Final

Record of Decision
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:

Leidos Engineering of Ohio, Inc.
8866 Commons Boulevard, Suite 201
Twinsburg, Ohio 44087

March 18, 2014

REPORT DOCUMENTATION PAGE

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Jed Thomas, PE

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13. SUPPLEMENTARY NOTES

None.

14. ABSTRACT

This Record of Decision presents remedial alternatives and the selected remedy for soil, sediment, and surface water within the Building 1200 area of concern. The selected remedy (Alternative 2: Attain Unrestricted [Residential] Land Use) involves the removal of 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 in subsurface soil, surface water, and sediment; therefore, no further action is required for these media.

15. SUBJECT TERMS

record of decision, remedial alternatives, selected remedy, no further action

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
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OhioEPA

May 16, 2014

Mr. Kevin Sedlak
Restoration Project Manager
Camp Ravenna
1438 State Route 534 SW
Newton Falls, OH 44444

Re: Approval and for the "Final Record of Decisions for Soil, Sediment, and Surface Water at the RVAAP-48 Anchor Test Area (Work Activity No. 267-000859-109) and RVAAP-13 Building 1200 (Work Activity No. 267-000859-188), Ravenna Army Ammunition Plant, Ravenna, Ohio," Dated March 18, 2014.

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received, reviewed, and signed the documents entitled, "Final Record of Decision for Soil, Sediment, and Surface Water at the RVAAP-13 Building 1200, Ravenna Army Ammunition Plant, Ravenna, Ohio," dated March 18, 2014, and "Final Record of Decision for Soil, Sediment, and Surface Water at the RVAAP-48 Anchor Test Area, Ravenna Army Ammunition Plant, Ravenna, Ohio," dated March 18, 2014. These documents, received by Ohio EPA's NEDO on March 19, 2014, was prepared for the U.S. Army Corps of Engineers (USACE) Louisville District, by Leidos Engineering of Ohio, Inc.

Ohio EPA has provided two signed copies of each final report. Please provide the appropriate signature to the enclosed documents and return one copy of each to the Ohio EPA.

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If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1249.

Sincerely,

Andrew C. Kocher
Site Coordinator
Division of Environmental Response and Revitalization

ACK/nvr

enclosures

cc: Brett Merkel, Army National Guard Directorate
Haney/Harris, Vista Sciences, Newton Falls
Gregory F. Moore, USACE, Louisville District

ec: Rod Beals, Ohio EPA, NEDO, DERR
Nancy Zikmanis, Ohio EPA, NEDO, DERR

Final

Record of Decision
for Soil, Sediment, and Surface Water
at RVAAP-13 Building 1200

Ravenna Army Ammunition Plant
Ravenna, Ohio

Contract No. W912QR-04-D-0028
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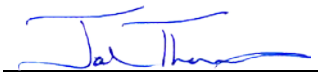
Prepared for:
U.S. Army Corps of Engineers
600 Martin Luther King, Jr. Place
Louisville, Kentucky 40202

Prepared by:
Leidos Engineering of Ohio, Inc.
8866 Commons Boulevard, Suite 201
Twinsburg, Ohio 44087

March 18, 2014

CONTRACTOR STATEMENT OF INDEPENDENT TECHNICAL REVIEW

Leidos has completed the Record of Decision 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

3/18/14
Date

W. Kevin Jago, PG
Independent Technical Review Team Leader

3/18/14
Date

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

Internal Leidos Independent Technical Review was conducted on the 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 Leidos Independent Technical Review comments are recorded on a Document Review Record per Leidos 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
Senior Program Manager

3/18/14
Date

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

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ARNG = Army National Guard
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Ohio EPA CO = Ohio Environmental Protection Agency Central Office
Ohio EPA DERR = Ohio Environmental Protection Agency Division of Environmental Response and Revitalization
REIMS = Ravenna Environmental Information Management System
USACE = United States Army Corps of Engineers

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ACRONYMS AND ABBREVIATIONS

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
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Act Information System
cm/s	centimeters per second
COC	Chemical of Concern
COPEC	Chemical of Potential Ecological Concern
CSM	Conceptual Site Model
CUG	Cleanup Goal
ERA	Ecological Risk Assessment
FS	Feasibility Study
ft	feet
ft^2	square feet
FWCUG	Facility-wide Cleanup Goal
HHRA	Human Health Risk Assessment
IRP	Installation Restoration Program
ISM	Incremental Sampling Method
LUC	Land Use Control
MCL	Maximum Contaminant Level
mg/kg	milligrams per kilogram
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
OHARNG	Ohio Army National Guard
Ohio EPA	Ohio Environmental Protection Agency
O&M	Operation and Maintenance
PP	Proposed Plan
RAO	Remedial Action Objective
RD	Remedial Design
RI	Remedial Investigation
ROD	Record of Decision
RSL	Regional Screening Level
RVAAP	Ravenna Army Ammunition Plant
SRC	Site-related Contaminant
SVOC	Semi-volatile Organic Compound
TCLP	Toxicity Characteristic Leaching Procedure

ACRONYMS AND ABBREVIATIONS (continued)

USACE	United States Army Corps of Engineers
U.S. Army	United States Department of the Army
USEPA	United States Environmental Protection Agency
USP&FO	United States Property and Fiscal Officer
yd^3	cubic yard

PART I: THE DECLARATION

A. SITE NAME AND LOCATION

This Record of Decision (ROD) addresses soil, sediment, and surface water contaminants at the Building 1200 area of concern (AOC) at the former Ravenna Army Ammunition Plant (RVAAP) in Ravenna, Ohio (Figures 1 and 2). The Building 1200 AOC is designated as RVAAP-13.

The facility, consisting of 21,683 acres, is located in northeastern Ohio within Portage and Trumbull counties, approximately 4.8 kilometers (3 miles) east/northeast of the City of Ravenna and approximately 1.6 kilometers (1 mile) northwest of the City of Newton Falls. The facility, previously known as RVAAP, was formerly used as a load, assemble, and pack facility for munitions production. As of September 2013, administrative accountability for the entire acreage of the facility has been transferred to the United States Property and Fiscal Officer (USP&FO) for Ohio and subsequently licensed to the Ohio Army National Guard (OHARNG) for use as a military training site (Camp Ravenna). References in this document to RVAAP relate to previous activities at the facility as related to former munitions production activities or to activities being conducted under the restoration/cleanup program.

The Building 1200 AOC is located in the eastern portion of the facility. The Comprehensive Environmental Response, Compensation, and Liability Act Information System (CERCLIS) Identifier for the former RVAAP is OH5210020736.

B. STATEMENT OF BASIS AND PURPOSE

The U.S. Department of the Army (U.S. Army) is the lead agency and has chosen the selected remedy for the Building 1200 AOC in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986, and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision is based on information contained in the Administrative Record file for the AOC.

The Ohio Environmental Protection Agency (Ohio EPA), the supporting state regulatory agency, approved the *Remedial Investigation/Feasibility Study Report for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200* (USACE 2012) and *Proposed Plan for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200* (USACE 2013). The remedial investigation/feasibility study (RI/FS) report evaluated contaminated soil, surface water, and sediment at the Building 1200 AOC. The RI/FS report and proposed plan (PP) recommended removing an estimated 225 yd^3 of surface soil [0-1 ft below ground surface (bgs)] from three areas within the AOC with off-site disposal to attain Unrestricted (Residential) Land Use. Ohio EPA concurs with the selected remedy and that it satisfies the requirements of the Ohio EPA *Director's Final Findings and Orders*, dated June 10, 2004 (Ohio EPA 2004).

C. ASSESSMENT OF THE SITE

The response action selected in this ROD is necessary to protect public health, welfare, and the environment from actual or potential releases of hazardous substances into the environment.

D. DESCRIPTION OF THE SELECTED REMEDY

The future use for the Building 1200 AOC is Military Training Land Use. Manganese was identified as a chemical of concern (COC) for the Representative Receptor (National Guard Trainee) and Resident Receptor in soil. No action is required to attain remedies for sediment or surface water at this AOC.

The selected remedy for the Building 1200 AOC is Alternative 2: Attain Unrestricted (Residential) Land Use, which involves removing surface soil (0-1 ft bgs) at locations B12ss-016M, B12ss-017M, and B12ss-022M with off-site disposal (Figure 3). The selected remedy was chosen because it is protective for all receptors (including the National Guard Trainee and Resident Receptor), is cost effective, and can be performed in a timely manner. The following is a brief list of activities associated with Alternative 2.

- Contaminated soil from locations B12ss-016M, B12ss-017M, and B12ss-022M at 0 to 1 ft bgs will be excavated.
- An estimated 225 yd^3 of excavated soil will be disposed at an off-site facility licensed and permitted to accept these wastes.
- Confirmation sampling will be conducted to determine whether cleanup goals (CUGs) have been attained.
- Successfully remediated areas will be graded and backfilled with clean soil and seeded.

The selected remedy will achieve a requisite level of protectiveness for the AOC. The cost for the selected remedy is estimated to be $182,882. The U.S. Army will not be required to develop and implement land use controls (LUCs) and five-year reviews, as this remedy attains Unrestricted (Residential) Land Use.

E. STATUTORY DETERMINATIONS

The selected remedy protects human health and the environment, complies with federal and state laws and regulations that are applicable or relevant and appropriate to the remedial action, is cost effective, and utilizes permanent solutions to the maximum extent practicable.

The selected remedy does not satisfy the statutory preference for treatment. The treatment technologies evaluated for soil contaminated with manganese were not found to be feasible or were cost prohibitive for implementation at the Building 1200 AOC, as noted in the approved RI/FS.

Because the selected remedy will not result in hazardous substances, pollutants, or contaminants remaining on site above levels that allow for Unrestricted (Residential) Land Use, five-year reviews will not be required for this remedial action.

F. RECORD OF DECISION DATA CERTIFICATION CHECKLIST

Table 1 provides the location of key remedy selection information contained in Part II, Decision Summary. Additional information can be found in the Administrative Record file for the Building 1200 AOC.

Table 1. ROD Data Certification Checklist

ROD Data Checklist Item	ROD Section	Page
COCs and their respective concentrations	II.G	13, 14
Baseline risk represented by the COCs	II.G	13, 14
Cleanup goals established for COCs and the basis for these goals	II.G	13, 14
How source materials constituting principal threats are addressed	II.K	18, 19
Current and reasonably anticipated future land use assumptions used in the baseline risk assessment and ROD	II.F	12, 13
Suitable potential land uses, following the selected remedy	II.L.4	21
Estimated capital and the total present worth costs, discount rate, and the number of years over which the remedy cost estimates are projected	II.J.7 II.L.3	18 21
Key factor(s) that led to selecting the remedy	II.L.1	19

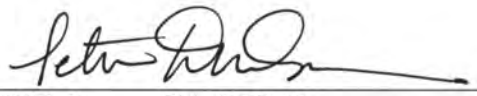
COC = Chemical of concern.
ROD = Record of Decision.

G. AUTHORIZING SIGNATURES AND SUPPORTING STATE REGULATORY AGENCY ACCEPTANCE OF REMEDY

1 June 2014

John P. Dernberger
COL, NGB
USPFO for Ohio

Date



7/14/2014

Peter Whitehouse, Chief DERR
Ohio Environmental Protection Agency

Date

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PART II: DECISION SUMMARY

A. SITE NAME, LOCATION, AND DESCRIPTION

The facility (CERCLIS Identification Number OH5210020736), consisting of 21,683 acres, is located in northeastern Ohio within Portage and Trumbull counties, approximately 4.8 kilometers (3 miles) east/northeast of the City of Ravenna and approximately 1.6 kilometers (1 mile) northwest of the City of Newton Falls. The facility, previously known as the RVAAP, was formerly used as a load, assemble, and pack facility for munitions production. As of September 2013, administrative accountability for the entire acreage of the facility has been transferred to the USP&FO for Ohio and subsequently licensed to OHARNG for use as a military training site (Camp Ravenna). References in this document to RVAAP relate to previous activities at the facility as related to former munitions production activities or to activities being conducted under the restoration/cleanup program.

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 Camp Ravenna. A site map of the Building 1200 AOC is presented in Figure 3. From 1941 to 1971, three buildings served as a quality assurance inspection station that encompassed disassembly of production line munitions items from explosive melt-pour operations. 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 U.S. Army is the lead agency and is responsible for any remediation, decisions, and cleanup at the Building 1200 AOC. These activities are being funded and conducted under the Installation Restoration Program (IRP). The Ohio EPA is the supporting state regulatory agency.

B. SITE HISTORY AND ENFORCEMENT ACTIVITIES

The former RVAAP was constructed in 1940 and 1941 for depot storage and ammunition assembly/loading and placed on standby status in 1950. Production activities resumed from 1954 to 1957 and 1968 to 1972. Demilitarization activities, including disassembly of munitions and explosives melt-out and recovery, continued until 1992.

Quality assurance inspection operations conducted at the AOC included disassembly and inspection of production line munitions items. 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 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. Historical records and field investigations for the AOC have not shown evidence of a discharge drainage ditch exiting the settling pond and flowing to a surface water body. Former buildings at the AOC also include Buildings S-4605 and T-4602. Building S-4605 functioned as a motor house and was approximately 69 ft^2. T-4602 operated as a control house and was approximately 117 ft^2.

Since 1989, the Building 1200 AOC has been included in various historical assessments and investigations conducted at the former RVAAP. The following historical environmental investigations have been completed for the Building 1200 AOC:

- Resource Conservation and Recovery Act (RCRA) Facility Assessment (Jacobs 1989),
- Preliminary Assessment for the Characterization of Areas of Contamination (USACE 1996),
- Phase I Remedial Investigation Report for High-Priority Areas of Concern (USACE 1998), and
- Characterization of 14 AOCs (MKM 2007).

In 2010, the PBA08 Remedial Investigation (PBA08 RI) was implemented to supplement historical data available for the AOC and support the development of the RI/FS report. The results of the PBA08 RI sampling were combined with applicable results of previous sampling events to evaluate the nature and extent of contamination, examine contaminate fate and transport, conduct risk assessments, and evaluate potential remedial alternatives. The nature and extent of contamination and conceptual site model (CSM) are presented in Section E of this ROD.

There have been no CERCLA enforcement actions related to the Building 1200 AOC.

C. HIGHLIGHTS OF COMMUNITY PARTICIPATION

As part of the community relations program, the U.S. Army and Ohio EPA have interacted with the public through news releases, public meetings, reading materials, direct mailings, an internet website, and receiving and responding to public comments. Specific items in the community relations program include:

Restoration Advisory Board: The U.S. Army established a Restoration Advisory Board in 1996 to promote community involvement in U.S. Department of Defense environmental cleanup activities and allow the public to review and discuss progress with decision makers. Board meetings are generally held every two or three months and are open to the public.

Community Relations Plan: The *Ravenna Army Ammunition Plant Community Relations Plan* (USACE 2003) was prepared to establish processes to keep the public informed of activities at the former RVAAP. The plan is available in the Administrative Record at Camp Ravenna.

Internet Website: The U.S. Army established an internet website in 2004 for the former RVAAP. It is accessible to the public at www.rvaap.org.

In accordance with CERCLA Section 117(a) and NCP Section 300.430(f)(2), the U.S. Army released the *Proposed Plan for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200* (USACE 2013) to the public on July 25, 2013. The PP and other project-related documents were made available to the public in the Administrative Record maintained at Camp Ravenna and in the Information Repositories at Reed Memorial Library in Ravenna, Ohio, and Newton Falls Public Library in Newton Falls, Ohio. A notice of availability for the PP was sent to the media outlets: radio stations, television stations, and newspapers (e.g., *Youngstown Vindicator, Warren Tribune-Chronicle, Akron Beacon Journal, and Ravenna Record Courier*), as specified in the RVAAP Community Relations Plan. The notice of availability initiated the 30-day public comment period beginning July 25, 2013, and ending August 23, 2013.

The U.S. Army held a public meeting on August 7, 2013, at the Paris Township Hall, Ravenna, Ohio to present the PP to the public. At this meeting, representatives of the U.S. Army provided information and answered questions. A transcript of the public meeting is available to the public and has been included in the Administrative Record. Responses to verbal comments received at this meeting are included in the Responsiveness Summary, which is Part III of this ROD. No additional written comments were received during the public comment period.

The U.S. Army considered public input from the public meeting on the PP when selecting the remedial alternative.

D. SCOPE AND ROLE OF RESPONSE ACTIONS

The overall program goal of the IRP at the former RVAAP is to clean up previously contaminated lands to reduce contamination to concentrations that will not cause risks to human health or the environment. No removal actions have been performed at the Building 1200 AOC to date.

This ROD addresses soil, sediment, and surface water. The intended future land use for the Building 1200 AOC is Military Training Land Use, which is consistent with the intended future land use for Camp Ravenna. The contamination present at the Building 1200 AOC poses a potential risk to human health because the COC concentrations exceeded CUGs for the Representative Receptor for Military Training Land Use (National Guard Trainee), as well as the Resident Receptor for Unrestricted (Residential) Land Use. Implementing the remedy described in this ROD will address potential risk through removal and off-site disposal of contaminated soil. The selected remedy described in the ROD is consistent with, and protective for, the intended future use (Military Training) at the AOC. Other media (e.g., groundwater) and AOCs at Camp Ravenna will be managed as separate actions or decisions by the U.S. Army and will be considered under separate RODs.

E. SUMMARY OF SITE CHARACTERISTICS

Site characteristics, nature and extent of contamination, and the CSM for the Building 1200 AOC are based on investigations conducted from 1989 through 2010 and are summarized in the *Remedial*

Investigation/Feasibility Study Report for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200 (USACE 2012).

E.1 Site Characteristics

E.1.1 Topography/Physiography

The topography at the Building 1200 AOC gently slopes radially from a high point just southwest of the former operations buildings (Figure 3). Ground elevations at the AOC range from 990 to 1004 ft above mean sea level. The closest surface water, 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 operations area to the former settling pond, and the former settling pond and associated discharge area.

E.1.2 Geology

The Building 1200 AOC is on a local bedrock high. The Building 1200 AOC is underlain by a thin unconsolidated interval generally less than 3 ft thick. The underlying bedrock formation observed at the Building 1200 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.

E.1.3 Hydrogeology

Three groundwater monitoring wells exist at the Building 1200 AOC. In addition, one background monitoring well exists to the south of the AOC. All monitoring wells (B12mw-010 through B12mw-012 and BKGmw-010) are screened in bedrock. The general groundwater flow pattern is from the southwest to the northeast. The hydraulic gradient across the AOC has an average value of 0.018 (ft/ft) (EQM 2010). Results of slug tests performed at three monitoring wells at the Building 1200 AOC in January and February 2005 revealed an average hydraulic conductivity at the AOC of 5.70E-05 cm/s.

Surface water drainage generally follows the topography of the AOC (Figure 3). 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 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 south of the settling pond discharge area.

E.1.4 Ecology

The ecological risk assessment (ERA) in the RI/FS report concluded that there are important and significant ecological resources at the AOC. Specifically, a wetland and special interest area of mixed mature woods are present and near contamination. The American beech (*Fagus grandifolia*), sugar maple (*Acer saccharum*), and American tulip tree (*Liriodendron tulipifera*) forest, wetland, and small grassy habitat were observed on the 7.7 acres of the AOC. These same types of habitats are found adjacent to the AOC and elsewhere at Camp Ravenna (OHARNG 2008). These habitats are also found in the larger, local ecoregion that surrounds Camp Ravenna (USFS 2011). There is no known unique resource at the AOC. Per the Camp Ravenna Joint Military Training Center Rare Species List, there are currently no federally listed species or critical habitats on Camp Ravenna property. State-endangered, state-threatened, state species-of-concern and state special-interest species have been identified at Camp Ravenna.

E.2 Site Investigations

Since 1989, the Building 1200 AOC has been included in various historical assessments and investigations conducted at the former RVAAP. The following environmental investigations have been completed for the Building 1200 AOC:

- Resource Conservation and Recovery Act (RCRA) Facility Assessment (Jacobs 1989),
- Preliminary Assessment for the Characterization of Areas of Contamination (USACE 1996),
- Phase I Remedial Investigation of High-Priority Areas of Concern (USACE 1998), and
- Characterization of 14 AOCs (MKM 2007).

In 2010, the PBA08 RI was implemented to supplement historical data available for the AOC and support the development of the RI/FS report. The results of the PBA08 RI sampling were combined with applicable results of previous sampling events to evaluate the nature and extent of contamination, examine contaminant fate and transport, conduct risk assessments, and evaluate potential remedial alternatives.

E.3 Nature and Extent of Contamination

No primary contaminant sources (e.g., pink water discharge) remain at the Building 1200 AOC; all operations were discontinued in 1971, and all remaining infrastructure has been removed as of 2005. Analysis of data collected during previous investigations and the PBA08 RI identified surface soil as the principal secondary source of contamination. Surface soil (0-1 ft bgs) contained the majority of site-related contaminants (SRCs) at the Building 1200 AOC. The prevalent SRCs detected in surface soil were semi-volatile organic compounds (SVOCs) and metals. Manganese was detected in all incremental sampling method (ISM) samples collected at the Building 1200 AOC with a

concentration of 1,800 mg/kg at sample location B12ss-022M, 2,700 mg/kg at sample location B12ss-017M, and 4,100 mg/kg at sample location B12ss-016M, all exceeding the background concentration of 1,450 mg/kg. The highest concentrations of SRCs occurred in the vicinity of the former Building 1200 location. The number and concentration of SRCs in surface soil generally decreased with distance from the former Building 1200 location.

Subsurface soil (soil deeper than 1 ft bgs), sediment, and surface water contained fewer detected SRCs than surface soil. The majority of subsurface soil SRCs were metals near former Building 1200. Concentrations of SRCs in subsurface soil decreased with depth. The majority of SRCs in sediment were metals; most were detected within the former settling pond. The majority of SRCs detected in intermittent surface water included SVOCs, metals, and explosive compounds; generally, these compounds were detected in portions of the drainage ditch between the former operational area and the former settling pond and within the settling pond. Explosive compounds were detected in surface water within the drainage ditch 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 by 21 ft long by 13 ft wide mound near the footprint of former Building T-4062. In December 2013, Remedial Design (RD) sampling was conducted to provide waste characterization of the recommended removal areas in support of an RD. As part of this field effort, approximately five test pits along the sides and top of the mound were hand dug with a shovel to the bottom of the mound/top of the former gravel road surface. At least 30 push probe sample aliquots were removed from the mound. In addition, the surface of the mound was cleared of snow and vegetation to allow for visual inspection. No building debris or construction materials were observed on the surface of the mound or encountered in the test pits or sample probes. The entire mound is comprised of clean, well sorted sandy soil and roots from the vegetation growing on the mound. Accordingly, this mound was confirmed to have no ACM, and no further action is warranted for this mound. Detailed results of the waste characterization sampling field effort will be presented in the RD.

E.4 Conceptual Site Model

The CSM is updated in this section to incorporate results of RIs conducted at the Building 1200 AOC. Elements of the CSM include:

- Primary and secondary contaminant sources and release mechanisms,
- Contaminant migration pathways and discharge or exit points,
- Potential receptors with unacceptable risk, and
- Data gaps and uncertainties.

E.4.1 Primary and Secondary Contaminant Sources and Release Mechanisms

No primary contaminant sources (e.g., pink water discharge) remain at the Building 1200 AOC. Analysis of data collected during previous investigations and the PBA08 RI identified surface soil as the principal secondary source of contamination. In particular, surface soil within the former operations area contained the majority and highest concentrations of SRCs, with manganese occurring at a sufficient concentration to be considered a COC. The available data indicate sediment within the lower drainage ditch and former settling pond is not a substantial secondary source of contamination.

The potential mechanisms for releases of contaminants from secondary sources at the Building 1200 AOC include:

- Erosion of soil matrices with sorbed contaminants and mobilization in turbulent surface water flow under storm conditions,
- Dissolution of soluble contaminants and transport in surface water, and
- Contaminant leaching to groundwater.

Available data show contaminant dissolution processes and transport from the former operations area are active due to the presence of SRCs in surface water samples. Sediment samples along the drainage ditch and former settling pond system indicate minimal transport and re-deposition of contaminants sorbed onto eroded soil matrices. Fate and transport modeling and groundwater monitoring data indicate contaminants with potential to leach from surface soil in the former operations area have not impacted groundwater and no contaminants are predicted to exceed the most restrictive risk-based criteria [U.S. Environmental Protection Agency (USEPA) maximum contaminant levels (MCLs), regional screening levels (RSLs), and facility-wide cleanup goals (FWCUGs)] for groundwater exposures at the nearest downgradient groundwater receptor.

E.4.2 Contaminant Migration Pathways and Exit Points

Contaminant migration from soil sources via surface water occurs primarily by: (1) movement of the particle-bound contaminants in surface water runoff; and (2) transport of dissolved constituents in surface water. Upon reaching portions of surface water conveyances where flow velocities decrease and particle-bound contaminants largely settle out as sediment accumulation, sediment-bound contaminants may become re-suspended and migrate during storm events, or may partition to a dissolved phase in surface water. The primary migration pathway for surface water at the Building 1200 AOC is the drainage system and former settling pond.

Deposition of particle-bound contaminants appears to occur within the uppermost reaches of the drainage ditch to the former settling pond. Flow velocities within the drainage ditch are likely low due to the gentle topography of the area, heavy vegetation cover, and small catchment area, which allows sorbed contaminants to settle out quickly within the upper reaches of the ditch. Dissolved phase contaminants in surface water migrate further along the drainage system as evidenced by the presence of SRCs, especially explosives, in surface water samples. Surface water exits the former settling pond

to the southeast, diffuses into a wooded area along the former discharge area, and infiltrates into the soil.

Groundwater at the Building 1200 AOC generally flows from southwest to northeast within sandstone/shale bedrock at a gentle, consistent gradient ranging from 0.018 to 0.026 ft/ft, based on historical data. Soil cover is generally less than 3 ft thick. Silty clays and silty sands dominate in the overburden. Contaminant leaching pathways from soil to the water table are through the thin soil cover and unsaturated bedrock interval. The unsaturated zone thickness ranges from 12 to 20 ft. Hydrogeologic conditions indicate a low degree of groundwater-surface water interaction, which limits infiltration to the uppermost groundwater zones. Evaluation of leaching potential from secondary soil sources and groundwater transport was conducted in the RI. Modeling results indicated selenium and cyclotrimethylenetrinitramine could exceed risk-based screening criteria beneath the source. Groundwater monitoring results collected at the AOC since 2004 have shown no detections of cyclotrimethylenetrinitramine and selenium concentrations have been less than risk-based criteria (USEPA MCLs, RSLs, and FWCUGs). The nearest downgradient groundwater receptor lies 4,100 ft to the northeast (tributary to Eagle Creek), and modeling results predict that no contaminants will reach this receptor at concentrations above MCLs/RSLs or FWCUGs. Based on the RI analysis, groundwater does not appear to be a mechanism for contaminant transport off of the AOC.

E.4.3 Potential Receptors

The National Guard Trainee is a Representative Receptor under the future use (Military Training Land Use). This receptor is assumed to be exposed to soil from 0 to 4 and 4 to 7 ft bgs, surface water, and sediment. Shallow bedrock at the AOC precludes exposure to soil below a depth of about 3 ft bgs.

Ecological receptors at the Building 1200 AOC are potentially exposed to contaminants in soil, sediment, and intermittent surface water within the drainage ditch and former settling pond wetland. A permanent, viable aquatic habitat is not present on the AOC, which precludes exposure to aquatic organisms. Groundwater is not considered an exposure medium for ecological receptors on the AOC given its depth and occurrence with bedrock, and there are no discharge points (e.g., springs, seeps) that would represent a potential exposure point.

F. CURRENT AND POTENTIAL FUTURE LAND USES

The Building 1200 AOC is currently managed by the Army National Guard/OHARNG. The AOC is not currently being utilized for training purposes. The future use of the Building 1200 AOC is Military Training Land Use. Accordingly, the National Guard Trainee is the Representative Receptor for Military Training Land Use. In accordance with CERCLA, the Resident Receptor was evaluated in the human health risk assessment (HHRA) to assess an Unrestricted (Residential) Land Use scenario. This ROD discusses future land use, as it pertains to soil, sediment, and surface water and how it impacts human health, the environment, and groundwater. Currently, groundwater at the AOC

is not used for domestic or industrial supplies. Groundwater will be evaluated as part of the Facility-wide Groundwater AOC.

G. SUMMARY OF SITE RISKS

The HHRA and ERA estimated risks to human and ecological receptors. The HHRA and ERA identified exposure pathways; COCs, if any; and provided a basis for remedial decisions. This section of the ROD summarizes the results of the HHRA and ERA, which are presented in detail in the *Remedial Investigation/Feasibility Study Report for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200* (USACE 2012) and *Proposed Plan for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200* (USACE 2013) located in the Administrative Record and Information Repositories.

G.1 Human Health Risk Assessment

The Building 1200 AOC is currently inactive (not used for military training). Currently, military training and operations are conducted at the facility and in the adjacent areas surrounding the AOC.

The OHARNG future land use for the AOC is Military Training Land Use. The most representative receptor for this land use is the National Guard Trainee. The HHRA evaluates exposure to contaminants and estimates risk for the National Guard Trainee. In addition, risk is estimated for the Resident Receptor to evaluate a potential Unrestricted (Residential) Land Use as a comparative baseline, in accordance with CERCLA.

The HHRA evaluated potential risk for the SRCs present in soil, sediment, and surface water discussed in Section E.3. One SRC, manganese in surface soil (0-1 ft bgs), was identified as a COC for the National Guard Trainee and Resident Receptor. The concentrations of manganese at locations B12ss-016M (4,100 mg/kg), B12ss-017M (2,700 mg/kg), and B12ss-022M (1,800 mg/kg) were greater than the National Guard Trainee FWCUG (351 mg/kg) and background concentration (1,450 mg/kg). Consequently, surface soil (0-1 ft bgs) at these three locations require remediation to attain the future use (Military Training Land Use) and Unrestricted (Residential) Land Use. No COCs were identified in subsurface soil (greater than 1 ft bgs), sediment, or surface water for either the National Guard Trainee or Resident Receptor. The COCs, CUGs, and locations requiring remediation are presented in Table 2.

G.2 Ecological Risk Assessment

The ERA for the Building 1200 AOC (USACE 2012) evaluated chemical contamination to determine if it posed a risk to the environment. The ERA incorporated historical and PBA08 RI data. The ERA identified important and significant ecological resources at the AOC. Specifically, a wetland and a special interest area of mixed mature woods are present near areas of detectable contamination. These findings invoked a Level II assessment.

The Level II assessment evaluated soil and sediment chemicals of potential ecological concern (COPECs) and identified integrated COPECs. The COPECs were further evaluated with technical and refinement factors agreed upon by the U.S. Army and Ohio EPA. The results of the ERA concluded that there are no chemicals requiring remediation or further evaluations to be conducted to protect the environment.

Table 2. Summary of COCs, CUGs, and Locations Requiring Remedy

Media	Chemicals of Concern	Cleanup Goals	Location and Depth Requiring Remediation
Surface Soil[1]	Manganese	1,450 mg/kg[2]	B12ss-016M, B12ss-017M, and B12ss-022M at 0-1 ft bgs
Subsurface Soil	None	Not applicable	Not applicable
Sediment	None	Not applicable	Not applicable
Surface Water	None	Not applicable	Not applicable

[1] Includes surface soil (0-1 ft bgs) for the Resident Receptor and deep surface soil (0-4 ft bgs) for the National Guard Trainee. Bedrock occurs at a depth of approximately 3 ft bgs and no soil samples could be collected below this depth. Because 0-1 ft bgs samples were collected using Incremental Sampling Methods (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.

[2] The cleanup goal for manganese is the facility-wide background value for surface soil (0-1 ft bgs).

ft bgs = feet below ground surface

mg/kg = Milligram per kilogram.

G.3 Basis for Action Statement

Results of the HHRA for the Building 1200 AOC indicate that exposure to soil under current and future land use (Military Training Land Use) may result in unacceptable risks to human receptors, unless remediation is undertaken. The response action selected in this ROD is necessary to protect public health and welfare or the environment from actual or threatened releases of hazardous substances.

H. REMEDIAL ACTION OBJECTIVES

The remedial action objective (RAO) references CUGs and target risk levels that are considered protective of human health under current and future use scenarios. The RAO for the Building 1200 AOC is to prevent: (1) National Guard Trainee exposure to COCs above CUGs in soil, surface water, and sediment; (2) adverse ecological effects from previous AOC activities; and (3) negative groundwater impacts from contaminant migration from source media (e.g., soil and sediment).

Conclusions of the ERA, presented in Sections E.1.4 and G.2, indicate remedial actions are not warranted to specifically protect ecological receptors. Evaluation of contaminant fate and transport, presented in Section E.4, indicates soil and sediment remediation to prevent negative groundwater impacts are not warranted. Remedial decisions specific to groundwater media at the Building 1200 AOC will be evaluated in a separate report. Table 2 presents the media-specific COCs, CUGs, and areas requiring remediation.

I. DESCRIPTION OF ALTERNATIVES

The RI/FS report developed and evaluated remedial alternatives for surface soil at the Building 1200 AOC. The remedial alternatives are listed below:

- Alternative 1: No Action, and
- Alternative 2: Attain Unrestricted (Residential) Land Use[1].

This section includes a description of various components of the remedial alternatives identified in the RI/FS report, including soil removal, disposal, and handling.

[1]*Alternative 2 was named "Attain National Guard Training and Residential Land Uses" in the RI/FS Report and was re-named "Attain Unrestricted (Residential) Land Use".*

I.1 Alternative 1 – No Action

Alternative 1 provides no remedial action and is required under NCP as a baseline for comparison with other remedial alternatives. Alternative 1 provides no additional protection to human health and the environment. Any current legal and administrative LUC mechanisms at the AOC will be discontinued. No future legal, administrative, or physical LUC mechanisms will be employed at the AOC. Environmental monitoring would not be performed, and five-year reviews would not be conducted in accordance with CERCLA 121(c). In addition, no restrictions on land use will be pursued.

I.2 Alternative 2 – Attain Unrestricted (Residential) Land Use

Unrestricted (Residential) Land Use was evaluated using the FWCUGs for the Resident Receptor, as well as any FWCUGs that may be more stringent for the National Guard Trainee. Alternative 2 involves removing and transporting chemical contaminants in soil that pose a risk to the Representative Receptor for Military Training Land Use (National Guard Trainee) and Resident Receptor for Unrestricted (Residential) Land Use. Approximately 225 yd^3 (ex situ) of contaminated surface soil (0-1 ft bgs) from locations B12ss-016M, B12ss-017M, and B12ss-022M will be excavated and transported to an off-site disposal facility licensed and permitted to accept these wastes. Confirmation sampling will be conducted to ensure CUGs are attained. Areas undergoing soil removal will be re-graded and backfilled with clean soil.

Alternative 2 does not include LUCs, CERCLA five-year reviews, or operation and maintenance (O&M) sampling as Unrestricted (Residential) Land Use will be attained through remedial actions conducted under this remedial alternative.

J. SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

These alternatives were evaluated with respect to the nine comparative analysis criteria, as outlined by CERCLA (Table 3). The nine criteria are categorized into three groups: threshold criteria, primary balancing criteria, and modifying criteria as follows:

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

1. Overall protection of human health and the environment.
2. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs).

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

3. Long-term effectiveness and permanence.
4. Reduction of toxicity, mobility, or volume through treatment.
5. Short-term effectiveness.
6. Implementability.
7. Cost.

Modifying Criteria – FS consideration to the extent that information was available. Evaluated fully after public comment period on the PP.

8. State acceptance.
9. Community acceptance.

Table 3. 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 – 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 – considers public input following a review of the public comments received on the Remedial Investigation/Feasibility Study Report and Proposed Plan.

CERCLA – Comprehensive Environmental Response, Compensation, and Liability Act of 1980.

J.1 Overall Protection of Human Health and the Environment

Alternative 1 does not provide overall protection of human health, as COCs for the National Guard Trainee and Resident Receptor remain on site. This criterion must be met for an alternative to be considered for final selection. Alternative 1 (No Action) will not reduce the short- or long-term risks from potential exposure to the COCs, and is thus not protective. Alternative 2 provides protection of human health by removing contamination and will not require additional protectiveness after contaminant removal, as the alternative will achieve Unrestricted (Residential) Land Use.

No risks were identified for ecological receptors. Therefore, neither alternative includes remedial actions to address ecological risks.

J.2 Compliance with Applicable or Relevant and Appropriate Requirements

CERCLA Section 121 specifies that remedial actions must comply with requirements or standards under federal or more stringent state environmental laws that are "applicable or relevant and appropriate to the hazardous substances or particular circumstances at the site." These enforceable standards protect future users of the AOC. There are no identified chemical-specific ARARs for Alternatives 1 or 2.

Location- and action-specific ARARs were identified for Alternative 2, as presented in Attachment A. Alternative 2 can be designed and implemented to meet the respective ARARs.

J.3 Long-Term Effectiveness and Permanence

Alternative 1 (No Action) is neither effective nor permanent long term. Alternative 1 will not involve any remedial action or LUCs for potential future exposure. Alternative 2 is considered permanent and effective long term since this alternative removes soil that presents a risk to the Resident Receptor. Alternative 2 attains Unrestricted (Residential) Land Use; therefore, no LUCs or five-year reviews are required.

J.4 Reduction of Toxicity, Mobility, or Volume through Treatment

Alternative 1: No Action and Alternative 2: Attain Unrestricted (Residential) Land Use do not include treatment as a principal element and, therefore, offer no reduction in toxicity, mobility, or volume because no treatment process is proposed.

J.5 Short-Term Effectiveness

Short-term effectiveness addresses the period of time needed to implement the remedy and any adverse impacts that may be posed to workers, the community, and environment during construction and operation of the remedy until CUGs are achieved. No short-term human health risks are associated with Alternative 1 (No Action) beyond baseline conditions because no actions will be

implemented that have impacts on soil, air quality, water resources, or biotic resources. Alternative 2 presents short-term risk to workers, the community, and the environment during soil excavation and transportation. Excavation will result in a temporary loss of vegetated habitat. Short-term environmental impacts are minimized through construction mitigation techniques. Mitigation measures (e.g., dust control, storm water controls, site housekeeping activities, covering and cleaning haul trucks) during excavation activities will minimize and/or eliminate all potential risks.

J.6 Implementability

No actions are proposed for Alternative 1. Alternative 2 can be readily implemented after the RD is developed and all appropriate coordination with local, state, and federal agencies is completed. Excavating surface soil, constructing temporary roads, and waste handling are conventional, straightforward construction techniques and methods. Multiple off-site disposal facilities are available to accept generated waste. Resources (e.g., equipment, material, trained personnel) to implement this alternative are readily available.

J.7 Cost

The present value cost to complete Alternative 1 is $0. No capital costs are associated with this alternative. The present value cost to complete Alternative 2 is approximately $182,882 (in base year 2010 dollars with a 4.125% discount factor). No O&M is required; therefore, no O&M costs are associated with these alternatives.

J.8 State Acceptance

State acceptance was evaluated formally after the public comment period on the PP. Ohio EPA concurs that Alternative 1: No Action does not provide adequate protection of human health and the environment. Therefore, Ohio EPA has expressed its support for Alternative 2: Attain Unrestricted (Residential) Land Use.

J.9 Community Acceptance

Community acceptance was evaluated formally after the PP public comment period. During the public meeting, the community voiced no objections to Alternative 2: Attain Unrestricted (Residential) Land Use, as indicated in Part III of this ROD, the Responsiveness Summary.

K. PRINCIPAL THREAT WASTES

Principal threat wastes, as defined by the USEPA in *A Guide to Principal Threat and Low Level Threat Wastes* (USEPA 1991), are source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained, or would present a significant risk to human health or the environment should exposure occur.

Wastes that generally are considered to constitute principal threats include, but are not limited to:

- Liquids - wastes contained in drums, lagoons or tanks, free product floating on or under groundwater.
- Mobile source material – surface soil or subsurface soil containing high concentrations of chemicals that are mobile due to wind entrainment, volatilization, surface runoff, or subsurface transport.
- Highly toxic source material – buried drummed non-liquid wastes, buried tanks containing non-liquid wastes, or soils containing significant concentrations of highly toxic materials.

USEPA guidance indicates where mobility and toxicity of source material combine to pose a potential risk of 10^{-3} or greater, generally treatment alternatives should be considered. The Building 1200 AOC does not contain source materials that are considered principal threat wastes, as described above, and no chemicals pose a risk of 10^{-3} or greater. As such, no remedies are required to address principal threat wastes at this AOC.

L. THE SELECTED REMEDY

Alternative 2: Attain Unrestricted (Residential) Land Use is selected for implementation at the Building 1200 AOC. This alternative also attains the requisite level of cleanup for Military Training Land Use.

L.1 Rationale for the Selected Remedy

The selected remedy meets the threshold criteria and provides the best overall balance of trade-offs in terms of the five balancing criteria:

- Long-term effectiveness and permanence;
- Reduction of toxicity, mobility, and volume;
- Short-term effectiveness;
- Implementability; and
- Cost.

The selected remedy is protective for the future use, is cost effective, and can be performed in a timely manner. Based on the available risk assessment information, the selected remedy will achieve the RAO, which prevents: (1) National Guard Trainee exposure to COCs above CUGs in soil, sediment, and surface water; (2) adverse ecological effects from previous AOC activities; and (3) negative groundwater impacts from contaminant migration from source media (e.g., soil and sediment).

Using engineering controls, personal protective equipment, erosion and sediment controls, proper waste handling practices, and monitoring will mitigate short-term effects during construction. The

selected remedy addresses state and community concerns by removing contaminated soil from the Building 1200 AOC.

L.2 Description of the Selected Remedy

Alternative 2 consists of excavating contaminated surface soil to attain Unrestricted (Residential) Land Use at the Building 1200 AOC. This alternative requires soil removal at sampling locations B12ss-016M, B12ss-017M, and B12ss-022M. The estimated total disposal volume (i.e., ex situ) is approximately 225 yd^3. Excavated soil will be transported by truck to an off-site disposal facility. This remedial alternative requires coordinating remediation activities with Ohio EPA and the U.S. Army. Coordinating with stakeholders during implementation of the excavation minimizes health and safety risks to on-site personnel and potential disruptions of Camp Ravenna activities. The time period to complete this remedial action is relatively short and does not include an O&M period to assess impacts from soil. Components of this remedial alternative include:

- RD;
- Waste characterization sampling;
- Site setup, soil excavation, and waste disposal;
- Confirmatory sampling; and
- Restoration.

Remedial Design. An RD plan will be developed prior to initiating remedial actions. This plan will outline construction permitting requirements; site preparation activities (e.g., staging and equipment storage areas, truck routes, storm water controls); the extent of the excavation; sequence of construction activities; decontamination; and segregation, transportation, and disposal of various waste streams. Engineering and administrative controls (e.g., erosion controls, health and safety controls) will be developed during the active construction period to ensure remediation workers and the environment are protected.

Waste Characterization Sampling. Waste characterization samples will be collected from the area requiring removal. The waste characterization samples are collected as ISM samples from the area(s) undergoing this remedy to provide the disposal facility data to properly profile the waste and determine if it is characteristically nonhazardous or hazardous. Each ISM sample analysis can include (but is not limited to) toxicity characteristic leaching procedure (TCLP) metals, TCLP SVOCs, TCLP Pesticides, TCLP Herbicides, Reactive Cyanide, Reactive Sulfide, and polychlorinated biphenyls.

Site Setup, Soil Excavation, and Waste Disposal. Erosion control material such as silt fences and straw bales will be installed to minimize sediment runoff prior to any ground disturbance. Dust generation will be minimized during excavation activities by keeping equipment movement areas and excavation areas misted with water. The health and safety of remediation workers, on-site employees, and the general public will be covered in a site-specific health and safety plan.

To achieve a scenario in which the AOC attains Unrestricted (Residential) Land Use, soil will be removed from locations B12ss-016M, B12ss-017M, and B12ss-022M from 0 to 1 ft bgs. Soil will be removed using conventional construction equipment such as backhoes, bulldozers, front-end loaders, and scrapers. Oversize debris will be crushed or otherwise processed to meet disposal facility requirements. Excavated soil will be hauled by truck to a licensed disposal facility permitted to accept the characterized waste stream.

Confirmatory Sampling. At the end of the soil excavation, confirmatory samples will be collected. The confirmatory samples will be sent to an off-site laboratory to be analyzed for COC concentration. If the analyses indicate the COC concentration in soil exceeds the CUGs, further excavation will be conducted. If confirmation sample results are less than CUGs, further soil removal will not be required, and the area can be restored.

Restoration. Once it is determined additional excavation will not be required, all disturbed and excavated areas will be backfilled with clean soil and graded to meet neighboring contours. The backfill will come from a source that was previously sampled and approved for use by Ohio EPA. After the area is backfilled and graded, workers will apply a seed mixture (as approved by the OHARNG) and mulch. Restored areas will be inspected and monitored as required in the Storm Water Pollution Prevention Plan.

L.3 Summary of the Estimated Remedy Costs

The present value cost to complete Alternative 2 is approximately $182,882 (in base year 2010 dollars with a 4.125% discount factor). No O&M is required; therefore, no O&M costs are associated with this alternative.

This cost estimate is based on the best available information regarding the anticipated scope of the selected remedy. This is an order of magnitude engineering cost estimate that is expected to be within –30 to +50% of the actual project cost in accordance with USEPA guidance (USEPA 1988).

L.4 Expected Outcomes of the Selected Remedy

Table 2 provides a summary of CUGs to be achieved for soil at the Building 1200 AOC after the construction phase. Residual risks after implementing the selected remedy will be within the acceptable risk range for the future use. Removing contaminated soil will reduce the likelihood of contaminant migration to other environmental media, such as surface water or groundwater. Removing soil to attain human health CUGs will also reduce risks to ecological receptors.

No negative socioeconomic and community revitalization impacts are expected from this remedial action. Positive socioeconomic impacts are expected from excavating and removing soil exceeding the CUGs because additional resources will available for use by the OHARNG training mission.

M. STATUTORY DETERMINATIONS

The selected remedy satisfies the statutory requirements of CERCLA Section 121 and the NCP, as described below.

M.1 Protection of Human Health and the Environment

Human exposure to COCs will be eliminated to levels that are protective through excavation and off-site disposal of soil at the Building 1200 AOC. The selected remedy also protects environmental receptors from potential exposure to COC-contaminated media. The selected remedy will attain the CUGs listed in Table 2.

M.2 Compliance with ARARs

The selected remedy will comply with the action-specific ARARs listed in Attachment A.

M.3 Cost-Effectiveness

The selected remedy meets the statutory requirement for a cost-effective remedy. Cost effectiveness is concerned with the reasonableness of the relationship between the effectiveness afforded by each alternative and its costs compared to other available options.

M.4 Utilization of Permanent Solutions and Alternative Treatment (or Resource Recovery) Technologies to the Maximum Extent Practicable

The selected remedy represents the maximum extent to which permanent solutions are practicable for soil at the AOC. The selected remedy represents the best balance of trade-offs between the alternatives because it provides a permanent solution for contaminated media, is cost-effective, and eliminates the need for long-term LUCs respective to chemical contaminants in soil.

M.5 Preference for Treatment as a Principal Element

The selected remedy uses permanent solutions to the maximum extent practicable. The remedy does not satisfy the statutory preference for treatment. The treatment technologies evaluated in the RI/FS report were found to be technically infeasible or cost prohibitive for implementation at the Building 1200 AOC. For example, biodegradation or thermal technologies are not effective for reducing manganese concentrations in soil.

M.6 Five-Year Review Requirements

Five-year reviews in compliance with CERCLA Section 121(c) and NCP Section 300.430(f) (4) (ii) will not be required.

N. DOCUMENTATION OF NO SIGNIFICANT CHANGE

The *Proposed Plan for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200* (USACE 2013) was released for public comment in July 2013. The PP identified Alternative 2: Attain Unrestricted (Residential) Land Use at the Building 1200 AOC as a recommended alternative. After the public comment period, no significant changes regarding the recommended alternative, as originally identified in the PP, were necessary or appropriate.

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PART III: RESPONSIVENESS SUMMARY FOR PUBLIC COMMENTS ON THE U.S. ARMY PROPOSED PLAN FOR THE BUILDING 1200 AOC AT RAVENNA ARMY AMMUNITION PLANT, RAVENNA, OH

A. OVERVIEW

In July 2013, the U.S. Army released the *Proposed Plan for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200* (USACE 2013) for public comment. A 30-day public comment period was held from July 25, 2013 to August 23, 2013. The U.S. Army hosted a public meeting on August 7, 2013, to present the PP and take questions and comments from the public for the record.

For soil, surface water, and sediment at the Building 1200 AOC, the U.S. Army recommended Alternative 2: Attain Unrestricted (Residential) Land Use. During the public meeting, Ohio EPA concurred with the recommendation of this alternative. Oral comments were not received at the public meeting and are addressed under Section B.

The community voiced no objections to Alternative 2, and this alternative is selected as the final remedy for soil, surface water, and sediment at the Building 1200 AOC in this ROD.

B. SUMMARY OF PUBLIC COMMENTS AND LEAD AGENCY RESPONSES

No comments were received verbally during the public meeting, and no written comments were received during the 30-day public comment period.

C. TECHNICAL AND LEGAL ISSUES

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

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FIGURES

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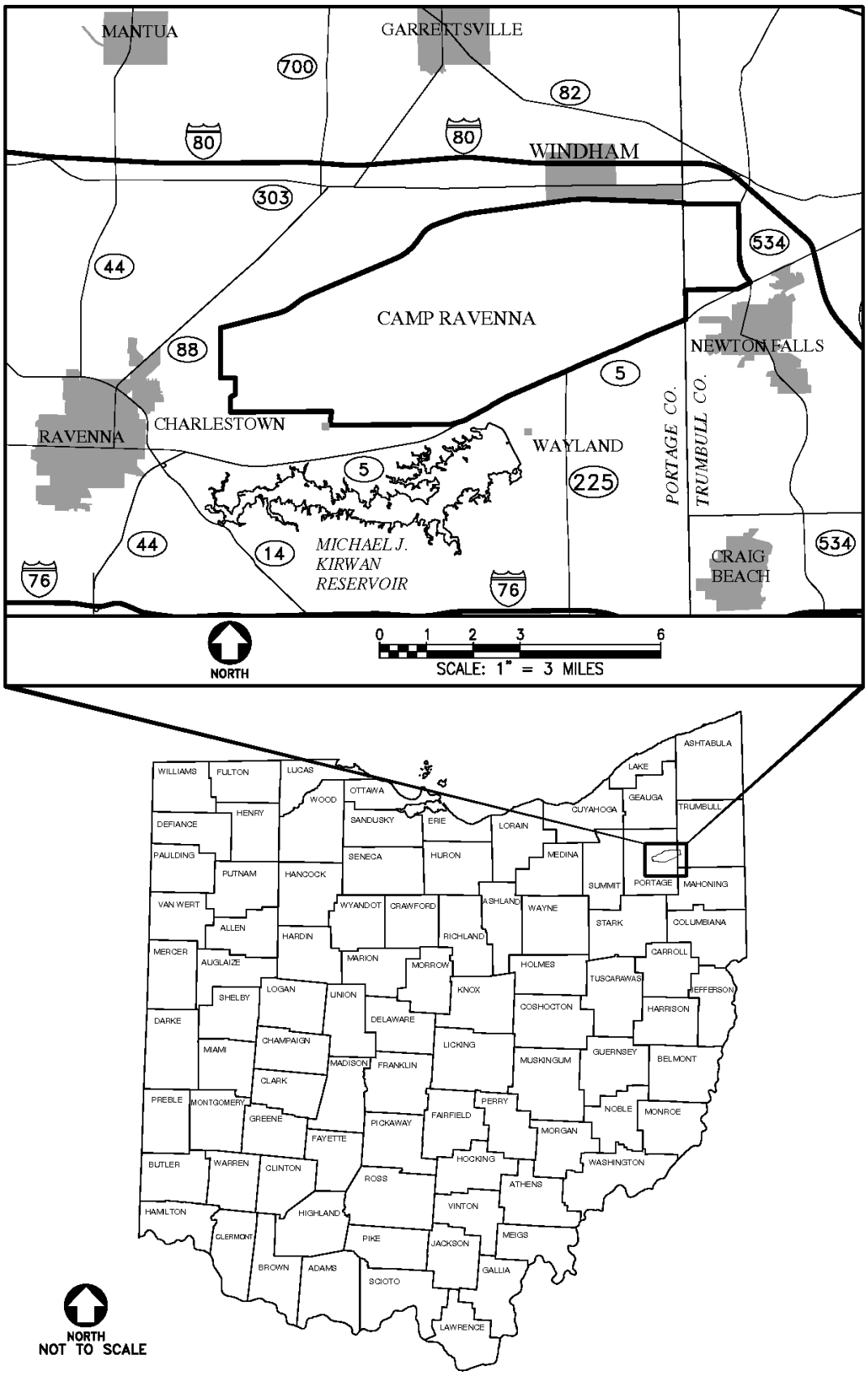

Figure 1. General Location and Orientation of the Camp Ravenna

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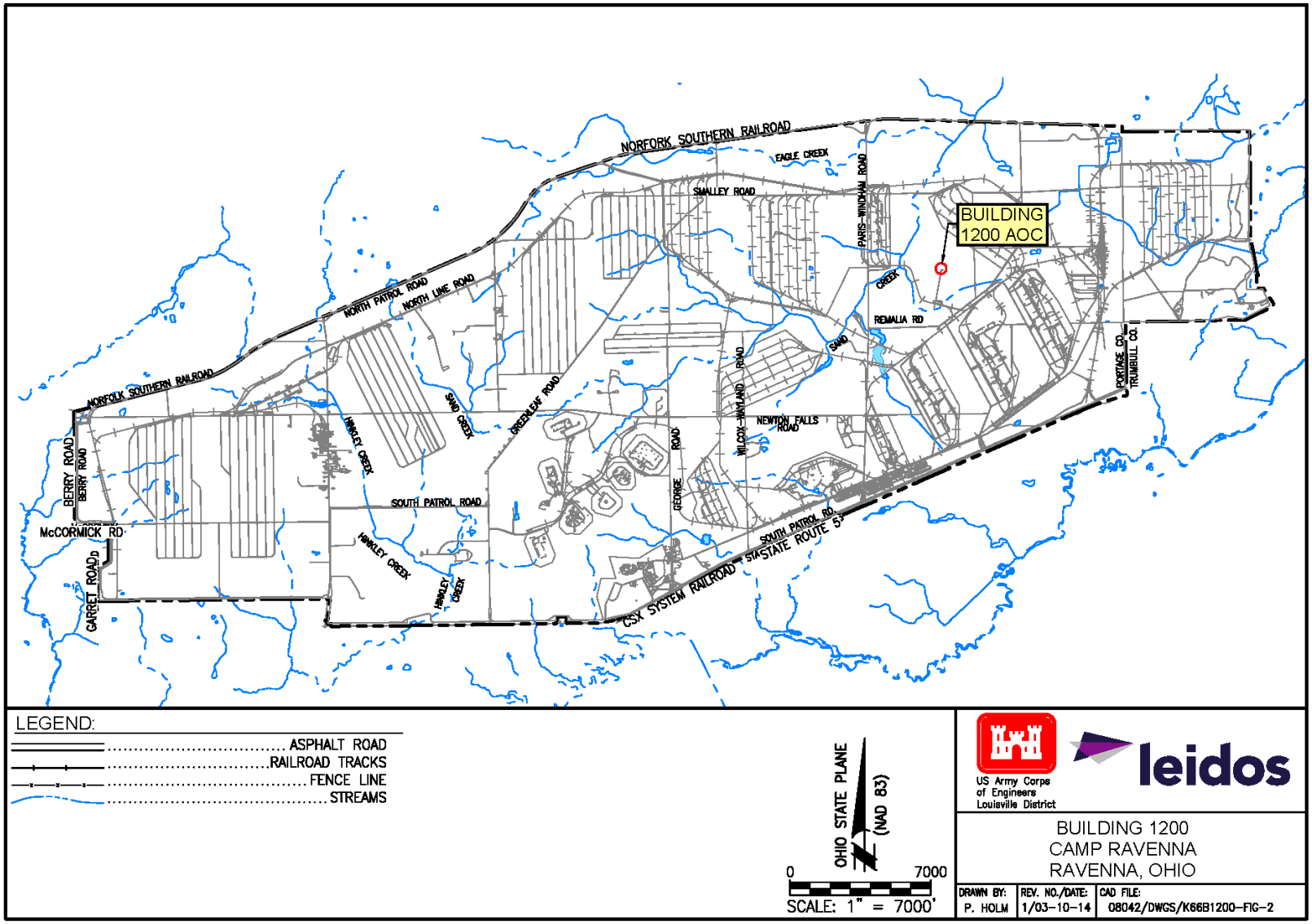

Figure 2. Camp Ravenna Installation Map

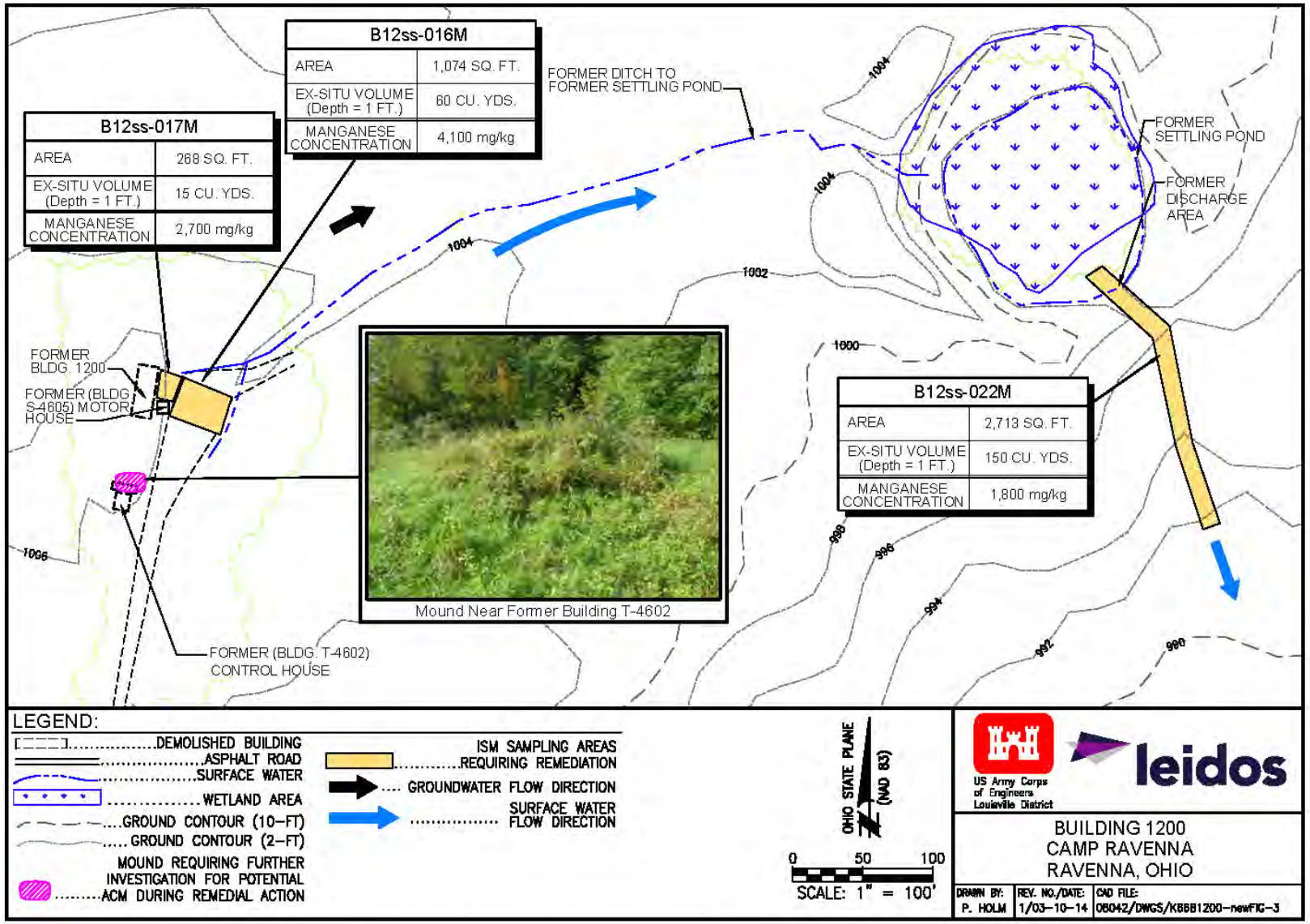

Figure 3. Building 1200 Area of Concern Site Features

ATTACHMENT A
DESCRIPTION OF ARARS

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Table A-1. Potential Action-Specific ARARs

Media and Citation	Description of Requirement	Potential ARAR Status	Standard
Prohibition of air pollution nuisances (e.g., fugitive dust) OAC Section 3745-15-07	These rules prohibit a release of nuisance air pollution that endangers health, safety, or welfare of the public or causes personal injury or property damage.	Applies to any activity that could result in the release of a nuisance air pollutant. This would include dust from excavation or soil management processes.	Any person undertaking an activity is prohibited from emitting nuisance air pollution.
Storm water requirements at construction sites 40 CFR Part 450	These rules require that storm water controls be employed at construction sites that exceed 1 acre in size.	Applies to any construction activity that exceeds 1 acre in total size.	Persons undertaking construction activities (including grubbing and land clearing) at an AOC where the construction footprint is over 1 acre in size must design and implement erosion and run-off controls.
Generation of contaminated soil or debris OAC Section 3745-52-11	These rules require that a generator determines whether a material generated is a hazardous waste.	Applies to any material that is or contains a solid waste. Must be characterized to determine whether the material is or contains a hazardous waste.	Any person that generates a waste as defined must use prescribed methods to determine if waste is considered characteristically hazardous.
Management of contaminated soil or debris that is or contains a hazardous waste OAC Sections 3745-52-30 through -34	These rules require that hazardous waste be properly packaged, labeled, marked, and accumulated onsite pending on-site or off-site disposal.	Applies to any hazardous waste or media containing a hazardous waste that is generated from on-site activities.	All hazardous waste must be accumulated in a compliant manner that includes proper marking, labeling, and packaging of such waste in accordance with the specified regulations. This includes inspection of containers or container areas where hazardous waste is accumulated on-site.
Acquisition and use of manifests for hazardous waste shipments to off-site treatment, storage, or disposal facilities OAC Sections 3745-52-20 through -23	These rules require that a Uniform Hazardous Waste Manifest be used for any off-site shipment of hazardous waste.	Applies to any shipment of hazardous waste to an off-site facility for treatment, storage, or disposal.	Requires a generator who transports or offers for transportation hazardous waste for off-site treatment, storage, or disposal to prepare a uniform hazardous waste manifest.

Table A-1. Potential Action-Specific ARARs (continued)

Media and Citation	Description of Requirement	Potential ARAR Status	Standard
Soil contaminated with RCRA hazardous waste OAC Section 3745-400-49 OAC Section 3745-400-48 UTS	These rules prohibit land disposal of RCRA hazardous waste subject to them unless the waste is treated to meet certain standards that are protective of human health and the environment. Standards for treatment of hazardous waste-contaminated soil prior to disposal are set forth in the two cited rules. Use of the greater of either technology-based standards or Universal Treatment Standard (UTS) is prescribed.	Land disposal restrictions (LDRs) apply only to RCRA hazardous waste. This rule is considered for ARAR status only upon generation of a RCRA hazardous waste. If any soil is determined to be RCRA hazardous, and if they will be disposed of on-site, this rule is potentially applicable to disposal of the soil.	All soil subject to treatment must be treated as follows: 1) For non-metals, treatment must achieve 90% reduction in total constituent concentration [primary constituent for which the waste is characteristically hazardous as well as for any organic or inorganic Underlying Hazardous Constituent (UHC)], subject to 3 below. 2) For metals and carbon disulfide, cyclohexanone, and methanol, treatment must achieve 90% reduction in constituent concentrations as measured in leachate from the treated media (tested according to the TCLP) or 90% reduction in total constituent concentrations (when a metal removal treatment technology is used), subject to 3 below. 3) When treatment of any constituent subject to treatment to a 90% reduction standard would result in a concentration less than 10 times the UTS for that constituent, treatment to achieve constituent concentrations less than 10 times the UTS is not required. This is commonly referred to as "90% capped by 10xUTS."
Soil contaminated with RCRA hazardous waste OAC Section 3745-400-49 OAC Section 3745-400-48 UTS	These rules prohibit land disposal of RCRA hazardous waste subject to them unless the waste is treated to meet certain standards that are protective of human health and the environment. Standards for treatment of hazardous contaminated soil prior to disposal are set forth in the two cited rules. Use of the greater of either technology-based standards or UTS is prescribed.	LDRs apply only to RCRA hazardous waste. This rule is considered for ARAR status only upon generation of a RCRA hazardous waste. If any soil is determined to be RCRA hazardous, and if they will be disposed of on-site, this rule is potentially applicable to disposal of the soil.	All soil subject to treatment must be treated as follows: 1) For non-metals, treatment must achieve 90% reduction in total constituent concentration (primary constituent for which the waste is characteristically hazardous as well as for any organic or inorganic UHC), subject to 3 below. 2) For metals and carbon disulfide, cyclohexanone, and methanol, treatment must achieve 90% reduction in constituent concentrations as measured in leachate from the treated media (tested according to the TCLP), or 90% reduction in total constituent concentrations (when a metal removal treatment technology is used), subject to 3 below. 3) When treatment of any constituent subject to treatment to a 90% reduction standard would result in a concentration less than 10 times the UTS for that constituent, treatment to achieve constituent concentrations less than 10 times the UTS is not required. This is commonly referred to as "90% capped by 10xUTS."

Table A-1. Potential Action-Specific ARARs (continued)

Media and Citation	Description of Requirement	Potential ARAR Status	Standard
Debris Contaminated with RCRA Hazardous Waste OAC Section 3745-400-49 OAC Section 3745-400-47	These rules prescribe conditions and standards for land disposal of debris contaminated with RCRA hazardous waste. Debris subject to this requirement for characteristic RCRA contamination that no longer exhibits the hazardous characteristic after treatment does not need to be disposed of as a hazardous waste. Debris contaminated with listed RCRA contamination remains subject to hazardous waste disposal requirements.	If RCRA hazardous debris is disposed of on-site, these rules are potentially applicable to disposal of the debris.	Standards are extraction or destruction methods prescribed in OAC Section 3745-400-47. Treatment residues continue to be subject to RCRA hazardous waste requirements.
Soil/Debris Contaminated with RCRA Hazardous Waste – Variance OAC Section 3745-400-44	The Director will recognize a variance approved by the USEPA from the alternative treatment standards for hazardous contaminated soil or for hazardous debris.	Potentially applicable to RCRA hazardous soil or debris that is generated and placed back into a unit and that will be land disposed of on-site.	A site-specific variance from the soil treatment standards can be used when treatment to concentrations of hazardous constituents greater (i.e., higher) than those specified in the soil treatment standards minimizes short- and long-term threats to human health and the environment. In this way, on a case-by-case basis, risk-based LDR treatment standards approved through a variance process could supersede the soil treatment standards.

ACM = Asbestos-containing Material
AOC = Area of Concern
ARAR = Applicable or Relevant and Appropriate Requirements
CAMU = Corrective Action Management Unit
CFR = Code of Federal Regulations
LDR = Land Disposal Restrictions
MTR = Minimum Technical Requirements
OAC = Ohio Administrative Code
RCRA = Resource Conservation and Recovery Act
TCLP = Toxicity characteristic leaching procedure
UHC = Underlying Hazardous Constituent
USEPA = U.S. Environmental Protection Agency
UTS = Universal Treatment Standard

Table A-2. Potential Location-Specific ARARs

Media and Citation	Description of Requirement	Potential ARAR Status	Standard
Presence of wetlands as defined in 10 CFR 1022.4(v).	Establishes the requirements to evaluate any action taken within a wetland to ensure that impacts are minimized or averted as required in 10 CFR 1022.3 (a) – (d).	Potentially applicable for activities that result in the impact of a wetland as defined.	Avoid to the extent possible the long- and short-term adverse effects associated with destruction, occupancy, and modification of wetlands. Measures to mitigate adverse effects of actions in a wetland include, but are not limited to, minimum grading requirements, runoff controls, design and construction constraints, and protection of ecologically-sensitive areas in 10 CFR 1022.12(a)(3). Take action to the extent practicable to minimize destruction, loss, or degradation of wetlands and to preserve, restore, and enhance the nature and beneficial value of wetlands. Potential effects of any new construction in wetlands that are not in a floodplain shall be evaluated to identify and, as appropriate, implement alternative actions that may avoid or mitigate adverse impacts on wetlands.

ARAR = Applicable or Relevant and Appropriate Requirements
CFR = Code of Federal Regulations

ATTACHMENT B
COMMENT RESPONSE CORRESPONDENCE

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Ravenna Army Ammunition Plant
8451 State Route 5
Ravenna, Ohio 44266

February 25, 2014

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Andrew Kocher, Project Manager
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program
Portage/Trumbull Counties, RVAAP-13 Building 1200
Responses to Ohio EPA Comments on the Draft Record of Decision for Soil, Sediment, and Surface Water at the RVAAP-13 Building 1200
(Work Activity No. 267-000859-188)

Dear Mr. Kocher,

On February 13, 2014, the U.S. Army received Ohio Environmental Protection Agency comments on the *Draft Record of Decision for Soil, Sediment, and Surface Water for RVAAP-13 Building 1200*. This letter presents responses to those comments.

This Record of Decision documents the mutually agreed remedy between Ohio EPA and the U.S. Army for the Building 1200 area of concern. Please contact the undersigned at (703) 601-7785 or brett.a.merkel.civ@mail.mil, if there are issues or concerns associated with the responses to comments. I look forward to your response prior to our submission of the Final Record of Decision.

Sincerely,

Brett Merkel

Brett A. Merkel
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Nancy Zikmanis, Ohio EPA, DERR-NEDO
Rod Beals, Ohio EPA, DERR-NEDO
Justin Burke, Ohio EPA, CO
Kevin Sedlak, ARNG, Camp Ravenna
Katie Tait, OHARNG Camp Ravenna
Glen Beckham, USACE Louisville
Nat Peters, USACE Louisville
Kevin Jago, Leidos
Jed Thomas, Leidos
Gail Harris, Vista Sciences

Subject: Responses to Ohio EPA comments of the Draft Record of Decision for Soil, Sediment, and Surface Water at Building 1200, Ravenna Army Ammunition Plant Restoration Program, Portage/Trumbull Counties, RVAAP-13 Building 1200

Ohio EPA Comments and Army Responses

1) Page 3, Line 19 - Please remove "Scott J. Nally, Director" and add "Craig W. Butler, Interim Director".

Army Response: Agree. The signatory for Ohio EPA has been revised as recommended.

2) Page 18, Lines 1-2 - Please add a reference here to Appendix A.

Army Response: Agree. The referenced text has been revised as follows:

"Location- and action-specific ARARs were identified for Alternative 2, as presented in Attachment A. Alternative 2 can be designed and implemented to meet the respective ARARs."

3) Pages 18-19, Lines 42-43 and Lines 1-2 - Please add another cost estimate assuming that asbestos is present in the mound.

Army Response: Clarification. A further assessment of the mound has been completed since the submission of the Draft ROD. This assessment, conducted in December 2013, included the further investigation specified in the feasibility study and concluded that there is no ACM within the suspect mound. Accordingly, the following changes have been implemented to the ROD on Page 10, lines 25-29, subsequent references to the mound in the text have been deleted, and the "Standard for Inactive Waste Disposal Sites" has been removed from the list of ARARs:

> 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 by 21 ft long by 13 ft wide mound near the footprint of former Building T-4062. In December 2013, Remedial Design sampling was conducted to provide waste characterization of the recommended removal areas in support of a Remedial Design. As part of this field effort, approximately 5 test pits along the sides and top of the mound were hand dug with a shovel to the bottom of the mound/top of the former gravel road surface. At least 30 push probe sample aliquots were removed from the mound. In addition, the surface of the mound was cleared of snow and vegetation to allow for visual inspection. No building debris or construction materials were observed on the surface of the mound or encountered in the test pits or sample probes. The entire mound is comprised of clean, well sorted sandy soil and roots from the vegetation growing on the mound. Accordingly, this mound was confirmed to have no ACM, and no further action is warranted for this mound. Detailed results of the waste characterization sampling field effort will be presented in the Remedial Design.

4) Pages 18-19, Lines 42-43 and 1-2 - Please update the cost estimate/base year (2010) due to the time, now 4 years later.

Army Response: Clarification. The main intent of the cost estimate throughout the CERCLA process is to provide a comparative analysis among the different alternatives. As the escalated costs do not have an impact on the comparative analysis, it is recommended that the cost estimate remain the same as was previously presented to the public in the proposed plan. No change is recommended.

5) Page 21, Lines 14-21 - Please add an estimate of the approximate size of the mound (area and volume).

Army Response: Clarification. The reference text has been deleted in response to Ohio EPA Comment 3. No further change is recommended.

6) Page 21, Lines 36-43 - Please delete this paragraph, as it is duplicative of Lines 14-21.

Army Response: Agree. This paragraph has been deleted as recommended.

7) Page 22, Lines 16-18 - See comments 3 and 4 above. Please revise.

Army Response: Clarification. Please see responses to comments 3 and 4. No change is recommended.

8) Figure 3 - Please add the area and volume of the mound. Also, if it does not make the figure too busy, add the manganese concentrations for the removal areas.

Army Response: Clarification and agree. The manganese concentrations for the removal areas have been added to the figure, as recommended. As noted in response to comment 3, no ACM is present in the mound and requires no further action. Accordingly, the area and volume of the mound is no longer pertinent for Figure 3.