

**Final
No Further Action Record of Decision for
RVAAP-032-R-01 40mm Firing Range Munitions Response Site
Version 1.0**

**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
Baltimore District
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Baltimore, Maryland 21201**

**Prepared by:
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May 10, 2019

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REPORT DOCUMENTATION PAGE

*Form Approved
OMB No. 0704-0188*

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14. ABSTRACT The U.S. Department of the Army (U.S. Army) is presenting this No Further Action (NFA) Record of Decision to document the No Further Action determination for the former Ravenna Army Ammunition Plant, RVAAP-032-R-01, 40mm Firing Range Munitions Response Site (MRS), in Portage and Trumbull Counties, Ohio. This NFA Record of Decision presents the U.S. Army's No Further Action determination, Ohio EPA concurrence with the NFA decision, and the response from the public during the 30-day public comment period for the MRS. Investigations have found no munitions and 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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16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT SAR	18. NUMBER OF PAGES 48	19a. NAME OF RESPONSIBLE PERSON Kimberly Vaughn
a. REPORT	b. ABSTRACT	c. THIS PAGE			19b. TELEPHONE NUMBER (Include area code) 512-658-6828
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Mike DeWine, Governor
Jon Husted, Lt. Governor
Laurie A. Stevenson, Director

June 7, 2019

RE: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859071

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

Subject: Final Record of Decision (ROD) for RVAAP-032-R-01 40mm Firing Range Munitions Response Site

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 [NFA] Record of Decision for RVAAP-032-R-01 40mm Firing Range Munitions Response Site Version 1.0," dated May 10, 2019. It was prepared by HydroGeoLogic, Inc.

Ohio EPA has no additional comments on the "Final No Further Action Record of Decision for RVAAP-032-R-01 40mm Firing Range Munitions Response Site Version 1.0." Based on the information contained in the final ROD document, other investigation documents and reports, and Ohio EPA's oversight participation during the investigation, Ohio EPA concurs with the final ROD document for RVAAP-032-R-01 40mm Firing Range Munitions Response Site recommending NFA.

If you have any questions concerning this letter, please contact Nicholas Roope at (330) 963-1235.

Sincerely,

Melisa Witherspoon, Chief
Division of Environmental Response and Revitalization

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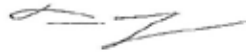
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CONTRACTOR'S STATEMENT OF INDEPENDENT TECHNICAL REVIEW

HydroGeoLogic, Inc. has completed the *Draft No Further Action Record of Decision for RVAAP-032-R-01 40mm Firing Range Munitions Response Site*, Version 1.0, at the former 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.

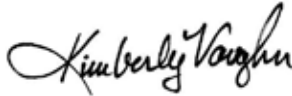
Reviewed/Approved by:



Timothy Leahy, PG, PMP
Project Manager
APTIM Federal Services

Date: May 10, 2019

Reviewed/Approved by:



Kimberly Vaughn
Project Manager

Date: May 10, 2019

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DOCUMENT DISTRIBUTION

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Tom Schneider, Ohio Environmental Protection Agency, Federal Facilities	0	Email/Transmittal Letter
Gail Harris, RVAAP Administrative Record Manager	2	2

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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TABLE OF CONTENTS

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CONTRACTOR'S STATEMENT OF INDEPENDENT TECHNICAL REVIEW

DOCUMENT DISTRIBUTION

TABLE OF CONTENTS	i
ACRONYMS AND ABBREVIATIONS	iii
PART I: DECLARATION.....	1
A. SITE NAME AND LOCATION	1
B. STATEMENT OF BASIS AND PURPOSE	1
C. DESCRIPTION OF THE SELECTED REMEDY	1
D. STATUTORY DETERMINATION	2
E. AUTHORIZING SIGNATURE	2
PART II: DECISION SUMMARY	3
A. SITE NAME, LOCATION, AND DESCRIPTION	3
B. SITE HISTORY AND ENFORCEMENT ACTIVITIES.....	3
C. COMMUNITY PARTICIPATION	4
D. SCOPE AND ROLE OF OPERABLE UNIT OR RESPONSE ACTION	5
E. SITE CHARACTERISTICS.....	5
E.1 Physical Characteristics.....	5
E.2 Site Investigations	7
E.3 Nature and Extent of Contamination.....	9
E.4 Conceptual Site Model.....	9
F. CURRENT AND POTENTIAL FUTURE SITE AND RESOURCE USES	10
G. SUMMARY OF SITE RISKS.....	10
G.1 MEC Hazard Assessment	10
G.2 Human Health and Ecological Risk Assessment	10
H. DOCUMENTATION OF NO SIGNIFICANT CHANGE.....	10
PART III: RESPONSIVENESS SUMMARY FOR PUBLIC COMMENTS ON THE PROPOSED PLAN FOR RVAAP-032-R-01 40MM FIRING RANGE MRS.....	11
A. Overview	11
B. Summary of Stakeholder Issues and Lead Agency Responses.....	11
B.1 Oral Comments from Public Meeting	11
B.2 Written Comments from Public Meetings	11
B.3 Telephone Comments from Public	11
C. Technical and Legal Issues	11
REFERENCES.....	13

LIST OF FIGURES

Figure 1	Location Map	17
Figure 2	MRS Location Map.....	19
Figure 3	MRS Map	21
Figure 4	2007 Site Inspection Results	23
Figure 5	2011 Remedial Investigation Results	25

LIST OF APPENDICES

Appendix A	Notice of Availability of the Proposed Plan
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ACRONYMS AND ABBREVIATIONS

amsl	above mean sea level
Army	U.S. Department of the Army
ARNG	Army National Guard
Camp Ravenna	Camp Ravenna Joint Military Training Center
CB&I	CB&I Federal Services, LLC
CERCLA	<i>Comprehensive Environmental Response, Compensation, and Liability Act</i>
CJAG	Camp James A. Garfield Joint Military Training Center
CSM	Conceptual Site Model
DFFO	<i>Director's Final Findings and Orders</i>
DMM	Discarded Military Munition
DoD	Department of Defense
e ² M	engineering-environmental Management, Inc.
ERA	ecological risk assessment
FS	Feasibility Study
HA	hazard assessment
HE	high explosives
HGL	HydroGeoLogic, Inc.
HHRA	human health risk assessment
HRR	<i>Historical Records Review</i>
ISM	Incremental Sampling Methodology
MC	munitions constituents
MD	munitions debris
MEC	munitions and explosives of concern
mm	millimeter
MMRP	Military Munitions Response Program
MRS	munitions response site
MRSPP	Munitions Response Site Prioritization Protocol
NFA	No Further Action
NFA Proposed Plan	Final <i>No Further Action Proposed Plan for RVAAP 032-R-01 40mm Firing Range MRS</i>
OHARNG	Ohio Army National Guard
Ohio EPA	Environmental Protection Agency
RDX	Research Department Explosives
RI	Remedial Investigation
ROD	Record of Decision
RVAAP	Ravenna Army Ammunition Plan
SI	Site Inspection
SI Report	<i>Final Site Investigation Report</i>

ACRONYMS AND ABBREVIATIONS (continued)

TNT	2,4,6-Trinitrotoluene
USACE	U.S. Army Corps of Engineers
USP&FO	U.S. Property and Fiscal Officer
UXO	unexploded ordnance

PART I: DECLARATION

A. SITE NAME AND LOCATION

The Army National Guard (ARNG) developed this No Further Action (NFA) Record of Decision (ROD) for the RVAAP-032-R-01 40 millimeter(mm) Firing Range Munitions Response Site (MRS) located at the former Ravenna Army Ammunition Plant (RVAAP) in Ravenna, Ohio (**Figure 1**). The former RVAAP is now known as Camp James A. Garfield Joint Military Training Center (CJAG). The 40mm Firing Range MRS is located in the northeastern portion of CJAG (**Figure 2**). CJAG was previously known as Camp Ravenna Joint Military Training Center (Camp Ravenna) and that name will be used in some historical reports.

CJAG is 21,683 acres and is federally owned. The facility is located in Portage and Trumbull Counties, Ohio, approximately 3 miles east-northeast of the City of Ravenna (**Figure 1**). Administrative accountability for CJAG was transferred to the U.S. Property and Fiscal Officer (USP&FO) for Ohio (the property owner) in multiple transfers the last being in September 2013. The facility is licensed to the Ohio Army National Guard (OHARNG) for use as a military training facility (Federal Facility ID No. OH213820736).

To maintain a distinction between historical operations and current activities, the term “RVAAP” will be used for historical discussions and “CJAG” will be used when referring to the current facility activities.

B. STATEMENT OF BASIS AND PURPOSE

The ARNG is the lead federal agency for environmental response actions at CJAG. The ARNG in consultation with the Ohio Environmental Protection Agency (Ohio EPA), determined that NFA is the selected remedy for the 40mm Firing Range MRS at the CJAG. The NFA determination meets the requirements of the *Comprehensive Environmental Response, Compensation, and Liability Act* (CERCLA) of 1980, as amended by the *Superfund Amendments and Reauthorization Act* of 1986 and the *National Oil and Hazardous Substances Pollution Contingency Plan*. The Army’s decision is based on information contained in the Administrative Record file for the 40mm Firing Range MRS.

The Ohio EPA, the supporting state regulatory agency, reviewed and concurred with the *Final No Further Action Proposed Plan for RVAAP-032-R-01 40mm Firing Range Munitions Response Site* (NFA Proposed Plan; HydroGeoLogic, Inc. [HGL], 2018b). The NFA Proposed Plan presented the Army’s preferred remedy for addressing the 40mm Firing Range MRS and invited public involvement during the comment period (October 25, 2018 through December 1, 2018) and public meeting (November 1, 2018). No U.S. Department of Defense (DoD) military munitions (i.e., unexploded ordnance [UXO], discarded military munitions, or munitions constituents [MC]-related contamination) originating from historical activities associated with the 40mm Firing Range MRS have been found at the MRS throughout the CERCLA process. The NFA determination under CERCLA at the 40mm Firing Range MRS satisfies the requirements of the *Director’s Final Findings and Orders* (DFFO) (Ohio EPA, 2004), specifically by documenting the Ohio EPA’s concurrence with the closeout of the Military Munitions Response Program (MMRP) investigation conducted for this MRS under Section XII, paragraph 26.

C. DESCRIPTION OF THE SELECTED REMEDY

No DoD military munitions confirmed to be munitions and explosives of concern (MEC) were encountered at the MRS during the Remedial Investigation (RI) field work, and only munitions debris (MD) were found. The results of the RI did not indicate the presence of MC-related contamination at the MRS. Therefore, NFA is the selected remedy for the 40mm Firing Range MRS under the MMRP pursuant to CERCLA requirements.

D. STATUTORY DETERMINATION

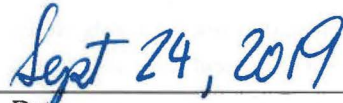
The results of the RI fieldwork for the 40mm Firing Range MRS support the determination that no risks associated with exposure to DoD military munitions and MC-related contamination exist at the MRS. Because no risks have been identified at the MRS, the ARNG has determined that NFA is necessary for DoD military munitions and MC-related contamination at the 40mm Firing Range MRS. NFA is protective of human health and the environment and meets the statutory requirements for cleanup standards established in Section 121 of CERCLA. Because there are no risks to human health or the environment associated with DoD military munitions and MC-related contamination at the MRS, five-year reviews are not required. No other remedial action is necessary to ensure protection of human health and the environment.

E. AUTHORIZING SIGNATURE

Approve:



William M. Myer
COL, GS
I&E, Army National Guard



Date

PART II: DECISION SUMMARY

A. SITE NAME, LOCATION, AND DESCRIPTION

The RVAAP, now known as the Camp James A. Garfield Joint Military Training Center (CJAG) is located in northeastern Ohio within Portage and Trumbull Counties and is approximately 3 miles east-northeast of the city of Ravenna. The facility is federally owned and is approximately 11 miles long and 3.5 miles wide. The facility is bounded by State Route 5, the Michael J. Kirwan Reservoir, and the CSX System Railroad to the south; Garret, McCormick, and Berry Roads to the west; the Norfolk Southern Railroad to the north; and State Route 534 to the east (**Figure 1**). CJAG is surrounded by the communities of Windham, Garrettsville, Newton Falls, Charlestown, and Wayland.

Administrative accountability of the 21,683-acre facility has been transferred to the USP&FO, which subsequently licensed CJAG to the OHARNG for use as a training site. The restoration program for the facility involves the remediation of areas affected by military activities when the RVAAP was in operation.

The 40mm Firing Range MRS is an 8.55-acre parcel located in the southern-central portion of CJAG within Portage County (**Figure 2**). The MRS is northeast of the intersection of Fuze and Booster Spur Road and Fuze and Booster Road (CB&I Federal Services LLC [CB&I], 2015). **Figure 3** presents the current boundaries of the MRS.

The 40mm Firing Range MRS was investigated under the MMRP, which was established under the Defense Environmental Restoration Program to address DoD military munitions located on current and former defense sites. Sites that are eligible under the MMRP are non-operational ranges where military munitions are known or suspected to be present. The 40mm Firing Range MRS was determined to be eligible under the MMRP.

B. SITE HISTORY AND ENFORCEMENT ACTIVITIES

The RVAAP was constructed in 1940 and 1941 for the assembly/loading and depot storage of ammunition. While serving as an ammunition plant, the 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 [RDX]) 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.

In addition to production and demilitarization activities at the load lines, other activities conducted at the RVAAP included the burning, demolition, and testing of munitions. The locations used as burning and demolition grounds consisted of large, open areas and abandoned quarries. Other areas of concern

associated with the RVAAP include a landfill, an aircraft fuel tank testing area, and various industrial support and maintenance facilities (CB&I, 2015).

The 40mm Firing Range MRS is the location of a former 40mm firing range that operated between 1969 and 1971. The area of the MRS consists of the 8.55 acres former firing range itself and the overshoot area the furthest location a 40mm grenade could have travelled from the firing point. The former firing range was used to perform acceptance tests that included muzzle velocity measurements and impact function tests. Munitions reportedly fired at the former firing range included the M407A1-series 40mm practice grenade and the M406-series high explosive (HE) 40mm grenade. The M406- and M407A1-series grenades were designed to be fired from 40mm grenade launchers attached to rifles. The 40mm practice grenades contained yellow marker dye, M9-series propellant, and RDX booster pellets (Army, 1977). The M9-series propellant consisted of nitrocellulose, nitroglycerin, potassium nitrate, ethyl centralite, and graphite. The M406-series HE 40mm grenades contained Composition B explosive, which is a mixture of RDX and TNT (engineering-environmental Management, Inc. [e²M], 2007). According to the *Final Installation Assessment of RVAAP Report No. 132* (U.S. Army Toxic and Hazardous Materials Agency, 1978), each of the approximately 2,500 rounds fired on this range was accounted for.

The furthest possible target distance for the 40mm grenades reported to have been fired at the former test range is 350 meters from the firing point (Army, 2003). The target impact area was well-defined with a berm that has since been removed. The firing point was situated at the eastern portion of the former test range. Remnants of the firing point location still remain and include a small wooden structure believed to be the former storage shed, gun mount foundation, and chronograph foundation (CB&I, 2015).

The MRS is mostly forested with thick vegetation and ground cover. An approximate 1.5-acre open area with tall grasses remains at the eastern portion of the MRS, near the location of the former firing point. A steep slope exists to the west of the former impact area and slopes downward toward the Fuze and Booster Quarry ponds. There are no wetlands, waterways, or sensitive area at the MRS (CB&I, 2015). The MRS is shown in **Figure 3**.

There have been no CERCLA enforcement actions related to the 40mm Firing Range MRS.

C. COMMUNITY PARTICIPATION

Using the RVAAP community relations program, ARNG and the Ohio EPA have interacted with the public through news releases, public meetings, reading materials, and a website. Specific items of the community relations program include the following:

- **Restoration Advisory Board:** A Restoration Advisory Board was established in 1996 to promote community involvement in DoD environmental cleanup activities and allow the public to review and discuss the progress with decision makers. Board meetings are generally held two to three times per year and are open to the public.
- **RVAAP Restoration Program Community Relations Plan:** The *Final Community Relations Plan for the Ravenna Army Ammunition Plant Restoration Program in Portage and Trumbull Counties, Ohio* (U.S. Army Corps of Engineers [USACE], 2017) was prepared to establish processes to keep the public informed of activities being conducted as part of the RVAAP restoration program.
- **RVAAP Restoration Program Website:** A website was established in 2004 for the RVAAP Restoration Program. The website provides information on the history of the RVAAP, areas of potential contamination, the cleanup program being implemented, current activities, and a schedule of upcoming events. This website is accessible to the public at www.rvaap.org.

In accordance with Section 117(a) of CERCLA, Section 300.430(f)(2) of the *National Oil and Hazardous Substances Pollution Contingency Plan*, and the *Final U.S. Army Military Munitions Response Program Munitions Response, Remedial Investigation/Feasibility Study Guidance* (Army, 2009) the ARNG released the NFA Proposed Plan for the 40mm Firing Range MRS (HGL, 2018b) in October 2018. The NFA Proposed Plan and other project-related documents were made available to the public as part of the Administrative Record maintained at CJAG and in the two Information Repositories at Reed Memorial Library in Ravenna, Ohio and Newton Falls Public Library in Newton Falls, Ohio. The notice of availability for the NFA Proposed Plan was sent to the Tribune Chronicle and Record Courier, as specified in the Community Relations Plan (USACE, 2017). The notice of availability initiated the 30-day public comment period which began on October 25, 2018, and ended on December 1, 2018.

The ARNG held a public meeting on November 1, 2018, at the Shearer Community Center, 9355 Newton Falls Road, Ravenna, Ohio 44266, to present the NFA Proposed Plan to the public. At this meeting, representatives of the ARNG provided information specific to the 40mm Firing Range MRS history, investigations, current site conditions, and proposed NFA. The representatives of the ARNG were also available to answer questions about the results of the MMRP-related investigations at the 40mm Firing Range MRS. Responses to the comments received at this meeting and during the public comment period are included in the Responsiveness Summary, which is Part III of this ROD.

The ARNG considered the input received on the NFA Proposed Plan when determining that NFA for DoD military munitions and MC-related contamination is appropriate for the 40mm Firing Range MRS.

D. SCOPE AND ROLE OF OPERABLE UNIT OR RESPONSE ACTION

The overall goal of the MMRP at RVAAP is to address risks to human health and the environment posed by DoD military munitions (i.e., unexploded ordnance (UXO) and discarded military munitions (DMM)) and MC-related contamination. Investigations conducted by the ARNG have determined that no unacceptable risk is posed by DoD military munitions at the 40mm Firing Range MRS. The ARNG has also determined there is no potential source for MC-related contamination. For this reason, the ARNG has determined that there is no source material or impacted environmental media resulting from historical DoD military munitions-related activities at the MRS. The NFA determination is protective of the receptors associated with future land use at the 40mm Firing Range MRS. No other investigations are ongoing at the MRS under the MMRP.

E. SITE CHARACTERISTICS

This section provides a brief overview of the 40mm Firing Range MRS that includes the physical characteristics, previous investigations completed under the MMRP, the nature and extent of contamination, and the most current conceptual site model (CSM).

E.1 Physical Characteristics

The physical characteristics such as topography, geology, hydrogeology, and ecological characteristics that contributed to identifying potential transport pathways, receptors and exposure scenarios used to evaluate health and ecological risks are presented in the following subsections.

E.1.1 Topography/Physiography

CJAG is located within the Southern New York section of the Appalachian Plateaus physiographic province characterized by rolling hills, incised streams, and dendritic drainage patterns. Past glacial activity created bogs, lakes, and other wetland areas. The topography at the 40mm Firing Range MRS is relatively flat with topography ranging from 1,150 feet above mean sea level (amsl) at the eastern portion of the former range, where the former firing point was located, to 1,170 feet amsl at the central portion of the MRS where the

impact area was located. The topography at the western portion of the MRS dips to an elevation low of approximately 1,130 feet amsl. There are no natural streams or ponds located within the MRS and the MRS is not located within a flood plain (CB&I, 2015).

E.1.2 Soils and Geology

CJAG is located atop Mississippian- and Pennsylvanian-age bedrock strata that are overlain by unconsolidated glacial deposits of varying thickness. The 40mm Firing Range MRS is located predominantly over the Homewood Sandstone Member. The eastern portion of the MRS is located over the Mercer Member. The bedrock elevation across the MRS is relatively flat at 1,150 feet amsl. Depth to bedrock ranges from just below ground surface at the west, south, and east portions of the MRS to approximately 25 feet below ground surface at the northern portion of the MRS.

The native soil types at the 40mm Firing Range MRS include the Mitiwanga silt loam with 0 to 2 percent slopes and the Mahoning silt loam with 2 to 6 percent slopes. The western portion of the MRS abuts soils characterized as pits and quarries associated with the former Fuze and Booster Quarry (CB&I, 2015).

E.1.3 Surface Water

CJAG is located within the Ohio River Basin with a major surface stream running adjacent to the western portion of the facility flowing to the Mahoning River before joining the Michael J. Kirwan Reservoir. After leaving the reservoir, the west branch joins the Mahoning River east of the facility.

Surface water drainage at the central portion of the MRS generally flows to the east-southeast or to the west following the topography. The nearest surface water drainage features are the ponds associated with the Fuze and Booster Quarry to the west of the MRS. No wetlands, bogs, kettle lakes, or kames have been identified as being present within the MRS and the MRS is not located in a floodplain. (CB&I, 2015).

E.1.4 Hydrogeology

Although groundwater recharge and discharge areas have not been delineated at CJAG, it is assumed that the extensive uplands areas at the facility, primarily located at the western portion of the facility, are regional recharge zones. Sand Creek, Hinkley Creek, and Eagle Creek are presumed to be major groundwater discharge areas. The 40mm Firing Range MRS is not situated in the upland areas that are considered to be regional recharge zones.

No groundwater monitoring wells have been specifically installed for the 40mm Firing Range MRS and the depth to the unconsolidated aquifer beneath the MRS is unknown. Based on the facility groundwater data collected for the Facility-Wide Groundwater Monitoring Program, the groundwater elevation at the MRS and the immediate vicinity appears to be at a potentiometric high of approximately 1,100 feet amsl. Therefore, the depth to groundwater at the 40mm Firing Range MRS may be as deep as 50 feet. The groundwater appears to flow in all directions from this higher formation (CB&I, 2015).

E.1.5 Ecology

CJAG is home to a range of vegetation and habitat resources. The vegetation community present at the 40mm Firing Range MRS is categorized as the “Dry Midsuccessional Cold-Deciduous Shrubland Alliance.” This shrubland alliance is associated with relatively open areas characterized by shrub species covering more than 50 percent of the area, with relatively few large trees. This alliance often is found within previously disturbed areas, and is dominated by gray dogwood, northern arrow-wood, blackberry, hawthorn, and multiflora rose.

The Camp Ravenna Integrated Natural Resources Management Plan and U.S. Fish and Wildlife Service (USFWS) Threatened and Endangered Species List indicate that one federally-listed threatened species, the

Northern Long-eared Bat, is known to reside within CJAG (OHARNG, 2014) (USFWS, 2018). In addition, the Ohio Department of Natural Resources has identified several state-listed threatened and endangered plant and animal species. Twelve state listed endangered species (1 mammal, 1 fish, 1 insect, 8 bird, and 1 plant species) and ten state listed threatened species (5 bird, 1 insect, 4 plants species) are included on the Rare Species List. No confirmed sightings of these species within the 40mm Firing Range MRS have been reported and no critical habitats are present within the MRS (CB&I, 2015).

E.2 Site Investigations

This section summarizes the CERCLA investigations that were completed at the 40mm Firing Range MRS under the MMRP.

E.2.1 Historical Records Review

In 2007, the ARNG prepared a *Historical Records Review* (HRR) under the MMRP for RVAAP restoration program that included the 40mm Firing Range MRS. The HRR described the 40mm Firing Range MRS as an approximate 5.17-acre area surrounded by forest. A wooden structure believed to be the former storage shed, gun mount foundation, and chronograph foundation located at the firing point were the only remnants of the range, as the impact area berm had been removed. The HRR reported that facility personnel had identified UXO beyond the impact area, on the slope that leads down to the Fuze and Booster Quarry MRS. However, the HRR did not identify the type or disposition of the UXO reported by the facility personnel (e²M, 2007).

E.2.2 Site Inspection

In 2007, the ARNG completed an MMRP Site Inspection (SI) at the former RVAAP that included the 40mm Firing Range MRS. At the time of the SI, the size of the 40mm Firing Range MRS was approximately 5.17 acres that included an open field surrounded by forest. As part of the SI activities, a meandering path magnetometer and metal detector assisted surveys for pieces of DoD military munitions were completed at the down-range target impact area, overshoot area, and firing point portions at the MRS.

Various items were found on the ground surface during the SI at the target impact area and 100 feet beyond. The DoD military munitions were evaluated by UXO-qualified personnel, determined as safe, and considered to be MD. The MD consisted of aluminum 40mm grenade nose caps and casings. Although DoD military munitions that were suspected to be MEC had been reportedly previously observed by facility personnel beyond the impact area, the presence of MEC was not verified during the SI field activities. No DoD military munitions were observed at the firing point or in the area between the firing point and impact area.

No samples for MC-related contamination were collected as part of the SI field activities.

The impact and overshoot areas where the MD was found encompassed 1.27 acres and became the revised MRS following the SI (e²M, 2008). **Figure 4** presents the impact and overshoot area at the MRS and the results of the SI field work.

E.2.3 Remedial Investigation

During planning for the RI field work, the previous findings of MD were evaluated and it was determined that the area between the firing point and the furthest possible target distance for the 40mm grenades reported to have been fired at the former 40mm Firing Range (350 meters from the firing point) required further investigation for DoD military munitions. The revised RI area was determined to be 8.55 acres that was inclusive of the 1.27-acre MRS identified during the SI. The combined area was referred to as the “Investigation Area” in the Final RI Report (CB&I, 2015). Numerous fragments of DoD military munitions

were encountered on the ground surface and in subsurface soils. The items were evaluated by UXO-qualified personnel, determined to be safe, and considered MD. The MD were associated with the 40mm practice grenades that are known to have been discharged at the former firing range. No DoD military munitions confirmed to be MEC were identified at the 40mm Firing Range MRS during the RI field activities.

Sampling for MC-related contamination was conducted during the RI at predetermined locations at the former impact area and 100 feet beyond as well as the location of the former firing point. In all, a total of three surface soil samples, not including quality control samples, were collected during the RI using the Incremental Sampling Methodology (ISM). Two ISM surface soil samples, each comprising 0.63 acres, were collected at the impact area and 100 feet beyond. A third ISM sample was collected at the 0.05-acre firing point at the east end of the former firing range. All three ISM samples were collected at depths between 0 and 0.5 feet. The soil sample locations were based on locations where the MD was identified and where MC-related contamination associated with historical activities were expected. The MC-related contamination sampling locations are presented in **Figure 5**.

The analytes detected during the RI sampling event consisted of nitroguanidine at the firing point and aluminum and lead at the former down range impact area. Nitroguanidine was detected at a very low concentration and is not an MC-related contaminant associated with the 40mm practice rounds fired at the former test range. Therefore, nitroguanidine was removed from further consideration as an MC-related contaminant at the MRS. The concentrations for both aluminum and lead were all below the background values and were not retained as MC-related contamination. Because no detected analytes were identified as MC-related contamination during the RI field activities, a Human Health Risk Assessment (HHRA) and Ecological Risk Assessment (ERA) were not required for inclusion in the Final RI Report.

Following the RI, the MRS boundary was expanded to encompass the 8.55-acre Investigation Area where the MD was found (CB&I, 2015). **Figure 5** depicts the current MRS boundaries, the site features associated with the historical activities that occurred at the MRS, and the locations where MD were found during the RI field work.

To date, no DoD military munitions confirmed to be MEC have been found at the 40mm Firing Range MRS. The RI fieldwork confirmed the results of previous investigations at the MRS; therefore, an explosive hazard is not present at the MRS. As a result, no MEC hazard assessment was required. The results of the RI did not indicate the presence of MC-related contamination at the MRS. The MRS was assigned a Munitions Response Site Prioritization Protocol (MRSP) priority of 5 (CB&I, 2015). MRSP scores range from 1 (highest priority sites) to 8, which is the lowest priority rating that a site can score.

E.2.4 Feasibility Study

Following the RI, a Feasibility Study (FS) was conducted to develop, evaluate, and perform a detailed analysis of potential remedial alternatives for the 40mm Firing Range MRS, as well as to Remedial Action Objectives and allow the DoD to select and propose an appropriate remedy. Based on further evaluation of the RI results, the project team concluded the 40mm Firing Range MRS be recommended for NFA. No explosive hazards were found during the RI; therefore, no MEC hazard assessment was required (HGL, 2018a). The MRSP tables were updated during the FS in accordance with the MRSP Primer and the revised MRSP priority is “No Longer Required”.

E.2.5 Proposed Plan

The Proposed Plan was completed for 40mm Firing Range MRS by the ARNG in 2018. The Proposed Plan recommended NFA as no risks have been identified at the MRS. The overall recommendation of NFA under the MMRP was considered protective of receptors that may be present at the MRS (HGL, 2018b).

E.3 Nature and Extent of Contamination

Data gathered by the ARNG during the SI and subsequent RI for the 40mm Firing Range MRS effectively characterized the nature and extent of DoD military munitions and MC-related contamination at the MRS. Based on the information presented in Part II, Sections A through E, it can be concluded that no further investigation is necessary at the MRS. As outlined in the RI Report, no evidence of intact DoD military munitions was identified at the MRS; there are no explosive hazards; and, no current sources for a release of MC-related contamination. In addition, ISM samples from the RI did not detect any past releases of MC-related contamination. Therefore, there is no explosive hazard or unacceptable risk due to MC-related contamination at the 40mm Firing Range MRS (CB&I, 2015).

E.4 Conceptual Site Model

The CSM discussion includes sources of contamination, release mechanisms, migration pathways, and potential receptors identified for the 40mm Firing Range MRS in support of the HHRA and ERA.

E.4.1 Primary and Secondary Contaminant Sources and Release Mechanisms

The 40mm Firing Range MRS is the location of a former 40mm firing range that operated between 1969 and 1971. Prior to the SI, it was reported that facility personnel identified UXO beyond the impact point on the slope that leads down to the Fuze and Booster Quarry MRS (e²M, 2007); however, it should be noted that item was not identified, and the finding itself could not be confirmed. Parts and pieces of 40mm grenades were found on the ground surface during the SI at the target impact area and 100 feet beyond. The items were confirmed to be MD and no MEC were found. Prior to the RI, MEC was still considered potentially present and a primary source of potential explosive hazards at the MRS. The associated secondary source of contamination was the potential release of MC-related contamination from any MEC on or just below the ground surface (e²M, 2008). The RI did not identify any DoD military munitions and only MD was found. The Final RI Report (CB&I, 2015) concluded that MC-related contamination was not detected at the MRS. The exposure pathways considered during the RI included the potential for human encounters with MEC on and just below the ground surface. Freeze/thaw cycling throughout the MRS and erosion at the steeper areas were evaluated since these physical processes have the potential to expose subsurface MEC (CB&I, 2015).

E.4.2 Contaminant Migration Pathways

The lack of DoD military munitions identified by the ARNG during SI and RI field activities is evidence that no explosive hazard is present in the surface or subsurface soils at the 40mm Firing Range MRS. The RI concluded that all exposure pathways for surface and subsurface soils were incomplete (CB&I, 2015).

E.4.3 Potential Human Receptors and Ecological Receptors

The likely human receptors identified for the 40mm Firing Range MRS include the Industrial Receptor as described in the FS. The NFA determination is protective of other potential future human receptors (such as residential receptors); however, 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 (HGL, 2018b).

Environmental receptors (biota) identified for the MRS include earthworms, voles, shrews, robins, foxes, and hawks (CB&I, 2015).

F. CURRENT AND POTENTIAL FUTURE SITE AND RESOURCE USES

Current activities at the 40mm Firing Range MRS include maintenance and natural resource management activities (CB&I, 2015). The future land use at the 40mm Firing Range MRS will include maintenance and natural resource management activities. It will also include military training and most likely construction activities as part of military use (HGL, 2018a).

G. SUMMARY OF SITE RISKS

The basis for NFA at the 40mm Firing Range MRS, including rationale for why a MEC Hazard Assessment (HA), HHRA, and ERA were not required, are provided in the following subsections.

G.1 MEC Hazard Assessment

The MEC HA methodology addresses human health and safety concerns associated with potential exposure to MEC at an MRS. The ARNG found no intact DoD military munitions or MEC at the 40mm Firing Range MRS during the MMRP SI or RI field activities, indicating that no source of explosive safety hazards is present. Therefore, the ARNG determined that the calculation of a MEC HA score was not warranted for the MRS (CB&I, 2015).

G.2 Human Health and Ecological Risk Assessment

The purpose of the HHRA is to document whether chemical contaminants (MC) may pose a risk to current or future human receptors and to identify which, if any, MRS conditions need to be addressed further in the CERCLA process. An ERA evaluates the potential for adverse effects posed to ecological receptors from the release of MC-related contamination at a MRS.

Soil samples were collected during the RI for analysis at three locations where MC-related contamination was suspected based on the locations where MD was found (impact area) and where the firing of the munitions occurred (firing area). The analytical results indicated that no known or suspected risks associated with MC-related contamination exist at the MRS, including evaluation for the Unrestricted (Residential) Receptor (CB&I, 2015).

H. DOCUMENTATION OF NO SIGNIFICANT CHANGE

The NFA Proposed Plan (HGL, 2018b) for the 40mm Firing Range MRS was released for public comment on October 25, 2018. The NFA Proposed Plan (HGL, 2018b) recommended NFA under the MMRP and pursuant to CERCLA requirements for the 40mm Firing Range MRS. After the public comment period, no significant changes regarding the selected remedy, as originally identified in the NFA Proposed Plan (HGL, 2018b), were necessary or appropriate.

PART III: RESPONSIVENESS SUMMARY FOR PUBLIC COMMENTS ON THE PROPOSED PLAN FOR RVAAP-032-R-01 40MM FIRING RANGE MRS

A. Overview

In October 2018, the ARNG released the NFA Proposed Plan. On November 1, 2018, ARNG held a public meeting at the Shearer Community Center on 9355 Newton Falls Road, Ravenna, Ohio for the 40mm Firing Range MRS. ARNG, Ohio EPA, US EPA were present for the meeting, and approximately 20 members of the community attended the meeting. The 30-day public comment period was held from October 25, 2018 to December 1, 2018.

B. Summary of Stakeholder Issues and Lead Agency Responses

No site-specific verbal comments were received during the public meeting. Members of the public were interested in the future use of CJAG as a whole. They had no questions or comments about the sites presented, or the NFA determination.

B.1 Oral Comments from Public Meeting

No oral comments or questions were received from members of the public at the November 2018 public meeting.

B.2 Written Comments from Public Meetings

No written comments or questions were received from members of the public at the November 2018 public meeting.

B.3 Telephone Comments from Public

No telephone comments were received from members of the public following publication of the news releases through the duration of the public comment period.

C. Technical and Legal Issues

There were no technical or legal issues raised during the public comment period.

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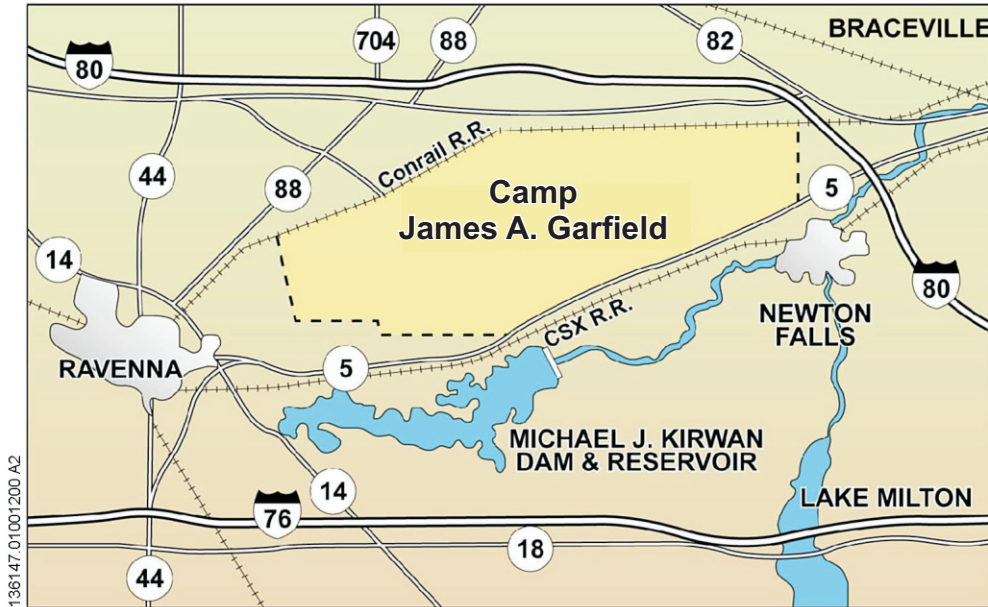
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<https://ecos.fws.gov/ecp0/profile/speciesProfile?sPCODE=A0JE>

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FIGURES

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 3/21/2019 JG
 Source: CB&I

Legend

 Camp James A. Garfield

Note:
 RVAAP=Ravenna Army Ammunition Plant




**Figure 1-1
 Location Map
 Camp James A. Garfield/
 Former RVAAP
 Portage and Trumbull
 Counties, Ohio**



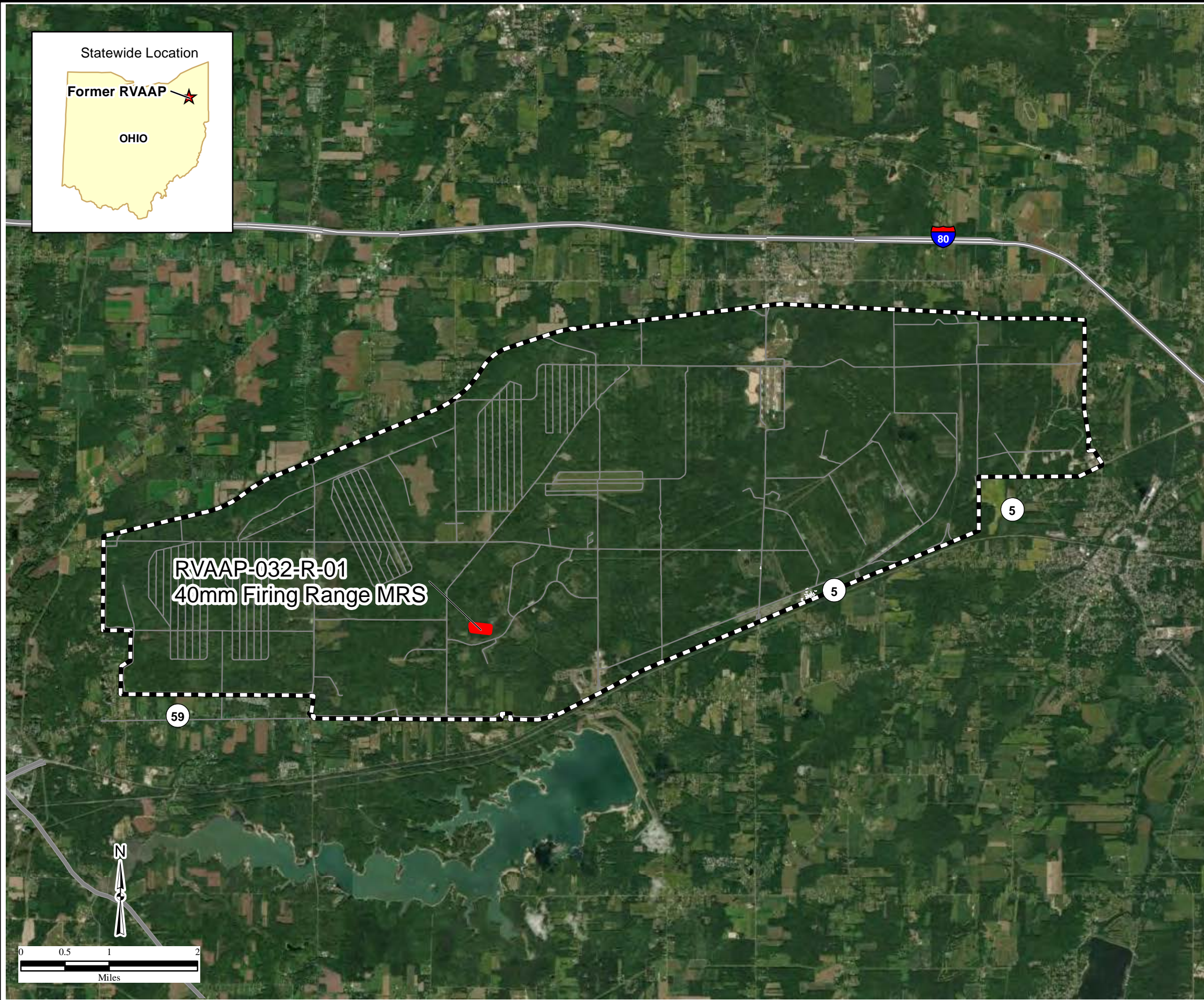
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Figure 2
Location Map
40mm Firing Range MRS
Former RVAAP
Portage/Trumbull Counties, Ohio

Legend

-  MRS Boundary
-  Facility Boundary
-  Road

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



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02/14/2019 JWR
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


-  Historical Records Review MRS Boundary
-  SI Recommended MRS Boundary
-  Suspected Firing Point Location

Figure 3
MRS MAP
40mm Firing Range MRS
Former RVAAP
Portage/Trumbull Counties, Ohio

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 12/10/2018 JWR
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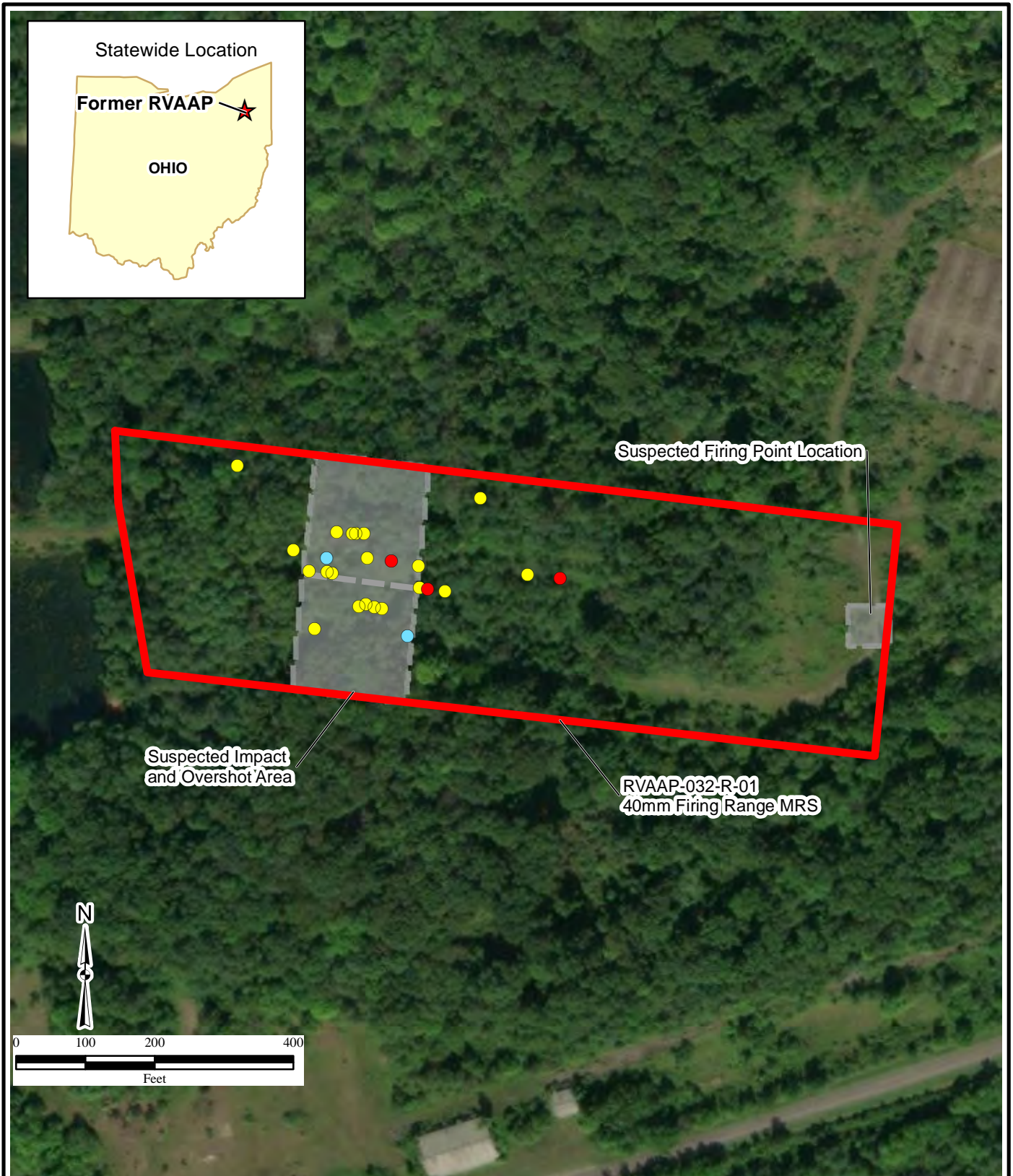
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- Historical Records Review MRS Boundary
- SI Recommended MRS Boundary
- Suspected Firing Point Location
- Meandering Path Survey Area
- Munitions Debris Location

Figure 4
2007 Site Inspection Results
40mm Firing Range MRS
Former RVAAP
Portage/Trumbull Counties, Ohio



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 02/14/2019 JWR
 Source APTIM

Legend

- Concentrated Subsurface MD Location
 - Individual Subsurface MD Location
 - Surface MD Location
 - 40mm Firing Range MRS Boundary
 - MC ISM Area
- MD denotes Munitions Debris
 MC denotes Munitions Constituents

Figure 5
2011 Remedial Investigation Results
40mm Firing Range MRS
Former RVAAP
Portage/Trumbull Counties, Ohio



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Appendix A
Notice of Availability of the Proposed Plan

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Affidavit of Publication, Record Courier, October 21, 2018 and October 28, 2018

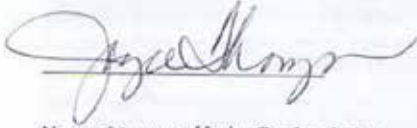
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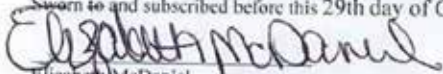
30 Record-Courier a newspaper printed and published in the city of Kent, and of General circulation in the County of Portage, State of Ohio, and personal knowledge of the facts herein stated and that the notice hereto annexed was Published in said newspapers for 2 insertions on the same day of the week from and after the 21st day of October, 2018 and that the fees charged are legal.



Name of Account: HydroGeoLogic Inc
Ad Number: 12499589
No. of Lines: 70

Day(s) Published: 10/21, 10/28.
Printers Fee: \$432.00

Sworn to and subscribed before this 29th day of October, 2018.



Elizabeth McDaniel
Notary Public
Commission Expires June 19, 2021



PUBLIC NOTICE

Camp Ravenna Joint Military Training Center
Camp Ravenna Environmental Office
1438 State Route 534 SW - Newton Falls, OH 44444
614-336-6136

**Public meeting to be held Thursday, November 1, 2018
for Army National Guard Release of Proposed Plans
for two Munitions Response Sites
at the Former Ravenna Army Ammunition Plant:
Fuze and Booster Quarry
40mm Firing Range**

Ravenna - The Army National Guard, in consultation with the Ohio Environmental Protection Agency, submits for public review and comment two (2) Proposed Plans for two Munitions Response Sites at the former Ravenna Army Ammunition Plant (RVAAP) in Portage and Trumbull counties, Ohio.

The Fuze and Booster Quarry and 40mm Firing Range are Munitions Response Sites (MRSs) within the former RVAAP (now known as Camp Ravenna) in Portage and Trumbull Counties, Ohio. These MRSs are being addressed under the Military Munitions Response Program (MMRP) in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). The Proposed Plans present the current status and information regarding the MRSs. The Proposed Plans detail the recommendation for No Further Action at both MRSs and provide the rationale for these recommendations.

On Thursday November 1, 2018, a public meeting will be held at the Shearer Community Center (Paris Township Hall) at 9355 Newton Falls Road, Ravenna, Ohio 44266 beginning at 6:00 p.m., with an informal open house when technical staff will be available to answer questions. At 6:30 p.m., the Army National Guard will briefly describe the assessment of the MRSs, present the No Further Action recommendation, and then request verbal comments from the public. Written comments regarding this recommendation may be submitted to the Army National Guard during the 30-day comment period from October 25, 2018 to December 1, 2018. All written comments should be addressed to Camp Ravenna Environmental Office; 1438 State Route 534 SW, Newton Falls, OH 44444 or sent via email to Kathryn.s.tait.nfg@mail.mil.

In accordance with CERCLA, the No Further Action recommendation presented in the Proposed Plans was summarized and also presented in earlier remedial investigation and feasibility study reports. All reports are now available for public review at the RVAAP Restoration Program Information Repositories at the Reed Memorial Library (167 East Main Street, Ravenna) and the Newton Falls Public Library (204 South Canal Street, Newton Falls). The reports are also available online at www.rvaap.org.

The final remedy for the MRSs will be selected based, in part, on public comments. In coordination with Ohio Environmental Protection Agency, the Army National Guard will select a final remedy after reviewing and considering all public comments submitted during the 30-day public comment period from October 25, 2018 to December 1, 2018. The Army National Guard encourages the public to review and comment on the recommendation presented in this document.

For more information or to participate in the review, please visit the RVAAP Restoration Program website (www.rvaap.org) or call Kathryn Tait at 614-336-6136.

Affidavit of Publication, Tribune Chronicle, October 21, 2018 and October 28, 2018

PUBLIC NOTICE
 Camp Ravenna Joint Military Training Center
 Camp Ravenna Environmental Office
 1438 State Route 534 SW - Newton Falls, OH 44444
 614-338-6136

Public meeting to be held Thursday, November 1, 2018
 for Army National Guard Release of Proposed Plans
 for two Munitions Response Sites
 at the Former Ravenna Army Ammunition Plant:
 Fuze and Booster Quarry
 40mm Firing Range

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For more information or to participate in the review, please visit the RVAAP Restoration Program website (www.rvaap.org) or call Kathryn Tait at 614-338-6136.

#294-2T-October 21 & 28, 2018 #WOH0046311

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