

**Final
No Further Action Record of Decision for
RVAAP-001-R-02 Ramsdell Quarry Landfill
Munitions Response Site Area 1 (North)
Version 2.0**

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

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

Prepared for:



**US Army Corps
of Engineers®**

**U.S. Army Corps of Engineers
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Baltimore, Maryland 21201**

**Prepared by:
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January 14, 2019

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REPORT DOCUMENTATION PAGE

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				11. SPONSOR/MONITOR'S REPORT NUMBER(S) NA	
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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-001-R-02 Ramsdell Quarry Landfill Munitions Response Site (MRS) Area 1 (North), in Portage and Trumbull Counties, Ohio. This NFA Record of Decision presents the U.S. Army's No Further Action determination, Ohio EPA Concurrence with the NFA decision, and the response from the public during the 30-day public comment period for the RVAAP-001-R-02 Ramsdell Quarry Landfill MRS Area 1 (North). Investigations have found no munitions and explosives of concern or concentrated areas of munitions debris, and no potential source of munitions constituents exists at the MRS. Therefore, there is no source material or impacted environmental media resulting from historical U.S. munitions-related activities at the MRS.					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			Kimberly Vaughn
U	U	U	SAR	50	19b. TELEPHONE NUMBER (Include area code) 512-658-6828

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John R. Kasich, Governor
 Mary Taylor, Lt. Governor
 Craig W. Butler, Director

OCT 29 2018

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

Re: **US Army Ravenna Ammunition Plt RVAAP
 Remediation Response
 Approval
 Remedial Response
 Portage County
 267000859204**

Subject: Concurrence with the "Final No Further Action Record of Decision for RVAAP-001-R-02 Ramsdell Quarry Landfill Munitions Response Site Area 1 (North) Version 1.0" Munitions Response Services at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio: Dated September 13, 2018 (Work Activity No. 267000859204)

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the *Final No Further Action Record of Decision for RVAAP-001-R-02 Ramsdell Quarry Landfill Munitions Response Site Area 1 (North) Version 1.0* document dated September 13, 2018. This document received by Ohio EPA NEDO on September 14, 2018, and was prepared by HydroGeoLogic, Inc. (HGL).

The Military Munitions Response Program (MMRP) remedial investigation for the Ramsdell Quarry Landfill (RQL) Munitions Response Site (MRS) Area 1 (North) investigated the potential presence of munitions and explosives of concern (MEC) within the defined portion of the MRS. To date, no MEC has been found at the RQL MRS North Area of Concern (AOC). Therefore, sampling for munitions constituents was not warranted. The chemicals of concern identified in surface soil and dry sediment during previous investigations will continue to be addressed under the Installation Restoration Program. As there are no further comments or potential issues to address for the RQL MRS North AOC, Ohio EPA concurs with the remedy of No Further Action for this AOC.

If you have any questions concerning this letter, or any findings made by Ohio EPA, please contact Nicholas Roope at (330) 963-1235.

Sincerely,

Craig W. Butler
 Director

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 29 OCT 2018

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CONTRACTOR'S STATEMENT OF INDEPENDENT TECHNICAL REVIEW

HydroGeoLogic, Inc. has completed the *Final No Further Action Record of Decision for RVAAP-001-R-02 Ramsdell Quarry Landfill Munitions Response Site Area 1 (North), Version 2.0* 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:



Timothy Leahy
Project Manager
APTIM Federal Services

Date: January 14, 2019

Reviewed/Approved by:



Kimberly Vaughn
Project Manager

Date: January 14, 2019

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**Final
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ARNG – Army National Guard

COR – Contracting Officer’s Representative

IED – Installation and Environmental Division

OHARNG – Ohio Army National Guard

RVAAP – Former Ravenna Army Ammunition Plant

USACE – United States Army Corps of Engineers

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ACRONYMS AND ABBREVIATIONS

amsl	above mean sea level
AOC	Area of Concern
Army	U.S. Department of the Army
ARNG	Army National Guard
Camp Ravenna	Camp Ravenna Joint Military Training Center
CB&I	CB&I Federal Services, LLC
CERCLA	<i>Comprehensive Environmental Response, Compensation, and Liability Act</i>
COC	chemical of concern
CSM	conceptual site model
DA	U.S. Department of the Army
DERP	Defense Environmental Restoration Program
DFFO	<i>Director's Final Findings and Orders</i>
DoD	Department of Defense
ERA	ecological risk assessment
GOCO	U.S. Government-owned and contractor-operated
HA	hazard assessment
HGL	HydroGeoLogic, Inc.
HHRA	human health risk assessment
I&E	Installation and Environment
IRP	Installation Restoration Program
MC	munitions constituents
MD	munitions debris
MEC	munitions and explosives of concern
MMRP	Military Munitions Response Program
MRS	Munitions Response Site
NFA	No Further Action
NFA PP	<i>Final No Further Action Proposed Plan for RVAAP-001-R-02 Ramsdell Quarry Landfill Munitions Response Site Area 1 (North)</i>
OHARNG	Ohio Army National Guard
Ohio EPA	Ohio Environmental Protection Agency
PP	Proposed Plan
RAB	Restoration Advisory Board
RI	Remedial Investigation
RI Report	<i>Final Remedial Investigation Report for RVAAP-001-R-01 Ramsdell Quarry Landfill MRS</i>
ROD	Record of Decision
RVAAP	Ravenna Army Ammunition Plan

ACRONYMS AND ABBREVIATIONS (continued)

SI	Site Inspection
TESL	Threatened and Endangered Species List
TNT	2,4,6-Trinitrotoluene
U.S.	United States
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Services
USP&FO	U.S. Property and Fiscal Officer

PART I: DECLARATION

A. SITE NAME AND LOCATION

The Army National Guard (ARNG) developed this No Further Action (NFA) Record of Decision (ROD) for the RVAAP-001-R-02 Ramsdell Quarry Landfill Munitions Response Site (MRS) Area 1 (North). The Ramsdell Quarry Landfill MRS Area 1 (North) is located at the northeastern portion of Camp Ravenna (**Figure 1 and 2**).

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

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

B. STATEMENT OF BASIS AND PURPOSE

The ARNG is the lead federal agency for environmental response actions at Camp Ravenna. The ARNG, in consultation with the Ohio Environmental Protection Agency (Ohio EPA), determined that NFA is the selected remedy for the Ramsdell Quarry Landfill MRS Area 1 (North) at the Camp Ravenna. The NFA determination meets the requirements of the *Comprehensive Environmental Response, Compensation, and Liability Act* (CERCLA) of 1980, as amended by the *Superfund Amendments and Reauthorization Act of 1986* and the *National Oil and Hazardous Substances Pollution Contingency Plan*. The Army’s decision is based on information contained in the Administrative Record file for the Ramsdell Quarry Landfill MRS Area 1 (North).

The Ramsdell Quarry Landfill MRS Area 1 (North) is co-located with the RVAAP-01 Ramsdell Quarry Landfill Area of Concern (AOC) being investigated under the Installation Restoration Program (IRP), pursuant to CERCLA. Portions of the IRP AOC overlap the southwest and southeast boundaries of the Ramsdell Quarry Landfill MRS Area 1 (North). Chemicals of concern (COCs) identified within the IRP AOC will continue to be addressed under the IRP.

The Ohio EPA, the supporting state regulatory agency, reviewed and concurred with the *Final No Further Action Proposed Plan for RVAAP-001-R-02 Ramsdell Quarry Landfill Munitions Response Site Area 1 (North)* (NFA Proposed Plan; HydroGeoLogic, Inc. [HGL], 2017) and their concurrence letter is included at the beginning of this ROD. The NFA Proposed Plan (PP) presented the ARNG’s preferred remedy for addressing the Ramsdell Quarry Landfill MRS Area 1 (North) and invited public involvement during the comment period (November 3, 2017 through December 8, 2017) and public meeting (November 8, 2017). No U.S. Department of Defense (DoD) military munitions (i.e., unexploded ordnance, discarded military munitions, or munitions constituents [MC]-related contamination) originating from historical activities associated with the Ramsdell Quarry Landfill MRS Area 1 (North) have been encountered throughout the CERCLA process. The NFA determination under the CERCLA process at the Ramsdell Quarry Landfill MRS Area 1 (North) satisfies the requirements of the *Director’s Final Findings and Orders* (DFFO) (Ohio EPA, 2004), specifically by documenting the Ohio EPA’s concurrence to the closeout of the MMRP investigation conducted for this MRS under Section XII, paragraph 26.

C. DESCRIPTION OF THE SELECTED REMEDY

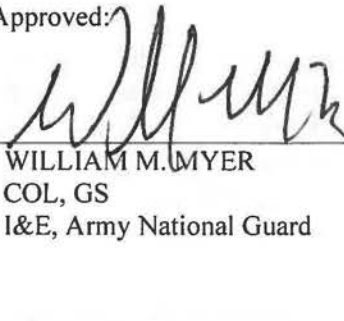
There was no evidence of DoD military munitions or munitions debris (MD) encountered at the MRS during the Remedial Investigation (RI) field work. Additionally, MC-related contamination was not detected at the MRS during the RI field work. Therefore, NFA is the selected remedy for the Ramsdell Quarry Landfill MRS Area 1 (North) under the Military Munitions Response Program (MMRP) pursuant to CERCLA.

D. STATUTORY DETERMINATION

The results of the RI fieldwork for the Ramsdell Quarry Landfill MRS Area 1 (North) support the determination that there is no risk associated with exposure to DoD military munitions, or MC-related contamination at the MRS. The ARNG has determined that NFA is acceptable for the Ramsdell Quarry Landfill MRS Area 1 (North) because there is no risk associated with the presence of DoD military munitions or MC-related contamination. The NFA is protective of human health and the environment, and meets the statutory requirements for cleanup standards established in Section 121 of CERCLA. Because there are no risks to human health or the environment associated with DoD military munitions, or MC-related contamination at the MRS, five-year reviews are not required. No other remedial action is necessary to ensure protection of human health and the environment.

E. AUTHORIZING SIGNATURE

Approved:



WILLIAM M. MYER
COL, GS
I&E, Army National Guard



Date

PART II: DECISION SUMMARY

A. SITE NAME, LOCATION, AND DESCRIPTION

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

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

The Ramsdell Quarry Landfill MRS Area 1 (North) is a 6.5-acre parcel located in the northeast portion of Camp Ravenna within Portage County (**Figure 2**). The MRS is located on the south side of Ramsdell Road and is co-located with the Ramsdell Quarry Landfill AOC. **Figure 3** presents the current boundaries of the MRS.

The Ramsdell Quarry Landfill MRS Area 1 (North) is being investigated under the MMRP that was established under the Defense Environmental Restoration Program (DERP) to address DoD military munitions located on current and former defense sites. Sites that are eligible under the MMRP are non-operational ranges where military munitions are known or suspected to be present. The Ramsdell Quarry Landfill MRS Area 1 (North) was determined to be eligible under the MMRP.

B. SITE HISTORY AND ENFORCEMENT ACTIVITIES

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

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

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

RVAAP include landfills, an aircraft fuel tank testing area, and various industrial support and maintenance facilities (CB&I Federal Services LLC [CB&I], 2015).

The Ramsdell Quarry Landfill MRS Area 1 (North) is located within a former quarry that was initially mined to recover material for use as construction ballast. Quarry operations ceased in 1941 and from 1946 to 1950 the quarry was used to thermally treat waste explosives from Load Line 1. In addition, approximately 18,000 500-pound incendiary or napalm bombs were burned on the surface of the former quarry bottom. Beginning in 1976, the western and southern sections of the abandoned quarry were used as a nonhazardous solid waste landfill. From 1978 until its closure in 1990, the landfill operated under a sanitary landfill permit issued by the State of Ohio. The landfill is currently an AOC (RVAAP-01 Ramsdell Quarry Landfill) that is being investigated under the IRP. The MRS is not part of the AOC; however, small areas of the landfill slightly overlap the southwest, south, and southeast boundaries of the MRS. Approximately 4 acres of moderate quality wetland are present at the MRS. The water levels in the wetlands can fluctuate seasonally, ranging from dry conditions at the higher areas at the east and south sections of the MRS to a maximum depth of 8 feet at the northwest section of the MRS.

The RVAAP-01 Ramsdell Quarry Landfill AOC is managed as Restricted Access under the IRP due to residual contamination that was left in-place following previous IRP remedial actions. The AOC is surrounded by a fence to prevent unauthorized access. The fence along Ramsdell Road is chain-link. The remainder of the fence surrounding the east, south, and west sides of the landfill AOC consist of five-tension wires. The Ramsdell Quarry Landfill MRS Area 1 (North) is located north of the landfill AOC within the fenced area. The MRS can be accessed through two gates located on Ramsdell Road; however, access is only granted after a briefing is provided and a sign in tracking sheet is filled out prior to entry. There is a gravel access road at the northwest corner of the fenced area. No other buildings or structures are present at the MRS (CB&I, 2015). Site features associated with the Ramsdell Quarry Landfill MRS Area 1 (North) are presented on **Figure 3**.

There have been no CERCLA enforcement actions related to the Ramsdell Quarry Landfill MRS Area 1 (North).

C. COMMUNITY PARTICIPATION

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

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

In accordance with Section 117(a) of CERCLA, Section 300.430(f)(2) of the *National Oil and Hazardous Substances Pollution Contingency Plan*, and the *Final U.S. Army Military Munitions Response Program*

Munitions Response, Remedial Investigation/Feasibility Study Guidance (Army, 2009) the ARNG released the NFA PP for the Ramsdell Quarry Landfill MRS Area 1 (North) (HGL, 2017) to the public in November 2017. The NFA PP and other project-related documents were made available to the public at the Administrative Record maintained at Camp Ravenna and in the two Information Repositories at Reed Memorial Library in Ravenna, Ohio and Newton Falls Public Library in Newton Falls, Ohio. The notice of availability for the NFA PP was sent to the Tribune Chronicle and Record Courier, as specified in the Community Relations Plan (USACE, 2017). The notice of availability initiated the 30-day public comment period beginning November 3, 2017 and ending December 8, 2017.

The ARNG held a public meeting on November 8, 2017, at the Charlestown Town Hall, 6368 Rock Spring Road, Ravenna, Ohio 44266, to present the NFA PP to the public. At this meeting, representatives of the Army provided information specific to the Ramsdell Quarry Landfill MRS Area 1 (North) history, investigations, current site conditions, and proposed NFA. Army representatives were also available to answer questions about the results of the munitions response investigations conducted under the MMRP at the Ramsdell Quarry Landfill MRS Area 1 (North). Responses to the comments received at this meeting and during the public comment period are included in the Responsiveness Summary, which is Part III of this ROD.

The ARNG considered the input received on the NFA PP when determining that NFA for both DoD military munitions and MC-related contamination is appropriate for the Ramsdell Quarry Landfill MRS Area 1 (North).

D. SCOPE AND ROLE OF RESPONSE ACTION

The overall goal of the munitions response conducted at Camp Ravenna was to address risks to human health and the environment posed by DoD military munitions that may be present and MC-related contamination. The munitions response that the ARNG conducted did not encounter DoD military munitions or evidence of their presence within the Ramsdell Quarry Landfill MRS Area 1 (North). Given there was no evidence that DoD military munitions were present, then there was no potential source of MC-related contamination. For this reason, the ARNG determined there is no source material or impacted environmental media associated with DoD military munitions at the Ramsdell Quarry Landfill MRS Area 1 (North). The NFA determination is protective of the receptors associated with future land use at the Ramsdell Quarry Landfill MRS Area 1 (North).

COCs identified within the collocated IRP AOC, RVAAP-01 Ramsdell Quarry Landfill, will continue to be addressed under the IRP pursuant to CERCLA. Although not anticipated, if additional hazards related to historical DoD activities are identified at the Ramsdell Quarry Landfill MRS Area 1 (North), they would be addressed under the appropriate restoration program.

E. SITE CHARACTERISTICS

This section provides a brief overview of the Ramsdell Quarry Landfill MRS Area 1 (North) that includes the physical characteristics, previous investigations completed under the MMRP, the nature and extent of contamination, and the most current conceptual site model (CSM).

E.1 Physical Characteristics

This section describes the physical characteristics such as topography, geology, hydrogeology, and ecological characteristics that contributed to identifying potential transport pathways, receptors and exposure scenarios used to evaluate human health and ecological risks.

E.1.1 Topography/Physiography

Camp Ravenna is located within the Southern New York section of the Appalachian Plateaus physiographic province characterized by rolling hills, incised streams, and dendritic drainage patterns. Past glacial activity

created bogs, lakes, and other wetland areas. The majority of the Ramsdell Quarry Landfill MRS Area 1 (North) is located in a depressed area that was a former quarry. The topography ranges from approximately 960 feet above mean sea level (amsl) at the bottom of the former quarry to approximately 980 feet amsl along Ramsdell Road at the northern boundary. The remainder of the MRS is surrounded by the closed landfill that has a topographical high of approximately 995 feet amsl. The natural drainage at the land-based portions of the MRS and the surrounding landfill is toward the quarry pond (CB&I, 2015).

E.1.2 Soils and Geology

Camp Ravenna is located atop Mississippian- and Pennsylvanian-age bedrock strata overlain by unconsolidated glacial deposits of varying thickness. The Ramsdell Quarry Landfill MRS Area 1 (North) is located over the Sharon Sandstone conglomerate unit and the bedrock elevation is relatively level at just over 950 feet amsl. The bedrock elevation gradually declines to the south.

The native soil types at the MRS were substantially reworked and surface soils were removed during former operation as a rock quarry. The soil classification for the MRS is described as pits and quarries. The native soils consist of the Loudonville silt loam with 2 to 6 percent slopes and the only native soils that remain here are located at the northern portion of the MRS, along the slope adjacent to the south of Ramsdell Road (CB&I, 2015).

E.1.3 Surface Water

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

In 2008, a delineation of wetlands and other waters were conducted at three sites at Camp Ravenna, including the Ramsdell Quarry Landfill/Ponds. This effort identified 4.039 acres of isolated palustrine emergent wetland which developed in the exposed abandoned quarry area within the MRS. No bogs, kettle lakes, or kames have been identified as being present within the MRS (CB&I, 2015).

E.1.4 Hydrogeology

Although groundwater recharge and discharge areas have not been delineated at Camp Ravenna, it is assumed that the extensive uplands areas at the facility, primarily located at the western portion of the facility, are regional recharge zones. Sand Creek, Hinkley Creek, and Eagle Creek are presumed to be major groundwater discharge areas. The Ramsdell Quarry Landfill MRS Area 1 (North) is located in the central, more level portion of the facility and is not presumed to be in a groundwater recharge area.

The depth to groundwater at the collocated IRP AOC and the MRS ranges from approximately 0 to 39.5 feet below ground surface with groundwater elevations between 971 and 994 feet amsl. The quarry pond at the MRS is significantly lower than the surrounding landfill and groundwater and surface water has the potential to interact at this portion of the MRS. The depth-to-groundwater measurements were obtained from existing monitoring wells installed primarily in shallow bedrock for the purposes of monitoring the RVAAP-01 Ramsdell Quarry Landfill AOC and from potentiometric data presented under the facility-wide groundwater monitoring program. The monitoring wells were installed in both the IRP AOC and the MRS.

Potentiometric data from the monitoring wells show that horizontal potentiometric gradients are consistently to the northeast during dry periods of the year. During the wet season of the year, a sufficient reservoir of water exists in the quarry pond at the MRS to induce a downward vertical hydraulic gradient (recharge) and produce flat hydraulic gradients across the collocated IRP AOC and the MRS. Rainfall events during the wet period of the year produce slight, localized flow gradient reversals between the quarry pond at the MRS and hydrologic upgradient locations at the IRP AOC for short periods of time (CB&I, 2015).

E.1.5 Ecology

Camp Ravenna is home to a range of vegetation and habitat resources. The plant communities at the Ramsdell Quarry Landfill MRS Area 1 (North) are predominantly characterized as Mixed Swamp Forest and Wetfields. Portions of the Red Maple Woods and Submergent Marsh plant communities are found along the northern edge of the MRS. The wetlands and other waters delineation conducted for the MRS identified the predominant vegetation in the quarry bottom to consist of invasive species such as *Typha angustifolia* (narrowleaved cattail), *Phragmites australis* (reed grass), and reed canary grass.

The *Camp Ravenna Integrated Natural Resources Management Plan* and U.S. Fish and Wildlife Services (USFWS) Threatened and Endangered Species List (TESL) indicate that one federally-listed threatened species, the Northern Long-eared Bat, is known to reside within Camp Ravenna (OHARNG, 2014) (USFWS, 2018). In addition, the Ohio Department of Natural Resources has identified several state-listed threatened and endangered plant and animal species. Twelve state listed endangered species (1 mammal, 1 fish, 2 insects, 2 birds, and 6 plant species) and eight state listed threatened species (2 birds, 1 insect, 1 mammal, 4 plants species) are included on the Camp Ravenna Rare Species List (OHARNG, 2014). No confirmed sightings of these species within the Ramsdell Quarry Landfill MRS Area 1 (North) have been reported and no critical habitats are present within the MRS (CB&I, 2015).

E.2 Site Investigations

E.2.1 Site Inspection (SI)

In 2007, the ARNG completed a Site Inspection (SI) at Camp Ravenna that included the Ramsdell Quarry Landfill MRS Area 1 (North). Subsurface anomalies were identified at several locations surrounding the wetland area during a meandering path survey. The nature of the anomalies was not determined because an intrusive investigation was not performed at that time. No DoD military munitions were found on the ground surface during the SI fieldwork. The areas at the MRS that were surveyed during the SI are presented on **Figure 4**.

Prior to the SI, the ARNG performed various sampling efforts at the RVAAP-01 Ramsdell Quarry Landfill AOC and the immediate surrounding area under the IRP. The sampling results indicated the presence of COCs within the collocated IRP AOC and the MRS. Some of these COCs were considered as potential MC-related contamination from the historical open burning activities that occurred there. No samples were collected at the MRS for MC-related contamination during the SI fieldwork.

Based on the results of the SI field activities, “Further Characterization” for DoD military munitions at the MRS was recommended. Further characterization for MC-related contamination at the MRS was not recommended in the *Final Site Inspection Report* (environmental-engineering Management, 2008) because the COCs were already being addressed at the co-located IRP AOC (CB&I, 2015).

E.2.2 Remedial Investigation (RI)

The ARNG conducted an RI at the Ramsdell Quarry Landfill MRS Area 1 (North) in two mobilization events: one from May through August 2011 and the other in August 2013. The RI fieldwork included a digital geophysical mapping survey and an investigation of buried anomalies at the dry areas (i.e., outside wetland areas) at the MRS. An underwater investigation of the deeper areas in the wetland was conducted by former U.S. Navy Explosive Ordnance and Disposal divers. No DoD military munitions were encountered either on the ground surface or in the underwater wetland areas. The RI results are presented on **Figure 5**.

Sampling for MC-related contamination at the MRS was not proposed as part of the RI fieldwork unless evidence of DoD military munitions was found (Shaw Environmental & Infrastructure, Inc., 2011). No

DoD military munitions were identified at the MRS during RI fieldwork and sampling for MC-related contamination was not warranted (CB&I, 2015).

Based on the results of the RI fieldwork, the ARNG concluded that DoD military munitions were not present and the nature and extent of MC-related contamination at the Ramsdell Quarry Landfill MRS Area 1 (North) has been adequately characterized. Because DoD military munitions were not encountered, there could be no potential sources for a release of MC-related contamination within the MRS. In the RI, the ARNG recommended the MRS for NFA for DoD military munitions and MC-related contamination (CB&I, 2015).

E.3 Nature and Extent of Contamination

Data gathered by the ARNG during the SI and subsequent RI for the Ramsdell Quarry Landfill MRS Area 1 (North) effectively characterized the nature and extent of DoD military munitions and MC-related contamination at the MRS. Based on the information presented in Part II, Sections A through E, no further investigation is necessary at the MRS.

As outlined in the RI Report, there was no evidence that DoD military munitions were present at the Ramsdell Quarry Landfill MRS Area 1 (North) MRS. As such, explosive hazards associated with military munitions were not present and there were no sources for a release of MC-related contamination. Therefore, neither DoD military munitions nor MC-related contamination pose a risk at the Ramsdell Quarry Landfill MRS Area 1 (North) (CB&I, 2015).

E.4 Conceptual Site Model (CSM)

The following CSM discussion includes areas where DoD military munitions may be present, sources of contamination, release mechanisms, migration pathways, and potential receptors identified for the Ramsdell Quarry Landfill MRS Area 1 (North).

E.4.1 Primary and Secondary Contaminant Sources and Release Mechanisms

The Ramsdell Quarry Landfill MRS Area 1 (North) was initially mined to recover material for roads and construction ballasts until 1941. From 1946 to 1950, the MRS was used to thermally treat waste explosives from Load Line 1. In addition, surface burning of approximately 18,000 500-pound incendiary or napalm bombs was performed on the quarry bottom. This potential for DoD military munitions consisting of munitions and explosives of concern (MEC) was considered the primary source of potential explosive hazards at the MRS prior to conducting the RI. An associated secondary source of MC-related contamination would be the release of MC contamination as a result of DoD military munitions on or just below the ground surface and submerged in the underwater areas of the MRS. Because DoD military munitions were not encountered during the RI, the ARNG determined in the *Final Remedial Investigation Report for RVAAP-001-R-01 Ramsdell Quarry Landfill MRS* (Final RI Report; CB&I, 2015) that MC-related contamination at the MRS was unlikely. The release mechanisms evaluated during the RI included the potential for DoD military munitions associated with the historical disposal activities at the MRS that could result in the potential for exposure to explosive hazards on and just below the ground surface and within the sediment in both the accessible and inaccessible areas of the MRS (CB&I, 2015).

E.4.2 Contaminant Migration Pathways

The fact that no DoD military munitions were encountered during SI and RI field activities provides evidence that MC-related contamination is not present in the surface or subsurface soils or sediment of the Ramsdell Quarry Landfill MRS Area 1 (North). Therefore, the ARNG concluded that exposure pathways for surface and subsurface soils and surface water were incomplete (CB&I, 2015).

E.4.3 Potential Human Receptors and Ecological Receptors

The likely human receptors for the future land use at the Ramsdell Quarry Landfill MRS Area 1 (North) are the Security Guard/Maintenance Worker. Environmental receptors (biota) identified for the MRS include terrestrial invertebrates (earthworms), voles, shrews, robins, foxes, barn owls, hawks, muskrats, mink, mallards, great blue herons, benthic invertebrates, and aquatic biota (CB&I, 2015).

F. CURRENT AND POTENTIAL FUTURE SITE AND RESOURCE USES

The Ramsdell Quarry Landfill MRS Area 1 (North) is federal property licensed to the OHARNG. Due to the residual contamination left in-place at the collocated IRP AOC, the future land use at the MRS is Restricted Access (HGL, 2017).

G. SUMMARY OF SITE RISKS

The basis for NFA at the Ramsdell Quarry Landfill MRS Area 1 (North), including brief summaries of the MEC Hazard Assessment (HA), human health risk assessment (HHRA), and ecological risk assessment (ERA), are provided in the following subsections.

G.1 Munitions and Explosive of Concern (MEC) Hazard Assessment (HA)

As part of the RI, the ARNG evaluated explosive safety hazards at the Ramsdell Quarry Landfill MRS Area 1 (North) using the MEC HA. Because DoD military munitions were not encountered at the Ramsdell Quarry Landfill MRS Area 1 (North) during either the SI or the subsequent RI, the ARNG determined that explosive safety hazards associated with such munitions were not present at the MRS and the calculation of a MEC HA score was not warranted (CB&I, 2015).

G.2 Human Health Risk Assessment (HHRA) and Ecological Risk Assessment (ERA)

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

Because the ARNG did not encounter DoD military munitions, concentrated areas of MD or evidence of munitions use during either the SI or RI conducted at the Ramsdell Quarry Landfill MRS Area 1 (North), media sampling for MC-related contamination was not warranted. Therefore, the ARNG did not perform an HHRA or an ERA for the MRS and it was determined that there was no risk from MC-related contamination at the MRS (CB&I, 2015).

H. DOCUMENTATION OF NO SIGNIFICANT CHANGE

The NFA PP (HGL, 2017) for the Ramsdell Quarry Landfill MRS Area 1 (North) was released for public comment on November 3, 2017. The NFA PP (HGL, 2017) recommended NFA under the MMRP and pursuant to CERCLA for the Ramsdell Quarry Landfill MRS Area 1 (North). After the public comment period, no significant changes regarding the selected remedy, as originally identified in the NFA PP (HGL, 2017), were necessary or appropriate.

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PART III: RESPONSIVENESS SUMMARY FOR PUBLIC COMMENTS ON THE PROPOSED PLAN FOR RVAAP-001-R-02 RAMSDELL QUARRY LANDFILL MRS AREA 1 (NORTH)

A. Overview

In November 2017, the ARNG released the NFA PPs and hosted a public meeting for the Atlas Scrap Yard, Block D Igloo-TD, Landfill North of Winklepeck, and Ramsdell Quarry Landfill Area 1 North MRSs. The 30-day public comment period was held from November 3, 2017 to December 8, 2017.

B. Stakeholder Issues and Lead Agency Responses

No site-specific verbal comments were received during the public meeting. The transcript from the meeting was incorporated into the Administrative Record.

B.1 Oral Comments from Public Meeting

No oral comments or questions were received from members of the public at the November 2017 public meeting.

B.2 Written Comments from Public Meetings

No written comments or questions were received from members of the public at the November 2017 public meeting.

B.3 Telephone Comments from Public

Various telephone inquiries were received from members of the public following publication of the public notices and prior to the November 8, 2017 public meeting. A summary of each inquiry is provided below.

B.3.1 Storage and Disposal Activities at Each MRS

Comment: A local resident contacted Ms. Kathryn Tait on October 25, 2017 inquiring about the plans for the four MRSs listed in the public notice and asking what would be stored and disposed of at the MRSs.

Response: Ms. Tait briefly discussed the history of these MRSs, the current and future land uses, and the meaning of the NFA remedy. During the discussion, Ms. Tait described the current and future land use at each MRS as military training and stated no munitions would be stored or disposed of at these MRSs in the future. In closing, Ms. Tait suggested if the local resident had additional questions that he contact her again, visit www.rvaap.org, and/or attend the November 8, 2017 public meeting.

B.3.2 Location of the Public Meeting

Comment: A council woman from the City of Kent contacted Ms. Kathryn Tait on October 26, 2017 for clarification on the location of the November 8, 2017 public meeting.

Response: Ms. Tait confirmed that the November 8, 2017 public meeting would be held at the Charlestown Hall at 6 p.m. and provided the physical address of the building location to the caller.

B.3.3 Synopsis of Conclusions and Proposed Remedies

Comment: The council woman from the City of Kent noted in the previous comment was unable to attend the November 8, 2017 public meeting and contacted Ms. Kathryn Tait on November 9, 2017 to discuss the conclusions and proposed remedies for each MRS.

Response: Ms. Tait returned the phone call on November 13, 2017 and summarized the conclusions and proposed remedies for each MRS. Ms. Tait indicated that no explosive hazards have been found at any MRS, that all four MRSs were proposed for NFA, and that the Ohio EPA concurs with NFA. Ms. Tait

suggested the council woman review the slide presentation for a synopsis of each MRS including the history and the proposed remedies. Ms. Tait provided the council woman with a copy of the slide presentation by email for her review.

C. Technical and Legal Issues

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

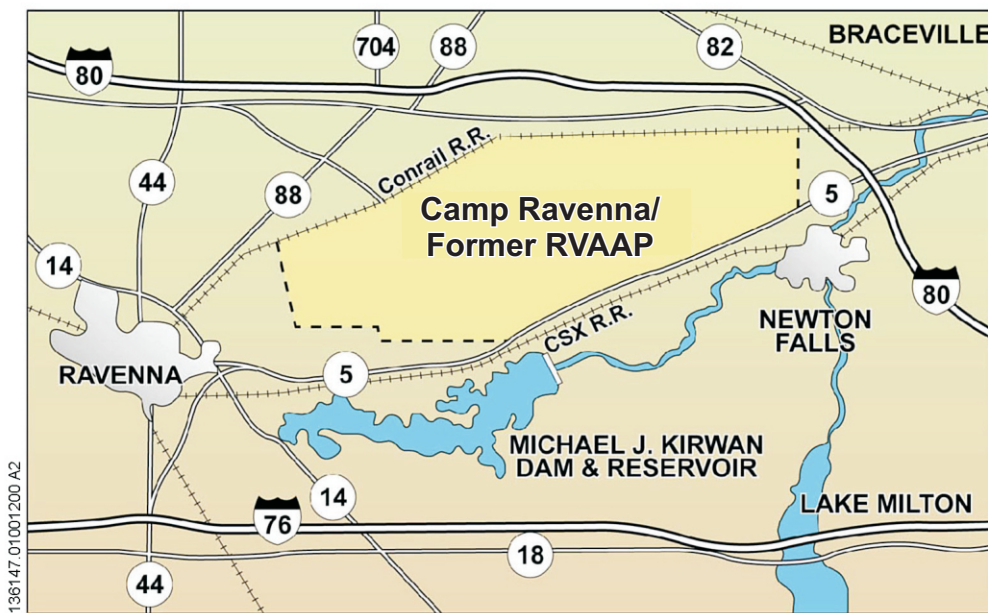
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- U.S. Fish and Wildlife Service (USFWS), 2018. Environmental Conservation Online System: Species Profile for Northern Long-Eared Bat (*Myotis septentrionalis*). <https://ecos.fws.gov/ecp0/profile/speciesProfile;jsessionid=6DA47AE967841D502600201F99E9370B?spcode=A0JE>. Accessed January 2, 2018.

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FIGURES

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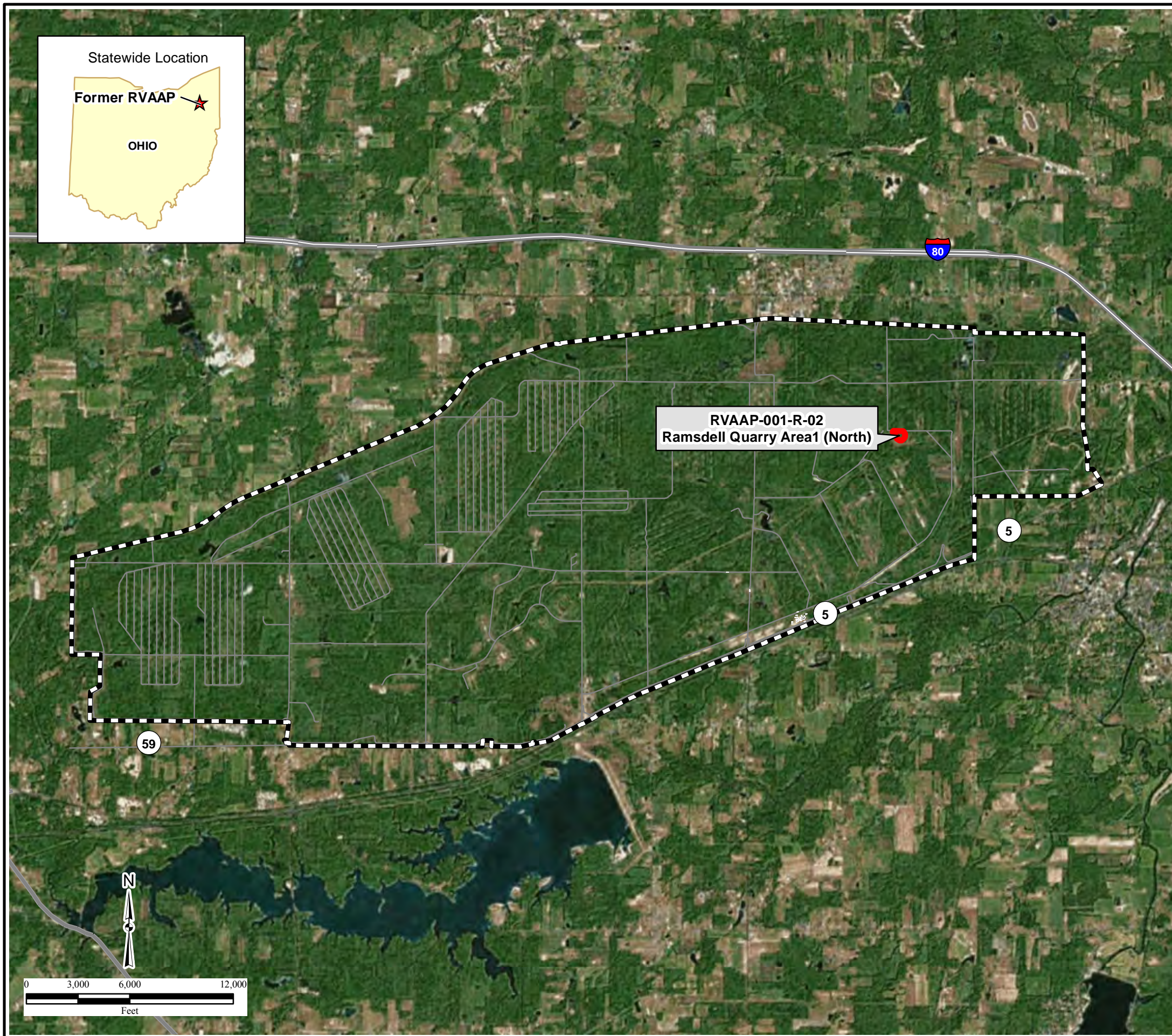
 Camp Ravenna/Former RVAAP

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






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Figure 2
Location Map
Ramsdell Quarry Landfill MRS Area 1 (North)
Camp Ravenna
Portage/Trumbull Counties, Ohio



Legend

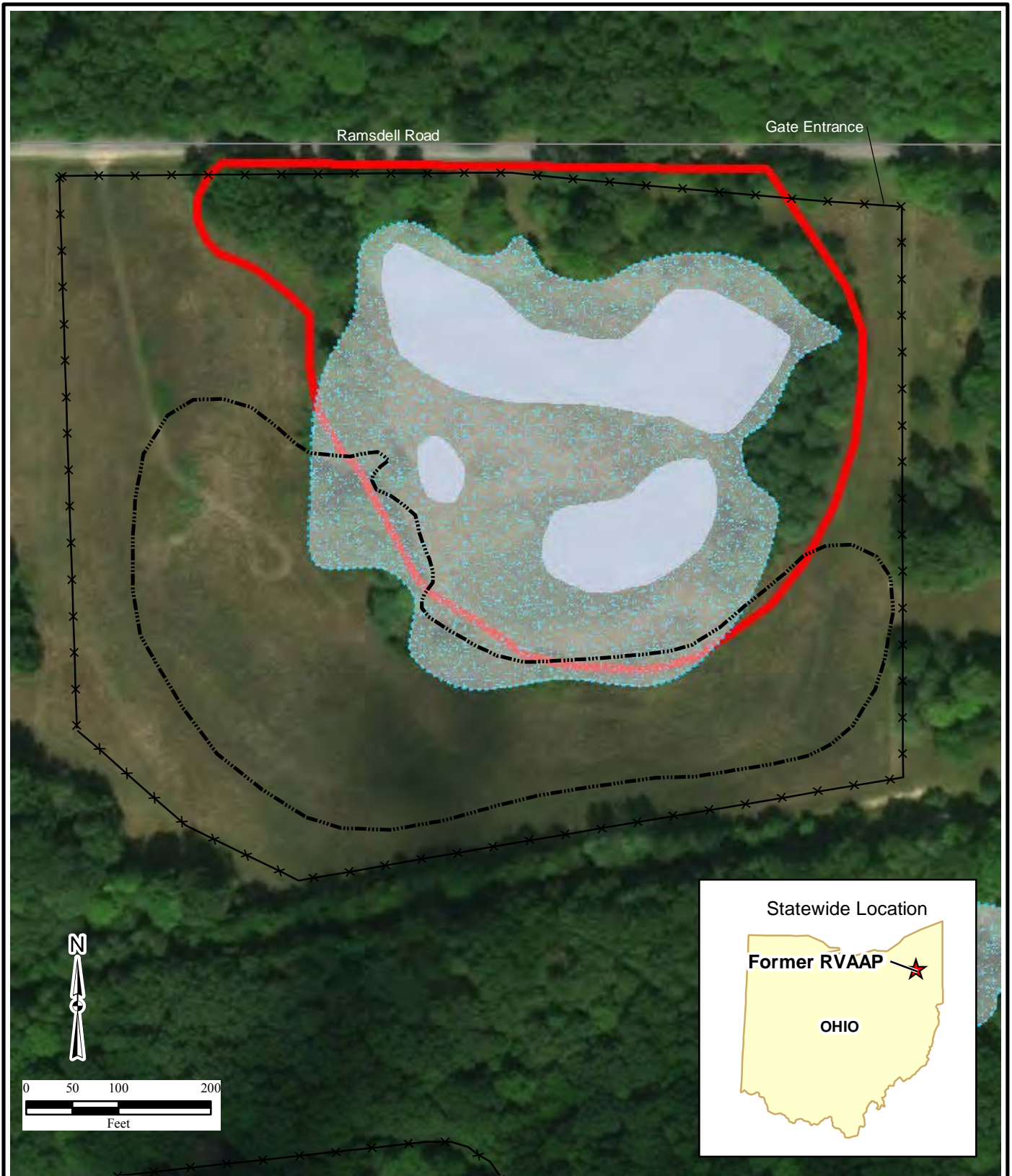
-  MRS Boundary
-  Facility Boundary
-  Road

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

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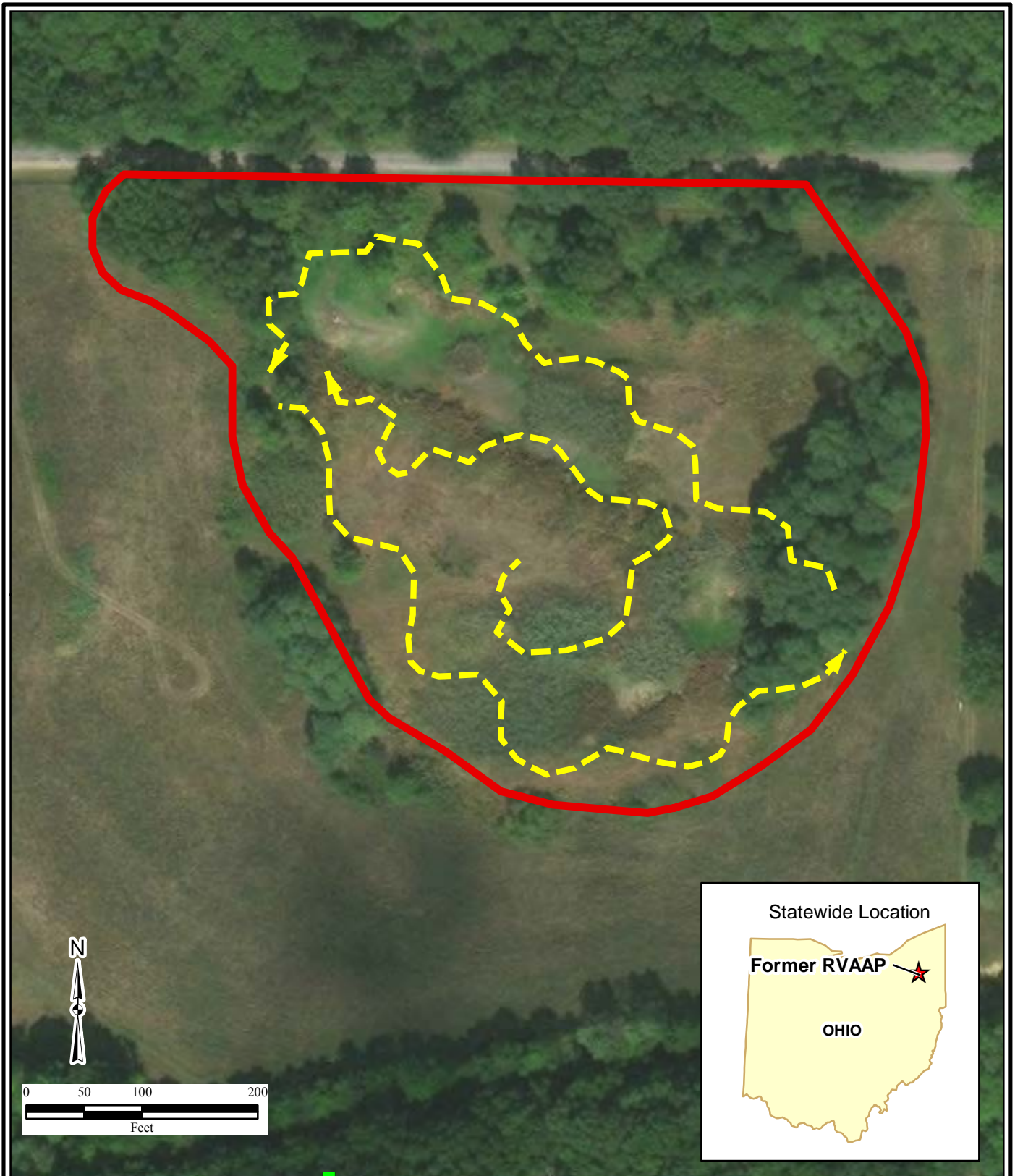
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-  MRS Boundary
 -  Surface Water
 -  Approximate Landfill Boundary
 -  Wetland
 -  Fence Line/AOC Boundary

Figure 3
MRS Map
Ramsdell Quarry Landfill MRS Area 1 (North)
Camp Ravenna/Former RVAAP
Portage/Trumbull Counties, Ohio

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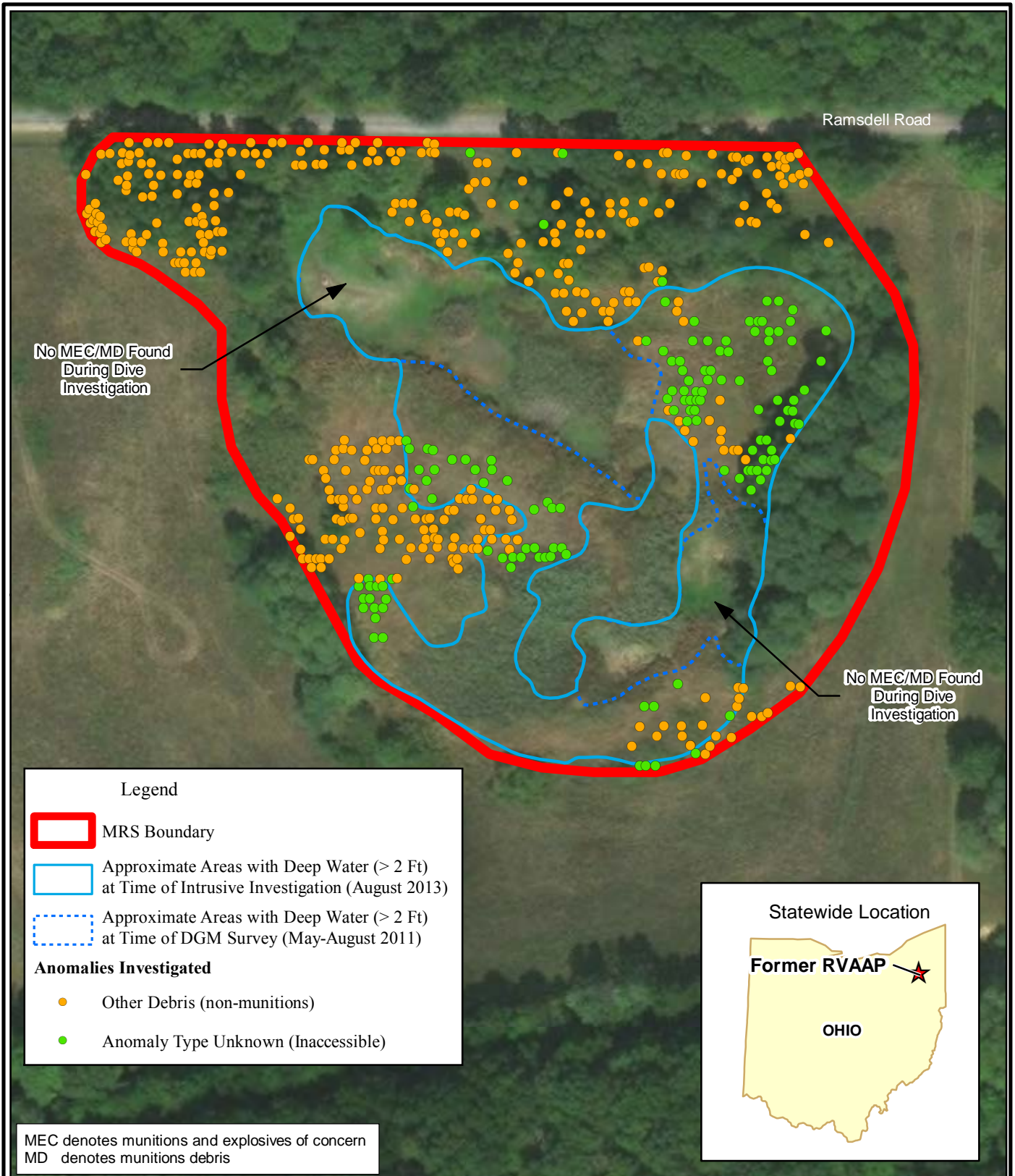
- Legend
-  MRS Boundary
 -  Meanering Path
 -  Survey Transects

Figure 4
Site Inspection Activities
Ramsdell Quarry Landfill MRS Area 1 (North)
Camp Ravenna/Former RVAAP
Portage/Trumbull Counties, Ohio

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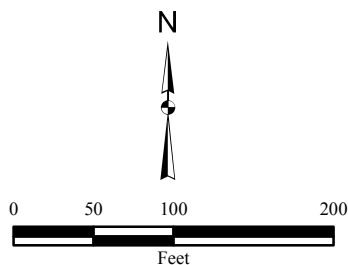


Figure 5
Remedial Investigation Results
Ramsdell Quarry Landfill MRS Area 1 (North)
Camp Ravenna/Former RVAAP
Portage/Trumbull Counties, Ohio

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Appendix A
Notice of Availability of the Proposed Plan

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Affidavit of Publication, Tribune Chronicle, October 22 and 29, 2017

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

Public meeting to be held Wednesday, November 8, 2017
for Army National Guard Release of
Proposed Plans for Munitions and Explosives of Concern and
Munitions Constituents at four Munitions Response Sites:
Ramsdell Quarry Landfill Area 1, North
Atlas Scrap Yard
Landfill North of Winklepeck
Block D Igloo-TD

Ravenna - The Army National Guard, in consultation with the Ohio Environmental Protection Agency, submits for public review and comments four (4) Proposed Plans for munitions and explosives of concern and munitions constituents with former national defense program activities at the former Ravenna Army Ammunition Plant (RVAAP) in Portage and Trumbull counties, Ohio. The Ramsdell Quarry Landfill Area 1, North; Atlas Scrap Yard; Landfill North of Winklepeck; and Block D Igloo-TD are Munitions Response Sites (MRSs) within the former RVAAP (now known as Camp Ravenna) in Portage and Trumbull Counties, Ohio. These MRSs are being addressed under the Military Munitions Response Program (MMRP) in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). The Proposed Plans present the current status and information regarding the MRSs. The Proposed Plans detail the recommendation for No Further Action at each MRS and provide the rationale for these recommendations. On Wednesday November 8, 2017, a public meeting will be held at the Charlestown Township Hall at 6366 Rock Spring Road, Ravenna, Ohio 44296 beginning at 6:00 p.m., with an informal open house when technical staff will be available to answer questions. At 6:30 p.m., the Army National Guard will briefly describe the assessment of the MRSs, present the No Further Action recommendation, and then request verbal comments from the public. Written comments regarding this recommendation may be submitted to the Army National Guard during the 30-day comment period from November 3, 2017 to December 8, 2017. All written comments should be addressed to Camp Ravenna Environmental Office, 1438 State Route 534 SW, Newton Falls, OH 44444 or sent via email to Kathryn.s.tan.nga@mail.mil. In accordance with CERCLA, the No Further Action recommendation presented in the Proposed Plans is also presented in earlier remedial investigation reports. All reports are now available for public review at the RVAAP Restoration Program Information Repository at the Reed Memorial Library (167 East Main Street, Ravenna) and the Newton Falls Public Library (204 South Canal Street, Newton Falls). The reports are also available online at www.rvaap.org. The final remedy for each MRS will be selected based, in part, on public comments. In coordination with Ohio Environmental Protection Agency, the Army National Guard will select a final remedy after reviewing and considering all public comments submitted during the 30-day public comment period from November 3, 2017 to December 8, 2017. The Army National Guard encourages the public to review and comment on the recommendation presented in this document. For more information or to participate in the review, please visit the RVAAP Restoration Program website (www.rvaap.org) or call Katie Tan at 614-336-6136.

#265-2T - October 22 & 29, 2017 • #WCH033481

PROOF OF PUBLICATION

STATE OF OHIO
 TRUMBULL COUNTY

SS: PAMELA EAZOR

BEING DULY SWORN, UPON OATH STATES THAT SHE IS AN AUTHORIZED REPRESENTATIVE OF THE TRIBUNE CHRONICLE, (A DIVISION OF EASTERN OHIO NEWSPAPERS INC) A DAILY NEWSPAPER PRINTED IN THE CITY OF WARREN, COUNTY OF TRUMBULL, STATE OF OHIO AND OF GENERAL CIRCULATION IN THE CITY OF WARREN, TRUMBULL COUNTY, OHIO AND IS INDEPENDENT IN POLITICS.

THAT THE ATTACHED ADVERTISEMENT WAS PUBLISHED IN THE TRIBUNE CHRONICLE EVERY:

SUNDAY FOR (2) TWO
 CONSECUTIVE WEEKS AND THAT THE FIRST INSERTION WAS
 ON SUNDAY THE 22nd DAY
 OF OCTOBER 2017


Pamela Eazor

SWORN TO BEFORE ME AND SUBSCRIBED IN MY PRESENCE ON THIS
1ST DAY OF November 2017

Lawrence J. Kovach
 NOTARY PUBLIC

LAWRENCE J. KOVACH, Notary Public
 STATE OF OHIO
 MY COMMISSION EXPIRES SEPTEMBER 23, 2022

SEAL



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

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Affidavit of Publication, Record Courier, October 22 and 29, 2017

Proof of Publication

Record Publishing Company
1050 W. Main Street,
Kent, OH 44240
Phone (330) 541-9400
Fax (330) 673-6363

 being first duly sworn depose and say that I am Advertising Clerk of
Record Publishing Company

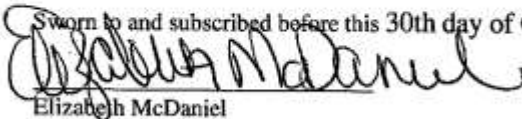
30 Record-Courier a newspaper printed and published in the city of Kent, and of General circulation in the County of Portage, State of Ohio, and personal knowledge of the facts herein stated and that the notice hereto annexed was Published in said newspapers for 2 insertions on the same day of the week from and after the 22nd day of October, 2017 and that the fees charged are legal.



Name of Account: HydroGeoLogic Inc
Ad Number: 12376892
No. of Lines: 72

Day(s) Published: 10/22, 10/29.

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Elizabeth McDaniel
Notary Public
Commission Expires June 19, 2021

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