

1 **Draft**
2 **No Further Action Proposed Plan**
3 **for**
4 **RVAAP-032-R-01 40mm Firing Range Munitions Response Site**
5 **Version 1.0**

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

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

10 **Prepared for:**



11 **US Army Corps
of Engineers®**

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21 **March 2018**

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REPORT DOCUMENTATION PAGE

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14. ABSTRACT The U.S. Department of the Army (U.S. Army) is presenting this No Further Action (NFA) Proposed Plan to involve the public in the remedy selection process for the former Ravenna Army Ammunition Plant, RVAAP-032-R-01 40mm Firing Range Munitions Response Site (MRS), in Portage and Trumbull Counties, Ohio. This NFA Proposed Plan presents the U.S. Army's preliminary recommendations for addressing the RVAAP-032-R-01 40mm Firing Range 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.					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
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1

PLACEHOLDER PAGE FOR:

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Documentation of Ohio EPA Concurrence of Final Document

3

(Documentation to be provided once concurrence is issued.)

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1 **DISCLAIMER STATEMENT**

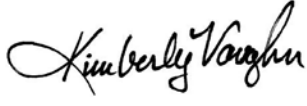
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7 contents hereof.

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1 **CONTRACTOR’S STATEMENT OF INDEPENDENT TECHNICAL REVIEW**

2 HydroGeoLogic, Inc., has completed the *Draft No Further Action Proposed Plan for*
3 *RVAAP-032-R-01 40mm Firing Range Munitions Response Site, Version 1.0*, at the Ravenna
4 Army Ammunition Plant in Portage and Trumbull Counties, Ohio. Notice is hereby given
5 that an independent technical review has been conducted that is appropriate to the level of
6 risk and complexity inherent in the project. During the independent technical review,
7 compliance with established policy, principles, and procedures, utilizing justified and valid
8 assumptions, was verified. This included review of data quality objectives; technical
9 assumptions; methods, procedures and materials to be used; the appropriateness of data used
10 and level of data obtained; and reasonableness of the results, including whether the product
11 meets customer’s needs consistent with law and existing United States Army Corps of
12 Engineers policy.

Prepared/Approved by:  Date: February 27, 2018
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DOCUMENT DISTRIBUTION

Draft No Further Action Proposed Plan for RVAAP-032-R-01 40mm Firing Range MRS, Version 1.0

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- 4
- 5 ARNG – Army National Guard
- 6 COR – Contracting Officer’s Representative
- 7 IED – Installation and Environmental Division
- 8 OHARNG – Ohio Army National Guard
- 9 USACE – United States Army Corps of Engineers
- 10

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37

ACRONYMS AND ABBREVIATIONS

1	ARAR	applicable relevant and	48	NCP	<i>National Oil and</i>
2		appropriate requirements	49		<i>Hazardous Substances</i>
3	Army	U.S. Department of the	50		<i>Pollution Contingency</i>
4		Army	51		<i>Plan</i>
5	CB&I	CB&I Federal Services	52	NFA	No Further Action
6		LLC	53	OHARNG	Ohio Army National
7	Camp Ravenna	Camp Ravenna Joint	54		Guard
8		Military Training Center	55	Ohio EPA	Ohio Environmental
9	CERCLA	<i>Comprehensive</i>	56		Protection Agency
10		<i>Environmental Response,</i>	57	RDX	Research Department
11		<i>Compensation, and</i>	58		Explosives
12		<i>Liability Act of 1980</i>	59	RI	Remedial Investigation
13	DMM	discarded military	60	ROD	Record of Decision
14		munitions	61	RVAAP	Ravenna Army
15	DoD	U.S. Department of	62		Ammunition Plant
16		Defense	63	SI	Site Inspection
17	e ² M	engineering-	64	TNT	2,4,6-Trinitrotoluene
18		environmental	65	U.S.	United States
19		Management, Inc.	66	USP&FO	U.S. Property and Fiscal
20	Final FS	<i>Final Feasibility Study</i>	67		Officer for Ohio
21		<i>for RVAAP-032-R-01</i>	68	UXO	unexploded ordnance
22		<i>40mm Firing Range</i>			
23		<i>Munitions Response Site,</i>			
24		<i>Version 1.0</i>			
25	Final RI Report	<i>Final Remedial</i>			
26		<i>Investigation Report for</i>			
27		<i>RVAAP-032-R-01 40mm</i>			
28		<i>Firing Range Munitions</i>			
29		<i>Response Site</i>			
30	FS	Feasibility Study			
31	HE	high explosives			
32	HGL	HydroGeoLogic, Inc.			
33	HRR	Historical Records			
34		Review			
35	ISM	Incremental Sampling			
36		Methodology			
37	LUC	land use control			
38	MC	munitions constituents			
39	MD	munitions debris			
40	MEC	munitions and explosives			
41		of concern			
42	MMRP	Military Munitions			
43		Response Program			
44	MRS	Munitions Response Site			
45	MRSPP	Munitions Response Site			
46		Prioritization Protocol			
47					

1 **1.0 INTRODUCTION**

2 The United States (U.S.) Department of the
3 Army (Army) is presenting this No Further
4 Action (NFA) **Proposed Plan** to involve the
5 public in the **remedy selection process** for the
6 RVAAP-032-R-01 40mm Firing Range
7 **Munitions Response Site (MRS)**. The former
8 Ravenna Army Ammunition Plant (RVAAP) is
9 located in Portage and Trumbull Counties,
10 Ohio, as shown on **Figure 1**. The location of
11 the 40mm Firing Range MRS in relation to the
12 former RVAAP is shown on **Figure 2**.

13 The Army, in consultation with the Ohio
14 Environmental Protection Agency (Ohio EPA),
15 is the lead agency for investigating, reporting,
16 making **remedial decisions**, and taking
17 **remedial actions** at the former RVAAP. This
18 NFA Proposed Plan presents the Army's
19 preliminary recommendations for addressing
20 the 40mm Firing Range MRS. Investigations
21 indicate that no **U.S. Department of Defense**
22 **(DoD) military munitions** were confirmed as
23 **munitions and explosives of concern (MEC)**
24 or risks associated with **munitions**
25 **constituents (MC)**-related contamination exist.

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

40 This NFA Proposed Plan summarizes
41 information contained in the *Final Remedial*
42 *Investigation Report for RVAAP-032-R-01*
43 *40mm Firing Range Munitions Response Site,*
44 *Version 1.0* (Final **Remedial Investigation**
45 **[RI]** Report; CB&I Federal Services LLC
46 [CB&I], 2015) and the *Final Feasibility Study*
47 *for RVAAP-032-R-01 40mm Firing Range*

48 *Munitions Response Site, Version 1.0* (Final
49 **Feasibility Study [FS]**) (HydroGeoLogic, Inc.
50 [HGL], 2018). The Army encourages the public
51 to review these documents to better understand
52 the history of the MRS, activities that have
53 been conducted there, and determinations that
54 have been made for the MRS under the
55 **Military Munitions Response Program**
56 **(MMRP)**.

57 The Army, in consultation with the Ohio EPA,
58 will review and consider all comments on this
59 NFA Proposed Plan received during the 30-day
60 public comment period. The public is
61 encouraged to review and comment on all
62 recommendations presented in this NFA
63 Proposed Plan.

64 **2.0 FACILITY AND MRS**
65 **BACKGROUNDS**

66 This section summarizes the history of the
67 former RVAAP and the 40mm Firing Range
68 MRS.

69 **2.1 Facility History**

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

86 **Administrative control** of the 21,683-acre
87 facility has been transferred to the U.S.
88 Property and Fiscal Officer for Ohio
89 (USP&FO) and subsequently licensed to the
90 Ohio Army National Guard (OHARNG) for
91 use as a training site, Camp Ravenna. The
92 restoration program for the facility involves the
93 remediation of areas affected by past activities
94 of the former RVAAP.

Public Comment Period:

_____ to _____, 2018

Public Meeting:

The Army will hold an open house/public meeting to explain the NFA Proposed Plan. Oral and written comments on the document will be accepted at the meeting. The open house/public meeting is scheduled for 6:00 p.m. on _____, 2018, at the _____.

Information Repositories:

Information used in selecting the **Preferred Alternative** 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 Alternative, 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.

2 The former RVAAP was constructed in 1940
3 and 1941 for assembly/loading and **depot**

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

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

43 In addition to production and demilitarization
44 activities at the load lines, other facilities at the
45 former RVAAP included areas used for the
46 burning, demolition, and testing of munitions.
47 These burning and demolition grounds
48 consisted of large, open areas and abandoned
49 quarries. Other areas of concern at the former
50 RVAAP include landfills, an aircraft fuel tank

1 testing area, and various industrial support and
2 maintenance facilities (CB&I, 2015).

3 **2.2 MRS Background and History**

4 The 40mm Firing Range MRS is an 8.55-acre
5 parcel located in the southern-central portion of
6 Camp Ravenna within Portage County. The
7 MRS is the location of a former 40mm **firing**
8 **range** that operated between 1969 and 1971.
9 The area of the MRS consists of the 5.17 acres
10 former firing range itself and the overshot area
11 that includes the furthest location that a 40mm
12 grenade used at the former range could have
13 travelled from the firing point. Munitions
14 reportedly fired at the former firing range
15 included the M407A1-series 40mm **practice**
16 **grenades** and the M406-series **high explosive**
17 **(HE)** 40mm grenade. The 40mm practice
18 grenades contained yellow marker dye,
19 M9-series **propellant**, and RDX booster pellets
20 (Army, 1977). The M406-series HE 40mm
21 grenades contained Composition B explosive
22 (engineering-environmental Management, Inc.
23 [e²M], 2007). According to the *Final*
24 *Installation Assessment of RVAAP Report No.*
25 *132* (U.S. Army Toxic and Hazardous
26 Materials Agency, 1978), each of the
27 approximately 2,500 rounds fired on this range
28 was accounted for.

29 The furthest possible target distance for the
30 40mm grenades reported to have been fired at
31 the MRS is 350 meters from the firing point
32 (Army, 2003). The target impact area was well-
33 defined with a **berm** that has since been
34 removed. The firing point was situated at the
35 eastern portion of the former range. Remnants
36 of the firing point location still remain and
37 include a wooden structure believed to be the
38 former storage shed, gun mount foundation,
39 and chronograph foundation (CB&I, 2015).

40 **2.3 MRS Historical Investigations**

41 The following investigations and reports have
42 been completed for the 40mm Firing Range
43 MRS under the MMRP:

- 44 • *Final Military Munitions Response Program*
45 *Historical Records Review (HRR), Ravenna*

46 *Army Ammunition Plant, Ohio* (HRR;
47 e²M, 2007)

- 48 • *Final Site Inspection Report, Ravenna Army*
49 *Ammunition Plant, Ohio* (Final Site
50 Inspection [SI] Report; e²M, 2008)

- 51 • Final RI Report (CB&I, 2015)

- 52 • Final FS (HGL, 2018)

53 **2.3.1 Historical Records Review**

54 The HRR described the 40mm Firing Range as
55 an approximate 5.17-acre area surrounded by
56 forest. A wooden structure believed to be the
57 former storage shed, gun mount foundation,
58 and chronograph foundation located at the
59 firing point were the only remnants of range, as
60 the impact area berm had been removed. The
61 HRR reported that facility personnel identified
62 **unexploded ordnance** (UXO) beyond the
63 impact point, on the slope that leads down to
64 the Fuze and Booster Quarry MRS. However,
65 the HRR did not identify the type or disposition
66 of the UXO reported by the facility personnel
67 (e²M, 2007).

68 **2.3.2 Site Inspection Summary**

69 In 2007, the Army completed an MMRP SI at
70 Camp Ravenna that included the 40mm Firing
71 Range MRS. At the time of the SI, the size of
72 the 40mm Firing Range MRS was
73 approximately 5.17 acres that included an open
74 field surrounded by forest. As part of the SI
75 activities, a meandering path magnetometer and
76 metal detector assisted surveys for DoD
77 military munitions were completed at the
78 down-range target impact area, overshot area,
79 and firing point portions at the MRS

80 No DoD military munitions that were
81 confirmed as MEC were observed at the firing
82 point or in the area between the firing point and
83 impact area; however, multiple DoD military
84 munitions that were confirmed by UXO-
85 qualified personnel as munitions debris (MD)
86 were found on the ground surface at the
87 suspected impact area and 100 feet beyond.
88 The MD consisted of aluminum 40mm grenade
89 nose caps and casings.

1 No samples for MC-related contamination were
2 planned for the SI field activities since
3 chemical contamination at the MRS was still
4 being addressed under the Installation
5 Restoration Program at the time of the SI work
6 plan development. However, by the time the SI
7 Report was completed, the responsibility for
8 investigation for MC-related contamination at
9 the MRS was to be addressed under the MMRP
10 going forward.

11 The impact and overshoot areas where the MD
12 was found encompassed 1.27 acres and became
13 the revised MRS following the SI (e²M, 2008).
14 **Figure 3** presents the impact and overshoot area
15 at the MRS and the results of the SI field work.

16 **2.4 Remedial Investigation Results**

17 During planning for the RI field work, the
18 previous findings of MD were evaluated and it
19 was determined that the area between the firing
20 point and the furthest possible target distance
21 for the 40mm grenades reported to have been
22 fired at the former 40mm Firing Range
23 (350 meters from the firing point) required
24 further investigation for DoD military
25 munitions. The revised RI area was determined
26 to be 8.55 acres that was inclusive of the
27 1.27-acre MRS identified during the SI. The
28 combined area was referred to as the
29 “Investigation Area” in the Final RI Report
30 (CB&I, 2015). Numerous DoD military
31 munitions were encountered on the ground
32 surface and in subsurface soils. The items were
33 evaluated by UXO-qualified personnel,
34 determined to be safe, and considered MD. The
35 MD were associated with the 40mm practice
36 grenades that are known to have been
37 discharged at the former firing range. No DoD
38 military munitions confirmed to be MEC were
39 identified at the 40mm Firing Range MRS
40 during the RI field activities.

41 Sampling for MC-related contamination was
42 conducted during the RI at predetermined
43 locations at the former impact area and 100 feet
44 beyond as well as the location of the former
45 firing point. In all, a total of three surface soil
46 samples, not including quality control samples,
47 were collected during the RI using the

48 **Incremental Sampling Methodology (ISM).**
49 Two ISM surface soil samples, each
50 comprising 0.63 acres, were collected at the
51 impact area and 100 feet beyond. A third ISM
52 sample was collected at the 0.05-acre firing
53 point at the east end of the former firing range.
54 All three ISM samples were collected at depths
55 between 0 and 0.5 feet. The soil sample
56 locations were based on locations where the
57 MD was identified and where MC-related
58 contamination associated with historical
59 activities were expected. The MC-related
60 contamination sampling locations are presented
61 in **Figure 4**.

62 The analytes detected during the RI sampling
63 event consisted of **nitroguanidine** at the firing
64 point and **aluminum** and **lead** at the former
65 down range impact area. Nitroguanidine was
66 detected at a very low concentration and is not
67 an MC-related contaminant associated with the
68 40mm practice rounds fired at the former test
69 range. Therefore, nitroguanidine was removed
70 from further consideration as an MC-related
71 contaminant at the MRS. The concentrations
72 for both aluminum and lead were all detected
73 below the Camp Ravenna **background**
74 **screening values** and were not retained as
75 MC-related contamination. Because no
76 detected analytes were identified as MC-related
77 contamination during the RI field activities, a
78 **Human Health Risk Assessment** and
79 **Ecological Risk Assessment** were not required
80 for inclusion in the Final RI Report.

81 The 8.55-acre Investigation Area where the
82 MD was found became the MRS following the
83 RI (CB&I, 2015). **Figure 4** depicts the current
84 MRS boundaries, the site features associated
85 with the historical activities that occurred at the
86 MRS, and the locations where MD were found
87 during the RI field work.

88 To date, no DoD military munitions confirmed
89 to be MEC have been found at the 40mm Firing
90 Range MRS. The RI fieldwork confirmed the
91 results of previous investigations at the MRS;
92 therefore, an explosive hazard is not expected
93 to be present at the MRS. As a result, no MEC
94 hazard assessment was required. The results of

1 the RI did not indicate the presence of
2 MC-related contamination at the MRS. The
3 MRS was assigned a **Munitions Response Site**
4 **Prioritization Protocol** (MRSPP) priority of 5
5 (CB&I, 2015).

6 **3.0 EVALUATION OF THE NO** 7 **FURTHER ACTION ALTERNATIVE**

8 Based on further evaluation of the RI results,
9 the Army concluded the 40mm Firing Range
10 MRS be recommended for NFA. The Army
11 also determined that, because the RI
12 recommended conducting a FS, the FS should
13 be conducted to provide the necessary rationale
14 to support and document the NFA
15 determination. An FS (HGL, 2018) was
16 prepared by the Army to perform a detailed
17 analysis of the NFA alternative for the MRS.
18 The purpose of this detailed analysis was to
19 support NFA at the MRS.

20 **3.1 Detailed Analysis of NFA Alternative**

21 The detailed analysis presented in the Final FS
22 (HGL, 2018) consisted of evaluating the NFA
23 alternative using the nine criteria listed in the
24 NCP. The NCP states that the first two criteria,
25 protection of human health and the
26 environment and compliance with **applicable**
27 **or relevant and appropriate requirements**
28 (ARARs), are “threshold criteria” that must be
29 met by the selected remedial action unless a
30 waiver is granted under Section 121(d)(4) of
31 CERCLA. The next five criteria are “primary
32 balancing criteria,” and the trade-offs within
33 this group must be balanced. The final two
34 criteria, state and community acceptance, are
35 “modifying criteria” that are evaluated
36 following the comment periods on the Final FS
37 (HGL, 2018) and the Proposed Plan.

38 **Threshold Criteria**

39 *Overall Protection of Human Health and the*
40 *Environment*—A determination and declaration
41 that this threshold criterion will be met by the
42 selected remedy must be made in the **Record**
43 **of Decision** (ROD). The threshold criterion will
44 be met if the risks associated with the human
45 exposures are eliminated, reduced, or
46 controlled through treatment, engineering, or

47 **land use controls** (LUCs), and if the remedial
48 action is protective of the environment. No
49 explosive hazards or unacceptable risks
50 associated with MC-related contamination are
51 present at the MRS; therefore, the No Action
52 alternative is protective of human health and
53 the environment and meets this criterion.

54 *Compliance with ARARs*—Compliance with
55 ARARs is a threshold criterion that must be
56 met by the proposed remedial alternative. There
57 are no chemical-specific, location-specific, or
58 action-specific ARARs identified for this
59 alternative. Therefore, the No Action
60 alternative meets this criterion.

61 **Balancing Criteria**

62 *Long-Term Effectiveness and Permanence*—
63 The long-term level of risk associated with
64 DoD military munitions and MC-related
65 contamination after implementation of the
66 remedial alternative is evaluated by this
67 criterion. No explosive hazards or unacceptable
68 risks associated with MC-related contamination
69 are present at this MRS; therefore, the No
70 Action alternative will be effective in the long-
71 term and no residual hazards or risks will
72 remain at the MRS.

73 *Reduction of Toxicity, Mobility, or Volume*
74 *Through Treatment*—The statutory preference
75 for remedial technologies that significantly and
76 permanently reduce the **toxicity, mobility, or**
77 **volume** of the waste is addressed by this
78 criterion. The No Action alternative includes no
79 treatment because there are no explosive
80 hazards or unacceptable risks associated with
81 MC-related contamination present at the MRS.

82 *Short-Term Effectiveness*—Because no active
83 remediation activities are conducted, no
84 additional hazards are posed to current
85 receptors or the future industrial receptor as a
86 result of implementing the No Action
87 alternative. The No Action alternative will not
88 result in any adverse short-term effects on the
89 environment.

90 *Implementability*—The technical and
91 administrative feasibility of implementing the
92 remedial alternative will be addressed.

1 Technical feasibility refers to the ability to
2 construct, reliably operate, and meet
3 technology-specific regulations for process
4 options until a remedial action is complete; it
5 also includes operation, maintenance,
6 replacement, and monitoring of technical
7 components of an alternative, if required, into
8 the future after the remedial action is complete.
9 Administrative feasibility refers to the ability to
10 obtain approvals from other offices and
11 agencies, the availability of treatment, storage,
12 and disposal services and capacity, and the
13 requirements for, and availability of, specific
14 equipment and technical specialists. The No
15 Action alternative does not involve active
16 remediation; therefore, technical feasibility is
17 not a consideration. No services or equipment
18 are necessary to implement the No Action
19 alternative. This alternative will not interfere
20 with any planned remedial action in the future.
21 The No Action alternative is administratively
22 feasible to OHARNG/Camp Ravenna because
23 no explosive hazards or unacceptable risks
24 associated with MC-related contamination are
25 present on the MRS and no services or
26 equipment is necessary to implement this
27 alternative. The No Action alternative is
28 expected to receive Ohio EPA concurrence
29 because no explosive hazards or unacceptable
30 risks associated with MC-related contamination
31 are present at the MRS.

32 *Cost*—Capital and long-term management
33 costs are estimated under this criterion. The No
34 Action alternative does not include treatment,
35 removal, or any other remedial action because
36 no explosive hazards or risks due to MC-related
37 contamination are present.

38 *Modifying Criteria*

39 *State Acceptance*—The Ohio EPA has
40 indicated they support NFA as the Preferred
41 Alternative recommended in this Proposed
42 Plan; however, final approval may be reserved
43 until public comments are satisfactorily
44 addressed in the ROD.

45 *Community Acceptance* — Community
46 acceptance of the Preferred Alternative will be

47 evaluated after the public comment period ends
48 and will be described in the ROD for the MRS.

49 **3.2 Overall Evaluation**

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

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

61 **4.0 SCOPE AND ROLE OF RESPONSE** 62 **ACTION**

63 The results of the RI fieldwork and evaluation
64 in the Final FS (HGL, 2018) for the 40mm
65 Firing Range MRS support the selection of
66 NFA as the Preferred Alternative for the MRS.
67 The remedy must be protective of the receptors
68 associated with the future land use. The future
69 land use at the 40mm Firing Range MRS will
70 include maintenance and natural resource
71 activities. It will also include military training
72 and most likely construction activities as part of
73 military use. The likely **human receptor** for
74 the future land is the Industrial Receptor.
75 **Environmental receptors** for the future land
76 use include terrestrial invertebrates
77 (earthworms), voles, shrews, robins, foxes, and
78 hawks (CB&I, 2015).

79 No DoD military munitions confirmed to be
80 MEC were encountered at the 40mm Firing
81 Range MRS. The results of the RI did not
82 indicate the presence of MC-related
83 contamination at the MRS. Therefore, no
84 explosive safety hazards or risks associated
85 with MC-related contamination exist for the
86 receptors that may be present on the MRS. No
87 other investigations are ongoing at the MRS
88 under the MMRP.

1 **5.0 SUMMARY OF HUMAN AND**
2 **ECOLOGICAL RISKS**

3 Under the MMRP, a recommendation of NFA
4 must be protective of the human and
5 environmental receptors at the MRS. The likely
6 human receptors identified for future land use
7 at the 40mm Firing Range MRS is the
8 Industrial Receptor. The likely environmental
9 receptors include terrestrial invertebrates
10 (earthworms), voles, shrews, robins, foxes,
11 hawks (CB&I 2015).

12 No DoD military munitions confirmed to be
13 MEC are present on the MRS. Therefore, no
14 explosive safety hazard or risks associated with
15 MC-related contamination exist at the MRS.

16 **6.0 CONCLUSIONS AND**
17 **RECOMMENDATIONS**

18 The results of the RI fieldwork and the
19 evaluation conducted in the FS for the 40mm
20 Firing Range MRS support the determination
21 that there are no hazards associated with
22 exposure to DoD military munitions and
23 MC-related contamination to human or
24 environmental receptors exist at the 40mm
25 Firing Range MRS. The Army, in consultation
26 with the Ohio EPA, is recommending NFA as
27 the Preferred Alternative under the MMRP for
28 the MRS.

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

38 **7.0 COMMUNITY PARTICIPATION**

39 Public participation is an important component
40 of the remedy selection process. The Army, in
41 coordination with the Ohio EPA, is soliciting
42 input from the community on the Preferred
43 Alternative. The comment period extends from
44 [redacted]. This period includes a
45 public meeting at which the Army will present

46 this NFA Proposed Plan. The Army will accept
47 oral and written comments on the NFA
48 Proposed Plan at this meeting.

49 **7.1 Public Comment Period**

50 The 30-day comment period extends from [redacted]
51 to [redacted], 2018, and provides an opportunity for
52 public involvement in the decision-making
53 process for the proposed action. The public is
54 encouraged to review and comment on this
55 NFA Proposed Plan. The Army and Ohio EPA
56 will consider all public comments before
57 selecting a remedy. During the comment
58 period, the public is also encouraged to review
59 documents pertinent to the 40mm Firing Range
60 MRS. This information is available at the
61 Information Repositories and online at
62 www.rvaap.org. To obtain further information,
63 contact the Camp Ravenna Environmental
64 Office.

65 **7.2 Public Meeting**

66 The Army will hold an open house and public
67 meeting on this NFA Proposed Plan on [redacted],
68 2018, at [redacted]. This
69 meeting will provide an opportunity for the
70 public to comment on the proposed remedy.
71 Comments made at the meeting will be
72 transcribed.

73 **7.3 Written Comments**

74 If the public would like to provide comments,
75 questions, or suggestions on this NFA Proposed
76 Plan or other relevant issues in writing, they
77 should be delivered to the Army at the public
78 meeting or mailed (postmarked no later than
79 [redacted], 2018). The public can also submit
80 comments, questions, or suggestions via email
81 before the end of the comment period to the
82 Camp Ravenna Environmental Office using the
83 following email address:
84 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

1 **7.4 Army Review of Public Comments**

2 The Army will review the public's comments
3 before selecting the most appropriate action for
4 the MRS. A **Responsiveness Summary**, a
5 document that summarizes the Army's
6 responses to comments received during the
7 public comment period, will be included in the
8 ROD. The Army's final choice of action will be
9 documented in the ROD. The ROD will be
10 added to the RVAAP Administrative Record
11 and 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:** This is 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 Alternative. It is
18 available for public review at the Ravenna
19 Army Ammunition Plant, Building 1037; call
20 (330) 358-7311 for an appointment.

21 **Aluminum:** Aluminum and its compounds
22 occur naturally and comprise about 8% of the
23 Earth's surface. Natural processes account for
24 most of the redistribution of aluminum in the
25 environment. Acidic precipitation mobilizes
26 aluminum from natural sources, and direct
27 anthropogenic (i.e., human made) releases of
28 aluminum compounds associated with
29 industrial processes occur mainly to air.
30 Certain uses lead to the presence of
31 aluminum in drinking water and foodstuffs.

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

37 **Background Screening Values:**
38 Concentrations established at Camp Ravenna
39 for inorganic elements (i.e., metals) that are
40 either naturally occurring or anthropogenic
41 (i.e., human made). Although detected results
42 may be above remediation goals, cleanup
43 does not typically occur if the detected results
44 are below the established background
45 screening values.

46 **Berm:** An earthen backstop constructed to stop
47 or redirect bullets fired on a range.

48 **Booster:** A sensitive explosive charge that acts
49 as a bridge between a (relatively weak)

50 conventional detonator and a low-sensitivity
51 (but typically high-energy) explosive such as
52 2,4,6-Trinitrotoluene. By itself, the initiating
53 detonator would not deliver sufficient energy
54 to set off the low-sensitivity charge.
55 However, it detonates the primary charge (the
56 booster), which then delivers an explosive
57 shockwave sufficient to detonate the
58 secondary, main, high-energy charge.

59 **Comprehensive Environmental Response,**
60 **Compensation, and Liability Act**
61 **(CERCLA):** This federal law was passed in
62 1980 and is commonly referred to as the
63 Superfund Program. It provides for liability,
64 compensation, cleanup, and emergency
65 response in connection with the cleanup of
66 inactive hazardous waste release sites that
67 endanger public health or the environment.

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

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

72 **Discarded Military Munitions (DMM):**
73 Military munitions that have been abandoned
74 without proper disposal or removed from
75 storage in a military magazine or other
76 storage area for the purpose of disposal. The
77 term does not include UXO, military
78 munitions that are being held for future use or
79 planned disposal, or military munitions that
80 have been properly disposed of consistent
81 with applicable environmental laws and
82 regulations.

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

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

93 **Ecological Risk Assessment:** The process for
94 evaluating how likely it is that the
95 environment may be impacted as a result of
96 exposure to one or more environmental

GLOSSARY OF TERMS

1 stressors such as chemicals, land change,
2 disease, invasive species and climate change.

3 **Environmental Receptor:** Living organisms
4 other than humans, the habitat which supports
5 such organisms, or natural resources which
6 could be adversely affected by environmental
7 contamination at a site.

8 **Explosive Hazard:** Any hazard containing an
9 explosive component. Explosive hazards
10 include UXO (including land mines), booby
11 traps, improvised explosive devices, and bulk
12 explosives.

13 **Feasibility Study (FS):** A study undertaken by
14 the lead agency to develop and evaluate
15 options for remedial action. The RI data are
16 used to define the objectives of the response
17 action, to develop remedial action
18 alternatives, and to undertake an initial
19 screening and detailed analysis of the
20 alternatives. The term also refers to a report
21 that describes the results of the study.

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

27 **High Explosives (HE):** An explosive, such as
28 TNT, that combusts nearly instantaneously,
29 thereby producing a violent, shattering effect.

30 **Human Health Risk Assessment:** The process
31 used to estimate the nature and probability of
32 adverse health effects in humans who may be
33 exposed to hazards in contaminated
34 environmental media, now or in the future.

35 **Human Receptor:** Any human individual or
36 population that is presently or will potentially
37 be exposed to, and adversely affected by, the
38 release or migration of contaminants or
39 exposure to potentially explosive hazards.

40 **Incremental Sampling Methodology (ISM):**
41 A sample collection and processing approach
42 having specific elements designed to control
43 data that is variable due to non-continuous
44 distribution of contaminants in environmental
45 media. ISM samples consist of collecting a
46 sufficient number of discrete "increments"
47 (typically 30 to 100) in an unbiased manner

48 throughout a specified area, combining and
49 variously processing the increments into a
50 single larger sample, and incrementally
51 separating out smaller samples (i.e., sub-
52 samples) from the processed larger sample to
53 obtain a representative aliquot (i.e., smaller
54 sized sample) for analysis. Properly executed,
55 the method provides unbiased, representative
56 and reproducible estimates of the mean
57 concentration of analytes for that sample
58 area.

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

71 **Land Use Controls (LUCs):** Used in
72 CERCLA remedies to prevent or control
73 exposures of potential receptors to
74 contamination remaining in place at the site
75 and to assure continued effectiveness of the
76 response action. LUCs include access
77 controls and monitoring.

78 **Large-Caliber Shell:** A projectile or shell is a
79 missile fired from the muzzle of a gun or
80 cannon. Projectiles above 7 inches in caliber
81 are considered large-caliber.

82 **Lead:** Lead is ubiquitous in the environment,
83 and human exposure arises from both natural
84 and anthropogenic activities. Exposure from
85 lead at high enough concentrations to
86 receptors is typically through ingestion or
87 inhalation.

88 **Military Munitions Response Program**
89 **(MMRP):** A U.S. Department of Defense
90 program consisting of actions necessary to
91 ensure protection of human health, welfare,
92 and the environment from the hazards
93 associated with MEC and MC at locations
94 impacted by historical military activities.

GLOSSARY OF TERMS

1 **Mobility:** The ability to move or to be moved
2 freely and easily.

3 **Munitions Constituents (MC):** Any material
4 originating from UXO, DMM, or other
5 military munitions, including explosive and
6 nonexplosive materials, and emission,
7 degradation, or breakdown elements of such
8 ordnance or munitions.

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

14 **Munitions and Explosives of Concern**
15 **(MEC):** A munitions or explosive that may
16 pose an explosive safety risk because it either
17 did not function as designed, was discharged
18 and/or abandoned, or is an explosive
19 constituent. MEC includes UXO, DMM, and
20 explosive constituents of munitions present in
21 high enough concentrations to pose an
22 explosive hazard.

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

26 **Munitions Response Site Prioritization**
27 **Protocol (MRSP):** The methodology
28 developed by the Army for prioritizing MRSs
29 for response actions under the MMRP.

30 **National Oil and Hazardous Substances**
31 **Pollution Contingency Plan (NCP):** The
32 National Oil and Hazardous Substances
33 Pollution Contingency Plan. These CERCLA
34 regulations provide the federal government
35 the authority to respond to the problems of
36 abandoned or uncontrolled hazardous waste
37 disposal sites as well as to certain incidents
38 involving hazardous wastes (e.g., spills).

39 **Nitroguanidine:** An organic compound that is
40 colorless and is in crystalline solid form. It is
41 not flammable and is a low-sensitivity
42 explosive; however, its detonation velocity is
43 high. It is used as a propellant, fertilizer, and
44 for other purposes.

45 **Practice Grenade:** A low-velocity 40mm
46 grenade that was used to train soldiers to fire
47 the M406-series low-velocity HE round. The
48 M407A1-series practice grenades contained

49 yellow marker dye, M9-series propellant, and
50 RDX booster pellets. Upon impact, the
51 windshield was either broken or became
52 detached from the pusher, releasing the signal
53 dye (usually a yellowish-orange powder)
54 marking the impact.

55 **Preferred Alternative:** The best remedial
56 response presented in the FS that meets the
57 Remedial Action Objectives as identified in
58 coordination by the Army and the Ohio EPA.
59 The determination to make this alternative
60 “final” is made after reviewing and
61 considering all comments submitted during
62 the 30-day public comment period.

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

71 **Production:** The action of making or
72 manufacturing from components or raw
73 materials.

74 **Propellant:** Something that causes munitions
75 to move or be driven forward or outward.

76 **Proposed Plan:** This CERCLA document
77 provides the public with information
78 necessary to participate in the selection of an
79 alternative. It is designed to solicit public
80 comment on a Preferred Alternative before a
81 ROD is established.

82 **Receptor:** See environmental receptor and
83 human receptor.

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

87 **Record of Decision:** A legal record signed by
88 the Army and Ohio EPA. It describes the
89 cleanup action or alternative selected for a
90 site, the basis for selecting that alternative,
91 public comments, responses to comments,
92 and the estimated cost of the alternative.

93 **Remedial Decision:** A formal, written
94 communication from the regulating authority
95 that approves a site investigation, identifies

GLOSSARY OF TERMS

1 the Preferred Alternative, and approves the
2 remedial action, if any, at a site.

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

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

13 **Responsiveness Summary:** A section of the
14 ROD where the Army documents and
15 responds to written and oral comments
16 received from the public about the Proposed
17 Plan.

18 **Site Inspection (SI):** Part of the CERCLA
19 evaluation process that is conducted
20 following a Preliminary Assessment to
21 further evaluate the extent to which a site
22 presents a threat to human health or the
23 environment.

24 **Toxicity:** The degree to which a substance can
25 damage an organism

26 **Unexploded Ordnance (UXO):** Military
27 munitions that have been primed, fuzed,
28 armed, or otherwise prepared for action; have
29 been fired, dropped, launched, projected, or
30 placed in such a manner as to constitute a
31 hazard to operations, installations, personnel,
32 or material; and remain unexploded either by
33 malfunction, design, or any other cause.

34 **Volume:** The amount of space that a substance
35 or object occupies

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

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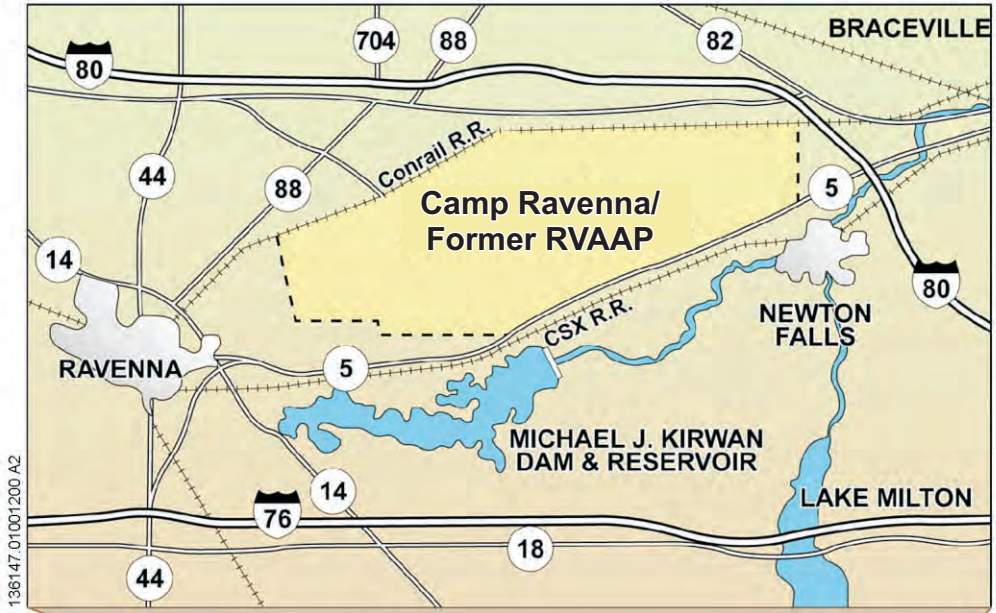
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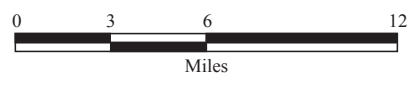
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FIGURES

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 \PP\01\Location_Map.cdr
 4/10/2017 JAR
 Source: CB&I

Legend

 Camp Ravenna/Former RVAAP




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



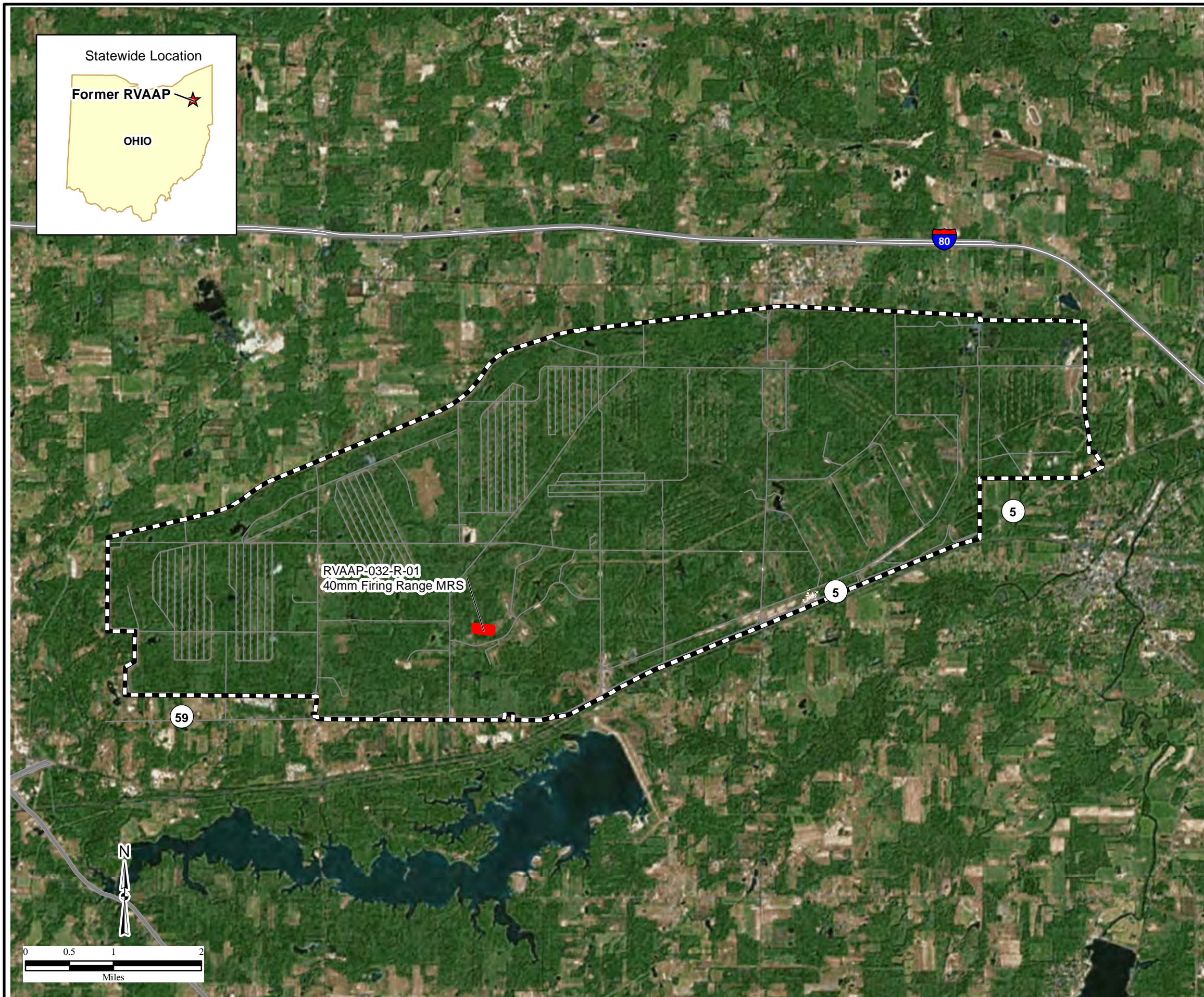
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Figure 2
MRS Location Map
40mm Firing Range MRS
Camp Ravenna/Former RVAAP
Portage/Trumbull Counties, Ohio

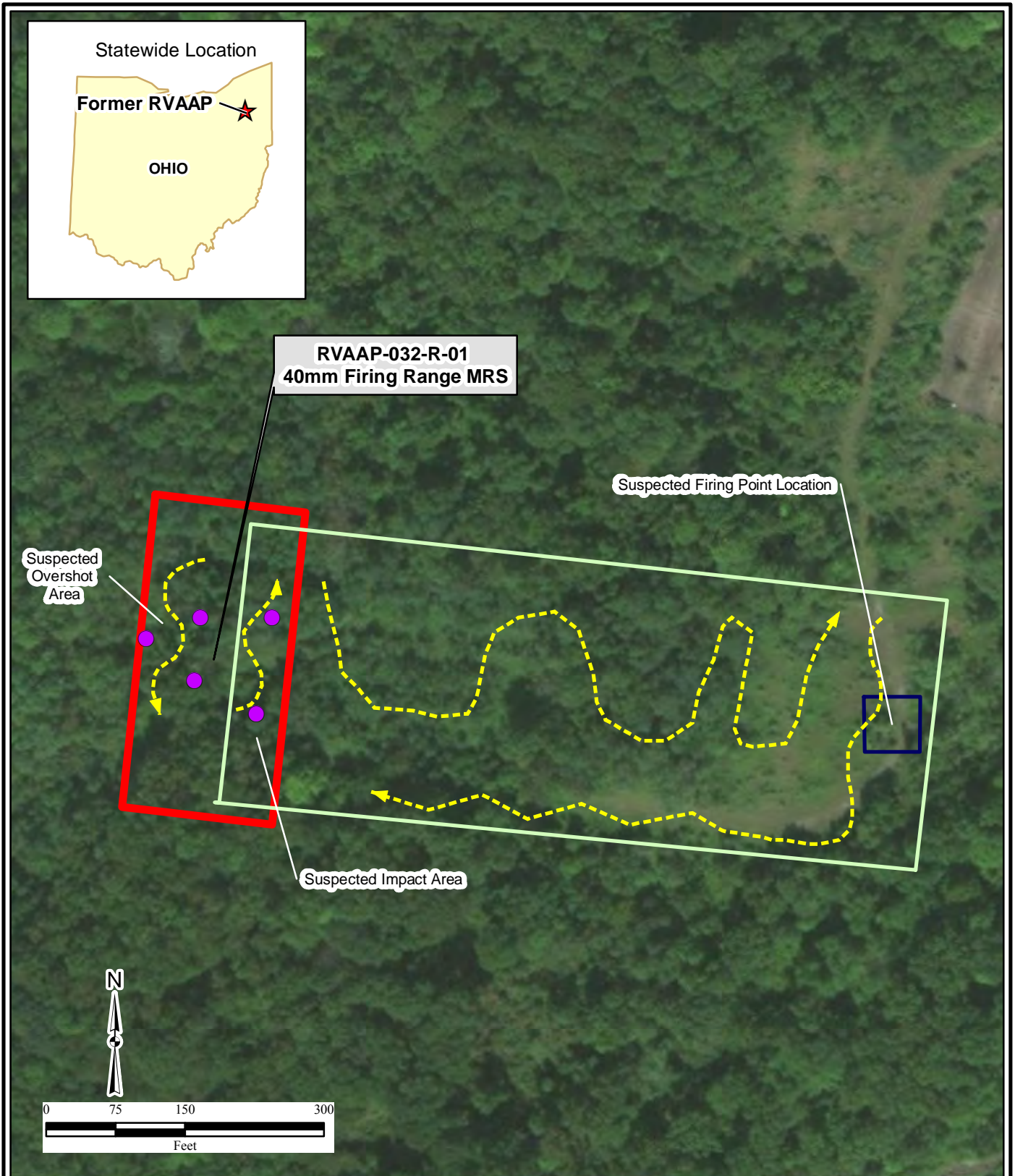
Legend

-  40mm Firing Range MRS Boundary
-  Facility Boundary
-  Road

Notes:
MRS denotes Munitions Response Site
RVAAP denotes Ravenna Army Ammunition Plant



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H:\MAMMS\Ravenna\GIS_Documents\Project_Maps
 VHGL\Feb2018\40mmFireRange\HGL_40mm_Fire_Range_003
 _Fig3_2007_Site_Inspection_Results.mxd
 02/26/2018 JWR
 Source APTIM

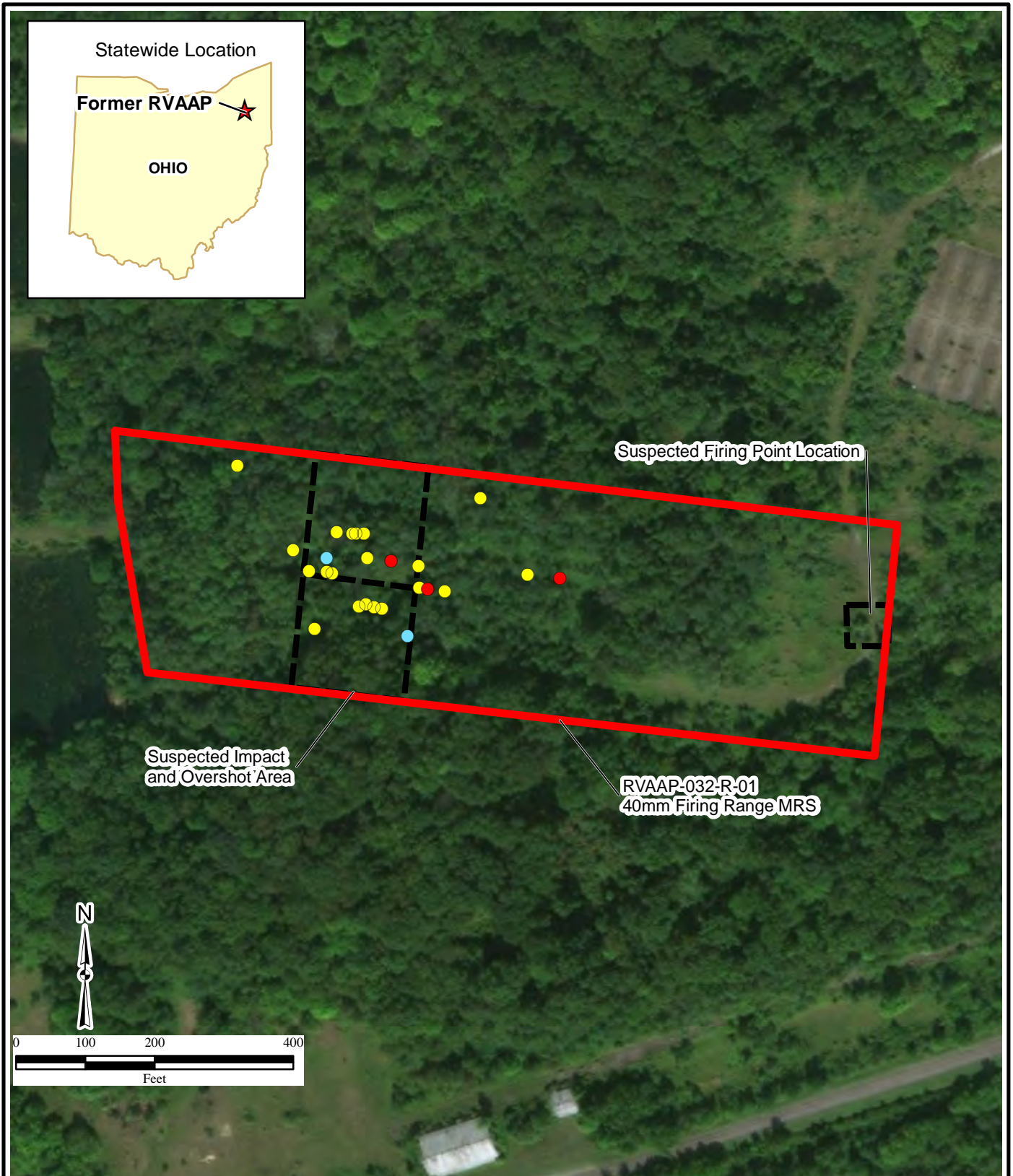


Legend

- Historical Records Review MRS Boundary
- SI Recommended MRS Boundary
- Suspected Firing Point Location
- Meandering Path Survey Area
- Munitions Debris Location

Figure 3
2007 Site Inspection Results
40mm Firing Range MRS
Camp Ravenna/Former RVAAP
Portage/Trumbull Counties, Ohio

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 VHGL\Feb2018\40mmFireRange\HGL_40mm_Fire_Range_004
 _Fig4_2011_Remedial_Investigation_Results.mxd
 02/26/2018 JWR
 Source APTIM

Legend

- Concentrated Subsurface MD Location
- Individual Subsurface MD Location
- Surface MD Location
- 40mm Firing Range MRS Boundary
- MC Sample Location

MD denotes Munitions Debris
 MC denotes Munitions Constituents

Figure 4
2011 Remedial Investigation Results
40mm Firing Range MRS
Camp Ravenna/Former RVAAP
Portage/Trumbull Counties, Ohio



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