

**Final  
No Further Action Proposed Plan  
for  
RVAAP-016-R-01 Fuze and Booster Quarry  
Munitions Response Site**

**Former Ravenna Army Ammunition Plant  
Portage and Trumbull Counties, Ohio**

**Contract No. W912DR-15-D-0016  
Delivery Order No. 0001**

**Prepared for:**



**US Army Corps  
of Engineers®**

**U.S. Army Corps of Engineers  
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**September 18, 2018**

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**REPORT DOCUMENTATION PAGE**

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<b>14. ABSTRACT</b> The U.S. Department of the Army (U.S. Army) is presenting this No Further Action (NFA) Proposed Plan to involve the public in the remedy selection process for the former Ravenna Army Ammunition Plant, RVAAP-016-R-01 Fuze and Booster Quarry Munitions Response Site (MRS), in Portage and Trumbull Counties, Ohio. This NFA Proposed Plan presents the U.S. Army's preliminary recommendations for addressing the RVAAP-016-R-01 Fuze and Booster Quarry MRS. Investigations have found no munitions or explosives of concern or concentrated areas of munitions debris, and no potential source of munitions constituents exists at the MRS. Therefore, there is no source material or impacted environmental media resulting from historical U.S. munitions-related activities at the MRS.					
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John R. Kasich, Governor  
Mary Taylor, Lt. Governor  
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October 24, 2018

Mr. David Connolly  
Army National Guard Directorate  
Environmental Programs Division  
ARNG-ILE-CR  
111 South George Mason Drive  
Arlington, VA 22204

**Re: US Army Ravenna Ammunition Plt RVAAP  
Remediation Response  
Plans  
Remedial Response  
Portage County  
267000859245**

**Subject: Review and Concurrence of the "Final No Further Action Proposed Plan for RVAAP-016-R-01 Fuze and Booster Quarry Munitions Response Site" Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio: Dated September 18, 2018 (Work Activity No. 267000859245)**

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the *Final No Further Action Proposed Plan for RVAAP-016-R-01 Fuze and Booster Quarry Munitions Response Site* dated September 18, 2018. This document was received by Ohio EPA NEDO on September 18, 2018. It was prepared by HydroGeoLogic, Inc. Ohio EPA concurs with the selected remedy. Any additional future investigations will be conducted under the Installation Restoration Program.

If you have any questions or concerns, please do not hesitate to contact Nicholas Roope at (330) 963-1235.

Sincerely,

A handwritten signature in blue ink, appearing to read "J. Sferra", is written over a faint, larger version of the signature.

James Sferra, Chief  
Division of Environmental Response and Revitalization

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**CONTRACTOR'S STATEMENT OF INDEPENDENT TECHNICAL REVIEW**

HydroGeoLogic, Inc., has completed the *Final No Further Action Proposed Plan for RVAAP-016-R-01 Fuze and Booster Quarry Munitions Response Site, Version 1.0*, at the Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio. Notice is hereby given that an independent technical review has been conducted that is appropriate to the level of risk and complexity inherent in the project. During the independent technical review, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of data quality objectives, technical assumptions; methods, procedures, and materials to be used; the appropriateness of data used and level of data obtained; and reasonableness of the results, including whether the product meets customer's needs consistent with law and existing United States Army Corps of Engineers policy.

Reviewed/Approved by:

Janardan J Patel

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## DOCUMENT DISTRIBUTION

### Final No Further Action Proposed Plan for RVAAP-016-R-01 Fuze and Booster Quarry MRS

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ARNG – Army National Guard

COR – Contracting Officer’s Representative

IED – Installation and Environment Division

OHARNG – Ohio Army National Guard

RVAAP – Former Ravenna Army Ammunition Plant

USACE – United States Army Corps of Engineers

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## ACRONYMS AND ABBREVIATIONS

ARAR	applicable or relevant and appropriate requirements	NFA	No Further Action
Army	U.S. Department of the Army	NPDES	National Pollutant Discharge Elimination System
ARNG	Army National Guard	OHARNG	Ohio Army National Guard
Camp Ravenna	Camp Ravenna Joint Military Training Center	Ohio EPA	Ohio Environmental Protection Agency
CB&I	CB&I Federal Services, LLC	PP	Proposed Plan
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act	RI	Remedial Investigation
COC	chemical of concern	ROD	Record of Decision
COR	Contracting Officer's Representative	RVAAP	Former Ravenna Army Ammunition Plant
DMM	discarded military munitions	SI	Site Inspection
DoD	U.S. Department of Defense	TNT	trinitrotoluene
e <sup>2</sup> M	Engineering-Environmental Management, Inc.	U.S.	United States
Final FS Report	<i>Final Feasibility Study for RVAAP-016-R-01 Fuze and Booster Quarry MRS, Version 1.0</i>	USACE	U.S. Army Corps of Engineers
Final Historical Records Review	<i>Final Military Munitions Response Program Historical Records Review, Ravenna Army Ammunition Plant, Ohio</i>	UXO	unexploded ordnance
Final RI Report	<i>Final Remedial Investigation Report for RVAAP-016-R-01 Fuze and Booster Quarry MRS, Version 1.0</i>		
Final SI Report	<i>Final Site Inspection Report, Ravenna Army Ammunition Plant, Ohio</i>		
FS	Feasibility Study		
HGL	HydroGeoLogic, Inc.		
HRR	Historical Records Review		
IED	Installation and Environment Division		
IRP	Installation Restoration Program		
ISM	Incremental Sampling Methodology		
MC	munitions constituents		
MD	munitions debris		
MEC	munitions and explosives of concern		
MMRP	Military Munitions Response Program		
MRS	munitions response site		
MRSPP	MRS Prioritization Protocol		

## 1.0 INTRODUCTION

The United States (U.S.) Department of the Army (Army or DA) is presenting this No Further Action (NFA) **Proposed Plan**\* (PP) to involve the public in the **remedy selection process** for the RVAAP-016-R-01 Fuze and Booster Quarry **Munitions Response Site (MRS)**. The former Ravenna Army Ammunition Plant (RVAAP) is located in Portage and Trumbull Counties, Ohio, as shown on **Figure 1**. The location of the Fuze and Booster Quarry MRS in relation to the former RVAAP is shown on **Figure 2**.

The Army, in consultation with the Ohio Environmental Protection Agency (Ohio EPA), is the lead agency for investigating, reporting, making **remedial decisions**, and taking **remedial actions** at the former RVAAP. This NFA PP presents the Army's preliminary recommendations for addressing the Fuze and Booster Quarry MRS. Investigations indicate that no **U.S. Department of Defense (DoD) military munitions** that were confirmed as **munitions and explosives of concern (MEC)** or risks associated with **munitions constituents (MC)**-related contamination exist.

The Army is issuing this NFA PP to address its public participation responsibilities under Section 117(a) of the **Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA)**, as amended by the Superfund Amendments and Reauthorization Act of 1986, and Section 300.430(f)(2) of the **National Oil and Hazardous Substances Pollution Contingency Plan** (40 Code of Federal Regulations 300). Implementation of the selected remedy at the MRS will comply with the requirements of the *Director's Final Findings and Orders for RVAAP* (Ohio EPA, 2004).

This NFA PP summarizes information contained in the Final Remedial Investigation Report for *RVAAP-016-R-01 Fuze and Booster Quarry MRS, Version 1.0* (Final **Remedial Investigation [RI]**) (CB&I Federal Services, LLC [CB&I], 2015) and the *Final Feasibility Study for RVAAP-016-R-01 Fuze and Booster Quarry MRS, Version 1.0* (Final **Feasibility**

**Study [FS]**) (HydroGeoLogic, Inc. [HGL], 2018). The Army encourages the public to review these documents to better understand the history of the MRS, activities that have been conducted there, and determinations that have been made for the MRS under the **Military Munitions Response Program (MMRP)**.

The Army, in consultation with the Ohio EPA, will review and consider all comments on this NFA PP received during the 30-day public comment period. The public is encouraged to review and comment on all recommendations presented in this NFA PP.

## 2.0 FACILITY AND MRS BACKGROUND

This section summarizes the history of the former RVAAP and of the Fuze and Booster Quarry MRS.

### 2.1 Facility History

The former RVAAP (Federal Facility ID No. OH213820736), now known as the Camp Ravenna Joint Military Training Center (Camp Ravenna), is located in northeastern Ohio within Portage and Trumbull Counties and is approximately 3 miles east-northeast of the city of Ravenna. The federally owned facility, approximately 11 miles long and 3.5 miles wide, is bounded by a Norfolk Southern railroad line to the north; State Route 5, the Michael J. Kirwan Reservoir, and a CSX railroad line to the south; State Route 534 to the east; and Garret, McCormick, and Berry Roads to the west. The facility is surrounded by the communities of Windham, Garrettsville, Newton Falls, Charlestown, and Wayland.

**Administrative control** of the 21,683-acre facility was transferred to the U.S. Property and Fiscal Officer for Ohio, which subsequently licensed the facility to the Ohio Army National Guard (OHARNG) for use as a training site, Camp Ravenna. The restoration program for the facility involves the remediation of areas affected by the activities of the former RVAAP.

The former RVAAP was constructed in 1940 and 1941 for assembly/loading and **depot storage** of ammunition. While being used as an ammunition

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\* Terminology used in this Proposed Plan is defined in the Glossary found at the back of this document.

plant, RVAAP was a U.S. Government-owned and contractor-operated industrial facility. The ammunition plant consisted of 12 munitions assembly facilities, referred to as "load lines." Load Lines 1 through 4 were used to melt and load 2,4,6-trinitrotoluene (TNT) and Composition B (a mixture of TNT and Research Department Explosive) into **large-caliber shells** and bombs. Operations on the load lines produced explosive dust, spills, and vapors that collected on the floors and walls of each building. Periodically, the floors and walls were cleaned with water and steam. After cleaning, the "pink water" wastewater, which contained TNT and Composition B, was collected in concrete holding tanks, filtered, and pumped into unlined ditches for transport to **earthen settling ponds**. Load Lines 5 through 11 manufactured **fuzes**, **primers**, and **boosters**. From 1946 to 1949, Load Line 12 produced ammonium nitrate for explosives and fertilizers; subsequently it was used as a **weapons demilitarization facility**.

In 1950, the facility was placed on standby status, and operations were limited to **renovation**, **demilitarization**, normal maintenance of equipment, and munitions storage. **Production** activities resumed from July 1954 to October 1957 and again from May 1968 to August 1972. Demilitarization and production activities were conducted at Load Lines 1, 2, 3, and 12. Demilitarization activities included disassembling munitions and melting out and recovering explosives using hot water and steam processes. These activities continued through 1992.

**Public Comment Period:**

October 25 to December 1, 2018

**Public Meeting:**

The Army will hold an open house/public meeting to explain the NFA PP. Oral and written comments on the document will be accepted at the meeting. The open house/public meeting is scheduled for 6:00 p.m. on November 1, 2018, at the Shearer Community Center (Paris Township Hall) at 9355 Newton Falls Road, Ravenna, Ohio 44266.

**Information Repositories:**

Information used in selecting the preferred remedy is available online at [www.rvaap.org](http://www.rvaap.org) and at the following locations:

**Reed Memorial Library**

167 East Main Street  
Ravenna, Ohio 44266  
(330) 296-2827

Hours of Operation:

9 a.m.–9 p.m., Monday–Thursday  
9 a.m.–6 p.m., Friday  
9 a.m.–5 p.m., Saturday  
1 p.m.–5 p.m., Sunday

**Newton Falls Public Library**

204 South Canal Street  
Newton Falls, Ohio 44444  
(330) 872-1282

Hours of Operation:

9 a.m.–8 p.m., Monday–Thursday  
9 a.m.–5 p.m., Friday and Saturday

The **Administrative Record** File, which includes the information used to select the preferred remedy, is available for review at the following location:

**Camp Ravenna Joint Military Training Center (Camp Ravenna)**

Environmental Office  
1438 State Route 534  
Newton Falls, Ohio 44444  
(614) 336-6136

Note: Access to Camp Ravenna is restricted, but an appointment to review the Administrative Record File can be scheduled.

In addition to production and demilitarization activities at the load lines, other facilities at RVAAP included areas used for the burning, demolition, and testing of munitions. These burning and demolition grounds consisted of large, open areas and abandoned quarries. Other areas of concern at the former RVAAP include landfills, an aircraft fuel tank testing area, and various industrial support and maintenance facilities (CB&I, 2015).

## 2.2 MRS History

The Fuze and Booster Quarry MRS comprises 4.92 acres of stone and ballast quarry excavated to provide building materials for RVAAP. Between 1945 and 1949 the quarry was used as an open burn area where sawdust waste generated at Load Lines 6 through 11 was thermally treated. Thereafter, the quarry was used as a landfill that reportedly accepted fuze and booster assemblies, projectiles, residual ash, and sanitary waste. In 1976, the landfill materials, inclusive of the munitions-related items historically disposed of at the MRS, were removed and transferred to either Ramsdell Quarry or one of the other burning grounds at RVAAP. Around this time, three elongated settling ponds were constructed at the MRS. From 1987 through 1993, spent brine regenerate and sand filtration backwash water were discharged to the ponds from the facility's potable water treatment system. The discharge was regulated under the National Pollutant Discharge Elimination System (NPDES) permit. The Ponds have been inactive since 1993 (HGL, 2018).

The MRS addressed in this NFA PP was initially 12.74 acres, revised to be a 4.92-acre area encompassing the three ponds and the area immediately surrounding them in the south-central portion of the former RVAAP. The 4.92-acre MRS is shown in the RVAAP-016-R-01 boundary on **Figure 3**. Additional details describing the MRS history are provided in the following sections.

## 2.3 MRS Historical Investigations

The following investigations and reports have been completed under the MMRP for the Fuze and Booster Quarry MRS:

- *Final Historical Records Review (HRR)* (Engineering-Environmental Management, Inc. [e<sup>2</sup>M], 2007);

- *Final Site Inspection Report* (Final Site Inspection [SI] Report) (e<sup>2</sup>M, 2008);
- *Final Remedial Investigation Report* (Final RI Report) (CB&I, 2015); and
- *Final Feasibility Study* (HGL, 2018).

### 2.3.1 Historical Records Review

The 2007 Final HRR was completed to document historical and other known information on select MRSs identified at the former RVAAP, including the Fuze and Booster Quarry MRS. The HRR activities included interviews with installation personnel. Some of the interviewees stated that munitions produced or used at the former RVAAP might have been destroyed at the Fuze and Booster Quarry MRS.

In 2007 the *Final Military Munitions Response Program Historical Records Review* (Final HRR) was performed and consisted of a limited-scope records search to document historical and other known information. The HRR identified the Fuze and Booster Quarry as an MRS 12.74-acre in size consisting of an expanded area around the quarry ponds in comparison to the current MRS. The type, condition, and extent of DoD military munitions located at the Fuze and Booster Quarry MRS was unknown at the time the HRR was prepared because no surveys for munitions-related items had been conducted (e<sup>2</sup>M, 2007). The HRR recommended a MEC assessment be performed at all three Fuze and Booster Quarry ponds in an SI (CB&I, 2015).

### 2.3.2 Site Inspection Summary

In 2007, SI field activities conducted under the MMRP at the former RVAAP included the Fuze and Booster Quarry MRS. Recommendations were made in the Final SI Report to reduce the size of the MRS.

Investigation activities at the MRS consisted of an **instrument-assisted visual survey** along the

quarry banks and surrounding areas (**Figure 4**). All items encountered were evaluated to determine whether they posed an explosive hazard and were subsequently documented as safe. Munitions debris (MD) was found on the southeastern side of the southern pond. Multiple high-concentrations areas of **subsurface anomalies** were detected during the survey. These areas were suspected to represent possible buried munitions-related items. The HRR reported that facility personnel had previously observed DoD military munitions items in the northern and southern ponds when water levels were

low; however, the bottom of the ponds were not investigated during the SI.

The SI recommended that the MRS footprint be decreased from 12.74 acres to 4.92 acres and the MRS further investigated under the MMRP with respect to DoD military munitions. The reduced MRS footprint recommended in the SI includes the quarry ponds and the area immediately surrounding them. The revised MRS boundary is presented in **Figure 4** (e<sup>2</sup>M, 2008).

## 2.4 Remedial Investigation Results

An RI was conducted at the Fuze and Booster Quarry MRS to characterize the nature and extent of any military munitions potentially present within the MRS. The RI field activities included a digital geophysical mapping survey of 2.6 acres of the accessible terrestrial areas surrounding the ponds. The remaining 0.75 acres was determined to be inaccessible due to a combination of thick vegetation at the water line and safety hazards associated with steep slopes along the banks of the ponds. The RI field activity results (**Figure 5**) are discussed below:

Digital geophysical surveys identified 208 clusters of high anomaly density around the shoreline of the northern pond. A total of 1,175 individual anomalies were outside of the high anomaly density areas. Of the 1,175 anomalies identified, 167 were due to cultural features such as abandoned water control intake structures and subsurface utilities; 68 anomalies were in shallow water; 8 anomalies were within an area of very steep terrain; 8 anomalies were nails placed for quality control purposes; 6 anomalies were just outside the boundary of the MRS; and 2 anomalies were the result of interpolation artifacts. A total of 916 individual anomalies of interest were identified by the digital geophysical surveys. Two additional anomalies of interest were added based on recommendations made by the Ohio EPA, making the total number of individual anomalies to be 918. Of the 918 anomalies of interest identified, 227 were selected for intrusive investigation by hand digging. Intrusive investigation of the high anomaly density areas was conducted using mechanical excavation techniques at 13 trench locations.

Four wet sediment samples were collected using Incremental Sampling Methodology (ISM) in accordance with the 2011 Work Plan. Two samples

were collected from the southern-most pond, one sample each was collected from the north and central ponds. The sample depths were between the sediment surface and 0.5-feet below sediment surface. Samples were analyzed for metals, geochemical metals, explosives, nitrocellulose, semi-volatile organic compounds, polychlorinated biphenyl, total organic carbon, and pH. Based on the analytical results, 34 site-related chemicals were identified as potential MC at the Fuze and Booster Quarry MRS (CB&I, 2015).

A human health risk assessment and ecological risk assessment were conducted to determine if the identified site-related chemicals posed a risk to future receptors. Eight chemicals of concern (COCs) were identified for residential receptors, no COCs were identified for the National Guard Trainee receptor, and 22 chemicals of potential ecological concern were identified for ecological receptors. Since no MEC, munitions potentially presenting an explosive hazard, or low concentrations of explosives or propellants were identified in the wet sediment, no MC source was identified. Therefore, there is no evidence that the identified site-related chemicals originated from munitions or other munitions-related activities. The Human Health and Ecological Risk Assessments concluded that no risks due to

MC-related contamination exist at the Fuze and Booster Quarry MRS (CB&I, 2015).

No DoD military munitions confirmed to be MEC were found during the intrusive investigation; however, MD only was encountered. Only cultural debris items (e.g., trash cans, metal pipes, and sheet metal) were observed within the ponds. Therefore, additional sampling for MC-related contamination was not warranted.

Based on the results of the RI fieldwork, the project team concluded that the nature and extent of DoD military munitions and MC at the Fuze and Booster Quarry MRS (**Figure 5**) had been adequately characterized. No explosive safety hazards or potential sources of DoD military munitions confirmed as MEC were found and no source of MC exists within the MRS (CB&I, 2015).

Because no explosive hazards were found during the RI no MEC hazard assessment was required. The



MRS was assigned a Munitions Response Site Prioritization Protocol (MRSPP) priority of 5.

## 2.5 Remedial Action Objective

As established in the RI, there are no identifiable hazards from MEC in soil and the MC in soil poses no risk to human or ecological receptors. Therefore, no remedial action objectives were developed for the MRS.

## 3.0 EVALUATION OF THE NO FURTHER ACTION ALTERNATIVE

Based on further evaluation of the RI results, the Army concluded the Fuze and Booster Quarry MRS be recommended for NFA. The Army also determined that, because the RI recommended conducting a FS, the FS should be conducted to provide the necessary rationale to support and document the NFA determination. An FS was prepared by the Army to perform a detailed analysis of the NFA alternative for the MRS. The purpose of this detailed analysis was to support NFA at the MRS.

### 3.1 Detailed Analysis of NFA Alternative

The detailed analysis presented in the FS consisted of evaluating the NFA alternative using the nine criteria listed in the NCP. The NCP states that the first two criteria, protection of human health and the environment and compliance with applicable or relevant and appropriate requirements (ARARs), are “threshold criteria” that must be met by the selected remedial action unless a waiver is granted under Section 121(d)(4) of CERCLA. The next five criteria are “primary balancing criteria,” and the trade-offs within this group must be balanced. The final two criteria, state and community acceptance, are “modifying criteria” that are evaluated following the comment periods on the FS report and the PP.

#### *Threshold Criteria*

*Overall Protection of Human Health and the Environment* – The selected remedy presented in the **Record of Decision (ROD)** must meet this threshold criterion. The threshold criterion will be met if the risks associated with human exposures are eliminated, reduced, or controlled, and if the remedial action is protective of the environment. No explosive hazard or unacceptable risk due to MC-related contamination is present at the MRS. Therefore, the No Action alternative is protective of

human health and the environment and meets this criterion.

*Compliance with ARARs* – Compliance with ARARs is a threshold criterion that must be met by the remedial action. There are no chemical-specific, location-specific, or action-specific ARARs identified for this alternative. Therefore, the No Action alternative meets this criterion.

#### *Balancing Criteria*

*Long-Term Effectiveness and Permanence* – The level of risk associated with DoD military munitions and MC-related contamination after implementation of the remedial alternative is evaluated by this criterion. No explosive hazard or unacceptable risk due to MC-related contamination is present at this MRS. Therefore, the No Action alternative will be effective in the long term and no residual hazards or risks will remain at the MRS.

*Reduction of Toxicity, Mobility, or Volume Through Treatment* – The statutory preference for remedial technologies that significantly and permanently reduce the **toxicity, mobility, or volume** of the waste is addressed by this criterion. The No Action alternative includes no treatment because there is no explosive hazard or unacceptable risk associated with MC-related contamination is present at the MRS.

*Short-Term Effectiveness* – The effect of the remedial alternative from the beginning of construction and implementation to the completion of the remedial alternative is addressed under this criterion. Because no active remediation activities are conducted, no additional hazards are posed to current receptors or the future industrial receptor as a result of implementing the No Action alternative. The No Action alternative will not result in any adverse short-term effects on the environment.

*Implementability* – The technical and administrative feasibility of implementing the remedial action is addressed by this criterion. Technical feasibility refers to the ability to construct, reliably operate, and meet technology-specific regulations for process options until a remedial action is complete. Administrative feasibility refers to the ability to obtain approvals from other offices and agencies; the availability of treatment, storage, and disposal services; and the requirements for, and availability

of, specific equipment and technical specialists. The No Action alternative does not involve active remediation. Therefore, technical feasibility is not a consideration. No services or equipment are necessary to implement No Action. This alternative will not interfere with any planned remedial action in the future. The No Action alternative is administratively feasible to OHARNG/Camp Ravenna because no explosive hazard or unacceptable risk due to MC-related contamination is present on the MRS. The No Action alternative is expected to receive Ohio EPA concurrence because no explosive hazard or unacceptable risk due to MC-related contamination is present at the MRS.

*Cost* – Capital and long-term management costs are estimated under this criterion. The No Action alternative has no capital or long-term management costs associated with it.

#### ***Modifying Criteria***

*State Acceptance* – This criterion will be evaluated during incorporation of regulatory review comments into this PP and future ROD.

*Community Acceptance* – This criterion will be evaluated when the PP is presented to the public for review and comment.

### **3.2 Overall Evaluation**

The NFA alternative is technically and administratively implementable and there are no costs. The No Action alternative is protective of human health and the environment because no explosive hazard or unacceptable risk due to MC-related contamination is present at the MRS.

The MRSPP tables were updated during the FS in accordance with the MRSPP Primer. The revised FS MRSPP priority is “No Longer Required” (HGL, 2018).

### **4.0 SCOPE AND ROLE OF RESPONSE ACTION**

The results of the RI fieldwork and evaluation in the Final FS for the Fuze and Booster Quarry MRS support the selection of NFA as the preferred remedy for the MRS. The remedy must be protective of the receptors associated with future land use. The future land use of the MRS is military training, maintenance, natural resource management, hunting and fishing activities, and restoration activities (e.g.,

groundwater monitoring). The **human receptors** with the greatest opportunity for exposure to an explosive hazard is the Industrial Receptor. The NFA determination is protective of other potential future human receptors (such as residential receptors). Though there are no current plans for the MRS to change from an industrial land use to a residential land use, there are no unacceptable risks to a potential future residential receptor from explosive hazards. **Environmental receptors** for the future land use include terrestrial invertebrates (earthworms), voles, shrews, robins, foxes, owls, hawks, muskrat, mink, mallards, great blue heron, benthic invertebrates, and aquatic biota (HGL, 2018).

DoD military munitions confirmed as MEC or concentrated areas of MD are not present, and no potential source of MC exists at the MRS. Therefore, no source material or impacted environmental media has resulted from historical U.S. munitions-related activities is present at the MRS.

Several site-related chemicals were identified and determined to be COCs during the RI. The COCs do not originate from munitions or munitions-related activities and are not considered MC. No risks due to MC-related contamination was identified in the RI. COCs identified during previous investigations at the MRS under the Installation Restoration Program (IRP) will continue to be addressed under the IRP. Although not anticipated, if any explosive hazards are identified at the MRS, they would be addressed under the MMRP as a separate response action. No other investigations are ongoing at the MRS under the MMRP.

### **5.0 SUMMARY OF HUMAN AND ECOLOGICAL RISKS**

Under the MMRP, a recommendation of NFA must be protective of the human and environmental receptors at the MRS. The Industrial Receptor was identified as the most likely human receptor for future land use at the Fuze and Booster Quarry MRS. The likely environmental receptors include terrestrial invertebrates (earthworms), voles, shrews, robins, foxes, owls, hawks, muskrat, mink, mallards, great blue heron, benthic invertebrates, and aquatic biota (CB&I, 2015).

No DoD military munitions confirmed to be MEC are present at the Fuze and Booster Quarry MRS.

Therefore, no explosive safety hazard or risks associated with MC exist for the likely receptors at the Fuze and Booster Quarry MRS (HGL, 2018).

## 6.0 PREFERRED ALTERNATIVE

The results of the RI fieldwork and the evaluation conducted in the FS for the Fuze and Booster Quarry MRS support the determination that no hazards associated with exposure to DoD military munitions and no potential for MC risks to human or environmental receptors exist at the Fuze and Booster Quarry MRS. The Army, in consultation with the Ohio EPA, is recommending NFA as the preferred remedy under the MMRP for the Fuze and Booster Quarry MRS.

As no risks have been identified at the MRS, the overall recommendation of NFA under the MMRP is protective of receptors that may be present at the MRS. This recommendation is not a final decision. The Army, in consultation with the Ohio EPA, will select NFA for the MRS after reviewing and considering all comments submitted during the 30-day public comment period.

### 6.1 Summary Statement

Based on the information currently available, the ARNG believes that NFA meets the threshold criteria and provides the best overall protection of the public. The ARNG expects NFA to satisfy the following statutory requirements of CERCLA Section 121(b): (1) be protective of human health and the environment; (2) comply with ARARs (or justify a waiver); (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 principle element, or explain why the preference for treatment will not be met.

## 7.0 COMMUNITY PARTICIPATION

Public participation is an important component of the remedy selection process. The Army, in coordination with the Ohio EPA, is soliciting input from the community on the preferred remedy. The comment period extends from October 25 to December 1, 2018. This period includes a public meeting at which the Army will present this NFA PP. The Army will accept oral and written comments at this meeting.

### 7.1 Public Comment Period

The 30-day comment period extends from October 25 to December 1, 2018 and provides an opportunity for public involvement in the decision-making process for the proposed action. The public is encouraged to review and comment on this NFA PP. The Army and Ohio EPA will consider all public comments before selecting a remedy. During the comment period, the public is also encouraged to review documents pertinent to the Fuze and Booster Quarry MRS. This information is available at the Information Repositories and online at [www.rvaap.org](http://www.rvaap.org). To obtain further information, contact the Camp Ravenna Environmental Office.

### 7.2 Public Meeting

The Army will hold an open house/public meeting on this NFA PP on November 1, 2018, at Shearer Community Center (Paris Township Hall) at 9355 Newton Falls Road, Ravenna, Ohio 44266. This meeting will provide an opportunity for the public to comment on the preferred remedy. Comments made at the meeting will be transcribed.

### 7.3 Written Comments

If the public would like to provide comments, questions, or suggestions on this NFA PP or other relevant issues in writing, they should be delivered to the Army at the public meeting or mailed (postmarked no later than December 1, 2018). The public can also submit comments, questions, or suggestions via email before the end of the comment period to the Camp Ravenna Environmental Office using the following email address: [kathryn.s.tait.nfg@mail.mil](mailto:kathryn.s.tait.nfg@mail.mil).

#### POINT OF CONTACT FOR WRITTEN COMMENTS

**Ms. Kathryn Tait**  
**Camp Ravenna Environmental Office**  
1438 State Route 534 SW  
Newton Falls, Ohio 44444

### 7.4 U.S. Army Review of Public Comments

The Army will review all public comments before selecting the most appropriate action for the MRS. A **Responsiveness Summary**, a document that summarizes the Army's responses to comments received during the public comment period, will be

included in the ROD. The Army's final choice of action will be documented in the ROD. The ROD will be added to the RVAAP Administrative Record and Information Repositories.

## GLOSSARY OF TERMS

**Administrative Control:** Direction or exercise of authority over subordinate or other organizations in respect to administration and support, including organization of Service forces, control of resources and equipment, personnel management, unit logistics, individual and unit training, readiness, mobilization, demobilization, discipline, and other matters not included in the operational missions of the subordinate or other organizations.

**Administrative Record:** A collection of documents, typically reports and correspondence, generated during site investigation and remedial activities. Information in the Administrative Record is used to select the preferred remedy. It is available for public review at the Camp Ravenna Environmental Office; call (330) 872-8003 for an appointment.

**Applicable or Relevant and Appropriate Requirements (ARARs):** The federal and state requirements that a selected alternative will attain. These requirements may vary among sites and alternatives.

**Booster:** A sensitive explosive charge that acts as a bridge between a (relatively weak) conventional detonator and a low-sensitivity (but typically high-energy) explosive such as TNT. By itself, the initiating detonator would not deliver sufficient energy to set off the low-sensitivity charge. However, it detonates the primary charge (the booster), which then delivers an explosive shockwave sufficient to detonate the secondary, main, high-energy charge.

**Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA):** This federal law was passed in 1980 and is commonly referred to as the Superfund Program. It provides for liability, compensation, cleanup, and emergency response in connection with the cleanup of inactive hazardous waste release sites that endanger public health or the environment.

**Demilitarization:** The reduction of one or more types of weapons or weapons systems.

**Depot Storage:** A designated location for the storage of military supplies.

**Digital Geophysical Mapping:** The process by which geological features are observed, analyzed, and recorded in the field and displayed in real-time on a computer or personal digital assistant.

**Discarded Military Munitions (DMM):** Military munitions that have been abandoned without proper disposal or removed from storage in a military magazine or other storage area for the purpose of disposal. The term does not include **unexploded ordnance (UXO)**, military munitions that are being held for future use or planned disposal, or military munitions that have been properly disposed of in a manner consistent with applicable environmental laws and regulations.

**Department of Defense (DoD) Military Munitions:** A munition or explosive deposited by DoD activities that may pose an explosive safety risk because it either did not function as designed, was discharged and/or abandoned, or is an explosive constituent. The term includes UXO, DMM, and munitions constituents (MC).

**Earthen Settling Pond:** An earthen structure that uses sedimentation to remove settleable matter and turbidity from wastewater.

**Environmental Receptor:** Any living organisms other than humans, the habitat that supports such organisms, or natural resources that could be adversely affected by environmental contaminations resulting from a release at or migration from a site.

**Explosive Hazard:** Any hazard containing an explosive component. Explosive hazards include unexploded explosive ordnance (including landmines), booby traps, improvised explosive devices, and bulk explosives.

**Feasibility Study:** A study undertaken by the lead agency to develop and evaluate options for remedial action. The RI data are used to define the objectives of the response action, to develop remedial action alternatives, and to undertake an initial screening and detailed analysis of the alternatives. The term also refers to a report that describes the results of the study.

**Fuze:** A device that detonates a munition's explosive material under specified conditions. In addition, a fuze has safety and arming mechanisms that protect users from premature or accidental detonation.

**Human Receptor:** Any human individual or population that is presently or will potentially be exposed to, and adversely affected by, the release or migration of contaminants.

## GLOSSARY OF TERMS

**Information Repository:** A collection of documents relating to a facility with investigations and response actions under CERCLA and/or a site's permitting activity or corrective action. It includes documents and information about site activities as well as general information about environmental regulations and CERCLA. The purpose of an Information Repository is to (1) ensure open and convenient public access to site-related documents and (2) better inform the public of the restoration process.

**Installation Restoration Program (IRP):** A comprehensive program to identify, investigate, and clean up contamination at active/operating Army installations. Eligible sites include those contaminated by past defense activities that require response under CERCLA, as amended by the Superfund Amendments and Reauthorization Act, and certain corrective actions required by the Resource Conservation and Recovery Act. The objective of the IRP is to clean up contaminated environmental impacts from past Army activities with the following goals: (1) reduce risk to acceptable levels to protect the health and safety of installation personnel and the public and (2) restore the quality of the environment. The IRP also complies with state, regional, and local requirements applicable to the cleanup of hazardous materials contamination, as well as related site safety. Community involvement activities are an integral part of the Army's IRP. Installation commanders seek community involvement early and throughout the cleanup process.

**Instrument-Assisted Visual Survey:** An investigation process whereby a line of unexploded ordnance technicians walks across the property in a systematic manner to identify items on the ground surface by sight or metallic items on or just below the ground surface using a magnetometer or other instrument. This approach is necessary in areas where there is vegetation that cannot be removed.

**Large-Caliber Shell:** A projectile or shell is a missile fired from the muzzle of a gun; it is always the projectile, whether issuing from the muzzle of a breech-loading rifle, using separate ammunition, or from the muzzle of a rapid-fire gun, using fixed, cartridge-case ammunition. Projectiles for guns of and above 7 inches in caliber are considered large-caliber.

**Military Munitions Response Program (MMRP):**

A U.S. Department of Defense program consisting of actions necessary to ensure protection of human health, welfare, and the environment from the hazards associated with DoD military munitions and MC-related contamination at locations impacted by historical military activities.

**Munitions Constituents (MC):** Any material originating from unexploded ordnance, discarded military munitions, or other military munitions, including explosive and nonexplosive materials, and emission, degradation, or breakdown elements of such ordnance or munitions.

**Munitions Debris (MD):** Remnants of military munitions (e.g., fragments, penetrators, projectiles, shell casings, links, fins) remaining after munitions use, demilitarization, or disposal.

**Munitions and Explosives of Concern (MEC):** A munition or explosive that may pose an explosive safety risk because it either did not function as designed, was discharged and/or abandoned, or is an explosive constituent. MEC includes unexploded ordnance, discarded military munitions, and explosive constituents of munitions present in high enough concentrations to pose an explosive hazard.

**Munitions Response Site (MRS):** Any area on a defense site that is known or suspected to contain MEC or MC.

**National Oil and Hazardous Substances Pollution Contingency Plan:** The National Oil and Hazardous Substances Pollution Contingency Plan is a collection of CERCLA regulations that provide the U.S. Government the authority to respond to the problems of abandoned or uncontrolled hazardous waste disposal sites as well as to certain incidents involving hazardous wastes (e.g., spills).

**Primer:** A primer, also known as a blasting cap, is a small, sensitive, primary explosive device generally used to detonate a larger, more powerful and less-sensitive secondary explosive such as TNT, dynamite, or plastic explosive. Primers come in a variety of types, including nonelectric caps, electric caps, and fuse caps.

**Production:** The action of making or manufacturing from components or raw materials, or the process of being so manufactured.

## GLOSSARY OF TERMS

**Proposed Plan (PP):** This CERCLA document provides the public with information necessary to participate in the selection of a remedy. It is designed to solicit public comment on a preferred remedy before a ROD is established.

**Receptor:** See human or ecological receptor.

**Record of Decision (ROD):** A legal record signed by the Army following coordination and concurrence with the Ohio EPA as per a June 10, 2004, agreement between the two parties. It describes the cleanup action or remedy selected for a site, the basis for selecting that remedy, public comments, responses to comments, and the estimated cost of the remedy.

**Remedial Action:** The actual construction or implementation phase of a CERCLA site cleanup that follows Remedial Design.

**Remedial Decision:** A formal, written communication from the regulating authority, that approves a site investigation, identifies the preferred remedy, and approves the remedial action, if any, at a site.

**Remedial Investigation (RI):** A CERCLA investigation that involves sampling environmental media, such as air, soil, and water, to determine the nature and extent of contamination and to calculate human health and environmental risks that result from the contamination.

**Remedy Selection Process:** A part of the CERCLA process, typically from the PP through the ROD, that involves public participation in identifying the preferred remedy. The final selection of the preferred remedy is made in the ROD after taking into consideration the recommendations in the PP and any comments received from the public during the 30-day comment period.

**Renovation:** The process of improving a broken, damaged, or outdated structure or piece of equipment.

**Responsiveness Summary:** A section of the ROD where the Army documents and responds to written and oral comments received from the public about the PP.

**Subsurface Anomaly:** An item seen as a subsurface irregularity (i.e., deviates from expected subsurface items such as pipes, utility lines, etc.) after geophysical investigation.

**Toxicity, Mobility, or Volume:** Term that refers to the degree which potential explosive hazards or munitions constituents can cause damage, move within environmental media without human interference (freeze-thaw cycling), or the volume of the explosively hazardous items or munitions constituents that remain on an MRS.

**Unexploded Ordnance (UXO):** Military munitions that: (a) Have been primed, fuzed, armed, or otherwise prepared for actions; (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 whether by malfunction, design, or any other cause.

**Weapons Demilitarization Facility:** A facility or installation involved in the reduction of a nation's army, weapons, weapons systems, or military vehicles to an agreed upon minimum.

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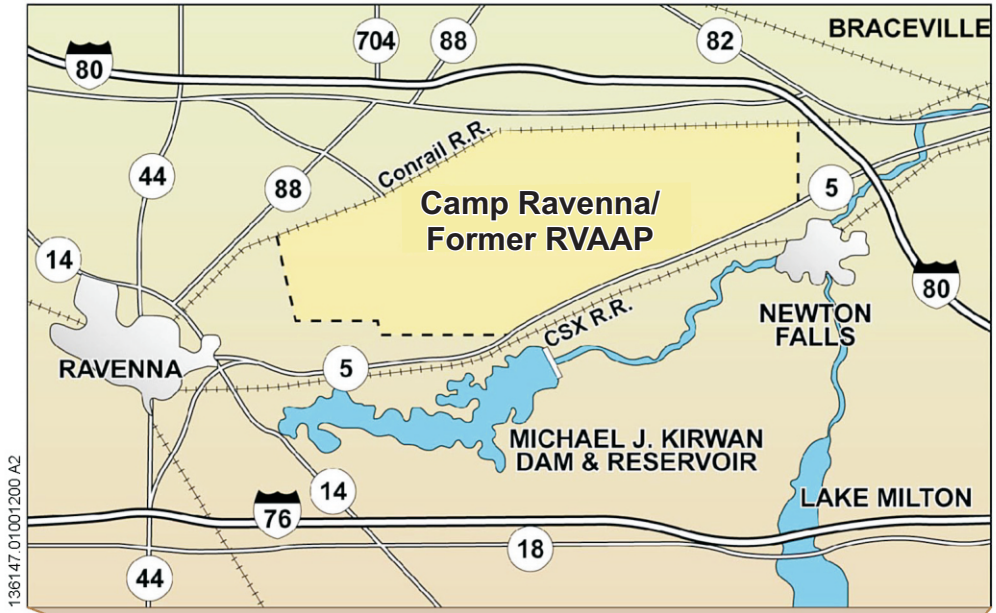
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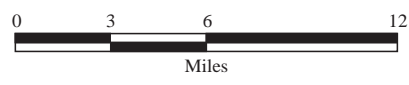
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## **FIGURES**

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 (01)Location\_Map.cdr  
 2/5/2018 JAR  
 Source: CB&I

Legend

 Camp Ravenna/Former RVAAP

Note:  
 RVAAP=Ravenna Army Ammunition Plant

**Figure 1**  
**Location Map**  
**Camp Ravenna/**  
**Former RVAAP**  
**Portage and Trumbull**  
**Counties, Ohio**



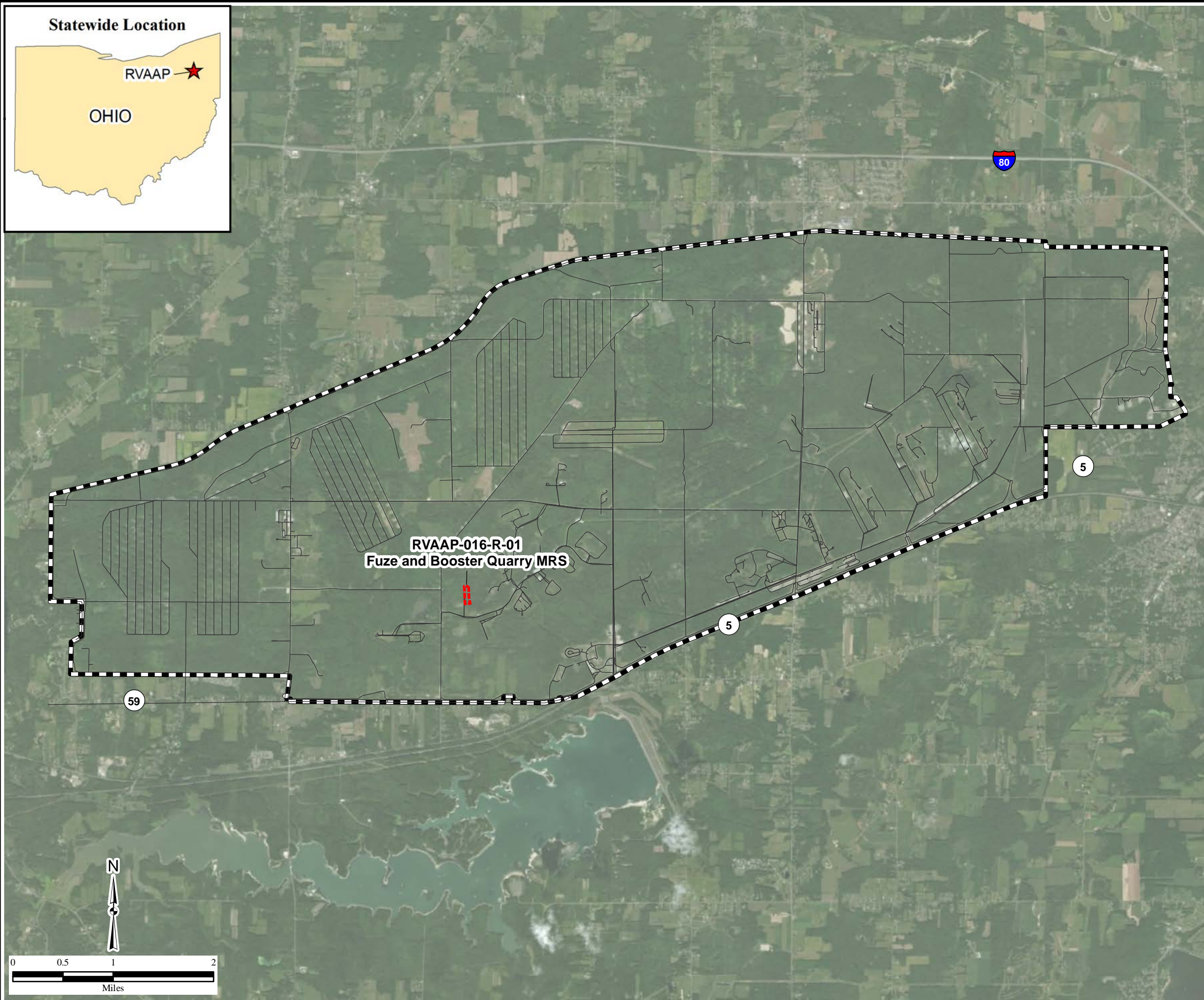
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**Figure 2**  
**MRS Location**  
**Fuze and Booster Quarry**  
**Camp Ravenna/Former RVAAP**  
**Portage and Trumbull Counties, Ohio**

Legend

- Road
- ▭ MRS
- ▭ Installation Boundary

Notes:  
MRS=munitions response site  
RVAAP=Ravenna Army Ammunition Plant



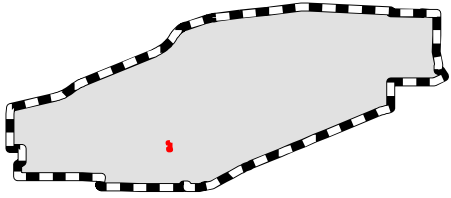
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2/5/2018 JAR  
Source: HGL, CB&I, USACE, eM  
ArcGIS Online Imagery



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Reference Location Map  
Former RVAAP



**Figure 3**  
**Fuze and Booster Quarry**  
**MRS Boundary**  
**and Site Features**  
**Camp Ravenna/Former RVAAP**  
**Portage and Trumbull**  
**Counties, Ohio**

Legend

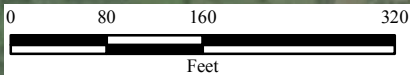
-  Former Water Control Intake
-  Surface Water
-  MRS
-  2007 HRR MRS Boundary
-  Installation Boundary

Notes:  
MRS=munitions response site  
RVAAP=Ravenna Army Ammunition Plant

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Source: HGL, CB&I, USACE, e2M  
ArcGIS Online Imagery

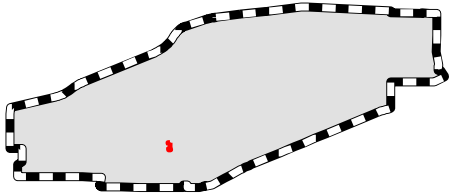


HGL—No Further Action Proposed Plan—Former RVAAP, Ohio



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Reference Location Map  
Former RVAAP



**Figure 4**  
**2007 Site Inspection Results**  
**Camp Ravenna/Former RVAAP**  
**Portage and Trumbull**  
**Counties, Ohio**

Legend

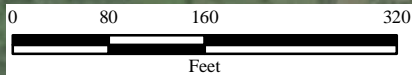
- Munitions Debris
- - - Meandering Path Survey Transect
- Subsurface Anomalies
- Surface Water
- MRS
- Installation Boundary

Notes:  
MRS=munitions response site  
RVAAP=Ravenna Army Ammunition Plant

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Source: HGL, CB&I, USACE, e2M  
ArcGIS Online Imagery

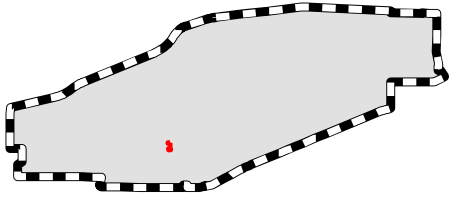


HGL—No Further Action Proposed Plan—Former RVAAP, Ohio



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Reference Location Map  
Former RVAAP



**Figure 5**  
**2015 Remedial**  
**Investigation Results**  
**Camp Ravenna/Former RVAAP**  
**Portage and Trumbull**  
**Counties, Ohio**

Legend

Single Anomaly Results:

-  MDAS
-  Exploratory Trench
-  Area of Pond Not Accessible for Diving Operations
-  Surface Water
-  High Anomaly Density Area
-  MRS
-  Installation Boundary

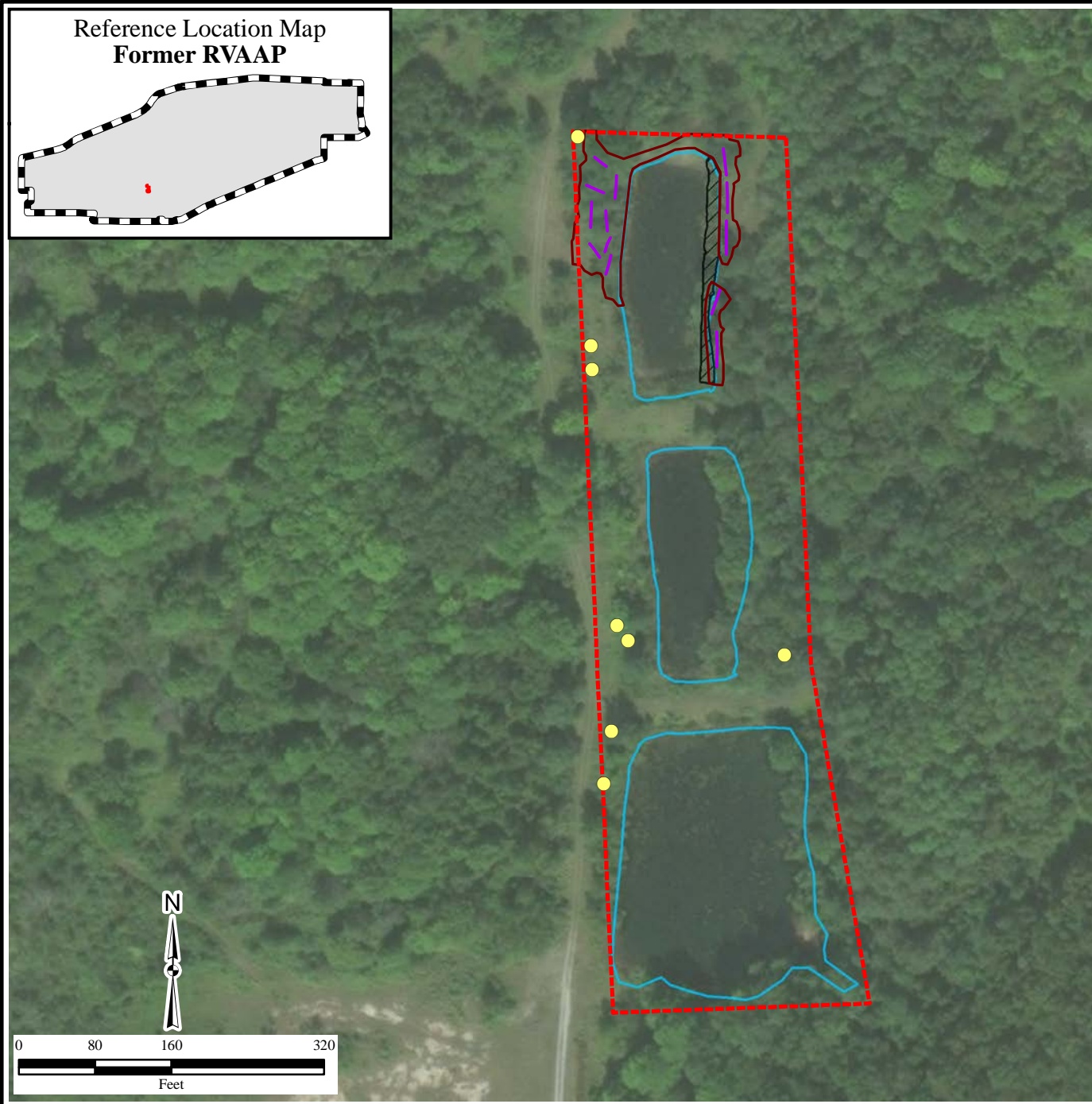
Notes:

MDAS=material documented as safe  
MRS=munitions response site  
RVAAP=Ravenna Army Ammunition Plant

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(05)FBQ\_Intrusive\_Results.mxd  
2/5/2018 JAR  
Source: HGL, CB&I, USACE, e2M  
ArcGIS Online Imagery



HGL—No Further Action Proposed Plan—Former RVAAP, Ohio



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