FINAL

Revised Property Management Plan for the Designated Areas of Concern and Munitions Response Sites

Version 4.0

Former Ravenna Army Ammunition Plant

Camp James A. Garfield Joint Military Training Center,

Portage and Trumbull Counties, Ohio

Prepared for:

Ohio Army National Guard
Camp James A. Garfield Joint Military Training Center,
Portage and Trumbull Counties, Ohio

Army National Guard Directorate
Arlington, VA

Prepared by:

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June 2021

Ohio Environmental Protection Agency

Mike DeWine, Governor
Jon Husted, Lt. Governor
Laurie A. Stevenson, Director

August 3, 2021

TRANSMITTED ELECTRONICALLY

Mr. Kevin M. Sedlak
Restoration Program Manager
ARNG-ILE Clean-up
Camp James A. Garfield JTC
1438 State Route 534
Newton Falls, OH 44444

RE: US Army Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859029

Subject: **Approval of the "Final Revised Property Management Plan for the Designated Areas of Concern and Munitions Response Sites, Version 4.0," Former Ravenna Army Ammunition Plant, Camp James A. Garfield Joint Military Training Center, Portage and Trumbull Counties, Ohio, dated June 18, 2021**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Final Revised Property Management Plan for the Designated Areas of Concern and Munitions Response Sites, Version 4.0" for the Former Ravenna Army Ammunition Plant, Camp James A. Garfield Joint Military Training Center, Portage and Trumbull Counties, Ohio, dated June 18, 2021. This document was received at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) via email June 17, 2021. The document was prepared for the United States Army Corps of Engineers on behalf of the National Guard Bureau by Chenega Tri-Services, LLC under Contract Number W912QR-18-C-0013.

The final document was reviewed by personnel from Ohio EPA, DERR. Pursuant to the Director's Findings and Orders paragraph 39 (b), Ohio EPA considers the document final and approved.

This letter is an official response from Ohio EPA that will be maintained as a public record.

If you have any questions, please contact me via email at kevin.palombo@epa.ohio.gov or call me at (330) 963-1292.

Sincerely,

Kevin M. Palombo
Environmental Specialist
Division of Environmental Response and Revitalization

KP/sc

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ACRONYMS AND ABBREVIATIONS

AOC	Area of Concern
ARNG	Army National Guard
BGS	Below Ground Surface
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CJAG	Camp James A. Garfield Joint Military Training Center
C.F.R.	Code of Federal Regulations
CO	Commanding Officer
DERP	Defense Environmental Restoration Program
DFFO	The Director's Final Findings and Orders
DoD	Department of Defense
FWGWMPP	Facility-Wide Ground Water Monitoring Program Plan
FWSAP	Facility-Wide Sampling and Analysis Plan
IAP	Installation Action Plan
IRP	Installation Restoration Program
LUC	Land Use Control
MC	Munitions Constituents
MEC	Munitions and Explosives of Concern
MMRP	Military Munitions Response Program
MRS	Munitions Response Site
NCP	National Contingency Plan
OHARNG	Ohio Army National Guard
OHIO EPA	Ohio Environmental Protection Agency
ORC	Ohio Revised Code
Orders	The Director's Final Findings and Orders
PMP	Property Management Plan
PP	Proposed Plan
RCO	Range Control Officer
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RDX	Cyclonite Hexahydro 1,3,5-Trinitro-1,3,5-Triazine
REIMS	Ravenna Environmental Information Management System

RI/FS	Remedial Investigation/ Feasibility Study
ROD	Record of Decision
RVAAP	Ravenna Army Ammunition Plant
SVOC	Semi-Volatile Organic Compound
TNT	2,4,6-Trinitrotoluene
UCMJ	Uniform Code of Military Justice
U.S.C.	United States Code
USEPA	United States Environmental Protection Agency
WBG	Winklepeck Burning Grounds
WWII	World War II

1.0 INTRODUCTION

1.1 PURPOSE

This Property Management Plan (PMP) identifies Land Use Controls (LUCs) and restrictions for specific Areas of Concern/Munitions Response Sites (AOCs/MRSs) at the former Ravenna Army Ammunition Plant (RVAAP), now known and operated as the Camp James A. Garfield Joint Military Training Center (CJAG) by the Ohio Army National Guard (OHARNG). CJAG was also formerly known as Camp Ravenna and may be referred to in this document as the "the facility", "former RVAAP" or "CJAG". The procedures described herein are intended to comply with the *Department of Defense (DoD) Manual, Defense Environmental Restoration Program (DERP) Management, Number 4715.20, March 9, 2012,* (Department of Defense Office of the Under Secretary of Defense for Acquisition, Technology and Logistics) and Ohio Revised Code (ORC) 5913.10.

Land Use Controls include any physical, legal, or administrative mechanism that places restrictions on the use of, or limits access to, real property to prevent exposure to contaminants at concentrations greater than permissible levels or other safety issues. The intent of using these controls is to protect the integrity of the remedy (if present) and human health and the environment by limiting the activities that may occur at an AOC/MRS. Land Use Controls are part of a remedial decision where there may be potential risks or safety issues associated with contaminants not fully eliminated by remedial actions. When implemented, these LUCs provide protection to individuals by limiting and/or preventing activities which could potentially result in risks to people using and working at the AOC/MRS. The Army is responsible to control land use on active installations such as at the facility and can internally restrict the use of such property.

This PMP provides mechanisms to implement and manage LUCs at the facility. Land Use Controls and other restrictions that are often used to support remedial decisions reached through the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) [42 §9601, *et seq*.] risk-based decision process, as implemented through the National Contingency Plan (NCP), 40 C.F.R. Part 300. The LUCs are usually necessary to assure the protection of human health and/or the environment is achieved. CERCLA and NCP regulations are followed at RVAAP, and the Ohio Environmental Protection Agency (Ohio EPA) is the lead regulatory agency. The CERCLA NCP process is consistent with the Final Findings and Orders issued by the Director, Ohio EPA, June 10, 2004. These Director's Final Findings and Orders ("Orders") were issued to the United States Department of the Army ("Army" or the "Respondent") pursuant to the authority vested in the Director of Environmental Protection ("Director"), on behalf of the Ohio Environmental Protection Agency ("Ohio EPA"), under Chapters 3734, 3745 and 6111 of the ORC. These Orders are entered into by the Army pursuant to authority vested in the Secretary of the Army by the CERCLA, 42 U.S.C. Section 9601 et seq; the Defense Environmental Restoration Program (DERP), 10 U.S.C. Section 2701 et seq.; and the NCP, 40 C.F.R. Part 300. The Orders require the Respondent to develop and implement: a Remedial Investigation/Feasibility Study (RI/FS), a Proposed Plan (PP), a Record of Decision (ROD), or other applicable studies/documentation and a remedy for each AOC/MRS or appropriate group of AOCs/MRSs at RVAAP. The Orders also require the Respondent to implement a Facility-Wide Ground Water Investigation, Monitoring and Remediation Program at RVAAP. All work, plans, and documentation at the RVAAP must be in conformance with CERCLA, the NCP, and the Orders (including the attached Appendices). The DERP [10 U.S.C.§2701, *et seq*.] is also relevant to the manner in which remediation will proceed, particularly with respect to safety issues unique to munitions and explosives of concern (MEC).

This PMP is required under Army Regulation 210-20, and satisfies requirements of the Orders. Components of the PMP (specifically LUCs) are enforceable under the Orders because the LUCs are part of the remedy and the remedy is a requirement of the Orders. If the Army fails to comply with LUCs or any component of a remedy established to protect human health and the environment at an AOC/MRS as identified through the CERCLA remedial decision process, then the Ohio EPA may take regulatory actions to ensure the failure is corrected.

If residual contamination is left in place after the CERCLA remediation process is complete and the contamination still poses a potential for unacceptable risks or exceeds cleanup standards, then the ROD for the AOC/MRS will require LUCs in accordance with the approved Remedial Design (RD).

Appendix A shall include an individual section for each AOC/MRS with LUCs. The AOCs/MRSs which do not require LUCs will also be included in Appendix A in order to document the final remedial decisions and facilitate overall installation management by the OHARNG. Each AOC/MRS in Appendix A will be tabbed by AOC/MRS number. The level of detail in this PMP varies between the body of the document (which includes general information applicable to the facility) and the AOC/MRS-specific sections in Appendix A. This PMP is a dynamic document and will be continually updated/revised/and amended as needed. As the remedial process for an AOC/MRS progresses to the approved RD stage, a new section will be added to Appendix A for that particular AOC/MRS. Each AOC/MRS-specific section in Appendix A includes, as applicable, strategies for implementation of LUCs, maintenance, monitoring, enforcement, and modification or termination of LUCs. The AOC/MRS-specific information in Appendix A is based upon the Final Record of Decision and the approved RD for that specific AOC/MRS.

Appendix B presents an AOC/MRS Site Inspection Form Template. The template will be used to prepare specific inspection forms to document all LUCs associated with each AOC/MRS, including any monitoring, maintenance, and reporting required for continued operation and maintenance.

The Solid Waste Management Sites located at the facility are listed in Appendix C.

Current copies of this PMP will be maintained by CJAG's Range Operations and Environmental Office, and the Army National Guard (ARNG) RVAAP Restoration Program Manager. The PMP shall also be referenced in the OHARNG Master Plan. Details regarding LUCs/restrictions will be included in the Master Plan.

1.2 BACKGROUND INFORMATION

The RVAAP Installation Restoration Program (IRP) began in 1989. The property boundary was resurveyed by OHARNG over a 2-year period (2002 and 2003) and the total acreage of the property was found to be 21,683 acres. As of September 2013, administrative accountability of the entire 21,683-acre former RVAAP has been transferred to the United States Property and Fiscal Office for Ohio. The installation has been licensed to the OHARNG for use as a military training site. Once transfer of the whole installation was complete, management of the IRP was transferred from the Army's Base Realignment and Closure Division to the ARNG with support from the OHARNG.

The facility is in northeastern Ohio within Portage and Trumbull counties, approximately 3 miles (4.8 km) east-northeast of the City of Ravenna and approximately 1 mile (1.6 km) northwest of the City of Newton Falls. The facility is a parcel of property approximately

11 miles (17.7 km) long and 3.5 miles (5.6 km) wide bounded by State Route 5, the Michael J. Kirwan Reservoir, and the CSX System Railroad on the south; Garret, McCormick, and Berry roads on the west; the Norfolk Southern Railroad on the north; and State Route 534 on the east (Figures 1 and 2). The facility is surrounded by several communities: Windham on the north; Garrettsville 6 miles (9.6 km) to the northwest; Newton Falls 1 mile (1.6 km) to the southeast; Charlestown to the southwest; and Wayland 3 miles (4.8 km) to the south.

When RVAAP was operational, CJAG did not exist and the entire 21,683-acre parcel was a government-owned, contractor-operated industrial facility. The RVAAP IRP encompasses investigation and cleanup of past activities over the entire 21,683 acres of the former RVAAP. Subsequent references in this document to RVAAP, or the former RVAAP, relate to previous activities at the installation as related to former munitions production activities or to activities being conducted under the restoration/cleanup program.

Industrial operations at the former RVAAP 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 into large-caliber shells and bombs. The 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. Following cleaning, the waste water, containing TNT and Composition B, was known as "pink water" for its characteristic color. Scupper systems were used to collect pink water, which was contained in concrete holding tanks, filtered, and pumped into unlined ditches for transport to earthen settling ponds. However, in some instances, "pink water" was swept from doorways, or scupper systems overflowed onto the ground surface. Load Lines 5 through 11 were used to manufacture fuzes, primers, and boosters. Potential contaminants in these load lines include lead compounds, mercury compounds, and explosives. From 1946 to 1949, Load Line 12 was used to produce ammonium nitrate for explosives and fertilizers prior to use as a weapons demilitarization facility.

In 1950, the facility was placed in standby status and operations were limited to renovation, demilitarization, and normal maintenance of equipment, along with storage of munitions. Production activities were resumed from July 1954 to October 1957 and again from May 1968 to August 1972. In addition to production missions, various demilitarization activities were conducted at facilities constructed at Load Lines 1, 2, 3, and 12. Demilitarization activities included disassembly of munitions and explosives melt-out and recovery operations using hot water and steam processes. Periodic demilitarization of various munitions continued through 1992.

In addition to production and demilitarization activities at the load lines, other facilities at RVAAP include AOCs/MRSs that were used for the burning, demolition, and testing of munitions. These burning and demolition grounds consist of large parcels of open space or abandoned quarries. Potential contaminants at these AOCs/MRSs include explosives, propellants, metals, and waste oils. Other types of AOCs/MRSs present at RVAAP include landfills, an aircraft fuel tank testing facility, and various general industrial support and maintenance facilities.

1.3 IMPLEMENTATION OF THE PROPERTY MANAGEMENT PLAN - ROLES AND RESPONSIBILITIES

It is the responsibility of the ARNG to implement, inspect, maintain and enforce LUCs at the former RVAAP. The OHARNG will assist with enforcement and management of the LUCs and will facilitate on-site operations and maintenance (O&M) associated with the LUCs.

2.0 OBJECTIVES

Per the *Department of Defense (DoD) Manual, Defense Environmental Restoration Program (DERP) Management, Number 4715.20, March 9, 2012,* (Department of Defense Office of the Under Secretary of Defense for Acquisition, Technology and Logistics), LUC implementation and management plans should present general objectives of the LUCs for that particular installation and detailed plans for specific AOCs/MRSs. Each AOC/MRS that requires a LUC on the facility has unique site-specific objectives which will be presented in the individual sections in the Appendix A.

The general performance objectives of the LUCs at the facility are as follows:

1.) Prevent unsafe exposure to surface soils, subsurface soil, wet sediment, dry sediment, surface water, and groundwater that may result in unacceptable risks or adverse health effects, including MEC risks at identified Munitions Response Sites. In addition, although not a general performance Objective associated with a LUC, all military activities executed within the facility must be in compliance with OHARNG and DoD safety regulations. If MEC or other hazards are encountered, the OHARNG has specific protective actions and procedures that will be followed. On CJAG and all operating installations, the Army is responsible for MEC safety through the Department of Defense Explosives Safety Board (DDESB) requirements and Army Regulations.

2.) Prevent ingestion of groundwater with concentrations above maximum contaminant levels (MCLs), RVAAP (specific) cleanup goals, or risk-based levels (where standards do not exist).

3.) Prevent off-site migration of contaminants to surrounding areas through ground water, surface water, or other impacted media at concentrations greater than MCLs, RVAAP (specific) cleanup goals, or other applicable risk-based levels per CERCLA.

3.0 GENERAL LAND USE CONTROLS

There are various terms used by different Federal Agencies that are related to or define a LUC. Terms such as LUCs, Institutional Controls (ICs), and Engineering Controls (ECs) are often used interchangeably. The DoD defines LUCs to include any type of physical, legal, or administrative mechanism that restricts the use of, or limits access to, real property to prevent exposure to contaminants at concentrations greater than permissible levels. The intent of using these controls is to protect human health, the environment, and the integrity of a remedy by limiting the access/activities that may occur at a particular contaminated site. The three types of LUCs (per DoD) are described below.

- Physical Mechanisms include a variety of engineered remedies to contain or reduce contamination, and/or physical barriers intended to limit access to property such as fences, signs, or landfill covers.
- Legal Mechanisms include restrictive covenants, negative easements, equitable servitudes, and deed notices that are meant to ensure the continued effectiveness of land use restrictions imposed as part of a remedial decision.
- Administrative Mechanisms include notices, adopted local land use plans and ordinances, construction permitting or other existing land use management systems that may be used to ensure compliance with use restrictions.

Certain LUCs are used to mitigate risks associated with exposure to contamination, when it is inappropriate or not feasible to eliminate those risks by removing or treating the contaminated media to unrestricted use levels. Generally, LUCs are used as a component of other remedial actions. In many circumstances LUCs are used when the alternative of leaving contaminants in place proves to be the most favorable risk management decision (e.g., due to technical or economic limitations, concerns regarding worker safety, or to prevent collateral ecological damage).

Land Use Controls for the facility were established based on results from remedial investigations and remedial actions where some degree of control was determined to be necessary to prevent unsafe exposure (exposure to concentrations expected to result in unacceptable risks or adverse health effects) to the residual contamination. All receptors and the input parameters used to evaluate their potential exposures were considered when determining potential risks and safe levels from exposure to residual contamination at the AOC/MRS. The specific Land Uses, exposure parameters, and the receptors can be found in the Human Health Risk Assessor's Manual (see RVAAP's *Facility Wide Human Health Risk Assessor Manual Amendment 1, USACE, 1 Dec 2005*) and the RVAAP's Facility-wide Cleanup Goal Report (*Final Facility-Wide Human Health Cleanup Goals for Ravenna Army Ammunition Plant, SAIC, 23 Mar 2010*). After the first version of this PMP was finalized, the Army prepared a "Final Technical Memorandum: Land Uses and Revised Risk Assessment Process for the Ravenna Army Ammunition Plant (Risk Assessment Technical Memo) (RVAAP Installation Restoration Program, Portage/Trumbull Counties, Ohio (Army National Guard Directorate, 2014)." The Risk Assessment Technical Memo defined three Categorical Land Uses and Representative Receptors to be considered during the RI phase of the CERCLA process. The Risk Assessment Technical Memo allowed for exceptions to evaluating these three Land Uses, depending upon their stage of completion in the CERCLA process and the conclusions of the document. These three Land Uses and Representative Receptors are summarized below.

1.) Unrestricted (Residential) Land Use – Resident Receptor (Adult and Child) (formerly called Resident Farmer)

2.) Military Training Land Use – National Guard Trainee

3.) Commercial/Industrial Land Use – Industrial Receptor (USEPA Composite Worker).

The Risk Assessment Technical Memo allowed for exceptions to evaluating these three Land Uses, depending upon their stage of completion. Because many of the AOCs had already had the RI completed at the time of the finalization of the Risk Assessment Technical Memorandum, the three Land Uses may not have been evaluated fully. The National Guard Trainee's exposure scenario is not for full time work so does not account for the potential of fulltime personnel on an AOC/MRS. Therefore, when there is a possibility that a full-time occupational exposure may occur on an AOC, the Commercial/Industrial Land Use using the Industrial Receptor is to be evaluated. Additionally, the Military Training Land Use requires additionally monitoring to ensure no full-time occupational exposure occurs. The Risk Assessment Technical Memo established that the Commercial/Industrial Land Use using the Industrial Receptor allows for full-time occupational personnel to work freely on the site and would be protective of both full-time occupational personnel and National Guard Trainees who have shorter exposure durations.

Land Use Controls, including O&M requirements associated specifically with any one RVAAP AOC/MRS, are discussed in Appendix A for that particular AOC/MRS. The AOC/MRS-specific narrative in Appendix A will be updated as necessary to support changes to the status of the AOCs/MRSs. Updates are the responsibility of the ARNG. The OHARNG will assist with on-site facilitation of updates.

The LUCs for each AOC/MRS will be reviewed as specifically described for each AOC/MRS in Appendix A. Operational and maintenance requirements and any corrective actions will be noted during reviews and recorded during the AOC/MRS-specific inspections. All reviews will be conducted at the intervals stated in Appendix A and will be documented in an annual report that will supplement the required five-year review process under CERCLA's Long Term Management requirements. It is anticipated that the frequency of the reviews and/or annual reports may be modified in the future (subsequent to Ohio EPA approval), but will be determined on an AOC/MRS specific-basis.

4.0 ENGINEERING CONTROLS

As previously defined, LUCs include any type of physical, legal, or administrative mechanism that restricts the use of, or limits access to, real property to prevent or reduce risk to human health and the environment. Physical mechanisms encompass a variety of engineered remedies to contain or reduce contamination and/or physical barriers to limit access to property, such as fences or signs. Based upon this definition, inspections completed for each AOC/MRS (using forms similar to that in Appendix B) will document all LUCs associated with each AOC/MRS, including any monitoring, maintenance, and reporting required for continued operation and maintenance.

The AOC-specific engineering controls will be documented in the appropriate section for each AOC/MRS in Appendix A. Such controls as fences, warning signs, Seibert stakes, or landfill covers may be part of an AOC/MRS-specific LUC. These requirements will be specified in the individual AOC/MRS sections in Appendix A of this PMP. The AOC-specific LUCs associated with each AOC/MRS, will include monitoring, maintenance, and reporting required for continued operation and maintenance.

4.1 LAND USE CONTROL AWARENESS TRAINING

4.1.1 Standard Awareness Training

LUC awareness training will be provided, as appropriate, to individuals (e.g., personnel, visitors, visiting units) before they are granted access to any area with a restrictive LUC. Individuals will be briefed if there are potential health or safety concerns or if the planned activity could impact an engineering control. For AOCs/MRSs achieving Commercial/Industrial Use or Military Training Use, the need for LUC training will be assessed on a case-by-case basis, depending on how the site is being utilized. The training will be conducted by the Army or OHARNG. The LUC training will provide an overview of this PMP and the procedures for preventing and reporting LUC violations, as well as any AOC/MRS specific restrictions. An annual refresher course will also be provided. Standard in-processing of newly assigned permanent party and contract employees shall include the standard LUC awareness training if the individual will be accessing any area with a LUC.

4.1.2 Training Materials

This PMP shall serve as the basis of all LUC awareness training materials. Appendix A includes the AOC/MRS-specific LUC information.

4.1.3 Training Records

Documentation of training sessions will be kept on record for future reference and to supplement inspections and the CERCLA Five-Year Review for each AOC/MRS. Each training record will annotate the date, time, location, instructor(s), name of audience (e.g., X-Company, Unit, Group, platoon, etc.), title of training, and which AOCs/MRSs are likely to be involved for purposes of awareness during field training activities.

5.0 MONITORING AND REPORTING

Site inspections will be conducted by the Army or OHARNG to confirm if the LUCs remain effective and meet LUC objectives for continued remedy protectiveness. Site inspections will be conducted periodically, as directed by the AOC/MRS-specific RD. At a minimum, a LUC AOC/MRS Inspection Form, similar to the one located in Appendix B of this PMP, will be completed for each periodic inspection. The scheduling and completion of periodic inspections for multiple AOCs/MRSs may be synchronized (subsequent to Ohio EPA approval) in order to increase efficiency and reduce administrative costs, without reducing the frequency of inspections. Results from periodic inspections will be reported in an annual LUC monitoring report, with changes in inspection frequency to be coordinated with and approved by Ohio EPA.

The annual LUC monitoring report will evaluate the status and effectiveness of LUCs with a description of how any LUC deficiencies, including inconsistent land uses, were addressed. The annual LUC report will summarize all monitoring completed during the calendar year for all the AOCs/MRSs. This annual LUC report will be submitted to the Ohio EPA for review and approval. The annual LUC monitoring reports will be used in the preparation of the CERCLA 121(c) Five-Year Review. The annual LUC monitoring report will include a written certification stating whether or not the LUCs remain in place and are effective.

Inspections will be conducted according to the frequency cited within the RD and Appendix A for the AOCs/MRSs listed in this PMP. A separate AOC/MRS-specific Inspection Form will be developed for each AOC/MRS in coordination with the Ohio EPA using the Template Form provided in Appendix B. The AOC/MRS-specific Inspection Forms will include specific monitoring and maintenance requirements for that particular AOC/MRS. The AOC/MRS- specific Inspection Forms will be completed by the Army or OHARNG (or a designated contractor) for each LUC inspection on an AOC/MRS and submitted to the Ohio EPA. The completed AOC/MRS-specific Inspection Forms will be used to support the preparation of the annual report (summarizing current status of land use classification and LUCs) for each AOC/MRS with LUCs covered by this PMP.

6.0 ENFORCEMENT OF LAND USE CONTROLS

All Army and OHARNG/CJAG personnel and authorized visitors to the installation will be required to comply with the prescribed LUCs. If Army or OHARNG personnel observe a LUC violation, they will immediately take appropriate corrective action (e.g., halt excavation operations, apprehend trespasser(s), take appropriate action to safely remove trespassers from unauthorized areas, etc.). Any observed LUC violations will be reported to CJAG Range Control within 48 hours, or as soon as practicable. The CJAG Environmental Office and ARNG Restoration Manager will take action to restore the integrity of the LUC, and will assess whether any additional preventive measure(s) should be considered as a result of the reported incident (e.g., repair fence, post signs, publish further command guidance, prosecute trespassers, etc.).

Administrative corrective measures should be sufficient to resolve most LUC violations (e.g., verbal or written counseling, administrative sanctions against contractors, etc.). However, in the event of a more egregious trespass or a repeat offender, offenders may be subjected to administrative action or punishment under the Uniform Code of Military Justice (UCMJ) for military personnel; or title 18 U.S.C. 1382 and title 50 U.S.C. 797 for civilians. Additionally, the Ohio Code of Military Justice, Ohio Revised Code (ORC) Chapter 5924 [or other state military code, as appropriate], can be applied if a violation is alleged to have been committed by a Soldier or other uniformed personnel subject to the UCMJ or deemed in violation of military law.

Since civilian personnel are not subject to military law, any sanctions imposed against civilians will be based upon applicable federal and state laws and regulations. Criminal sanctions may be considered for, but not limited to, such acts as unauthorized hunting (OAC Chapters 1531 and 1533; ORC sections 1547.69, 2923.16 and 4519.40), trespassing (ORC 2911.21), and attempted theft of scrap (ORC 2913.01 (K)).

If the Army discovers any land use that is inconsistent with LUC objectives or practices, and/or that impairs the effectiveness of remedial actions at an AOC/MRS, the Army will notify Ohio EPA in writing as soon as practicable, but no later than ten (10) calendar days after discovery, with a written description of the inconsistent land use. Within ten (10) calendar days after such notification, the Army will provide Ohio EPA with information regarding what efforts or measures have been or will be taken to address the inconsistent land use.

The LUCs in this PMP are enforceable by the Ohio EPA pursuant to the applicable RODs and RDs, which were prepared in accordance with the Orders for RVAAP.

7.0 CERCLA 121(C) FIVE-YEAR REVIEWS

As part of the CERCLA Section 121(c) Five-Year remedy review process, the Army shall prepare a report evaluating the continued effectiveness of the remedy, including effectiveness of the LUCs and an assessment of whether there is a need to modify the LUCs. The Five-Year Review report will be submitted to the Ohio EPA.

The Army will verify whether the LUCs continue to be properly documented and maintained. Each review of the remedy will evaluate whether conditions have changed due to contaminant attenuation, migration or other factors such as land use. Such changes will be investigated to the extent deemed necessary, depending on the AOC/MRS conditions. If the risk levels have changed since initial LUC implementation, LUC modifications will be considered, which may include a change in monitoring frequency.

8.0 MODIFICATIONS

This PMP shall be binding upon the lead Army Agency, and upon its successors, subject to amendment or termination as set forth herein. Any modifications to this PMP will be provided to all stakeholders for their comment and approval. Any modifications to the PMP must be documented in a manner to demonstrate that all LUCs herein are properly maintained throughout the Installation.

The current lead Army agency will provide notice of modification(s) to the Ohio EPA for review, comment, and approval, prior to implementation of the proposed modification. "Change pages" will be appropriately marked, and will identify the effective date. The most current version of the PMP will be maintained by the Army and available as part of the administrative record and on the Ravenna Environmental Information Management System (REIMS) and/or the current repository.

The modifications to LUCs in this PMP may be amended or terminated by consent of all of the following: the current lead Army agency and the Ohio EPA. Amendment shall mean any changes to the LUCs set forth under the AOC/MRS-specific section in Appendix A. Termination shall mean the elimination of all LUCs set forth herein and all other obligations.

9.0 POINTS OF CONTACT

There are five Points of Contact for the facility. These are listed in the following.

Ohio EPA Site Coordinator, RVAAP Restoration Program Division of Environmental Response and Revitalization Ohio EPA, Northeast District Office 2110 East Aurora Road Twinsburg, OH 44087 (330) 963-1200
CJAG Environmental Office 1438 State Route 534 SW Newton Falls, OH 44444 (614) 336-6136
United States Property and Fiscal Officer for Ohio 2811 W. Dublin-Granville Road Columbus, OH 43235-2788 (614) 336-7201
CJAG Base Operations Supervisor CJAG Post Headquarters, Building 1001 8451 State Route 5 Ravenna, OH 44266 (614) 336-4978
Army National Guard Directorate RVAAP Restoration Program Manager, CJAG 1438 State Route 534 SW Newton Falls, OH 44444 (614) 336-2053

10.0 PMP APPROVALS

APPROVED:

Digitally signed by ROBINSON.SHAUN.THOMAS.1073023145
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SHAUN T. ROBINSON
MAJ, LG OHARNG
Commanding

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KEVIN M. SEDLAK
RVAAP Restoration Program Manager
Army National Guard Directorate

FIGURES

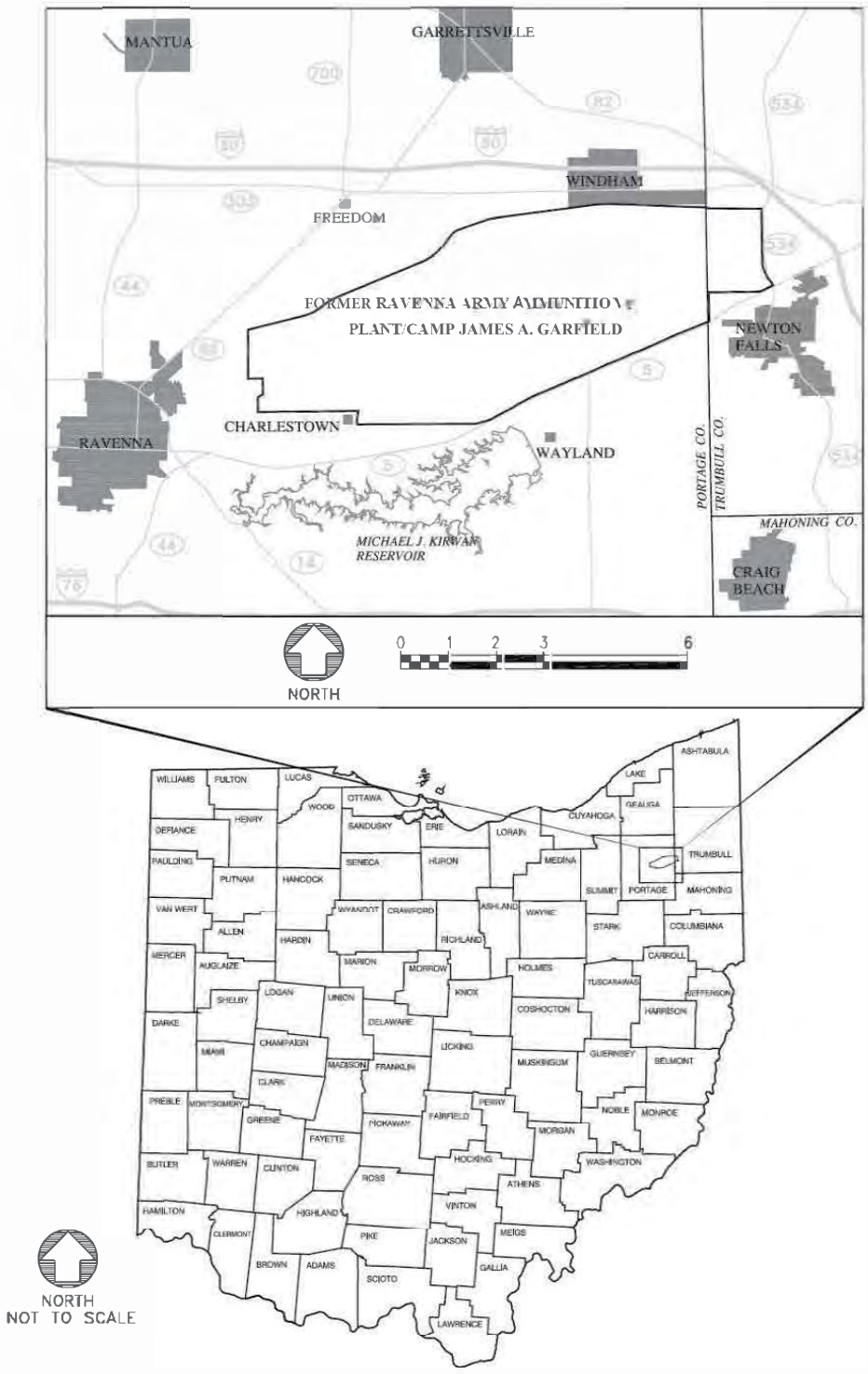
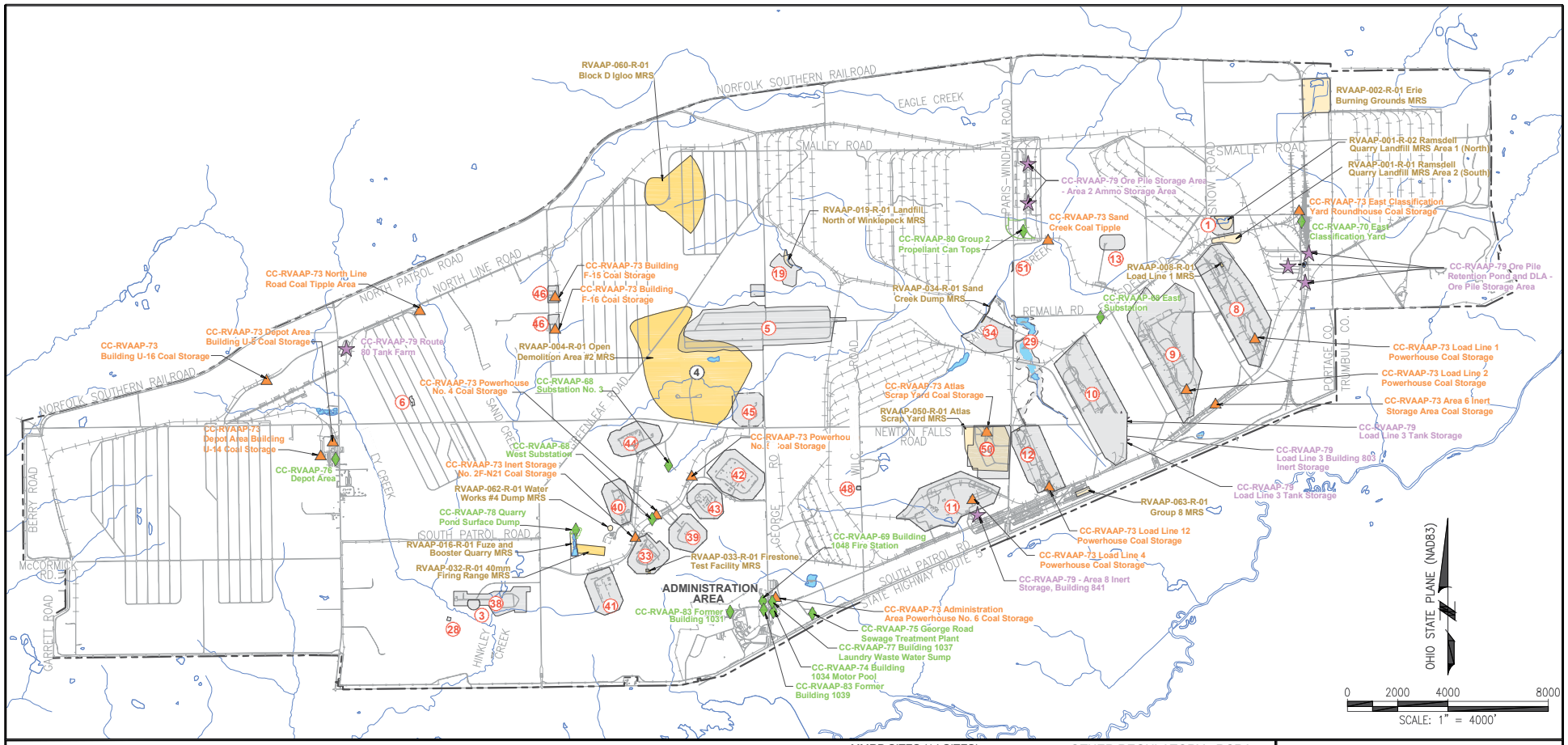


Figure 1. General Location and Orientation of the former RVAAP/Camp James A. Garfield



IRP SITES - CERCLA

- (1) RVAAP-01 ..... RAMSDELL QUARRY LANDFILL
- (3) RVAAP-03 ..... OPEN DEMOLITION AREA #1
- (5) RVAAP-05 ..... WINKLEPECK BURNING GROUNDS
- (6) RVAAP-06 ..... C BLOCK QUARRY
- (8) RVAAP-08 ..... LOAD LINE 1
- (9) RVAAP-09 ..... LOAD LINE 2
- (10) RVAAP-10 ..... LOAD LINE 3
- (11) RVAAP-11 ..... LOAD LINE 4
- (12) RVAAP-12 ..... LOAD LINE 12
- (13) RVAAP-13 ..... BLDG 1200 & DILUTION\SETTLING POND
- (19) RVAAP-19 ..... LANDFILL NORTH OF WINKLEPECK BURNING GROUNDS
- (28) RVAAP-28 ..... MUSTARD AGENT BURIAL SITE
- (29) RVAAP-29 ..... UPPER AND LOWER COBBS PONDS
- (33) RVAAP-33 ..... LOAD LINE 6
- (34) RVAAP-34 ..... SAND CREEK DISPOSAL ROAD LANDFILL
- (38) RVAAP-38 ..... NACA TEST AREA
- (39) RVAAP-39 ..... LOAD LINE 5
- (40) RVAAP-40 ..... LOAD LINE 7
- (41) RVAAP-41 ..... LOAD LINE 8
- (42) RVAAP-42 ..... LOAD LINE 9
- (43) RVAAP-43 ..... LOAD LINE 10
- (44) RVAAP-44 ..... LOAD LINE 11
- (45) RVAAP-45 ..... WET STORAGE AREA
- (46) RVAAP-46 ..... BUILDINGS F-15 AND F-16
- (48) RVAAP-48 ..... ANCHOR TEST AREA
- (50) RVAAP-50 ..... ATLAS SCRAP YARD
- (51) RVAAP-51 ..... DUMP ALONG PARIS-WINDHAM ROAD
- RVAAP-66 ..... FACILITY-WIDE GROUNDWATER
- RVAAP-67 ..... FACILITY-WIDE SEWERS

COMPLIANCE RESTORATION SITES (13 SITES)

- RVAAP-68 ..... ELECTRIC SUBSTATIONS (E,W,NO.3)
- RVAAP-69 ..... BUILDING 1048 – FIRE STATION
- RVAAP-70 ..... EAST CLASSIFICATION YARD
- RVAAP-72 ..... FACILITY-WIDE USTs
- RVAAP-73 ..... FACILITY-WIDE COAL STORAGE
- RVAAP-74 BUILDING 1034 MOTOR POOL HYDRAULIC LIFT
- RVAAP-75 .GEORGE ROAD SEWAGE TREATMENT PLANT
- RVAAP-76 ..... DEPOT AREA
- RVAAP-77 BUILDING 1037 LAUNDRY WASTE WATER SUMP
- RVAAP-78 ..... QUARRY POND SURFACE DUMP
- RVAAP-79 ..... DLA ORE STORAGE SITES
- RVAAP-80 ..... GROUP 2 PROPELLANT CAN TOPS
- RVAAP-83 ..... FORMER BUILDINGS 1031 AND 1039

MMRP SITES (14 SITES)

- RVAAP-001-R-02 ..... RAMSDELL QUARRY LANDFILL AREA 1 (NORTH)
- RVAAP-001-R-01 ..... RAMSDELL QUARRY LANDFILL AREA 2 (SOUTH)
- RVAAP-002-R-01 ..... ERIE BURNING GROUNDS MRS
- RVAAP-004-R-01 ..... OPEN DEMOLITION AREA #2 MRS
- RVAAP-008-R-01 ..... LOAD LINE 1 MRS
- RVAAP-016-R-01 ..... FUZE AND BOOSTER QUARRY MRS
- RVAAP-019-R-01 ..... LANDFILL NORTH OF WINKLEPECK MRS
- RVAAP-032-R-01 ..... 40MM FIRING RANGE MRS
- RVAAP-033-R-01 ..... FIRESTONE TEST FACILITY MRS
- RVAAP-034-R-01 ..... SAND CREEK DUMP MRS
- RVAAP-050-R-01 ..... ATLAS SCRAP YARD MRS
- RVAAP-060-R-01 ..... BLOCK D IGLOO MRS
- RVAAP-061-R-01 ..... BLOCK D IGLOO – TD MRS
- RVAAP-062-R-01 ..... WATER WORKS #4 DUMP MRS
- RVAAP-063-R-01 ..... GROUP 8 MRS

OTHER REGULATORY - RCRA

- (4) RVAAP-04 ..... OPEN DEMOLITION AREA #2

LEGEND:

- COMPLIANCE RESTORATION SITES – APPROVED
- DLA ORE STORAGE AREAS (7 SITES)
- COAL STORAGE AREAS (17 SITES)
- AOC SITES
- MMRP SITES
- RAILROAD TRACKS
- FENCELINE
- STREAM OR CREEK

US Army Corps of Engineers Louisville District

leidos

FORMER RVAAP/CAMP RAVENNA
PORTAGE & TRUMBULL COUNTIES, OHIO

DRAWN BY:	REV. NO./DATE:	CAD FILE:
P. HOLM	REV.2/02-05-16	08042/DWGS/Q94-RVAAP-AOCs

Location of AOCs at RVAAP/Camp Ravenna.

APPENDIX A

SUMMARY OF REMEDIAL DECISIONS FOR EACH AOC/MRS INCLUDING LAND USE AND ENGINEERING CONTROLS, WHERE APPLICABLE

Appendix A, Section A.1 - Contains Sites with LUCs

Appendix A, Section A.2 - Contains Sites with a Remedial Decision of No Further Action (NFA) for Soil, Sediment, and Surface Water

Appendix A, Section A.1

Sites with LUCs

LIST OF EACH AOC/MRS IN APPENDIX A, SECTION A.1, SPECIFIC LUCS, AND REVISION DATES

AOC/MRS	Appendix Tab	Land Use Controls	ROD Signature Date	Date Section added to the PMP	Revision or Update
RVAAP-01 Ramsdell Quarry Landfill	RVAAP -01	The LUCs for the RQL AOC are as follows: • Maintenance of the 6 ft high chain-link security fence at the northern perimeter of RQL and a five-strand, high tensile wire fence at the eastern, southern, and western perimeters. Maintenance of the closed sanitary landfill. • All activities must be in compliance with established digging restrictions and established exposure limits. o All digging or excavation within the quarry bottom is prohibited due to the residual asbestos and contamination. o Digging and excavation on the landfill cap is regulated by the post-closure care plan and the Ohio solid waste regulations. • Permanent warning signs will be installed and maintained around RQL on the gates and on the chain-link and high tensile wire fence at 300 ft centers to warn of the ACM hazard in the quarry bottom. The signs will meet the requirements of OAC 3745-20-07(B)(1)(b). As no soil disturbing activities are allowed within the quarry bottom, OSHA asbestos awareness training set forth at 29 CFR 1926.1101(k)(9)(vii) is not required. Any personnel entering the quarry bottom will be briefed of the asbestos hazards.	June 18, 2013	April 9, 2014	
RVAAP-05 Winklepeck Burning Grounds	RVAAP-05	The LUCs for the WBG AOC are as follows: • The AOC cannot be used for Unrestricted (Residential) Land Use unless or until additional evaluation shows that risk levels resulting from residual contamination have been reduced to levels acceptable for Unrestricted (Residential) Land Use and any residual MEC hazards have been removed.	August 19, 2008 ESD March 2015	August 2012	April 2017

LIST OF EACH AOC/MRS IN APPENDIX A, SECTION A.1, SPECIFIC LUCS, AND REVISION DATES

AOC/MRS	Appendix Tab	Land Use Controls	ROD Signature Date	Date Section added to the PMP	Revision or Update

		• Groundwater use or extraction of groundwater located at or underlying the WBG AOC or any portion thereof is prohibited, except for the following:
		  • The installation, development, purging, and sampling of new or existing monitoring wells in accordance with the most recent Facility-Wide Sampling and Analysis Plan (FWSAP) as part of the AOC-specific IRP, the Facility-Wide Ground Water Monitoring Program Plan (FGWMPP), or the Facility-Wide Groundwater Remedial Investigation.
		  • The modification of existing wells, if necessary, to allow for construction on the range.
		  • The abandonment and replacement of monitoring wells damaged by activities or removed for construction, and abandonment of wells no longer utilized as part of IRP or FGWMPP activities, in accordance with Ohio EPA guidance, the most recent FWSAP and applicable Ohio Administrative Code requirements.			

RVAAP-08, 09, 10, 11 Load Lines 1, 2, 3, 4	RVAAP-08, 09, 10, and 11	The Final Revised Interim ROD did not contain any formal LUCs. The Land Use was designated as National Guard Mounted Training (no digging). Until the remedial process is completed at these four AOCs, the OHARNG will ensure land use is maintained as Mounted Training – No Digging (tracked and wheeled vehicle use, no digging beyond 4 feet bgs, exposure of 24 hours/day for 39 days/year for 25 years). There are also annual inspections to confirm the land use remains appropriate.	June 4, 2007	March 2018	

LIST OF EACH AOC/MRS IN APPENDIX A, SECTION A.1, SPECIFIC LUCS, AND REVISION DATES

AOC/MRS	Appendix Tab	Land Use Controls	ROD Signature Date	Date Section added to the PMP	Revision or Update
RVAAP-12 Load Line 12	RVAAP-12	The LUCs for the LL12 AOC are as follows: Land Use Restrictions: Land use of LL12 shall be limited by the maintenance of the existing Camp Ravenna perimeter fence, which shall be a 6-foot chain-link fence topped with a v-shaped bracket slanting inward and outward with a three-strand barbed wire bracket. Land use shall be limited to use of LL12 for National Guard mounted training operations. Activities at LL12 shall be limited to the following: tracked and wheeled vehicle operations and associated training activities along with training area development and maintenance, maintaining the integrity of monitoring wells, road and culvert repair, routine ditch maintenance, vegetation management [mowing, brush and weed cutting, controlled burning, and herbicide application]; and compatible natural resources management activities (including but not limited to such activities as flora and fauna surveys, timber management to include timber stand improvement and forest products harvesting, soil stabilization and erosion control, invasive/non-native species control, nuisance wildlife control, drainage maintenance, wetland delineations, grassland management, and scientific research). Duration of exposure shall be based upon the established National Guard Trainee exposure scenario cited per person at 39 days per year at 24 hour per day for a maximum of 25 years (USACE 2005b). All activities must be in compliance with established digging restrictions and established exposure limits. All other uses of LL12 are prohibited, and the U.S. Army will cause appropriate notice to be posted. Disturbance Restrictions: All digging or excavation on LL12 to depths more than 4 ft BGS is prohibited with the exceptions: ground surface repairs, as	March 20, 2009	March 2018	

AOC/MRS	Appendix Tab	Land Use Controls	ROD Signature Date	Date Section added to the PMP	Revision or Update
		required, resulting from maneuver damage; and routine maintenance of the roads, ditches and culverts.			
RVAAP-51 Dump Along Paris-Windham Road	RVAAP-51	The LUCs for the Dump Along Paris-Windham Road AOC are as follows: Seibert stakes, Unauthorized Personnel warning sign and Asbestos Waste Disposal warning signs shall be posted at least every 300 feet around the AOC perimeter. The signs will meet the requirements of Ohio Administrative Code (OAC) 3745-20-07-(B)(1)(b). All digging or excavation within the AOC is prohibited due to residual asbestos and COCs in the surface soil. The digging restriction will be managed using permanent signs and Seibert Stakes placed along the AOC perimeter.	May 24, 2018	February 2020	

1

SECTION A.1, TAB RVAAP-01: RAMSDELL QUARRY LANDFILL

1 BACKGROUND

Ramsdell Quarry Landfill (RQL) was initially a stone quarry that operated until 1941. During operations, the quarry was excavated 30 to 40 ft below existing grade. The excavated sandstone and quartzite pebble conglomerate was used for road and construction ballast. From 1946 to the 1950s, the bottom of the quarry was used to burn waste explosives from Load Line 1. Reportedly, 18,000 500-lb (225-kg) incendiary or napalm bombs were burned and liquid residues from annealing operations were disposed of in the quarry.

Between 1941 and 1989, the western and southern sections of the abandoned quarry were used for landfill operations. No information is available regarding landfill disposal activities from 1941 to 1976, and no information is available on other activities at the quarry from the 1950s to 1976. Only nonhazardous solid waste was deposited in RQL from 1976 until it was closed in 1989. In 1978, a portion of the abandoned quarry was permitted as a sanitary landfill by the State of Ohio. The sanitary landfill was closed in 1990 under State of Ohio solid waste regulations. A clay cap was placed on the former permitted landfill area covering approximately 4 acres of the AOC.

2 PUBLICATIONS

The following publications pertinent to the remedial decision for RQL can be located on www.rvaap.org or in established information repositories:

- Final Supplemental Remedial Investigation for Sediment and Surface Water at RVAAP-01, RVAAP-04, RVAAP-16, RVAAP-001-R-01. Leidos. 29 November 2017.
- Final Remedial Action Report for Soil and Dry Sediment at the RVAAP-01 Ramsdell Quarry Landfill. Leidos. 30 January 2015.
- Final Remedial Design for Soil and Dry Sediment at the RVAAP-01 Ramsdell Quarry Landfill. Leidos. 9 April 2014
- Final Record of Decision Amendment for the RVAAP-01 Ramsdell Quarry Landfill at the Ravenna Army Ammunition Plant, Ravenna, Ohio. SAIC. 24 May 2012.
- Revised Final Modified Proposed Plan for Soil and Dry Sediment at RVAAP-01 Ramsdell Quarry Landfill at the Ravenna Army Ammunition Plant, Ravenna, Ohio. SAIC 2012. 6 June 2012.
- Final Engineering Evaluation for Soil and Dry Sediment at RVAAP-01 Ramsdell Quarry Landfill at the Ravenna Army Ammunition Plant, Ravenna, Ohio. SAIC. 2 September 2011.
- Revised Final Remedial Design for RVAAP-01 Ramsdell Quarry Landfill at the Ravenna Army Ammunition Plant, Ravenna, Ohio. SAIC. 17 June 2010.

- Final Record of Decision for the RVAAP-01 Ramsdell Quarry Landfill at the Ravenna Army Ammunition Plant, Ravenna, Ohio. SAIC. 24 March 2009.
- Wetlands and Other Waters Delineation Report Remedial Action Areas at Ramsdell Quarry Landfill, Load Line 12, and Fuze and Booster Quarry Landfill/Ponds at the Ravenna Army Ammunition Plant and Ravenna Training and Logistics Site, Ravenna, Ohio. EnviroScience. 29 December 2008.
- Final Proposed Plan for Soil and Dry Sediment at Ramsdell Quarry Landfill (RVAAP-01) at the Ravenna Army Ammunition Plant, Ravenna, Ohio. SAIC. March 2007
- Revised Final Feasibility Study for Ramsdell Quarry Landfill (RVAAP-01) at the Ravenna Army Ammunition Plant, Ravenna, Ohio. SAIC. October 2006.
- Final Sampling and Analysis Plan Addendum No. 2 for the Phase I Remedial Investigation of Ramsdell Quarry Landfill at the Ravenna Army Ammunition Plant, Ravenna, Ohio. SAIC. June 2006
- Final Phase I Remedial Investigation Report for Ramsdell Quarry Landfill at the Ravenna Army Ammunition Plant, Ravenna, Ohio. SAIC. September 2005
- Final Project Management Plan Performance-Based Contract for Six Environmental Areas of Concern at the Ravenna Army Ammunition Plant, Ravenna, Ohio. SAIC. 14 July 2005

3 SITE LOCATION AND DESCRIPTION

RQL encompasses approximately 14 acres in the northeastern portion of CJAG. RQL includes old-field communities with patches of forests and grasslands. The land surface in a large portion of the AOC slopes into a former quarry, which occupies most of the AOC. The quarry bottom is about 40 feet below the surrounding area. Former quarry operations resulted in the removal of much of the original soil.

Surface water runoff collects in an isolated wetland in the bottom of the former quarry. There is no surface water drainage outlet from the quarry. When water is present in the wetland, the water depth is usually less than 4 feet. The drainage ways and ditch lines outside of the quarry, located along access roads and the former rail line in the southern part of the AOC, only contain water during rain events.

4 LAND USE AND ACTIVITIES

RQL will be managed as restricted access due to residual asbestos and contamination and the closed landfill at the AOC.

5 REMEDY OBJECTIVES

Where applicable, the previously applied remedies at RQL consisted of excavation of contaminated soil and installation of the fence to preclude likely exposure through human contact. Following these remedies, hazardous substances, pollutants, or contaminants remained at levels greater than those that allow unlimited use and unrestricted exposure. Therefore a component of the remedial action includes Land Use Controls (LUCs) (see next section). Because LUCs will be used as part of the remedy, any property owner subsequent to the federal government will be required to enter into an environmental covenant meeting the requirements of ORC Section 5301.82. The remedy applied to soil and dry sediment.

The Final Supplemental Remedial Investigation for Sediment and Surface Water at RVAAP-01, RVAAP-04, RVAAP-16, RVAAP-001-R-01(November 2017) concluded that no further action is needed with regard to surface water or wet sediment at RVAAP-01.

6 LAND USE CONTROLS

The RQL AOC-specific LUCs were designed considering specific parameters developed for Restricted Access. The LUCs for RQL are as follows:

- All activities must be in compliance with established digging restrictions and established exposure limits: 1) All digging or excavation within the quarry bottom is prohibited due to the residual asbestos and contamination and 2) Digging and excavation on the landfill cap will be regulated by the post-closure care plan and the Ohio solid waste regulations.
- Permanent warning signs will be installed and maintained around RQL on the gates and on the chain-link and high tensile wire fence at 300 ft centers to warn of the ACM hazard in the quarry bottom. The signs will meet the requirements of OAC 3745-20-07(B)(1)(b).
- As no soil disturbing activities are allowed within the quarry bottom, OSHA asbestos awareness training set forth at 29 CFR 1926.1101(k)(9)(vii) is not required. Any personnel entering the quarry bottom will be briefed of the asbestos hazards.

7 MONITORING AND REPORTING

Periodic monitoring of LUCs, in the form of site inspections, will be conducted by the Army to confirm that the LUCs remain effective and still meet LUC objectives for continued remedy protectiveness. Site inspections will be conducted on an annual basis. Inspections of the solid waste landfill will be conducted in accordance with State of Ohio solid waste regulations and the Ohio Environmental Protection Agency (Ohio EPA) *Director's Final Findings and Orders* (Ohio EPA 2004).

The Annual RQL-LUC Inspection Reports will be submitted to the Ohio EPA for review and approval as they are completed. The RQL-LUC Inspection Forms for RQL and other AOCs/MRSs will be summarized in an Annual LUC Report for each year. The Annual LUC Report will be submitted to the Ohio EPA for review and approval.

The Annual LUC Report will evaluate the status and effectiveness of LUCs with a description of how any LUC deficiencies or inconsistent uses were addressed. The Annual LUC Reports will be

used in part for the preparation of the CERCLA 121(c) Five-Year Review. As part of the Annual LUC Report, a written certification will be submitted stating whether or not the LUCs remain in place and are effective.

CJAG/ Former Ravenna Army Ammunition Plant (RVAAP) Land Use Control (LUC) Inspection Form for RVAAP-01 Ramsdell Quarry Landfill Area of Concern (AOC)

In accordance with the CJAG/former RVAAP Property Management Plan (PMP) Appendix A and the Final Remedial Design for Soil and Dry Sediment at RVAAP-01 Ramsdell Quarry Landfill (RQL), a LUC inspection of RQL was conducted by_____ _____ on _____.

According to LUCs set forth in the *Final Remedial Design for Soil and Dry Sediment at the RVAAP-01 Ramsdell Quarry Landfill*, dated 9 April 2014, and memorialized in the PMP, periodic monitoring of LUCs, in the form of site inspections, is required to be conducted by the Army to confirm that the LUCs remain effective and still meet LUC objectives for continued remedy protectiveness. Site inspections are required to be conducted on an annual basis and inspections of the solid waste landfill are conducted in accordance with State of Ohio solid waste regulations and the Ohio Environmental Protection Agency (Ohio EPA) Director's Final Findings and Orders (Ohio EPA 2004). Additional LUC inspections may be conducted when landfill inspections are conducted as needed. The required Annual LUC Report is to be submitted to the Ohio EPA for review and approval.

The inspections shall include the following:

- Review of LUC training/inbriefs/maintenance and access logs and other documentation as applicable to RQL.
- Evaluation of activities at RQL to ensure that all activities executed within RQL are in compliance with the established digging restrictions and established exposure limits (Security Guard/Maintenance Worker - one (1) hour/day for 250 days/year for 25 years).
    - All digging or excavation within the quarry bottom is prohibited due to residual asbestos and contamination.
    - Digging and excavation on the landfill cap will be regulated by the post closure care plan and the Ohio solid waste regulations.
    - Due to not meeting the industrial/commercial standard, exposure monitoring for the full-time facility employee must be conducted to ensure and document that exposure at the AOC is not above the established exposure limit set for the Security Guard/Maintenance worker of one (1) hour/day for 250 days/year for 25 years.
- Inspection of warning signs on gates and fencing.
- Inspection of RQL fencing and gates.

LUC deficiencies or inconsistent land uses that are identified must be reported and identified on the inspection form/report and must also be reported to the Army National Guard (ARNG)/Ohio Army National Guard (OHARNG).

Review of LUCs – Management/Effectiveness/Corrective Action

Activities and Land Use:

a.) This AOC is to be managed as Restricted Access and is restricted from residential land use. Has residential use occurred? Have other land uses or land use changes occurred?

b.) What activities have occurred at RQL since the last inspection? Has any maintenance been performed at the AOC?

c.) Are activities at RQL being conducted in compliance with established digging restrictions and established exposure limits (exposure for full-time employees who access RQL must be tracked)?

d.) Are the warning signs in place and functional? Please note condition and any deficiencies.

e.) Is the RQL fencing and gates intact and in good condition? Please note condition and any deficiencies.

Inspections and Reporting:

Inspections are required on an annual basis. Periodic monitoring inspections may be conducted as needed. Are annual inspections being conducted as required? Have any additional inspections been completed?

An Annual Report is required. Has the annual report been completed and submitted to the Ohio EPA?

Training/Inbriefs (as applicable to RQL):
Are RQL LUC training and/or inbriefs (for those who need to access RQL) being conducted as applicable? Describe the training (content/who attended/who provided/documentation of training).

If training was not provided, explain why and what corrective actions were initiated.

Is access to RQL for full-time employees of the facility being logged in order to track exposure? Please review access logs to ensure exposure is within the established exposure limits.

LUC Violations (if any):
Description of any observed/noted LUC violation(s) as identified:

Date of Notification of LUC violations (if applicable) to ARNG/OHARNG:

Description of any corrective actions taken to remedy observed LUC violations or recommended corrective actions:

Additional Notes/Comments:

Original Inspection Completed by: Signature: Printed Name: Title: Organization:

RVAAP-01 Ramsdell Quarry Landfill (RQL) – Land Use Control (LUC) Brief for Contractors/Personnel

The Army National Guard (ARNG)/Ohio Army National Guard (OHARNG) are required to conduct Long Term Monitoring (LTM)/LUC monitoring at RVAAP-01 RQL at CJAG/former Ravenna Army Ammunition Plant (RVAAP). LUCs include any type of physical, legal, or administrative mechanisms that restrict use of or limit access to real property to prevent or reduce risks to human health and the environment. Established LUCs are set forth in the *Final Remedial Design for Soil and Dry Sediment at the RVAAP-01 Ramsdell Quarry Landfill*, dated 9 April 2014, and formalized in Appendix A of the Property Management Plan (PMP).

The RQL Area of Concern (AOC) consists of approximately 14 acres and was initially a stone quarry that operated until 1941. During operations, the quarry was excavated 30 to 40 feet below existing grade. The excavated sandstone and quartzite pebble conglomerate was used for road and construction ballast. From 1946 to the 1950s, the bottom of the quarry was used to burn explosives from Load Line 1. Between 1941 and 1989, the western and southern sections of the abandoned quarry were used for landfill operations. No information is available regarding landfill disposal activities from 1941 to 1976, and no information is available on other activities at the quarry from the 1950s to 1976. Only nonhazardous solid waste was deposited in RQL from 1976 until it was closed in 1989. In 1978, a portion of the abandoned quarry was permitted as a sanitary landfill by the State of Ohio. The sanitary landfill was closed in 1990 under State of Ohio solid waste regulations. A clay cap was placed on the former permitted landfill area covering approximately four (4) acres of the AOC. RQL is to be managed as Restricted Access due to residual asbestos and contamination and the closed landfill at the AOC.

The following LUCs have been developed for RQL considering specific parameters established for Restricted Access and must be adhered to:

- All activities must be in compliance with established digging restrictions and established exposure limits (Security Guard/Maintenance Worker - one (1) hour/day for 250 days/year for 25 years).
    - All digging or excavation within the quarry bottom is prohibited due to residual asbestos and contamination.
    - Digging and excavation on the landfill cap will be regulated by the post closure care plan and the State of Ohio solid waste regulations.
    - Due to not meeting the industrial/commercial standard, exposure monitoring for the full-time facility employee must be conducted to ensure and document that exposure at the AOC is not above the established exposure limit set for the Security Guard/Maintenance worker of one (1) hour/day for 250 days/year for 25 years.
- Permanent warning signs will be installed and maintained around RQL on the gates and on the chain link and high tensile wire fence at 300 feet centers to warn of the asbestos hazard in the quarry bottom. The signs will meet the requirements of OAC 3745-20-07 (B)(1)(b).
- As no soil disturbing activities are allowed within the quarry bottom, OSHA asbestos awareness training set forth in 29 CFR 1926.1101(k)(9)(vii) is not required. Any personnel entering the quarry bottom will be briefed of the asbestos hazards.
- Periodic monitoring of LUCs, in the form of site inspections, is required to be conducted by the ARNG/OHARNG to confirm that the LUCs remain effective and still meet LUC objectives for continued remedy protectiveness. Site inspections are required to be conducted on an annual basis and inspections of the solid waste landfill are conducted in accordance with State of Ohio solid waste regulations and the Ohio Environmental Protection Agency (Ohio EPA) Director's Final Findings and Orders (Ohio EPA 2004). The required annual inspection is to be submitted to the Ohio EPA for review and approval.

If a LUC violation is identified, please contact Range Control at (614)336-6041 to report.

I have been briefed and understand the requirements and LUCs/restrictions at Ramsdell Quarry Landfill. I will comply with all requirements. I will complete the access log for RQL when obtaining the key and accessing the AOC.

Printed Name	Signature	Company	Date

Sign In/Out Sheet for Ramsdell Quarry Landfill – Please sign in and out when entering and exiting the Ramsdell Quarry Landfill. Please also note what activities were performed and what areas of the AOC were accessed.

Name/Company	**Date**	**Time In**	**Time Out**	**Description of Activities Performed (i.e., mowing, gw sampling, etc)**	**Areas Accessed (please choose and check)**
					□ Quarry bottom □ Groundwater monitoring wells □ Landfill cap
					□ Quarry bottom □ Groundwater monitoring wells □ Landfill cap
					□ Quarry bottom □ Groundwater monitoring wells □ Landfill cap
					□ Quarry bottom □ Groundwater monitoring wells □ Landfill cap
					□ Quarry bottom □ Groundwater monitoring wells □ Landfill cap
					□ Quarry bottom □ Groundwater monitoring wells □ Landfill cap
					□ Quarry bottom □ Groundwater monitoring wells □ Landfill cap

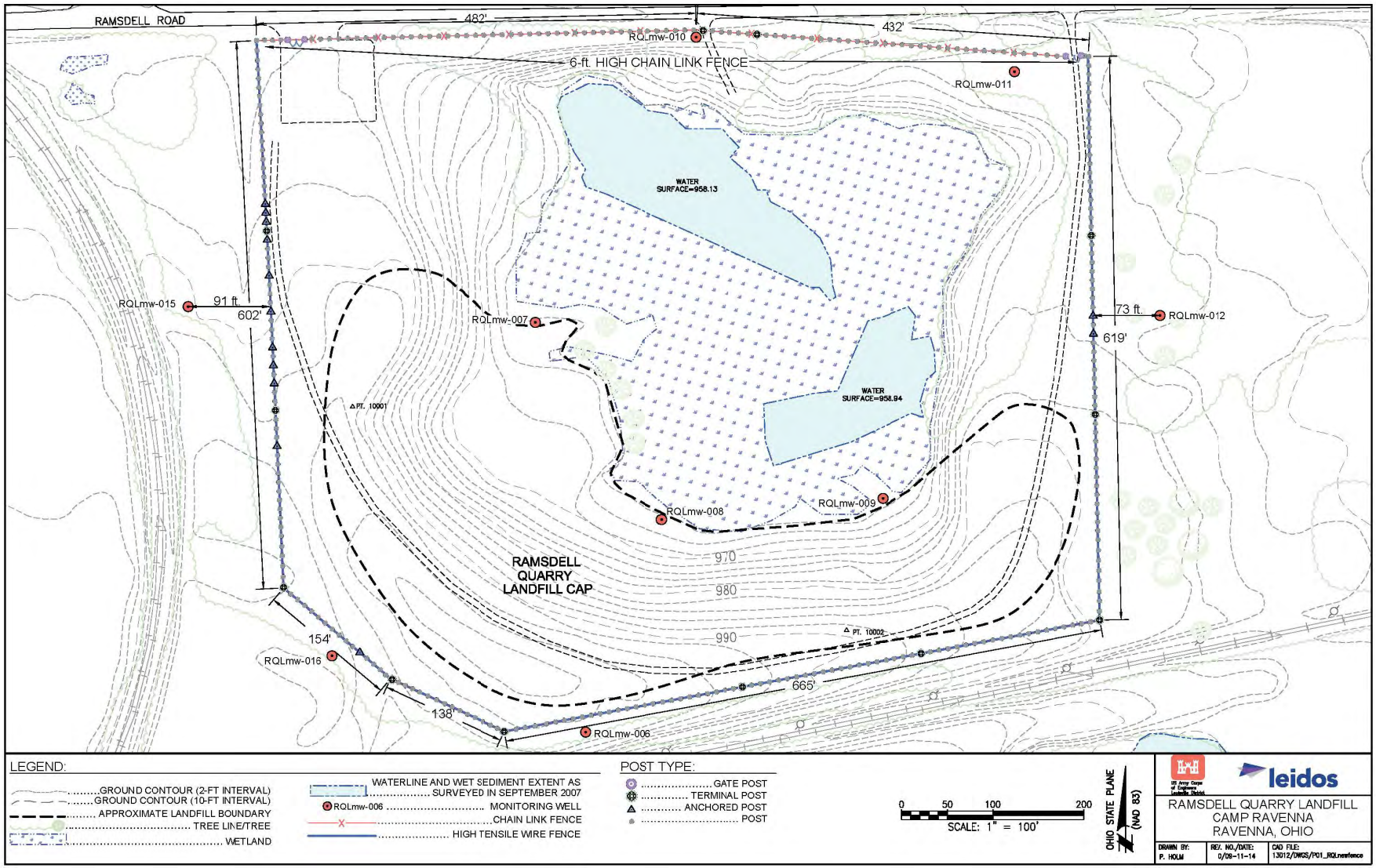


Figure 5-1. Ramsdell Quarry Landfill Fence Line

SECTION A.1, TAB RVAAP-05: WINKLEPECK BURNING GROUNDS

1 BACKGROUND

The total burning ground area consists of 211.66 acres and has been in operation since 1941. Prior to 1980, burning was conducted on the bare ground and the ash was abandoned at the site. Wastes treated in the area included RDX, antimony sulfide, Composition B, lead azide, TNT, propellants, black powder, waste oil, sludge from the load lines, domestic wastes and small amounts of laboratory chemicals. From 1980 until 1998, periodic burning of scrap explosives, propellants, and explosive-contaminated waste materials (e.g., wipe rags, paper, and cardboard) was conducted in raised refractory-lined metal trays within a 1.5-acre area. A Part-B permit covering the active portion of the site was withdrawn in 1994. The burn-trays along the 90-day storage unit of Building 1601 were closed in accordance with Ohio EPA guidance in 1998. MEC is present in the AOC.

2 PUBLICATIONS

The following publications relevant to the remedial decision at WBG can be located on www.RVAAP.org or in established information repositories:

- Final Remedial Design for the Post-ROD Changes to the Remedy at RVAAP-05 Winklepeck Burning Grounds, Former Ravenna Army Ammunition Plant/Camp Ravenna, Portage and Trumbull Counties, Ohio. US Army Corp of Engineers, Louisville District. August 2015.

- Final Explanation of Significant Differences for Post-ROD Changes to the Remedy at RVAAP-05 Winklepeck Burning Grounds, Former Ravenna Army Ammunition Plant/Camp Ravenna, Portage and Trumbull Counties, Ohio. US Army Corp of Engineers, Louisville District. March 2015.

- Final Remedial Investigation/Feasibility Study Supplement for RVAAP-05 Winklepeck Burning Grounds, Former RVAAP/Camp Ravenna, Portage and Trumbull Counties, Ohio. US Army Corp of Engineers, Louisville District. 19 September 2014.

- Final Remedial Action Completion Report for RVAAP- 05 Winklepeck Burning Grounds Pads 61/61A, 67, and 70 at Ravenna Army Ammunition Plant. MKM Engineers. 19 Nov 2009.

- Final Contractor Quality Control Plan for the Remedial Action at RVAAP- 05 Winklepeck Burning Grounds at Ravenna Army Ammunition Plant. MKM Engineers. 17 Nov 2008.

- Final Explosives Safety Submission for the Munitions and Explosives of Concern Survey and Munitions Response of RVAAP- 05 Winklepeck Burning Grounds at Ravenna Army Ammunition Plant, Revision 3, Amendment 3. MKM Engineers. 9 Oct 2008.

- Final Project Management Plan for RVAAP-05 Winklepeck Burning Grounds Remedial Design/Remedial Action, Revision 2. MKM Engineers. 4 Sept 2008.

- Final Record of Decision for Soil and Dry Sediment at RVAAP- 05 Winklepeck Burning Grounds at Ravenna Army Ammunition Plant. SAIC. Aug 2008.

- Final Remedial Action Work Plan for RVAAP-05 Winklepeck Burning Grounds at Ravenna Army Ammunition Plant. MKM Engineers. 27 July 2008.

- Revised Final Report On The Biological Field-Truthing Effort At Winklepeck Burning Grounds At Ravenna Army Ammunition Plant, Ravenna, Ohio. SAIC. Aug 2006.

- Final Sampling and Analysis Plan Addendum No. 2 for RVAAP- 05 Winklepeck Burning Grounds Feasibility Study. SAIC. Feb 2006.

- Proposed Plan for the Winklepeck Burning Grounds, Ravenna Army Ammunition Plant, Ravenna, Ohio. SAIC. Dec 2005.

- Final Site Safety and Health Plan for the Phase II MEC Clearance and Munitions Response at RVAAP- 05 Winklepeck Burning Grounds. MKM Engineers. March 2005.

- Final Work Plan for Phase II MEC Clearance and Munitions Response at RVAAP- 05 Winklepeck Burning Grounds. MKM Engineers. March 1, 2005.

- Revised Final Focused Feasibility Study for RVAAP- 05 Winklepeck Burning Grounds. SAIC. March 2005.

- Final Phase I MEC Density Survey After Action Report at RVAAP- 05 Winklepeck Burning Grounds. MKM Engineers. 1 March 2005.

- Final Phase II Remedial Investigation Report for the Winklepeck Burning Grounds at RVAAP. SAIC. April 2001.

- Final Sampling and Analysis Plan and Site Safety and Health Plan Addendum No. 1 for the Winklepeck Burning Grounds Feasibility Study. SAIC. Oct 2000.

- Closure, Completion of Partial Closure of RVAAP-07 Building 1601 Hazardous Waste Storage and RVAAP- 05 Winklepeck Burning Grounds (WBG). Ohio EPA. 5 May 1999.

- Final Resource Conservation and Recovery Act (RCRA) Closure Field Investigation Report for the Deactivation Furnace Area, Open Detonation Area, Building 1601, and Pesticides Building at RVAAP. SAIC. June 1998.

- Final Sampling and Analysis Plan Addendum for the Phase II Remedial Investigation of the Winklepeck Burning Grounds and Determination of Facility-Wide Background at the Ravenna Army Ammunition Plant. SAIC. April 1998.

- Phase I Remedial Investigation Report for High Priority Areas of Concern at the Ravenna Army Ammunition Plant, Ravenna, Ohio. Final. SAIC. Feb 1998.

- Final Public Meeting Briefing Phase I Remedial Investigation of High Priority Areas of Concern at the Ravenna Army Ammunition Plant. SAIC. Sept 1997.

- Final Phase I Remedial Investigation Site Safety and Health Plan Addendum for High Priority Areas of Concern for the Ravenna Army Ammunition Plant. SAIC. July 1996.

- Final Phase I Remedial Investigation Sampling and Analysis Plan Addendum for High Areas of Concern for the Ravenna Army Ammunition Plant. SAIC. July 1996.

- Final Quality Control Plan for the Phase I Remedial Investigation for High Areas of Concern at RVAAP. SAIC. June 1996.

3 SITE LOCATION AND DESCRIPTION

Winklepeck Burning Ground (WBG) encompasses 211.66 acres and is located in the central portion of RVAAP as illustrated within Figure 2 of this PMP and Figure 1 of this Appendix Tab (RVAAP-05). The WBG tract of land exists in an open field within a gently rolling plain having a west to east run-off gradient with a network of looping gravel roads traversing past the once used burning pad areas. It is located within the Camp Ravenna range complex and will be utilized as a range.

4 LAND USE AND ACTIVITIES

The WBG will be utilized as a range. This planned Land Use is considered to be Military Training, but the removal action conducted in Fiscal Year 2017 was performed to meet Commercial/Industrial standards. The Department of Army has classified the WBG as an Operational Range at the WBG AOC. During a Supplemental Remedial Investigation/Feasibility Study (RI/FS) (final report dated September 19, 2014), USACE determined that removal of an additional 5250 cubic yards total of soil from five different locations would allow the residual chemical contamination to meet the standards for Commercial/Industrial Land Use. In accordance with the Risk Assessment Technical Memorandum, meeting the Commercial/Industrial Land Use would allow for use by either National Guard Trainees or full-time personnel without monitoring exposure parameters. While there is no plan to have full-time personnel occupy the AOC, the Army desired that flexibility. Therefore, the Army prepared an Explanation of Significant Differences (ESD) for Post-ROD Changes to the Remedy and a Remedial Design (RD) pursuant to the approved ESD. A Remedial Action (RA) was conducted in November 2016 through January 2017 to implement the ESD and RD. Upon completion of the RA, the residual chemical contamination meets the criteria for Commercial/Industrial Land Use. Given that WBG is now an operational small arms range, any residual MEC will be handled in accordance with Army safety regulations governing operational ranges.

5 REMEDY OBJECTIVES

Where applicable, the previously applied remedy consisted of excavation of contaminated soil to preclude likely exposure through human contact at the WBG AOC. A portion of that remedy resulted in hazardous substances, pollutants, or contaminants remaining greater than levels that allow unlimited use and unrestricted exposure. Therefore a component of the remedial action

includes Land Use Controls (LUCs) (see next section). Because LUCs will be used as part of the remedy, any property owner subsequent to the federal government will be required to enter into an environmental covenant meeting the requirements of ORC Section 5301.82.

6 LAND USE CONTROLS

The WBG AOC-specific LUCs were designed for exposure associated with the Commercial/Industrial Land Use. This exposure scenario is based on full-time occupational exposure using the USEPA Regional Screening Levels (RSLs) for full-time workers which were in effect at the time the Supplemental RI/FS was prepared (i.e., May 2013 RSLs).

The LUCs for the WBG AOC are as follows:

- The AOC cannot be used for Unrestricted (Residential) Land Use unless or until additional evaluation shows that risk levels resulting from residual contamination have been reduced to levels acceptable for Residential Land Use and any residual MEC hazards have been removed.

- Groundwater use or extraction of groundwater located at or underlying the WBG AOC or any portion thereof is prohibited, except for the following:

    - The installation, development, purging, and sampling of new or existing monitoring wells in accordance with the most recent Facility-Wide Sampling and Analysis Plan (FWSAP) as part of the AOC-specific IRP, the Facility-Wide Ground Water Monitoring Program Plan (FGWMPP), or the Facility-Wide Groundwater Remedial Investigation.

    - The modification of existing wells, if necessary, to allow for construction on the range.

    - The abandonment and replacement of monitoring wells damaged by activities or removed for construction, and abandonment of wells no longer utilized as part of IRP or FGWMPP activities, in accordance with Ohio EPA guidance, the most recent FWSAP, and applicable Ohio Administrative Code requirements.

7 MONITORING AND REPORTING

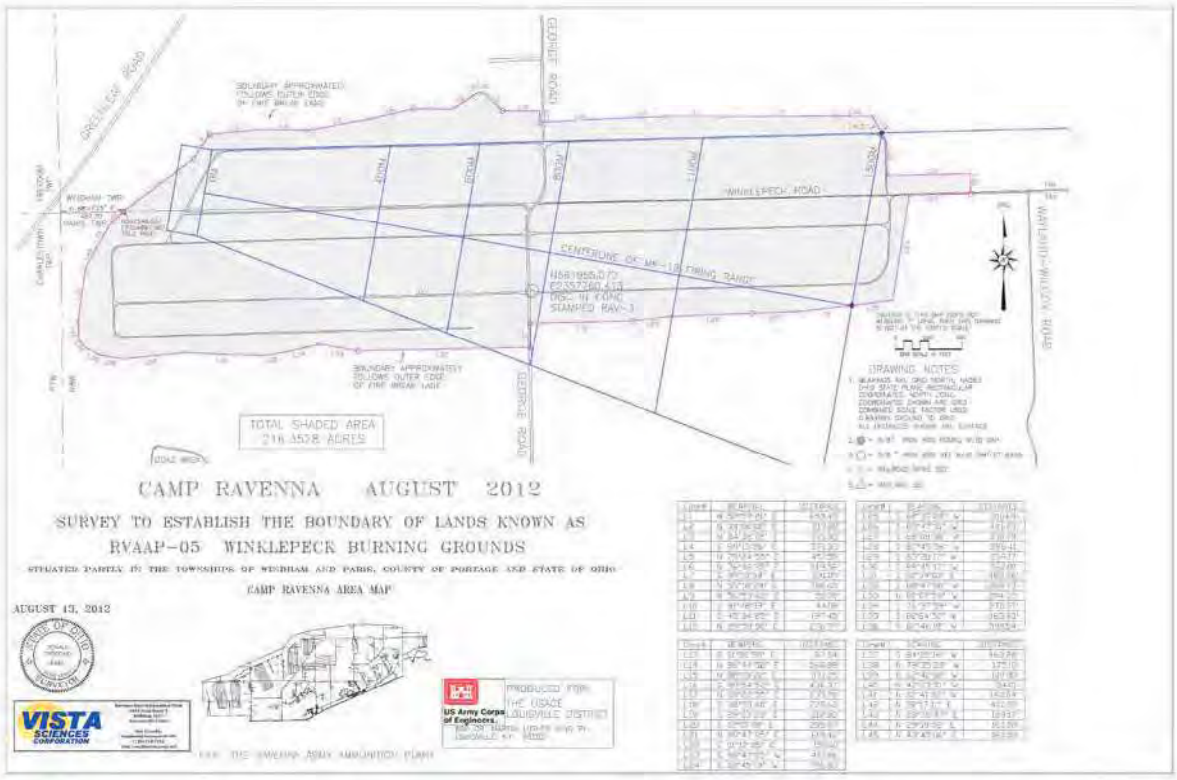
Periodic monitoring of LUCs in the form of site inspections will be conducted by the Army to confirm that the LUCs remain effective and still meet LUC objectives for continued remedy protectiveness. Site inspections will be conducted on an annual basis.

The Annual WBG-LUC Inspection Reports will be submitted to the Ohio EPA for review and approval as they are completed. The WBG-LUC Inspection Forms for WBG and other AOCs/MRSs will be summarized in an Annual LUC Report for the installation each year. The Annual LUC Report will be submitted to the Ohio EPA for review and approval.

The Annual LUC Report will evaluate the status and effectiveness of LUCs with a description of how any LUC deficiencies or inconsistent uses were addressed. The Annual LUC Reports will be used in part for the preparation of the CERCLA 121(c) Five-Year Review. As part of the Annual

LUC Report, a written certification will be submitted stating whether or not the LUCs remain in place and are effective.

FIGURE 1. WINKLEPECK BURNING GROUNDS MAP WITH METES AND BOUNDS.



Note: The red line represents the boundary of Winklepeck Burning Grounds and the blue lines represent the range fan of the Mark-19 Firing Range as it existed in 2012.

CJAG/Former Ravenna Army Ammunition Plant (RVAAP)
RVAAP-05 Winklepeck Burning Grounds – Inspection Form

In accordance with the CJAG/former RVAAP Property Management Plan (PMP), an inspection of RVAAP-05 Winklepeck Burning Grounds (WBG) was conducted by ———— on ————. The annual inspection required by the PMP includes the following:

- Review of LUC training and documentation as applicable to WBG.
- Evaluation of activities at WBG to ensure that residential use and groundwater use is not occurring.

LUC deficiencies or inconsistent land uses that are identified must be reported and identified on the inspection form and properly reported to the Army National Guard (ARNG)/Ohio Army National Guard (OHARNG).

Review of LUCs – Management/Effectiveness/Corrective Action

1. Activities and Land Use

a.) This AOC is restricted from residential land use. Has residential use occurred?

b.) Groundwater use or extraction of groundwater located at or underlying the WBG AOC or any portion thereof is prohibited, except for the following:

- The installation, development, purging, and sampling of new or existing monitoring wells in accordance with the most recent Facility-Wide Sampling and Analysis Plan (FWSAP) as part of the AOC-specific IRP, the Facility-Wide Ground Water Monitoring Program Plan (FGWMPP), or the Facility-Wide Groundwater Remedial Investigation.
- The modification of existing wells, if necessary, to allow for construction on the range.
- The abandonment and replacement of monitoring wells damaged by activities or removed for construction, and abandonment of wells no longer utilized as part of IRP or FGWMPP activities, in accordance with Ohio EPA guidance, the most recent FWSAP, and applicable Ohio Administrative Code requirements.

Have any groundwater activities been conducted and, if yes, are they within the established control parameters?

2. Inspections and Reporting

a.) Inspections are required on an annual basis. Are annual inspections being completed?

b.) An annual report is required. Has the annual report been completed and submitted?

3. Training (as applicable to WBG)

a.) Was LUC training (specific to WBG) being conducted as applicable? Describe the training (content/who attended/who provided/documentation of training).

b.) If training was not provided, explain why and what corrective actions were initiated?

4. Description of any observed/noted LUC violation(s):
5. Date of Notification of LUC violation (if applicable):
6. Description of any corrective actions taken to remedy observed LUC violation(s) or recommended corrective actions:
7. Additional Notes/Comments:

Original Inspection Completed by:

Signature:	
Printed Name:	
Title:	Organization:
Date:	

SECTION A.1, TAB RVAAP-08, 09, 10, AND 11: LOAD LINES 1, 2, 3, AND 4

1 BACKGROUND

RVAAP-08, 09, 10 and 11 are the designated numbers for four Areas of Concern (AOCs), known as Load Lines 1 through 4 (LLs 1-4). While these are unique, individual AOCs, they have historically been studied and treated together, so they are addressed together in this section of Appendix A. RVAAP-08, 09, 10, and 11collectively cover approximately 800 acres on the former Ravenna Army Ammunition Plant (RVAAP), now known as Camp James A. Garfield Joint Military Training Center (CJAG).

Industrial operations at RVAAP primarily consisted of 12 munitions assembly facilities referred to as "load lines." LLs 1 - 4 were used between 1941 and 1971 to melt and load trinitrotoluene (TNT) and Composition B (a mixture of TNT and cyclotrimethylenetrinitramine (RDX)) into large-caliber shells. The operation of the load lines produced explosive dust, spills, and vapors that collected on the floors and walls of each building. Periodically the floors and walls would be cleaned with water and steam. The liquid, containing TNT and Composition B, was known as "pink water" for its characteristic color and was collected in sumps or settling ponds and in some instances would washout onto the surrounding ground. Various industrial operations associated with the munitions loading process and munitions rehabilitation activities were also conducted during the operation of LLs 1 - 4. As a result of these operational activities, soils were contaminated with explosives, metals, SVOCs, and PCBs.

A Remedial Action for soil and dry sediment was completed in 2008. At first, building demolition ended with floor slabs of the main production buildings remaining in place. Therefore, the Final Revised Interim Record of Decision (ROD) for Remediation of Soils specified that the at-grade slabs would be inspected and maintained until removed as they acted as covers over potentially explosives-contaminated soils that may have remained under the slabs.

After the Interim ROD was approved, the Army obtained funding to demolish the floor slabs and, with oversight and approval of the Ohio EPA, removed the at-grade slabs to make the site more accessible for future OHARNG training activities. Subsequent to demolition of the floor slabs, additional soil investigation and removal activities were conducted. The results of site investigations and summaries of removal actions for LLs 1 - 4 are described in numerous documents, which are listed in Section 2, below. Currently, concrete elevated walkways remain within the Load Lines (which will be demolished by the OHARNG when the site is developed for training).

In 2013 and 2014, the Army developed the *Final Technical Memorandum: Land Uses and Revised Risk Assessment Process for the RVAAP Installation Restoration Program* (hereafter referred to as the Technical Memorandum) (ARNG 2014), which identified three Categorical Land Uses and Representative Receptors to be considered during the CERCLA process. These three Land Uses and Representative Receptors are:

1. Unrestricted (Residential) Land Use – Resident Receptor (Adult and Child) (formerly called Resident Farmer),

2. Military Training Land Use – National Guard Trainee, and

3. Commercial/Industrial Land Use – Industrial Receptor (U.S. Environmental Protection Agency [USEPA] Composite Worker).

The Technical Memorandum established, with concurrence from the Ohio EPA, that sites which meet the cleanup standards for the Commercial/Industrial Land Use are also suitable for Military Training (National Guard Trainee) including use by a full-time worker.

Recently, the Final Feasibility Study (FS) Addendum for Soil, Sediment, and Surface Water at Load Lines 1, 2, 3, 4, and 12, Volumes 1 & 2 (June 2017) found that only limited areas of surface and subsurface soil at each load line pose unacceptable risk to the Industrial Receptor. The FS Addendum recommended Alternative 3 (Commercial/Industrial Land Use – Ex-situ Thermal Treatment of Soil and Administrative LUCs) to address residual contamination and unacceptable risk. Implementation of Alternative 3 would include excavation and ex-situ thermal treatment of approximately 5,700 cubic yards of soil and excavation and off-site disposal of approximately 160 cubic yards of lead-contaminated soil from Load Lines 1 through 4 and 12. The areas estimated for removal from LLs 1 through 4 are 0.3 acres from LL 1, 0.01 acres from LL 2, 0.6 acres from LL 3, and 0.14 acres from LL 4, or approximately 1.05 acres total from LLs 1 through 4. Alternative 3 is protective of the likely future land user (Industrial Receptor) and is a green and highly sustainable alternative. The Army plans to proceed with the CERCLA process for LLs 1 through 4 and 12 by preparing a Proposed Plan for the alternative recommended in the FS Addendum.

2 PUBLICATIONS

The following publications related to Load Lines 1 through 4 can be located on www.RVAAP.org or in established RVAAP information repositories:

- Final Feasibility Study Addendum for Soil, Sediment, and Surface Water at RVAAP Load Lines 1, 2, 3, 4, and 12, Volumes 1 & 2, June 2017.

- Final Engineering Evaluation/Cost Analysis for RVAAP-67 Facility-wide Sewers: Load Line 2 Functional Area and CC RVAAP-75 George Road Sewage Treatment Plant Mercury Spill, March 2017.

- Final PBA13 Remedial Investigation Sample and Analysis Plan Addendum for Load Line 1, 2, 3, 4, and 12, April 2016.

- Final Technical Memorandum: Land Uses and Revised Risk Assessment Process for the RVAAP Installation Restoration Program, February 2014.

- Final Characterization Sampling Report of Surface and Subsurface Incremental Sampling Methodology at RVAAP-08, 09, 10, 11, and 12 Load Lines 1, 2, 3, 4, and 12, March 2013.

- Final Sampling Report of Surface and Subsurface Incremental Sampling Methodology at Load Lines 1, 2, 3, and 4 (RVAAP-08, 09, 10, and 11), Volumes 1 & 2, March 2011.

- Final Remediation Completion Report Sub-Slab Soils at RVAAP-09 Load Line 2, RVAAP-10 Load Line 3, and RVAAP-12 Load Line 4, December 2010.

- Final Sampling and Analysis of Soils Below Floor Slabs at RVAAP-08 Load Line 1 and Other Building Locations, September 2010.

- Final Work Plan for Sampling and Closure of Load Lines 1 - 4, 12 (RVAAP- 08, 09, 10, 11, 12) and other Areas of Concern, July 2010.

- Final Stormwater Pollution Prevention Plan for Remediation of Sub-Slab Soils at RVAAP-08 Load Line 1, RVAAP-09 Load Line 2, RVAAP-10 Load Line 3, March 2010.

- Final Multi-Increment Sampling and Analysis of Soils Below Floor Slabs at RVAAP-09 Load Line 2, RVAAP-10 Load Line 3, and RVAAP-11 Load Line 4 at Ravenna Army Ammunition Plant, December 2009.

- Final of the Sampling and Screening Analysis of Soils Below Floor Slabs at RVAAP-09 Load Line 2, RVAAP-10 Load Line 3, and RVAAP-11 Load Line 4 at Ravenna Army Ammunition Plant, September 2009

- Final Work Plan Addendum 1 for the Sampling of Soils Below Floor Slabs and Remediation at RVAAP-08 Load Line 1 and Other Building Locations, August 2009.

- Final Remedial Action Completion Report for the Remediation of Soils and Dry Sediments at RVAAP-08 Load Line 1, RVAAP-09 Load Line 2, RVAAP-10 Load Line 3, and RVAAP-11 Load Line 4 at Ravenna Army Ammunition Plant, June 2008.

- Final Work Plan for the Sampling of Soils Below Floor Slabs at Load Lines 2-4 and Excavation and Transportation of Contaminated Soils to Load Line 4 (Buildings G-1, G-1A, and G-3), May 2008.

- Final Project Coordination Plan for the Sampling of Soils Below Floor Slabs at RVAAP-09, 10, and 11 Load Lines 2, 3, and 4 and Excavation and Transportation of Contaminated Soils to RVAAP-11 Load Line 4 (Buildings G-1, G-1A and G-3), March 2008.

- Final Letter Report Work Plan for the Sampling of Soils Below Floor Slabs at RVAAP-09, 10, and 11 Load Lines 2, 3, and 4 and Excavation and Transportation of Contaminated Soils to RVAAP-11 Load Line 4 (Buildings G-1, G-1A and G-3), February 2008.

- Final Stormwater Pollution Prevention Plan for Remediation of Soils at RVAAP-08, 09, 10, and 11 Load lines 1 – 4, July 2007.

- Final Remedial Action Work Plan for Remediation of Soils at Load lines 1 – 4 (RVAAP-08, 09, 10, and 11), April 2007.

- Final Revised Interim Record of Decision for the Remediation of Soils at RVAAP-08, 09, 10, and 11 Load lines 1 – 4, January 2007.

- Final Construction Field Plans for the Remediation of Soils at RVAAP-08 Load Line 1, RVAAP-09 Load Line 2, RVAAP-10 Load Line 3, and RVAAP-11 Load Line 4 at Ravenna Army Ammunition Plant, November 2006.

- Final Project Plans of the Structural Analysis and MEC Support for RVAAP-08, 09, 10 and 11 Load Lines 1 - 4, at Ravenna Army Ammunition Plant, November 2006.

- Final Proposed Plan for the Remediation of Soils at Load Lines 1 through 4 at the Ravenna Army Ammunition Plant Ravenna, Ohio, July 2005.

- Final Focused Feasibility Study for the Remediation of Soils at LLs 1-4, RVAAP, May 2005.

- Final Proposed Remedial Goal Options for Soil at RVAAP-08, 09, 10, and 11 Load Lines 1-4, September 2004.

- Final Phase II Remedial Investigation Report for Load Line 4 at RVAAP, September 2004.

- Final Geotechnical Laboratory Results for the Phase II Remedial Investigations for RVAAP-09, 10, and 11 Load Lines 2, 3, and 4 at Ravenna Army Ammunition Plant, April 2003.

- Final Sampling and Analysis Plan Addendum No. 1 for the Phase II Remedial Investigation of Load Lines 2, 3, and 4 at RVAAP, July 2001.

- Final Phase I Remedial Investigation Report for High Priority Areas of Concern at the Ravenna Army Ammunition Plant, Ravenna, Ohio, February 1998.

- Final Public Meeting Briefing Phase I Remedial Investigation of High Priority Areas of Concern at the Ravenna Army Ammunition Plant, September 1997.

- Final Phase I Remedial Investigation Sampling and Analysis Plan Addendum for High Areas of Concern for the Ravenna Army Ammunition Plant, July 1996.

- Final Quality Control Plan for the Phase I Remedial Investigation for High Areas of Concern at RVAAP, June 1996.

3 SITE LOCATION AND DESCRIPTION

The LLs 1 through 4 AOCs are located in the southeastern portion of the former RVAAP installation, as shown in Figure 2 of this Property Management Plan (PMP), with LL 1 being the easternmost.

Site elevations for LL 1 vary from approximately 12.2 m (40 ft) across LL 1, from 309.6 m (1,016 ft) amsl relative to the North American Vertical Datum of 1988 (NAVD88) near the main entrance to 297.2 m (975 ft) amsl near the east perimeter fence. Inside the production area, the ground surface is hummocky as a result of the extensive excavation of bedrock to accommodate the load lines buildings and infrastructure. Outside the production area and to the southeast, the terrain slopes more uniformly southeastward, with elevations ranging from 298.7 m (980 ft) amsl at the railroad track to 285.9 m (938 ft) amsl at the perimeter fence. This smoother topography reflects

the presence of glacial sedimentary cover that has been relatively undisturbed throughout RVAAP's active life.

Elevations within the bounds of LL 2 vary from approximately 301 to 307 m (990 to 1,010 ft) amsl. However, topography drops sharply to the south of the AOC, in the direction of Kelly's Pond. In general, the land surface slopes from the center of the load line in all directions. There is a high point (1,020 ft) to the north of the AOC, and surface elevation decreases to 930 ft to the south within the bounds of the former RVAAP. Kelly's Pond is located just south of the fenced boundary of LL 2 and a group of four ponds (identified as the Load Line 2 ponds) are located northeast of the AOC perimeter fence.

LL 3 is characterized by sloping topography on a reworked sandstone bedrock surface. Elevations within the bounds of the AOC vary from approximately 299 to 311 m (980 to 1,020 ft) amsl. Topographic elevations across most of the AOC generally decrease from east to the west and north towards Cobbs Pond and the stream entering Cobbs Pond. Along the southern most portion of the AOC, land surface elevations gently decrease to the south toward South Service Road.

The topography within LL 4 is subdued on a glacial till surface. Elevations within the bounds of the AOC vary from approximately 299 to 305 m (980 to 1,000 ft) amsl. The overall topography slopes very gently from north to south within the AOC with localized steeper slopes cut along the main stream and southwestern edge of the settling pond.

4 LAND USE AND ACTIVITIES

Administrative accountability for Camp Ravenna, including LLs 1 – 4, has been transferred to the USP&FO for Ohio and licensed to the Ohio Army National Guard (OHARNG) for use as a military training site. Due to ongoing restoration activities, LLs 1 - 4 are not currently used for military training purposes although future land use will include military training activities. The Final Revised Interim Record of Decision for the Remediation of Soils at RVAAP-08, 09, 10, and 11 Load lines 1 – 4 specified that the planned future use of these four AOCs is National Guard Mounted Training (No Digging). Mounted Training refers to training on vehicles only with vehicle disturbance up to a depth of four (4) feet; however, National Guard Trainees would be restricted from manual digging in these areas.

When the CERCLA process is completed, pursuant to the 2017 FS Addendum, the Army anticipates that LLs 1 – 4 will be suitable for Commercial/Industrial use.

5 REMEDY OBJECTIVES

The selected remedy for soil and dry sediment at the LLs 1 - 4 AOCs, as documented in the Final Revised Interim ROD for the Remediation of Soils (2007), was to excavate contaminated surface and subsurface soils and dry sediment from discrete contaminated areas. The remedial action objective (RAO) was to allow for land use by the National Guard Trainee by achieving cleanup goals for National Guard Trainee, which was considered the most representative receptor. Following excavation of the contaminated surface and subsurface soils and dry sediment and confirmatory soil sampling indicating that material with concentrations of COCs exceeding clean-

up goals had been removed, clean backfill was placed in excavated areas, and the AOCs were restored.

The implemented remedy also included the following components:

- Groundwater monitoring to ensure the remedy did not impact groundwater;
- Maintenance of building slabs and foundations; and
- Five year reviews in accordance with CERCLA 121(c) and 300.430(f)(4)(ii).

The Interim ROD stated that as part of the selected remedy, groundwater monitoring will be performed for five years at select existing wells in LLs 1-4 to monitor for potential impacts to groundwater from remedy implementation. This groundwater monitoring data would supplement data from the Facility-Wide Groundwater Monitoring Program. The Interim ROD also stated that the concrete slabs and building foundations that remain in place after remediation will be inspected periodically (until removed) to ensure their integrity has not been compromised allowing infiltration to potentially contaminated soils underneath. The remedial action will be subjected to five-year reviews as part of the CERCLA process to assure that human health and the environment are being protected.

6 LAND USE CONTROLS

According to the Final Interim ROD, the need for and type of land use controls will be determined in future RODs for the site; thus, land use controls are not a component of the chosen Alternative as presented in the Interim ROD. It also stated that no O&M activities are required under the chosen Alternative (Alternative SDS3). It stated that the concrete slabs and building foundations that remain in place will be inspected periodically to assess their integrity, and maintained and repaired as necessary, until removed. It also stated that groundwater monitoring would be required for 5 years to ensure the selected remedy does not impact groundwater. Five year reviews would also be required until such a time as LLs 1-4 allow for unrestricted access. The Interim ROD also specified that the Land Use would be National Guard Mounted Training (No Digging).

As described Section 1, the Army has removed the building slabs and contaminated soil under the slabs and conducted additional investigation of the AOCs achieving the requirement to inspect and maintain the slabs until removal. Groundwater samples have been collected for soil COCs from monitoring wells identified in the Interim ROD since the completion of the Remedial Action therefore achieving the requirement to monitoring groundwater. Groundwater at Camp Ravenna is managed under the Facility-Wide Groundwater Monitoring Program, which is a component of the *Director's Final Findings and Orders* which includes semi-annual groundwater monitoring at chosen wells throughout the facility including wells within LLs 1-4. A separate RI/FS will be completed for facility-wide groundwater. These activities are being performed outside of the Interim ROD requirements.

The Army plans to proceed with the CERCLA process for LLs 1 – 4 and 12 by preparing a Proposed Plan for the alternative recommended in the FS Addendum (June 2017) to meet Commercial/Industrial use. Once the process is complete, the only LUC anticipated for soil, wet sediment and surface water is that the AOCs will not be used for Residential Land Use.

Until the remedial process is completed at these four AOCs, the OHARNG will ensure land use is maintained as Mounted Training – No Digging (tracked and wheeled vehicle use, no manual digging by the Trainee, and exposure of 24 hours/day for 39 days/year for 25 years).

7 MONITORING AND REPORTING

Periodic monitoring of the land use and other conditions of the Interim ROD, in the form of site inspections, will be conducted by the Army to confirm that the Interim ROD conditions are being met. Site inspections will be conducted annually and will be documented using an inspection form like the one that follows this section. Monitoring results will be reported in an annual LUC report which will be submitted to the Ohio EPA. The annual LUC monitoring reports will be used in part for the preparation of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) 121(c) Five-Year Review.

CJAG/ Former Ravenna Army Ammunition Plant (RVAAP) Inspection Form for RVAAP-08 Load Line 1, RVAAP-09 Load Line 2, RVAAP-10 Load Line 3, and RVAAP-11 Load Line 4 Areas of Concern (AOC)

This inspection of Load Line 1, Load Line 2, Load Line 3 and Load Line 4 (LL1-4) was conducted by ___ _____ on _____.

According to the *Final Interim Record of Decisions (ROD) for the Remediation of Soils at Load Lines 1 through 4 at the Ravenna Army Ammunition Plant*, dated January 2007, the selected remedy included soil excavation and the following components:

- Groundwater monitoring to ensure the remedy did not impact groundwater;
- Maintenance of building slabs and foundations; and
- Five year reviews in accordance with CERCLA 121(c) and 300.430(f)(4)(ii).

The 2007 Interim ROD further indicated that "for the selected remedy, groundwater monitoring will be performed for five years at select existing wells in LLs 1-4 to monitor for potential impacts to groundwater from remedy implementation. Groundwater monitoring data will supplement data from the Facility-Wide Groundwater Monitoring Program. Groundwater samples will be collected semi-annually for the first two years after remedy implementation. The sampling frequency thereafter will be based on the laboratory results. Groundwater samples will be submitted to an environmental chemistry laboratory for analysis of the full suite of constituents (i.e., VOCs, SVOCs, PCBs, pesticides, explosives, propellants and TAL metals). Findings will be evaluated in the context of the facility-wide groundwater monitoring program and any action will be determined by the Army, with approval by Ohio EPA. In addition, the concrete slabs and building foundations that remain in place after remediation will be inspected periodically to ensure their integrity has not been compromised allowing infiltration to potentially contaminated soils underneath. The remedial action will be subjected to five-year reviews as part of the CERCLA process to assure that human health and the environment are being protected." According to the Interim ROD, the intended future use of the AOCs is Mounted Training – No Digging.

Based on the 2007 Interim ROD, the U.S. Army will conduct the following to ensure the components of the selected remedy are met:

- Ensure that groundwater monitoring was conducted for five years after the remedial action was completed in 2007/2008;
- Ensure that building slabs and foundations were maintained and inspected periodically if in place;
- Ensure land use is maintained as Mounted Training – No Digging (tracked and wheeled vehicle use, no digging beyond 4 feet bgs, exposure of 24 hours/day for 39 days/year for 25 years); and
- Conduct five-year reviews as necessary.

Verification of the compliance with these components will be documented on an inspection form for Load Lines 1-4 similar to the one on the following page.

Inspection Form for Load Lines 1, 2, 3, and 4

1. Activities and Land Use:

a. This AOC is to be managed as Mounted Training – No Digging. What activities have occurred at LL1-4 within the last year? Are the activities within the established use for the AOC?

b. Are the activities being conducted at LL1-4 in compliance with established digging restrictions and exposure parameters?

2. Inspections and Reporting:

a. Has a 5-Year Review been completed for this AOC as required?

3. Groundwater Monitoring:

a. Was groundwater monitoring conducted for 5 years after the remedial action in accordance with the Interim ROD?

4. Concrete Slabs and Building Foundations:

a. Were the concrete slabs and building foundations inspected periodically to ensure their integrity was not been compromised allowing infiltration to potentially contaminated soils underneath?
Not Applicable. Slabs and building foundations have been removed.

Additional Notes/Comments:

Inspection Completed by:

Signature

Printed Name:
Title:
Organization:
Date:

SECTION A.1, TAB RVAAP-12: LOAD LINE 12

1 BACKGROUND

The Load Line 12 (LL12) Area of Concern (AOC), RVAAP-12, is comprised of approximately 80 acres on the former Ravenna Army Ammunition Plant (RVAAP), now known as Camp James A. Garfield Joint Military Training Center (CJAG). It was originally known as the Ammonium Nitrate Plant which started operations in November 1941. Several structures related to the production of ammonium nitrate, as well as support operations, existed on the LL12 AOC. The western half of the AOC contained former production areas; the eastern half of the AOC did not contain any known production facilities. In May 1943, production of ammonium nitrate was terminated. From 1946 to 1950, a private contractor leased LL12 to produce fertilizer-grade ammonium nitrate. From 1965 to 1967, a private contractor leased the Neutral Liquor Building (Building FF-19) for the production of aluminum chloride. The Army terminated the lease early due to environmental concerns related to air emissions and wastewater discharges to Upper and Lower Cobbs Ponds. In June 1944, three evaporation/ crystallization units (Buildings 900, 904, and 905) were converted for demilitarization of munitions. Rinsate from demilitarization operations was initially allowed to flow out of the buildings and directly onto the ground or to drainage ditches. In 1981, the LL12 Pink Water Treatment Plant was built to treat the demilitarization effluent prior to discharge. After the termination of demilitarization operations, the treatment plant was used under a National Pollutant Discharge Elimination System (NPDES) permit to treat explosives-tainted storm water from LL12 and other RVAAP locations. Currently, there are no above-grade structures remaining at the AOC; all buildings were demolished between 1973 and 2000.

A Remedial Action including excavation and off-site disposal to address arsenic-contaminated dry sediment was completed in 2010.

In 2013 and 2014, the Army developed the Final Technical Memorandum: Land Uses and Revised Risk Assessment Process for the RVAAP Installation Restoration Program (hereafter referred to as the Technical Memorandum) (ARNG 2014), which identified three Categorical Land Uses and Representative Receptors to be considered during the CERCLA process. These three Land Uses and Representative Receptors are:

1. Unrestricted (Residential) Land Use – Resident Receptor (Adult and Child) (formerly called Resident Farmer),

2. Military Training Land Use – National Guard Trainee, and

3. Commercial/Industrial Land Use – Industrial Receptor (U.S. Environmental Protection Agency [USEPA] Composite Worker).

The Technical Memorandum established, with concurrence from the Ohio EPA, that sites which meet the cleanup standards for the Commercial/Industrial Land Use are also suitable for Military Training (National Guard Trainee) including use by a full-time worker.

Recently, the Final Feasibility Study (FS) Addendum for Soil, Sediment, and Surface Water at RVAAP Load Lines 1, 2, 3, 4, and 12, Volumes 1 & 2 (June 2017) found that removal of an additional 372 cubic yards of soil over an area of only 0.06 acres would allow LL 12 to attain Commercial/Industrial Land Use, providing the Army more flexibility in the future. The FS Addendum recommended Alternative 3 (Commercial/Industrial Land Use – Ex-situ Thermal Treatment of Soil and Administrative LUCs) to address residual contamination and unacceptable risk. Implementation of Alternative 3 would include excavation and ex-situ thermal treatment of soil. Alternative 3 is protective of the likely future land user (Industrial Receptor) and is a green and highly sustainable alternative. The Army plans to proceed with the CERCLA process for LLs 1 – 4 and 12 by preparing a Proposed Plan for the alternative recommended in the FS Addendum.

2 PUBLICATIONS

The following publications related to LL12 can be located on <www.RVAAP.org> or in established RVAAP information repositories:

- Final Feasibility Study Addendum for Soil, Sediment, and Surface Water at RVAAP Load Lines 1, 2, 3, 4, and 12, Volumes 1 & 2, June 21, 2017.

- Final Phase III Remedial Investigation Report for Wet Sediment and Surface Water at RVAAP-12 Load Line 12, Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio, February 16, 2017.

- Final PBA13 Remedial Investigation Sample and Analysis Plan Addendum for Load Line 1, 2, 3, 4, and 12, April 8, 2016.

- Final Technical Memorandum: Land Uses and Revised Risk Assessment Process for the RVAAP Installation Restoration Program, February 2014.

- Final Characterization Sampling Report of Surface and Subsurface Incremental Sampling Methodology at RVAAP-08, 09, 10, 11, and 12 Load Lines 1, 2, 3, 4, and 12, March 29, 2013.

- Final Remedial Action Report for the RVAAP-12 Load Line 12, August 2010.

- Final Work Plan for Sampling and Closure of Load Lines 1 - 4, 12 (RVAAP- 08, 09, 10, 11, 12) and other Areas of Concern, July 2010.

- Final PBA 2008 Supplemental Investigation Sampling and Analysis Plan Addendum No. 1 at Ravenna Army Ammunition Plant, December 2009.

- Final Remedial Design for RVAAP-12 Load Line 12 at Ravenna Army Ammunition Plant, October 2009.

- Final Work Plan Performance-Based Acquisition for Environmental Investigation and Remediation MEC Avoidance/Removal Services, September 2009.

- Final Sampling and Analysis Plan for Groundwater Sampling at RVAAP-12 Load Line 12 at Ravenna Army Ammunition Plant, Addendum 1, April 2009.

- Final Record of Decision for Soil and Dry Sediment for RVAAP-12 Load Line 12 at Ravenna Army Ammunition Plant, March 2009.

- Wetlands and Other Waters Delineation Report Remedial Action Areas at Ramsdell Quarry Landfill, Load Line 12, and Fuze and Booster Quarry Landfill/Ponds at the Ravenna Army Ammunition Plant and Ravenna Training and Logistics Site, Ravenna, Ohio, December 2008.

- Final Characterization of 14 AOCs at Ravenna Army Ammunition Plant, March 2007.

- Final Proposed Plan for Soil and Dry Sediment at Load Line 12 (RVAAP-12) Ravenna Army Ammunition Plant, Ravenna, Ohio, March 2007.

- Final Feasibility Study for Load Line 12 (RVAAP-12) Ravenna Army Ammunition Plant Ravenna, Ohio, July 2006.

- Final Phase II Remedial Investigation Supplemental Report for Load Line 12 (RVAAP-12) at the Ravenna Army Ammunition Plant, Ravenna, Ohio, November 2005.

- Final Sampling and Analysis Plan Addendum for the Characterization of 14 RVAAP AOCs at RVAAP, October 2004.

- Final Phase II Remedial Investigation Report for Load Line 12 at the Ravenna Army Ammunition Plant, Ravenna, Ohio, DACA62-00-D-0001, DO CY06, March 2004.

- Final Revised Final Technical Memorandum Human Health and Ecological Risk Assessment Approach for the Load Line 1 and Load Line 12 Phase II Remedial Investigations at RVAAP, August 2002.

- Final Sampling and Analysis Plan Addendum No. 1 for the Phase II Remedial Investigation of Load Line 12 at Ravenna Army Ammunition Plant, September 2000.

- Final Phase I Remedial Investigation Report for High Priority Areas of Concern at the Ravenna Army Ammunition Plant, Ravenna, Ohio, February 1998.

- Final Public Meeting Briefing Phase I Remedial Investigation of High Priority Areas of Concern at the Ravenna Army Ammunition Plant, September 1997.

- Final Phase I Remedial Investigation Sampling and Analysis Plan Addendum for High Areas of Concern for the Ravenna Army Ammunition Plant, July 1996.

- Final Quality Control Plan for the Phase I Remedial Investigation for High Areas of Concern at RVAAP, June 1996.

3 SITE LOCATION AND DESCRIPTION

The LL12 AOC is approximately 80 acres and is located in the southeastern portion of the former RVAAP facility (see Figure 2 of this Property Management Plan). Ground surface elevations across LL12 range from approximately 970 to 987 feet above mean sea level (AMSL). The majority of LL12 was re-graded and soil was distributed during demolition activities that occurred between 1998 and 2000. At LL12, the Main Ditch that bisects the central part of the AOC flows into drainage ditches located north of the AOC. A stream traverses LL12 from west to east and intercepts the Main Ditch near the northern boundary of the AOC. Ultimately, the drainage flows into the Cobbs Pond complex (Upper and Lower Cobbs Ponds) several hundred yards to the north of LL12.

4 LAND USE AND ACTIVITIES

Administrative accountability for CJAG, including the LL12 AOC, has been transferred to the USP&FO for Ohio and licensed to the Ohio Army National Guard (OHARNG) for use as a military training site. Due to ongoing restoration activities, LL12 is not currently used for military training purposes although future land use will include military training activities. The Final Record of Decision for Soil and Dry Sediment at RVAAP-12 Load Line 12 indicated that the intended future land use for LL12 is for National Guard training. Specifically, this area will be used for mounted training. Maneuver damage may occur up to four (4) feet bgs.
When the CERCLA process is completed, pursuant to the 2017 FS Addendum, the Army anticipates that LL12 will be suitable for both Commercial/Industrial and Military Training Land Uses; however the planned future land use remains Military Training.

5 REMEDY OBJECTIVES

The selected remedy for soil and dry sediment at the LL12 AOC, as documented in the *Record of Decision for Soil and Dry Sediment for the RVAAP-12 Load Line 12* (USACE 2009a), was to excavate contaminated dry sediment within the Main Ditch aggregate to achieve a cleanup of arsenic for the most representative receptor (National Guard Trainee). The remedial action, as documented in the *Final Remedial Action Report for the RVAAP-12 Load Line 12* (USACE, 2010), was to attain the remedial action objective (RAO) for the Chemical of Concern (COC), arsenic, as established in the LL12 Record of Decision (ROD) to allow for land use by the National Guard Trainee. A portion of the remedy resulted in concentrations of hazardous substances, pollutants, or contaminants remaining at levels that would not allow unlimited use and unrestricted exposure. Therefore, a component of the remedial action included Land Use Controls (LUCs) (see next section).

The Final Phase III Remedial Investigation Report for Wet Sediment and Surface Water at RVAAP-12 Load Line 12 (February 16, 2017) documented that no additional remedial actions are needed for wet sediment and surface water.

When the CERCLA process is advanced, pursuant to the 2017 FS Addendum, the Army anticipates that the RAO for the planned remedial action at LL12 will be to remove soil such that LL12 will achieve Commercial/Industrial Land Use.

6 LAND USE CONTROLS

The LL12 AOC-specific LUCs were designed considering certain parameters developed for exposure established for the National Guard Trainee Land Use exposure scenario.

According to the Final Remedial Design for RVAAP-12 Load Line 12, the LUCs for the LL12 AOC are as follows:

- Land Restrictions

  Land use of LL12 shall be limited by the maintenance of the existing Camp Ravenna perimeter fence, which shall be a 6-foot chain-link fence topped with a v-shaped bracket slanting inward and outward with a three-strand barbed wire bracket.

  Land use shall be limited to use of LL12 for National Guard mounted training operations. Activities at LL12 shall be limited to the following: tracked and wheeled vehicle operations and associated training activities along with training area development and maintenance, maintaining the integrity of monitoring wells, road and culvert repair, routine ditch maintenance, vegetation management [mowing, brush and weed cutting, controlled burning, and herbicide application]; and compatible natural resources management activities (including but not limited to such activities as flora and fauna surveys, timber management to include timber stand improvement and forest products harvesting, soil stabilization and erosion control, invasive/non-native species control, nuisance wildlife control, drainage maintenance, wetland delineations, grassland management, and scientific research).

  Duration of exposure shall be based upon the established National Guard Trainee exposure scenario cited per person at 39 days per year at 24 hour per day for a maximum of 25 years (USACE 2005b). All activities must be in compliance with established digging restrictions and established exposure limits. All other uses of LL12 are prohibited, and the U.S. Army will cause appropriate notice to be posted.

- Disturbance Restrictions

  All digging or excavation on LL12 to depths more than 4 ft BGS is prohibited with the exceptions:

  - Ground surface repairs, as required, resulting from maneuver damage; and
  - Routine maintenance of the roads, ditches and culverts.

When the CERCLA process is advanced, pursuant to the 2017 FS Addendum, the Army anticipates that the RAO for the planned remedial action at LL12 will be to remove soil such that LL12 will achieve Commercial/Industrial Land Use. The only LUC anticipated after that removal action would be to prohibit residential use.

7 MONITORING AND REPORTING

Periodic monitoring of LUCs in the form of site inspections will be conducted by the Army to confirm whether the LUCs remain effective and meet LUC objectives for continued remedy protectiveness. Site inspections will be conducted at least once per year and will be documented

using a form like the one that immediately follows this section. Monitoring results will be reported in an annual LUC monitoring report which will be submitted to the Ohio EPA.

The annual LUC monitoring report will evaluate the status and effectiveness of LUCs with a description of how any LUC deficiencies or inconsistent uses were addressed. The annual LUC monitoring reports will be used in part for the preparation of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) 121(c) Five-Year Review. As part of the LUC monitoring report, a written certification will be submitted stating whether or not the LUCs remain in place and are effective.

CJAG/ Former Ravenna Army Ammunition Plant (RVAAP) Land Use Control (LUC)
Inspection Form for
RVAAP-12 Load Line 12 Area of Concern (AOC)

In accordance with the CJAG/former RVAAP Property Management Plan (PMP) and the Final Remedial Design for Soil and Dry Sediment at RVAAP-12 Load Line 12 (LL12), a LUC inspection of LL12 was conducted by_____ on __.

According to LUCs set forth in the *Final Remedial Design for the RVAAP-12 Load Line 12*, dated 1 October 2009, and memorialized in the PMP, periodic monitoring of LUCs, in the form of site inspections, is required to be conducted by the Army to confirm that the LUCs remain effective and still meet LUC objectives for continued remedy protectiveness. Site inspections are required to be conducted as necessary but not less than once per year. The required Annual LUC Report is to be submitted to the Ohio EPA for review and approval.

Based on the 2009 Remedial Design document, the U.S. Army will implement LUCs to achieve the performance objectives listed below for LL12:

- Maintain the CJAG perimeter fence – Land use of LL12 shall be limited by the maintenance of the existing CJAG perimeter fence which shall be of 6-foot, chain-link fence topped with v-shaped bracket slanting inward and outward with a three-strand barbed wire bracket.
- Restrict future land use to National Guard mounted training – Land use shall be limited to use of LL12 for National Guard mounted training operations. Activities at LL12 shall be limited to the following: tracked and wheeled vehicle operations and associated training activities along with training area development and maintenance, maintaining the integrity of monitoring wells, road and culvert repair, routine ditch maintenance, vegetation management, and compatible natural resources management activities;
- Maintain a LUC training program;
- Limit activities to tracked and wheeled operations that are consistent with the National Guard mounted training scenario and other essential security, safety, and natural resources management activities (National Guard Trainee – Mounted Training - 24 hours/day for 39 days/year for 25 years); and
- Prohibit digging beyond four (4) feet below ground surface (bgs) except for routine maintenance of roads, ditches and culverts, and ground surface repairs resulting from maneuver damage.

Therefore, the annual LUC inspection shall include the following (at a minimum):

- Inspection of the CJAG perimeter fence;
- Review of activities at LL12 including exposure timeframes, signage/markers, types of activities performed, and any disturbance/digging activities;
- Review of LUC training program as applicable to LL12;

LUC deficiencies or inconsistent land uses that are identified must be reported and identified on the inspection form/report and must also be reported to the Army National Guard (ARNG)/Ohio Army National Guard (OHARNG).

Review of LUCs – Management/Effectiveness/Corrective Action

1. Activities and Land Use:

a. This AOC is to be managed as National Guard Trainee - Mounted Training. What activities have occurred at LL12 within the last year? Are the activities within the established limitations of use for the AOC?

b. Are the activities being conducted at LL12 in compliance with established digging restrictions and exposure parameters? How is this being tracked and managed?

c. Are signage/markers in place to identify areas where the LUCs apply? Are they being maintained?

d. Is the Camp Ravenna perimeter fence and associated gates being maintained in order to be an effective and protective control and deter trespassers?

2. Inspections and Reporting:

a. Inspections are required on an annual basis. Are annual inspections being conducted as required?

b. An Annual Report is required. Has the annual report been completed and submitted to the Ohio EPA? Did the annual report provide a written certification stating whether or not the LUCs remain in place and effective?

c. Are the LUCs for LL12 incorporated into the Property Management Plan (PMP) (i.e., map indicating the location and dimensions of the AOC with the LUC location, environmental overlay and appropriate Ohio EPA notice procedures)?

d. Has a 5-Year Review been completed for this AOC as required?

3. Training/Inbriefs (as applicable to LL12):

a. Is a LUC training program in place and being conducted as applicable to LL12? Describe the training (content/who attended/who provided/documentation of training).

b. If training was not provided, explain why and what corrective actions were initiated.

4. LUC Evaluation and Reporting of Violations (if any):

a. Are LUCs in place and being effectively managed at LL12?

b. Were any LUC violations or deficiencies noted?

Provide a description of any observed/noted LUC violation(s) as identified and a date of notification of LUC violations (if applicable) to ARNG/OHARNG. Also provide a description of any corrective actions taken to remedy observed LUC violations or recommended corrective actions.

Additional Notes/Comments:
Inspection Completed by Signature: Printed Name: Title: Organization: Date:

RVAAP-12 Load Line 12 (LL12) – Land Use Control (LUC) Brief for Contractors/Personnel

The Army National Guard (ARNG)/Ohio Army National Guard (OHARNG) are required to conduct Long Term Monitoring (LTM)/LUC monitoring at RVAAP-12 Load Line 12 (LL12) at CJAG/former Ravenna Army Ammunition Plant (RVAAP). LUCs include any type of physical, legal, or administrative mechanisms that restrict use of or limit access to real property to prevent or reduce risks to human health and the environment. Established LUCs for LL12 are set forth in the *Final Remedial Design for RVAAP- 12 Load Line 12*, dated 1 October 2009.

Brief History of LL12

LL12 is approximately 80 acres in the southeastern portion of the facility. LL12 was originally known as the Ammonium Nitrate Plant and started operations in 1941. The western half of LL12 contained former production areas and the eastern half was previously cleared, but did not contain any known production facilities. The investigations also identified an area immediately north of LL12 (informally termed the Team Track Area) that was used for the offloading and staging of materials. In May 1943, production of ammonium nitrate was terminated. From 1946 to 1950, a private contractor leased LL12 to produce fertilizer-grade ammonium nitrate. From 1965 to 1967, a private contractor leased Building FF-19 for the production of aluminum chloride. The U.S. Army terminated this lease early due to environmental concerns related to air emissions and wastewater discharges to Cobbs Ponds. In June 1944, Buildings 900, 904, and 905 were converted for demilitarization of munitions. Rinsate from demilitarization operations was initially allowed to flow out of the buildings and directly onto the ground or to drainage ditches. In 1981, the LL12 Pink Water Treatment Plant was built to treat the demilitarization effluent prior to discharge. After the termination of demilitarization operations, the treatment plant was used under an NPDES permit to treat explosives-tainted storm water from LL12 and other RVAAP locations. Currently, there are no above-grade structures remaining at the LL12. LL12 is to be managed as Mounted Training – No Digging due to residual contamination at the AOC above cleanup goals for Commercial/Industrial and Residential Use.

Summary of Land Use Controls at LL12

The following LUCs have been developed for LL12 considering specific parameters established for Mounted Training – No Digging and must be adhered to:

- Maintain the CJAG perimeter fence – Land use of LL12 shall be limited by the maintenance of the existing CJAG perimeter fence which shall be of 6-foot, chain-link fence topped with v-shaped bracket slanting inward and outward with a three-strand barbed wire bracket.
- Restrict future land use to National Guard mounted training – Land use shall be limited to use of LL12 for National Guard mounted training operations. Activities at LL12 shall be limited to the following: tracked and wheeled vehicle operations and associated training activities along with training area development and maintenance, maintaining the integrity of monitoring wells, road and culvert repair, routine ditch maintenance, vegetation management, and compatible natural resources management activities;
- Maintain a LUC training program;
- Limit activities to tracked and wheeled operations that are consistent with the National Guard mounted training scenario and other essential security, safety, and natural resources management activities (National Guard Trainee – Mounted Training - 24 hours/day for 39 days/year for 25 years); and
- Prohibit digging beyond four (4) feet below ground surface (bgs) except for routine maintenance of roads, ditches and culverts, and ground surface repairs resulting from maneuver damage.

If a LUC violation is identified, please contact Range Control at (614)336-6041 to report.

I have been briefed and understand the requirements and LUCs/restrictions at Load Line 12. I will comply with all requirements. I will complete the access log for LL12 when obtaining the key and accessing the AOC. Please sign and submit to CJAG ENV Office (Katie Tait).

Printed Name	Signature	Company	Date

Sign In/Out Sheet for Load Line 12 – Please sign in and out when entering and exiting Load Line 12. Please also note what activities were performed while at Load Line 12.

Name/Company	Date	Time In	Time Out	Description of Activities Performed (i.e., mowing, groundwater sampling, etc.)

SECTION A.1, TAB RVAAP-51: DUMP ALONG PARIS-WINDHAM ROAD

1 BACKGROUND

The Dump Along Paris-Windham Road was used as an open dump for a variety of miscellaneous construction and demolition material, including asbestos containing material (ACM) which included transite roofing and siding, laboratory bottles and drums, concrete, brick, glass, scrap metal, fencing, and wood debris. There are no records indicating the quantities of material dumped at the Area of Concern (AOC) or the dates of operation.

2 PUBLICATIONS

The following publications pertinent to the remedial decision for the Dump Along Paris-Windham Road can be located on www.rvaap.org or in established information repositories.

- Relative Risk Site Evaluation for Newly Added Sites. USACHPPM. 23 October 1998.
- Decision Document for a Removal Action at Paris-Windham Road Dumpsite (RVAAP-51). USACE. 2003a.
- Final Report for Remedial Design/Removal Action Plan at Paris-Windham Road Dump. MKM. March 2004.
- Final Site Characterization and Focused Feasibility Study for the RVAAP-51 Dump Along Paris-Windham Road. USACE. 15 December 2015.
- Final Proposed Plan for Soil, Sediment, and Surface Water for RVAAP-51 Dump Along Paris-Windham Road. USACE. 29 September 2016.
- Final Record of Decision for Soil, Sediment and Surface Water at RVAAP-51 Dump Along Paris-Windham Road. USACE. 15 September 2017.
- Final Remedial Design for Soil at RVAAP-51 Dump Along Paris-Windham Road. Chenega Tri-Services, LLC. 27 February 2019.
- Final Remedial Action Completion Report for Soil at RVAAP-51 Dump Along Paris-Windham Road. Chenega Tri-Services, LLC. 13 November 2019.

3 SITE LOCATION AND DESCRIPTION

The Dump Along Paris-Windham Road is located in the south-central portion of CJAG, along a steep embankment on the west side of Paris-Windham Road between the bridge over Sand Creek and the intersection of Paris-Windham Road with Remalia Road. The former dump was approximately 400 ft long by 30 ft wide and slopes east to west, away from Paris-Windham Road. The slope face ranges 40–60 degrees from horizontal. No permanent surface water features are present at the AOC. Surface water occurs only intermittently as storm water runoff in the drainage swale located at the base of the slope face of the dump during and after rainfall events and periods of snow melt. Surface water runoff follows the topography and flows in a westerly direction through a drainage swale at the base of the dump slope, entering Sand Creek. Sand Creek is located to the west and north at distances ranging from approximately 30 ft (north end of the AOC) to 170 ft (south central portion of the AOC). The Sand Creek floodplain occupies the land between the dump and Sand Creek.

4 LAND USE AND ACTIVITIES

The Dump Along Paris-Windham Road will be managed as restricted access due to residual asbestos and chemicals of concern (COCs) remaining is shallow soil at the AOC.

5 REMEDY OBJECTIVES

After the limited Remedial Design (RD)/Remedial Action (RA) was completed, risk at the AOC was further evaluated through a Final Site Characterization (SC) and Focused Feasibility Study (FFS). This SC/FFS evaluated soil, sediment, and surface water at the Dump Along Paris-Windham Road. Permanent surface water and sediment are not present at the AOC; therefore, no further action (NFA) was required for these media and remedial alternatives only addressed soil (inclusive of dry sediment). Further, the ecological risk assessment (ERA) recommended NFA for soil and surface water with respect to ecological receptors. Based on the results of the SC/FFS, the Proposed Plan (PP) and Record of Decision (ROD) required that Land Use Controls (LUCs) be implemented due to the asbestos and COCs remaining in shallow soil

6 LAND USE CONTROLS

The LUCs to be implemented at the AOC includes the following:

- Signs and boundary markers (Seibert stakes) posted at least every 300 feet along the AOC perimeter, and
- Digging Restrictions.

Signs and Boundary Markers

Alternating Seibert Stakes (11) and "Unauthorized Personnel" warning signs (5) and Asbestos Waste Disposal Site warning signs are placed along the perimeter at approximately 50-foot intervals. (Figure 1). The "Unauthorized Personnel" warning signs read:

DANGER
UNAUTHORIZED
PERSONNEL
KEEP OUT

The "Asbestos Waste Disposal Site" warning signs read as follows:

DANGER
ASBESTOS WASTE
DISPOSAL SITE
NO DIGGING
DO NOT CREATE DUST
BREATHIING ASBESTOS
IS HAZARDOUS TO YOUR
HEALTH

Digging Restrictions

All digging or excavation within the AOC is prohibited due to residual asbestos and COCs in the surface soil. The digging restriction will be managed using permanent signs and Seibert Stakes placed along the AOC perimeter.

7 MONITORING AND REPORTING

Annual LUC Inspection

Periodic monitoring of LUCs in the form of site inspections will be conducted by the Army to confirm that the LUCs remain effective and still meet LUC objectives for continued remedy protectiveness. Site inspections will be conducted on an annual basis. The Annual Dump Along Paris-Windham Road LUC Inspection Reports will be submitted to the Ohio EPA for review and approval as they are completed. The LUC Inspection Forms for Dump Along Paris-Windham Road and other AOCs/MRSs will be summarized in an Annual LUC Report for the installation each year. The Annual LUC Report will be submitted to the Ohio EPA for review and approval. The Annual LUC Report will evaluate the status and effectiveness of LUCs with a description of how any LUC deficiencies or inconsistent uses were addressed. The Annual LUC Reports will be used in part for the preparation of the CERCLA 121(c) Five-Year Review. As part of the Annual LUC Report, a written

certification will be submitted stating whether or not the LUCs remain in place and are effective.

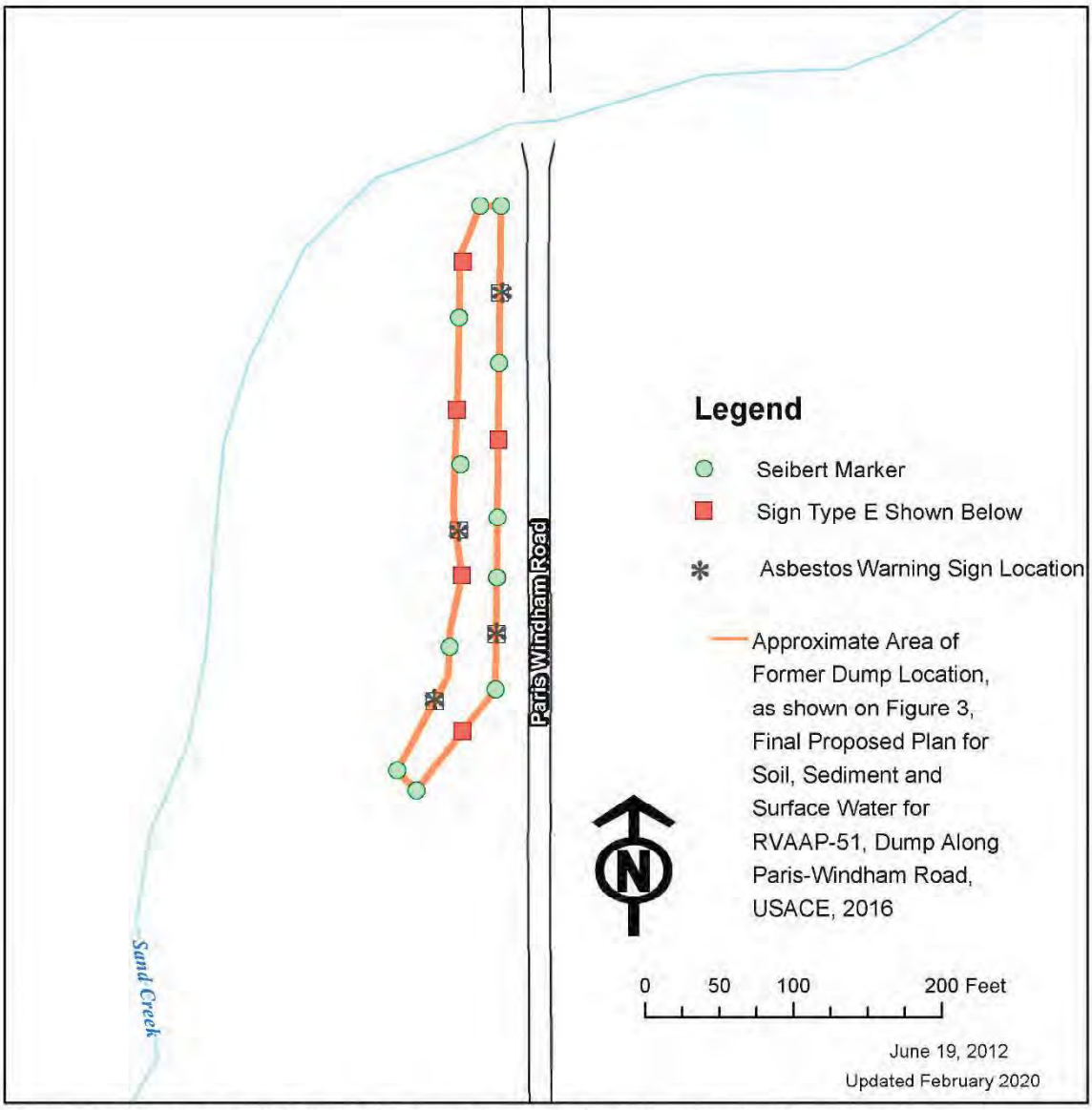


Figure 1 - "As-Installed" Seibert Markers, Signs and Asbestos Warning Sign Locations

(10"x14") Black stripe faces AOC

RVAAP-51 Dump Along Paris-Windham Road,
Former Ravenna Army Ammunition Plant, Ravenna, Ohio

CJAG/Former Ravenna Army Ammunition Plant (RVAAP)

RVAAP-51 Dump Along Paris Windham Road – Inspection Form

In accordance with the CJAG/former RVAAP Property Management Plan (PMP) and Final Remedial Design, an inspection of RVAAP-51 Dump Along Paris Windham Road was conducted by _____ on _____.

The annual inspection required by the PMP includes the following:

- Review of LUC training and documentation as applicable to the Dump Along Paris Windham Road.
- Evaluation of activities at the AOC to ensure that residential use and digging is not occurring.
- Inspection of Seibert Stakes and signage.
- Inspection of the soil cover.

LUC deficiencies or inconsistent land uses that are identified must be reported and identified on the inspection form and properly reported to the Army National Guard (ARNG)/Ohio Army National Guard (OHARNG).

Review of LUCs – Management/Effectiveness/Corrective Action

1. Activities and Land Use

a.) This AOC is restricted from residential land use. Has residential use occurred?

b.) Digging is prohibited at the AOC. Has digging occurred at the AOC?

c.) Warning signs and Seibert Stakes are required at the AOC along the boundary. Are Seibert Stakes and signage present, functional and in good condition? Are they visible (free of vegetation)?

d.) The soil cover installed after the 2003 soil removal action creates a barrier between the receptor and the residual PAHs and asbestos in the soil. Is the soil cover intact? Is any damage or erosion on the soil cover present?

2. Inspections and Reporting

a.) Inspections are required on an annual basis. Are annual inspections being completed?

b.) An annual report is required. Has the annual report been completed and submitted?

3. Training (as applicable to Dump Along Paris-Windham Road)

a.) Was LUC training (specific to the AOC) being conducted as applicable? Describe the training (content/who attended/who provided/documentation of training).

b.) If training was not provided, explain why and what corrective actions were initiated?

4. Description of any observed/noted LUC violation(s):
5. Date of Notification of LUC violation (if applicable):
6. Description of any corrective actions taken to remedy observed LUC violation(s) or recommended corrective actions:
7. Additional Notes/Comments:

Original Inspection Completed by:

Signature:	
Printed Name:	
Title:	Organization:
Date:	

BOUNDARY SURVEY OF RVAAP-51 DUMP ALONG PARIS-WINDHAM ROAD LAND USE CONTROL AREA

CAMP JAMES A. GARFIELD FKA CAMP RAVENNA JOINT MILITARY TRAINING CENTER AND RAVENNA ARMY AMMUNITION PLANT (RVAAP) SITUATED IN THE COUNTY OF PORTAGE AND THE STATE OF OHIO AND BEING PART OF ORIGINAL WINDHAM TOWNSHIP LYING AND BEING IN TOWNSHIP 4 NORTH, RANGE 6 WEST IN THE CONNECTICUT WESTERN RESERVE AND FIRELANDS

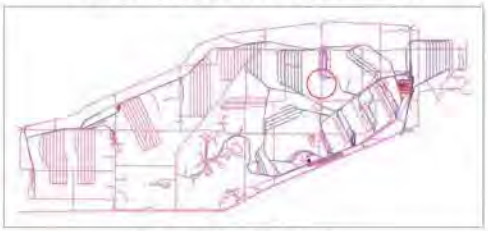
LINE	BEARING	DISTANCE
L1	S01°15'19"W	49.75'
L2	S02°03'19"E	49.91'
L3	S00°01'23"W	49.85'
L4	S00°48'28"W	52.49'
L5	S00°13'57"W	39.44'
L6	S00°19'46"E	40.01'
L7	S00°17'09"W	44.10'
L8	S45°00'46"W	32.05'
L9	S40°16'47"W	48.12'
L10	N57°42'48"W	23.33'
L11	N30°22'14"E	63.27'
L12	N08°08'05"E	35.48'
L13	N05°49'09"W	30.97'
L14	N09°45'05"E	46.94'
L15	N05°38'55"W	41.45'
L16	N02°01'05"E	39.47'
L17	N01°38'19"E	50.01'
L18	N02°21'26"E	48.87'
L19	N19°56'08"E	32.97'
L20	S76°13'17"E	20.49'

Coordinate Table			
Pt #	Northing	Easting	Descriptor
100	565025.9	2367706.8	POB SEIBERT MARKER
101	564976.1	2367705.7	SEIBERT MARKER
102	564926.3	2367707.5	SEIBERT MARKER
103	564876.4	2367707.5	SEIBERT MARKER
104	564823.9	2367706.8	SEIBERT MARKER
105	564784.5	2367706.6	SEIBERT MARKER
106	564744.5	2367706.8	SEIBERT MARKER
107	564700.4	2367706.6	SEIBERT MARKER
108	564677.7	2367683.9	SEIBERT MARKER
109	564641.0	2367652.8	SEIBERT MARKER
110	564653.5	2367633.1	SEIBERT MARKER
111	564708.1	2367665.1	SEIBERT MARKER
112	564743.2	2367670.1	SEIBERT MARKER
113	564774.0	2367667.0	SEIBERT MARKER
114	564820.3	2367674.9	SEIBERT MARKER
115	564861.5	2367670.8	SEIBERT MARKER
116	564901.0	2367672.2	SEIBERT MARKER
117	564950.9	2367673.7	SEIBERT MARKER
118	564999.8	2367675.7	SEIBERT MARKER
119	565030.8	2367686.9	SEIBERT MARKER

LEGEND:

= SEIBERT MARKER

CAMP JAMES A GARFIELD



Portage &Trumble County
LOCATION MAP

Ohio Army National Guard

Ohio

Produced in April 2020 for:

US Army Corps of Engineers
600 Dr. Martin Luther King Jr. Place
Louisville, KY 40202

Louisville District

Surveyor of Record
Scott D. Masciantoni, PLS SU075486 / LS5918
Chenega Tri-Servcies, LLC

Coordinates shown hereon are referenced to NAD83,
Ohio State Plane Coordinate System, North Zone, US Feet
Bearings shown hereon are Grid North

GRAPHIC SCALE 1"=20'
0 20 40 80

THIS MAP IS INTENDED TO DISPLAYED and/or PLOTTED @ 1"=20' on a 22"x34" Page

CHENEGA TRI-SERVICES, LLC

FIGURE 1

Appendix A, Section A.2

No Further Action (NFA) Sites

Table A2
AOC/MRS SITES THAT HAVE ACHIEVED NO FURTHER ACTION (NFA) STATUS

The AOCs and MRSs listed in this Appendix are those sites that have achieved No Further Action (NFA) as part of the RVAAP Restoration Program. The sites have achieved NFA status through either the Installation Restoration Program (IRP) or the Military Muntions Response Program (MMRP). The sites that have achieved NFA are listed in the "AOC/MRS" and "Appendix Tab" columns. Each NFA site listed on this table is summarized in the pages following this table. This Appendix will be updated annually to include additional AOCs/MRSs that have achieved NFA.

The "Date NFA Achieved Through Remedial Action" column lists the Remedial Action report date for those sites where a remedial action was required by the Decision Document for the NFA to be achieved.
The "Revision or Update" column lists the date that the PMP was revised or updated for a specific AOC/MRS site after it was originally added to the PMP (ex. Added new media that achieved NFA).

AOC/MRS	Appendix Tab	No Further Action Details	Date NFA Achieved Through Remedial Action	Decision Document Army Signature Date	Date Added to the PMP	Revision or Update
RVAAP-001-R-01 Ramsdell Quarry Area 2 (South) MRS	RVAAP-001-R-01	Final No Further Action Record of Decision for RVAAP-001-R-01 Ramsdell Quarry Landfill Area 2 (South) Munitions Response Site, Version 2.0	Not Applicable	November 12, 2019	February 2020	June 2021
		Final Record of Decision for Sediment and Surface Water at Six Areas of Concern/Munitions Response Sites	Not Applicable	September 15, 2020		
RVAAP-001-R-02 Ramsdell Quarry Landfill Area 1 (North)	RVAAP-001-R-02	Final No Further Action Record of Decision for RVAAP-001-R-02 Ramsdell Quarry Landfill Area 1 (North) Munitions Response Site, Version 2.0	Not Applicable	March 8, 2019	February 2020	June 2021
		Final Record of Decision for Sediment and Surface Water at Six Areas of Concern/Munitions Response Sites	Not Applicable	September 15, 2020		

Table A2
AOC/MRS SITES THAT HAVE ACHIEVED NO FURTHER ACTION (NFA) STATUS

AOC/MRS	Appendix Tab	No Further Action Details	Date NFA Achieved Through Remedial Action	Decision Document Army Signature Date	Date Added to the PMP	Revision or Update
RVAAP-02 Erie Burning Grounds	RVAAP-02	Final Record of Decision for Soil and Dry Sediment at RVAAP- 02 Erie Burning Grounds	Not Applicable	October 30, 2007	August 2018	June 2021
		Final Record of Decision for Sediment and Surface Water at Six Areas of Concern/Munitions Response Sites	Not Applicable	September 15, 2020		
RVAAP-002-R-01 Erie Burning Grounds	RVAAP-002-R-01	Final No Further Action Record of Decision for RVAAP-002-R-01 Erie Burning Grounds Munitions Response Site, Version 1.0	Not Applicable	November 12, 2019	February 2020	
RVAAP-04 Open Demolition Area #2	RVAAP-04	Final Record of Decision for Soil and Dry Sediment at the RVAAP- 04 Open Demolition Area #2	Not Applicable	October 30, 2007	August 2018	
RVAAP-008-R-01 Load Line 1A MRS	RVAAP-008-R-01	Final No Further Action Record of Decision for RVAAP-008-R-01 Load Line #1A Munitions Response Site	Not Applicable	December 18, 2018	August 2018	
RVAAP-13 Building 1200	RVAAP-13	Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200	May 14, 2015	July 1, 2014	August 2018	
RVAAP-016-R-01 Fuze and Booster Quarry MRS	RVAAP-016-R-01	Final No Further Action Record of Decision for RVAAP-016-R-01 Fuze and Booster Quarry Munitions Response Site, Version 1.0	Not Applicable	October 7, 2019	February 2020	
RVAAP-16 Fuze and Booster Quarry	RVAAP-16	Final Record of Decision for Soil and Dry Sediment at the RVAAP-16 Fuze and Booster Quarry Landfill/Ponds	March 6, 2010	October 30, 2007	June 2021	
		Final Record of Decision for Sediment and Surface Water at Six Areas of Concern/Munitions Response Sites	Not Applicable	September 15, 2020		

Table A2
AOC/MRS SITES THAT HAVE ACHIEVED NO FURTHER ACTION (NFA) STATUS

AOC/MRS	Appendix Tab	No Further Action Details	Date NFA Achieved Through Remedial Action	Decision Document Army Signature Date	Date Added to the PMP	Revision or Update
RVAAP-19 Landfill North of Winklepeck	RVAAP-19	Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP-19 Landfill North of Winklepeck Burning Grounds	Not Applicable	July 20, 2020	June 2021	
RVAAP-019-R-01 Landfill North of Winklepeck MRS	RVAAP-019-R-01	Final No Further Action Record of Decision for RVAAP-019-R-01 Landfill North of Winklepeck Munitions Response Site, Version 2.0	Not Applicable	March 8, 2019	February 2020	
RVAAP-28 Suspected Mustard Agent Burial Site	RVAAP-28	Final Action Memorandum: RVAAP-28 Suspected Mustard Agent Burial Site	Not Applicable	July 17, 2017	June 2021	
RVAAP-29 Upper and Lower Cobbs Pond	RVAAP-29	Final Record of Decision for Soil, Sediment and Surface Water at RVAAP-29 Upper and Lower Cobbs Ponds	Not Applicable	June 7, 2019	February 2020	
RVAAP-032-R-01 40mm Firing Range MRS	RVAAP-032-R-01	Final No Further Action Record of Decision for RVAAP-032-R-01 40mm Firing Range Munitions Response Site, Version 1.0	Not Applicable	September 24, 2019	February 2020	
RVAAP-33 Load Line 6	RVAAP-33	Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP-33 Load Line 6	Not Applicable	May 12, 2018	February 2020	
RVAAP-033-R-01 Firestone Test Facility MRS	RVAAP-033-R-01	Final No Further Action Record of Decision for RVAAP-033-R-01 Firestone Test Facility Munitions Response Site	Not Applicable	November 12, 2019	August 2018	

Table A2
AOC/MRS SITES THAT HAVE ACHIEVED NO FURTHER ACTION (NFA) STATUS

AOC/MRS	Appendix Tab	No Further Action Details	Date NFA Achieved Through Remedial Action	Decision Document Army Signature Date	Date Added to the PMP	Revision or Update
RVAAP-034-R-01 Sand Creek Dump MRS	RVAAP-034-R-01	Final No Further Action Record of Decision for RVAAP-034-R-01 Sand Creek Dump Munitions Response Site, Version 1.0	Not Applicable	November 12, 2019	August 2018	
RVAAP-39 Load Line 5	RVAAP-39	Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP-39 Load Line 5	Not Applicable	March 16, 2018	February 2020	
RVAAP-40 Load Line 7	RVAAP-40	Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP-40 Load Line 7	Not Applicable	June 7, 2019	February 2020	
RVAAP-41 Load Line 8	RVAAP-41	Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP-41 Load Line 8	Not Applicable	June 16, 2018	February 2020	
RVAAP-43 Load Line 10	RVAAP-43	Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP-43 Load Line 10	Not Applicable	March 16, 2017	June 2021	
RVAAP-44 Load Line 11	RVAAP-44	Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP-44 Load Line 11	Not Applicable	May 12, 2018	February 2020	
RVAAP-46 Buildings F-15 and F-16	RVAAP-46	Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP-46 Buildings F-15 and F-16	Not Applicable	July 20, 2020	June 2021	
RVAAP-48 Anchor Test Area	RVAAP-48	Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP-48 Anchor Test Area	May 16, 2015	July 1, 2014	August 2018	

Table A2
AOC/MRS SITES THAT HAVE ACHIEVED NO FURTHER ACTION (NFA) STATUS

AOC/MRS	Appendix Tab	No Further Action Details	Date NFA Achieved Through Remedial Action	Decision Document Army Signature Date	Date Added to the PMP	Revision or Update
RVAAP-49 Central Burn Pits	RVAAP-49	Final Record of Decision for Soil and Dry Sediment at RVAAP-49 Central Burn Pits	December 5, 2008	June 22, 2009	August 2018	
RVAAP-050-R-01 Atlas Scrap Yard MRS	RVAAP-050-R-01	Final No Further Action Record of Decision for RVAAP-050-R-01 Atlas Scrap Yard Munitions Response Site	Not Applicable	December 4, 2018	February 2020	
RVAAP-061-R-01 Block D Igloo TD MRS	RVAAP-061-R-01	Final No Further Action Record of Decision for RVAAP-061-R-01 Block D Igloo - TD Munitions Response Site, Version 1.0	Not Applicable	December 18, 2018	February 2020	
RVAAP-062-R-01 Water Works No. 4 MRS	RVAAP-062-R-01	Final No Further Action Record of Decision for RVAAP-062-R-01 Water Works #4 Dump Munitions Response Site, Version 1.0	Not Applicable	November 12, 2019	August 2018	
CC RVAAP-68 Electrical Substations (East, West, No. 3)	CC RVAAP-68	Final Record of Decision for Soil, Sediment, and Surface Water at CC RVAAP-68 Electric Substations (East, West, No. 3)	Not Applicable	May 1, 2017	June 2021	
CC RVAAP-71 Barn No. 5 Petroleum Release	CC RVAAP-71	Final Site Inspection CC RVAAP-71 Barn No. 5 Petroleum Release	Not Applicable	Site achieved NFA through Site Inspection in 2015.	June 2021	
CC RVAAP-72 Facility-Wide Storage Tanks	CC RVAAP-72	Final Site Inspection CC RVAAP-72 Facility-Wide Underground Storage Tanks	Not Applicable	Site achieved NFA through Site Inspection in 2015.	June 2021	

Table A2
AOC/MRS SITES THAT HAVE ACHIEVED NO FURTHER ACTION (NFA) STATUS

AOC/MRS	Appendix Tab	No Further Action Details	Date NFA Achieved Through Remedial Action	Decision Document Army Signature Date	Date Added to the PMP	Revision or Update
CC RVAAP-73 Facility-Wide Coal Storage	CC RVAAP-73	Final Record of Decision for CC RVAAP-73 Facility-Wide Coal Storage	Not Applicable	April 24, 2019	June 2021	
CC RVAAP-77 Building 1037 Laundry Waste Water Sump	CC RVAAP-77	Final Site Inspection CC RVAAP-77 Building 1037 Laundry Waste Water Sump	Not Applicable	Site achieved NFA through Site Inspection in 2015.	June 2021	
CC RVAAP-80 Group 2 Propellant Can Tops	CC RVAAP-80	Final Site Inspection Report: CC RVAAP-80 Group 2 Propellant Can Tops	Not Applicable	Site achieved NFA through Site Inspection in 2017.	June 2021	
CC RVAAP-83 Former Buildings 1031 and 1039	CC RVAAP-83	Final Site Inspection Report CC RVAAP-83 Former Buildings 1031 and 1039	Not Applicable	Site achieved NFA through Site Inspection in 2015.	June 2021	

Appendix A.2-001-R-01: Ramsdell Quarry Landfill Munitions Response Site (MRS) Area 2 (South) – (RVAAP-001-R-01) – No Further Action (NFA) Status

A.2-001.1 Background

The Ramsdell Quarry Landfill MRS Area 2 (South) is a 6.93-acre site located in the northeastern part of the facility within a former quarry that was initially mined for construction material such as gravel. The MRS was originally 13.43 acres and consisted of two areas:

- **Area 1:** 6.5 acres and located in an old quarry bottom where open burning operations of munitions occurred
- **Area 2:** 6.93 acres located south of Area 1 composed of a small inactive soil borrow pit and wooded area that may have been used as a disposal area for the munitions treated in Area 1.

Based on differing site uses (open burning vs disposal), the original MRS was split into two MRSs [Area 1 (North) and Area 2 (South)] after the Site Inspection in 2008.

A.2-001.2 Publications

The following publications can be located on www.RVAAP.org or in established RVAAP information repositories:

- Final Military Munitions Response Program Historical Records Review, Ravenna Army Ammunition Plant, Ohio. e2M. January 2007.
- Final Site Inspection Report, Ravenna Army Ammunition Plant, Ohio, Military Munitions Response Sites. e2M. May 2008.
- Final Remedial Investigation Report for RVAAP-001-R-01 Ramsdell Quarry Landfill Munitions Response Site, Version 1.0. CB&I Federal Services, LLC. 27 January 2015.
- Final Remedial Investigation Work Plan for Sediment and Surface Water at RVAAP-01, RVAAP-04, RVAAP-16, RVAAP-001-R-01, and Inventory of Sediment and Surface Water at Multiple Sites. Leidos. 12 August 2016.
- Final Supplemental Remedial Investigation for Sediment and Surface Water at RVAAP-01, RVAAP-04, RVAAP-16, RVAAP-001-R-01, and Inventory of Sediment and Surface Water at Multiple Sites. Leidos. 29 November 2017.
- Final Feasibility Study for RVAAP-001-R-01 Ramsdell Quarry Landfill Munitions Response Site Area 2 (South), Version 1.0. HydroGeoLogic, Inc. 17 January 2018.
- Final No Further Action Proposed Plan for RVAAP-001-R-01 Ramsdell Quarry Landfill Munitions Response Site Area 2 (South), Version 1.0. HydroGeoLogic, Inc. 4 January 2019.
- Final Proposed Plan for Sediment and Surface Water at Six Areas of Concern/Munitions Response Sites. Leidos. 10 May 2019.
- Final No Further Action Record of Decision for RVAAP-001-R-01 Ramsdell Quarry Area 2 (South) Munitions Response Site. HydroGeoLogic, Inc. 19 August 2019.
- Final Record of Decision for Sediment and Surface Water at Six Areas of Concern/Munitions Response Sites. Leidos. 4 June 2020.

A.2-001.3 Site Location and Description

The Ramsdell Quarry Landfill MRS Area 2 (South) is a 6.93-acre parcel located in the northeast portion of the facility within Portage County. The MRS is located south of the Ramsdell Quarry Landfill MRS Area 1 (North) and north of Load Line #1.

The MRS is heavily wooded with thick ground vegetation and contains a small, inactive soil borrow pit at the east side of the MRS. Approximately 0.5 acres of wetland are now located in the former soil borrow pit and along the eastern boundary of the MRS.

The topography at the MRS is relatively flat with ground surface elevation gradually ranging upgradient to the west from approximately 975 to 990 feet amsl. A topographical low of 970 feet amsl is presented in the former soil borrow pit at the eastern portion of the MRS. Natural drainage appears to follow the local topography.

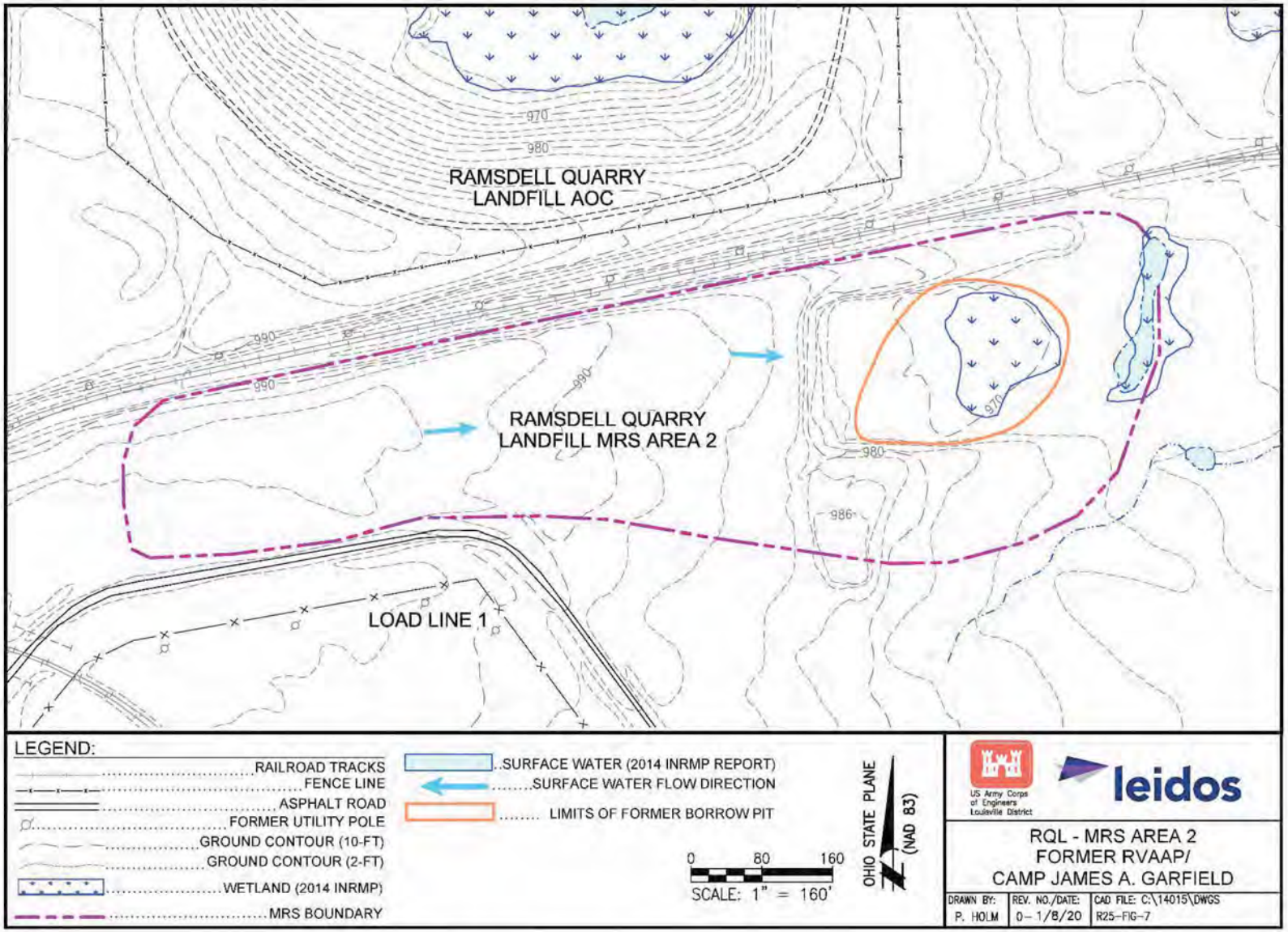
The MRS is located on federal property, with administrative accountability assigned to the U.S. Property and Fiscal Officer (USP&FO) for Ohio. The MRS is jointly managed by the Army National Guard (ARNG) and Ohio Army National Guard (OHARNG).

A.2-001.4 No Further Action Required

No Further Action (NFA) under CERCLA is necessary for the Ramsdell Quarry Landfill MRS Area 2 (South) under the Military Munitions Response Program (MMRP). No evidence of Department of Defense (DoD) military munitions classified as munitions and explosives of concern (MEC) were encountered at the MRS during RI field activities conducted under the MMRP. The MRS was further evaluated for munitions constituents (MC) during the RI and the RI Report concluded that no detected analytes were identified as MC-related contamination (CB&I Federal Services, LLC [CB&I], 2015). Therefore, no risk due to MC-related contamination is present at the MRS.

No Further Action (NFA) under CERCLA is necessary for the Ramsdell Quarry Landfill MRS Area 2 (South) for sediment and surface water under the Installation Restoration Program (IRP). No COCs were identified for further evaluation in an FS for surface water or sediment at RQL MRS Area 2 because surface water was not present and no COCs were identified in sediment (Leidos, 2020).

No MEC was encountered at the Ramsdell Quarry Landfill MRS Area 2 (South) and there are no explosive hazards or sources for MC-related contamination. The recommendation of NFA at the MRS under the MMRP and IRP is protective of human health and the environment and meets the statutory requirements for cleanup standards established in Section 121 of CERCLA.



Ramsdell Quarry Landfill MRS Area 2 Site Features

Appendix A.2-001-R-02: Ramsdell Quarry Area 1 (North) Munitions Response Site (MRS) – (RVAAP-01-R-02) - No Further Action (NFA) Status.

A.2-001.1 Background

RQL Area 1 was used as a quarry until 1941. During that time, it was excavated to 30–40 ft below existing grade to provide road and construction ballast materials. Between 1941 and 1989, the western and southern sections of the abandoned quarry were used for landfill operations. No information is available regarding landfill disposal activities from 1941–1976; however, only non-hazardous solid waste was deposited at the landfill from 1976–1989. The permitted sanitary landfill was closed in September 1990 under State of Ohio solid waste regulations.

In addition, from 1946 to the 1950s, the bottom of the quarry was used to burn waste explosives from Load Line 1. During this time, approximately 18,000 225-kg (500-lb) incendiary or napalm bombs were reportedly burned in the abandoned quarry. Liquid residues from annealing operations also were dumped in the quarry. No additional historical information is currently available on how the quarry was used, other than for landfill operations, from the 1950s until 1976, when operational records show that non-hazardous solid wastes were placed in RQL.

A.2-001.2 Publications

The following publications can be located on www.RVAAP.org or in established RVAAP information repositories:

- Final Military Munitions Response Program Historical Records Review, Ravenna Army Ammunition Plant, Ohio. e2M. January 2007.
- Final Site Inspection Report, Ravenna Army Ammunition Plant, Ohio, Military Munitions Response Sites. E2M. May 2008.
- Final Remedial Investigation Report for RVAAP-001-R-01 Ramsdell Quarry Landfill Munitions Response Site, Version 1.0. CB&I Federal Services, LLC. 27 January 2015.
- Final Remedial Investigation Work Plan for Sediment and Surface Water at RVAAP-01, RVAAP-04, RVAAP-16, RVAAP-001-R-01, and Inventory of Sediment and Surface Water at Multiple Sites. Leidos. 12 August 2016.
- Final No Further Action Proposed Plan for RVAAP-001-R-02 Ramsdell Quarry Landfill Munitions Response Site Area 1 (North). HydroGeoLogic, Inc. 1 August 2017.
- Final Supplemental Remedial Investigation for Sediment and Surface Water at RVAAP-01, RVAAP-04, RVAAP-16, RVAAP-001-R-01, and Inventory of Sediment and Surface Water at Multiple Sites. Leidos. 29 November 2017.
- Final No Further Action Record of Decision for RVAAP-001-R-02 Ramsdell Quarry Landfill Munitions Response Site Area 1 (North) Version 2.0. HydroGeoLogic, Inc. 14 January 2019.
- Final Proposed Plan for Sediment and Surface Water at Six Areas of Concern/Munitions Response Sites. Leidos. 10 May 2019.
- Final Record of Decision for Sediment and Surface Water at Six Areas of Concern/Munitions Response Sites. Leidos. 4 June 2020.

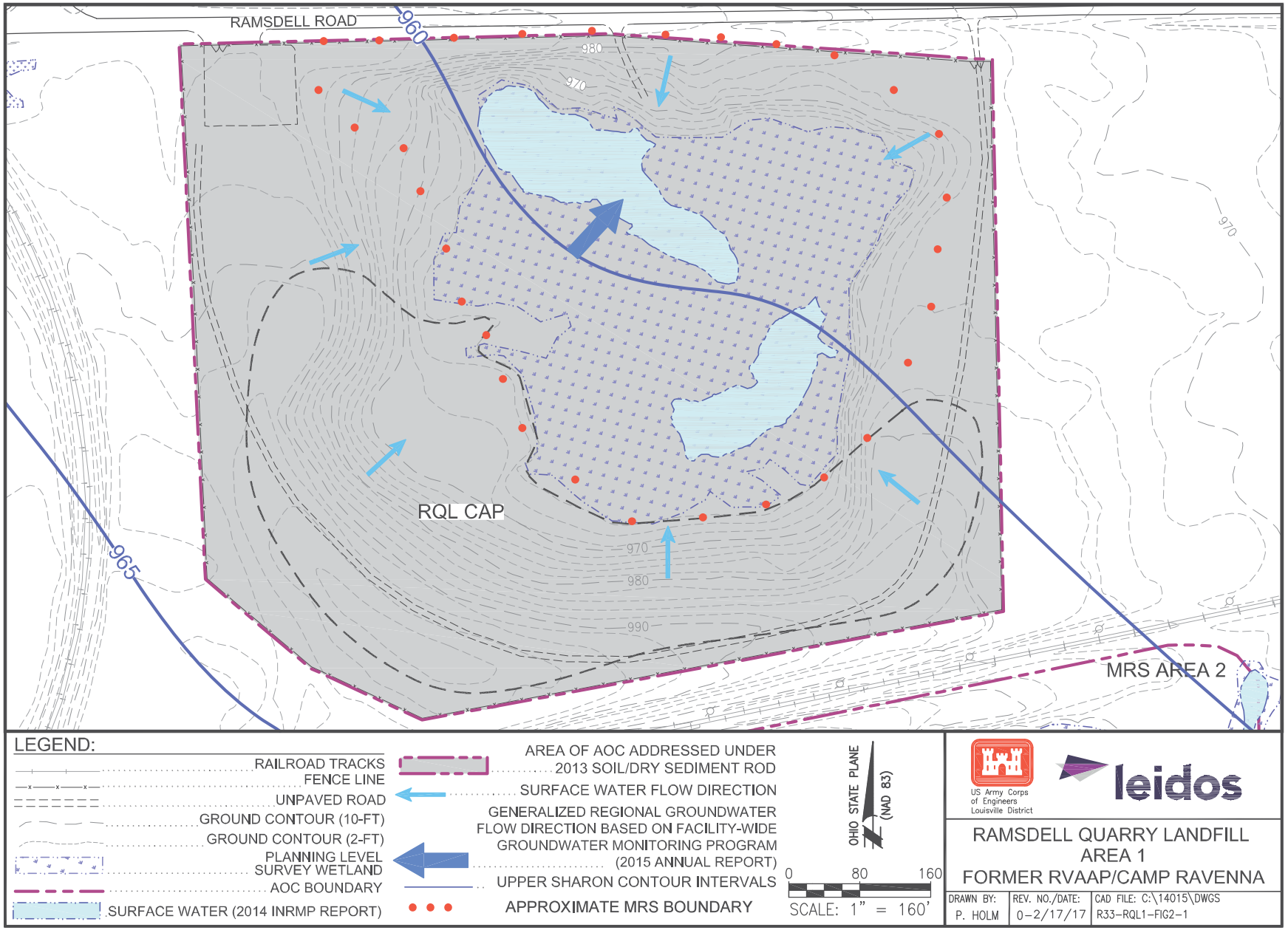
A.2-001.3 Site Location and Description

RQL Area 1 is located immediately south of Ramsdell Road near the intersection of Ramsdell Road and Snow Road in the northeastern part of CJAG. RQL Area 1 encompasses approximately 14 acres in the northeastern portion of the former RVAAP. RQL includes old-field communities with patches of forests and grasslands. The land surface in a large portion of the AOC slopes into a former quarry, which occupies most of the AOC. The quarry bottom is about 40 feet below the surrounding area. Former quarry operations resulted in the removal of much of the original soil.

A.2-001.4 No Further Action Required

No Further Action (NFA) under CERCLA is necessary for Area 1 (North) under the Military Munitions Response Program (MMRP). No evidence of Department of Defense (DoD) military munitions classified as munitions and explosives of concern (MEC) were encountered at the MRS during RI field activities conducted under the MMRP. The MRS was further evaluated for munitions constituents (MC) during the RI and the RI Report concluded that no detected analytes were identified as MC-related contamination (CB&I Federal Services, LLC [CB&I], 2015). Therefore, no risk due to MC-related contamination is present at the MRS.

Additionally, NFA for sediment and surface water under CERCLA is necessary for RQL Area 1.



Ramsdell Quarry Landfill Area 1 AOC Features

Appendix A.2-02: Erie Burning Grounds (EBG) – (RVAAP-02) – No Further Action (NFA) Status

A.2-02.1 Background

The Erie Burning Grounds (EBG) area, designated as RVAAP-02, may have been used for brick manufacturing prior to its acquisition by the US Army in 1940. From 1941 to 1951, the Area of Concern (AOC) was used to perform open burning of propellants, bulk explosives, and explosives-contaminated materials, such as rags, paper, and sawdust. Metal items contaminated with explosives were also burned to make them safe for salvaging or recycling. Once burned, the metal items were recovered and processed as scrap. Ash residues were not removed. A wooden chute at the east end of Track 49 was used to move material to a burn area immediately north of the rail spur. A burning area, enclosed by water-filled ditches for fire control, was constructed south of Track 49. This area is informally called the T-Area. A borrow area between Tracks 49 and 10 may have also been used for open burning.

A.2-02.2 Publications

The following publications relevant to the Record of Decision (ROD) for EBG can be located on www.RVAAP.org or in established RVAAP information repositories:

- Final Phase II Remedial Investigation Report for RVAAP- 02 Erie Burning Grounds at Ravenna Army Ammunition Plant. SAIC. 26 September 2005.
- Final Addendum to the Phase II Remedial Investigation Report for RVAAP- 02 Erie Burning Grounds at Ravenna Army Ammunition Plant. SAIC. 25 September 2006.
- Final Proposed Plan for Soil and Dry Sediment at RVAAP- 02 Erie Burning Grounds at Ravenna Army Ammunition Plant. SAIC. 22 February 2007.
- Final Record of Decision for Soil and Dry Sediment at RVAAP- 02 Erie Burning Grounds at Ravenna Army Ammunition Plant. SAIC. 19 September 2007b.
- Final Remedial Investigation Work Plan for Sediment and Surface Water at RVAAP-01, RVAAP-04, RVAAP-16, RVAAP-001-R-01, and Inventory of Sediment and Surface Water at Multiple Sites. Leidos. 12 August 2016.
- Final Supplemental Remedial Investigation for Sediment and Surface Water at RVAAP-01, RVAAP-04, RVAAP-16, RVAAP-001-R-01, and Inventory of Sediment and Surface Water at Multiple Sites. Leidos. 29 November 2017.
- Final Proposed Plan for Sediment and Surface Water at Six Areas of Concern/Munitions Response Sites. Leidos. 10 May 2019.
- Final Record of Decision for Sediment and Surface Water at Six Areas of Concern/Munitions Response Sites. Leidos. 4 June 2020.

A.2-02.3 Site Location and Description

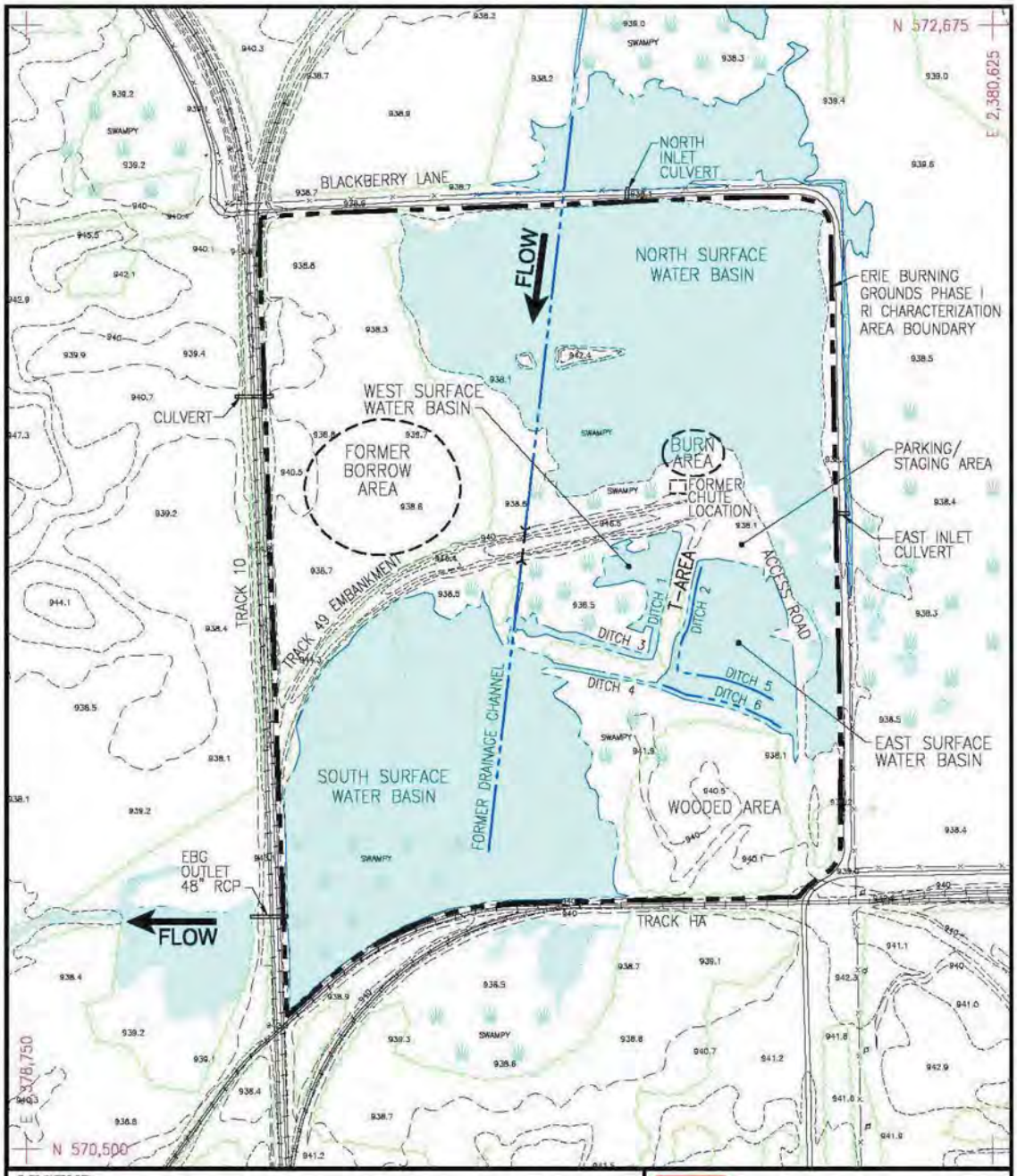
EBG covers approximately 35 acres in the northeastern corner of the facility. In the 1990s, the area became inundated due to sedimentation, vegetation growth, and beaver activity, which plugged some drainage culverts and small streams that drained EBG. The resulting wetlands now cover approximately 60% of the AOC. The eastern end of the Track 49 embankment, the former burn area, the northern part of the gravel access road, and the T-Area are where most burning activities are known or suspected to have occurred.

A.2-02.4 No Further Action Required

In 2007, No Further Action (NFA) under CERCLA was proved necessary for soil and dry sediment at EBG.

In 2020, NFA under CERCLA was proved necessary for sediment and surface water for Unrestricted (Residential) Land Use at EBG.

NFA is protective of human health and the environment and meets the statutory requirements for cleanup standards established in Section 121 of CERCLA. Because contamination at EBG at EBG does not pose a potential risk to human health or the environment, five-year reviews will not be required for soil and dry sediment (SAIC, 2007b and Leidos, 2020).



LEGEND:

- GRAVEL ROAD
- RAILROAD TRACKS
- GROUND CONTOUR (10-FT INTERVAL)
- GROUND CONTOUR (2-FT INTERVAL)
- 923.8 SPOT ELEVATION
- TRIBUTARY
- STREAM
- TREELINE
- EBG PHASE I RI CHARACTERIZATION AREA BOUNDARY
- RCP REINFORCED CONCRETE PIPE

OHIO STATE PLANE (NAD 83)

0 100 200 300

SCALE: 1" = 300'

US Army Corps of Engineers Louisville District

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
LOUISVILLE, KENTUCKY

ERIE BURNING GROUNDS
RVAAP - RAVENNA, OHIO

DRAWN BY:	REV. NO./DATE:	CAD FILE:
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Appendix A.2-002-R-01: Erie Burning Grounds Munitions Response Site (MRS)– (RVAAP-002-R-01) – No Further Action (NFA) Status.

A.2-002.1 Background

The Erie Burning Ground (EBG) munitions response site (MRS) is approximately 34 acres in the northeastern corner of the facility (Figure A.2-02-1, Erie Burning Grounds MRS Boundary). The area may have been used for brick manufacturing prior to its acquisition by the US Army in 1940. From 1941 to 1951, the site was used to perform open burning of propellants, bulk explosives, and explosives-contaminated materials, such as rags, paper, and sawdust. Metal items contaminated with explosives were recovered and processed as scrap. Ash residues were not removed. A wooden chute at the east end of Track 49 was used to move material to a burn area immediately north of the rail spur. A burning area, enclosed by water-filled ditches for fire control, was constructed south of Track 49. This area is informally called the T-Area. A borrow area between tracks 49 and 10 may have also been used for open burning. In the 1990s, the area became inundated due to sedimentation, vegetation growth, and beaver activity, which plugged some drainage culverts and small streams that drained EBG. The resulting wetlands now cover approximately 60% of the MRS. The eastern end of the Track 49 embankment, the former burn area, the northern part of the gravel access road, and the T-Area are where most burning activities are known or suspected to have occurred.

The Erie Burning Grounds MRS is co-located with an Installation Restoration Program (IRP) Area of Concern. The Erie Burning Grounds MRS is being investigated under the Military Munitions Response Program (MMRP), a similar program to the IRP. The MMRP was established under the Defense Environmental Restoration Program (DERP) to address Department of Defense (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 Erie Burning Grounds MRS was determined to be eligible under the MMRP.

A.2-002.2 Publications

The following publications can be located on www.RVAAP.org or in established RVAAP information repositories:

- Final Remedial Investigation Report for RVAAP-002-R-01 Erie Burning Ground MRS. CB&I Federal Services, LLC. 27 August 2014.
- Final Feasibility Study for RVAAP-002-R-01 Erie Burning Grounds MRS. HydroGeoLogic, Inc. August 2018.
- Final No Further Action Proposed Plan for RVAAP-002-R-01 Erie Burning Grounds Munitions Response Site, Ver. 1.0. HydroGeoLogic, Inc. 19 December 2018.
- Final Proposed Plan for Sediment and Surface Water at Six Areas of Concern/Munitions Response Sites. Leidos. 10 May 2019.
- Final Record of Decision for RVAAP-002-R-01 Erie Burning Grounds MRS. HydroGeoLogic, Inc. 16 July 2019.

A.2-002.3 Site Location and Description

The Erie Burning Grounds MRS is a 33.93-acre parcel in the northeastern portion of the facility within Portage County. The MRS is the location of a former burning ground that operated between 1941 and 1951. After the burning ground was discontinued, the MRS was inundated with water due to sedimentation, vegetation growth, and beaver damming and now contains wetland areas of depths ranging from 3 to 5 feet in depth depending on season and precipitation. The topography at the terrestrial portions of the MRS is relatively flat with ground surface elevation ranging from approximately 938.1 to 942.4 feet above mean sea level (amsl). The vegetation communities at the Erie Burning Grounds MRS are a mixture of mixed

cold-deciduous successional forest, and semi-permanently and permanently flooded herbaceous alliances that are classified as Cattail Marsh and Oak-Maple Swamp Forest.

The MRS is located on federal property, with administrative accountability assigned to the U.S. Property and Fiscal Officer (USP&FO) for Ohio. The MRS is jointly managed by the Army National Guard (ARNG) and Ohio Army National Guard (OHARNG).

A.2-002.4 No Further Action Required

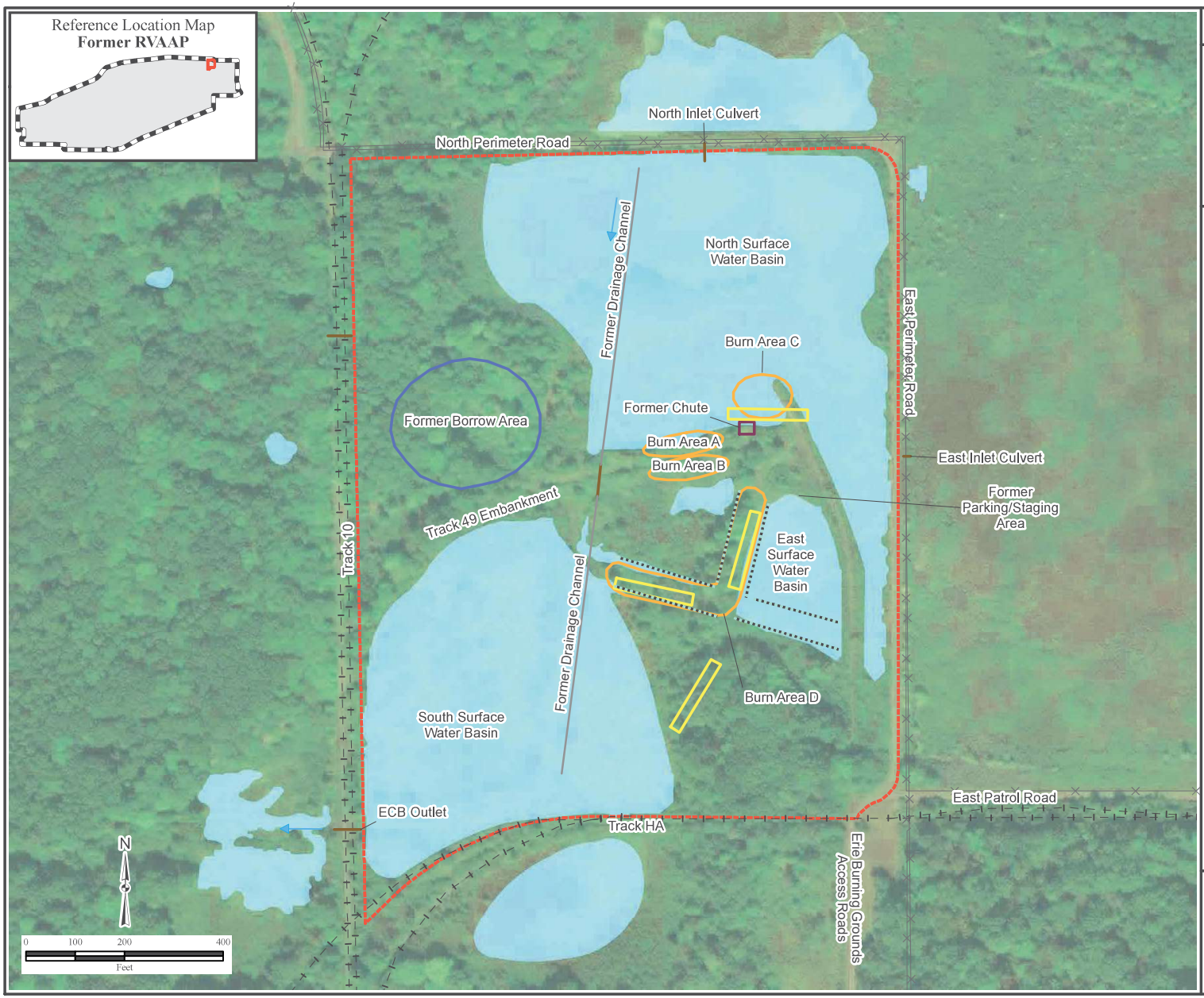
No Further Action (NFA) under CERCLA is necessary for the Erie Burning Ground MRS under the Military Munitions Response Program (MMRP). No evidence of DOD military munitions classified as munitions and explosives of concern were encountered at the MRS during RI field activities conducted under the MMRP. The MRS was further evaluated for munitions constituents (MC) during the RI. The Human Health and Ecological Risk Assessments concluded that no potential risks to human or ecological receptors due exist at the MRS due to MC-related contamination exist at the Erie Burning Ground MRS (CB&I Federal Services, LLC, 2014).

No MEC was encountered at the Erie Burning Ground MRS, and there are no explosive hazards or sources for MC-related contamination. The recommendation of NFA at the MRS under the MMRP is protective of human health and the environment and meets the statutory requirements for cleanup standards established in Section 121 of CERCLA.

A.2-002.5 References

CB&I Federal Services, LLC, 2014. Final Remedial Investigation Report for RVAAP-002-R-01 Erie Burning Ground MRS, Version 1.0. Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio. August.

Figure 3
Erie Burning Grounds MRS Boundary and Site Features Former RVAAP Portage and Trumbull Counties, Ohio



Legend

- Culvert/Outlet
- Ditch
- Drainage Flow Direction
- Former Drainage Channel
- Fence
- Former Railroad
- Former Burn Area
- Exposed Metal (Historical)
- Former Borrow Area
- Former Chute
- Surface Water (OHARNG, 2014)
- MRS
- Installation Boundary

Notes:
ECB=erosion control blankets
MRS=munitions response site
RVAAP=Ravenna Army Ammuntion Plant

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Source: HGL,CB&I, USACE, e²M, Ohio Army National Guard (OHARNG), 2014. Integrated Natural Resources Management Plan (INRMP) at the Camp Ravenna Joint Military Training Center, Portage and Trumbull Counties, Ohio. December. ArcGIS Online Imagery

Appendix A.2-04: Open Demolition Area #2 (ODA2) (RVAAP-04) – No Further Action (NFA) Status for Soil and Dry Sediment

A.2-04.1 Background

Starting in 1948, Open Demolition Area #2 (ODA2), designated as RVAAP-04, was used by the US Army as a location to detonate bombs, various caliber munitions, and off-specification bulk explosives that could not be destroyed through any other means due to their condition at the RVAAP. Materials to be destroyed by open detonation were typically placed in pits excavated to depths of at least 4 ft, then covered with 2 ft of soil, and detonated. Following detonation, the Area of Concern (AOC) was searched for scrap metal, shrapnel, or Munitions and Explosives of Concern (MEC). MEC has been found several thousand feet from the detonation site and throughout ODA2. Other operations at this AOC included the burial of MEC and a munitions firing area. Known historical areas of operation within ODA2 include:

- Open Detonation Areas: Following detonation and the removal of metal pieces, the pits were backfilled, mulched, and seeded.
- Open Burning Area: From 1981 to 1986, the US Army used the area to thermally destroy explosives-contaminated sludges and residues from other RVAAP production areas.
- 40-mm Projectile Prototype Testing Range: The US Army fired projectiles into targets in this area.
- Three explosive storage bunkers: Buildings 1501, 1502, and 1503.
- Burial Sites 1 and 2: Burial Site 1 is located approximately 200 ft northeast of Building 1501 and is approximately 2 acres in size. Burial Site 2 is located approximately 100 ft north of Building 1503 and is approximately 1 acre in size. MEC was likely buried at both areas.
- A MEC disposal area located along a 70-ft embankment northeast of Building 1503 overlooking Sand Creek. MEC exists at the ground surface in this part of the AOC.

A.2-04.2 Publications

The following publications relevant to the Record of Decision (ROD) for ODA2 can be located on www.RVAAP.org or in established RVAAP information repositories:

- Final Phase II Remedial Investigation Report for RVAAP- 04 Open Demolition Area #2 at Ravenna Army Ammunition Plant, Volumes 1 & 2. SpecPro. 27 September 2005.
- Final Addendum to the Phase II Remedial Investigation Report for RVAAP-04 Open Demolition Area #2 at Ravenna Army Ammunition Plant. SAIC. 12 September 2006.
- Final Proposed Plan for Soil and Dry Sediment at RVAAP-04 Open Demolition Area #2 at Ravenna Army Ammunition Plant. SAIC. 23 February 2007.
- Final Record of Decision for Soil and Dry Sediment at RVAAP- 04 Open Demolition Area #2 at Ravenna Army Ammunition Plant. SAIC. 19 September 2007b.

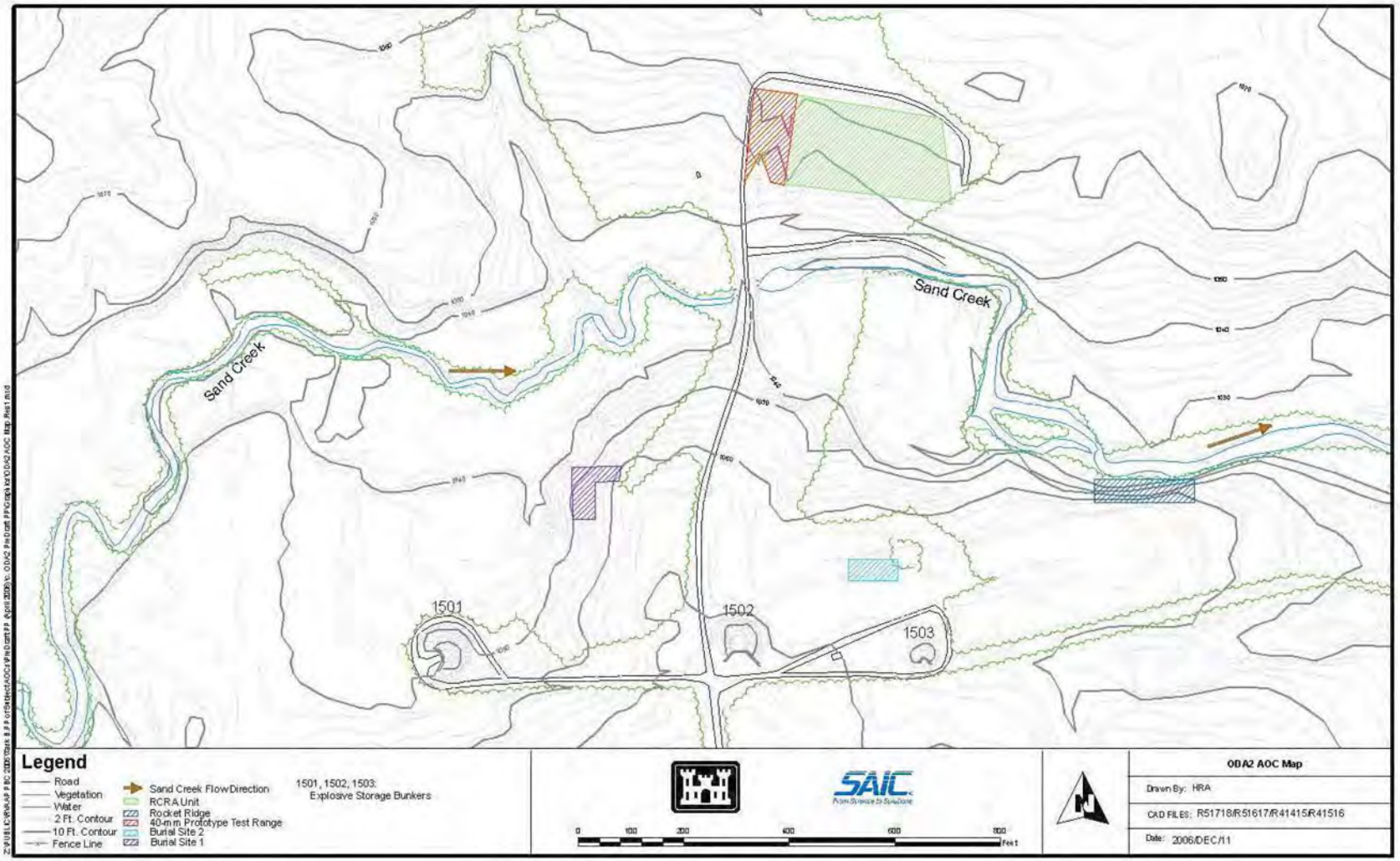
A.2-04.3 Site Location and Description

ODA2 is situated in the central portion of the facility and is 25 acres. Elevations across ODA2 range from approximately 1,017 to 1,071 ft above mean sea level. ODA2 is characterized by gently to steeply sloping topography. The AOC is bisected by Sand Creek. Structures at ODA2 include three above-ground explosive storage bunkers and gravel access and paved roads. Access to ODA2 is restricted by a locked gate on the main access road that enters the AOC from the south.

A.2-04.4 No Further Action Required

No Further Action (NFA) under CERCLA is necessary for soil and dry sediments at ODA2. Groundwater and surface water at ODA2 will be addressed under future CERCLA decisions. Land use controls will not be implemented as part of this decision because chemicals in soil and dry sediment do not exceed cleanup goals for the intended land use. Land use is currently restricted at ODA2 because of the documented presence of MEC. ODA2 will be maintained as restricted access under intended future land use. The Army will address land use controls for ODA2 under the Military Munitions Response Program (MMRP), as part of future response actions for MEC. The Army will maintain current interim use restrictions at ODA2 until such time that final actions are completed under the MMRP.

NFA for soil and sediment is protective of human health under the intended future land use and is protective of the environment. NFA meets the statutory requirements for cleanup standards established in Section 121 of CERCLA. The Army will address requirements for periodic reviews under the MMRP, as part of future response actions for MEC (SAIC, 2007b).


Sand Creek
Sand Creek
1501
1502
1503
Legend
Road
Vegetation
Water
2 Ft. Contour
10 Ft. Contour
Fence Line
Sand Creek Flow Direction
RCRA Unit
Rocket Ridge
40-mm Prototype Test Range
Burial Site 2
Burial Site 1
1501, 1502, 1503:
Explosive Storage Bunkers
0
100
200
400
600
800
Feet
SAIC
From Science to Solutions
ODA2 AOC Map
Drawn By: HRA
CAD FILES: R51718/R51617/R41415/R41516
Date: 2006/DEC/11

Appendix A.2-008-R-01: Load Line 1A Munitions Response Site (MRS) (RVAAP-008-R-01) No Further Action (NFA) Status

A.2-008.1 Background

The former Load Line #1 was used to melt and load TNT and Composition B explosives into large-caliber shells during World War II and the Korean War. Activities initially conducted near the MRS included packing and shipping. After munitions manufacturing ceased at Load Line #1, the later activities near the MRS included the demilitarization of primers containing propellants at a former popping furnace.

The MRS was originally referred to as "Load Line #1 MRS" during the previous investigations and activities that occurred at the MRS under the Military Munitions Response Program (MMRP) and prior to the Remedial Investigation (RI) field work. In coordination with the Ohio EPA and the Army National Guard (ARNG), the designation for the current MRS area was revised to "Load Line #1A MRS" following the RI field work due to propellants that have since been observed outside the current MRS boundary.

A.2-008.2 Publication

The following publications relevant to the Record of Decision (ROD) for Load Line 1A MRS can be located on www.RVAAP.org or in established RVAAP information repositories:

- Final Site Inspection Report, Ravenna Army Ammunition Plant, Military Munitions Response Sites. Environmental and Engineering Management, LLC (e2M). 13 May 2008.
- Final Work Plan for Military Munitions Response Program Remedial Investigation, Ravenna Army Ammunition Plant Ravenna, Ohio, Shaw Environmental & Infrastructure, Inc., (Shaw) March 2011.
- Final Remedial Investigation Report for RVAAP-008-R-01 Load Line #1A MRS Version 2.0. CB&I Federal Services. LLC, 28 August 2014.
- Final No Further Action Proposed Plan for RVAAP-008-R-01 Load Line #1A Munitions Response Site Version 1.0. CB&I Federal Services, LLC, 06 May 2015.
- Final No Further Action Record of Decision for RVAAP-008-R-01 Load Line #1A Munitions Response Site Version 1.0. CB&I Federal Services, LLC, 14 August 2015b.

A.2-008.3 Site Location and Description

Load Line #1 is located in the southeastern portion of the facility. The Load Line #1A MRS is located at the north end of the former Load Line #1. Load Line #1 is approximately 164 acres in area. The load line is characterized by moderately subdued topography and ground surface elevations range from approximately 1,016 to 975 ft above mean sea level (amsl). All buildings at Load Line #1 have been demolished.

A.2-008.3 No Further Action Required

No Further Action (NFA) under CERCLA is necessary for the Load Line #1A MRS under the MMRP. No evidence of munitions and explosives of concern (MEC) was found at the MRS during the Remedial Investigation (RI) field work that was conducted under the MMRP. The MRS was further evaluated for munitions constituents (MC) at locations specified in the Final Work Plan for Military Munitions Response Program Remedial Investigation Environmental Services (Shaw, 2011), and no chemicals of concern (COCs) or chemicals of potential ecological concern (COPECs) that presented potential risks to human or environmental receptors, respectively, were found. The MRS is collocated with a designated Installation Response Program (IRP) Area of Concern (AOC), RVAAP-08 Load Line #1. COCs identified in the environmental media at the collocated AOC, if any, have either already been addressed or will continue to be addressed under future CERCLA decisions to be carried out under the IRP.

No MEC were encountered at the Load Line #1A MRS, and there are no explosive hazards or sources for MC. The recommendation of NFA at the MRS under the MMRP is protective of human health and the environment and meets the statutory requirements for cleanup standards established in Section 121 of CERCLA (CB&I Federal Services, 2015b).

FIGURE 3 SITE MAP

Appendix A.2-13: Building 1200 – (RVAAP-13) – No Further Action (NFA) STATUS for Soil, Sediment, and Surface Water

A.2-13.1 Background

The Building 1200 Area of Concern (AOC) was designated as the Ammunition Sectioning Area. From 1941 to 1971, three buildings served as a quality assurance (QA) inspection station that encompassed disassembly of production line munitions items, including explosive melt-pour operations. The primary operations building was Building 1200, which was a 30 by 20 ft combined reinforced concrete and transite panel frame structure. The steam melt-out process generated explosives-contaminated wastewater (pink water), which discharged from the building via a pipe, through a crushed slag gravel bed, and into a ditch connected to a 0.5-acre, unlined settling pond (located approximately 415 ft northeast of Building 1200). The depth of the settling pond is less than 3 ft. Overflow from the settling pond discharged directly to the ground surface southeast of the pond; there is no documented evidence of a discharge drainage ditch exiting the settling pond and flowing to a surface water body.

Building demolition activities took place between November 2004 and August 2005, and no buildings or structures remain at the AOC. The remaining surface features include the access road, drainage ditch from the former operations area to the former settling pond, and the former settling pond and associated discharge area.

A.2-13.2 Publications

The following publications can be located on <www.RVAAP.org> or in established RVAAP information repositories:

- Final Quality Control Plan for the Phase I Remedial Investigation for High Areas of Concern at RVAAP, June 1996.
- Final Phase I Remedial Investigation Sampling and Analysis Plan Addendum for High Areas of Concern for the Ravenna Army Ammunition Plant, July 1996.
- Final Phase I Remedial Investigation Site Safety and Health Plan Addendum for High Priority Areas of Concern for the Ravenna Army Ammunition Plant, July 1996.
- Final Public Meeting Briefing Phase I Remedial Investigation of High Priority Areas of Concern at the Ravenna Army Ammunition Plant, September 1997.
- Phase I Remedial Investigation Report for High Priority Areas of Concern at the Ravenna Army Ammunition Plant, Ravenna, Ohio, February 1998.
- Final Sampling and Analysis Plan Addendum for the Characterization of 14 RVAAP AOCs at RVAAP, October 2004.
- Final Characterization of 14 AOCs at Ravenna Army Ammunition Plant, March 2007.

- Final Quality Assurance Surveillance Plan for the 2008 Performance-Based Acquisition of Environmental Investigation and Remediation at Ravenna Army Ammunition Plant, September 2008.
- Final Project Management Plan for the 2008 Performance-Based Acquisition of Environmental Investigation and Remediation, September 2008.
- Final Work Plan Performance-Based Acquisition for Environmental Investigation and Remediation MEC Avoidance/Removal Services, September 2009.
- Final PBA 2008 Supplemental Investigation Sampling and Analysis Plan Addendum No. 1 at Ravenna Army Ammunition Plant, December 2009.
- Final Remedial Investigation/Feasibility Study Report for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200, March 2012.
- Final Proposed Plan for Soil, Sediment and Surface Water at RVAAP-13 Building 1200, April 2013.
- Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200, March 2014.
- Final Remedial Design for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200 and RVAAP-48 Anchor Test Area, August 2014.
- Final Remedial Action Report for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200, May 2015.

A.2-13.3 Site Location and Description

The Building 1200 AOC is a former operational facility designated as RVAAP-13. The AOC is approximately 7.7 acres and is situated in the eastern portion of CJAG. Building demolition activities took place between November 2004 and August 2005, and no buildings or structures remain at the AOC. The remaining surface features include the access road, drainage ditch from the former operations area to the former settling pond, and the former settling pond and associated discharge area.

The topography at the Building 1200 AOC gently slopes radially from a high point just southwest of the former operations buildings. Ground elevations at the AOC range from 990 to 1004 ft above mean sea level (amsl). Intermittent surface water flows in the drainage ditch from the former operations area east to the former settling pond during precipitation events and periods of snow melt. The ditch tends to hold water for extended periods of time due to the low permeability of soil. Surface water discharge from the former settling pond occurs via an outlet channel to the southeast. Discharge flow is diffuse and enters into a heavily wooded area to the south of the pond. The nearest defined surface water conveyance (large ditch line or tributary flowing southwest to Sand Creek) that receives surface water flow lies approximately 1,000 ft to the southeast of the settling pond discharge area.

The Building 1200 AOC is on a local bedrock high. The AOC is underlain by a thin unconsolidated interval generally less than 3 ft thick. The underlying bedrock formation observed at the AOC is the Pennsylvanian age Pottsville Formation, Sharon Sandstone Member. The sandstone unit of the Sharon member (informally referred to as the Sharon Conglomerate) is a highly porous, loosely

cemented, permeable, cross-bedded, frequently fractured and weathered orthoquartzite sandstone, which is locally conglomeritic. The Sharon Conglomerate exhibits locally occurring thin shale lenses in the upper portion of the unit. Upper members of the Pottsville Formation are not present at the AOC.

A.2-13.4 Land Use and Activities

The AOC will be used for Military Training. The selected and implemented remedy for soil, sediment, and surface water allows for Unrestricted (Residential) Land Use, which also allows for Military Training Land Use.

A.2-13.5 Remedy Objectives

The *Record of Decision for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200* (USACE 2014) documented that no further action (NFA) was required for sediment and surface water at the AOC. Manganese in soil was identified as a chemical of concern (COC) requiring remediation to attain Unrestricted (Residential) Land Use. Remedial activities were conducted in December 2014 and January 2015 and were summarized in the *Remedial Action Report for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200* (USACE 2015). A total of 376 tons of contaminated soil was excavated from two contaminated areas within the AOC and transported and disposed at a local landfill. Confirmation sampling results and concurrence from the Ohio Environmental Protection Agency (EPA) concluded that the AOC met the criteria for Unrestricted (Residential) Land Use after implementation of the remedial action.

A.2-13.6 Land Use Controls

Land use controls (LUCs) are not required for soil, sediment, and surface water at the Building 1200 AOC. The remedial action achieved the remedial action objective (RAO) for manganese in soil to attain Unrestricted (Residential) Land Use, and NFA was required for sediment and surface water. Other media (i.e., groundwater) will be addressed as part of future actions.

A.2-13.7 Monitoring and Reporting

Five-year reviews are not required for soil, sediment, and surface water at the Building 1200 AOC, which is compliant with Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121(c).

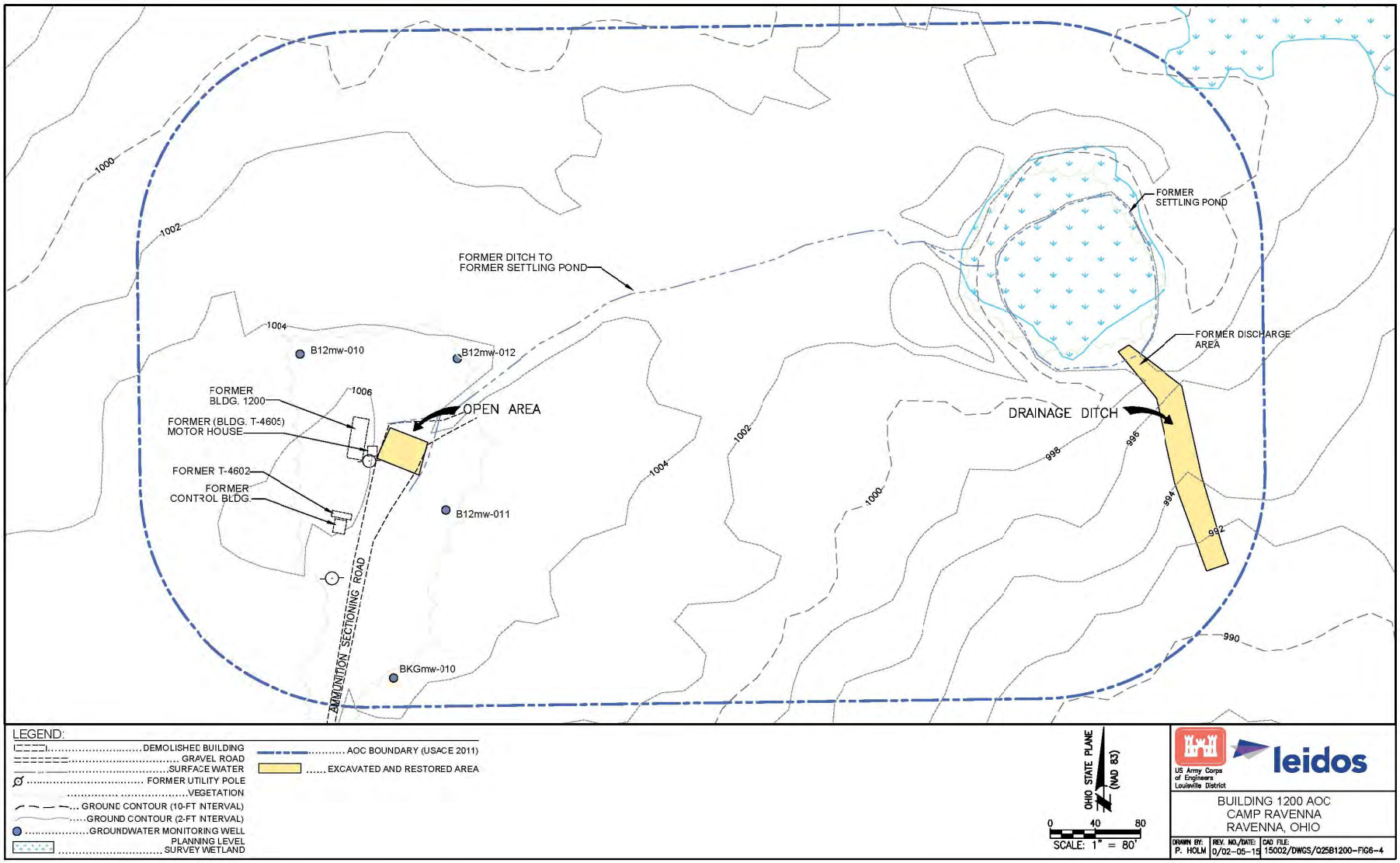


Figure A.13-1. Features of the Building 1200 AOC

Appendix A.2-016-R-01: Fuze and Booster Quarry (RVAAP-016-R-01) No Further Action (NFA) Status.

A.2-016.1 Background

The Fuze and Booster Quarry (FBQ) munitions response site (MRS) was a stone and ballast quarry excavated to provide building material for RVAAP (Figure A.2-016-1, Fuze and Booster Quarry MRS Boundary). Between 1945 and 1949 the quarry was used as an open burn area where sawdust waste generated at Load Lines 6 through 11 was thermally treated. Thereafter, the quarry was used as a landfill that reportedly accepted fuze and booster assemblies, projectiles, residual ash, and sanitary waste. In 1976, the landfill materials, inclusive of the munitions-related items historically disposed of at the MRS, were removed and transferred to either Ramsdell Quarry or one of the other burning grounds at RVAAP. From 1987 through 1993, spent brine regenerate and sand filtration backwash water were discharged to the ponds from the facility's potable water treatment system. The discharge was regulated under the National Pollutant Discharge Elimination System (NPDES) permit. The Ponds have been inactive since 1993. The MRS addressed in the No Further Action (NFA) Proposed Plan (PP) was initially 12.74 acres, revised to be a 4.92-acre area encompassing the three ponds and the area immediately surrounding them in the south-central portion of the former RVAAP.

A.2-016.2 Publications

The following publications can be located on www.RVAAP.org or in established RVAAP information repositories:

- Final Military Munitions Response Program Historical Records Review, Ravenna Army Ammunition Plant, Ohio. e2M. January 2007.
- Final Site Inspection Report, Ravenna Army Ammunition Plant, Ohio, Military Munitions Response Sites. e2M. May 2008.
- Final Remedial Investigation (RI) Report for RVAAP-016-R-01 Fuze and Booster Quarry MRS, Version 1.0. CB&I Federal Services, LLC. 5 June 2015.
- Final Feasibility Study for RVAAP-016-R-01 Fuze and Booster Quarry MRS, Version 1.0. HydroGeoLogic, Inc. 6 January 2018.
- Final No Further Action Proposed Plan for RVAAP-016-R-01 Fuze and Booster Quarry Munitions Response Site. HydroGeoLogic, Inc. 18 September 2018.
- Final No Further Action Record of Decision for RVAAP-016-R-01 Fuze and Booster Quarry Munitions Response Site, Version 1.0. HydroGeoLogic, Inc. 3 July 2019.

A.2-016.3 Site Location and Description

The 4.92-acre Fuze and Booster Quarry MRS is located south of Newton Falls Road and north of Fuze and Booster Road at CJAG. The current configuration of the MRS consists of the three elongated ponds situated end to end and separated by earthen berms. The topography in the vicinity of the Fuze and Booster Quarry MRS is characterized by gentle slopes to the east and west of the MRS down towards the three elongated ponds. Elevations across the MRS range from 1,140 feet above mean sea level (amsl) along the upper slopes of the ponds to approximately 1,125 feet amsl in the ponds themselves.

The surface water in the ponds is approximately 15 to 20 feet below the surrounding grade, and the depths of the water in the ponds fluctuate depending on the season and amount of precipitation. The southern two quarry ponds are filled with water year-round. Water is typically present in the northern pond; however, water levels can vary widely, and sometimes no water is present during very dry periods. The ponds are surrounded by mature hardwood forest, and a gravel road leads up to the western side of the MRS.

The MRS is located on federal property, with administrative accountability assigned to the U.S. Property and Fiscal Officer (USP&FO) for Ohio. The MRS is jointly managed by the Army National Guard (ARNG) and Ohio Army National Guard (OHARNG).

A.2-016.4 No Further Action Required

NFA under CERCLA is necessary for the Fuze and Booster Quarry MRS under the Military Munitions Response Program (MMRP). No evidence of Department of Defense (DoD) military munitions classified as munitions and explosives of concern were encountered at the MRS during RI field activities conducted under the MMRP. The MRS was further evaluated for munitions constituents (MC) during the RI and the RI Report concluded that no site-related chemicals originated from munitions or other munitions-related activities. The Human Health and Ecological Risk Assessments concluded that no potential risks to human or environmental receptors due to MC-related contamination exist at the Fuze and Booster Quarry MRS (CB&I Federal Services, LLC, 2015).

No munitions and explosives of concern (MEC) was encountered at the Fuze and Booster Quarry MRS, and there are no explosive hazards or sources for MC-related contamination. The recommendation of NFA at the MRS under the MMRP is protective of human health and the environment and meets the statutory requirements for cleanup standards established in Section 121 of CERCLA.

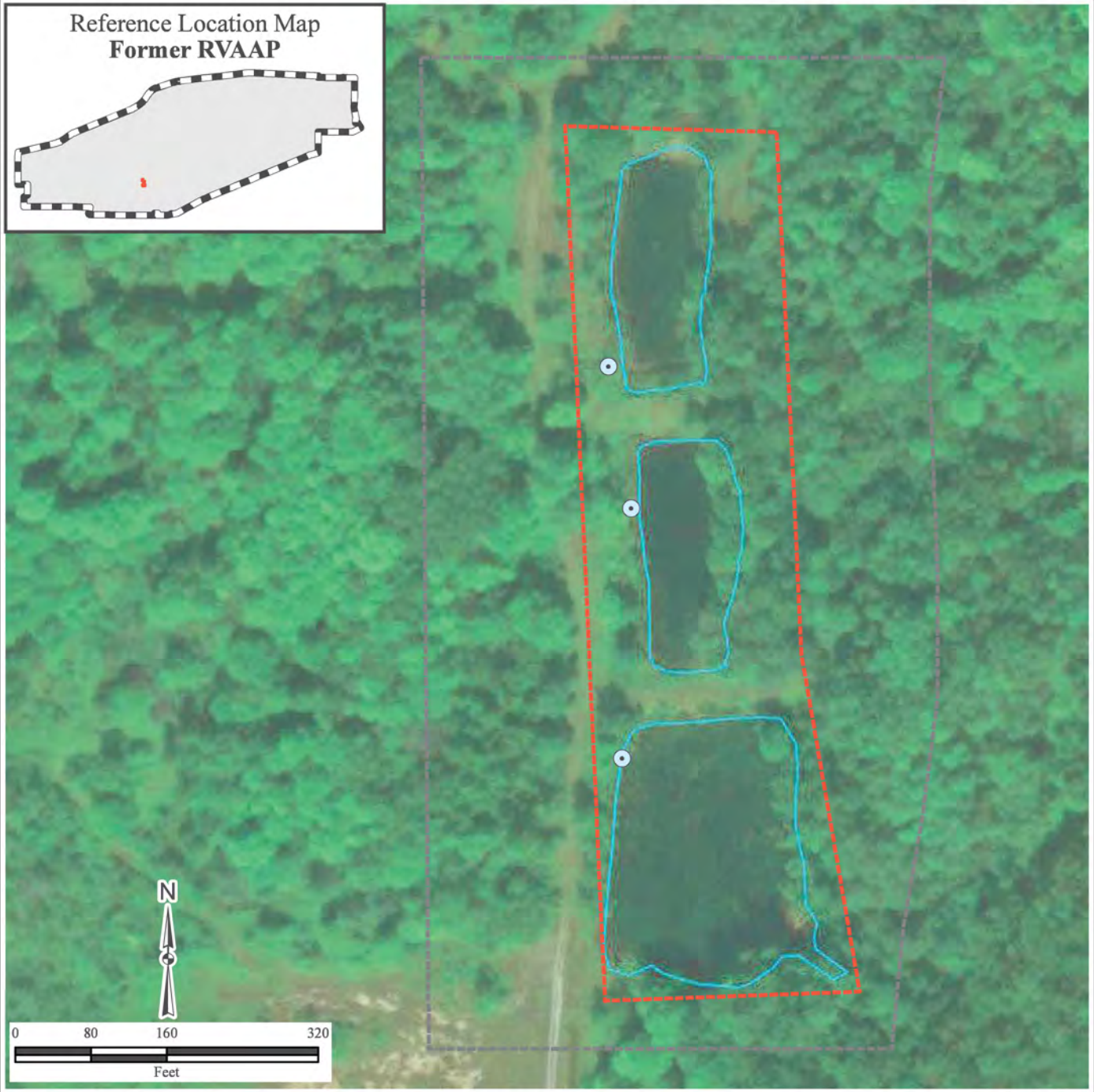


Figure A.2-016-1
Fuze and Booster Quarry MRS Boundary and Site Features
Camp Ravenna/Former RVAAP
Portage and Trumbull Counties, Ohio

Legend

- Former Water Control Intake
- Surface Water
- MRS
- 2007 HRR MRS Boundary
- Installation Boundary

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

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Source: HGL,CB&I, USACE, e²M ArcGIS Online Imagery

HGL HydroGeoLogic, Inc

Appendix A.2-16: Fuze and Booster Quarry – (RVAAP-16) – No Further Action (NFA) Status.

A.2-016.1 Background

The Fuze and Booster Quarry (FBQ), designated as RVAAP-16, is co-located with the FBQ MRS, designated as RVAAP-016-R-01. FBQ operated from 1945 until 1993 and encompasses approximately 45 acres in the south-central part of the former RVAAP. Reportedly, the quarry was used for open burning and as a landfill before 1976. The debris resulting from these activities was reportedly removed during construction of three settling ponds (quarry ponds) in 1976. These quarry ponds, up to 20 to 30 ft deep and separated by earthen berms, were constructed to receive spent brine regenerate, groundwater iron oxide filtrant, and sand filtration backwash water discharge from one of the former RVAAP water treatment plants. The discharge was regulated under a National Pollutant Discharge Elimination System (NPDES) permit and continued until 1993. The Ponds have been inactive since 1993.

A.2-016.2 Publications

The following publications can be located on www.RVAAP.org or in established RVAAP information repositories:

- Final Phase I/Phase II Remedial Investigation of the Fuze and Booster Quarry Landfill/Ponds (RVAAP-16). SpecPro/SAIC. November 2005.
- Final Feasibility Study for Fuze and Booster Quarry Landfill/Ponds (RVAAP-16). SAIC. July 2006.
- Final Proposed Plan for Soil and Dry Sediment or Fuze and Booster Quarry Landfill/Ponds (RVAAP-16). SAIC. March 2007.
- Final Record of Decision for Soil and Dry Sediment or Fuze and Booster Quarry Landfill/Ponds (RVAAP-16). SAIC. 19 September 2007.
- Wetlands and Other Waters Delineation Report Remedial Action Areas at Ramsdell Quarry Landfill, Load Line 12, and Fuze and Booster Quarry Landfill/Ponds at the Ravenna Army Ammunition Plant and Ravenna Training and Logistics Site, Ravenna, Ohio. EnviroScience. 29 December 2008.
- Final Remedial Design for the RVAAP-16 Fuze and Booster Landfill/Ponds. SAIC. 26 June 2009.
- Final Remedial Action report for the RVAAP-16 Fuze and Booster Landfill/Ponds. SAIC. 5 March 2010.
- Final Remedial Investigation Work Plan for Sediment and Surface Water at RVAAP-01, RVAAP-04, RVAAP-16, RVAAP-001-R-01, and Inventory of Sediment and Surface Water at Multiple Sites. Leidos. 12 August 2016.
- Final Supplemental Remedial Investigation for Sediment and Surface Water at RVAAP-01, RVAAP-04, RVAAP-16, RVAAP-001-R-01, and Inventory of Sediment and Surface Water at Multiple Sites. Leidos. 29 November 2017.
- Final Proposed Plan for Sediment and Surface Water at Six Areas of Concern/Munitions Response Sites. Leidos. 10 May 2019.
- Final Record of Decision for Sediment and Surface Water at Six Areas of Concern/Munitions Response Sites. Leidos. 4 June 2020.

A.2-016.3 Site Location and Description

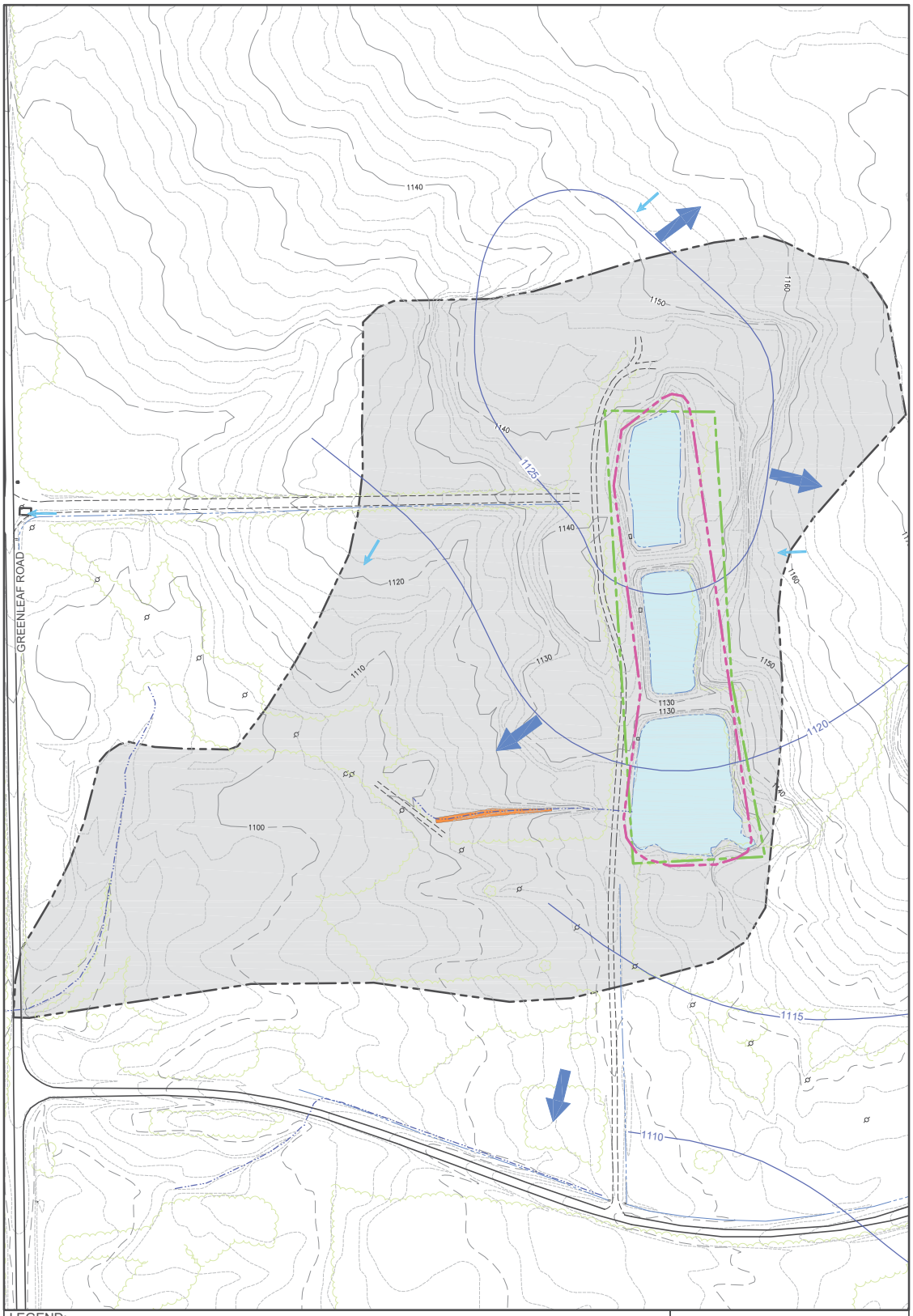
FBQ is located in the central portion of CJAG and includes the approximately 5- acre MRS evaluated under the MMRP and the 45-acre AOC evaluated under the IRP. The site consists of 11 small, shallow settling basins at the western portion of the site; 3 man-made quarry ponds at the eastern portion of the site; a

drainage ditch leading from the quarry ponds to the settling basins; gravel access roads; and debris piles. The wet sediment and surface water at this site consist of the quarry ponds. Based on the underwater investigation performed during the MMRP RI (CB&I 2015a), the maximum depth of water at the ponds is approximately 10 ft at the northern portion of the southern pond, but the average water depth of the three quarry ponds was approximately 6–7 ft. The ponds are separated by earthen berms.

The southern two quarry ponds are filled with water year round. Water is typically present in the northern pond; however, water levels can vary widely, and sometimes no water is present during very dry periods. Surface water flows in the ponds from north to south through a series of gated culverts between the three ponds. Surface water overflow exits the southernmost pond through a culvert to the drainage ditch at the southwestern corner of the pond.

A.2-016.4 No Further Action Required

No Further Action (NFA) for soil, dry sediment, sediment, surface water under CERCLA is necessary for the Fuze and Booster Quarry based on Records of Decision for soil and dry sediment (SAIC, 2007) and sediment and surface water (Leidos, 2020), and a Remedial Action for soil and dry sediment (SAIC, 2010). The Remedial Action for soil and dry sediment was completed in 2010 (SAIC, 2010).



Fuze and Booster Quarry Landfill/Ponds AOC Features

Appendix A.2-19: Landfill North of Winklepeck Burning Grounds – (RVAAP-19) – No Further Action (NFA) Status for Soil, Sediment and Surface Water

A.2-19.1 Background

The Landfill North of Winklepeck Burning Grounds (LNWBG) is in the central portion of CJAG and is north of the Mark 19 Range and Winklepeck Burning Grounds (WBG) Area of Concern (AOC). LNWBG includes a 28-acre area of investigation (AOI) and a 3.4-acre AOC, also known as Area A. An area within the WBG was used as landfill for general refuse from 1941–1969. Most of these wastes were burned and covered with earth. From 1969–1978 burning operations were moved to an area just north of Winklepeck Burning Grounds, and Winklepeck Burning Grounds were used for landfilling refuse only. Aerial photography of LNWBG indicates that no additional activities were conducted after these stated timeframes, and there is no documentation of additional operations at LNWBG after 1978.

A.2-19.2 Publications

The following publications relevant to the Record of Decision (ROD) for the LNWBG AOC can be located on www.RVAAP.org or in established RVAAP information repositories:

- Final Phase I Remedial Investigation Report for the Phase I Remedial Investigation of High Priority Areas of Concern at the Ravenna Army Ammunition Plant. SAIC. February 1998.
- Final Characterization of 14 Areas of Concern at Ravenna Army Ammunition Plant. MKM Engineers. March 2007.
- Final Remedial Investigation Report for Soil, Sediment, and Surface Water at RVAAP-19 Landfill North of Winklepeck Burning Grounds. Leidos. 25 April 2018.
- Final Proposed Plan for Soil, Sediment, and Surface Water at RVAAP-19 Landfill North of Winklepeck Burning Grounds. Leidos. 4 April 2019.
- Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP-19 Landfill North of Winklepeck Burning Grounds. Leidos. 18 February 2020.

A.2-19.3 Site Location and Description

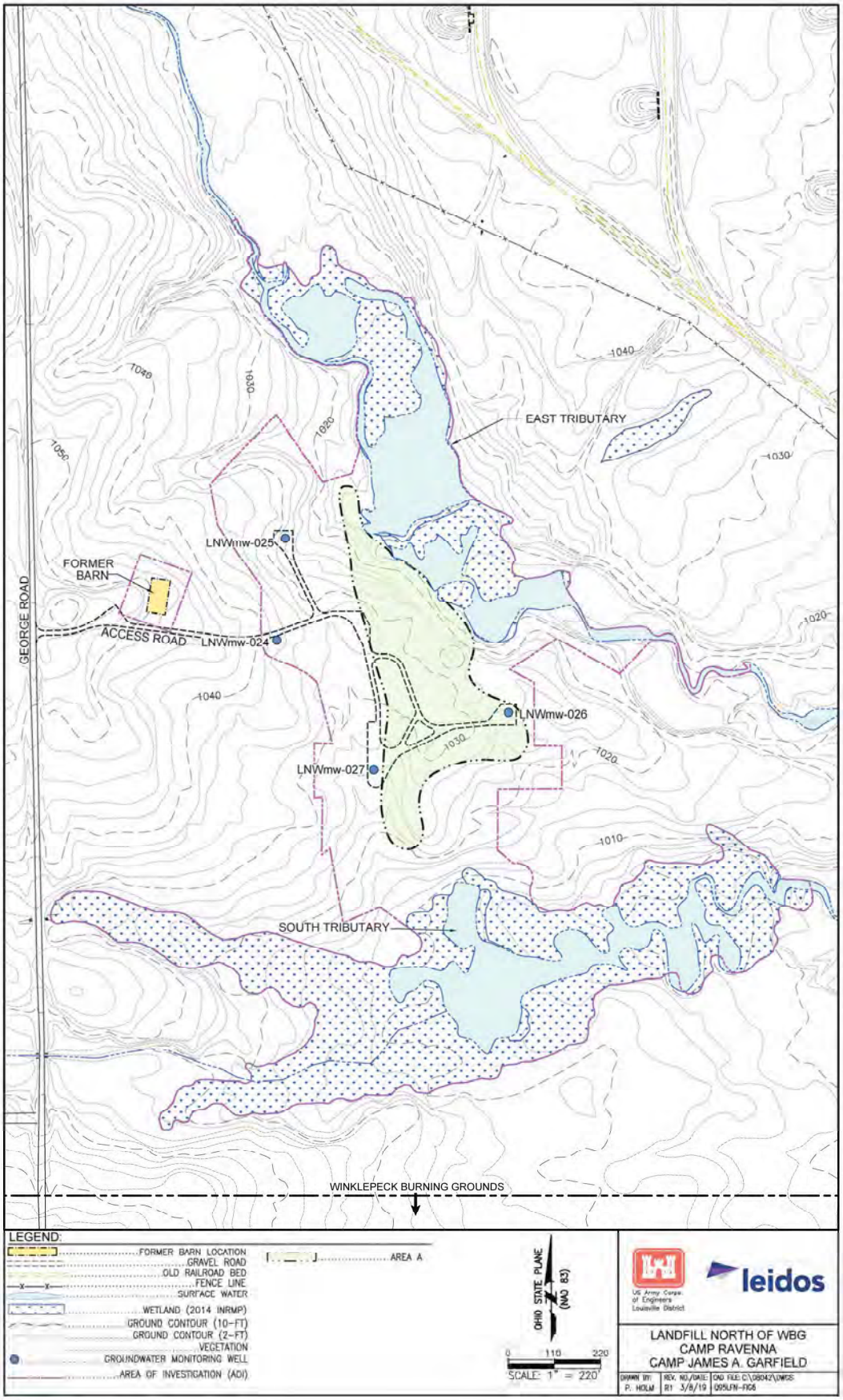
LNWBG is east of George Road, south of Smalley Road, and north of the Mark 19 Range and WBG AOC. Ground elevations across LNWBG range from approximately 994–1,054 ft above mean sea level. The topographic high is on the western boundary at the former location of a barn. The topographic relief is moderate from the location of the former barn to the areas disturbed by operational activities. The highest elevation at the area disturbed by operational activities is 1,032 ft above mean sea level.

Perennial surface water features (wetlands and tributaries) are located within the eastern and southern portions of the AOI (Figure 2). Surface water occurs intermittently as storm water runoff on the ground surface of the disturbed area. Surface water flow is the primary migration pathway for contamination to leave this area, flowing through ditches and surface water drainage features that follow site topography toward the East Tributary and South Tributary. The generalized groundwater flow direction is from the center of the AOI to the northeast and southeast.

A.2-19.4 No Further Action Required

No Further Action (NFA) under CERCLA is necessary for soil, sediment, and surface water at LNWBG for Unrestricted (Residential) Land Use. Consequently, no further action is necessary for the future use of this site (Military training). Groundwater at LNWBG will be addressed under future CERCLA decisions. Land use controls will not be implemented as part of this decision, as the human health risk assessment

(HHRA) did not identify any chemicals of concern (COCs) that pose unacceptable risk to the Resident Receptor (Adult and Child) and the ecological risk assessment (ERA) recommended no further action. Because the HHRA did not identify any COCs that pose unacceptable risk to the Resident Receptor (Adult and Child) and the ERA recommended no further action, five-year reviews will not be required.



Site Features of Landfill North of Winklepeck Burning Grounds

Appendix A.2-019-R-01: Landfill North of Winklepeck Munitions Response Site (MRS) – (RVAAP-019-R-01) – No Further Action (NFA) Status.

A.2-019.1 Background

The MRS accepted general plant refuse, explosive wastes residue, and open burn waste including flares and booster cups from Winklepeck Burning Grounds. Details regarding the operational history of disposal activities at the Landfill North of Winklepeck MRS, however, are incomplete (e2M, 2007).

A.2-019.2 Publications

The following publications can be located on www.RVAAP.org or in established RVAAP information repositories:

- Final Military Munitions Response Program Historical Records Review, Ravenna Army Ammunition Plant, Ohio. e2M. January 2007.
- Final Site Inspection Report, Ravenna Army Ammunition Plant, Ohio, Military Munitions Response Sites. e2M. May 2008.
- Final Remedial Investigation Report for RVAAP-019-R-01 Landfill North of Winklepeck and RVAAP-060-R-01 Block D Igloo Munitions Response Sites, Version 1.0. CB&I Federal Services, LLC. 04 March 2015.
- Final No Further Action Proposed Plan for RVAAP-019-R-01 Landfill North of Winklepeck Munitions Response Site. HydroGeoLogic, Inc. 2 August 2017.
- Final No Further Action Record of Decision for RVAAP-019-R-01 Landfill North of Winklepeck Munitions Response Site, Version 2.0. HydroGeoLogic, Inc. 14 January 2019.

A.2-019.3 Site Location and Description

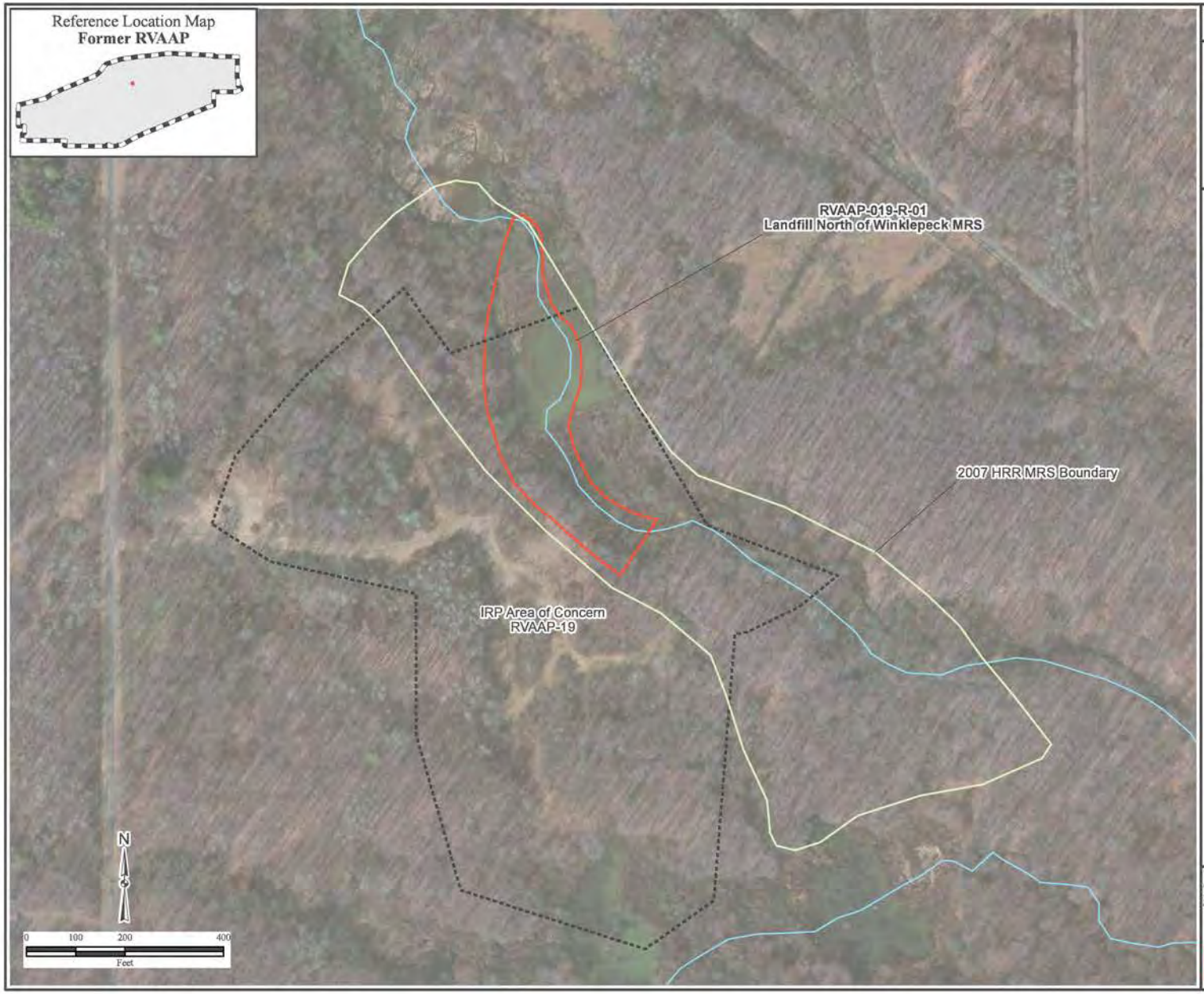
The Landfill North of Winklepeck MRS is a 2.3-acre area along the northern slope of a collocated area of concern (AOC), the Landfill North of Winklepeck Burning Grounds (RVAAP-19). The MRS is situated on top of a small bluff at the north central portion of the facility that overlooks an unnamed stream to the east.

No Material Potentially Presenting An Explosive Hazard (MPPEH) or concentrated areas of munitions debris are present, and no potential source of munitions constituent (MC) 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.

A.2-019.4 No Further Action Required

The results of the RI fieldwork for the Landfill North of Winklepeck MRS support the determination that there is no risk associated with exposure to DoD military munitions, or MC-related contamination at the MRS. 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.

Figure 3
Landfill North of Winklepeck MRS
Previous Investigation Footprints
Camp Ravenna/Former RVAAP
Portage and Trumbull Counties, Ohio



Legend

- IRP Area of Concern Boundary
- 2007 HRR MRS Boundary
- MRS Boundary
- Installation Boundary

Notes:
HRR=Historical Records Review
IRP=Installation Restoration Program
MRS=munitions response site
RVAAP=Ravenna Army Ammuntion Plant

\\Gsl-srv-01\HGLGIS\Ravenna_AAP\LNW\RoD\(03)LNWAreas.mxd
1/4/2018 JAR
*Source: HGL,CB&I, USACE, e*M ArcGIS Online Imagery*

Appendix A.2-28: Suspected Mustard Agent Burial Site – (RVAAP-28) – No Further Action (NFA) Status.

A.2-28.1 Background

The SMABS is referred to as the "suspected" mustard agent burial site because the use of sulfur mustard agent at the former RVAAP, and specifically at this AOC, has never been confirmed. A former RVAAP employee indicated that an area within the former National Advisory Committee for Aeronautics (NACA) Test Area was excavated and one 55-gallon drum and 7 small cans (allegedly mustard agent) were removed and identified as nontoxic. This excavation and removal was performed in 1969 and the former employee who identified the location where the materials were buried, was the person who actually buried and treated them with 'quicklime' after World War II. The remaining potential for buried mustard agent areas is based solely on verbal-historical accounts taken from unconfirmed and undocumented sources.

Three separate areas were identified as potential locations where the mustard agent was allegedly buried. These three areas were investigated and evaluated to determine the presence of mustard agent and or Chemical Agent Identification Sets (CAIS) test kits.

There is no documented evidence of any use or release of mustard agent at the AOC.

A.2-28.2 Publications

The following publications can be located on www.RVAAP.org or in established RVAAP information repositories:

- Final RVAAP Geophysical Survey Results, Suspected Mustard Agent Burial Site (RVAAP-28) (letter). SAIC. 17 April 1998.
- Final Report on the Additional Groundwater Monitoring Well Installation and Groundwater Sampling at the Suspected Mustard Agent Burial Site. SpecPro. May 2006.
- Final Report on the Geophysical Investigation, Suspected Mustard Agent Burial Site. Environmental Quality Management, Inc. 21 May 2008.
- Final Digital Geophysical Mapping Report for the RVAAP-34 Sand Creek Disposal Road Landfill, RVAAP-03 Open Demolition Area #1, and RVAAP-28 Mustard Agent Burial Site Version 1.0. Shaw Environmental & Infrastructure, Inc. 11 January 2011.
- Final Site Inspection Report for RV AAP-28 Suspected Mustard Agent Burial Site. U.S. Army Corps of Engineers, Huntsville Center. 27 April 2015.
- Final Engineering Evaluation/Cost Analysis: RVAAP-28 Suspected Mustard Agent Burial Site at Camp Ravenna Joint Military Training Center Portage and Trumbull Counties, Ohio. U.S. Army Corps of Engineers, Louisville District. 19 September 2016.
- Final Action Memorandum: RVAAP-28 Suspected Mustard Agent Burial Site at Camp Ravenna Joint Military Training Center Portage and Trumbull Counties, Ohio. U.S. Army Corps of Engineers, Louisville District. 27 July 2017.

A.2-28.3 Site Location and Description

The SMABS AOC is located in the southwestern portion of the former RVAAP. The AOC consists of the three areas identified by former RVAAP employees. The three areas are as follows:

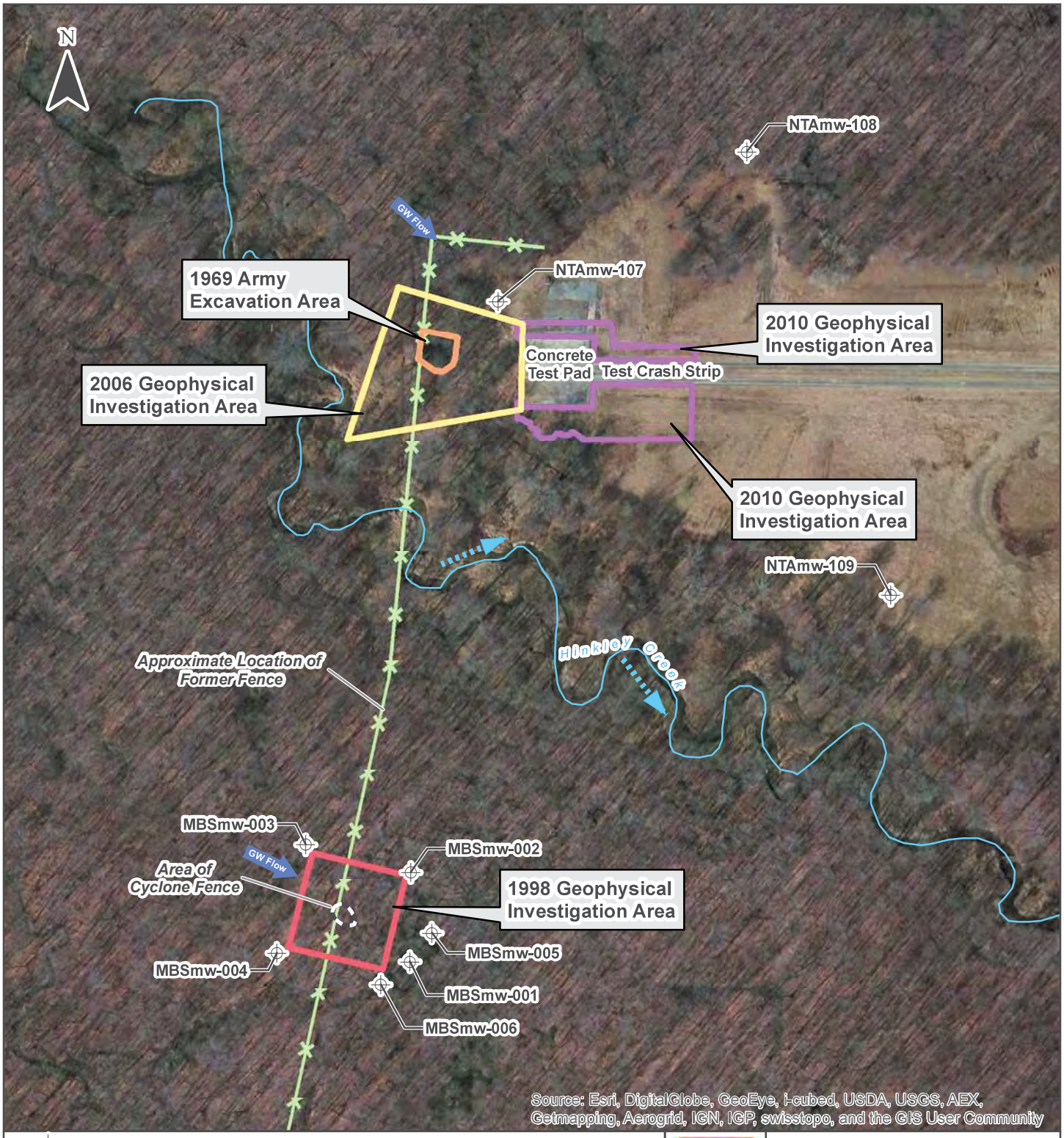
- The 1998 Army Excavation Area is approximately 24,329 ft^2.
- The 2006 Geophysical Investigation Area is approximately 29,644 $ft^{2,}$, and
- The 2010 Geophysical Survey area is 26,622 ft^2.

The three investigation areas, located both north and south of Hinkley Creek, cover approximately 1.8 acres total.

A.2-28.4 No Further Action Required

Based on the results of an Engineering Evaluation/Cost Analysis (EE/CA) completed in 2016, there are no actual or threatened releases of contaminants from this AOC that present an imminent and substantial endangerment to public health, or welfare, or the environment. The EE/CA showed that it is unlikely that any mustard agent or CAIS was used on the former RVAAP, and more unlikely it was buried on the Installation in any location.

The No Action Alternative selected in the EE/CA was considered protective because there is no evidence to substantiate the presence of any mustard agent or related materials. The OHARNG has implemented a Contingency Plan. Given that the Department of Defense (DOD) and the Army have well-documented, protective measures and proven regulations in place to fully protect the soldiers and have demonstrated this successfully, the alternative (No Action) would provide reasonable safety and protective measures that are required regardless of CERCLA. These are mandatory and would be fully implemented. The SMABS AOC will continue to be managed according to Army Regulations and safe practices as stated in the Contingency Plan but no remedial action is warranted and no endangerment exists.



Groundwater Monitoring Wells
1969 Army Excavation Area
1998 Geophysical Investigation Area
2006 Geophysical Investigation Area
2010 Geophysical Investigation Area
Approximate Location of Former Fence
Former Location of Cyclone Fence
General Shallow Groundwater Flow Direction
Surface Water Flow Direction

0 100 200
Feet

PROJECTION: NAD83 UTM Zone 17N

U.S. ARMY CORPS OF ENGINEERS
LOUISVILLE DISTRICT

INSTALLATION RESTORATION PROGRAM

RVAAP-28
SUSPECTED MUSTARD AGENT BURIAL SITE
FORMER RVAAP/CAMP RAVENNA
PORTAGE AND TRUMBULL COUNTIES, OHIO

CB&I Federal Services LLC
150 Royall Street
Canton, MA 02021

Appendix A.2-29: Upper and Lower Cobbs Ponds (RVAAP-29) – No Further Action (NFA) Status for Soil, Sediment and Surface Water

A.2-29.1 Background

Upper Cobbs Pond and Lower Cobbs Pond were constructed in 1940–1941, expanding a natural drainage conveyance to receive effluent discharge and to serve as the unlined sedimentation basins for Load Lines 3 and 12. From 1941–1971, the ponds received effluent from the Load Lines 3 and 12 sawdust filtration units, wash water, storm water runoff, and surface water runoff. Rinsate from demilitarization operations at Load Lines 3 and 12 was initially allowed to flow out of buildings and directly onto the ground or to drainage ditches, which ultimately discharged to Upper Cobbs Pond and Lower Cobbs Pond.

A.2-29.2 Publications

The following publications relevant to the Record of Decision (ROD) for the Upper and Lower Cobbs Ponds AOC can be located on www.RVAAP.org or in established RVAAP information repositories:

- Final Phase I Remedial Investigation Report for the Phase I Remedial Investigation of High Priority Areas of Concern at the Ravenna Army Ammunition Plant. SAIC. February 1998.
- Final Phase II Remedial Investigation Report Upper and Lower Cobbs Ponds. MKM Engineers. September 2005.
- Final Phase III Remedial Investigation Report for Soil, Sediment, and Surface Water at RVAAP-29 Upper and Lower Cobbs Ponds at Former Ravenna Army Ammunition Plant. Leidos. 10 August 2017.
- Final Proposed Plan for Soil, Sediment, and Surface Water at RVAAP- 29 Upper and Lower Cobbs Ponds at Former Ravenna Army Ammunition Plant. Leidos. 12 January 2018.
- Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP- 29 Upper and Lower Cobbs Ponds at Former Ravenna Army Ammunition Plant. Leidos. 22 February 2019.

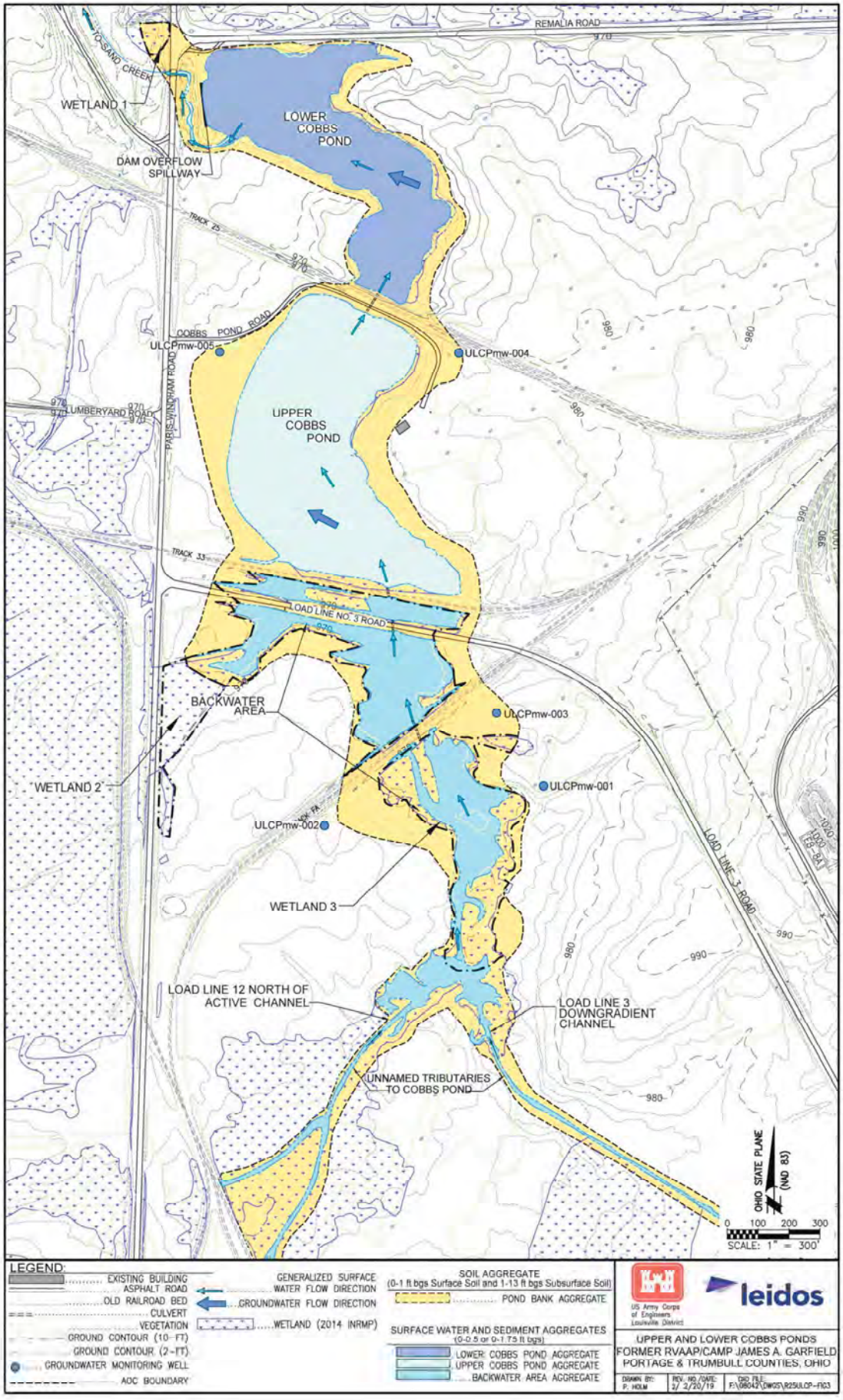
A.2-29.3 Site Location and Description

The Upper and Lower Cobbs Ponds Area of Concern (AOC) is approximately 39 acres and is located east of Paris-Windham Road and south of Remalia Road, north of Load Line 12, northwest of Load Line 3, in the east-central portion 0f the facility. The AOC includes approximately 18 acres of pond banks, the 5.2-acre Backwater Area, the 9.4-acre Upper Cobbs Pond, and the 6.4-acre Lower Cobbs Pond. Perennial surface water is present within Upper Cobbs Pond, Lower Cobbs Pond, and the Backwater Area. Surface water flows south to north, originating from drainage ditches from Load Line 3 and Load Line 12. Surface water flows through the Backwater Area to Upper Cobbs Pond then to Lower Cobbs Pond. Surface water ultimately exits the AOC through a dam overflow spillway located near the intersection of Remalia and Paris-Windham Roads. The spillway then enters an unnamed tributary that discharges into Sand Creek, northwest of the AOC. Three planning-level survey wetlands and wetland complexes are located at the AOC.

A.2-29.4 No Further Action Required

NFA under CERCLA is necessary for soil, sediment, and surface water at the Upper and Lower Cobbs Ponds AOC. Land use controls and five-year reviews are not required as no contaminants of concern (COCs) were identified in soil, sediment and surface water that posed unacceptable risk to the Resident receptor.

NFA for soil and sediment is protective of human health under the intended future land use and is protective of the environment. NFA meets the statutory requirements for cleanup standards established in Section 121 of CERCLA.


REMALIA ROAD
TO SAND CREEK
WETLAND 1
LOWER COBBS POND
DAM OVERFLOW SPILLWAY
TRACK 75
COBBS POND ROAD
ULCPmw-005
ULCPmw-004
PARIS-WINDHAM ROAD
LUMBERYARD ROAD
UPPER COBBS POND
TRACK 33
LOAD LINE NO. 3 ROAD
BACKWATER AREA
ULCPmw-003
WETLAND 2
ULCPmw-001
ULCPmw-002
WETLAND 3
LOAD LINE 3 ROAD
LOAD LINE 12 NORTH OF ACTIVE CHANNEL
LOAD LINE 3 DOWNGRADIENT CHANNEL
UNNAMED TRIBUTARIES TO COBBS POND
OHIO STATE PLANE (NAD 83)
0 100 200 300
SCALE: 1" = 300'
LEGEND:
EXISTING BUILDING
ASPHALT ROAD
OLD RAILROAD BED
CULVERT
VEGETATION
GROUND CONTOUR (10-FT)
GROUND CONTOUR (2-FT)
GROUNDWATER MONITORING WELL
AOC BOUNDARY
GENERALIZED SURFACE WATER FLOW DIRECTION
GROUNDWATER FLOW DIRECTION
WETLAND (2014 INRMP)
SOIL AGGREGATE
(0-1 ft bgs Surface Soil and 1-13 ft bgs Subsurface Soil)
POND BANK AGGREGATE
SURFACE WATER AND SEDIMENT AGGREGATES
(0-0.5 or 0-1.75 ft bgs)
LOWER COBBS POND AGGREGATE
UPPER COBBS POND AGGREGATE
BACKWATER AREA AGGREGATE
US Army Corps of Engineers Louisville District
leidos
UPPER AND LOWER COBBS PONDS
FORMER RVAAP/CAMP JAMES A. GARFIELD
PORTAGE & TRUMBULL COUNTIES, OHIO
DRAWN BY: P. HOLM
REV. NO./DATE: 2/ 2/20/19
DRG FILE: F:\098042\DWGS\R25ULCP-FI03

Appendix A.2-032-R-01: 40mm Firing Range (RVAAP-032-R-01) Munitions Response Site (MRS) - No Further Action (NFA) Status.

A.2-032.1 Background

The 40mm Firing Range munitions response site (MRS) is the location of a former 40mm firing range that operated between 1969 and 1971. The area of the MRS consists of the 5.17 acres former firing range itself and the overshot area that includes the furthest location that a 40mm grenade used at the former range could have travelled from the firing point. The former firing range was used to perform acceptance tests that included muzzle velocity measurements and impact function tests. Munitions reportedly fired at the former firing range included the M407A1-series 40mm practice grenade and the M406-series high explosive (HE) 40mm grenade. The M406- and M407A1-series grenades were designed to be fired from 40mm grenade launchers attached to rifles. The 40mm practice grenades contained yellow marker dye, M9-series propellant, and RDX booster pellets. The M9-series propellant consisted of nitrocellulose, nitroglycerin, potassium nitrate, ethyl centralite, and graphite. The M406-series HE 40mm grenades contained Composition B explosive, which is a mixture of RDX and TNT.

A.2-032.2 Publications

The following publications can be located on www.RVAAP.org or in established RVAAP information repositories:

- Final Military Munitions Response Program Historical Records Review, Ravenna Army Ammunition Plant, Ohio. e2M. January 2007.
- Final Site Inspection Report, Ravenna Army Ammunition Plant, Ohio, Military Munitions Response Sites. e2M. May 2008.
- Final Remedial Investigation (RI) Report for RVAAP-032-R-01 40mm Firing range MRS, Version 1.0. CB&I Federal Services, LLC. 30 April, 2015.
- Final Feasibility Study for RVAAP-032-R-01 40mm Firing Range MRS, Version 1.0. HydroGeoLogic, Inc. 5 January 2018.
- Final No Further Action Proposed Plan for RVAAP-032-R-01 40mm Firing range Munitions Response Site. HydoGeoLogic, Inc. September 2018.
- Final No Further Action Record of Decision for RVAAP-032-R-01 40mm Firing Range MRS, Version 1.0., HydroGeoLogic, Inc. 10 May 2019.

A.2-032.3 Site Location and Description

The MRS is located in the western portion of the facility west of the Fuze and Booster Quarry Area of Concern (RVAAP-16). The MRS is mostly forested with thick vegetation and ground cover. An approximate 1.5-acre open area with tall grasses remains at the eastern portion of the MRS, near the location of the former firing point. The topography at the 40mm Firing Range MRS is relatively flat, although a steep slope exists to the west of the former impact area and slopes downward toward the Fuze and Booster Quarry MRS ponds. There are no wetlands, waterways, or sensitive area at the MRS.

A.2-032.4 No Futher Action Required

No Further Action (NFA) under CERCLA is necessary for the 40mm Firing Range MRS under the Military Munitions Response Program (MMRP). No evidence of Department of Defense (DoD) military munitions classified as munitions and explosives of concern were encountered at the MRS during RI field activities conducted under the MMRP. The MRS was further evaluated for munitions constituents (MC) during the RI and the RI Report concluded that no detected analytes were identified as MC-related contamination (CB&I Federal Services, LLC [CB&I], 2015). Therefore, no risk due to MC-related

contamination is present at the MRS. No munitions and explosives of concern (MEC) was encountered at the 40mm Firing Range MRS and there are no explosive hazards or sources for MC-related contamination.

No MEC was encountered at the 40mm Firing Range MRS and there are no explosive hazards or sources for MC-related contamination. The recommendation of NFA at the MRS under the MMRP is protective of human health and the environment and meets the statutory requirements for cleanup standards established in Section 121 of CERCLA.

H:\MAMMS\Ravenna|GIS_Documents\Project_Maps\HGL\March2017\40mmFireRange\HGL_40mm_Fire_Range_003_Fig1_3_MRS_Map.mxd
6/20/2017 JWR
Source CB&I

Legend
- Suspected Impact and Overshot Area
- MRS Boundary
- Suspected Firing Point Location
- Direction of Slope

Figure 1-3
MRS Map
40mm Firing Range MRS Camp
Ravenna/Former RVAAP
Portage/Trumbull Counties, Ohio

Appendix A.2-33: Load Line 6 (RVAAP-33) – No Further Action (NFA) Status for Soil, Sediment and Surface Water

A.2-33.1 Background

From 1941–1945, Load Line 6 operated at full capacity as a finished product assembly line to produce fuzes for artillery projectiles. Load Line 6 was deactivated at the end of World War II, and the process equipment was removed. From 1950–1970 Load Line 6 was used by the Firestone Tire and Rubber Company Defense Research Division for developing shaped charges for armor penetration.

A total of 23 of the 27 production buildings were thermally decontaminated and demolished in 2002. The remaining four production buildings were demolished between 2005 and 2007 by conventional methods. All footers and floor slabs were removed to a minimum of 4 ft bgs.

A.2-33.2 Publications

The following publications relevant to the Record of Decision (ROD) for Load Line 6 can be located on www.RVAAP.org or in established RVAAP information repositories:

- Final Report for the Phase I Remedial Investigation at Load Line 6 (RVAAP 33). MKM Engineers, Inc. August 2007.
- Final Phase II Remedial Investigation Report for Soil, Sediment and Surface Water at RVAAP-33 Load Line 6. Leidos. 9 June 2016.
- Final Proposed Plan for Soil, Sediment, and Surface Water at RVAAP- 33 Load Line 6. Leidos. 12 March 2017.
- Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP- 33 Load Line 6. Leidos. 25 January 2018.

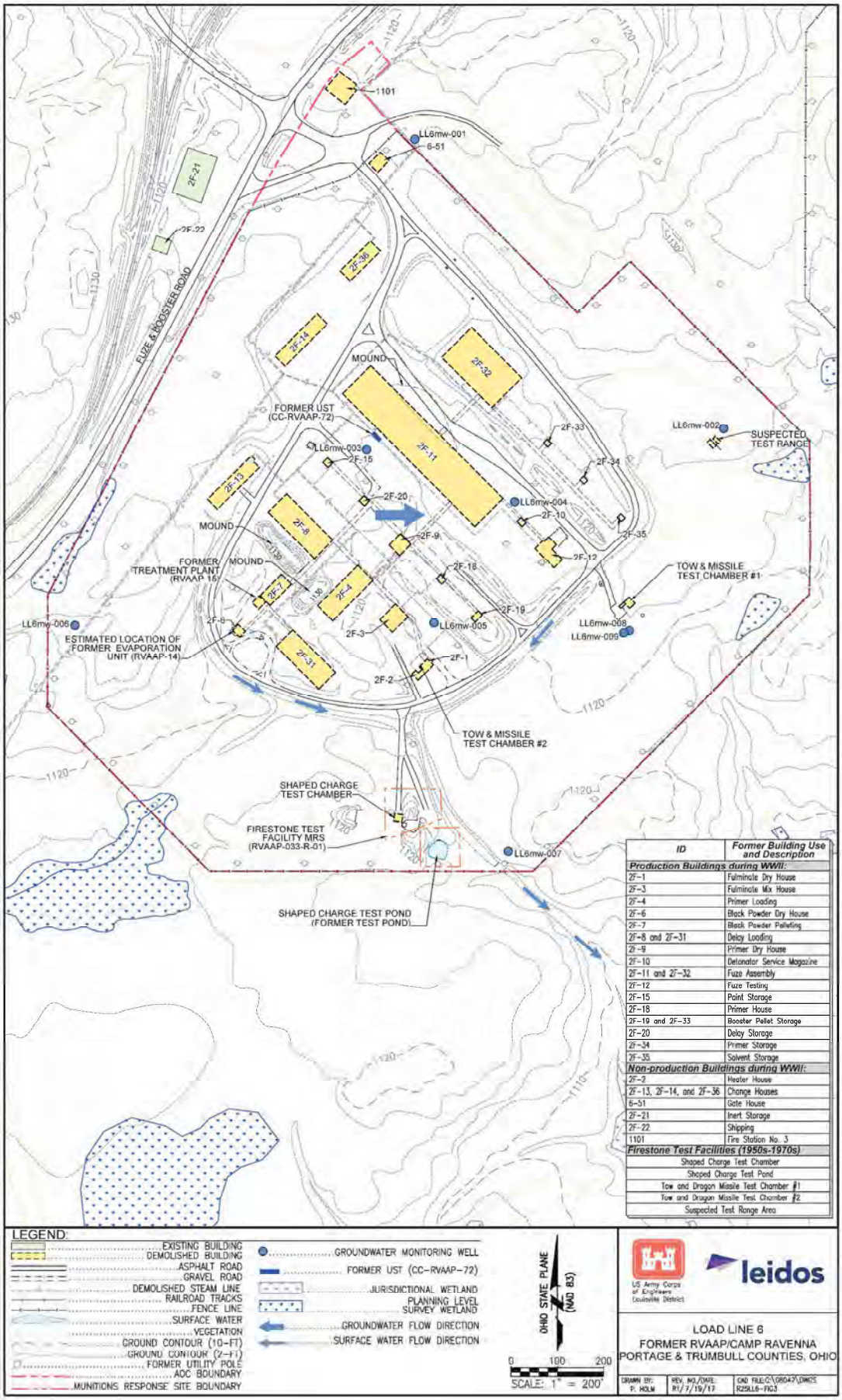
A.2-33.3 Site Location and Description

Load Line 6, formerly known as Fuze Line #2, is a 43-acre Area of Concern (AOC) located immediately south of Fuze and Booster Road at the intersection of Fuze and Booster Spur Road. The AOC is located in the south-central portion of the facility, west of Load Line 5 and east of Load Line 8. Remaining features at Load Line 6 include a one-lane asphalt perimeter road that enters the AOC from the north that provided access to the former production buildings. Remnants of the Firestone Test Facility [Munitions Response Site (MRS) RVAAP-033-R-01] include the Shaped Charge Test Chamber foundation, Former Test Pond, concrete blocks around the pond, and access road to the pond. The perimeter fence at Load Line 6 is still in place, but it is not currently maintained. Small construction drainage ditches border the perimeter road. Load Line 6 is currently overgrown with grass, trees, and scrub vegetation.

A.2-33.4 No Further Action Required

No Further Action (NFA is necessary for soil, sediment, and surface water at Load Line 6 for Unrestricted (Residential) Land Use. Consequently, no further action is necessary for the future use of the site (Military Training). Groundwater at Load Line 6 will be addressed under future CERCLA decisions. Land use controls will not be implemented at Load Line 6, as no CERCLA-related chemicals of concerns were identified in soil, sediment, or surface water for the Resident Receptor.

NFA for soil, sediment and surface water is protective of human health and the environment and meets the statutory requirements for cleanup standards established in Section 121 of CERCLA. Because the CERCLA-related contamination present in soil, sediment, and surface water at Load Line 6 does not pose a potential risk to human health or the environment, five-year reviews will not be required.



ID	Former Building Use and Description
Production Buildings during WWII:	
2F-1	Fulminate Dry House
2F-3	Fulminate Mix House
2F-4	Primer Loading
2F-6	Black Powder Dry House
2F-7	Black Powder Pelleting
2F-8 and 2F-31	Delay Loading
2F-9	Primer Dry House
2F-10	Detonator Service Magazine
2F-11 and 2F-32	Fuze Assembly
2F-12	Fuze Testing
2F-15	Paint Storage
2F-18	Primer House
2F-19 and 2F-33	Booster Pellet Storage
2F-20	Delay Storage
2F-34	Primer Storage
2F-35	Solvent Storage
Non-production Buildings during WWII:	
2F-2	Heater House
2F-13, 2F-14, and 2F-36	Change Houses
6-51	Gate House
2F-21	Inert Storage
2F-22	Shipping
1101	Fire Station No. 3
Firestone Test Facilities (1950s-1970s)	
Shaped Charge Test Chamber	
Shaped Charge Test Pond	
Tow and Dragon Missile Test Chamber #1	
Tow and Dragon Missile Test Chamber #2	
Suspected Test Range Area	

Figure 3. Load Line 6 Site Features

Appendix A.2-033-R-01: Firestone Test Facility Munitions Response Site (MRS) (RVAAP-033-R-01) – No Further Action (NFA) Status

A.2-033.1 Background,

The Firestone Test Facility was originally an approximately 1-acre area that consisted of three buildings, a test pond, and a suspected test range. Two of the buildings were used as a test chamber for tube-launched, optically-tracked, wire-guided missiles and Dragon missiles, while shaped charges were tested under water at the test pond. Due to the classified nature of the research that was conducted at the Firestone Test Facility, there is little available information regarding the activities that occurred or how the tests were conducted. The tests that were conducted were reportedly contained, which limited any release of Munitions and Explosives of Concern (MEC) (engineering-environmental Management, Inc. [e2M], 2007). A third, smaller building was located adjacent to the former test pond that was used for testing shaped charges. The building, which measured 10 feet high and 10 feet square, was constructed of reinforced concrete and fitted with steel plates and was surrounded by a barricade constructed of railroad ties. All three buildings have been removed, and the areas have been cleared of surface construction debris. Some buried construction debris is evident in the area around the former test pond due to mounded areas with rebar protruding through the ground surface.

A.2-033.2 Publications

The following publications relevant to the Firestone Test Facility MRS can be located on www.RVAAP.org or in established RVAAP information repositories:

- Final Site Inspection Report, Ravenna Army Ammunition Plant, Ohio. Environmental and Engineering Management, LLC (e2M). May 2008.
- Final Remedial Investigation Report for RVAAP-033-R-01 Firestone Test Facility MRS, Version 1.0. CB&I Federal Services, LLC, 26 August 2014.
- Final No Further Action Proposed Plan for RVAAP-033-R-01 Firestone Test Facility Munitions Response Site, Version 1.0. CB&I Federal Services, LLC, 06 May 2015.
- Final No Further Action Record of Decision for RVAAP-033-R-01 Firestone Test Facility Munitions Response Site. CB&I Federal Services, LLC, 14 August 2015.

A.2-033.3 Site Location and Description

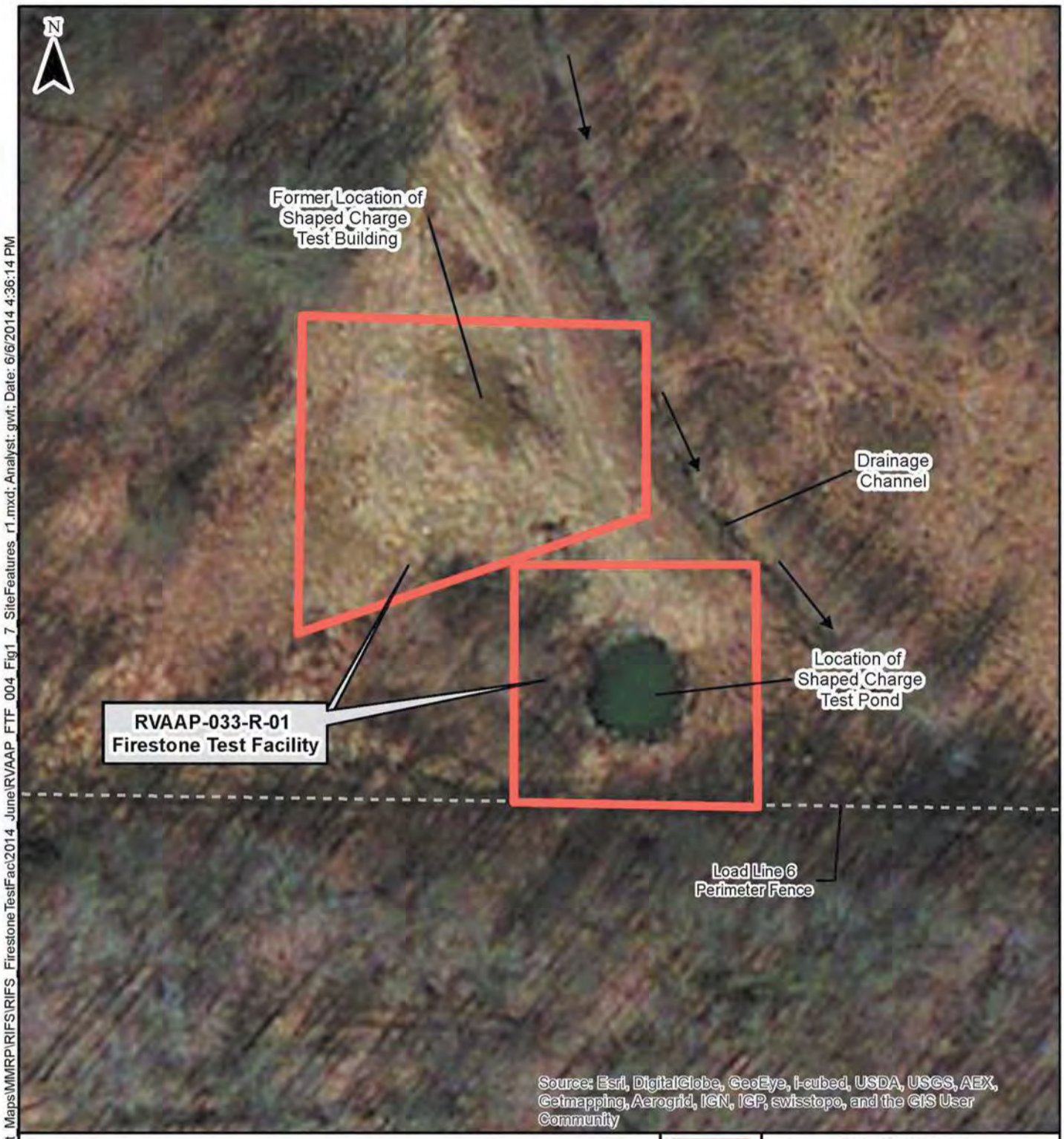
The Firestone Test facility MRS is located within Load Line #6 in the west-central portion of the facility. The MRS is currently 0.41 acres and is the location of the former building and area around the former test pond. The MRS is currently undeveloped, vacant land with no improvements. The topography at the Firestone Test Facility MRS is relatively flat to gently sloping towards the natural drainage channel to the east and adjacent to the MRS. The ground surface elevation at the MRS is approximately 1,115 feet above mean seal level (amsl). Natural drainage at the MRS is towards the drainage ditch that runs along the eastern boundary of the MRS or the former man-made test pond.

A.2-033.4 No Further Action Required

No Further Action (NFA) under CERCLA is necessary for the Firestone Test Facility MRS under the Military Munitions Response Program (MMRP). No evidence of MEC was found at the MRS during the Remedial Investigation (RI) field work that was conducted under the MMRP. The MRS was further evaluated for munitions constituents (MC) at locations specified in the Final Work Plan for Military Munitions Response Program Remedial Investigation Environmental Services (Work Plan; Shaw Environmental & Infrastructure, Inc. [Shaw], 2011), and no chemicals of concern (COCs) or chemicals of

potential ecological concern (COPECs) that presented potential risks to human or environmental receptors, respectively, were found.

No MEC were encountered at the Firestone Test Facility MRS, and there are no explosive hazards or sources for MC. The recommendation of NFA at the MRS under the MMRP is protective of human health and the environment and meets the statutory requirements for cleanup standards established in Section 121 of CERCLA (CB&I Federal Services, LLC., 2015).



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Appendix A.2-034-R-01: Sand Creek Dump Munitions Response Site (MRS) (RVAAP-034-R-01) – No Further Action (NFA) Status

A.2-034.1 Background

The Sand Creek Dump MRS is a former open dump area that operated from 1950 to 1960. The site overlaps with an Installation Restoration program (IRP) Area of Concern known as the Sand Creek Disposal Road Landfill (RVAAP-34). In general, it is assumed that the construction- and debris-type materials were delivered and dumped over an embankment located immediately adjacent to Sand Creek. The dump site extended along the embankment for approximately 1,200 feet and varied in width from 20 to 40 feet from the top of the bank to the bottom. The bank slopes from east to west towards Sand Creek at 40 to 60 degrees from horizontal (CB&I, 2015b).

Two demilitarized 75mm projectiles were found following the 2003 Removal Action (RA) at the collocated AOC and were considered munitions debris (MD). Evaluation of the Sand Creek Dump as an MRS was initiated under the Military Munitions Response Program (MMRP) following the MD findings during the RA. A 105mm projectile was observed in Sand Creek during the 2008 Site Investigation (SI) field work; however, it is not known from where the projectile originated. The projectile appeared to be empty, but it was not inspected to determine the explosive safety status as either "safe" or "hazardous." The projectile was not observed in the creek during the RI field work, and the disposition of this projectile is unknown. The 2015 Remedial Investigation (RI) field work confirmed the results of previous investigations at and outside the MRS where no munitions and explosives of concern (MEC) have ever been found; therefore, an explosive safety hazard is not present at the Sand Creek Dump MRS. Based on the results of MEC investigation, it was determined that no potential source of munitions constituents (MC) was present at the Sand Creek Dump MRS.

A.2-034.2 Publications

The following publications relevant to the Record of Decision (ROD) for the Sand Creek Dump MRS can be located on www.RVAAP.org or in established RVAAP information repositories:

- Final Site Inspection Report, Ravenna Army Ammunition Plant, Ohio. environmental-engineering management, Inc. (e2M). May 2008.
- Final Remedial Investigation Report for RVAAP-034-R-01 Sand Creek Dump MRS. CB&I Federal Services, LLC. 25 March 2015a.
- Final No Further Action Proposed Plan for RVAAP-034-R-01 Sand Creek Dump Munitions Response Site, Version 1.0. CB&I Federal Services, LLC. 28 May 2015b.
- Final No Further Action Record of Decision for RVAAP-034-R-01 Sand Creek Dump Munitions Response Site, Version 1.0. CB&I Federal Services, LLC. 29 September 2015.

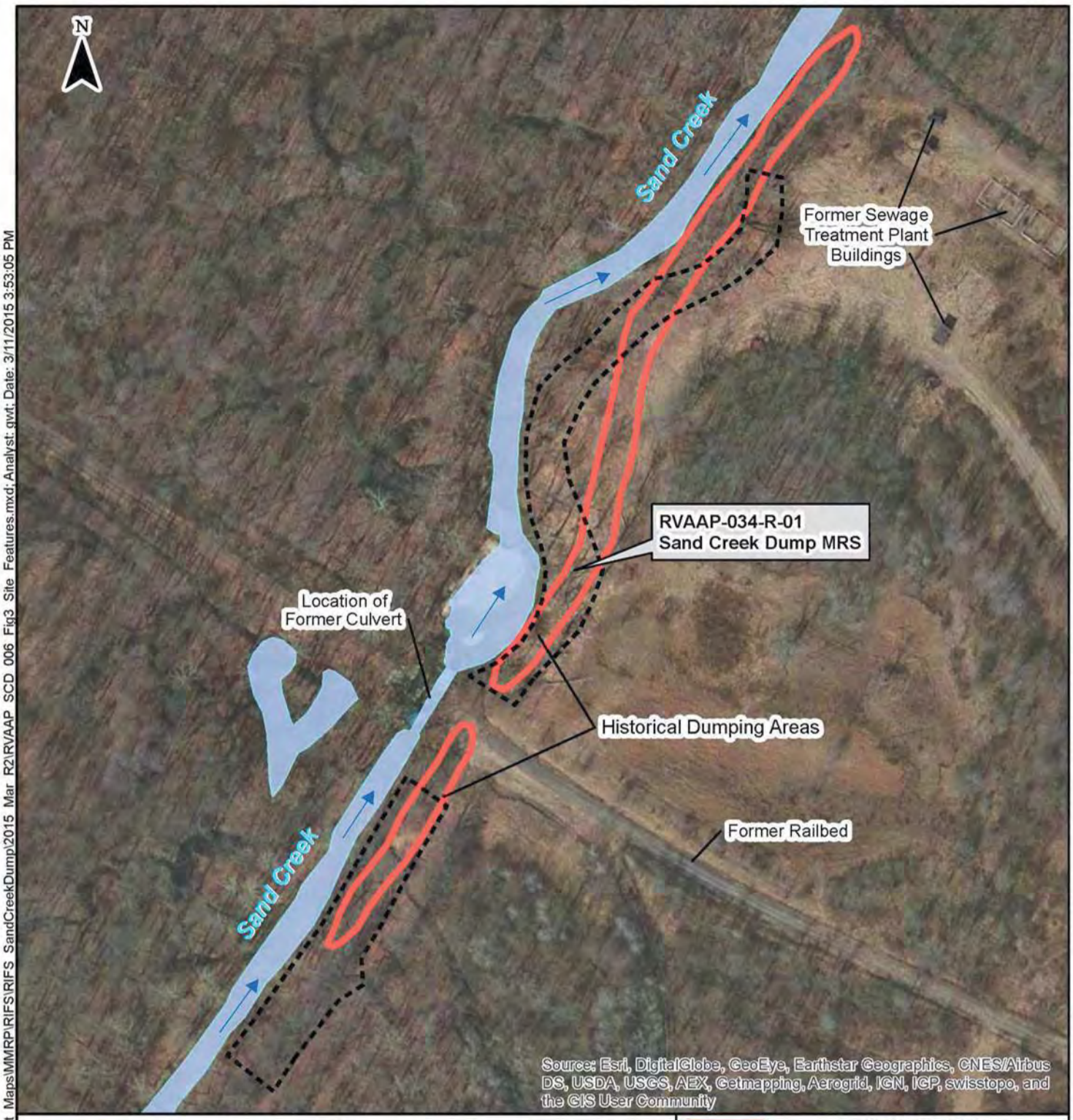
A.2-034.2 Site Location and Description

The Sand Creek Dump MRS is located in the eastern portion of the facility and encompasses 0.85 acres along the eastern bank of Sand Creek. The bank slopes from east to west towards Sand Creek 40 to 60 degrees from horizontal. Topographic relief between the top of embankment and the surface of Sand Creek varies across the MRS, but ranges from approximately 15 to 25 feet. The slope of the embankment is the area at the MRS where construction debris was historically dumped. A former railroad bed bisects the MRS and the top of the embankment at both the northern and southern portions of the MRS are relatively level with elevations ranging between approximately 965 to 970 feet above mean sea level (amsl). A narrow floodplain occupies the land between the bottom of the embankment and Sand Creek. The bottom of the embankment represents the lowest elevation at the MRS at approximately 950 amsl.

A.2-034.4 No Further Action Required

No Further Action (NFA) under CERCLA is necessary for the Sand Creek Dump MRS under the Military Munitions Response Program (MMRP). No evidence of munitions and explosives of concern (MEC) or a source of munitions constituents (MC) from MEC or munitions-related activities were found at the MRS during the Remedial Investigation (RI) field work that was conducted under the MMRP.

No MEC were encountered at the Sand Creek Dump MRS, and there are no explosive hazards or sources for MC. The recommendation of NFA at the MRS under the MMRP is protective of human health and the environment and meets the statutory requirements for cleanup standards established in Section 121 of CERCLA (CB&I Federal Services, 2015).



MRS Boundary
AOC Boundary
Stream
Direction of Flow

0 150 Feet

Projection : NAD_1983_UTM_Zone_17N

U.S. ARMY CORPS OF ENGINEERS

MILITARY MUNITIONS RESPONSE PROGRAM

SAND CREEK DUMP MRS
FORMER RVAAP/CAMP RAVENNA
PORTAGE AND TRUMBULL COUNTIES, OHIO

CB&I Federal Services LLC
150 Royall Street
Canton, MA 02021

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FIGURE 3 SITE FEATURES MAP

Appendix A.2-39: Load Line 5 (RVAAP-39) – No Further Action (NFA) Status for Soil, Sediment and Surface Water

A.2-39.1 Background

From 1941–1945, Load Line 5 operated at full capacity as a finished product assembly line to produce fuzes for artillery projectiles. With the exception of a mercury fulminate primer that was loaded and assembled at Load Line 5 and black powder used in fuzes, all primary explosive products were delivered to Load Line 5 as sealed, finished sub-assemblies (e.g., detonators from Load Line 9). Load Line 5 was deactivated at the end of World War II, and the process equipment was removed. Load Line 5 has not been used since 1945, and no historical information exists to indicate Load Line 5 was used for any other processes other than producing fuzes. No fuel storage tanks were present at the AOC during operations. Additionally, no fuel materials were used operationally at Load Line 5, and no burning was conducted.

A.2-39.2 Publications

The following publications relevant to the Record of Decision (ROD) for Load Line 6 can be located on www.RVAAP.org or in established RVAAP information repositories:

- Final Remedial Investigation Report for Soil, Sediment and Surface Water at RVAAP-39 Load Line 5. Leidos. 16 June 2016.
- Final Proposed Plan for Soil, Sediment, and Surface Water at RVAAP- 39 Load Line 5. Leidos. 6 December 2016.
- Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP- 39 Load Line 5. Leidos. 22 December 2017.

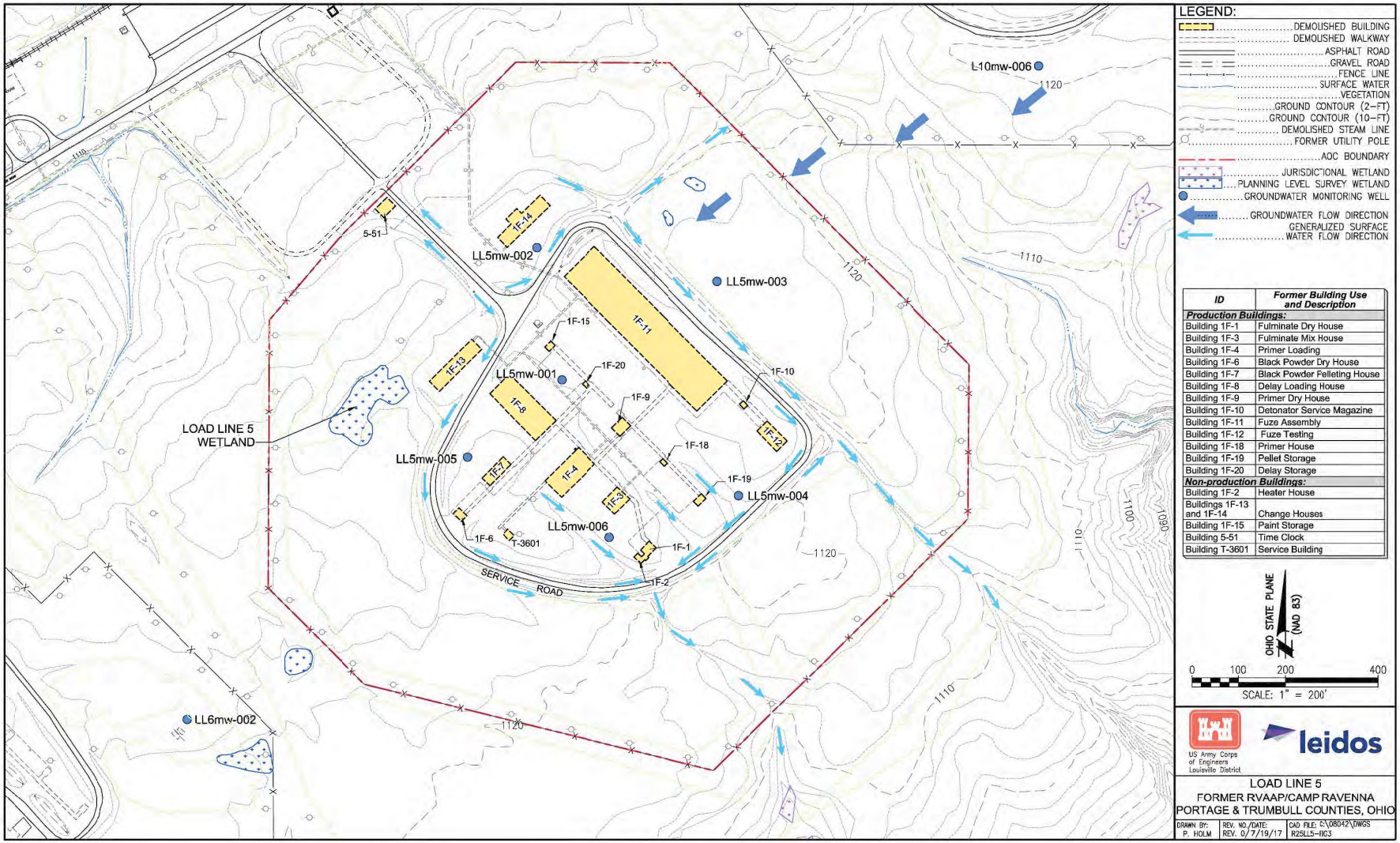
A.2-39.3 Site Location and Description

Load Line 5, formerly known as Fuze Line #1, is a 39-acre fenced Area of Concern (AOC) located south of Fuze and Booster Road in the south-central portion of the facility. All buildings, including slabs and foundations, were removed in 2006 and 2007. Remaining features at Load Line 5 include a one-lane asphalt perimeter road that enters the AOC from the northwest and surrounds the locations of the former production area (FPA) and access roads within the AOC. The FPA consists of 11.1 acres. The non-production area is 27.1 acres and includes the areas between the perimeter road and perimeter fence. The Load Line 5 perimeter fence is still in place, but it is not currently maintained. Small construction drainage ditches border the perimeter road.

A.2-39.4 No Further Action Required

NFA is necessary for soil, sediment, and surface water at Load Line 5 for Unrestricted (Residential) Land Use. Consequently, no further action is necessary for the future use of the site (Military Training). Groundwater at Load Line 5 will be addressed under future CERCLA decisions. Land use controls will not be implemented at Load Line 5, as no CERCLA-related COCs were identified in soil, sediment, or surface water for the Resident Receptor.

NFA for soil, sediment and surface water is protective of human health and the environment and meets the statutory requirements for cleanup standards established in Section 121 of CERCLA. Because the CERCLA-related contamination present in soil, sediment, and surface water at Load Line 5 does not pose a potential risk to human health or the environment, five-year reviews will not be required.



ID	Former Building Use and Description
Production Buildings:	
Building 1F-1	Fulminate Dry House
Building 1F-3	Fulminate Mix House
Building 1F-4	Primer Loading
Building 1F-6	Black Powder Dry House
Building 1F-7	Black Powder Felleting House
Building 1F-8	Delay Loading House
Building 1F-9	Primer Dry House
Building 1F-10	Detonator Service Magazine
Building 1F-11	Fuze Assembly
Building 1F-12	Fuze Testing
Building 1F-18	Primer House
Building 1F-19	Pellet Storage
Building 1F-20	Delay Storage
Non-production Buildings:	
Building 1F-2	Heater House
Buildings 1F-13 and 1F-14	Change Houses
Building 1F-15	Paint Storage
Building 5-51	Time Clock
Building T-3601	Service Building

Figure 3. Load Line 5 Site Features

Appendix A.2-40: Load Line 7 (RVAAP-40) – No Further Action (NFA) Status for Soil, Sediment and Surface Water

A.2-40.1 Background

From 1941–1945, Load Line 7 and Load Line 8 operated at full capacity to produce booster charges for artillery projectiles. In 1968, Load Line 7 was modified to produce M-406 High Explosive and M-407A1 practice 40mm projectiles. Load Line 7 was reactivated from 1969–1970. In 1970, Load Line 7 was again deactivated, and the process equipment was removed.

A.2-40.2 Publications

The following publications relevant to the Record of Decision (ROD) for Load Line 7 can be located on www.RVAAP.org or in established RVAAP information repositories:

- Final Remedial Investigation/Feasibility Study Report for Soil, Sediment and Surface Water at RVAAP-40 Load Line 7. Leidos. 27 July 2016.
- Revised Final Proposed Plan for Soil, Sediment, and Surface Water at RVAAP- 40 Load Line 7. Leidos. 16 March 2018.
- Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP- 40 Load Line 7. Leidos. 22 February 2019.

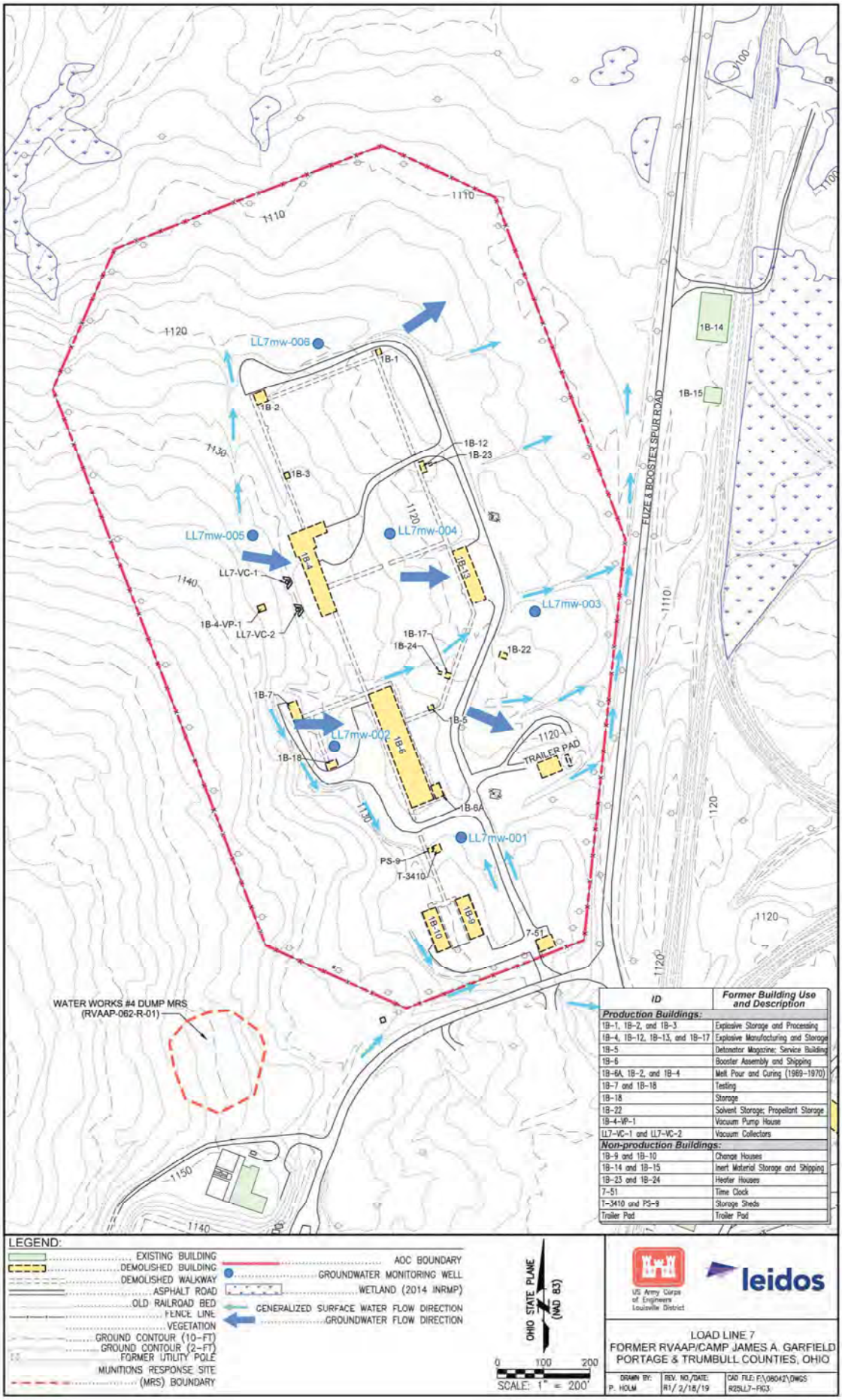
A.2-40.3 Site Location and Description

Load Line 7, formerly known as Booster Line #1, is a 37-acre fenced AOC located on the west side of Fuze and Booster Spur Road, south of Load Line 11, and northeast of Water Works #4 in the south-central portion of the facility. Remaining features at Load Line 7 include a one-lane asphalt road that enters the AOC from the south and runs along the east and north sides of the locations of the former production buildings. The buildings at Load Line 7 were demolished and removed in 2006. Three access roads lead from the road to the western production areas. The Load Line 7 perimeter fence is still in place, but it is not currently maintained. Small constructed drainage ditches border the access road. Load Line 7 is currently overgrown with grass, trees, and scrub vegetation.

A.2-40.4 No Further Action Required

No Further Action (NFA) is necessary for soil, sediment, and surface water at Load Line 7 for Unrestricted (Residential) Land Use. Consequently, no further action is necessary for the future use of the site (military training). Groundwater at Load Line 7 will be addressed under future CERCLA decisions. Land use controls will not be implemented at Load Line 7, as no CERCLA-related chemicals of concern were identified in soil, sediment, or surface water for the Resident Receptor.

NFA for soil, sediment and surface water is protective of human health and the environment and meets the statutory requirements for cleanup standards established in Section 121 of CERCLA. Because the CERCLA-related contamination present in soil, sediment, and surface water at Load Line 7 does not pose a potential risk to human health or the environment, five-year reviews will not be required. No other remedial action is necessary to ensure protection of human health and the environment for these media.



ID	Former Building Use and Description
Production Buildings:	
1B-1, 1B-2, and 1B-3	Explosive Storage and Processing
1B-4, 1B-12, 1B-13, and 1B-17	Explosive Manufacturing and Storage
1B-5	Detonator Magazine; Service Building
1B-6	Booster Assembly and Shipping
1B-6A, 1B-2, and 1B-4	Melt Pour and Curing (1969-1970)
1B-7 and 1B-18	Testing
1B-18	Storage
1B-22	Solvent Storage; Propellant Storage
1B-4-VP-1	Vacuum Pump House
LL7-VC-1 and LL7-VC-2	Vacuum Collectors
Non-production Buildings:	
1B-9 and 1B-10	Change Houses
1B-14 and 1B-15	Inert Material Storage and Shipping
1B-23 and 1B-24	Heater Houses
7-51	Time Clock
T-3410 and PS-9	Storage Sheds
Trailer Pad	Trailer Pad

Figure 3. Load Line 7 Site Features

Appendix A.2-41: Load Line 8 (RVAAP-41) – No Further Action (NFA) Status for Soil, Sediment and Surface Water

A.2-41.1 Background

From 1941–1945, Load Line 8 operated at full capacity as a finished product assembly line to produce booster charges for artillery projectiles, along with Load Line 7. Load Line 8 was deactivated at the end of World War II, and the process equipment removed. From 1969–1971 Load Line 8 was reactivated for melt-pour operations and assembly. No fuel storage tanks were present at Load Line 8 during operations, and no historical information exists to indicate Load Line 8 was used for any other processes. The buildings at Load Line 8, including building slabs and foundations and the series of wood frame walkways connecting these buildings, were demolished and removed in 2006.

A.2-41.2 Publications

The following publications relevant to the Record of Decision (ROD) for Load Line 8 can be located on www.RVAAP.org or in established RVAAP information repositories:

- Final Remedial Investigation Report for Soil, Sediment and Surface Water at RVAAP-41 Load Line 8. Leidos. 20 July 2016.
- Final Proposed Plan for Soil, Sediment, and Surface Water at RVAAP- 41 Load Line 8. Leidos. 17 March 2017.
- Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP- 41 Load Line 8. Leidos. 25 January 2018.

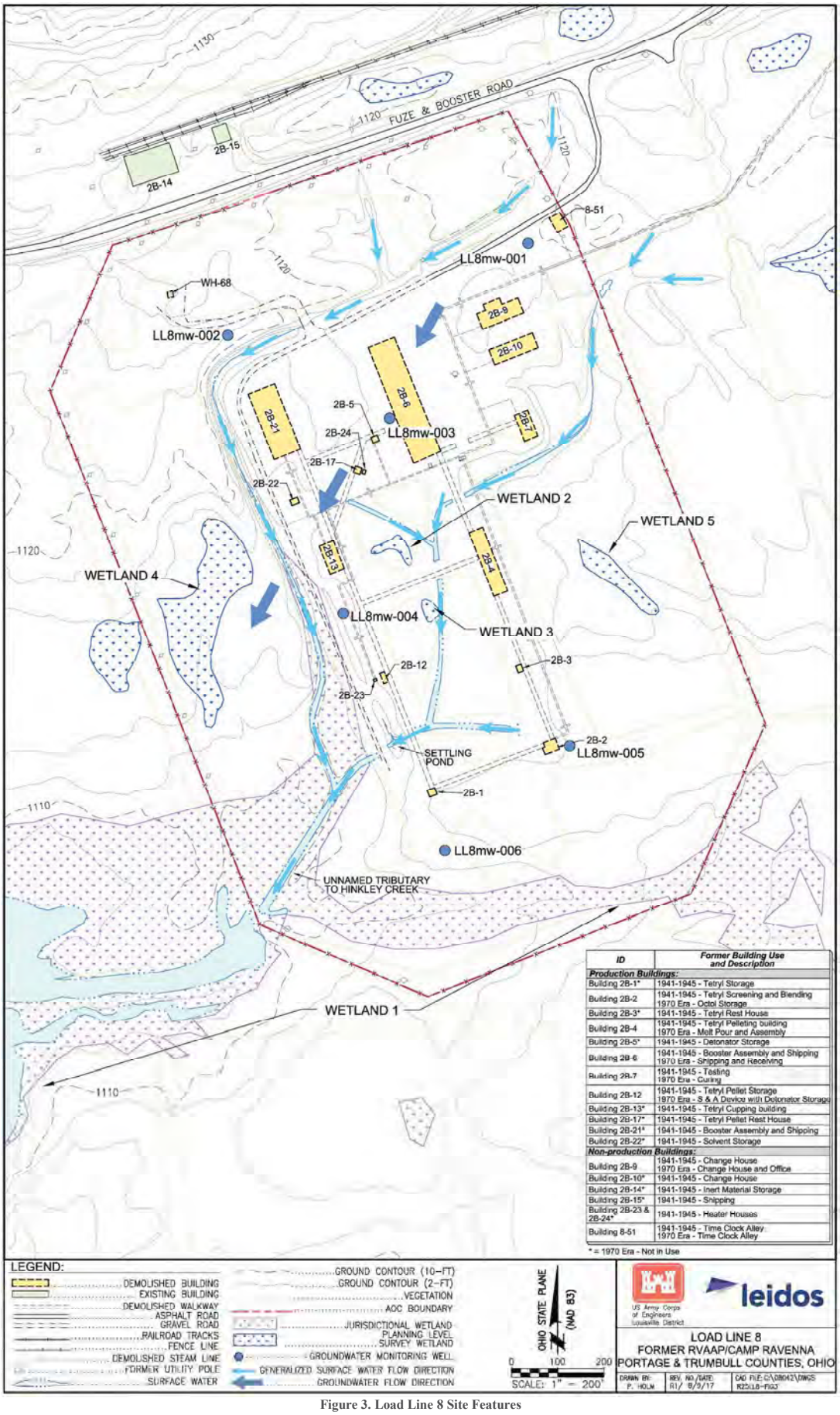
A.2-41.3 Site Location and Description

Load Line 8, formerly known as Booster Line #2, is an approximately 44-acre fenced Area of Concern (AOC) located on Fuze and Booster Road in the south-central portion of the facility, west of Load Line 6, and south of the 40mm Test Area. Remaining features at Load Line 8 include a one-lane asphalt perimeter road that enters the AOC from the northeast and surrounds the locations of the former production buildings along the northern and western sides. The Load Line 8 perimeter fence is still in place, but it is not currently maintained. Small construction drainage ditches are present along the access road and through the central portion of the AOC. Load Line 8 is currently overgrown with grass, trees, and scrub vegetation.

A.2-41.4 No Further Action Required

NFA is necessary for soil, sediment, and surface water at Load Line 8 for Unrestricted (Residential) Land Use. Consequently, no further action is necessary for the future use of the site (Military Training). Groundwater at Load Line 8 will be addressed under future CERCLA decisions. Land use controls will not be implemented at Load Line 8, as no CERCLA-related COCs were identified in soil, sediment, or surface water for the Resident Receptor.

NFA for soil, sediment and surface water is protective of human health and the environment and meets the statutory requirements for cleanup standards established in Section 121 of CERCLA. Because the CERCLA-related contamination present in soil, sediment, and surface water at Load Line 8 does not pose a potential risk to human health or the environment, five-year reviews will not be required.



ID	Former Building Use and Description
Production Buildings:	
Building 2B-1*	1941-1945 - Tetryl Storage
Building 2B-2	1941-1945 - Tetryl Screening and Blending 1970 Era - Octol Storage
Building 2B-3*	1941-1945 - Tetryl Rest House
Building 2B-4	1941-1945 - Tetryl Pelleting building 1970 Era - Melt Pour and Assembly
Building 2B-5*	1941-1945 - Detonator Storage
Building 2B-6	1941-1945 - Booster Assembly and Shipping 1970 Era - Shipping and Receiving
Building 2B-7	1941-1945 - Testing 1970 Era - Curing
Building 2B-12	1941-1945 - Tetryl Pellet Storage 1970 Era - S & A Device with Detonator Storage
Building 2B-13*	1941-1945 - Tetryl Cupping building
Building 2B-17*	1941-1945 - Tetryl Pellet Rest House
Building 2B-21*	1941-1945 - Booster Assembly and Shipping
Building 2B-22*	1941-1945 - Solvent Storage
Non-production Buildings:	
Building 2B-9	1941-1945 - Change House 1970 Era - Change House and Office
Building 2B-10*	1941-1945 - Change House
Building 2B-14*	1941-1945 - Inert Material Storage
Building 2B-15*	1941-1945 - Shipping
Building 2B-23 & 2B-24*	1941-1945 - Heater Houses
Building 8-51	1941-1945 - Time Clock Alley 1970 Era - Time Clock Alley

* = 1970 Era - Not in Use

Figure 3. Load Line 8 Site Features

Appendix A.2-43: Load Line 10 – (RVAAP-43) – No Further Action (NFA) Status for Soil, Sediment and Surface Water

A.2-43.1 Background

Load Line 10, formerly known as the Percussion Element Manufacturing Line, is a 36-acre, fenced AOC located south of Fuze and Booster Road, southwest of Load Line 9, and northeast of Load Line 5 in the south-central portion of CJAG. From 1941–1945, Load Line 10 produced percussion elements used during World War II. Percussion elements consist of primer cups and a percussion element charge (i.e., explosive) that ignites a less sensitive propellant. From 1951–1957, Load Line 10 produced percussion elements and primers. Percussion primers are devices that contain a percussion element and the less sensitive propellant. From 1969–1971, unknown quantities of primers were produced at Load Line 10. In 1971, Load Line 10 was deactivated permanently, and the production equipment was removed.

A.2-43.2 Publications

The following documents for the Load Line 10 AOC can be located on www.RVAAP.org or in established RVAAP information repositories:

- Resource Conservation and Recovery Act Facility Assessment, Preliminary Review/ Visual Site Inspection Ravenna Army Ammunition Plant Ravenna, Ohio. Jacobs Engineering Group, Inc. October 1989.
- Characterization of 14 AOCs at Ravenna Army Ammunition Plant. MKM Engineers, Inc. March 2007.
- Final Investigation of the Under Slab Surface Soils, Post Slab and Foundation Removal at RVAAP-39 Load Line 5, RVAAP-40 Load Line 7, RVAAP-41 Load Line 8, and RVAAP-43 Load Line 10, Version 1.0, Ravenna Army Ammunition Plant, Ravenna, Ohio. USACE. January 2009.
- Final Remedial Investigation Report for Soil, Sediment, Surface Water at RVAAP-43 Load Line 10, Former Ravenna Army Ammunition Plant Portage and Trumbull Counties, Ohio. USACE. June 2015.
- Final Proposed Plan for Soil, Sediment, and Surface Water at RVAAP-43 Load Line 10. Leidos. 18 August 2016.
- Final Record of Decision for Soil, Sediment, and Surface Water for Soil, Sediment, and Surface Water at RVAAP-43 Load Line 10. Leidos. 10 March 2017.

A.2-43.3 Site Location and Description

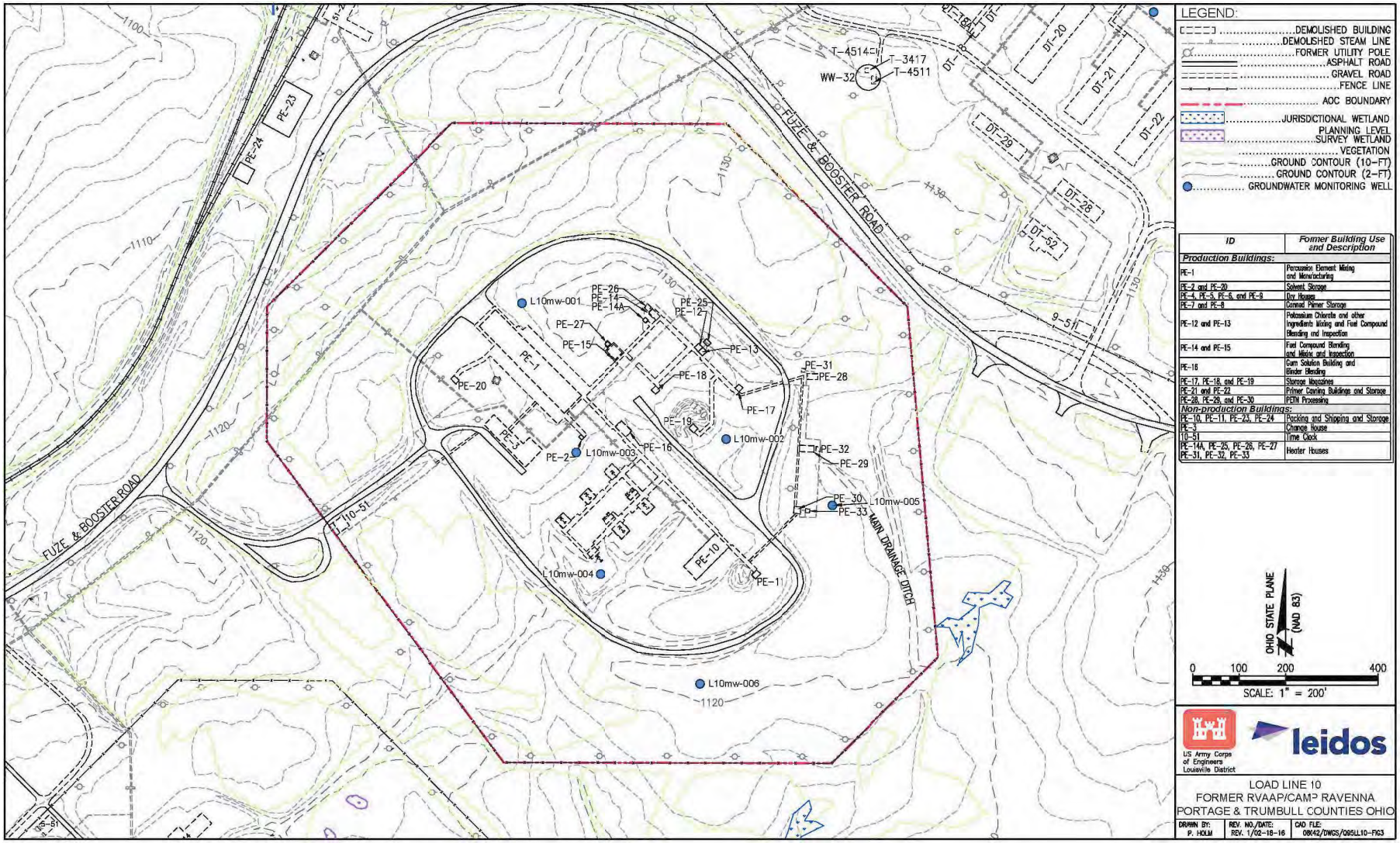
All Load Line 10 buildings, including slabs and foundations, were removed in 2007. Remaining features at Load Line 10 include a one-lane asphalt perimeter road that enters the AOC from the west and encircles the former production area (FPA) and access roads within the AOC. The FPA consists of approximately 12 acres, is located within the asphalt perimeter road in the central portion of the AOC and was historically used to manufacture percussion elements and primers and contained the former production and storage buildings and multiple access roads. The Load Line 10 perimeter fence is still in place, although it is not currently maintained. Small construction drainage ditches border the access road and are also located within the FPA.

Ground elevations across Load Line 10 range from approximately 1,114 to 1,133 ft above mean sea level. The central portion of Load Line 10 is a topographic high (or divide) with gentle slopes to the northwest and southeast outside of the FPA (Figure 3).

No permanent surface water features are present at the AOC. Surface water intermittently occurs as overland storm water runoff associated with heavy rainfall events and generally drains into small ditches bordering roads and within the FPA. Surface water drainage from the southern two-thirds of Load Line 10 exits to the south through a drainage channel that flows south-southeast. The channel drains to an unnamed stream, which enters the west branch of the Mahoning River. In the northern portion of Load Line 10, several small drainage ditches direct surface runoff to the northwest, ultimately into larger drainage ditches that border Fuze and Booster Road.

A.2-43.4 No Further Action Required

No Further Action (NFA) under CERCLA is necessary for soil, sediment, and surface water at Load Line 10 for Unrestricted (Residential) Land Use. Consequently, no further action is necessary for the future use of this site (Military training). Groundwater at Load Line 10 will be addressed under future CERCLA decisions. Land use controls will not be implemented as part of this decision, as no CERCLA-related chemicals of concern (COCs) were identified in soil, sediment and surface water for the Resident Receptor.



Load Line 10 Site Features

Appendix A.2-44: Load Line 11 (RVAAP-44) – No Further Action (NFA) Status for Soil, Sediment and Surface Water

A.2-44.1 Background

From 1941–1945, Load Line 11 operated at full capacity to produce artillery primers. From 1951–1957, Load Line 11 was reactivated to produce primers. From 1969– 1971, it was reactivated to produce MR ZA4 fuzes. Load Line 11 was deactivated, and all process equipment was removed in 1971. The buildings at Load Line 11, including building slabs and foundations, footers, and basements and the series of wood frame walkways connecting these buildings, were demolished and removed in 2001 and 2004–2005.

A.2-44.2 Publications

The following publications relevant to the Record of Decision (ROD) for Load Line 11 can be located on www.RVAAP.org or in established RVAAP information repositories:

- Final Report for the Remedial Investigation at Load Line 11 (AOC 44). MKM Engineers, Inc. September 2005.
- Final Phase II Remedial Investigation Report for Soil, Sediment and Surface Water at RVAAP-44 Load Line 11. Leidos. 12 August 2016.
- Final Proposed Plan for Soil, Sediment, and Surface Water at RVAAP- 44 Load Line 11. Leidos. 17 March 2017.
- Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP- 44 Load Line 11. Leidos. 15 February 2018.

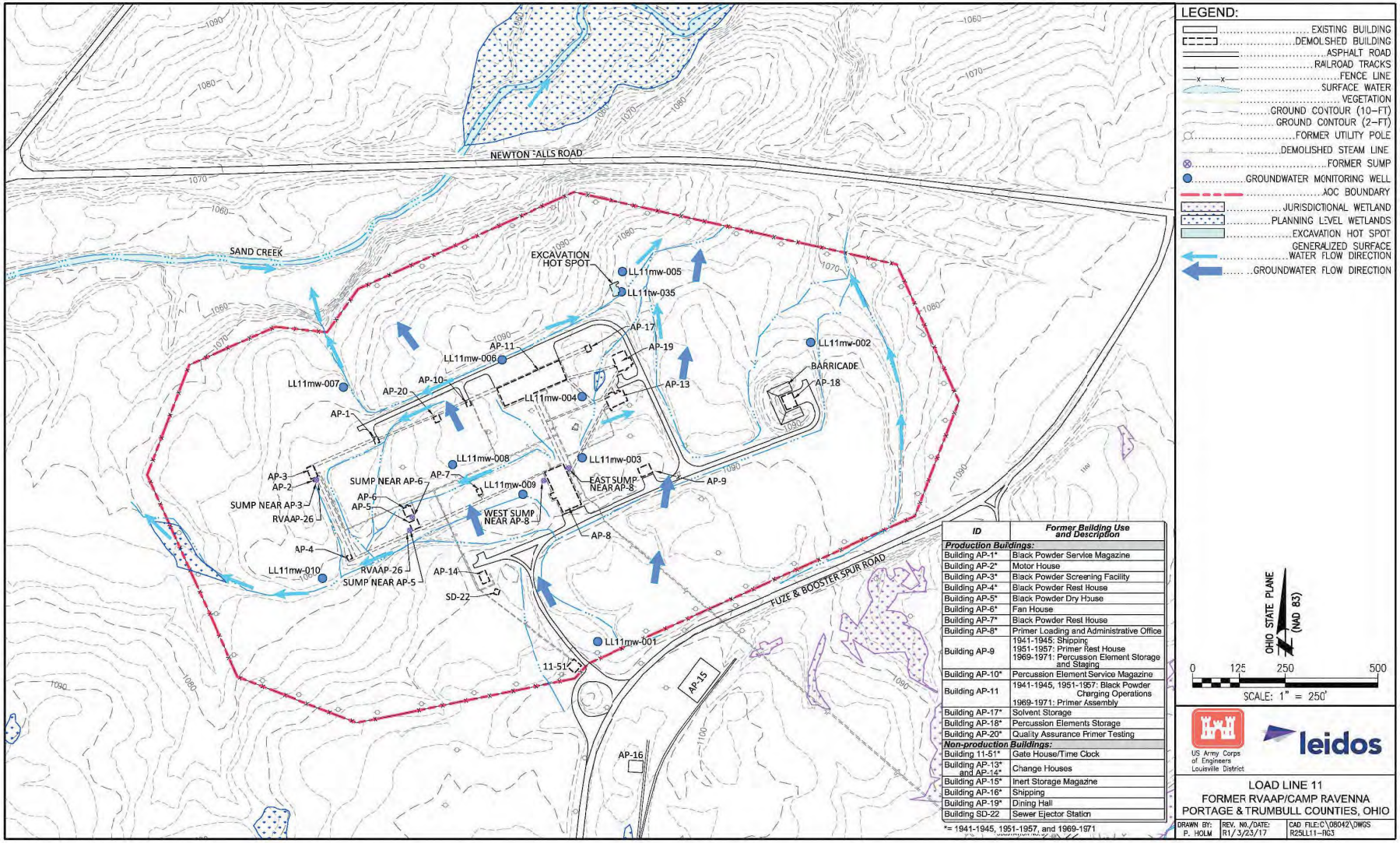
A.2-44.3 Site Location and Description

Load Line 11, formerly known as Booster Line #1, is an approximately 48-acre fenced Area of Concern (AOC) located immediately north and west of Fuze and Booster Spur Road and south of Newton Falls Road, in the south-central portion of the facility. Remaining features at Load Line 11 include a one-lane asphalt perimeter road that enters the AOC from the south and encircles 75% of the former production area and an asphalt parking area located near former Building AP-11. The Load Line 11 perimeter fence is still in place, but it is not currently maintained. Small construction drainage ditches border the access road. Load Line 11 is currently overgrown with grass, trees, and scrub vegetation with some forest along the western, northern, and eastern boundaries of the AOC.

A.2-44.4 No Further Action Required

No Further Action (NFA) is necessary for soil, sediment, and surface water at Load Line 11 for Unrestricted (Residential) Land Use. Consequently, no further action is necessary for the future use of the site (Military Training). Groundwater at Load Line 11 will be addressed under future CERCLA decisions. Land use controls will not be implemented at Load Line 11, as no CERCLA-related COCs were identified in soil, sediment, or surface water for the Resident Receptor.

NFA for soil, sediment and surface water is protective of human health and the environment and meets the statutory requirements for cleanup standards established in Section 121 of CERCLA. Because the CERCLA-related contamination present in soil, sediment, and surface water at Load Line 11 does not pose a potential risk to human health or the environment, five-year reviews will not be required.



ID	Former Building Use and Description
Production Buildings:	
Building AP-1*	Black Powder Service Magazine
Building AP-2*	Motor House
Building AP-3*	Black Powder Screening Facility
Building AP-4*	Black Powder Rest House
Building AP-5*	Black Powder Dry House
Building AP-6*	Fan House
Building AP-7*	Black Powder Rest House
Building AP-8*	Primer Loading and Administrative Office
Building AP-9	1941-1945: Shipping 1951-1957: Primer Rest House 1969-1971: Percussion Element Storage and Staging
Building AP-10*	Percussion Element Service Magazine
Building AP-11	1941-1945, 1951-1957: Black Powder Charging Operations 1969-1971: Primer Assembly
Building AP-17*	Solvent Storage
Building AP-18*	Percussion Elements Storage
Building AP-20*	Quality Assurance Primer Testing
Non-production Buildings:	
Building 11-51*	Gate House/Time Clock
Building AP-13* and AP-14*	Change Houses
Building AP-15*	Inert Storage Magazine
Building AP-16*	Shipping
Building AP-19*	Dining Hall
Building SD-22	Sewer Ejector Station

*= 1941-1945, 1951-1957, and 1969-1971

Figure 3. Load Line 11 Site Features

Appendix A.2-46: Buildings F-15 and F-16 – (RVAAP-46) – No Further Action (NFA) Status for Soil, Sediment and Surface Water

A.2-46.1 Background

Buildings F-15 and F-16 were used for surveillance testing on explosives and propellants and testing disassembly processes during World War II, the Korean War, and the Vietnam War (between 1941 and 1974). The number of tests conducted on miscellaneous explosives and propellants, the quantities of material tested, and the exact dates of testing are unknown.

Historical facilities at the AOC included five process and support buildings. All buildings and structures at the AOC have been demolished, except for one former coal-powered boiler house (Building U-17). Building F-15 was demolished in 2005. The floor slabs and foundations associated with Buildings F-15 and F-16 were removed and disposed of in 2009. The exact date of the demolition of Building F-16 is unknown. Potential contaminants at Buildings F-15 and F-16 included explosives and inorganic chemicals (e.g., metals). Other potential contaminants included PAHs and PCBs from previous site use at Buildings U-17 and U-18 (former coal-powered boiler houses).

Two former coal piles were located south of Buildings F-15 and F-16. These are addressed as a separate AOC (designated as CC-RVAAP-73). The historical records review produced documentation of a 1,100-gal aboveground storage tank (AST) near Building U-17 that contained #2 fuel oil (heating oil) and was surrounded by a 2-ft berm. The AST was managed under the Spill Prevention Control & Counter Measures Plan for the Ravenna Army Ammunition Plant (RAI 1992). It is estimated that the AST was removed between 1994 and 1996.

A.2-46.2 Publications

The following documents for the RVAAP-46 AOC can be located on www.RVAAP.org or in established RVAAP information repositories:

- Final Characterization of 14 Areas of Concern at Ravenna Army Ammunition Plant. MKM Engineers. March 2007.
- Final Sampling and Analysis of Soils Below Floor Slabs at RVAAP-08 Load Line 1 and Other Building Locations. URS. 17 September 2010.
- Final Remedial Investigation Report for Soil, Sediment, and Surface Water at RVAAP-46 Buildings F-15 and F-16. Leidos. 5 April 2018.
- Final Proposed Plan for Soil, Sediment, and Surface Water at RVAAP-46 Buildings F-15 and F-16. Leidos. 1 April 2019.
- Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP-46 Buildings F-15 and F-16. Leidos. 12 February 2020.

A.2-46.3 Site Location and Description

The AOC, which is the combined operational areas for both Buildings F-15 and F-16, is approximately 12.3 acres (6.6 and 5.7 acres, respectively) located west of Block D and east of Slagle Road in the west-central portion of CJAG.

The AOC is relatively flat with drainage ditches beside access roads and at the western boundary of the AOC along Slagle Road. The Building F-15 area is currently a gravel- and grass-covered clearing with dense vegetation growing on the edges of the site (ARNG 2016). Gravel-lined roads lead to the site from Slagle Road. The Building F-16 area is densely vegetated with trees and grass, with a gravel- and grass-

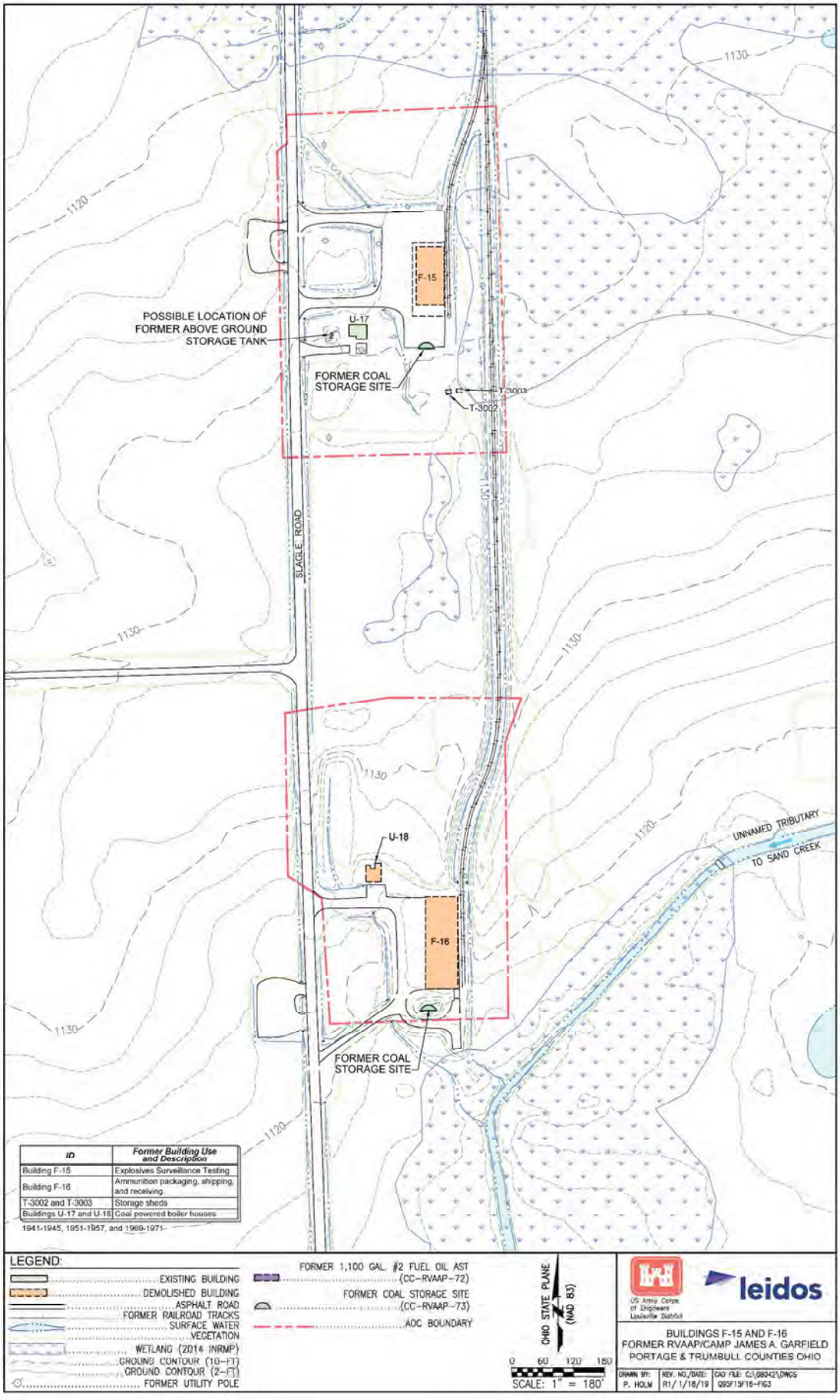
covered clearing located in the southeastern portion of the site. A railroad track bed oriented in a north-south direction is located in the eastern portion of the AOC. This track bed only contains ballasts, as the tracks have been removed. No fences exist around the perimeter boundary of the AOC operational areas.

Surface water follows topographic relief and drains into ditches that exit the AOC. Surface runoff from the Building F-15 operational area flows overland to the northwest to a tributary to Eagle Creek. Surface runoff from the Building F-16 operational area flows overland to the southeast to a tributary to Sand Creek.

A.2-46.4 No Further Action Required

No Further Action (NFA) under CERCLA is necessary for soil, sediment, and surface water at the Building F-15 and F-16 AOC for Unrestricted (Residential) Land Use. Consequently, no further action is necessary for the future use of this site (Military Training). Groundwater at the Building F-15 and F-16 AOC will be addressed under future CERCLA decisions. Land use controls will not be implemented as part of this decision, as the human health risk assessment (HHRA) did not identify any chemicals of concern (COCs) that pose unacceptable risk to the Resident Receptor (Adult and Child) and the ecological risk assessment (ERA) recommended no further action.

The recommendation NFA for soil, sediment and surface water is protective of human health and the environment and meets the statutory requirements for cleanup standards established in Section 121 of CERCLA. Because the HHRA did not identify any COCs that pose unacceptable risk to the Resident Receptor (Adult and Child) and the ERA recommended no further action, five-year reviews will not be required.



Buildings F-15 and F-16 Site Features

Appendix A.2-48: Anchor Test Area – (RVAAP-48) – No Further Action (NFA) STATUS for Soil, Sediment, and Surface Water

A.2-48.1 Background

Although operational information is relatively limited about this former research and development area used by the Firestone Tire and Rubber Company Defense Research Division, it is believed that Anchor Test Area was used for testing explosives-driven soil anchoring devices. These devices typically consisted of metal rods driven into the ground and attached via a cable to stabilize structures or anchor them to the ground. The dates this Area of Concern (AOC) was used are unknown; however, a 1961 drawing shows the final design for the AOC; therefore, it is likely it was not active until after the early 1960s. Aerial photographs from 1966 confirm the construction of AOC features, but it is unknown whether Anchor Test Area was active at the time of the photographs.

A.2-48.2 Publications

The following publications can be located on <www.RVAAP.org> or in established Ravenna Army Ammunition Plant (RVAAP) information repositories:

- Hazardous and Medical Waste Study No. 37-EF-5360-99 Relative Risk Site Evaluation for Newly Added Sites, October 1998.
- Final Sampling and Analysis Plan Addendum for the Characterization of 14 RVAAP AOCs, October 2004.
- Final Characterization of 14 AOCs at Ravenna Army Ammunition Plant, March 2007.
- Final Quality Assurance Surveillance Plan for the 2008 Performance-Based Acquisition of Environmental Investigation and Remediation at Ravenna Army Ammunition Plant, September 2008.
- Final Project Management Plan for the 2008 Performance-Based Acquisition of Environmental Investigation and Remediation, December 2008.
- Final Work Plan Performance-Based Acquisition for Environmental Investigation and Remediation MEC Avoidance/Removal Services, September 2009.
- Final PBA 2008 Supplemental Investigation Sampling and Analysis Plan Addendum No. 1 at Ravenna Army Ammunition Plant, December 2009.
- Final Remedial Investigation/Feasibility Study Report for Soil, Sediment, and Surface Water at the RVAAP-48 Anchor Test Area, Ravenna Army Ammunition Plant, Ravenna, Ohio, January 2012.
- Final Proposed Plan for Soil, Sediment, and Surface Water at RVAAP-48 Anchor Test Area, May 2013.
- Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP-48 Anchor Test Area, March 2014.
- Final Remedial Design for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200 and RVAAP-48 Anchor Test Area, August 2014.

- Final Remedial Action Report for Soil, Sediment, and Surface Water at RVAAP-48 Anchor Test Area, April 2015.

A.2-48.3 Site Location and Description

Anchor Test Area is approximately 0.5 acres and is located approximately 50-75 ft west of Wilcox-Wayland Road and 2,500 ft south of Newton Falls Road (Figures 2-2 and 2-3). The distinct surface features of the AOC are the former earthen blast wall (dirt mounds) and a nearby 12 by 36 ft sandpit. The anchor tests were likely performed within the sandpit. The adjacent dirt mounds functioned as blast walls. One mound is approximately 8-10 ft high while the others are only 1-2 ft high. The dirt mounds are still observable, although the mounds are overgrown with vegetation and small trees. The sandpit is no longer visually distinct due to vegetative growth. Metal debris is visible in the area, and a section of concrete culvert can be seen in one of the dirt mounds.

The immediate vicinity is heavily forested with the exception of the large wetland approximately 500 ft to the south. No perennial surface water or drainage conveyance features are present at the AOC. Sediment and surface water are not considered media of concern at Anchor Test Area. Surface water occurs only intermittently as overland storm water runoff associated with heavy rainfall events and generally flows towards the wetland located 500 ft to the south. The wetland is drained to the south by an unnamed stream which enters the west branch of the Mahoning River.

Anchor Test Area is located on the southern edge of a small topographic high isolated from other former operational areas at an elevation of approximately 1004 ft above mean sea level (amsl). From this topographic high, the elevation gently slopes downward towards the south and west to approximately 998 ft amsl.

A.2-48.4 Land Use and Activities

The AOC will be used for Military Training. The selected and implemented remedy for soil allows for Unrestricted (Residential) Land Use, which also allows for Military Training Land Use.

A.2-48.5 Remedy Objectives

The *Record of Decision for Soil, Sediment, and Surface Water at RVAAP-48 Anchor Test Area* (USACE 2014) documented that sediment and surface water are not present at the AOC. Arsenic in soil was identified as a chemical of concern (COC) requiring remediation to attain Unrestricted (Residential) Land Use. Remedial activities were conducted in November 2014 and were summarized in the *Remedial Action Report for Soil, Sediment, and Surface Water at RVAAP-48 Anchor Test Area* (USACE 2015). A total of 45 tons of contaminated soil was excavated from within the AOC and transported and disposed at a local landfill. Confirmation sampling results and concurrence from the Ohio Environmental Protection Agency (Ohio EPA) concluded that the AOC met the criteria for Unrestricted (Residential) Land Use after implementing the remedial action.

A.2-48.6 Land Use Controls

Land use controls (LUCs) are not required for soil, sediment, or surface water. The remedial action achieved the remedial action objective (RAO) for arsenic in soil to attain Unrestricted (Residential) Land Use. Sediment and surface water are not present at Anchor Test Area. Other media (i.e., groundwater) will be addressed as part of future actions.

A.2-48.7 Monitoring and Reporting

Five-year reviews are not required for soil, sediment, and surface water at Anchor Test Area, which is compliant with Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121(c).

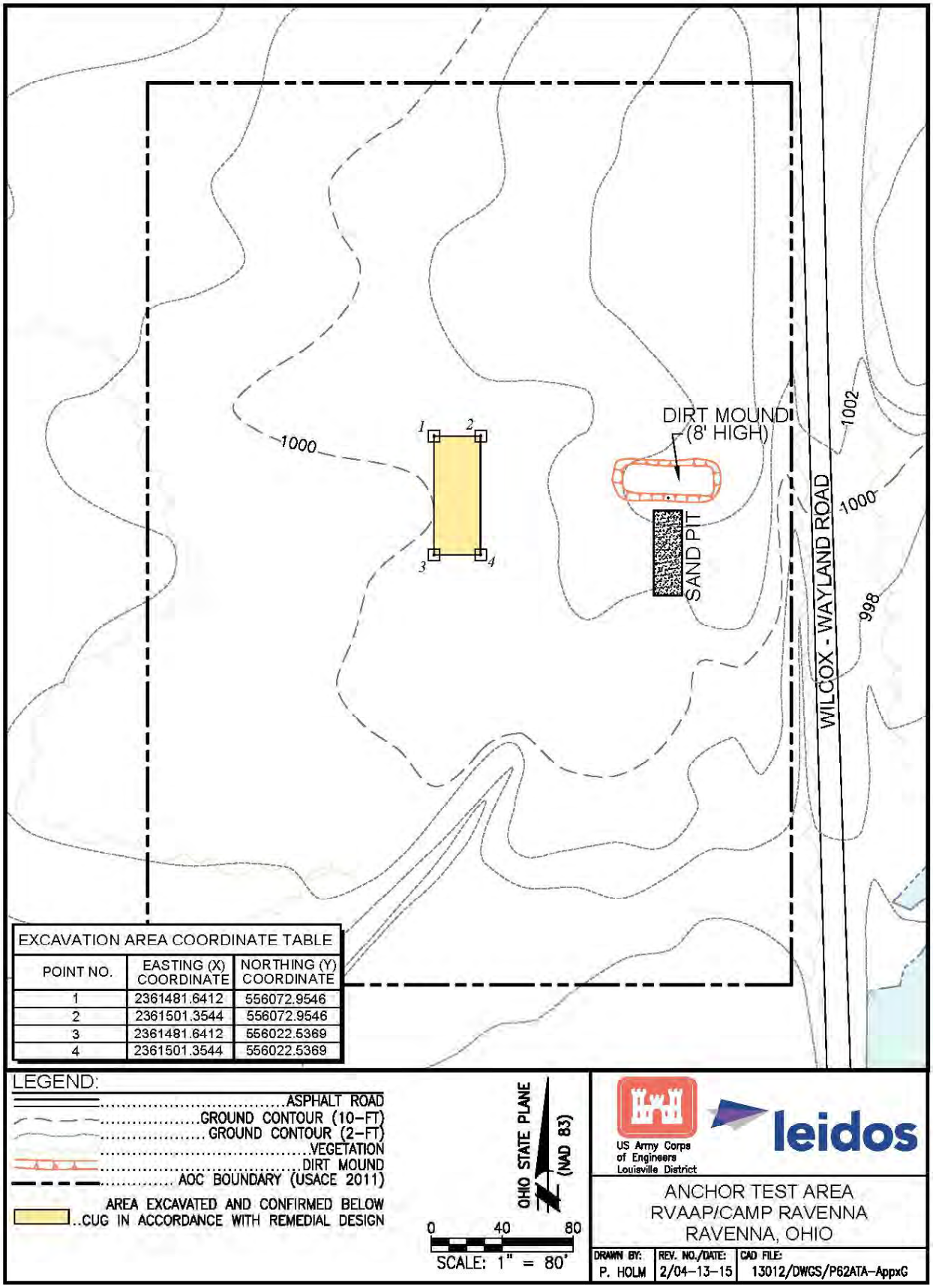


Figure A.48-1. Features of Anchor Test Area

Appendix A.2-49: Central Burn Pits (RVAAP-49) – No Further Action (NFA) Status for Soil and Dry Sediment

A.2-49.1 Background

The Central Burn Pits (CBP), designated as AOC RVAAP-49, was originally used as a lumber and building materials storage area. CBP was later used for open burning of non-explosive wastes, electrical components, wooden boxes and other combustible scrap. Operation of the burn pits is believed to have started shortly after RVAAP began operations and continued until the mid1970s, although actual dates are unknown. In addition, disposal of non-hazardous waste material (e.g., concrete, metal, excess fill dirt and gravel) occurred at CBP; these materials were placed in various piles and elongated berms throughout the AOC.

A.2-49.2 Publications

The following publications relevant to the Record of Decision (ROD) for the CBP can be located on www.RVAAP.org or in established RVAAP information repositories:

- Final Remedial Investigation Report for RVAAP-49 Central Burn Pits at Ravenna Army Ammunition Plant. MKM Engineers, Inc./SAIC. 20 September 2005.
- Final Engineering Evaluation/Cost Analysis for RVAAP-49 Central Burn Pits at Ravenna Army Ammunition Plant. SAIC. 24 January 2007.
- Final Action Memorandum for RVAAP-49 Central Burn Pits at Ravenna Army Ammunition Plant. SAIC. 20 June 2007.
- Final Remedial Investigation Report Addendum No. 1 for the RVAAP- 49 Central Burn Pits at Ravenna Army Ammunition Plant. SAIC. 27 June 2008b.
- Final Proposed Plan for Soil and Dry Sediment at the RVAAP- 49 Central Burn Pits at Ravenna Army Ammunition Plant. SAIC. 24 October 2008.
- Final Removal Action Report for the RVAAP- 49 Central Burn Pits at Ravenna Army Ammunition Plant. SAIC. 05 December 2008.
- Final Record of Decision for Soil and Dry Sediment at RVAAP- 49 Central Burn Pits at Ravenna Army Ammunition Plant. SAIC. 21 April 2009.

A.2-49.3 Site Location and Description

The CBP is in the east-central area at the intersection of Paris-Windham Road and Lumber Yard Road and is approximately 20 acres in size. The Area of Concern (AOC) is bordered by former railroad tracks to the north (Track 39) and south (Track 33), and Sand Creek to the west-northwest. The topography across the majority of CBP is relatively flat due to historical grading and fill activities. Undisturbed topography is characterized by gently undulating contours.

A.2-49.4 No Further Action required

No Further Action (NFA) under CERCLA is necessary for soil and dry sediment at CBP. Groundwater and surface water at CBP will be addressed under future CERCLA decisions. Land use controls will not be implemented as part of this decision. No chemicals of concern (COCs) were above cleanup goals [as established in the Remedial Investigation Report Addendum No. 1 for RVAAP-49 Central Burn Pits (SAIC, 2008b)] in soil and dry sediment for the most likely foreseeable future land use (National Guard Trainee) and the residential land use (Resident Subsistence Farmer).

NFA for soil and dry sediment is protective of human health and the environment and meets the statutory requirements for cleanup standards established in Section 121 of CERCLA. Because no contaminants of concern in soil and dry sediment at CBP exceeded cleanup goals for the most likely foreseeable future

land use and the residential land use, and exposure does not pose a potential risk to human health or the environment, five-year reviews will not be required for soil and dry sediment (SAIC, 2009).

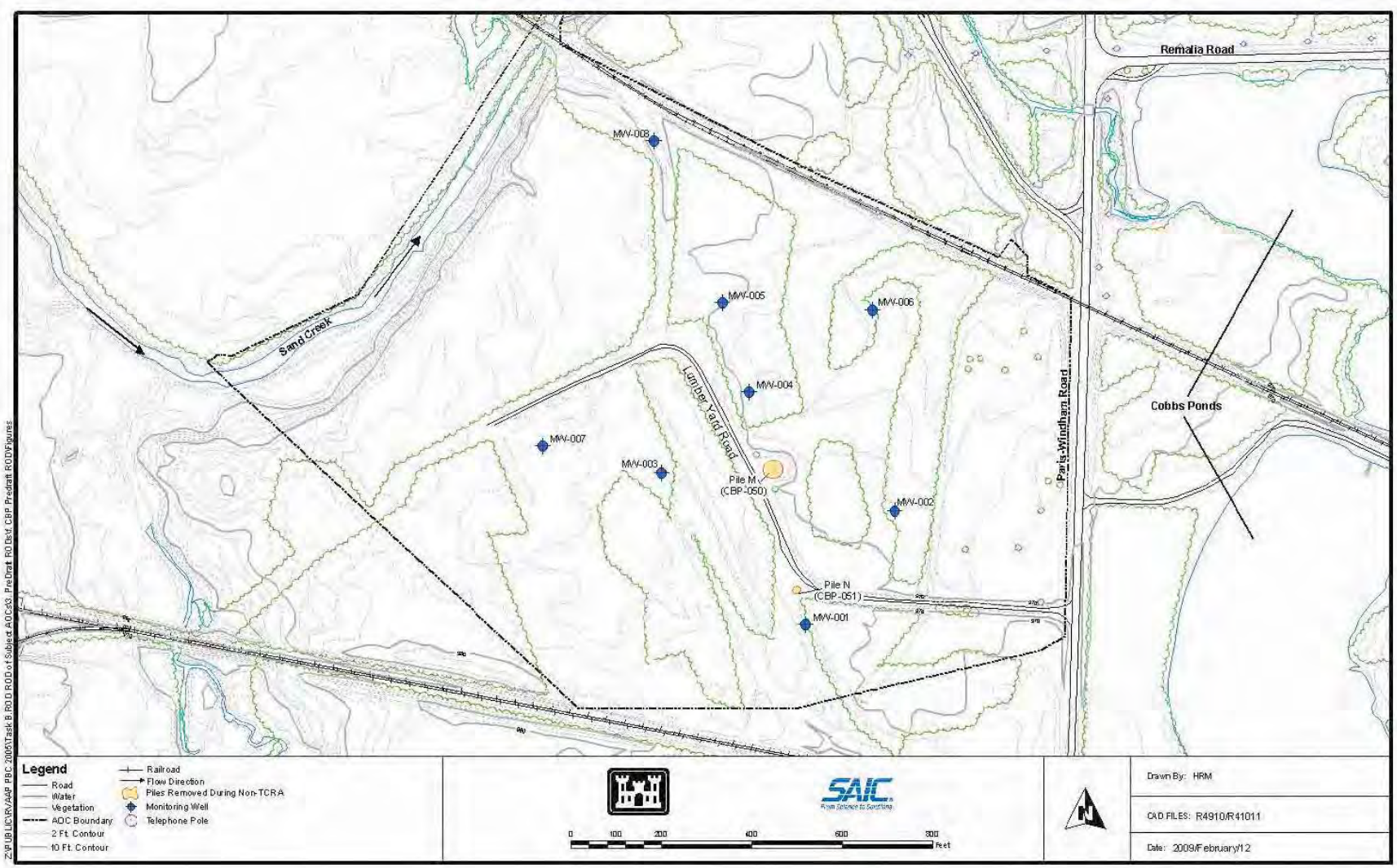


Figure 3. Central Burn Pits Area of Concern Map

Appendix A.2-050-R-01: Atlas Scrap Yard Munitions Response Site (MRS) – (RVAAP-050-R-01) – No Further Action (NFA) Status.

A.2-050.1 Background

The Atlas Scrap Yard MRS was originally used as a camp to house workers during the construction of the installation starting in 1940. After World War II the buildings associated with the camp were demolished. After 1969, the MRS was used as a storage area and scrap yard for nonexplosive scrap material.

A.2-050.2 Publications

The following publications can be located on www.RVAAP.org or in established RVAAP information repositories:

- Final Military Munitions Response Program Historical Records Review, Ravenna Army Ammunition Plant, Ohio. e2M. January 2007.
- Final Site Inspection Report, Ravenna Army Ammunition Plant, Ohio, Military Munitions Response Sites. e2M. May 2008.
- Final Remedial Investigation Report for RVAAP-050-R-01 Atlas Scrap Yard Munitions Response Site, Version 2.0. CB&I Federal Services, LLC. 25 August 2014.
- Final No Further Action Proposed Plan for RVAAP-050-R-01 Atlas Scrap Yard Munitions Response Site. HydroGeoLogic, Inc. 03August 2017.
- Final No Further Action Record of Decision for RVAAP-050-R-01 Atlas Scrap Yard Munitions Response Site. HydroGeoLogic, Inc. 05 September 2018.

A.2-050.3 Site location and Description

The MRS comprises 66.04 acres and is located in the south-central portion of the former RVAAP as shown on Figure 2. The topography at the Atlas Scrap Yard MRS ranges from flat to gently rolling hills. Natural drainage is toward the wetland area at the northeast portion of the MRS.

A.2-050.4 No Further Action Required

There was no evidence of Department of Defense (DoD) military munitions or MD encountered at the MRS during the 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 Atlas Scrap Yard MRS under the MMRP pursuant to CERCLA requirements.

The results of the RI fieldwork for the Atlas Scrap Yard MRS support the determination that there is no risk associated with exposure to DoD military munitions, or MC-related contamination at the MRS. The Army has determined that NFA is acceptable for the Atlas Scrap Yard MRS 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.

Figure 3
Atlas Scrap Yard MRS Boundary
Camp Ravenna/Former RVAAP
Portage and Trumbull Counties, Ohio

Legend

- Former Debris Area
- IRP Area of Concern Boundary
- MRS Boundary
- Installation Boundary

Notes:
IRP=Installation Restoration Program
MRS=munitions response site
RVAAP=Ravenna Army Ammuntion Plant

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Source: HGL,CB&I, USACE, e²M, ArcGIS Online Imagery

Appendix A.2-061-R-01: Block D Igloo TD Munitions Response Site (MRS) – (RVAAP-061-R-01) – No Further Action (NFA) Status.

A.2-061.1 Background

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 M110 fuze. At the time of the incident, the igloo was 95 percent full.

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.

Information obtained during the SI indicated non-munitions related debris fragments from the 1943 explosion had been observed outside of the facility at two locations as far as 2.9 miles (15,000 feet) to the northeast. The Army concluded in the SI Report that the presence of the debris fragments at these two locations (denoted as Area 1 and Area 2) represented the potential for military munitions to be present beyond the facility boundaries. Area 1 and Area 2 were non-contiguous areas and were located approximately 2.2 and 2.9 miles northeast of the former Igloo-7-D-15, respectively. The combined acreage of Area 1 and Area 2 is 14.13 acres and was considered as the revised Block D Igloo-TD MRS.

In 2015, the Army reevaluated the original estimate of how far fragments associated with the M-41 20-lb fragmentation bomb that exploded at the former Igloo 7-D-15 would have traveled. The result of this second look is that, using more recent information, the estimate of how far fragments associated with the 20-lb bomb would have traveled was reduced from 3,800 feet (the maximum distance pieces of concrete were reported following the blast) to 2,389 feet. As outlined in the RI Report, the maximum extent of Department of Defense (DoD) military munitions associated with the 1943 explosion at Igloo 7-D-15 could not have reached the Block D Igloo-TD MRS and there are no hazards and no sources for a release of munitions constituent (MC)-related contamination.

A.2-061.2 Publications

The following publications can be located on www.RVAAP.org or in established RVAAP information repositories:

- Final Military Munitions Response Program Historical Records Review, Ravenna Army Ammunition Plant, Ohio. e2M. January 2007.
- Final Site Inspection Report, Ravenna Army Ammunition Plant, Ohio, Military Munitions Response Sites. e2M. May 2008.
- Final Remedial Investigation Report for RVAAP-019-R-01 Landfill North of Winklepeck and RVAAP-060-R-01 Block D Igloo Munitions Response Sites, Version 1.0. CB&I Federal Services, LLC. 04 March 2015.
- Final No Further Action Proposed Plan for RVAAP-061-R-01 Block D Igloo – TD Munitions Response Site. HydroGeoLogic, Inc. 31 July 2017.
- Final No Further Action Record of Decision for RVAAP-061-R-01 Block D Igloo – TD Munitions Response Site, Version 1.0. HydroGeoLogic, Inc. 14 September 2018.

A.2-061.3 Site Location and Description

The Block D Igloo-TD MRS is located outside the northern boundary of the facility. The MRS is within the community of Windham, which includes residences, farm fields, and stands of woodlands. Area 1 and Area 2 are located approximately 2.2 and 2.9 miles, respectively, northeast of former Igloo 7-D-15 that exploded in 1943. Area 1 is approximately 12 acres and is located on two properties that are adjacent to the facility boundary. Both properties are agricultural land that contain residences. Area 1 is mostly heavily wooded with an area of open field. Area 2 is located approximately 0.7 miles northeast of Area 1 and is 2.13 acres. Area 2 is heavily wooded and is located adjacent to the west of Windham Park that is a local recreational area containing several baseball fields. The nearest residence to Area 2 is approximately 1,000 feet to the south. The topography of the MRS areas is relatively flat and there are no surface water features on any of the properties that make up the MRS.

A.2-061.4 No Further Action Required

The Army determined there is no possibility that munitions and explosives of concern may have travelled beyond the facility boundary and into the Block D Igloo-TD MRS and there is, therefore, no source of MC-related contamination. This determination is based on the RI completed under the Military Munitions Response Program (MMRP) (CB&I Federal Services LLC [CB&I], 2015). Therefore, NFA is the selected remedy for the Block D Igloo-TD MRS under the Military Munitions Response Program (MMRP) pursuant to CERCLA.

The results of the RI fieldwork for the Block D Igloo MRS support the determination that there is. no risk associated with exposure to DoD military munitions, or MC-related contamination at the Block D Igloo-TD MRS. The Army has determined that NFA is acceptable for the Block D Igloo-TD MRS 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.

Appendix A.2-68: Electric Substations (East, West, No. 3) – (CC RVAAP-68) – No Further Action (NFA) Status for Soil, Sediment and Surface Water

A.2-68.1 Background

The three former substations were key distribution points for electrical power throughout the facility. These substations are the East Substation, the West Substation and Substation No. 3. The use of several hazardous and regulated materials was documented during the operation of the three former substations, including petroleum products (fuels and oils), polychlorinated biphenyls (PCBs), and lead acid batteries. Annual PCB inventory inspections were conducted on a facility-wide basis to document quantities of PCB oil located throughout the facility. The results of the inspections were documented in annual PCB inventory reports, which listed all PCB-containing items, including transformers, capacitors, contaminated soil, and hydraulic equipment containing contaminated oil.

East Substation: The former East Substation was in use from the 1940s through 1993, servicing Load Lines 1, 2, 3, 4, and 12, as well as providing power for miscellaneous facilities on the eastern side of the facility. While in use, the East Substation consisted of an approximately 1,170-square-foot (ft^2) brick Switch House (Building 25-27) constructed of a 6-inch-thick reinforced concrete floor. The interior of the building was divided into a general area for the switch gear panel and a smaller room used for storing lead acid batteries for backup power. In August 1993, the transformers were drained and moved to Building 854 for disposal. The only remaining structure at the East Substation is the former Switch House Building, which was not included as part of the Remedial Investigation (RI).

West Substation: The former West Substation serviced the Fuze and Booster Hill area, including Load Lines 5 through 11, the Administration Area, and George Road Area. The layout of the West Substation was similar to the former East Substation with a 964 ft^2 brick building (Building 28-28) with a switch gear panel room and battery storage room (currently in use by OHARNG), with two pad-mounted transformers, and other electrical equipment, surrounded by a metal fence. Equipment was removed from service in 1993. The only remaining structure at the West Substation is Building 28-28. This building is not included as part of this RI and is currently used by OHARNG for military training exercises.

Substation No. 3: There was no building associated with former Substation No. 3. Equipment was stored outside within a fenced compound. The only structures that remain at former Substation No. 3 include the concrete foundations for the transformers, other electrical equipment, and stumps from former utility poles. Transformers and other electrical equipment were used to service the western portion of the facility, including the Depot Area.

A.2-68.2 Publications

The following documents for the CC RVAAP-68 AOC can be located on www.RVAAP.org or in established RVAAP information repositories:

- Final Historical Records Review Report for the 2010 Phase I Remedial Investigation Services at Compliance Restoration Sites (9 Areas of Concern) Revision 0. SAIC. 11 December 2011.
- Final Remedial Investigation Report CC RVAAP-68 Electric Substations (East, West, No. 3). Environmental Chemical Corporation and AMEC Environment & Infrastructure, Inc. 31 July 2015.
- Final Proposed Plan for Soil, Sediment, and Surface Water at CC RVAAP-68 Electric Substations (East, West, No. 3). Leidos. 30 September 2016.
- Final Record of Decision for Soil, Sediment, and Surface Water at CC RVAAP-68 Electric Substations (East, West, No. 3). Leidos. 6 April 2017.

A.2-68.3 Site Location and Description

The East Substation is located on the southwest corner of the Ramsdell Road and Load Line 2 Road intersection. The topography at the former East Substation is generally flat with a slight grade to the north-northwest, such that the area drains toward the roadside ditch along Remalia Road. There are no wetlands, creeks, streams, or other water bodies within the East Substation Area. The nearest wetland downgradient from this ditch is located approximately 0.25 mi to the west. The area comprises approximately 12,300 ft^2 and is covered with grass and some low growing shrubs. Building 25-27 is a brick building on a concrete slab foundation, measuring approximately 47 by 28 ft. A gravel pad located adjacent to Building 25-27 was used to store transformers.

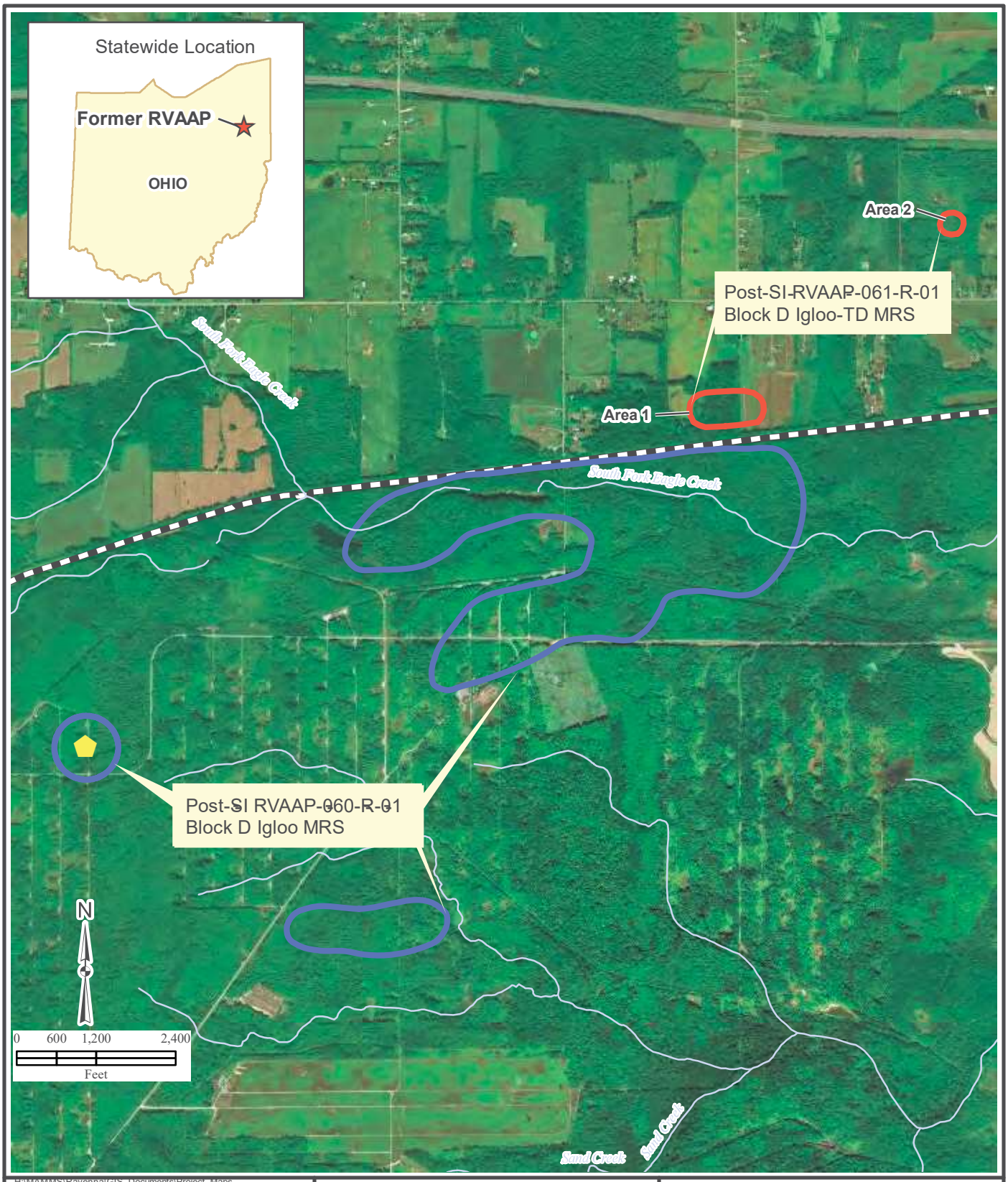
The West Substation is located north of Fuze and Booster Road across from Load Line 5 Load Line 6. The topography at the former West Substation is generally flat. While the larger area surrounding the West Substation drains generally to the north, the localized AOC area reportedly drains to the south to the small ditch that runs parallel to the southwest side of the building and along the southeast boundary parallel to Fuze and Booster Road (SAIC 2011). There are no wetlands, creeks, streams, or other water bodies within the West Substation Area. The nearest wetland downgradient from this ditch is located approximately 800 ft to the northeast. The former substation comprised an area of approximately 3,000 ft^2. Grass surrounds the area where the transformers were located and around Building 28-28. In addition, there is a gravel area west of Building 28-28 used for parking by OHARNG personnel. The concrete foundations for the transformers still exist at the AOC.

Substation No. 3 lies in the middle of an area bounded by Fuze and Booster Road, Fuze and Booster Spur Road, Demolition Road and Newton Falls Road. The topography at the former Substation No. 3 is generally flat. There are no wetlands, creeks, streams, or other water bodies within the Substation No. 3 area. However, a wetland and associated aquatic habitat are located just beyond the southeast site boundary. This AOC drains to the southeast toward a large wetland and an unnamed tributary to Sand Creek. The substation comprised an area of approximately 10,000 ft^2. There is an approximately 12-inch metal corrugated pipe culvert located along the driveway to the northeast. The AOC is in an open field and is surrounded by wooded areas. No building existed at former Substation No. 3. The concrete foundations used to support the transformers remain at the AOC.

A.2-68.4 No Further Action Required

No further action is necessary for soil, sediment, and surface water at Electric Substations (East, West, No. 3) for Unrestricted (Residential) Land Use. Consequently, no further action is necessary for the future use of the site (Military Training). Groundwater at Electric Substations (East, West, No. 3) will be addressed under future CERCLA decisions. Land use controls will not be implemented as part of this decision, as no CERCLA-related chemicals of concern (COCs) were identified in soil, sediment, or surface water for the Resident Receptor.

The recommendation of no further action for soil, sediment, and surface water is protective of human health and the environment and meets the statutory requirements for cleanup standards established in Section 121 of CERCLA. Because the CERCLA-related contamination present in soil, sediment, and surface water at Electric Substations (East, West, No. 3) does not pose a potential risk to human health or the environment, five-year reviews will not be required.



H:\MAM\MS\Ravenna\GIS_Documents\Project_Maps\HGL\Feb2018\Block_D_Igloo_ROD\HGL_RVAAP_BDI_004_Fig4_BlockDIgloo_Post_SI_SiteFeatures.mxd
02/20/2018 JWR
Source Aptim

Legend

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

S denotes 2007 Site nvestigation

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

MRS Boundary

Site Investigation MRS Boundary and Remedial Investigation Expanded Investigation Area

0 130 260 Feet

Projection : NAD_1983_UTM_Zone_17N

U.S. ARMY CORPS OF ENGINEERS
BALTIMORE DISTRICT

MILITARY MUNITIONS RESPONSE PROGRAM

WATER WORKS #4 DUMP MRS
FORMER RVAAP/CAMP RAVENNA
PORTAGE AND TRUMBULL COUNTIES, OHIO

CB&I Federal Services LLC
150 Royall Street
Canton, MA 02021

H:\MMRS\Ravenna\GIS_Documents\Project_Maps\MMRP\RIFS\RIFS_WW42015_Feb\RVAAP_WW4_006_Fig3_MRS_Features_r2.mxd: Analyst: gwt: Date: 3/9/2015 2:58:22 PM

A.2-68.3 Site Location and Description

The East Substation is located on the southwest corner of the Ramsdell Road and Load Line 2 Road intersection. The topography at the former East Substation is generally flat with a slight grade to the north-northwest, such that the area drains toward the roadside ditch along Remalia Road. There are no wetlands, creeks, streams, or other water bodies within the East Substation Area. The nearest wetland downgradient from this ditch is located approximately 0.25 mi to the west. The area comprises approximately 12,300 ft2 and is covered with grass and some low growing shrubs. Building 25-27 is a brick building on a concrete slab foundation, measuring approximately 47 by 28 ft. A gravel pad located adjacent to Building 25-27 was used to store transformers.

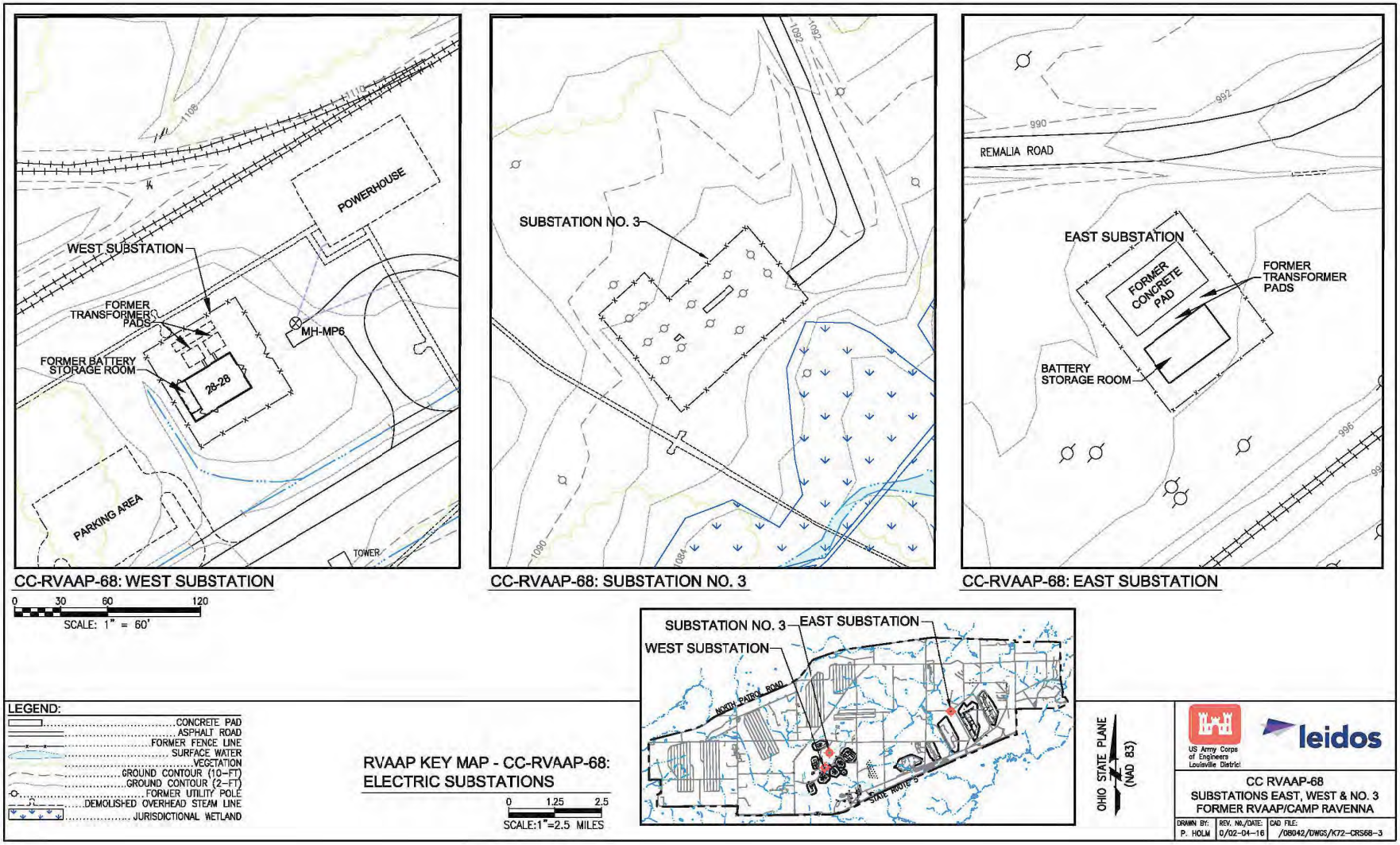
The West Substation is located north of Fuze and Booster Road across from Load Line 5 Load Line 6. The topography at the former West Substation is generally flat. While the larger area surrounding the West Substation drains generally to the north, the localized AOC area reportedly drains to the south to the small ditch that runs parallel to the southwest side of the building and along the southeast boundary parallel to Fuze and Booster Road (SAIC 2011). There are no wetlands, creeks, streams, or other water bodies within the West Substation Area. The nearest wetland downgradient from this ditch is located approximately 800 ft to the northeast. The former substation comprised an area of approximately 3,000 ft^2. Grass surrounds the area where the transformers were located and around Building 28-28. In addition, there is a gravel area west of Building 28-28 used for parking by OHARNG personnel. The concrete foundations for the transformers still exist at the AOC.

Substation No. 3 lies in the middle of an area bounded by Fuze and Booster Road, Fuze and Booster Spur Road, Demolition Road and Newton Falls Road. The topography at the former Substation No. 3 is generally flat. There are no wetlands, creeks, streams, or other water bodies within the Substation No. 3 area. However, a wetland and associated aquatic habitat are located just beyond the southeast site boundary. This AOC drains to the southeast toward a large wetland and an unnamed tributary to Sand Creek. The substation comprised an area of approximately 10,000 ft^2. There is an approximately 12-inch metal corrugated pipe culvert located along the driveway to the northeast. The AOC is in an open field and is surrounded by wooded areas. No building existed at former Substation No. 3. The concrete foundations used to support the transformers remain at the AOC.

A.2-68.4 No Further Action Required

No further action is necessary for soil, sediment, and surface water at Electric Substations (East, West, No. 3) for Unrestricted (Residential) Land Use. Consequently, no further action is necessary for the future use of the site (Military Training). Groundwater at Electric Substations (East, West, No. 3) will be addressed under future CERCLA decisions. Land use controls will not be implemented as part of this decision, as no CERCLA-related chemicals of concern (COCs) were identified in soil, sediment, or surface water for the Resident Receptor.

The recommendation of no further action for soil, sediment, and surface water is protective of human health and the environment and meets the statutory requirements for cleanup standards established in Section 121 of CERCLA. Because the CERCLA-related contamination present in soil, sediment, and surface water at Electric Substations (East, West, No. 3) does not pose a potential risk to human health or the environment, five-year reviews will not be required.



Electric Substations (East, West, No. 3) Site Features

Appendix A.2-71: Barn No. 5 Petroleum Release – (CC RVAAP-71) – No Further Action (NFA) Status

A.2-71.1 Background

The Barn No. 5 Petroleum Release Area of Concern (AOC) (CC RVAAP-71) is the site of a 1964 gasoline release from a broken underground pipeline near Barn No. 5. According to the historic spill records, petroleum-related chemicals (gasoline range hydrocarbons) associated with the former buried gasoline pipeline were released to the environment. The pipeline was located outside the southern installation fence in the vicinity of Barn No. 5. The 1964 pipeline break caused a consequent release of an estimated 20 barrels of gasoline at the AOC.

A.2-71.2 Publications

The following publications relevant CC RVAAP-71can be located on www.RVAAP.org or in established RVAAP information repositories:

- Final Historical Records Review Report for the 2010 Phase I Remedial Investigation Services at Compliance Restoration Sites (9 Areas of Concern) Revision 0. SAIC. 11 December 2011.
- Final Site Inspection Report CC RVAAP-71 Barn No. 5 Petroleum Release. Environmental Chemical Corporation. 12 February 2015.

A.2-71.3 Site Location and Description

The CC RVAAP-71 Barn No. 5 Petroleum Release AOC is approximately 0.6 acres including the footprint of Barn No. 5 and the land between the barn and fence line in the vicinity of Post No. 6. Barn No. 5 was demolished sometime between 1966 and 1979.

CC RVAAP-71 is located in the western portion of CJAG along the southern property fence line. South Patrol Road, which is a dirt and gravel road, runs within the former RVAAP property lines and the fence line. Old State Route 5, which is currently named Newton Falls Road and is a two-lane, paved road, runs outside the fence line and to the south of the AOC. The Barn No. 5 footprint is located directly north of Post No. 6, which is a gate that was previously used to access the former RVAAP. A portion of Hinkley Creek runs northwest of the AOC and flows under South Patrol Road from northeast to southwest

A.2-71.4 No Further Action Required

The results of the 2015 Site Investigation (SI) indicated that No Further Action (NFA) is warranted at the CC RVAAP-71 Barn No. 5 Petroleum Release AOC.


Hinkley Creek
Former Barn No. 5
DU01
Post No. 6
South Patrol Road
Newton Falls Road (Old State Rt. 5)
LEGEND
Post No. 6
Creek and Stream
Flow Direction
Pipeline (Approx)
Fence Line
Facility Property Line
CC RVAAP-71 Site Area (Approx)
Pipeline Easement (Approx)
Decision Unit
Former Barn No. 5 Footprint
NOTES & SOURCES
Map Coordinates: NAD 83, UTM Zone 17N
TITLE
Figure 2-1
Site Features
CC RVAAP-71
Barn No. 5
Petroleum Release
Former Ravenna Army Ammunition Plant
Portage and Trumbull Counties, Ohio
0 100 200 Feet
N
ECC
Marlborough, Massachusetts
NO.
2-1

Appendix A.2-72: Facility-Wide Underground Storage Tanks – (CC RVAAP-72) – No Further Action (NFA) Status

A.2-72.1 Background

This AOC includes all 58 documented former petroleum (e.g., gasoline, fuel oil, diesel, etc.) underground storage tanks (USTs) located at the former RVAAP that were installed to support former RVAAP operations. This AOC includes only petroleum USTs (e.g., gasoline, fuel oil, diesel, etc.) and does not include USTs that were used to store waste products from RVAAP operations, such as waste oil, pink water, wastewater, and spent chemical reagent. The former RVAAP facility consists of 21,683 acres in east-central Portage County and southwestern Trumbull County. The 58 USTs were located throughout the facility. All former UST locations are no longer active.

A Site Investigation (SI) was conducted at 15 of the 58 former UST locations (Environmental Chemical Corporation, 2015). The SI was based on the findings of the Historical Records Review Report (HRR) for the 2010 Phase I Remedial Investigation Services at CR Sites (9 Areas of Concern) (Science Applications International Corporation [SAIC] 2011a). The 15 USTs that were investigated during the SI were closed based on the SI results. The other 43 of the 58 USTs under CC RVAAP-72 FWUSTs have no further action (NFA) documentation and/or records of soil sampling results less than the State of Ohio Bureau of Underground Storage Tank Regulations (BUSTR) criteria.

A.2-72.2 Publications

The following publications relevant to the No Further Action (NFA) determination Facility-Wide Underground Storage Tanks can be located on www.RVAAP.org or in established RVAAP information repositories:

- Final Historical Records Review Report for the 2010 Phase I Remedial Investigation Services at Compliance Restoration Sites (9 Areas of Concern) Revision 0. SAIC. 11 December 2011.
- Final Site Inspection Report CC RVAAP-72 Facility-Wide Underground Storage Tanks. Environmental Chemical Corporation. 8 July 2015.

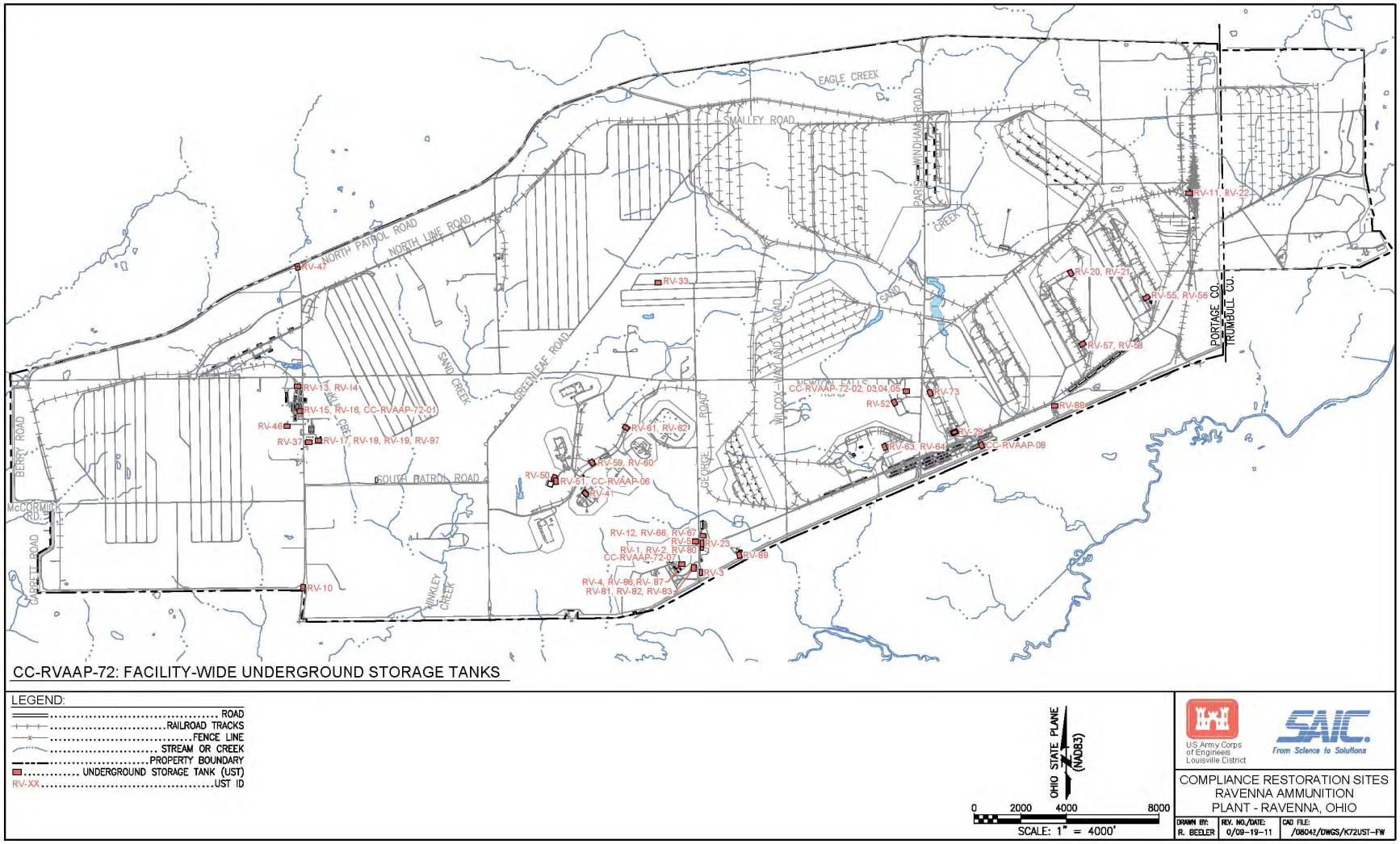
A.2-72.3 Site Location and Description

The 58 former USTs were generally associated with manufacturing and transportation facilities located throughout the former RVAAP facility. The physical property characteristics of each UST site vary. However, all USTs were installed above bedrock in unconsolidated material. The majority of USTs were installed above the water table in the vadose zone.

Sediment and surface water are not present at this AOC, and groundwater is being evaluated on a facility-wide basis (RVAAP-66 Facility-Wide Groundwater).

A.2-72.4 No Further Action Required

Based on the HRR, 43 of the 58 USTs under CC RVAAP-72 FWUSTs have no further action (NFA) documentation and/or records of soil sampling results less than the State of Ohio Bureau of Underground Storage Tank Regulations (BUSTR) criteria. The other 15 USTs were closed based on the results of the SI.



Facility-Wide Underground Storage Tanks Map and Site Features

Appendix A.2-73: Facility-Wide Coal Storage – (CC RVAAP-73) – No Further Action (NFA) Status for Soil, Sediment and Surface Water

A.2-73.1 Background

The former RVAAP received bulk coal primarily by rail at the Sand Creek and North Line Road coal tipples. Bulk coal was typically stored and staged in uncovered piles on the ground surface. Coal was distributed throughout the former RVAAP by truck. Coal storage locations included covered bins and uncovered storage piles on the ground surface. There were 19 former coal storage locations on the former RVAAP that were investigated in the Final Historical Records Review (HRR, SAIC 2011), which include:

- Load Line No. 1 Power House (Power House No. 1);
- Load Line No. 2 Power House (Power House No. 2);
- Load Line No. 4 Power House (Power House No. 7);
- Load Line No. 12 Power House (Power House No. 3);
- Building F-15; • Building F-16;
- Atlas Scrap Yard;
- North Line Road Coal Tipple;
- Sand Creek Coal Tipple;
- East Classification Yard;
- Administration Area (Power House No. 6);
- Building U-5;
- Building U-14;
- Building 51-25 (Power House No. 5);
- Building 52-15 (Power House No. 4);
- Inert Storage 2F-21;
- Area No. 6 Inert Storage;
- Former Coal Pile South of East Classification Yard; and
- Building U-16 Boiler House U-16.

No documentation of accidental or large volume spills or releases associated with the coal storage areas was found during the HRR. No aboveground storage tanks or underground storage tanks are associated with the former coal storage areas.

The HRR recommended 4 of the 19 areas for additional investigation: North Line Road Coal Tipple, Sand Creek Coal Tipple, Building U-16 Boiler House and the Former Coal Pile South of East Classification Yard. The investigations for the North Line Road Coal Tipple, Sand Creek Coal Tipple, and Building U-16 Boiler House are documented in the Remedial Investigation CC RVAAP-73 Facility-Wide Coal Storage (Parsons 2017). The Former Coal Pile South of East Classification Yard was investigated as part of the Remedial Investigation for CC RVAAP-79 DLA Ore Storage Sites where it is referred to as the Concrete Pad Storage Area. Based on the HRR, the 14 sites were determined to have No Further Action (NFA) status.

North Line Road Coal Tipple: This area was used as a bulk coal receiving, storage, and distribution area. Based on historical aerial photographs of this area, coal storage piles appear in the 1952 through 1966 photos. Most of the coal appears to have been removed by 1979.

Sand Creek Coal Tipple: This area was used as a bulk coal receiving, storage, and distribution area. However, historical aerial photographs do not show clear evidence of coal storage in this area.

Building U-16 Boiler House: This area was used to store coal for boiler supply/steam generation. Based on historical aerial photographs of this area, coal storage piles appear in the 1952 through 1966 photos. Most of the coal appears to have been removed by 1979.

A.2-73.2 Publications

The following publications relevant to the Record of Decision (ROD) for the Facility-Wide Coal Storage AOC can be located on www.RVAAP.org or in established RVAAP information repositories:

- Final Historical Records Review Report for the 2010 Phase I Remedial Investigation Services at Compliance Restoration Sites (9 Areas of Concern) Revision 0. SAIC. 11 December 2011.
- Final Remedial Investigation Report CC RVAAP-73 Facility-Wide Coal Storage. Parsons. 17 February 2017.
- Final Proposed Plan CC RVAAP-73 Facility-Wide Coal Storage. Parsons. 1 February 2018.
- Final Record of Decision for CC RVAAP-73 Facility-Wide Coal Storage. Parsons. 26 November 2018.

A.2-73.3 Site Location and Description

As shown on the accompanying figure (Page A.2-CC73-4), the coal storage facilities were located throughout the former RVAAP facility. Building U-16 Boiler House is located north of Bundling/North Line Road, west of Route 80 (also known as Freedom Road) and north of Newton Falls Road North Line Road Coal Tipple is located just south of Bundling/North Line Road; east of Road 7C, and north of Newton Falls Road. Sand Creek Coal Tipple is located in the north-central portion of CJAG, just east of Paris-Windham Road and west of Building 1200.

The North Line Road Coal Tipple area is approximately 1.22 acres. No building is associated with this location, and the area is generally flat with a slight grade to the east-southeast toward Sand Creek. The area is unpaved and partially vegetated with low shrubs. The surrounding area is wooded. A ditch exists to the north of the area along the south side of North Line Road. The ditch flows east-northeast into Sand Creek. There are no wetlands, creeks, streams, or other water bodies within the North Line Road Coal Tipple area.

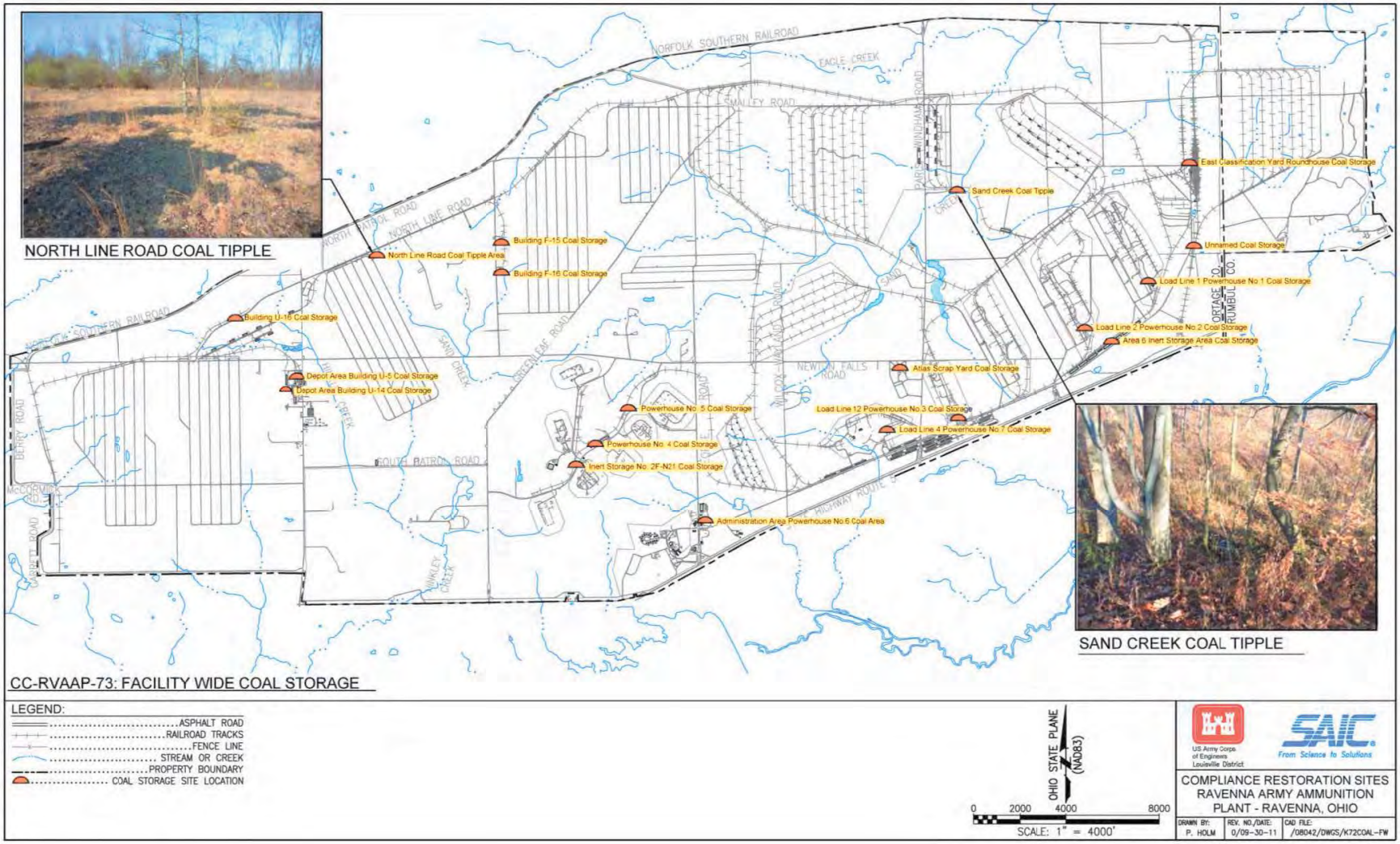
The Sand Creek Coal Tipple area is approximately 0.65 acres. The tipple is at the base of the former rail spur and is covered by woody/shrub-type vegetation. The topography in the immediate area of the Sand Creek Coal Tipple is generally flat, but the area topography slopes toward Sand Creek to the east and south. The HRR (SAIC 2011) reported that residual coal was observed at the surface. Sand Creek runs adjacent to the area to the south and east. There are no wetlands, creeks, streams, or other water bodies within the Sand Creek Coal Tipple area. However, Sand Creek is located within 50 feet of the southeast corner of the area. Sand Creek flows to the east paralleling the area's southern boundary where a tributary enters the creek approximately 50 feet east of the northeast corner of the area (Parsons 2017). Sand Creek then flows northeast away from the Sand Creek Coal Tipple area.

The Building U-16 Boiler House area is 0.138 acres and is generally flat, with a slight grade to the southeast. The boiler house has been demolished, and the area has been graded. There are no structures within the investigated area. The surface of the area is covered mainly with grasses and small shrubs. A rail line exists just north of the area. There are no wetlands, creeks, streams, or other water bodies within the Building U-16 Boiler House area. The nearest downgradient surface water body is a tributary (and associated wetlands) of Hinckley Creek, located approximately 1,100 feet south of the Building U-16 Boiler House area (Parsons 2017).

A.2-73.4 No Further Action Required

No Further Action (NFA) under CERCLA is necessary at CC RVAAP-73 Facility-Wide Coal Storage for soil, sediment, and surface water to meet Unrestricted (Residential) Land Use. Groundwater will be addressed as part of a separate Remedial Investigation for RVAAP-66 Facility-Wide Groundwater. The Army will not be required to implement land use controls (LUCs) as part of this decision, as no Chemicals of Concern (COCs) were identified in soil, sediment, or surface water for the Resident Receptor.

The recommendation NFA for soil, sediment and surface water is protective of human health and the environment. Because this remedy will not result in hazardous substances, pollutants or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure, a five-year review will not be required for this remedial action.



Facility-Wide Coal Storage Map and Site Features

Appendix A.2-77: Building 1037 Laundry Waste Water Sump – (CC RVAAP-77) – No Further Action (NFA) Status

A.2-77.1 Background

The CC RVAAP-77 Building 1037 Laundry Waste Water Sump Area of Concern (AOC) consists of the former concrete sump location at Building 1037. The building was used from World War II until 1992 as the laundry for the facility. The former laundry building was used from World War II through 1992 to launder workers' overalls that were potentially contaminated with explosives and propellants used during munitions production. The laundry area occupied the entire footprint (approximately 3,181 square feet [sq ft]) of Building 1037. The concrete sump was located outside the former laundry building. The size of the waste water sump was 13 ft by 16 ft. The top of the waste water sump was at ground surface and the bottom of the waste water sump was at approximately 11.5 ft bgs.

The concrete sump served as a settling basin for discharged laundry rinse water prior to entering the sanitary sewer at manhole MH-1-3, as shown in Figure 2-1. The sump was used to capture solids carried by the rinse water, including potentially explosive-contaminated residues, prior to the water being discharged to the sewer. In approximately 1954, the concrete sump was emptied of its contents (sawdust) and backfilled in place with clean soil. The concrete sump was replaced by a small, above ground, stainless steel settling tank. Demolition and removal of the sump occurred between September and October 2009.

A.2-77.2 Publications

The following publications relevant to the No Further Action (NFA) determination for the Building 1037 Laundry Waste Water Sump AOC can be located on www.RVAAP.org or in established RVAAP information repositories:

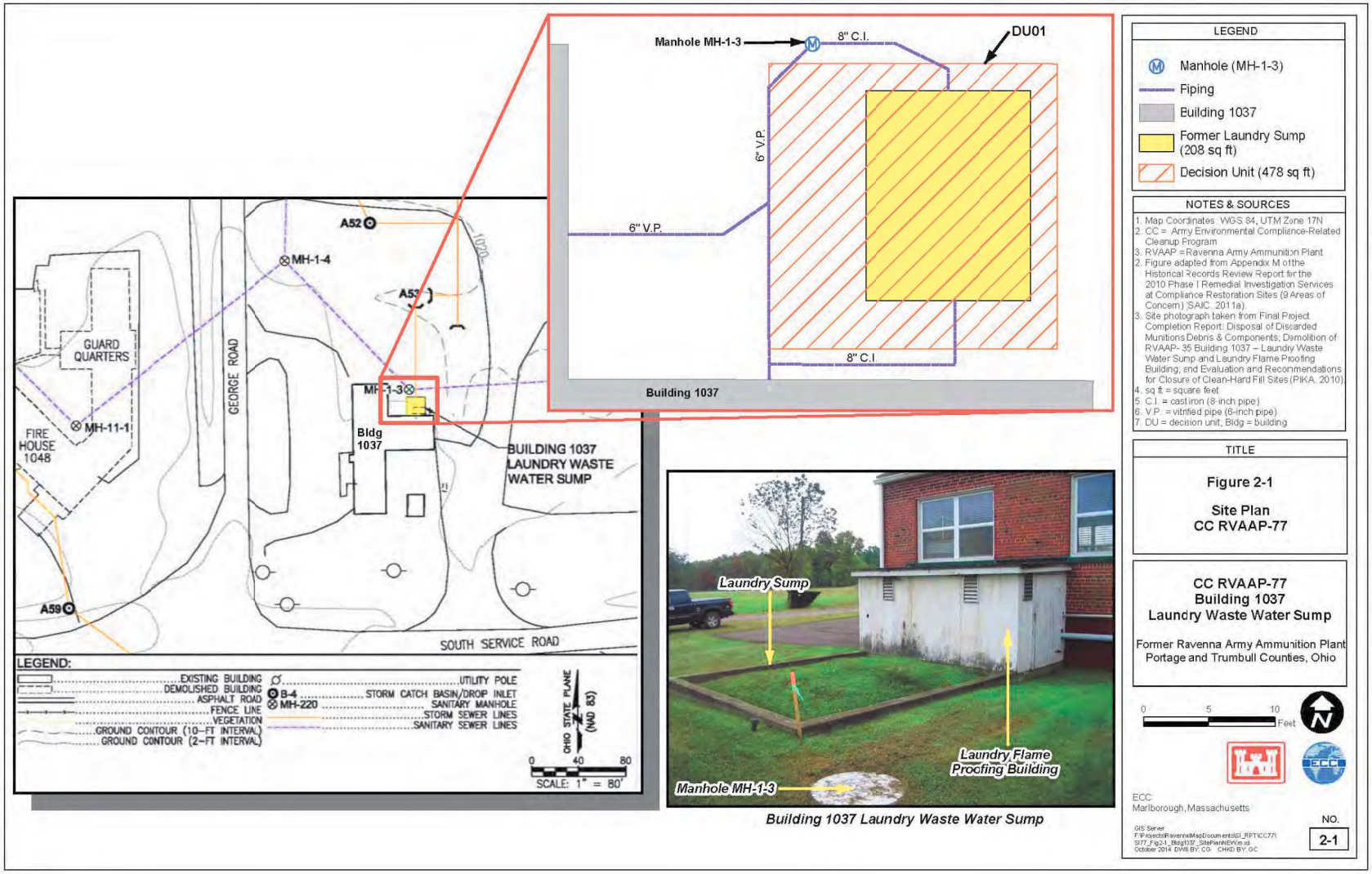
- Final Historical Records Review Report for the 2010 Phase I Remedial Investigation Services at Compliance Restoration Sites (9 Areas of Concern) Revision 0. SAIC. 11 December 2011.
- Final Site Inspection CC RVAAP-77 Building 1037 Laundry Waste Water Sump. Environmental Chemical Corporation. 11 February 2015.

A.2-77.3 Site Location and Description

Building 1037 is located east of George Road and north of South Service Road in the former Administration Area (Figure 2-1). Building 1037 was the former laundry building from World War II through 1992 and used from 1992 to 2013 by the Army Base Realignment and Closure Division for administrative offices. The building currently houses Camp James A. Garfield's Range Operations. Site topography is generally flat. Surface water runoff from Building 1037 Laundry Waste Water Sump drains into the storm sewer system. The acreage of the is estimated to be less than 1 acre.

A.2-77.4 No Further Action Required

Based on the Final Site Investigation, No Further Action (NFA) is required for soil at the CC RVAAP-77 Building 1037 Laundry Waste Water Sump:



Building 1037 Laundry Waste Water Sump

Appendix A.2-80: Group 2 Propellant Can Tops – (CC RVAAP-80) – No Further Action (NFA) Status

A.2-80.1 Background

The Group 2 Propellant Can Tops Area of Concern (AOC) is located at the southern end of the former Group 2 Ammunition Storage Area. The area is approximately 12.4 acres. Propellent cans and tops were identified at the AOC in 2008. A Site Investigation (SI) which included removal of tops and cans and sampling was completed in 2016 which determined that NFA was required at this AOC.

A.2-80.2 Publications

The following publications relevant to the AOC can be located on www.RVAAP.org or in established RVAAP information repositories:

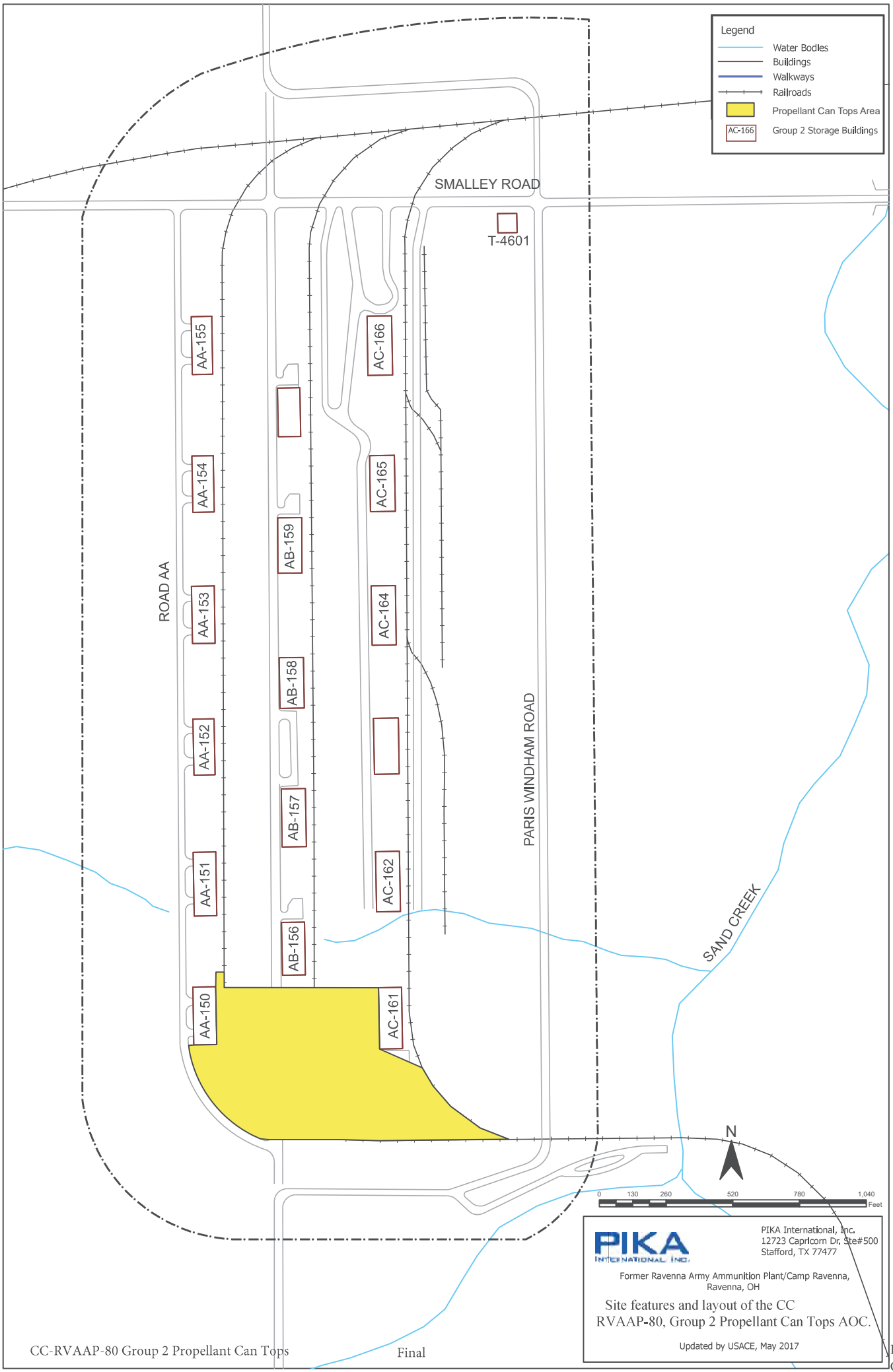
- Final Historical Records Review Report for 2010 Preliminary Assessment Compliance Restoration Sites CC RVAAP-78 Quarry Pond Surface Dump & CC RVAAP-80 Group 2 Propellant Can Tops. Prudent Technologies, Inc. 14 April 2011.
- Final Investigation for the Compliance Restoration Site CC RVAAP-80 Group 2 Propellant Can Tops and Other environmental Services. PIKA International, Inc. 27 January 2012.
- Final Site Inspection Report: CC RVAAP-80 Group 2 Propellant Can Tops. PIKA International, Inc. 10 May 2017.

A.2-80.3 Site Location and Description

Propellant can tops were identified on the ground surface at the southern end of the former Group 2 Ammunition Storage Area. This area is located in the north-central portion of the former RVAAP facility and is bounded by Paris-Windham Road, Smalley Road and Road AA. The propellant cans and tops were initially identified on the ground surface and near surface (9-inch depth maximum) by OHARNG in the winter of 2008. The propellant cans and tops were observed in the vegetated area located immediately south of the ammunition storage magazines near the southern railroad spur lines. This area consists of approximately 539,572 square feet (12.4 acres).

A.2-80.4 No Further Action Required

Based on the SI, no contamination or evidence of a release at the AOC was identified and a No Further Action was achieved.


Legend
Water Bodies
Buildings
Walkways
Railroads
Propellant Can Tops Area
AC-166
Group 2 Storage Buildings
SMALLEY ROAD
T-4601
ROAD AA
PARIS WINDHAM ROAD
SAND CREEK
AA-155
AA-154
AA-153
AA-152
AA-151
AA-150
AB-159
AB-158
AB-157
AB-156
AC-166
AC-165
AC-164
AC-162
AC-161
N
0
130
260
520
780
1,040
Feet
PIKA INTERNATIONAL, INC.
PIKA International, Inc.
12723 Capricorn Dr. Ste#500
Stafford, TX 77477
Former Ravenna Army Ammunition Plant/Camp Ravenna, Ravenna, OH
Site features and layout of the CC RVAAP-80, Group 2 Propellant Can Tops AOC.
Updated by USACE, May 2017

Appendix A.2-83: Former Buildings 1031 and 1039 – (CC RVAAP-83) – No Further Action (NFA) Status

A.2-83.1 Background

CC RVAAP-83 is one area of concern (AOC) that is comprised of two sites: (1) Former Building 1031 and (2) Former Building 1039. Former Building 1031 was constructed in 1942 and functioned as the RVAAP hospital until it reportedly closed in 1988. Former Building 1039 was constructed in 1942. Building 1039 contained and operated a photography laboratory, a chemistry laboratory, and a medical x-ray facility. The photo laboratory was used for large-scale photo development activities until its closure in the early 1970s. Both building have been demolished.

A.2-83.2 Publications

The following publications relevant to the No Further Action (NFA) determination for Former Buildings 1031 and 1039 can be located on www.RVAAP.org or in established RVAAP information repositories:

- Final Historical Records Review Report for the 2010 Phase I Remedial Investigation Services at Compliance Restoration Sites (9 Areas of Concern) Revision 0. SAIC. 11 December 2011.
- Final Site Inspection Report CC RVAAP-83 Former Buildings 1031 and 1039. Environmental Chemical Corporation. 15 June 2015.

A.2-83.3 Site Location and Description

Former Buildings 1031 and 1039 are located in the former Administration Area, which is located in the central southern portion of the facility. Building 1031 was approximately 13,500 square feet. Building 1039 was approximately 6,100 square feet. Both were located along South Service Road.

A.2-83.4 No Further Action Required

Based on the 2015 Site Inspection Report, No Further Action was achieved at the AOC.

Legend

- Fence Line
- Road
- Former Building
- 30-ft Buffer
- Manhole
- Drainage Ditch
- Underground Drainage Pipe
- Sewer Line
- Former Steam Line
- Drainage Flow

N

0 50 100 Feet

1 inch = 100 feet

NOTES & SOURCES

1) Map Coordinates: WGS 84, UTM Zone 17N in Meters
Aerial photograph from USGS.
2) Sewer/Manhole/ Drainage Ditch/Former Steam Line from utilities drawing, Accession No. 1000.2A.

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
LOUISVILLE, KENTUCKY

CC-RVAAP-83
Former Building 1031
Site Map with Aerial Photo

RVAAP/CAMP RAVENNA
RAVENNA, OHIO

Legend

- Fence Line
- Road
- Former Building
- 30-ft Buffer
- Approximate Sump Area
- Manhole
- Drainage Ditch
- Underground Drainage Pipe
- Sewer Line
- Former Steam Line
- Drainage Flow

N

0 40 80 Feet

1 inch = 80 feet

NOTES & SOURCES

1) Map Coordinates: WGS 84, UTM Zone 17N in Meters
Aerial photograph from USGS.
2) Sewer/Manhole/ Drainage Ditch/Former Steam Line from utilities drawing, Accession No. 1000.2A.

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
LOUISVILLE, KENTUCKY

CC-RVAAP-83
Former Building 1039
Site Map with Aerial Photo
RVAAP/CAMP RAVENNA
RAVENNA, OHIO

ECC GIS Server D:\OtherGIS\Ravenna\MapDocuments\HRR\HRR_Fig3-5_CC83_Bldg1039_wAerial.mxd

APPENDIX B

AOC/MRS SITE INSPECTION FORM TEMPLETE

Camp James A. Garfield Joint Military Training Center (CJAG)
Former Ravenna Army Ammunition Plant (RVAAP)
LUC AOC/MRS Inspection Form Template

In accordance with the CJAG/former RVAAP Property Management Plan (PMP) dated__and Appendix A-
____ an inspection of AOC /MRS_____was conducted by_____[*indicate Army or its approved representative*] on_____date.

Description of any observed Land Use Control (LUC) violation(s)

_____
_____
_____
_____

Date(s) of Notifications:_____

Description of any corrective actions taken to remedy observed LUC violation(s)

_____
_____
_____
_____

Status of LUC Procedures

- **AOC/MRS Map** – Is the AOC/MRS map current with respect to AOC/MRS boundaries, land activities and prescribed LUCs?

_____
_____
_____
_____

- **Signs and Other Markers –** Are the required Seibert stakes, signage and/or other required markers in place and functional? If not, when and what corrective actions will be undertaken? If not required for this AOC, note as "Not required."

_____
_____
_____
_____

- **Training –** Was the LUC Awareness training consistently conducted over the past year? If not, why not? What corrective actions were initiated? Who provided training?

_____
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- **Required Monitoring –** Did the Army or the designated representative conduct required monitoring over the past year? If not, why not. Provide dates of inspection.

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_____

Date: _____

Name/Title: _____

Organization: _____

Signature: _____

APPENDIX C

SOLID WASTE MANAGEMENT SITES

APPENDIX C – SOLID WASTE MANAGEMENT SITES

Program	AOC ID	Description	Buried Waste or Surficial Waste?	Original Waste Placement Date	Waste Removal Actions and Dates	Waste Type
IRP & MMRP	RVAAP-01 & RVAAP-001- R-02	Ramsdell Quarry Landfill & Ramsdell Quarry Area 1 (North)	Buried	Before 1989		Buried Waste - Solid Waste Management Unit
IRP & MMRP	RVAAP-16 & RVAAP-016- R-01	Fuze and Booster Quarry Landfill/Ponds	Buried	Before 1976		Buried Waste - Solid Waste Management Unit Troop Labor Site
IRP & MMRP	RVAAP-32 & RVAAP-032- R-01	40mm Firing range	Buried	Before 1977		Buried Waste - Solid Waste Management Unit Troop Labor Site
IRP	RVAAP-51	Dump Along Paris-Windham Road	Buried	Unknown		Solid Waste Management Unit: Asbestos Waste
IRP & CRS	RVAAP-21 & CCRVAAP-76	Depot Sewage Treatment Plant & Depot Area CRS	Surficial	Before 1993	Pallets removal and recycling was completed in December 2019. Concrete removal and recycling was completed in February 2020. All solid waste has been properly removed and recycled and is no longer present.	Open Dumping of Solid Waste
IRP & MMRP	RVAAP-33 & RVAAP-033- R-01	Load Line 6 & Firestone test Facility	Surficial	2005		Surficial Scattered Waste - CDD Surficial Mounded Waste - Open Dumping of Solid Waste
IRP	RVAAP-38	NACA Test Area	Surficial	1947-1953	Surficial waste/debris was properly removed and recycled on the eastern portion of the AOC during a geophysical survey completed in November 2017.	Surficial Waste - Open Dumping of Solid Waste

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Program	AOC ID	Description	Buried Waste or Surficial Waste?	Original Waste Placement Date	Waste Removal Actions and Dates	Waste Type
IRP, MMRP & CRS	RVAAP-46, RVAAP-046-R- 01, CC RVAAP-73 (F15) & CC RVAAP-73 (F16)	Buildings F15 and F-16, Buildings F15 and F-16 MRS & Building F-15 andF-16 Coal Storage	Surficial	1974	Proper transport and removal of surficial scattered debris and piled construction and demolition debris was completed in January 2019. Debris within the fenced compound associated with Building U17 still remains and will be removed as part of future building demolition.	Surficial Scattered Waste - Open Dumping of Solid Waste Surficial Piled Waste - CDD
IRP	RVAAP-49	Central Burn Pits	Surficial	Mid-1970's		Surficial Scattered Waste - Open Dumping of Solid Waste Surficial Mounded Waste - Open Dumping of Solid Waste
CRS	CC RVAAP-73 & Site P	U-16 Boiler House Coal Storage & Site P	Surficial	Before 1979		Open Dumping of Solid Waste
NA	Site B	Potential Area of Solid Waste Debris Identified via Site Interviews	Surficial	Unknown		Open Dumping of Solid Waste
NA	Site C	Potential Area of Solid Waste Debris Identified via Site Interviews - Block A and Block B	Surficial	Unknown	Proper transport and recycling of dunnage piles/solid waste was completed in March 2020.	Open Dumping of Solid Waste Troop Labor Site
IRP & MMRP	RVAAP-02 & RVAAP-002-R-01	Erie Burning Grounds & Erie Burning Grounds MRS	Buried and Surficial	1951		Surficial Waste - Open Dumping of Solid Waste/Buried Waste - Solid Waste Management Unit

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Program	AOC ID	Description	Buried Waste or Surficial Waste?	Original Waste Placement Date	Waste Removal Actions and Dates	Waste Type
IRP	RVAAP-05	Winklepeck Burning Grounds	Buried and Surficial	Early 1990s		Surficial Waste - Open Dumping of Solid Waste/Buried Waste - Solid Waste Management Unit Troop Labor Site
IRP & MMRP	RVAAP-19 & RVAAP-019- R-01	Landfill North of Winklepeck Burning Grounds	Buried and Surficial	Before 1978		Surficial Waste - Open Dumping of Solid Waste/Buried Waste - Solid Waste Management Unit
IRP & MMRP	RVAAP-34 & RVAAP-034- R-01	Sand Creek Disposal Road Landfill & RVAAP-034-R-01 Sand Creek Dump	Buried and Surficial	1950-1960		Surficial Waste - Open Dumping of Solid Waste/Buried Waste - Solid Waste Management Unit
IRP, MMRP & CRS	RVAAP-50, RVAAP-050-R- 01 & CC RVAAP-73	Atlas Scrap Yard, Atlas Scrap Yard MRS & Atlas Scrap Yard Coal Storage	Buried and Surficial	Vietnam War Era		Surficial Waste - Open Dumping of Solid Waste/Buried Waste - Solid Waste Management Unit
MMRP	RVAAP-062-R-01	Water Works #4 Dump MRS	Buried and Surficial	1941-1949		Surficial Waste - Open Dumping of Solid Waste/Buried Waste - Solid Waste Management Unit
MMRP	RVAAP-063-R-01	Group 8 MRS	Buried and Surficial	Unknown		Surficial Waste - Open Dumping of Solid Waste/Buried Waste - Solid Waste Management Unit