

Final

**Proposed Plan
for Soil, Sediment, and Surface Water
at RVAAP-13 Building 1200**

**Ravenna Army Ammunition Plant
Ravenna, Ohio**

**Contract No. W912QR-04-D-0028
Delivery Order No. 0001**

Prepared for:



**US Army Corps
of Engineers®**

**United States Army Corps of Engineers
Louisville District**

Prepared by:



**SAIC Engineering of Ohio
8866 Commons Boulevard
Twinsburg, Ohio 44087**

April 9, 2013

REPORT DOCUMENTATION PAGE

*Form Approved
OMB No. 0704-0188*

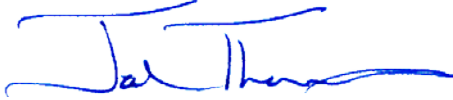
The public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.

1. REPORT DATE (DD-MM-YYYY) 09-04-2013		2. REPORT TYPE Technical		3. DATES COVERED (From - To) 1996 to 2013	
4. TITLE AND SUBTITLE Final Proposed Plan for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200 Ravenna Army Ammunition Plant Ravenna, Ohio				5a. CONTRACT NUMBER W912QR-04-D-0028	
				5b. GRANT NUMBER NA	
				5c. PROGRAM ELEMENT NUMBER NA	
6. AUTHOR(S) Thomas, Jed, PE				5d. PROJECT NUMBER Delivery Order No. 0001	
				5e. TASK NUMBER NA	
				5f. WORK UNIT NUMBER NA	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) SAIC Engineering of Ohio, Inc. 8866 Commons Boulevard Twinsburg, Ohio 44087				8. PERFORMING ORGANIZATION REPORT NUMBER 3827.20130407.001	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) USACE - Louisville District U.S. Army Corps of Engineers 600 Martin Luther King Jr., Place PO Box 59 Louisville, Kentucky 40202-0059				10. SPONSOR/MONITOR'S ACRONYM(S) USACE	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S) NA	
12. DISTRIBUTION/AVAILABILITY STATEMENT Reference distribution page.					
13. SUPPLEMENTARY NOTES None.					
14. ABSTRACT This Proposed Plan for Building 1200 presents remedial alternatives and the preferred alternative for remedy of soil, sediment, and surface water within the Building 1200 AOC. The preferred remedial alternative (Alternative 2: Attain Unrestricted Land Use) involves the removal of shallow surface soil with chemical contamination above the cleanup goal for Unrestricted Land Use and disposal off-site at a licensed disposal facility. Removal will be conducted at locations B12ss-016M, B12ss-017M, and B12ss-022M under this alternative. There are no chemicals of concern (COCs) in deep surface soil, subsurface soil, surface water, and sediment; therefore, no further action is recommended for these media.					
15. SUBJECT TERMS Proposed Plan, remedial alternatives, preferred alternative, no further action					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			Mark Nichter
U	U	U	U	36	19b. TELEPHONE NUMBER (Include area code) 502.315.6375

CONTRACTOR STATEMENT OF INDEPENDENT TECHNICAL REVIEW

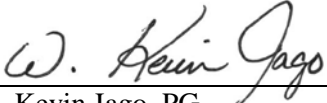
Science Applications International Corporation (SAIC) has completed the Final Proposed Plan for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200 at the Ravenna Army Ammunition Plant, Ravenna, Ohio. Notice is hereby given that an independent technical review has been conducted that is appropriate to the level of risk and complexity inherent in the project. During the independent technical review, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of data quality objectives; technical assumptions; methods, procedures, and materials to be used; the appropriateness of data used and level of data obtained; and reasonableness of the results, including whether the product meets the customer's needs consistent with law and existing United States Army Corps of Engineers (USACE) policy.



Jed Thomas, PE
Study/Design Team Leader

4/9/13

Date



W. Kevin Jago, PG
Independent Technical Review Team Leader

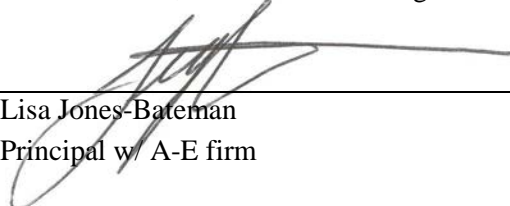
4/9/13

Date

Significant concerns and the explanation of the resolution are as follows:

Internal SAIC Independent Technical Review was conducted on the Preliminary Draft version of this document. Subsequent versions of this document (e.g., Draft and Final) incorporated changes based on the technical reviews of USACE, the Ohio Army National Guard, and the Ohio Environmental Protection Agency. Internal SAIC Independent Technical Review comments are recorded on a Document Review Record per SAIC quality assurance procedure QAAP 3.1. This Document Review Record is maintained in the project file. Changes to the report addressing the comments have been verified by the Study/Design Team Leader.

As noted above, all concerns resulting from independent technical review of the project have been considered.



Lisa Jones-Bateman
Principal w/ A-E firm

4/9/13

Date



John R. Kasich, Governor
Mary Taylor, Lt. Governor
Scott J. Nally, Director

June 24, 2013

CERTIFIED MAIL
7012 1010 0002 2260 4374

Mr. Mark Patterson
Environmental Program Manager
Ravenna Army Ammunition Plant
Building 1037
8451 State Route 5
Ravenna, OH 44266-9297

Re: APPROVAL OF THE "FINAL PROPOSED PLAN FOR SOIL, SEDIMENT, AND SURFACE WATER AT THE RVAAP-13 BUILDING 1200 AT THE RAVENNA ARMY AMMUNITION PLANT, RAVENNA, OHIO," DATED APRIL 9, 2013 (WORK ACTIVITY NO. 267-000859-109)

Dear Mr. Patterson:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the document entitled, "*Final Proposed Plan for Soil, Sediment, and Surface Water at the RVAAP-13 Building 1200 at the Ravenna Army Ammunition Plant, Ravenna, Ohio,*" dated April 9, 2013. This document, received by Ohio EPA's NEDO on April 10, 2013, was prepared for the U.S. Army Corps of Engineers (USACE) Louisville District, by SAIC Engineering of Ohio, Inc.

Ohio EPA has reviewed this documentation and the *Response to Comments* and has found no significant deficiencies. As a result, the "Final Proposed Plan for Soil, Sediment, and Surface Water at the RVAAP-13 Anchor Test Area" has been approved.

Please let know when the Public Meeting will begin at least two weeks prior to commencement.

Scanned

By: *AMH*
Date: *06-26-2013*

Northeast District Office • 2110 East Aurora Road • Twinsburg, OH 44087-1924
www.epa.ohio.gov • (330) 963-1200 • (330) 487-0769 (fax)

RECEIVED
06-26-2013

E-MAILED
06-26-2013 AMH

APPROVAL FOR THE FINAL PROPOSED PLAN FOR SOIL, SEDIMENT, AND SURFACE WATER
RVAAP-13 BUILDING 1200
RAVENNA ARMY AMMUNITION PLANT, RAVENNA, OHIO
JUNE 24, 2013
PAGE 2

If you have any questions or concerns, please do not hesitate to contact Eileen Mohr at
(330) 963-1221.

Sincerely,



Nancy Zikmanis
Environmental Supervisor
Division of Environmental Response and Revitalization

ACK:NZ/kss

cc: Ann Wood, NGB
Katie Tait, OHARNG, Camp Ravenna
Cullen Grasty, Louisville District Corps of Engineers

ec: Eileen Mohr, Ohio EPA, NEDO, DERR
Todd Fisher, Ohio EPA, NEDO, DERR
Andrew Kocher, Ohio EPA, NEDO, DERR
Justin Burke, Ohio EPA, CO, DERR

Final

**Proposed Plan
for Soil, Sediment, and Surface Water
at RVAAP-13 Building 1200**

Ravenna Army Ammunition Plant
Ravenna, Ohio

Contract No. W912QR-04-D-0028
Delivery Order No. 0001

Prepared for:

U.S. Army Corps of Engineers
600 Martin Luther King, Jr. Place
Louisville, Kentucky 40202

Prepared by:

SAIC Engineering of Ohio
8866 Commons Boulevard
Twinsburg, Ohio 44087

April 9, 2013

DOCUMENT DISTRIBUTION
for the
Final
Proposed Plan
for Soil, Sediment, and Surface Water
at RVAAP-13 Building 1200
Ravenna Army Ammunition Plant
Ravenna, Ohio

Name/Organization	Number of Printed Copies	Number of Electronic Copies
Glen Beckham, USACE – Louisville District	1	1
Kevin Jago, SAIC	1	1
Brett Merkel – ARNG	0	1
Eileen Mohr, Ohio EPA-NEDO	2	2
Mark Nichter, USACE – Louisville District	1	1
Mark Patterson, RVAAP Facility Manager	1	1
Katie Tait, OHARNG	1	1
Jed Thomas, SAIC	1	1
Ann Wood, ARNG	0	1
Camp Ravenna Administrative Record	2	2
REIMS	0	1
SAIC Project File W912QR-04-D-0028	1	1
SAIC Central Records Facility	0	1

NGB = National Guard Bureau
OHARNG = Ohio Army National Guard
REIMS = Ravenna Environmental Information Management System
RVAAP = Ravenna Army Ammunition Plant
SAIC = Science Applications International Corporation
USACE = United States Army Corps of Engineers
USAEC = United States Army Environmental Command

TABLE OF CONTENTS

1.0 INTRODUCTION..... 1
 2.0 RVAAP DESCRIPTION AND BACKGROUND..... 2
 3.0 BUILDING 1200 AREA OF CONCERN DESCRIPTION AND BACKGROUND..... 3
 4.0 AREA OF CONCERN CHARACTERISTICS..... 3
 5.0 SCOPE AND ROLE OF RESPONSE ACTION..... 5
 6.0 SUMMARY OF HUMAN AND ECOLOGICAL RISKS 5
 7.0 REMEDIAL ACTION OBJECTIVE..... 7
 8.0 SUMMARY OF FEASIBILITY STUDY ALTERNATIVES..... 8
 8.1 Alternative 1 – No Action..... 8
 8.2 Alternative 2 – Attain Unrestricted Land Use 8
 9.0 EVALUATION OF FEASIBILITY STUDY ALTERNATIVES..... 9
 10.0 PREFERRED FEASIBILITY STUDY ALTERNATIVE..... 11
 11.0 COMMUNITY PARTICIPATION..... 11
 11.1 Community Participation 11
 11.2 Public Comment Period 11
 11.3 Written Comments 11
 11.4 Public Meeting 12
 11.5 U.S. Army Review of Public Comments 12
 GLOSSARY OF TERMS 12
 REFERENCES 13

LIST OF TABLES

Table 1. Chemicals of Concern and Cleanup Goals to Attain Unrestricted Land Use..... 7
 Table 2. CERCLA Evaluation Criteria..... 9
 Table 3. Comparative Analysis of Remedial Alternatives 10

LIST OF FIGURES

Figure 1. General Location and Orientation of RVAAP/Camp Ravenna 17
 Figure 2. RVAAP/Camp Ravenna Installation Map..... 18
 Figure 3. Building 1200 AOC Site Features.... 19

LIST OF ACRONYMS

ACM	Asbestos-containing Material
AOC	Area of Concern
ARAR	Applicable or Relevant and Appropriate Requirement
bgs	Below Ground Surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	Chemical of Concern
COPC	Chemical of Potential Concern
COPEC	Chemical of Potential Ecological Concern
ERA	Ecological Risk Assessment
FWCUGs	Facility-wide Cleanup Goals
FS	Feasibility Study
GRA	General Response Action
HHRA	Human Health Risk Assessment
HMX	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
ISM	Incremental Sampling Method
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NFA	No Further Action
O&M	Operation and Maintenance
OHARNG	Ohio Army National Guard
Ohio EPA	Ohio Environmental Protection Agency
PCB	Polychlorinated Biphenyl
PMP	Property Management Plan
PP	Proposed Plan
RAFLU	Reasonable and Anticipated Future Land Use
RAO	Remedial Action Objective
RDX	Hexahydro-1,3,5-trinitro-1,3,5-triazine
RI	Remedial Investigation
ROD	Record of Decision
RVAAP	Ravenna Army Ammunition Plant
SRC	Site-related Contaminant
SVOC	Semi-volatile Organic Compound
TNT	2,4,6-Trinitrotoluene
USACE	United States Army Corps of Engineers
VOC	Volatile Organic Compound

THIS PAGE INTENTIONALLY LEFT BLANK.

1.0 INTRODUCTION

This Proposed Plan (PP) presents the preferred alternative to achieve a remedy for soil, sediment, and surface water within the Building 1200 Area of Concern (AOC) at the Ravenna Army Ammunition Plant (RVAAP) in Ravenna, Ohio (Figure 1). The Building 1200 AOC is designated as RVAAP-13. This PP presents remedial alternatives developed in the *Remedial Investigation/Feasibility Study Report for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200* (USACE 2012) and provides rationale for selecting the preferred alternative. Groundwater will be addressed in a separate decision document under the RVAAP Facility-Wide Groundwater AOC (RVAAP-66).

The U.S. Army, in coordination with the Ohio Environmental Protection Agency (Ohio EPA), issues this PP. This PP provides the public with information to comment upon the selection of an appropriate response action. The remedy will be selected for the Building 1200 AOC after review and consideration of all comments submitted during the 30-day public comment period. Therefore, the public is encouraged to review and comment on all alternatives presented in this PP.

The U.S. Army is issuing this PP as part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986 and Section 300.430(f)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 *Code of Federal Regulations* 300). Selection and implementation of a remedy will also be consistent with the requirements of the Ohio EPA *Director's Final Findings and Orders*, dated June 10, 2004 (Ohio EPA 2004).

Public Comment Period:

July 25, 2013 to August 23, 2013

Public Meeting:

The U.S. Army will hold an open house and public meeting to present the preferred alternative and additional details presented in the *Remedial Investigation/Feasibility Study Report for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200* (USACE 2012). Oral and written comments will also be accepted at the meeting. The open house and public meeting are scheduled for 6:00PM, August 7, 2013, at the Paris Township Hall, 9355 Newton Falls Road, Ravenna, Ohio 44266.

Information Repositories:

Information used in selecting the preferred alternative is available for public review at the following locations:

Reed Memorial Library

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

Hours of operation:

9AM – 9PM Monday – Thursday

9AM – 6PM Friday

9AM – 5PM Saturday

1PM – 5PM Sunday

Newton Falls Public Library

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

Hours of operation:

10AM – 8PM Tuesday - Friday

9AM – 5PM Friday and Saturday

The **Administrative Record File**, containing information used in selecting the preferred alternative, is available for public review at the following location:

Camp Ravenna Joint Military Training Center (Former Ravenna Army Ammunition Plant)

Building 1037
8451 State Route 5
Ravenna, Ohio 44266-9297
(330) 358-7311

Fax: (330) 358-7314

Note: Access is restricted to Camp Ravenna, but the file can be obtained or viewed with prior notice to Camp Ravenna.

This PP summarizes information that can be found in greater detail in the Remedial Investigation/Feasibility Study (RI/FS) Report (USACE 2012) and other documents contained in the Administrative Record file for the Building 1200 AOC (see box on page 1). The U.S. Army encourages the public to review these documents to gain a more comprehensive understanding of the AOC and activities that have been conducted to date.

2.0 RVAAP DESCRIPTION AND BACKGROUND

The current RVAAP consists of 1,260 acres scattered throughout the Ohio Army National Guard (OHARNG) Camp Ravenna Joint Military Training Center, hereafter referred to as Camp Ravenna. Camp Ravenna is owned by the National Guard Bureau who licenses it to the OHARNG for use as a military training site. Camp Ravenna 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 (Figure 1). The RVAAP portions of the property are located solely within Portage County. RVAAP and Camp Ravenna occupy 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; Garrett, 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). Camp Ravenna 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, Camp Ravenna did not exist; the entire 21,683-acre parcel was a federal government-owned, contractor-operated, industrial facility in 1954.

The RVAAP Installation Restoration Program encompasses investigation and cleanup of past activities over the entire 21,683 acres of the former RVAAP. References to RVAAP in this document indicate the historical extent of RVAAP, which is inclusive of the combined acreages of the current Camp Ravenna and RVAAP, unless otherwise specifically stated.

Former industrial operations at 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 wastewater, containing TNT and Composition B, was known as “pink water” for its characteristic color. Pink water was collected in concrete holding tanks, filtered, and pumped into unlined ditches for transport to earthen settling ponds. 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 on 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, 12, and the Depot Area. 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.

3.0 BUILDING 1200 AREA OF CONCERN DESCRIPTION AND BACKGROUND

The Building 1200 AOC is located in the eastern portion of RVAAP (Figure 2). From 1941 to 1971, the AOC's complex of three buildings served as a quality assurance inspection station that encompassed disassembly of production line munitions items from explosive melt-pour operations. Following the inspection of the munitions items, the remaining explosive material would be removed via a steam melt-out process prior to off-site disposition of the item. The primary operations building was Building 1200, which was a 30 ft 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 approximated 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. The AOC is approximately 7.7 acres in size.

The U.S. Army demolished all buildings (Buildings 1200, S-4605, and T-4602) at the AOC between November 2004 and August 2005. Demolition activities included the complete removal of buildings, floor slabs, and footers (MKM 2005). Additionally, flat panel transite siding was removed and disposed off-site.

Following building demolition activities, disturbed soil within the former building footprints was re-graded, seeded, and mulched to match neighboring contours. Remnant infrastructure consists only of the ditch from the former buildings to the former settling pond, former settling pond, and discharge area from the former settling pond. None of these areas were backfilled or re-graded during

demolition activities. The area immediately surrounding the AOC is forested, with the exception of the access road (Ammunition Sectioning Road), a small, sparsely vegetated area around the former building footprints, and the former settling pond.

The following environmental reports have been completed for the Building 1200 AOC:

- *Preliminary Assessment for the Characterization of Areas of Contamination* (USACE 1996);
- *Phase I Remedial Investigation Report for High-Priority Areas of Concern* (USACE 1998);
- *Characterization of 14 AOCs at the Ravenna Army Ammunition Plant* (MKM 2007); and
- *Remedial Investigation/Feasibility Study Report for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200* (USACE 2012).

4.0 AREA OF CONCERN CHARACTERISTICS

The AOC characteristics, nature and extent of contamination, and conceptual site model are based on the various assessments and investigations conducted from 1996 through 2010.

Elevations across the Building 1200 AOC range from approximately 990 to 1,004 ft above mean sea level. Storm water runoff from former operational areas within the AOC generally follows surface topography and drains from north to south. The closest surface water body outside the AOC, a tributary of Sand Creek, is located approximately 1,000 ft south of the former settling pond. The remaining surface features include the access road, drainage ditch from the former buildings to the former settling pond, and former settling pond and associated discharge area (Figure 3).

Silty clay glacial sediment overlies sandstone bedrock at the Building 1200 AOC, except where disturbed by RVAAP activities.

Soil borings show the unconsolidated glacial till is less than 3 ft thick.

The general groundwater flow pattern in most of the AOC is to the northeast. The closest surface stream to the northeast (downgradient) of the AOC where groundwater contaminants may migrate to surface water is the headwater of an unnamed tributary to the Mahoning River located about 4,100 ft northeast of the AOC. Although a small tributary to Sand Creek lies 1,000 ft south of the AOC, it is not located in the direction of downgradient groundwater flow. Therefore, the headwaters of the tributary to the Mahoning River were selected as the downgradient receptor for evaluation of contaminant migration in groundwater.

The following paragraphs discuss chemical scenarios affecting the nature and extent of site-related contaminants (SRCs) in soil, sediment, and surface water at the Building 1200 AOC. As presented in the RI/FS, SRCs were determined by comparing chemical concentrations to facility-wide background concentrations and eliminating essential nutrients, such as calcium, sodium, and potassium. In addition, if a chemical other than an explosive was detected in fewer than 5% of the total samples collected at the Building 1200 AOC, it was evaluated on a case-by-case basis. Identification of a chemical as a SRC does not indicate that it poses a risk to human health or the environment. SRCs are further evaluated, as summarized in Section 6.0 of this PP, to determine if they pose an unacceptable risk and require remediation.

Surface soil [0-1 ft below ground surface (bgs)] at the Building 1200 AOC contained the majority of the SRCs. The prevalent SRCs detected in surface soil were one volatile organic compound (VOC), 14 semi-volatile organic compounds (SVOCs), four explosives, and 14 metals. The highest concentrations of the SRCs occurred in the vicinity of the former Building 1200 location.

The number and concentrations of SRCs in surface soil generally decreased with distance from the former Building 1200 location. Pesticides and polychlorinated biphenyls (PCBs) were not identified as SRCs in surface soil.

Subsurface soil (soil deeper than 1 ft bgs) contained fewer detected SRCs than surface soil, and SRC concentrations decreased with depth. One VOC, two SVOCs, one propellant, and five metals were identified as SRCs. Organic SRCs were detected in one subsurface soil sample collected near the former Building 1200 footprint. The majority of the metals were detected in one sample within the former settling pond and one sample near the former Building 1200 location. Explosives, pesticides, and PCBs were not detected in subsurface soil.

SRCs found in sediment were two VOCs, two SVOCs, one propellant, one pesticide, and seven metals. Sediment occurs in the section of the drainage ditch west of the former settling pond and within the pond. The occurrence of metals in sediment was generally sporadic, with the exception of cadmium. Organic SRCs were primarily detected in the eastern section of the drainage ditch near the former settling pond. No explosives were detected in sediment samples collected from the eastern section of the drainage ditch and within the former settling pond. The absence of detectable explosives in sediment indicates limited migration from surface soil within the former operations area and the western section of the drainage ditch closest to the Building 1200 location.

SRCs found in surface water were two VOCs, six SVOCs, four explosives, and five metals. Surface water, when present at the Building 1200 AOC, is intermittent and occurs mainly as storm water runoff or snow melt accumulation in the eastern section of the drainage ditch near the former settling pond and within the pond. Generally, the maximum detected concentration of SRCs occurred in the eastern section of the drainage ditch near the former settling pond.

Manganese and explosive compounds were identified as SRCs in surface water but not in corresponding sediment samples.

An asbestos visual inspection performed as part of the RI/FS in 2011 by a certified Asbestos Hazard Evaluation Specialist did not identify any asbestos-containing material (ACM) on the ground surface at the AOC. However, the inspection recommended further investigation of a 4 ft high mound near the footprint of former Building T-4062.

The potential for soil contaminants to migrate to groundwater was modeled and presented in the RI/FS report (USACE 2012).

Modeling included evaluation of potential leaching of contaminants from soil to groundwater and the potential for contaminants to migrate from sources to a selected receptor location (e.g., tributary to the Mahoning River). Modeling results indicate selenium and hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX) could exceed screening criteria beneath the source area; however, no chemicals were predicted to migrate to the selected downgradient surface water receptor location (e.g., headwaters of tributary to the Mahoning River) at concentrations above screening criteria. RDX has never been detected in downgradient monitoring wells since groundwater monitoring began in 2004, and selenium has been detected in a downgradient monitoring well but at concentrations less than screening levels.

5.0 SCOPE AND ROLE OF RESPONSE ACTION

The Reasonable and Anticipated Future Land Use (RAFLU) of the Building 1200 AOC is Military Training (which is equivalent to the National Guard Training Land Use presented in the RI/FS Report). The representative receptor for this RAFLU is the National Guard Trainee. The response action evaluated alternatives to attain this RAFLU for soil, sediment, and surface water. Although Residential Land Use is not anticipated at

RVAAP or this AOC, the response action also evaluated Unrestricted Land Use. The Resident Farmer was evaluated as the representative receptor for Unrestricted Land Use, with the exception of a few chemicals where the National Guard Trainee has lower facility-wide cleanup goals (FWCUGs) than the Resident Farmer.

The preferred alternative for a groundwater remedy will be addressed under the RVAAP Facility-Wide Groundwater AOC as a separate decision. However, the selected remedy for soil, sediment, and surface water at the Building 1200 AOC must also be protective of groundwater.

6.0 SUMMARY OF HUMAN AND ECOLOGICAL RISKS

A human health risk assessment (HHRA) was performed to identify chemicals of concern (COCs) and provide a risk management evaluation to determine COCs requiring remediation based on potential risks to human receptors.

The exposure depths evaluated in the HHRA for the Resident Farmer were surface soil (0-1 ft bgs) and subsurface soil (1-13 ft bgs). The exposure depth for the National Guard Trainee was deep surface soil (0-4 ft bgs). Bedrock is present at 3 ft bgs; therefore, there is no soil exposure below 3 ft bgs for the Resident Farmer subsurface soil (1-13 ft bgs) or the National Guard Trainee deep surface soil (0-4 ft bgs) and subsurface soil (4-7 ft bgs). The 0-3 ft bgs exposure depth for the National Guard Trainee has been characterized using two different sample types during investigations to date. Soil samples from 0-1 ft bgs were collected using the incremental sampling method (ISM) and samples from 1-3 ft bgs were collected using discrete sampling methods. These two sample intervals collected within the deep surface soil exposure depth were evaluated separately. Surface water and sediment were also evaluated.

COCs were determined for each exposure depth based on guidance established in *Facility-Wide Human Health Cleanup Goals for the Ravenna Army Ammunition Plant* (USACE 2010), herein referred to as the FWCUG Report.

Fourteen metals, four explosives, 14 SVOCs, and one VOC were identified as SRCs in surface soil. Risk-based screening identified four metals (aluminum, chromium, cobalt, and manganese), one explosive (RDX), and one SVOC [benzo(a)pyrene] as chemicals of potential concern (COPCs) in surface soil. COPCs were compared to FWCUGs to determine COCs. The manganese concentrations in surface soil (0-1 ft bgs) at ISM sample locations B12ss-016M (4,100 mg/kg), B12ss-017M (2,700 mg/kg), and B12ss-022M (1,800 mg/kg) all exceeded the surface soil background concentration (1,450 mg/kg). Locations B12ss-016M also exceeded the Resident Farmer surface soil FWCUG for manganese (2,927 mg/kg). These locations are shown in Figure 3.

Five metals, one propellant, two SVOCs, and one VOC were identified as SRCs in deep surface soil and subsurface soil. Risk-based screening identified arsenic as the only COPC in deep surface soil and subsurface soil. The COPC was compared to FWCUGs to determine COCs. Arsenic was not identified as a COC because the weight of evidence indicated that soil concentrations were not indicative of AOC contamination. Manganese was not identified as a COC in subsurface soil (1-3 ft bgs). Therefore, there were no COCs identified for soil below than 1 ft bgs.

Seven metals, one propellant, one pesticide, two SVOCs, and two VOCs were identified as SRCs in sediment. Risk-based screening identified three metals (aluminum, chromium, and cobalt) as COPCs in sediment. COPCs were compared to FWCUGs to determine COCs. No COCs were identified for sediment.

Five metals, four explosives, six SVOCs, and two VOCs were identified as SRCs in surface water.

Risk-based screening identified one metal (manganese), two explosives (3-nitrotoluene and RDX), and one SVOC [bis(2-ethylhexyl)phthalate] as COPCs in surface water. COPCs were compared to FWCUGs to determine COCs. No COCs were identified for surface water.

The ecological habitat at the approximately 7.7-acre Building 1200 AOC is dominated by forest and is large enough to support cover and food for small birds and mammals. The habitat to the east and around the former 0.39-acre settling pond is intermittently flooded and recognized as a wetland. The cleared area in the western portion of the AOC continues to be maintained grounds surrounding the former buildings.

Currently, there are no federally listed species or critical habitats on Camp Ravenna. The Building 1200 AOC has not been previously surveyed for state-listed or federally listed species; however, there has been no documentation of threatened or endangered species at the AOC. State-threatened, state species-of-concern, and state special-interest species have been identified at RVAAP. The Building 1200 AOC has not been previously surveyed for rare species.

A Level I ecological risk assessment (ERA) was conducted to evaluate if the AOC had past releases or the potential for current contamination and if important ecological resources exist on or near the AOC. Based on the historical ERA, there were 14 soil chemicals of potential ecological concern (COPECs), five sediment COPECs, and six surface water COPECs.

Important places and resources identified by the U.S. Army and Ohio EPA include wetlands, terrestrial areas used for breeding by large or dense populations of animals, habitats used by threatened and endangered species, state land designated for wildlife or game management, locally important ecological places, and state parks.

The environmental facts and characteristics of the AOC were compared to a list of 39 important/significant places and resources recognized by the U.S. Army and/or Ohio EPA.

Because there is contamination at the Building 1200 AOC and important or ecologically significant resources in the form of a special interest area and wetland are present, the ERA continued to require a Level II Screening Level ERA.

The Level II ERA identified 14 COPECs for soil [aluminum; cadmium; chromium; cobalt; copper; lead; manganese; mercury; selenium; zinc; TNT; octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX); nitrocellulose; and RDX] and five COPECs for sediment (beryllium, mercury, nitrocellulose, lindane, and acetone) based on the historical and PBA08 RI data. The soil and sediment COPECs were further evaluated with technical and refinement factors agreed upon by the U.S. Army and Ohio EPA. The results concluded that there are no chemicals requiring remediation or further evaluations to be conducted to protect the environment. Per guidance from the Ohio EPA, there was sufficient justification to recommend no further action (NFA) for the Building 1200 AOC from the ecological perspective.

7.0 REMEDIAL ACTION OBJECTIVE

The remedial action objective (RAO) references remedial cleanup goals (CUGs) that are considered protective of human health and the environment under current land use and the RAFLU.

The RAO for this remedy is to prevent: National Guard Trainee exposure to COCs above CUGs in soil, sediment, and surface water; adverse ecological effects from previous AOC activities; and negative groundwater impacts from contaminant migration from source media (e.g., soil and sediment). Ohio EPA policy for remedial actions is to attain a target risk of 1E-05 and a hazard index of 1. Manganese concentrations in the 0-1 ft bgs sample interval at B12ss-016M and B12ss-017M were identified as a risk; therefore, evaluation of remedial alternatives was recommended in the RI/FS Report with manganese CUG of 1,800 mg/kg.

Since the approval of the RI/FS Report, guidance has deviated, resulting in a change of the manganese CUG to the surface soil background concentration of 1,450 mg/kg to attain Unrestricted Land Use. This change adds ISM sample location B12ss-022M as an area requiring remediation.

The response action addresses manganese above the CUG in surface soil (0-1 ft bgs) at locations B12ss-016M, B12ss-017M, and B12ss-022M to allow for Unrestricted Land Use. There are no chemicals requiring remediation in soil greater than 1 ft bgs. In addition, no chemicals require remediation in surface water or sediment. Table 1 presents the COCs and CUGs for surface soil under this remedy.

The visual inspection for ACM performed by a certified Asbestos Hazard Evaluation Specialist as part of the RI/FS in 2011 identified a mound approximately 4 ft in height near former Building T-4062. This mound will undergo further investigation as part of the remedial alternative.

Table 1. Chemicals of Concern and Cleanup Goals to Attain Unrestricted Land Use at Building 1200 AOC

Media	Chemicals of Concern (Maximum concentration)	Cleanup Goals ^b	Location and Depth Requiring Remediation
Surface Soil ^a	Manganese (4,100 mg/kg at B12ss-016M)	1,450 mg/kg	B12ss-016M, B12ss-017M, and B12ss-022M at 0-1 ft bgs

^a Inclusive of surface soil (0-1 ft bgs) for the Resident Farmer and deep surface soil (0-4 ft bgs) for the National Guard Trainee. Because 0-1 ft bgs samples were collected using ISM and the 1-3 ft bgs samples were collected using discrete sampling, these intervals were evaluated separately. All concentrations of manganese below 1 ft bgs were below the facility-wide background concentration.

^b Cleanup goal (CUG) for Unrestricted Land Use is the surface soil background concentration.

8.0 SUMMARY OF FEASIBILITY STUDY ALTERNATIVES

The following general response actions (GRAs) were considered in the FS for remediation of contaminated soil at the Building 1200 AOC:

- No action;
- Land use controls and five-year reviews;
- Removal;
- Treatment; and
- Disposal and handling.

Technologies under each GRA were screened and selected for their ability to reduce exposure to contaminants in soil. Because soil contains chemical contamination above CUGs, the technologies were evaluated for their ability to remove or reduce contaminants in the shortest timeframe.

Technologies selected under these GRAs were combined into the following two alternatives for detailed analysis. Costs were estimated for each alternative.

8.1 Alternative 1 – No Action

Cost: \$0

This remedial alternative provides no further remedial action and is required under the NCP as a baseline for comparison with other remedial alternatives. This is not protective of human health for the RAFLU (Military Training) or Unrestricted Land Use. Under this alternative, there is no reduction in toxicity, mobility, or volume of contaminated soil. Access restrictions and environmental monitoring would be discontinued. The Building 1200 AOC would have no legal, physical, or administrative land use controls. Environmental monitoring would not be performed. Since contaminants remain at the AOC that are above levels for Unrestricted Land Use, five-year reviews would be conducted as part of this No Action alternative (USEPA 2001).

8.2 Alternative 2 – Attain Unrestricted Land Use

Estimated Implementation Cost: \$182,882
30-yr Operation and Maintenance (O&M) Cost: \$0

Estimated Total Cost: \$182,882

Actions within the Building 1200 AOC for this alternative includes excavation of surface soil (0-1 ft bgs) within B12ss-016M, B12ss-017M, and B12ss-022M with off-site disposal.

This remedial alternative involves removal and off-site disposal of approximately 225 cubic yards (ex situ) of surface soil with manganese concentrations above the CUG to attain Unrestricted Land Use. There are no COCs in soil below 1 ft bgs, surface water, or sediment; therefore, NFA is recommended for these media.

Prior to excavation, delineation sampling will be conducted to further refine the volume of soil requiring removal. Additionally, waste characterization samples will be collected to determine if the soil will be disposed as nonhazardous or characteristically hazardous waste. Using current data and site knowledge, it is assumed that the soil will be considered nonhazardous waste.

Soil that exceeds the manganese CUG at locations B12ss-016M, B12ss-017M, and B12ss-022M will be removed (Figure 3) by mechanical equipment and disposed off-site. Confirmation samples will be collected. Once CUGs are attained, the excavated areas will be backfilled with clean soil and re-vegetated.

The asbestos visual inspection performed as part of the RI/FS in 2011 did not identify any ACM on the ground surface at the AOC. However, the inspection recommended further investigation of a 4 ft high mound near the footprint of former Building T-4062. The investigation of this mound will include sampling to see if ACM is present.

If ACM is present within the mound and it is determined to be a risk requiring a remedy, the remedial design will be updated to address ACM removal, and the remedial activities will include removal and disposal of the mound.

Successful implementation of this alternative will attain Unrestricted Land Use. There is no O&M period following the remedial action because Unrestricted Land Use is achieved. The U.S. Army and OHARNG will not be required to develop and implement land use controls. Five-year reviews in accordance with CERCLA 121(c) are not required following the remedy.

9.0 EVALUATION OF FEASIBILITY STUDY ALTERNATIVES

The alternatives were evaluated with respect to the nine comparative analysis criteria, as outlined by CERCLA (Table 2). The nine criteria are categorized into three groups: threshold criteria, primary balancing criteria, and modifying criteria. These criteria are as follows.

Threshold Criteria – must be met for the alternative to be eligible for selection as a remedial option.

Primary Balancing Criteria – used to weigh major trade-offs among alternatives.

Modifying Criteria – may be considered to the extent information is available during development of the FS but can be fully considered only after public comment on this PP.

The comparative analysis evaluates the relative performance of Alternatives 1 and 2 with respect to each of the nine criteria. Identifying the advantages and disadvantages of each alternative, relative to one another, helps to identify the relative strengths of the preferred alternative. These strengths, combined with risk management decisions made by the U.S. Army and Ohio EPA, as well as input from the community, will serve as the basis for selecting the remedy.

Table 2. CERCLA Evaluation Criteria

Overall Protection of Human Health and the Environment – considers whether or not an alternative provides adequate protection and describes how risks posed through each pathway are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) – considers how a remedy will meet all the applicable or relevant and appropriate requirements of other federal and state environmental statutes and/or provide grounds for invoking a waiver.

Long-term Effectiveness and Permanence – considers the magnitude of residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time once cleanup goals have been met.

Reduction of Toxicity, Mobility, or Volume Through Treatment – considers the anticipated performance of the treatment technologies that may be employed in a remedy.

Short-term Effectiveness – considers the speed with which the remedy achieves protection, as well as the potential to create adverse impacts on human health and the environment that may result during the construction and implementation period.

Implementability – considers the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement the chosen solution.

Cost – considers capital costs and operation and maintenance costs associated with the implementation of the alternative.

State Acceptance – indicates whether the state concurs with, opposes, or has no comment on the preferred alternative.

Community Acceptance – will be addressed in the Record of Decision (ROD) following a review of the public comments received on the remedial investigation (RI) report, focused feasibility study (FS) report, and the Proposed Plan (PP).

Table 3 summarizes the comparative analysis of remedial alternatives for the Building 1200 AOC from the FS. Criterion 1, Overall Protectiveness of Human Health and the Environment, is rated as either protective or not protective. Criterion 2, Compliance with Applicable or Relevant and Appropriate Requirements (ARARs), is rated as either compliant or not compliant. The remaining seven criteria are rated as high, medium, or low. A rating of high indicates the alternative performs the best, and a rating of low indicates the alternative performs the worst. An alternative with a high cost is scored “low” (worst) under Criterion 7, Cost.

Alternative 1, No Action, will provide no protection of human health or the environment from the AOC contaminants beyond current conditions. No effort will be taken to prevent or minimize human or ecological exposure to contaminated soil. Concentrations of contaminants could pose future risk to both the National Guard Trainee and Resident Farmer.

Alternative 2 is considered protective regarding overall human health and the environment and is compliant with ARARs. The long-term effectiveness and permanence is “high,” as the alternative attains the RAFLU and Unrestricted Land Use by removing contaminated soil. The reduction of toxicity, mobility, or volume through treatment is considered “medium.” No treatment is implemented, but the mobility of COCs is reduced given the excavated soil is disposed of at an off-site facility equipped with engineering controls. The short-term effectiveness is considered “medium,” as the soil removal presents short-term risk to workers, the community, and the environment during excavation and transportation of soil. Implementability is considered “medium,” as Alternative 2 can be readily and quickly implemented. The estimated cost of \$182,882 is ranked as “medium.”

Table 3. Comparative Analysis of Remedial Alternatives				
NCP Evaluation Criteria^a	Alternative 1 – No Action		Alternative 2 – Attain Unrestricted Land Use	
Threshold Criteria	Result		Result	
1. Overall Protectiveness of Human Health and the Environment	Not protective		Protective	
2. Compliance with ARARs	Not compliant		Compliant	
Balancing Criteria	Result		Result	
3. Long-term Effectiveness and Permanence	Low	1	High	3
4. Reduction of Toxicity, Mobility, or Volume through Treatment	Low	1	Medium	2
5. Short-term Effectiveness	High	3	Medium	2
6. Implementability	High	3	Medium	2
7. Cost	High	3	Medium	2
Balancing Criteria Score	11		11	
^a Criterion 1, Overall Protectiveness of Human Health and the Environment, is rated as either protective or not protective. Criterion 2, Compliance with ARARs, is rated as either compliant or not compliant. The remaining five criteria are rated as high (alternative that performs the best), medium (moderate alternative performance), or low (alternative that performs the worst) Scoring for the Balancing Criteria is as follows: High = 3, Medium = 2, Low = 1 ARAR = Applicable or Relevant and Appropriate Requirement NCP = National Oil and Hazardous Substances Pollution Contingency Plan				

10.0 PREFERRED FEASIBILITY STUDY ALTERNATIVE

The U.S. Army, in coordination with Ohio EPA, is recommending Alternative 2 (Attain Unrestricted Land Use) to be implemented as the remedial action at the Building 1200 AOC. Alternative 1 (No Action) was also evaluated. However, Alternative 1 was eliminated from consideration since it is not protective of human health and not compliant with ARARs. Alternative 2 is protective for the RAFLU, supports military mission training use and is also protective for Unrestricted Land Use. This alternative is cost effective and can be performed in a timely manner. Mitigation measures (e.g., dust control, storm water controls, site housekeeping activities, and covering and cleaning haul trucks) during excavation activities minimize and/or eliminate all potential risks to workers and the community.

Based on the available risk assessment information, the preferred alternative will achieve the RAO.

This recommendation is not a final decision. The U.S. Army, in coordination with Ohio EPA, will select the remedy for the Building 1200 AOC after reviewing and considering all comments submitted during the 30-day public comment period.

11.0 COMMUNITY PARTICIPATION

11.1 Community Participation

Public participation is an important component of the remedy selection. The U.S. Army, in coordination with Ohio EPA, is soliciting input from the community on the preferred alternative. The comment period extends from July 25, 2013 to August 23, 2013. This period includes a public meeting at which the U.S. Army will present this PP. The U.S. Army will accept both oral and written comments at this meeting.

11.2 Public Comment Period

The 30-day comment period is from July 25, 2013 to August 23, 2013, and provides an opportunity for public involvement in the decision-making process for the proposed action. The public is encouraged to review and comment on this PP. All public comments will be considered by the U.S. Army and Ohio EPA before selecting a remedy. During the comment period, the public is encouraged to review documents pertinent to the Building 1200 AOC.

This information is available at the Information Repositories and online at www.rvaap.org. To obtain further information, contact the Camp Ravenna Environmental Office.

INFORMATION REPOSITORIES

Reed Memorial Library

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

Hours of operation:

9AM – 9PM Monday – Thursday
9AM – 6PM Friday
9AM – 5PM Saturday
1PM – 5PM Sunday

Newton Falls Public Library

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

Hours of operation:

10AM – 8PM Tuesday – Friday
9AM – 5PM Friday and Saturday

11.3 Written Comments

If the public would like to comment in writing on this PP or other relevant issues, please deliver comments to the U.S. Army at the public meeting or mail written comments (postmarked no later than August 23, 2013).

**POINT OF CONTACT FOR
WRITTEN COMMENTS**

Camp Ravenna Environmental Office
1438 State Route 534 SW
Newton Falls, OH 44444

11.4 Public Meeting

The U.S. Army will hold an open house and public meeting for this PP on August 7, 2013, at 6:00PM, in the Paris Township Hall to accept comments. This meeting will provide an opportunity for the public to comment on the proposed action. Comments made at the meeting will be transcribed.

11.5 U.S. Army Review of Public Comments

The U.S. Army will review the public's comments as part of the process in reaching a final decision on the most appropriate action to be taken.

A Responsiveness Summary, a document that summarizes the U.S. Army's responses to comments received during the public comment period, will be included in the Record of Decision (ROD). The U.S. Army's final choice of action will be documented in the ROD. The ROD will be added to the RVAAP Administrative Record and Information Repositories.

ADMINISTRATIVE RECORD FILE

Camp Ravenna Joint Military Training Center (former Ravenna Army Ammunition Plant)

Building 1037
8451 State Route 5
Ravenna, Ohio 44266-9297
(330) 358-7311
Fax: (330) 358-7314

Note: Access is restricted to the Camp Ravenna, but the file can be obtained or viewed with prior notice to Camp Ravenna.

GLOSSARY OF TERMS

Administrative Record: a collection of documents, typically as reports and correspondence, generated during site investigation and remedial activities. Information in the Administrative Record represents the information used to select the preferred alternative. It is available for public review at the Ravenna Army Ammunition Plant, Building 1037; call (330) 358-7311 for an appointment.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA): a federal law passed in 1980, commonly referred to as the Superfund Program. It provides liability, compensation, cleanup, and emergency response in connection with the cleanup of inactive hazardous substance release sites that endanger public health or the environment.

Chemical of Concern (COC): chemical substances specific to an AOC that potentially pose significant human health or ecological risks. COCs are typically further evaluated for remedial action.

Ecological Receptor: a plant, animal, or habitat exposed to an adverse condition.

Exposure Point Concentration: a value used in the HHRA and ERA to quantify exposures for all or part of an AOC.

Exposure Unit: a location or area where a receptor may move at random and come into contact with an environmental medium (e.g., soil, surface water, and/or sediment).

Feasibility Study (FS): a CERCLA document that reviews and evaluates multiple remedial technologies under consideration at a site. It also identifies the preferred remedial action alternative.

Five-Year Review: a review conducted to determine whether each AOC remedy remains protective of human health and the environment and functions as intended based on the decision documents.

Human Receptor: a hypothetical person, based on current or potential future land use, who may be exposed to an adverse condition. For example, a Resident Farmer is considered to be the most sensitive human receptor under future Unrestricted Land Use in this PP.

National Oil and Hazardous Substances Pollution Contingency Plan (NCP): the set of regulations that implement CERCLA and address responses to hazardous substances and pollutants or contaminants.

Property Management Plan (PMP): a management document to help manage land use controls established to protect human health and the environment at AOCs and management response sites. A PMP presents defined land uses and land use restrictions to ensure the property assumptions are appropriate or will remain appropriate through restrictions in the future.

Reasonable and Anticipated Future Land Use (RAFLU): the U.S. Army projected land use for an AOC that identifies potential future receptors, HHRA's for those future receptors, and remedial decisions to be protective of those future receptors.

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

Remedial Action Objective (RAO): these specific goals, developed from the evaluation of applicable or relevant and appropriate requirements, are to be protective of human health and the environment.

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

Responsiveness Summary: a section of the ROD where the U.S. Army documents and responds to written and oral comments received from the public about the PP.

Risk Assessment: an evaluation that determines potential harmful effects, or lack thereof, posed to human health and the environment due to exposure to chemicals found at a CERCLA site.

Target Risk: the Ohio EPA (2009) identifies $1E-05$ (1×10^{-5}) as a target for cancer risk for carcinogens and an acceptable target hazard index of 1 for non-carcinogens.

REFERENCES

MKM (MKM Engineers, Inc.) 2005. *Thermal Decomposition and Demolition of Load Line 11 and Buildings F-15, 1200, S-4605, and T-4602 at the Ravenna Army Ammunition Plant*. December 2005.

MKM 2007. *Characterization of 14 AOCs at Ravenna Army Ammunition Plant*. March 2007.

Ohio EPA (Ohio Environmental Protection Agency) 2004. *Director's Final Findings and Orders in the matter of US Army, Ravenna Army Ammunition Plan*, June 2004.

Ohio EPA 2009. *Technical Decision Compendium: Human Health Cumulative Carcinogenic Risk and Non-carcinogenic Hazard Goals for DERR Remedial Response Program*. August 2009.

USACE (United States Army Corps of Engineers) 1996. *Preliminary Assessment for the Characterization of Areas of Contamination at the Ravenna Army Ammunition Plant, Ravenna, Ohio*. February 1996.

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

USACE 2010. *Facility-Wide Human Health Cleanup Goals for the Ravenna Army Ammunition Plant, RVAAP, Ravenna, Ohio*. March 2010.

USACE 2012. *Remedial Investigation/ Feasibility Study Report for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200, Ravenna Army Ammunition Plant, Ravenna, Ohio*. March 2012.

USEPA (United States Environmental Protection Agency) 2001. *Comprehensive Five-Year Review Guidance*. OSWER No. 9355.7-03B-P, June 2001.

FIGURES

THIS PAGE INTENTIONALLY LEFT BLANK.

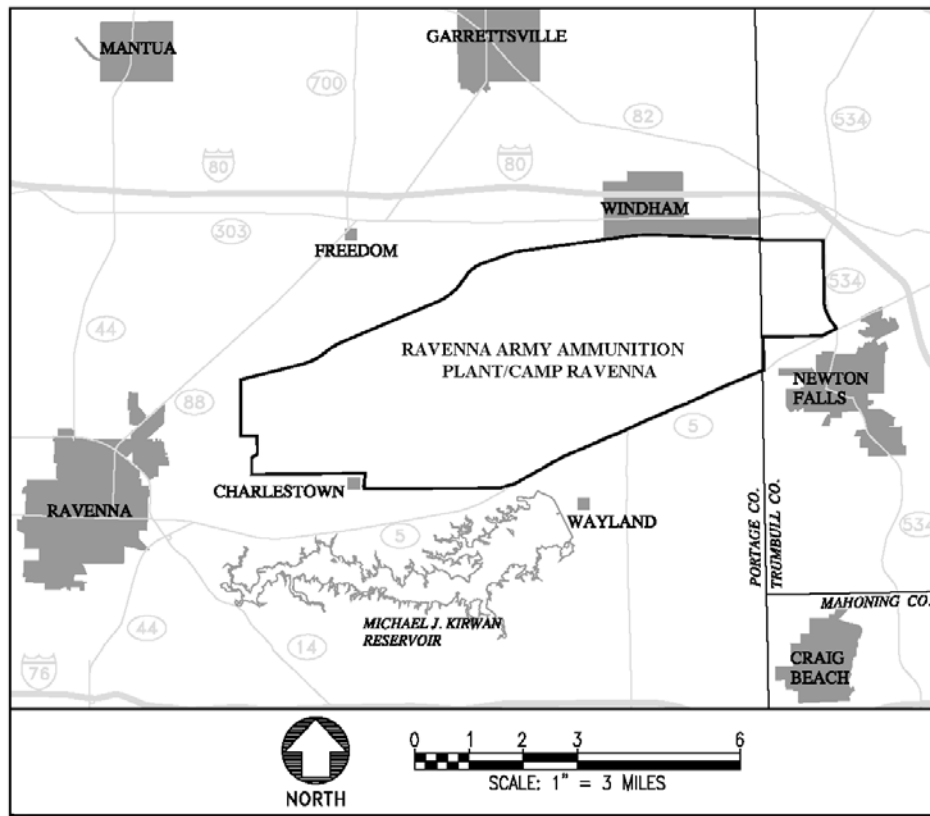
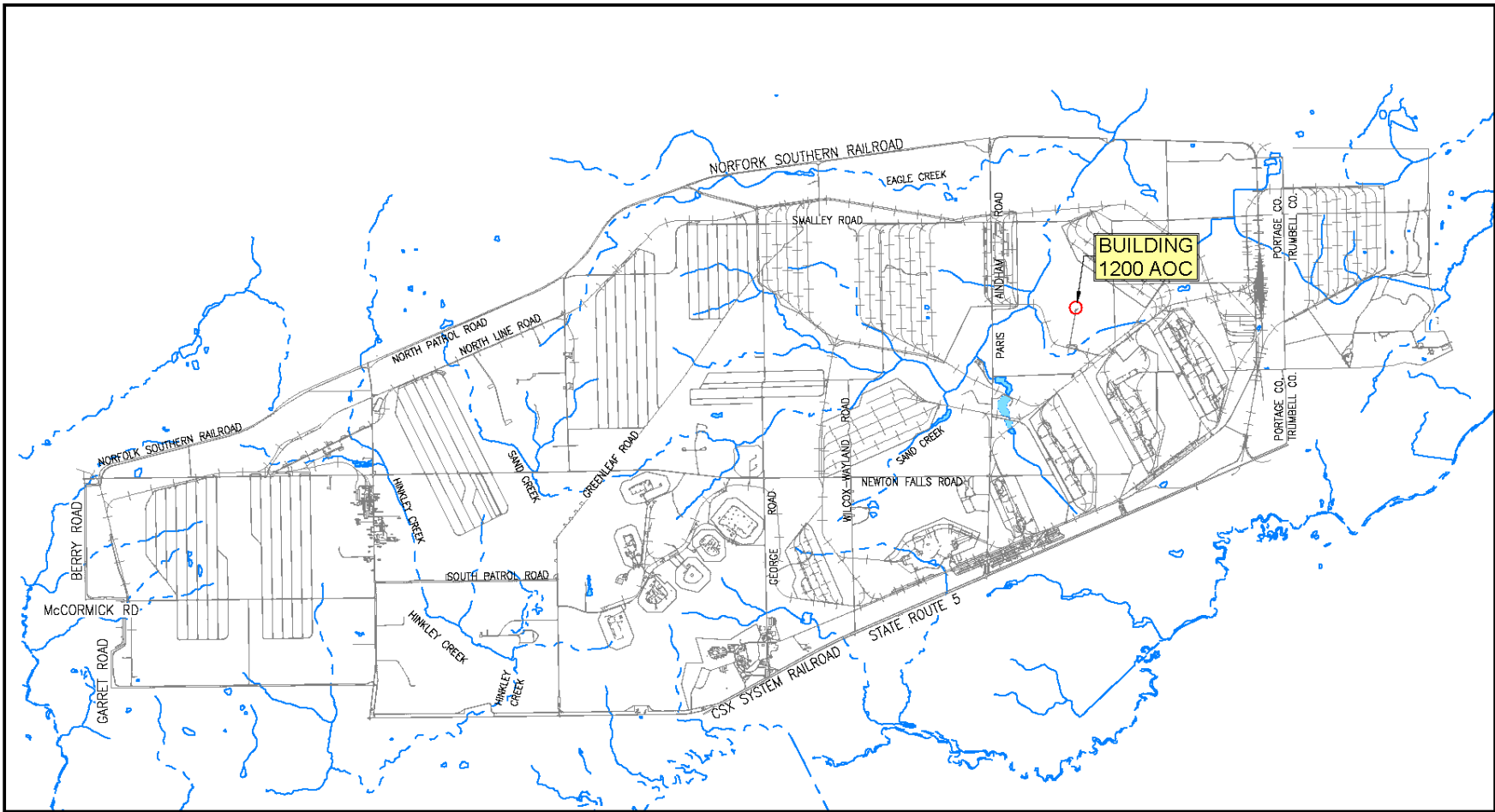
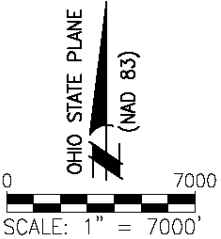


Figure 1. General Location and Orientation of RVAAP/Camp Ravenna



LEGEND:

- ASPHALT ROAD
- RAILROAD TRACKS
- x-x-x- FENCE LINE
- ~~~~~ STREAMS



US Army Corps of Engineers
Louisville District



**BUILDING 1200
RAVENNA ARMY AMMUNITION
PLANT - RAVENNA, OHIO**

DRAWN BY: P. HOLM	REV. NO./DATE: 0/02-28-11	CAD FILE: 08042/DWGS/K66B1200-FIG-2
----------------------	------------------------------	--

Figure 2. RVAAP/Camp Ravenna Installation Map

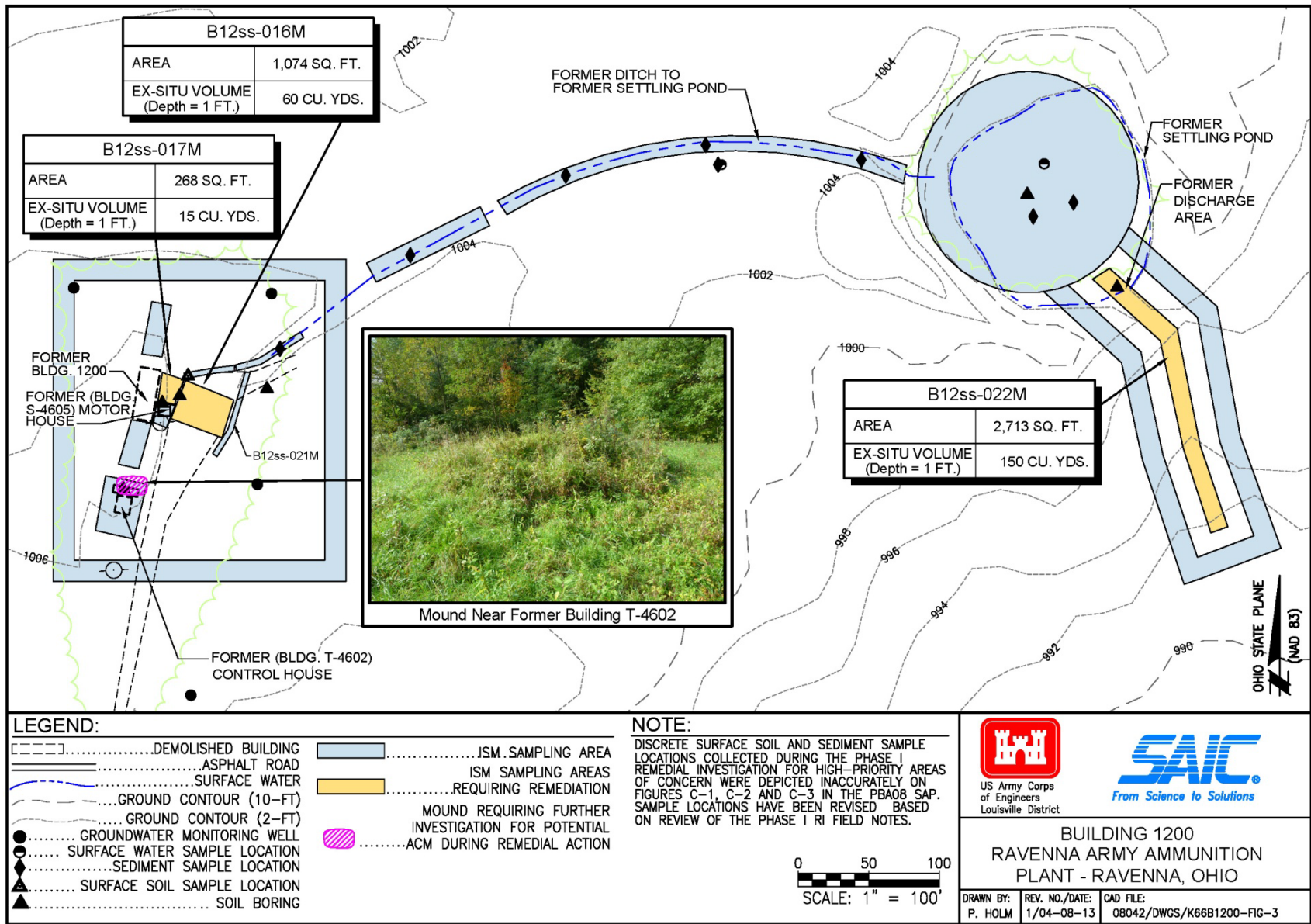


Figure 3. Building 1200 AOC Site Features

THIS PAGE INTENTIONALLY LEFT BLANK.

COMMENT RESPONSE TABLES

THIS PAGE INTENTIONALLY LEFT BLANK.

**DRAFT PROPOSED PLAN FOR SOIL, SEDIMENT, AND SURFACE WATER AT THE RVAAP-13 BUILDING 1200
RAVENNA ARMY AMMUNITION PLANT, RAVENNA OHIO
COMMENT RESPONSE TABLE ~ REVISION 0**

Comment Number	Page or Sheet	Comment	Recommendation	Response
<i>Ohio EPA</i>				
O-1.	Page 1, Line 9	The text states that Building 1200 is designated as RVAAP-12. It should be RVAAP-13		Agree. Text has been corrected.
O-2.	Page 6, Line 1 & Table 1	The Cleanup Goal (CUG) for manganese of 1,800 mg/kg is incorrect. This CUG was established in a previous document and was based on “mounted training, no digging.” The correct CUG to use, based on background concentrations, is 1,450 mg/kg		<p>Agree. Use of the precedent CUG was approved in the Final Building 1200 RI/FS Report. However, recognizing that guidance established since the approval of the RI/FS Report is to limit the use of precedent CUGs only to those receptors (e.g., National Guard Trainee) and activities (e.g., digging, no digging) for which they were originally established, the CUG for manganese has been revised to 1,450 mg/kg. Accordingly, the following changes to the report have been made:</p> <ol style="list-style-type: none"> 1) Location B12ss-022M has been added to the recommended removal area. 2) The removal volumes have been increased to account for newly added location B12ss-022M. 3) The cost estimate has been updated from the cost estimate provided in the final RI/FS Report to account for this additional removal area. 4) The CUG has been changed to the background concentration of 1,450 mg/kg.
O-3.	Page 6, Lines 10 to 11, & Page 7, Line 34	Based on the correct CUG of 1,450 mg/kg, another sample exceeds this concentration and this area will also need to be remediated. Sample BS12ss-022M had a concentration of 1,800 mg/kg.		Agree. The CUG has been revised to 1,450 mg/kg. See response to comment O-2 for further discussion on the recommended remedy. In addition, the remedy will include delineation sampling to segment ISM area B12ss-022M and refine the area and volume of soil that requires excavation.

**DRAFT PROPOSED PLAN FOR SOIL, SEDIMENT, AND SURFACE WATER AT THE RVAAP-13 BUILDING 1200
RAVENNA ARMY AMMUNITION PLANT, RAVENNA OHIO
COMMENT RESPONSE TABLE ~ REVISION 0**

Comment Number	Page or Sheet	Comment	Recommendation	Response
O-4.	Page 16, Figure 3	Please include the location of the mound to be evaluated for asbestos containing material (ACM) and the area that includes sample B12ss-022M (highlighted in orange – “Requiring Remediation”).		Agree. The location and a photo of the mound requiring evaluation of ACM has been added to Figure 3. Please see response to comment O-2 for the recommended remedial action.

ADDITIONAL REVISIONS TO DOCUMENT

Revisions have been made to this Final Proposed Plan consistent with resolutions of Ohio EPA’s 18 Universal Comments for the 2008 Performance-Based Acquisition RI/FS Report, dated 21 September 2012. In addition, since the date the Draft Proposed Plan was issued, the Army National Guard has assumed lead responsibility for execution of the RVAAP Installation Restoration Program. As such, Army program staff and the Army National Guard Staff Judge Advocate office conducted a review of the Draft Proposed Plan concurrent with Ohio EPA’s review. Notable changes are as follows:

- 1) The Reasonable and Anticipated Future Land Use for Anchor Test Area is defined as “Military Training,” consistent with the *Draft Technical Memorandum for Risk Assessment Issues: Land Uses and Facility-Wide Cleanup Goals*, dated 25 March 2013.
- 2) The previous Alternative 2 was named “Attain National Guard Training and Residential Land Use.” As resolved for the Ohio EPA’s 18 Universal Comments, that alternative been re-named “Attain Unrestricted Land Use.” Text has been put in the Proposed Plan to explain that Unrestricted Land Use is based on the Resident Farmer receptor, with exception of a few chemicals where another receptor has lower FWCUGs than the Resident Farmer. In addition, text has been added to the revised Proposed Plan to explain the change of the alternative name from the final RI/FS Report.
- 3) A review was performed to identify and correct any inconsistencies in the “deep surface soil” exposure depth terminology. Deep surface soil refers to the 0–4 ft bgs exposure depth for the National Guard Trainee. Because the 0-4 ft bgs deep surface soil exposure depth was characterized using two different sample types (ISM and discrete samples), the HHRA refers to the 0–1 ft bgs ISM sample interval collected within the deep surface soil exposure depth and the 1–4 ft discrete sample interval collected within the deep surface soil exposure depth. Per the FWHHRAM, the following terms are consistently used: Surface soil = 0–1 ft bgs (for Resident Farmer), deep surface soil = 0–4 ft bgs (for National Guard Trainee), subsurface soil = 1–13 ft bgs (for Resident Farmer), subsurface soil = 4–7 ft bgs (for National Guard Trainee).
- 4) In the Nature and Extent discussion, references to “deep surface soil,” “shallow soil,” and “shallow surface soil,” and other risk/exposure depth terms are removed because this section addresses soil contaminants only on the basis of SRCs within surface soil (0–1 ft bgs) and subsurface soil (all depths > 1 ft bgs). This dependency is due to separate RVAAP background values for surface soil (0–1 ft bgs) and subsurface soil (all depths greater than 1 ft bgs).
- 5) Revisions to contact information (e.g., contacting the Camp Ravenna Environmental Office) within the Proposed Plan now align with that presented in the Final Proposed Plan for the Ramsdell Quarry Landfill.