

**Final
No Further Action Proposed Plan for
RVAAP-061-R-01 Block D Igloo-TD Munitions Response Site**

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

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

Prepared for:



**US Army Corps
of Engineers®**

**U.S. Army Corps of Engineers
Baltimore District
10 S. Howard Street, Room 7000
Baltimore, Maryland 21201**

Prepared by:

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July 31, 2017

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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)-061-R-O I Block D Igloo-Transferred (TD) 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 Block D Igloo-TD MRS. Investigations have not found material potentially presenting an explosive hazard (MPPEH) or munitions and explosives of concern (MEC) at the MRS. Therefore, no explosive hazards and no risk to receptors exist from historical activities associated with manufacturing, storing, transporting, testing, training, and/or disposal that occurred at the facility.					
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John R. Kasich, Governor
Mary Taylor, Lt. Governor
Craig W. Butler, Director

September 6, 2017

Mr. Mark Leeper, P.G., MBA
Team Lead
Cleanup and Restoration Branch
ARNG Directorate
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111 South George Mason Drive
Arlington, VA 22204

**Re: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Plans
Remedial Response
Portage County
267000859235**

Subject: "Final No Further Action Proposed Plan for RVAAP-061-R-01 Block D Igloo-TD Munitions Response Site" Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio: Dated July 31, 2017

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the "Final No Further Action Proposed Plan (Final PP) for RVAAP-061-R-01 Block D Igloo-TD Munitions Response Site (MRS)" dated July 31, 2017. This document received by Ohio EPA's NEDO on August 1, 2017, was prepared by HydroGeoLogic, Inc., as a result of the investigation completed under the military munitions response program.

Based on the information contained in the Final PP, other investigation documents/reports, and Ohio EPA's oversight participation during the investigation, Ohio EPA approves the Final PP for the Block D Igloo-TD MRS. As stated in the Final PP, the Army will offer a public comment period between November 3 through December 8, 2017 and hold an open house/public meeting on November 8, 2017.

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

Sincerely,

Michael Proffitt, Chief
Division of Environmental Response and Revitalization

NCR/nvr

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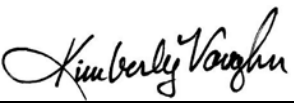
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CONTRACTOR'S STATEMENT OF INDEPENDENT TECHNICAL REVIEW

HydroGeoLogic, Inc. has completed the *Final No Further Action Proposed Plan for RVAAP-061-R-01 Block D Igloo-TD Munitions Response Site*, at the former Ravenna Army Ammunition Plant in 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.

Prepared/Approved by:  Date: July 31, 2017
David Crispo, P.E.
Project Manager
CB&I Federal Services LLC

Reviewed/Approved by:  Date: July 31, 2017
Kimberly Vaughn
Project Manager
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Gail Harris, RVAAP Administrative Record Manager	2	2

ARNG—Army National Guard

COR—Contracting Officer's Representative

IED—Installation and Environment Division

OHARNG—Ohio Army National Guard

RVAAP—former Ravenna Army Ammunition Plant

USACE—United States Army Corps of Engineers

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ACRONYMS AND ABBREVIATIONS

Camp Ravenna	Camp Ravenna Joint Military Training Center
CB&I	CB&I Federal Services LLC
CERCLA	<i>Comprehensive Environmental Response, Compensation, and Liability Act of 1980</i>
DFFO	Director's Final Findings and Orders
DMM	discarded military munitions
e ² M	engineering-environmental Management, Inc.
Final RI Report	<i>Final Remedial Investigation Report for RVAAP-019-R-01 Landfill North of Winklepeck MRS and RVAAP-060-R-01 Block D Igloo MRS, Version 1.0</i>
HRR	Historical Records Review
MC	munitions constituents
MD	munitions debris
MEC	munitions and explosives of concern
MMRP	Military Munitions Response Program
MPPEH	material potentially presenting an explosive hazard
MRS	Munitions Response Site
NFA	no further action
Ohio EPA	Ohio Environmental Protection Agency
RI	Remedial Investigation
RVAAP	former Ravenna Army Ammunition Plant
Shaw	Shaw Environmental & Infrastructure, Inc.
SI	Site Inspection
SI Report	Final Site Inspection Report
TD	transferred
TNT	trinitrotoluene
U.S.	United States
U.S. Army	U.S. Department of the Army
UXO	unexploded ordnance

1.0 INTRODUCTION

The United States (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 RVAAP-061-R-01 Block D Igloo-TD **Munitions Response Site (MRS)**. The former Ravenna Army Ammunition Plant (RVAAP) is located in Portage and Trumbull Counties, Ohio, as shown on **Figure 1**. The location of the Block D Igloo-TD MRS in relation to the former RVAAP is shown on **Figure 2**.

The U.S. Army, in consultation with the Ohio Environmental Protection Agency (Ohio EPA), is the lead agency for investigating, reporting, making **remedial decisions**, and taking **remedial actions** at the former RVAAP. This NFA Proposed Plan presents the U.S. Army's preliminary recommendations for addressing the Block D Igloo-TD MRS. Investigations do not indicate that **material potentially presenting an explosive hazard (MPPEH)**, **munitions and explosives of concern (MEC)**, or concentrated areas of **munitions debris (MD)** are present at the MRS. Since there is no MPPEH, MEC, or MD present, there cannot be a source for **munitions constituents (MC)**. Therefore, no explosive hazards or MC risks to human or environmental receptors exist.

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

This NFA Proposed Plan summarizes information contained in the *Final Remedial Investigation Report for RVAAP-019-R-01 Landfill North of Winklepeck MRS and RVAAP-060-R-01 Block D Igloo MRS, Version 1.0* (Final Remedial Investigation [RI] Report) (CB&I Federal Services LLC [CB&I], 2015). The U.S. Army encourages the public to review this document to better understand the history of the MRS, activities that have been conducted there, and determinations that have been made for the MRS under the **Military Munitions Response Program (MMRP)**.

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

2.0 FACILITY AND MRS BACKGROUND

This section presents a summary of the history of the former RVAAP and of the Block D Igloo-TD MRS.

2.1 Facility History

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

Public Comment Period:

November 3 to December 8, 2017

Public Meeting:

The U.S. 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 November 8, 2017, at the Charlestown Town Hall, 6368 Rock Spring Road, Ravenna, Ohio 44266.

Information Repositories:

Information used in selecting the preferred remedy is available online at www.rvaap.org and at the following locations:

Reed Memorial Library

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

Hours of Operation:

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

Newton Falls Public Library

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

Hours of Operation:

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

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

Camp Ravenna Joint Military Training Center (Camp Ravenna)

Environmental Office
1438 State Route 534
Newton Falls, Ohio 44444
(330) 872-8003

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

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

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

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

hot water and steam processes. These activities continued through 1992.

In addition to production and demilitarization activities at the load lines, other facilities at the former RVAAP included MRSs used for the burning, demolition, and testing of munitions. These burning and demolition grounds consisted of large, open areas and abandoned quarries. Other areas of concern at the former RVAAP include landfills, an aircraft fuel tank testing area, and various industrial support and maintenance facilities (Science Applications International Corporation, 2011).

2.2 MRS History

The “D” Block storage bunkers (igloos) are located in the north-central portion of the facility. On March 24, 1943, 2,516 clusters of M-41 20-pound **fragmentation bombs** exploded in Igloo 7-D-15 as they were being loaded into the bunker for storage. The explosion was reported to have been caused by rough handling and the faulty design of the M-110 fuze. At the time of the incident, the igloo was 95 percent full.

The 60-foot-long igloo was constructed of reinforced concrete with a steel door. The bunker was primarily earthen covered with the exception for the front of it. The igloo-shaped configuration of the bunker was designed to protect from external force in the event of an internal explosion. The **directional configuration** of Igloo 7-D-15 and the door location was toward the east.

Concrete fragments were distributed as far as 3,800 feet east towards the “E” Block igloos following the blast. Prior to the 2007 Site Inspection (SI) field work, the debris field for the explosion was identified as 622.24 acres within the former RVAAP boundaries and approximately 19.25 acres outside the facility to the northwest of former Igloo 7-D-15. The area outside of the facility consisted of residences, farm fields that were separated by stands of woodlands, railroad tracks, and a right-of-way. These locations inside and

outside of the facility were considered separately as the Block D Igloo MRS and Block D Igloo-TD MRS, respectively, prior to the SI (**Figure 3**).

2.3 MRS Historical Investigations

The following investigations and reports have been completed under the MMRP for the Block D Igloo MRS, the location of Igloo-7-D-15 that exploded and impacted areas within the facility boundaries, and Block D Igloo-TD MRS that is located outside of the facility boundaries:

- *Final Military Munitions Response Program Historical Records Review* (HRR) (engineering-environmental Management, Inc. [e²M], 2007)
- *Final Site Inspection Report* (SI Report) (e²M, 2008)
- Final RI Report (CB&I, 2015)

2.3.1 SI Summary

In 2007, SI field activities were conducted at MRSs under the MMRP at the former RVAAP that included both the Block D Igloo MRS and the Block D Igloo-TD MRS. Recommendations were made in the SI Report to reduce the 3,000-foot radius of the Block D Igloo MRS around former Igloo 7-D-15. The recommendations to reduce the MRS radius around the former igloo eliminated the 19.25-acre area outside the northern portion of the facility that was the original Block D Igloo-TD MRS.

During preparation of the HRR in support of the SI activities, e²M identified additional information from a U.S. Army Corps of Engineers Rock Island District Map that nonmunitions-related debris fragments from the 1943 explosion had been observed at two locations outside of the facility. The debris was reportedly observed as far as 2.9 miles (15,000 feet) to the northeast of former Igloo-7-D-15. These areas were not surveyed during the SI field work and additional investigation was recommended in the SI Report since the report of debris fragments at these two locations

indicated that MEC could be present outside of the facility. The combined area of these two locations is 14.13 acres. The SI Report recommended that the two areas that made up the 14.13 acres become the revised Block D Igloo-TD MRS (e²M, 2008). **Figure 4** presents the 2008 boundaries for the Block D Igloo and Block D Igloo-TD MRSs that were carried forward following the SI and into the RI.

2.3.2 RI Work Plan Summary

In 2011, CB&I evaluated the original estimate of how far fragments would have traveled away from former Igloo-7-D-15 when the bombs inside it exploded in 1943. The result of this second look is that, using more recent information, the estimate of how far fragments would have traveled was reduced from 3,800 feet to 2,389 feet. Based on this new estimate, it was determined that no fragments could have traveled beyond the facility boundary or as far as the Block D Igloo-TD. Therefore, no MEC or MPPEH would have traveled beyond the facility boundary and into the Block D Igloo-TD. The new estimate of 2,389 feet is presented in a technical memorandum titled Rationale for Reduction in Investigation Area for Block D Igloo MRS (RVAAP-060-R-28 01). This memorandum was reviewed and approved by Ohio EPA and is included as Appendix A to the Final RI Report (CB&I, 2015).

2.4 Remedial Investigation Results

No RI fieldwork activities were conducted at the Block D Igloo-TD MRS based on the revised estimate that no munitions fragments could have traveled beyond the facility boundary or as far as the Block D Igloo-TD MRS. An RI was conducted at the Block D Igloo MRS, located within the facility boundaries, to evaluate for potential MPPEH and MEC from the 1943 explosion. The RI included an **instrument-assisted visual survey** and an **analog intrusive (“mag and dig”) investigation**. The maximum horizontal distance of MD found on or just below the ground surface was 1,800 feet and supported the revised estimate of 2,389 feet. The results

of the RI fieldwork conducted at the Block D Igloo MRS confirmed no further investigation at the Block D Igloo-TD MRS would be required. **Figure 5** presents the boundaries of the Block D Igloo MRS following the RI which represents the maximum distance that MPPEH from the former Igloo-7-D-15 explosion could have traveled.

3.0 SCOPE AND ROLE OF RESPONSE ACTION

The area of the Block D Igloo-TD MRS that was carried forward into the RI is situated outside of the facility on private land that is wooded and used for agricultural purposes (**Figure 4**). The results of the RI fieldwork conducted at the Block D Igloo MRS support the determination that NFA is the appropriate selected remedy for the Block D Igloo-TD MRS. The selected remedy must be protective of the **receptors** associated with future land use. The future land use of the MRS is residential, recreational, and agricultural. The likely **human receptors** for the future land use are the Resident Receptor (Adult and Child) (Shaw Environmental & Infrastructure, Inc. [Shaw], 2011). No **environmental receptors** have been identified, since an RI was not completed at the Block D Igloo-TD MRS.

The Block D Igloo-TD MRS was reduced and eliminated from containing any MPPEH/MEC due to the studies carried out and the RI fieldwork completed for the Block D Igloo MRS. Further, because no MPPEH/MEC or concentrated areas of MD are present, no potential source of MC exists. Therefore, there is no source material or impacted environmental media resulting from hazards at the MRS.

No other investigations are ongoing at the MRS under the MMRP or the **Installation Restoration Program**. Although not anticipated, if additional hazards are identified at this MRS, they would be addressed under the MMRP as a separate response action.

4.0 SUMMARY OF HUMAN AND ECOLOGICAL RISKS

Under the MMRP, a recommendation of NFA must be protective of the human and environmental receptors at the MRS. The likely human receptors identified for future land use at the Block D Igloo-TD MRS are the Resident Receptor (Adult and Child) (Shaw, 2011). No environmental receptors have been identified, since an RI was not completed at the MRS.

No MEC or any type of munitions fragment is present on the MRS. Therefore, there is no explosive safety hazard or risk due to chemical contamination to any receptors that may be present on the Block D Igloo-TD MRS.

5.0 CONCLUSIONS AND RECOMMENDATIONS

The results of the Block D Igloo MRS RI field work support the determination that no munitions fragments could have traveled beyond the facility boundary or as far as the Block D Igloo-TD MRS. Therefore, no hazards associated with exposures to MPPEH/MEC and no potential for MC risk to human or environmental receptors exist at the MRS. The U.S. Army, in consultation with the Ohio EPA, is recommending NFA as the preferred remedy under the MMRP for the Block D Igloo-TD MRS.

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

6.0 COMMUNITY PARTICIPATION

Public participation is an important component of the remedy selection process. The U.S. Army, in coordination with the Ohio EPA, is soliciting input from the community on the preferred remedy. The comment period extends from November 3 to December 8, 2017. This

period includes a public meeting at which the U.S. Army will present this NFA Proposed Plan. The U.S. Army will accept oral and written comments at this meeting.

6.1 Public Comment Period

The 30-day comment period is from November 3 to December 8, 2017, and provides an opportunity for public involvement in the decision-making process for the proposed action. The public is encouraged to review and comment on this NFA Proposed Plan. The U.S. Army and Ohio EPA will consider all public comments before selecting a remedy. During the comment period, the public is also encouraged to review documents pertinent to the Block D Igloo-TD MRS. This information is available at the **Information Repositories** and online at www.rvaap.org. To obtain further information, contact the Camp Ravenna Environmental Office.

6.2 Public Meeting

The U.S. Army will hold an open house/public meeting on this NFA Proposed Plan on November 8, 2017, at 6:00 p.m. at the Charlestown Town Hall, 6368 Rock Spring Road, Ravenna, Ohio 44266. This meeting will provide an opportunity for the public to comment on the preferred remedy. Comments made at the meeting will be transcribed.

6.3 Written Comments

If the public would like to provide comments, questions, or suggestions on this NFA Proposed Plan or other relevant issues in writing, they should be delivered to the U.S. Army at the public meeting or mailed (postmarked no later than December 8, 2017). The public can also submit their comments, questions, or suggestions via email prior to the end of the comment period to the Camp Ravenna Environmental Office at 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

**6.4 U.S. Army Review of Public
Comments**

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

GLOSSARY OF TERMS

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

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

Analog Intrusive (“Mag and Dig”) Investigation: An investigation process whereby hand-held analog geophysical instruments are passed back and forth in (i.e., “in sweep mode”) by **Unexploded Ordnance (UXO) Technicians** in a well-defined area. Analog instruments emit an audible signal as the instrument is moved past a metallic item. The UXO Technician progresses along the search lane or throughout the area and stops when an anomaly is encountered. Anomalies identified are either flagged or immediately excavated. Detection depth is likely limited to 2–4 feet.

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

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA): This federal law was passed in 1980 and is commonly referred to as the

Superfund Program. It provides for liability, compensation, cleanup, and emergency response in connection with the cleanup of inactive hazardous waste release sites that endanger public health or the environment.

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

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

Directional Configuration: Construction of a system that is adapted to ensure a pre-determined direction for transmitting an item or signal.

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

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

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

Fragmentation Bomb: An aerial antipersonnel bomb that scatters shrapnel over a wide area upon explosion.

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

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

Information Repository: A collection of documents relating to a facility with investigations and response actions under CERCLA and/or a site's permitting activity or corrective action. It includes documents and information about site activities as well as general information about environmental

GLOSSARY OF TERMS

regulations and CERCLA. The purpose of an Information Repository is to (1) ensure open and convenient public access to site-related documents and (2) better inform the public of the restoration process.

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

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

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

Material Potentially Presenting an Explosive Hazard (MPPEH): Material that, prior to determination of its explosives safety status, potentially contains explosives or munitions (e.g., munitions containers and packaging material; munitions debris remaining after munitions use, demilitarization, or disposal; and range-related debris); or potentially contains a high enough concentration of explosives such that the material presents an explosive hazard (e.g., equipment, drainage systems, holding tanks, piping, or ventilation ducts that were associated with munitions production, demilitarization, or disposal operations).

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

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

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

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

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

National Oil and Hazardous Substances Pollution Contingency Plan: The National Oil and Hazardous Substances Pollution

GLOSSARY OF TERMS

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

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

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

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

Receptor: See human or ecological receptor.

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

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

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

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

and environmental risks that result from the contamination.

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

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

Responsiveness Summary: A section of the Record of Decision where the U.S. Army documents and responds to written and oral comments received from the public about the Proposed Plan.

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

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

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REFERENCES

CB&I Federal Services LLC (CB&I), 2015. *Final Remedial Investigation Report for RVAAP-019-R-01 Landfill North of Winklepeck MRS and RVAAP-060-R-01 Block D Igloo MRS*, Version 1.0, prepared for the U.S. Army Corps of Engineers, Baltimore District, March.

engineering-environmental Management, Inc. (e²M), 2007. *Final Military Munitions Response Program Historical Records Review, Ravenna Army Ammunition Plant, Ohio*, January.

e²M, 2008. *Final Site Inspection Report, Ravenna Army Ammunition Plant, Ohio, Military Munitions Response Sites*, May.

Ohio Environmental Protection Agency (Ohio EPA), 2004. *Director's Final Findings and Orders (DFFO) for RVAAP*, Division of Emergency and Remedial Response, June 10.

Science Applications International Corporation, 2011. *Phase II Remedial Investigation Report for Soil, Sediment, and Surface Water at RVAAP Load Line 6, Ravenna Army Ammunition Plant, Ravenna, Ohio*, Draft, November 4.

Shaw Environmental & Infrastructure, Inc. (Shaw), 2011. *Work Plan Addendum for Military Munitions Response Program Remedial Investigation Environmental Services*, Version 1.0, Final, December 7.

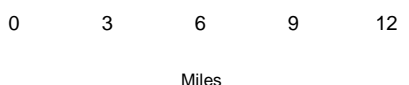
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FIGURES

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
 Camp Ravenna/Former RVAAP




Figure 1
Location Map
Camp Ravenna/
Former RVAAP
Portage/Trumble Counties
Ohio



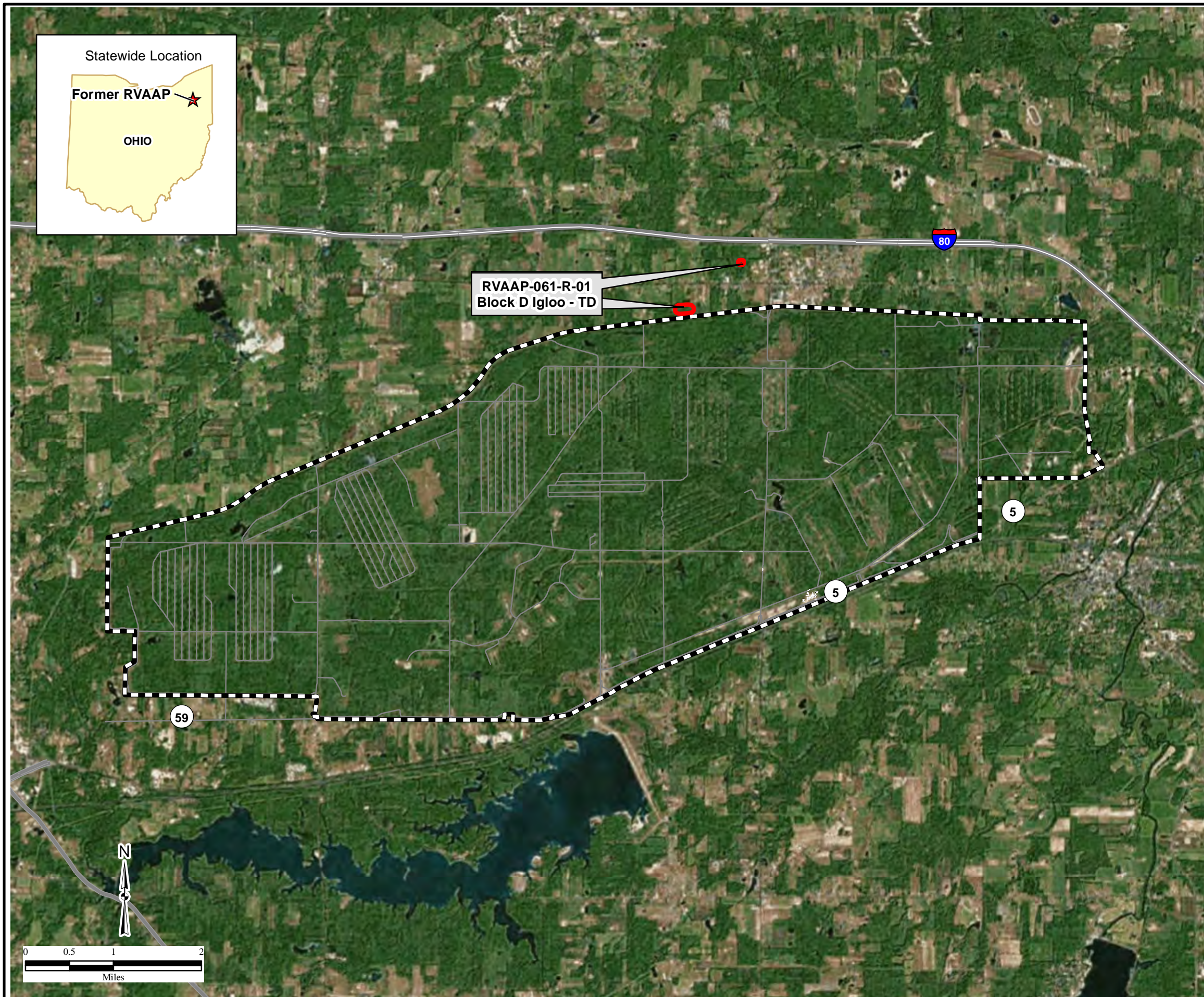
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Figure 2
MRS Location
Camp Ravenna/Former RVAAP
Portage/Trumbull Counties, Ohio

Legend

-  Block D Igloo - TD MRS Boundary
-  Facility Boundary
-  Road

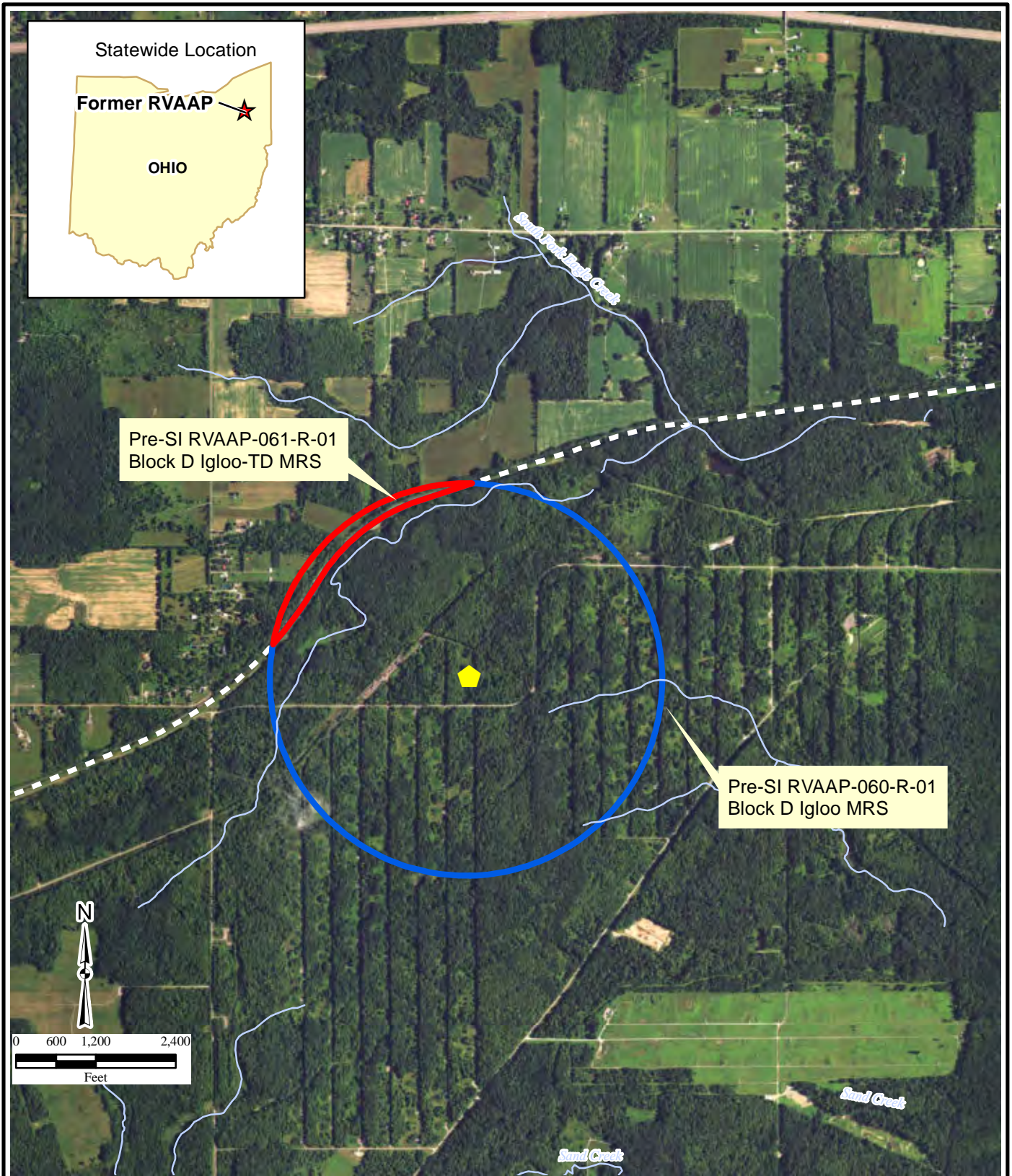
Notes:
MRS=munitions response site
RVAAP=Ravenna Army Ammunition Plant



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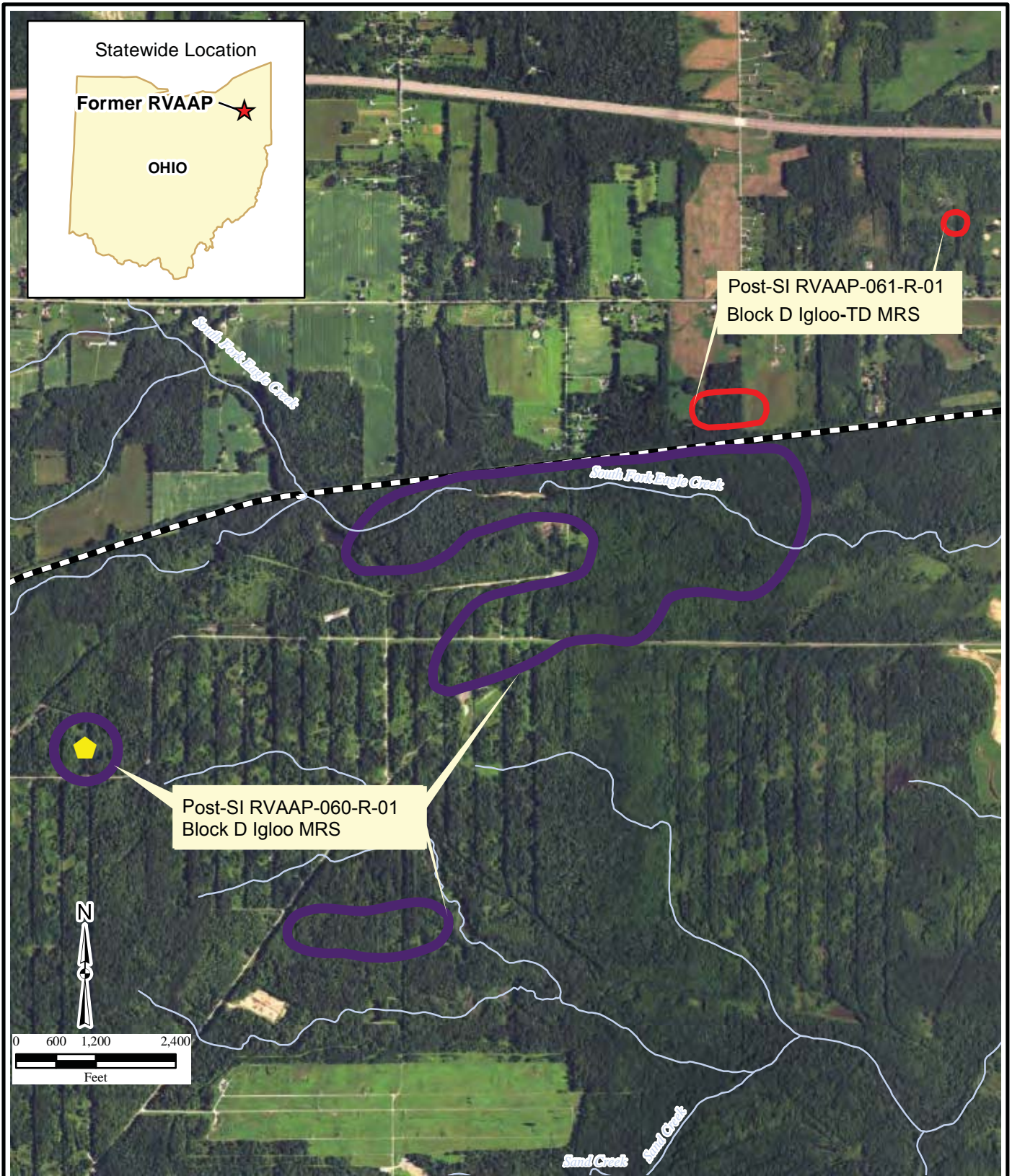
-  Location of Former Igloo 7-D-15
-  Stream
-  Pre-SI Block D Igloo-TD MRS
-  Pre-SI Block D Igloo-TD MRS
-  Facility Boundary

Note: SI denotes 2007 Site Inspection (e2M)

Figure 3
Pre-SI MRS Boundaries Map
Block D Igloo-TD MRS
Camp Ravenna/Former RVAAP
Portage/Trumble Counties Ohio

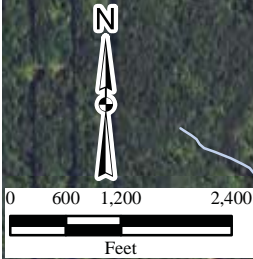


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Post-SI RVAAP-061-R-01
Block D Igloo-TD MRS

Post-SI RVAAP-060-R-01
Block D Igloo MRS



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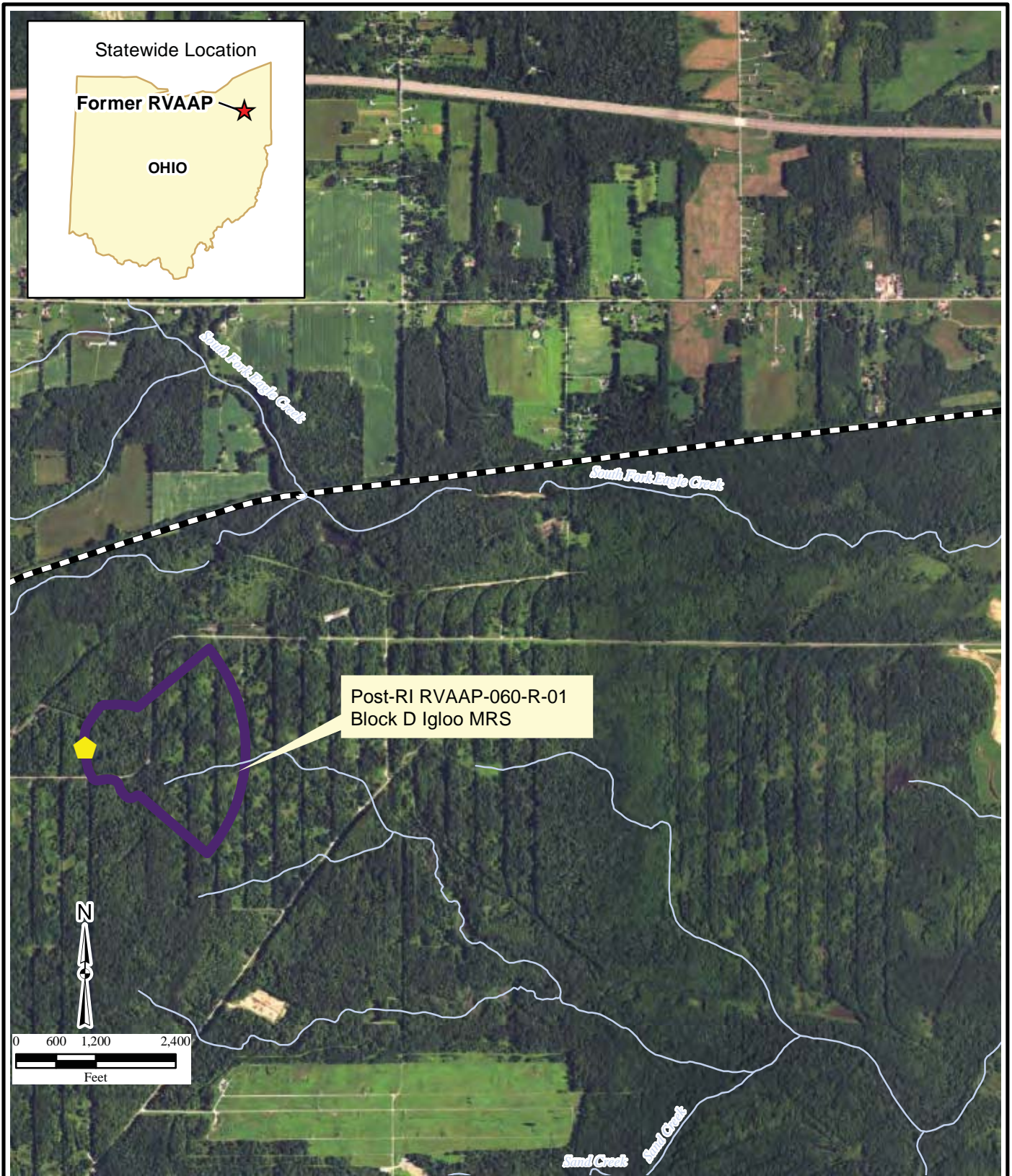
-  Location of Former Igloo 7-D-15
-  Stream
-  Post-SI Block D Igloo MRS
-  Post-SI Block D Igloo-TD MRS
-  Facility Boundary

Note: SI denotes Site Inspection (e2M)

Figure 4
Post-SI MRS Boundaries Map
Block D Igloo-TD MRS
Camp Ravenna/Former RVAAP
Portage/Trumble Counties Ohio







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 Source CB&I

Legend

-  Location of Former Igloo 7-D-15
-  Stream
-  Post-RI Block D Igloo MRS
-  Facility Boundary

Note: RI denotes 2015 Remedial Investigation (CB&I)

Figure 5
Post-RI MRS Boundaries Map
Block D Igloo-TD MRS
Camp Ravenna/Former RVAAP
Portage/Trumble Counties Ohio



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