

1 **Draft**
2 **No Further Action Proposed Plan**
3 **for**
4 **RVAAP-016-R-01 Fuze and Booster Quarry**
5 **Munitions Response Site**
6 **Version 1.0**

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

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

11 **Prepared for:**



12 **US Army Corps
of Engineers®**

13 **U.S. Army Corps of Engineers**
14 **Baltimore District**
15 **2 Hopkins Plaza**
16 **Baltimore, Maryland 21201**

17 **Prepared by:**
18 **HydroGeoLogic, Inc. (HGL)**
19 **11107 Sunset Hills Road**
20 **Suite 400**
21 **Reston, Virginia 20190**

22 **March 21, 2018**

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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-016-R-01 Fuze and Booster Quarry 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 for the RVAAP-016-R-01 Fuze and Booster Quarry MRS. Investigations have found no MPPEH 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 40	19a. NAME OF RESPONSIBLE PERSON Kimberly Vaughn
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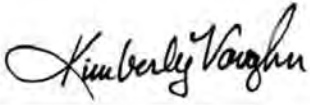
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CONTRACTOR’S STATEMENT OF INDEPENDENT TECHNICAL REVIEW

HydroGeoLogic, Inc., has completed the *Draft 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 Digitally signed by Janardan J Patel
DN: cn=Janardan J Patel, o=HGL, ou=ECD,
email=jpatel@hgl.com, c=US
Date: 2018.03.20 11:01:33 -0400' Date: March 20, 2018
Janardan Patel, PMP
Program Manager

Prepared/Approved by:  Date: March 21, 2018
Kimberly Vaughn
Project Manager

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4 ARNG – Army National Guard
5 COR – Contracting Officer’s Representative
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7 OHARNG – Ohio Army National Guard
8 RVAAP – Former Ravenna Army Ammunition Plant
9 USACE – United States Army Corps of Engineers

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ACRONYMS AND ABBREVIATIONS

1	ARAR	applicable or relevant and	49	MRS	munitions response site
2		appropriate requirements	50	MRSP	MRS Prioritization Protocol
3	ARNG	Army National Guard	51	NFA	No Further Action
4	Camp Ravenna	Camp Ravenna Joint Military	52	NPDES	National Pollutant Discharge
5		Training Center	53		Elimination System
6	CB&I	CB&I Federal Services, LLC	54	OHARNG	Ohio Army National Guard
7	CERCLA	Comprehensive	55	Ohio EPA	Ohio Environmental
8		Environmental Response,	56		Protection Agency
9		Compensation and Liability	57	PP	Proposed Plan
10		Act	58	RI	Remedial Investigation
11	COC	chemical of concern	59	ROD	Record of Decision
12	COR	Contracting Officer's	60	RVAAP	Former Ravenna Army
13		Representative	61		Ammunition Plant
14	DMM	discarded military munitions	62	SI	Site Inspection
15	DoD	U.S. Department of Defense	63	TNT	trinitrotoluene
16	e ² M	Engineering-Environmental	64	U.S.	United States
17		Management, Inc.	65	U.S. Army	U.S. Department of the Army
18	Final FS Report	<i>Final Feasibility Study for</i>	66	USACE	U.S. Army Corps of
19		<i>RVAAP-016-R-01 Fuze and</i>	67		Engineers
20		<i>Booster Quarry MRS, Version</i>	68	UXO	unexploded ordnance
21		<i>1.0</i>			
22	Final Historical				
23	Records Review	<i>Final Military Munitions</i>			
24		<i>Response Program Historical</i>			
25		<i>Records Review, Ravenna</i>			
26		<i>Army Ammunition Plant, Ohio</i>			
27	Final RI Report	<i>Final Remedial Investigation</i>			
28		<i>Report for RVAAP-016-R-01</i>			
29		<i>Fuze and Booster Quarry</i>			
30		<i>MRS, Version 1.0</i>			
31	Final SI Report	<i>Final Site Inspection Report,</i>			
32		<i>Ravenna Army Ammunition</i>			
33		<i>Plant, Ohio</i>			
34	FS	Feasibility Study			
35	HGL	HydroGeoLogic, Inc.			
36	HRR	Historical Records Review			
37	IED	Installation and Environment			
38		Division			
39	IRP	Installation Restoration			
40		Program			
41	ISM	Incremental Sampling			
42		Methodology			
43	MC	munitions constituents			
44	MD	munitions debris			
45	MEC	munitions and explosives of			
46		concern			
47	MMRP	Military Munitions Response			
48		Program			

1 **1.0 INTRODUCTION**

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

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

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

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

44 2015) and the *Final Feasibility Study for RVAAP-*
45 *016-R-01 Fuze and Booster Quarry MRS,*
46 *Version 1.0* (Final **Feasibility Study** [FS])
47 (HydroGeoLogic, Inc. [HGL], 2018). The U.S.
48 Army encourages the public to review these
49 documents to better understand the history of the
50 MRS, activities that have been conducted there,
51 and determinations that have been made for the
52 MRS under the **Military Munitions Response**
53 **Program (MMRP)**.

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

60 **2.0 FACILITY AND MRS**
61 **BACKGROUND**

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

65 **2.1 Facility History**

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

82 **Administrative control** of the 21,683-acre
83 facility was transferred to the U.S. Property and
84 Fiscal Officer for Ohio, which subsequently
85 licensed the facility to the Ohio Army National
86 Guard (OHARNG) for use as a training site,

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

1 Camp Ravenna. The restoration program for the
2 facility involves the remediation of areas affected
3 by the activities of the former RVAAP.

4 The former RVAAP was constructed in 1940 and
5 1941 for assembly/loading and **depot storage** of
6 ammunition. While being used as an ammunition
7 plant, RVAAP was a U.S. Government-owned
8 and contractor-operated industrial facility. The
9 ammunition plant consisted of 12 munitions
10 assembly facilities, referred to as “load lines.”
11 Load Lines 1 through 4 were used to melt and
12 load 2,4,6-trinitrotoluene (TNT) and
13 Composition B (a mixture of TNT and Research
14 Department Explosive) into **large-caliber shells**
15 and bombs. Operations on the load lines produced
16 explosive dust, spills, and vapors that collected
17 on the floors and walls of each building.
18 Periodically, the floors and walls were cleaned
19 with water and steam. After cleaning, the “pink
20 water” wastewater, which contained TNT and
21 Composition B, was collected in concrete holding
22 tanks, filtered, and pumped into unlined ditches
23 for transport to **earthen settling ponds**. Load
24 Lines 5 through 11 manufactured **fuzes, primers,**
25 and **boosters**. From 1946 to 1949, Load Line 12
26 produced ammonium nitrate for explosives and
27 fertilizers; subsequently it was used as a **weapons**
28 **demilitarization facility**.

29 In 1950, the facility was placed on standby status,
30 and operations were limited to **renovation,**
31 **demilitarization,** normal maintenance of
32 equipment, and munitions storage. **Production**
33 activities resumed from July 1954 to October
34 1957 and again from May 1968 to August 1972.
35 Demilitarization and production activities were
36 conducted at Load Lines 1, 2, 3, and 12.
37 Demilitarization activities included
38 disassembling munitions and melting out and
39 recovering explosives using hot water and steam
40 processes. These activities continued
41 through 1992.

Public Comment Period:

_____ to _____

Public Meeting:

The U.S. 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 _____ p.m. on _____, at the _____.

Information Repositories:

Information used in selecting the preferred remedy is available online at 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:

10 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.

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

11 2.2 MRS History

12 The Fuze and Booster Quarry MRS comprises
13 4.92 acres of stone and ballast quarry excavated
14 to provide building materials for RVAAP.
15 Between 1945 and 1949 the quarry was used as
16 an open burn area where sawdust waste generated
17 at Load Lines 6 through 11 was thermally treated.
18 Thereafter, the quarry was used as a landfill that
19 reportedly accepted fuze and booster assemblies,
20 projectiles, residual ash, and sanitary waste. In
21 1976, the landfill materials, inclusive of the
22 munitions-related items historically disposed of
23 at the MRS, were removed and transferred to
24 either Ramsdell Quarry or one of the other
25 burning grounds at RVAAP. Around this time,
26 three elongated settling ponds were constructed at
27 the MRS. From 1987 through 1993, spent brine
28 regenerate and sand filtration backwash water
29 were discharged to the ponds from the facility's
30 potable water treatment system. The discharge
31 was regulated under the National Pollutant
32 Discharge Elimination System (NPDES) permit.
33 The Ponds have been inactive since 1993
34 (HGL, 2018).

35 The MRS addressed in this NFA PP was initially
36 12.74 acres, revised to be a 4.92-acre area
37 encompassing the three ponds and the area
38 immediately surrounding them in the south-
39 central portion of the former RVAAP. The
40 4.92-acre MRS is shown in the RVAAP-016-R-
41 01 boundary on **Figure 3**. Additional details
42 describing the MRS history are provided in the
43 following sections.

44 2.3 MRS Historical Investigations

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

- 48 • *Final Historical Records Review (HRR)*
49 (Engineering-Environmental Management,
50 Inc. [e²M], 2007);
- 51 • *Final Site Inspection Report (Final Site*
52 *Inspection [SI] Report)* (e²M, 2008);
- 53 • *Final Remedial Investigation Report (Final*
54 *RI Report)* (CB&I, 2015); and
- 55 • *Final Feasibility Study* (HGL, 2018).

56 2.3.1 Historical Records Review

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

66 In 2007 the *Final Military Munitions Response*
67 *Program Historical Records Review* (Final HRR)
68 was performed and consisted of a limited-scope
69 records search to document historical and other
70 known information. The HRR identified the Fuze
71 and Booster Quarry as an MRS 12.74-acre in size
72 consisting of an expanded area around the quarry
73 ponds in comparison to the current MRS. The
74 type, condition, and extent of DoD military
75 munitions located at the Fuze and Booster Quarry
76 MRS was unknown at the time the HRR was
77 prepared because no surveys for munitions-
78 related items had been conducted (e²M, 2007).
79 The HRR recommended a MEC assessment be
80 performed at all three Fuze and Booster Quarry
81 ponds in an SI (CB&I, 2015).

82 2.3.2 Site Inspection Summary

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

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

1 quarry banks and surrounding areas (**Figure 4**).
2 All items encountered were evaluated to
3 determine whether they posed an explosive
4 hazard and were subsequently documented as
5 safe. Munitions debris (MD) was found on the
6 southeastern side of the southern pond. Multiple
7 high-concentrations areas of **subsurface**
8 **anomalies** were detected during the survey.
9 These areas were suspected to represent possible
10 buried munitions-related items. The HRR
11 reported that facility personnel had previously
12 observed DoD military munitions items in the
13 northern and southern ponds when water levels
14 were low; however, the bottom of the ponds were
15 not investigated during the SI.

16 The SI recommended that the MRS footprint be
17 decreased from 12.74 acres to 4.92 acres and the
18 MRS further investigated under the MMRP with
19 respect to DoD military munitions. The reduced
20 MRS footprint recommended in the SI includes
21 the quarry ponds and the area immediately
22 surrounding them. The revised MRS boundary is
23 presented in **Figure 4** (e²M, 2008).

24 **2.4 Remedial Investigation Results**

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

37 Digital geophysical surveys identified 208
38 clusters of high anomaly density around the
39 shoreline of the northern pond. A total of 1,175
40 individual anomalies were outside of the high
41 anomaly density areas. Of the 1,175 anomalies
42 identified, 167 were due to cultural features such
43 as abandoned water control intake structures and
44 subsurface utilities; 68 anomalies were in shallow
45 water; 8 anomalies were within an area of very
46 steep terrain; 8 anomalies were nails placed for
47 quality control purposes; 6 anomalies were just a

48 outside the boundary of the MRS; and 2
49 anomalies were the result of interpolation
50 artifacts. A total of 916 individual anomalies of
51 interest were identified by the digital geophysical
52 surveys. Two additional anomalies of interest
53 were added based on recommendations made by
54 the Ohio EPA, making the total number of
55 individual anomalies to be 918. Of the 918
56 anomalies of interest identified, 227 were
57 selected for intrusive investigation by hand
58 digging. Intrusive investigation of the high
59 anomaly density areas was conducted using
60 mechanical excavation techniques at 13 trench
61 locations.

62 Four wet sediment samples were collected using
63 Incremental Sampling Methodology (ISM) in
64 accordance with the 2011 Work Plan. Two
65 samples were collected from the southern-most
66 pond, one sample each was collected from the
67 north and central ponds. The sample depths were
68 between the sediment surface and 0.5-feet below
69 sediment surface. Samples were analyzed for
70 metals, geochemical metals, explosives,
71 nitrocellulose, semi-volatile organic compounds,
72 polychlorinated biphenyl, total organic carbon,
73 and pH. Based on the analytical results, 34
74 site-related chemicals were identified as potential
75 MC at the Fuze and Booster Quarry MRS
76 (CB&I, 2015).

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

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

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

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

20 Because no explosive hazards were found during
21 the RI no MEC hazard assessment was required.
22 The MRS was assigned a Munitions Response
23 Site Prioritization Protocol (MRSPP) priority
24 of 5.

25 **3.0 EVALUATION OF THE NO** 26 **FURTHER ACTION** 27 **ALTERNATIVE**

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

39 **3.1 Detailed Analysis of NFA Alternative**

40 The detailed analysis presented in the FS
41 consisted of evaluating the NFA alternative using
42 the nine criteria listed in the NCP. The NCP states
43 that the first two criteria, protection of human
44 health and the environment and compliance with

45 applicable or relevant and appropriate
46 requirements (ARARs), are “threshold criteria”
47 that must be met by the selected remedial action
48 unless a waiver is granted under Section
49 121(d)(4) of CERCLA. The next five criteria are
50 “primary balancing criteria,” and the trade-offs
51 within this group must be balanced. The final two
52 criteria, state and community acceptance, are
53 “modifying criteria” that are evaluated following
54 the comment periods on the FS report and the PP.

55 ***Threshold Criteria***

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

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

75 ***Balancing Criteria***

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

86 *Reduction of Toxicity, Mobility, or Volume*
87 *Through Treatment* – The statutory preference for
88 remedial technologies that significantly and
89 permanently reduce the toxicity, mobility, or

1 volume of the waste is addressed by this criterion.
2 The No Action alternative includes no treatment
3 because there is no explosive hazard or
4 unacceptable risk associated with MC-related
5 contamination is present at the MRS.

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

17 *Implementability* – The technical and
18 administrative feasibility of implementing the
19 remedial action is addressed by this criterion.
20 Technical feasibility refers to the ability to
21 construct, reliably operate, and meet technology-
22 specific regulations for process options until a
23 remedial action is complete. Administrative
24 feasibility refers to the ability to obtain approvals
25 from other offices and agencies; the availability
26 of treatment, storage, and disposal services; and
27 the requirements for, and availability of, specific
28 equipment and technical specialists. The No
29 Action alternative does not involve active
30 remediation; therefore, technical feasibility is not
31 a consideration. No services or equipment are
32 necessary to implement No Action. This
33 alternative will not interfere with any planned
34 remedial action in the future. The No Action
35 alternative is administratively feasible to
36 OHARNG/Camp Ravenna because no explosive
37 hazard or unacceptable risk due to MC-related
38 contamination is present on the MRS and the No
39 Action alternative is expected to receive Ohio
40 EPA concurrence because no explosive hazard or
41 unacceptable risk due to MC-related
42 contamination is present at the MRS.

43 *Cost* – Capital and long-term management costs
44 are estimated under this criterion. The No Action
45 alternative does not have any capital or long-term
46 management costs associated with it.

47 *Modifying Criteria*

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

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

54 **3.2 Overall Evaluation**

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

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

65 **4.0 SCOPE AND ROLE OF RESPONSE** 66 **ACTION**

67 The results of the RI fieldwork and evaluation in
68 the Final FS for the Fuze and Booster Quarry
69 MRS support the selection of NFA as the
70 preferred remedy for the MRS. The remedy must
71 be protective of the receptors associated with
72 future land use. The future land use of the MRS
73 is military training, maintenance, natural resource
74 management, hunting and fishing activities, and
75 restoration activities (e.g., groundwater
76 monitoring). The **human receptors** with the
77 greatest opportunity for exposure to an explosive
78 hazard is the Industrial Receptor. **Environmental**
79 **receptors** for the future land use include
80 terrestrial invertebrates (earthworms), voles,
81 shrews, robins, foxes, owls, hawks, muskrat,
82 mink, mallards, great blue heron, benthic
83 invertebrates, and aquatic biota (HGL, 2018).

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

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

15 **5.0 SUMMARY OF HUMAN AND** 16 **ECOLOGICAL RISKS**

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

28 No DoD military munitions confirmed to be
29 MEC are present at the Fuze and Booster Quarry
30 MRS. Therefore, no explosive safety hazard or
31 risks associated with MC exist for the likely
32 receptors at the Fuze and Booster Quarry MRS
33 (HGL, 2018).

34 **6.0 CONCLUSIONS AND** 35 **RECOMMENDATIONS**

36 The results of the RI fieldwork and the evaluation
37 conducted in the FS for the Fuze and Booster
38 Quarry MRS support the determination that no
39 hazards associated with exposure to DoD military
40 munitions and no potential for MC risks to human
41 or environmental receptors exist at the Fuze and
42 Booster Quarry MRS. The U.S. Army, in
43 consultation with the Ohio EPA, is
44 recommending NFA as the preferred remedy

45 under the MMRP for the Fuze and Booster
46 Quarry MRS.

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

56 **7.0 COMMUNITY PARTICIPATION**

57 Public participation is an important component of
58 the remedy selection process. The U.S. Army, in
59 coordination with the Ohio EPA, is soliciting
60 input from the community on the preferred
61 remedy. The comment period extends from
62 [MONTH DATE] to [MONTH DATE], 2018.
63 This period includes a public meeting at which
64 the U.S. Army will present this NFA PP. The U.S.
65 Army will accept oral and written comments at
66 this meeting.

67 **7.1 Public Comment Period**

68 The 30-day comment period extends from
69 [MONTH DATE] to [MONTH DATE], 2018 and
70 provides an opportunity for public involvement in
71 the decision-making process for the proposed
72 action. The public is encouraged to review and
73 comment on this NFA PP. The U.S. Army and
74 Ohio EPA will consider all public comments
75 before selecting a remedy. During the comment
76 period, the public is also encouraged to review
77 documents pertinent to the Fuze and Booster
78 Quarry MRS. This information is available at the
79 Information Repositories and online at
80 www.rvaap.org. To obtain further information,
81 contact the Camp Ravenna Environmental
82 Office.

83 **7.2 Public Meeting**

84 The U.S. Army will hold an open house/public
85 meeting on this NFA PP on [MONTH DATE],
86 2018, at [TIME] p.m. at _____. This
87 meeting will provide an opportunity for the
88 public to comment on the preferred remedy.

1 Comments made at the meeting will be
2 transcribed.

3 **7.3 Written Comments**

4 If the public would like to provide comments,
5 questions, or suggestions on this NFA PP or other
6 relevant issues in writing, they should be
7 delivered to the U.S. Army at the public meeting
8 or mailed (postmarked no later than [MONTH
9 DATE], 2018). The public can also submit
10 comments, questions, or suggestions via email
11 before the end of the comment period to the Camp
12 Ravenna Environmental Office using the
13 following email address:
14 kathryn.s.tait.nfg@mail.mil.

**POINT OF CONTACT FOR
WRITTEN COMMENTS**

Camp Ravenna Environmental Office

1438 State Route 534 SW
Newton Falls, Ohio 44444

15 **7.4 U.S. Army Review of Public** 16 **Comments**

17 The U.S. Army will review all public comments
18 before selecting the most appropriate action for
19 the MRS. A **Responsiveness Summary**, a
20 document that summarizes the U.S. Army's
21 responses to comments received during the public
22 comment period, will be included in the ROD.
23 The U.S. Army's final choice of action will be
24 documented in the ROD. The ROD will be added
25 to the RVAAP Administrative Record and
26 Information Repositories.

GLOSSARY OF TERMS

- 1 **Administrative Control:** Direction or exercise
2 of authority over subordinate or other
3 organizations in respect to administration and
4 support, including organization of Service
5 forces, control of resources and equipment,
6 personnel management, unit logistics,
7 individual and unit training, readiness,
8 mobilization, demobilization, discipline, and
9 other matters not included in the operational
10 missions of the subordinate or other
11 organizations.
- 12 **Administrative Record:** A collection of
13 documents, typically reports and
14 correspondence, generated during site
15 investigation and remedial activities.
16 Information in the Administrative Record is
17 used to select the preferred remedy. It is
18 available for public review at the Camp
19 Ravenna Environmental Office; call
20 (330) 872-8003 for an appointment.
- 21 **Booster:** A sensitive explosive charge that acts as
22 a bridge between a (relatively weak)
23 conventional detonator and a low-sensitivity
24 (but typically high-energy) explosive such as
25 TNT. By itself, the initiating detonator would
26 not deliver sufficient energy to set off the low-
27 sensitivity charge. However, it detonates the
28 primary charge (the booster), which then
29 delivers an explosive shockwave sufficient to
30 detonate the secondary, main, high-energy
31 charge.
- 32 **Comprehensive Environmental Response,
33 Compensation, and Liability Act of 1980
34 (CERCLA):** This federal law was passed in
35 1980 and is commonly referred to as the
36 Superfund Program. It provides for liability,
37 compensation, cleanup, and emergency
38 response in connection with the cleanup of
39 inactive hazardous waste release sites that
40 endanger public health or the environment.
- 41 **Demilitarization:** The reduction of one or more
42 types of weapons or weapons systems.
- 43 **Depot Storage:** A designated location for the
44 storage of military supplies.
- 45 **Digital Geophysical Mapping:** The process by
46 which geological features are observed,
47 analyzed, and recorded in the field and
48 displayed in real-time on a computer or
49 personal digital assistant.
- 50 **Discarded Military Munitions (DMM):**
51 Military munitions that have been abandoned
52 without proper disposal or removed from
53 storage in a military magazine or other storage
54 area for the purpose of disposal. The term does
55 not include **unexploded ordnance (UXO)**,
56 military munitions that are being held for future
57 use or planned disposal, or military munitions
58 that have been properly disposed of in a manner
59 consistent with applicable environmental laws
60 and regulations.
- 61 **Department of Defense (DoD) Military
62 Munitions:** A munition or explosive deposited
63 by DoD activities that may pose an explosive
64 safety risk because it either did not function as
65 designed, was discharged and/or abandoned, or
66 is an explosive constituent. The term includes
67 UXO, DMM, and munitions constituents (MC).
- 68 **Earthen Settling Pond:** An earthen structure that
69 uses sedimentation to remove settleable matter
70 and turbidity from wastewater.
- 71 **Environmental Receptor:** Any living organisms
72 other than humans, the habitat that supports
73 such organisms, or natural resources that could
74 be adversely affected by environmental
75 contaminations resulting from a release at or
76 migration from a site.
- 77 **Explosive Hazard:** Any hazard containing an
78 explosive component. Explosive hazards
79 include unexploded explosive ordnance
80 (including landmines), booby traps, improvised
81 explosive devices, and bulk explosives.
- 82 **Feasibility Study:** A study undertaken by the
83 lead agency to develop and evaluate options for
84 remedial action. The RI data are used to define
85 the objectives of the response action, to develop
86 remedial action alternatives, and to undertake
87 an initial screening and detailed analysis of the
88 alternatives. The term also refers to a report that
89 describes the results of the study.
- 90 **Fuze:** A device that detonates a munition's
91 explosive material under specified conditions.
92 In addition, a fuze has safety and arming

GLOSSARY OF TERMS

1 mechanisms that protect users from premature
2 or accidental detonation.

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

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

19 **Installation Restoration Program (IRP):** A
20 comprehensive program to identify,
21 investigate, and clean up contamination at
22 active/operating U.S. Army installations.
23 Eligible sites include those contaminated by
24 past defense activities that require response
25 under CERCLA, as amended by the Superfund
26 Amendments and Reauthorization Act, and
27 certain corrective actions required by the
28 Resource Conservation and Recovery Act. The
29 objective of the IRP is to clean up contaminated
30 environmental impacts from past U.S. Army
31 activities with the following goals: (1) reduce
32 risk to acceptable levels to protect the health
33 and safety of installation personnel and the
34 public and (2) restore the quality of the
35 environment. The IRP also complies with state,
36 regional, and local requirements applicable to
37 the cleanup of hazardous materials
38 contamination, as well as related site safety.
39 Community involvement activities are an
40 integral part of the U.S. Army's IRP.
41 Installation commanders seek community
42 involvement early and throughout the cleanup
43 process.

44 **Instrument-Assisted Visual Survey:** An
45 investigation process whereby a line of
46 unexploded ordnance technicians walks across
47 the property in a systematic manner to identify
48 items on the ground surface by sight or metallic

49 items on or just below the ground surface using
50 a magnetometer or other instrument. This
51 approach is necessary in areas where there is
52 vegetation that cannot be removed.

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

61 **Military Munitions Response Program**
62 **(MMRP):** A U.S. Department of Defense
63 program consisting of actions necessary to
64 ensure protection of human health, welfare, and
65 the environment from the hazards associated
66 with DoD military munitions and MC-related
67 contamination at locations impacted by
68 historical military activities.

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

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

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

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

93 **National Oil and Hazardous Substances**
94 **Pollution Contingency Plan:** The National Oil

GLOSSARY OF TERMS

1 and Hazardous Substances Pollution
2 Contingency Plan is a collection of CERCLA
3 regulations that provide the U.S. Government
4 the authority to respond to the problems of
5 abandoned or uncontrolled hazardous waste
6 disposal sites as well as to certain incidents
7 involving hazardous wastes (e.g., spills).

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

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

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

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

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

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

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

43 **Remedial Investigation (RI):** A CERCLA
44 investigation that involves sampling
45 environmental media, such as air, soil, and
46 water, to determine the nature and extent of

47 contamination and to calculate human health
48 and environmental risks that result from the
49 contamination.

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

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

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

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

70 **Unexploded Ordnance (UXO):** Military
71 munitions that: (a) Have been primed, fuzed,
72 armed, or otherwise prepared for actions; (b)
73 Have been fired, dropped, launched, projected,
74 or placed in such a manner as to constitute a
75 hazard to operations, installations, personnel, or
76 material; and (c) Remain unexploded whether
77 by malfunction, design, or any other cause.

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

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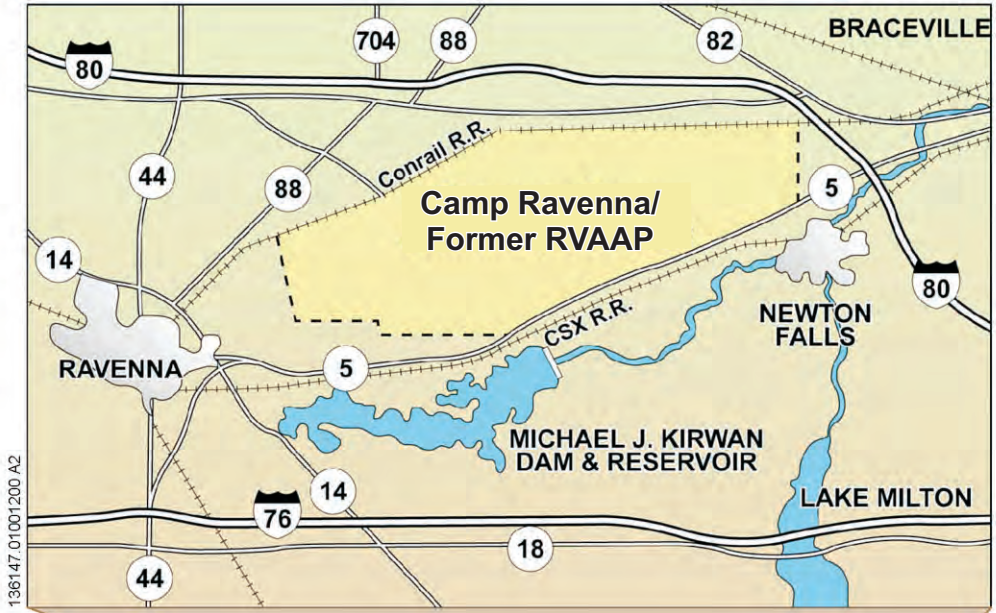
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3 *RVAAP-016-R-01 Fuze and Booster Quarry*
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17 *and Booster Quarry MRS, Version 1.0. Former*
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19 *Trumbull Counties, Ohio.* January.
- 20 Ohio Environmental Protection Agency
21 (Ohio EPA), 2004. *Director's Final Findings*
22 *and Orders (DFFO) for RVAAP,* Division of
23 *Emergency and Remedial Response,* June 10.

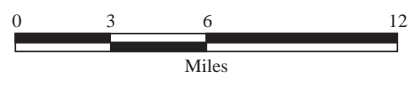
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FIGURES

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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

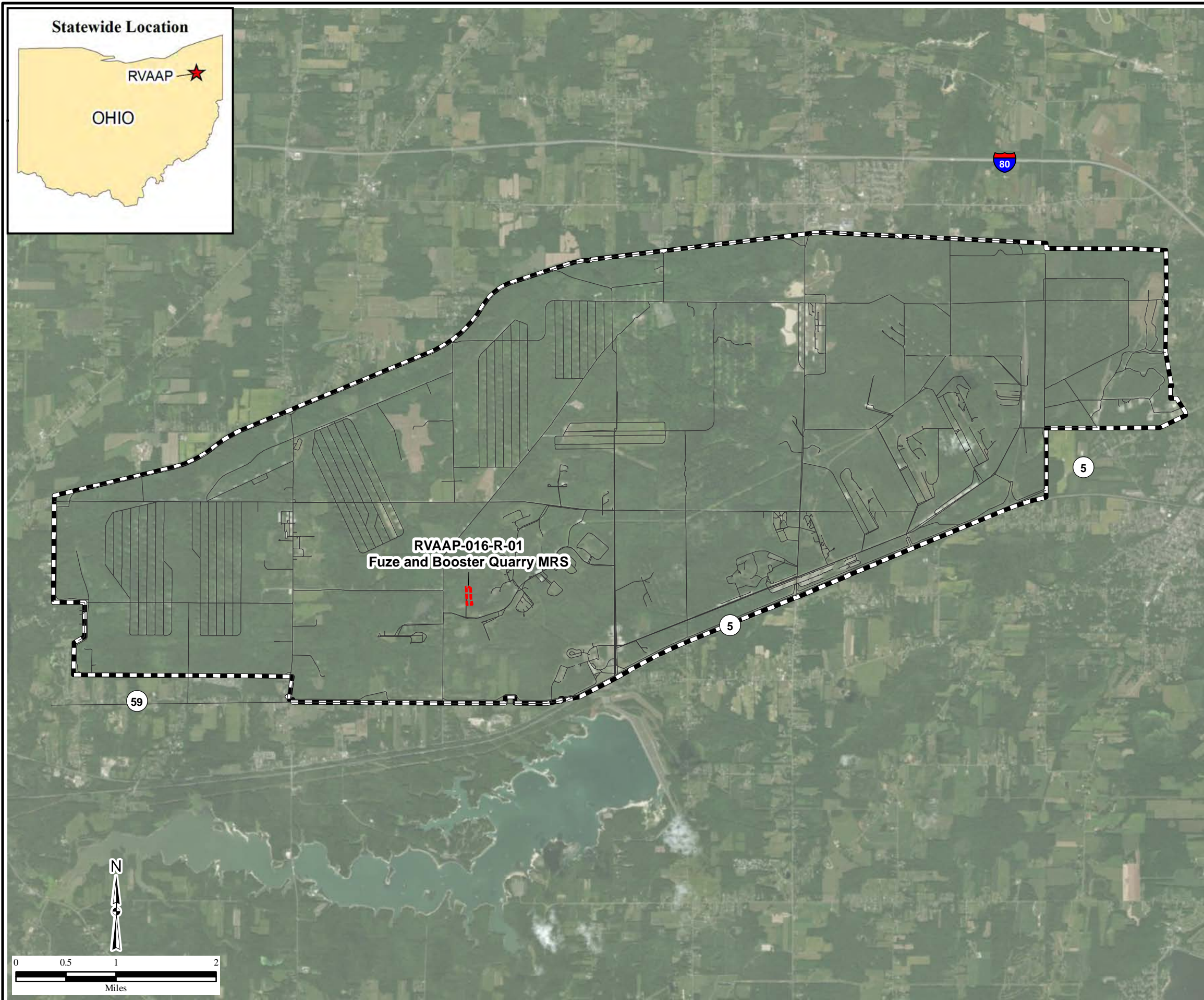
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Figure 2
MRS Location
Fuze and Booster Quarry
Camp Ravenna/Former RVAAP
Portage and Trumbull Counties, Ohio

Legend

- Road
- ▭ MRS
- ▭ Installation Boundary

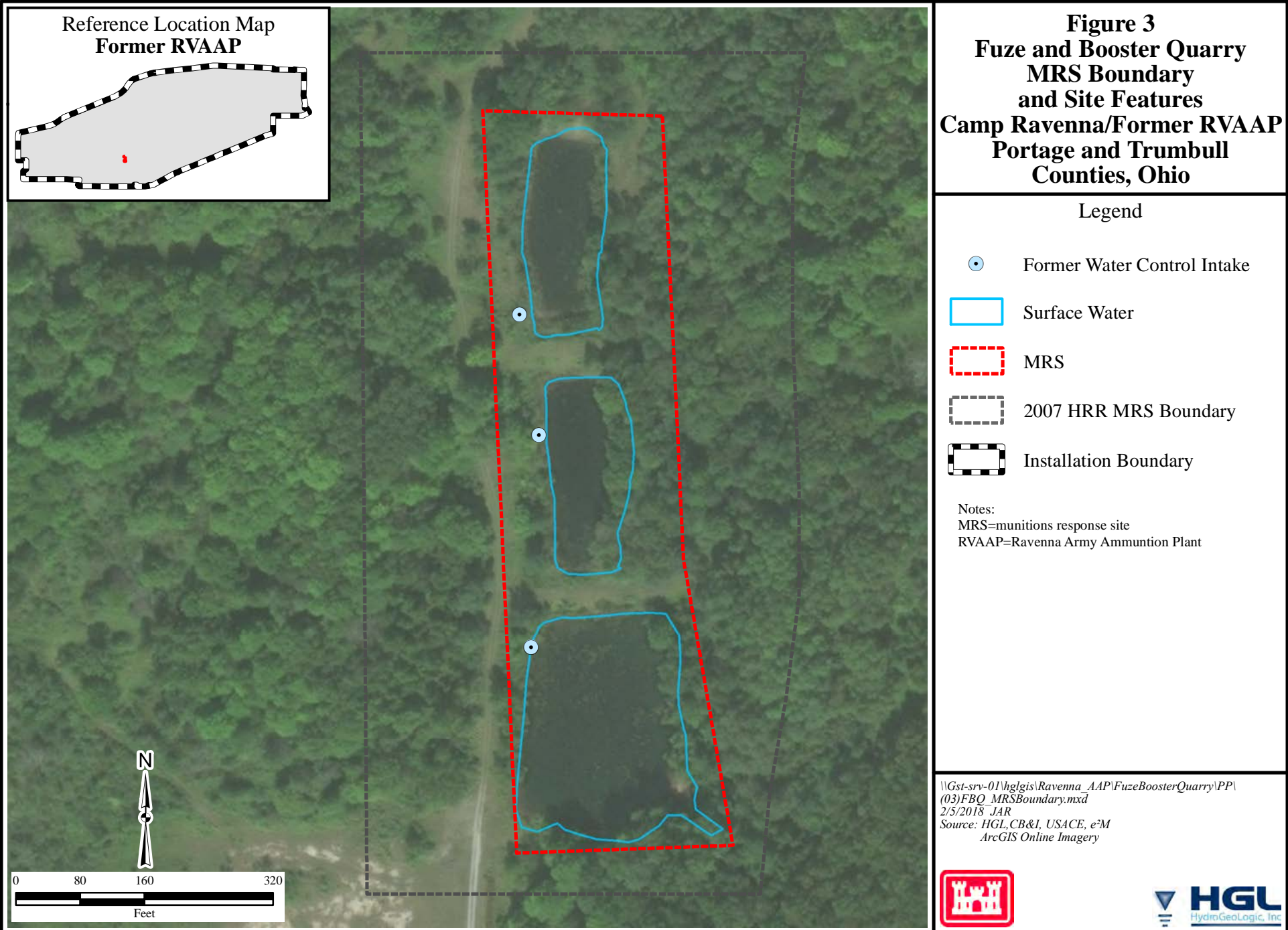
Notes:
MRS=munitions response site
RVAAP=Ravenna Army Ammunition Plant



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2/5/2018 JAR
Source: HGL, CB&I, USACE, e2M
ArcGIS Online Imagery



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Reference Location Map
Former RVAAP

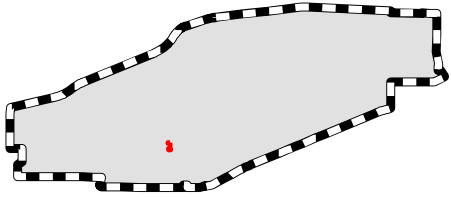


Figure 4
2007 Site Inspection Results
Camp Ravenna/Former RVAAP
Portage and Trumbull
Counties, Ohio

Legend

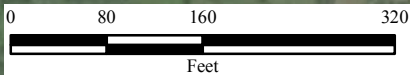
- Munitions Debris
- - - > Meandering Path Survey Transect
- Subsurface Anomalies
- Surface Water
- - - MRS
- Installation Boundary

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

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(04)FBQ_S1.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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Reference Location Map
Former RVAAP

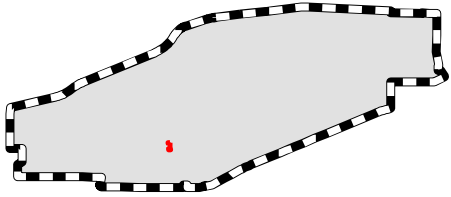









Figure 5
2015 Remedial
Investigation Results
Camp Ravenna/Former RVAAP
Portage and Trumbull
Counties, Ohio

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

\\Gst-srv-01\hglgis\Ravenna_AAP\FuzeBoosterQuarry\PP\
(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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