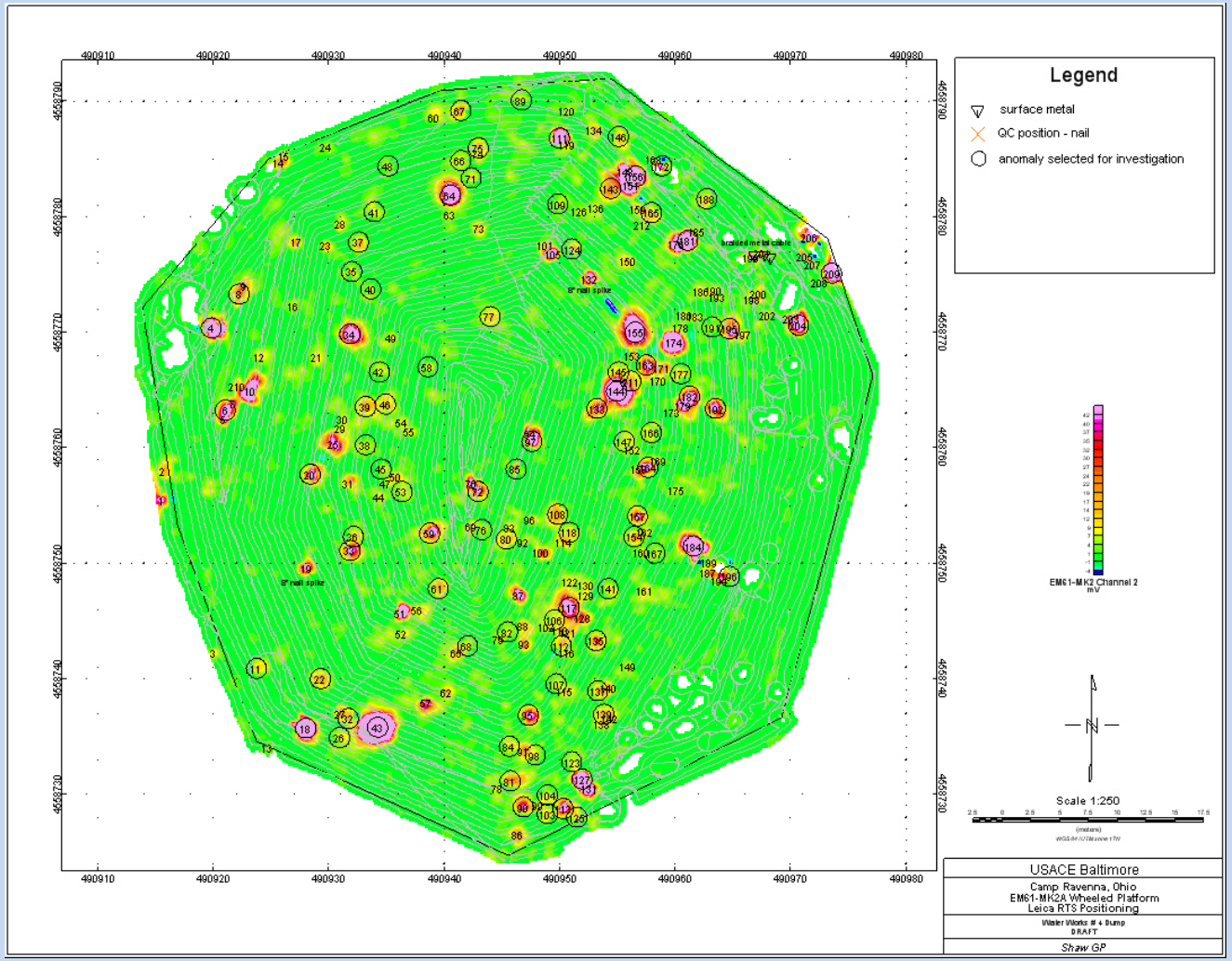
WW4D
Historical Investigations

- Archives Search Report completed by Army in 2004.
- Historical Records Review completed by e^2M in 2007.
- e^2M conducted SI field work in 2007.
- SI Report completed by e^2M in 2008.
- SI Report results/recommendations for WW4 Dump MRS:
  - 20-155mm projectile ogives scattered throughout wooded area (all MDAS).
  - Subsurface anomalies were detected in the open clearing.
  - No MC detected in surface soil sample from clearing above screening criteria.
  - Reduction in MRS area from 6.15 to 0.77 acres was recommended.
  - Further characterization for potential MEC at the revised MRS recommended.

WW4D
Remedial Investigation

- MMRP RI was conducted at WW4 Dump MRS between September and December 2011
- WW4 Dump RI field work:
  - Expanded investigation area to include the wooded area where ogives were found during the SI Report (original 6.15 acres).
  - Instrument-assisted visual survey at the combined MRS and wooded area.
  - Full DGM coverage of the 0.77 acre MRS.
  - Intrusive investigation of subsurface anomalies identified during DGM survey.
  - Sample for MC if MEC or concentrated areas of MD found.

WW4D
Remedial Investigation



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WW4D
Remedial Investigation Results

- Instrument-assisted visual survey:
  - Five ogives found at isolated locations in wooded area (all MDAS).
- Intrusive activities at MRS dump area:
  - 93 of 205 anomalies identified from DGM selected for investigation (45% of anomalies)
  - Two ogives found just below ground surface (both MDAS).
- No MEC found.

- Conclusions: No risks associated with exposure to MEC at the MRS.
- Final RI Report issued/approved by Ohio EPA in March 2015.

Scope and Role of WW4D Response Action

- This RI addresses potential explosive safety hazards associated with the historical disposal of munitions-related items at the WW4 Dump MRS.
- No munitions-related source materials were found that may impact environmental media at the MRS or the expanded investigation area.

WW4D
Recommendations

WW4 Dump MRS – No Further Action

- Future Land Use – Military Training
- Intended Land Users – National Guard Trainee and Engineering School Instructor
- No MEC found; therefore, no explosive safety hazards present.
- No MEC = No MC source.
- Unrestricted Land Use achieved since no MEC or MC.
- No future actions recommended at WW4 Dump MRS under the MMRP.

Sand Creek Dump MRS

SCD
Historical Background

- SCD MRS is 0.85 acre area located at the eastern portion of former RVAAP.
- Former open dump that operated from 1950 to 1960.
- Construction debris materials were dumped over embankment next to Sand Creek.
- 2-75mm projectile shells (MDAS) were found on ground surface during 2003 removal action.
- No explosive safety hazards identified.

SCD
Current Conditions

- The MRS is co-located with an IRP AOC (Sand Creek Disposal Road Landfill).
- No significant cultural features.
- Topography from top of embankment to Sand Creek ranges from 15 to 25 feet.
- Sand Creek is immediately adjacent to west of MRS.
- MRS is located within a 100-year flood plain.
- Vegetation consists mostly of swamp and forest communities.
- Current activities - maintenance and natural resource management

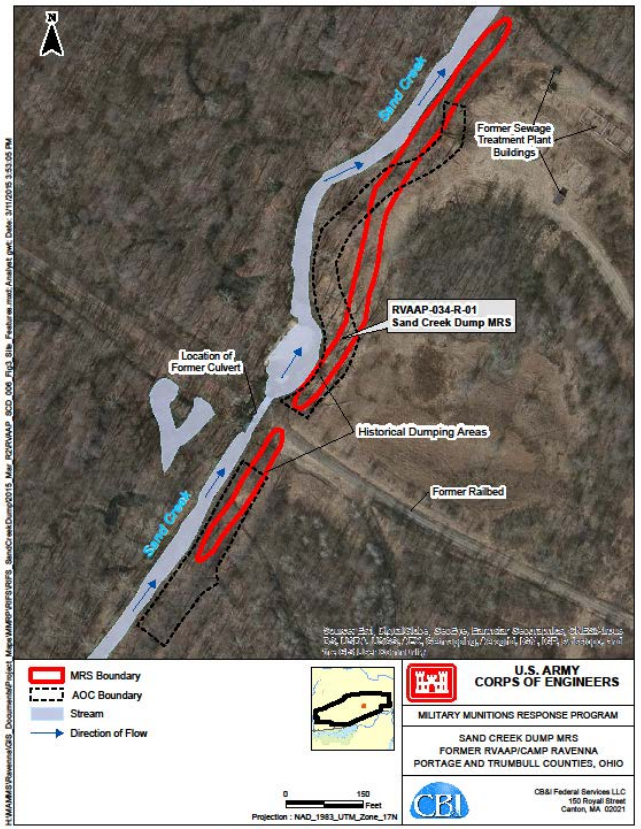

FIGURE 3 SITE FEATURES MAP

SCD
Historical Investigations

- Removal Action by MKM in 2003 (IRP).
- Archives Search Report completed by Army in 2004 (MMRP).
- Historical Records Review completed by e^2M in 2007 (MMRP).
- e^2M conducted SI field work in 2007 (MMRP).
- SI Report completed by e^2M in 2008 (MMRP).
- Phase I RI by CB&I in 2010 (IRP).
  - Full DGM coverage of co-located AOC.
  - Media sampling included 18 ISM surface soil samples, 2 ISM sediment samples, and 58 subsurface soil samples.

SCD
Site Inspection Results

- Multiple subsurface anomalies identified during instrument-assisted MEC surveys.
- No MEC or MD found on ground surface.
- 105mm projectile observed in Sand Creek – was not determined as either MDAS or MDEH.
- Further characterization for potentially buried MEC was recommended.
- Sampling for MC was being conducted at co-located AOC under the IRP.

SCD Phase I Remedial Investigation Results

- Phase I RI was conducted at co-located AOC under the IRP.
- Full coverage DGM of AOC identified areas of buried anomalies – mostly north of former rail bed.
- Low concentrations of TNT and 2-amino-4,6-DNT detected but not considered as COCs or COPECs.
- COCs identified as potential MC for the National Guard Trainee:
  - Benzo(a)pyrene and benzo(b)fluoranthene (surface soil – 0 to 4 feet)
  - Lead (subsurface soil – 4 to 7 feet)

SCD
Remedial Investigation

- MMRP RI was conducted at SCD MRS in December 2011.
- SCD RI field work:
  - DGM survey to cover areas not covered during the IRP investigation.
  - Intrusive investigation of subsurface anomalies identified during DGM survey.
  - Visual survey of creek where 105mm projectile was seen during the SI field work.
  - Sample for MC if MEC or concentrated areas of MD found.

SCD
Remedial Investigation Results

- Intrusive investigation activities:
  - 8 trenches to maximum depth of 2.5 feet bgs.
  - Hand dug at 167 individual anomaly locations.
- No MEC was found during the intrusive investigation activities or visual survey of the creek.
- Conclusions: No risks associated with exposures to MEC at the MRS.
- Final RI Report issued/approved by Ohio EPA in March 2015.

Scope and Role of SCD Response Action

- This RI addresses potential explosive safety hazards associated with the potential disposal of munitions-related items at the SCD MRS.
- No munitions-related source materials were found that may impact environmental media at the MRS.
- Any response actions associated with non-munitions related hazards are being addressed under the IRP.

SCD Recommendations

SCD MRS – No Further Action

- Future Land Use – Military Training
- Intended Land User – National Guard Trainee
- No MEC found; therefore, no explosive safety hazards present.
- No MEC = No MC source
- No future actions recommended at SCD MRS under the MMRP.

QUESTIONS?