Final

Record of Decision for Soil, Sediment, and Surface Water at RVAAP-39 Load Line 5

Former Ravenna Army Ammunition Plant
Portage and Trumbull Counties, Ohio

Contract No. W912QR-15-C-0046

Prepared for:

US Army Corps of Engineers®

U.S. Army Corps of Engineers
Louisville District

Prepared by:

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December 22, 2017

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None.

14. ABSTRACT

This Record of Decision documents the selection of No Further Action (NFA) with respect to soil, sediment, and surface water to attain Unrestricted (Residential) Land Use at Load Line 5. In addition, this document presents the physical characteristics, geology, and hydrogeology of Load Line 5. This document also summarizes nature and extent of contamination in soil, sediment, and surface water; contaminant fate and transport; and human health and ecological risk assessments. These evaluations indicate there are no chemicals of concern (COCs) that pose unacceptable risk.

15. SUBJECT TERMS

record of decision, no further action, land use, chemicals of concern

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CONTRACTOR STATEMENT OF INDEPENDENT TECHNICAL REVIEW

Leidos has completed the Record of Decision for Soil, Sediment, and Surface Water at RVAAP-39 Load Line 5 at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio. Notice is hereby given that an independent technical review has been conducted that is appropriate to the level of risk and complexity inherent in the project. During the independent technical review, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of data quality objectives; technical assumptions; methods, procedures, and materials to be used; the appropriateness of data used and level of data obtained; and reasonableness of the results, including whether the product meets the customer's needs consistent with law and existing U.S. Army Corps of Engineers policy. In addition, an independent verification was performed to ensure all applicable changes were made per regulatory and Army comments.

Elias H Rogatz

12/22/2017

Eli Rogatz
Study/Design Team Leader

Date

Crystal Hann

12/22/2017

Crystal Hann
Independent Technical Review Team Leader

Date

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

Internal Leidos Independent Technical Review comments are recorded on a Document Review Record per Leidos standard operating procedure ESE A3.1 Document Review. 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.

12/22/2017

Lisa Jones-Bateman
Senior Program Manager

Date

Ohio Environmental Protection Agency

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

February 20, 2018

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

Re: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project records
Remedial Response
Portage County
267000859099

Subject: Concurrence of Final Record of Decision for Soil, Sediment, and Surface Water at Load Line 5 for the Former Ravenna Army Ammunition Plant (RVAAP) Document (Work Activity No. 267-000859-099)

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the Final Record of Decision (ROD) for Soil, Sediment, and Surface Water at RVAAP-39 Load Line 5. The document is dated December 22, 2017, and was received at Ohio EPA Northeast District Office (NEDO) on December 22, 2017. This letter serves to document Ohio EPA's concurrence regarding the proposal of No Further Action (NFA) for the RVAAP Load Line 5 site as contained in the final ROD.

We have no comments on the Final Record of Decision for Load Line 5 Soil, Sediment, and Surface Water. Based on the information contained in the Final ROD document, other investigation documents/reports, and Ohio EPA's oversight participation during the investigation, Ohio EPA concurs with the Final ROD document for the RVAAP Load Line 5 for NFA.

If you have any questions concerning the above, please feel free to contact Megan Oravec at (330) 963-1168.

Sincerely,

Michael Proffitt, Chief
Division of Environmental Response and Revitalization

MP:MNO:nvp

cc: Craig Coombs, USACE, Louisville District
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600 Martin Luther King, Jr. Place
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DOCUMENT DISTRIBUTION
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for Soil, Sediment, and Surface Water at RVAAP-39 Load Line 5
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ARNG = Army National Guard.
CO = Central Office.
DERR = Division of Environmental Response and Revitalization.
IED = Installation and Environment Division.
NEDO = Northeast District Office.
OHARNG = Ohio Army National Guard.
Ohio EPA = Ohio Environmental Protection Agency.
REIMS = Ravenna Environmental Information Management System.
SWDO = Southwest District Office.
USACE = U.S. Army Corps of Engineers.

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ACRONYMS AND ABBREVIATIONS

amsl	above mean sea level
AOC	Area of Concern
Army	U.S. Department of the Army
AT123D	Analytical Transient 1-, 2-, and 3-Dimensional Model
bgs	below ground surface
Camp Ravenna	Camp Ravenna Joint Military Training Center
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Act Information System
CMCOPC	Contaminant Migration Chemical of Potential Concern
COC	Chemical of Concern
COPEC	Chemical of Potential Ecological Concern
ERA	Ecological Risk Assessment
FPA	Former Production Area
FWCUG	Facility-wide Cleanup Goal
FWGWMP	Facility-wide Groundwater Monitoring Program
HHRA	Human Health Risk Assessment
HMX	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
IRP	Installation Restoration Program
MDL	Method Detection Limit
OHARNG	Ohio Army National Guard
Ohio EPA	Ohio Environmental Protection Agency
PAH	Polycyclic Aromatic Hydrocarbon
PBA08 RI	2008 Performance-based Acquisition Remedial Investigation
PCB	Polychlorinated Biphenyl
PP	Proposed Plan
RDX	Hexahydro-1,3,5-trinitro-1,3,5-triazine
RI	Remedial Investigation
ROD	Record of Decision
RSL	Regional Screening Level
RVAAP	Ravenna Army Ammunition Plant
SL	Screening Level
SRC	Site-related Contaminant
TNT	2,4,6-Trinitrotoluene
USEPA	U.S. Environmental Protection Agency
USP&FO	U.S. Property & Fiscal Officer
VOC	Volatile Organic Compound

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PART I: THE DECLARATION

A SITE NAME AND LOCATION

This Record of Decision (ROD) addresses soil, sediment, and surface water contaminants at Load Line 5. Load Line 5 is designated as area of concern (AOC) RVAAP-39 within the former Ravenna Army Ammunition Plant (RVAAP), Ravenna, Ohio (Figures 1 and 2).

The former RVAAP is now known as Camp Ravenna Joint Military Training Center (Camp Ravenna). Camp Ravenna, consisting of 21,683 acres, is federally owned and 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. As of September 2013, administrative accountability for the entire acreage of the facility has been transferred to the U.S. 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).

Load Line 5 is located in the south-central portion of Camp Ravenna. The Comprehensive Environmental Response, Compensation, and Liability Act Information System (CERCLIS) Identifier for RVAAP is OH5210020736.

B STATEMENT OF BASIS AND PURPOSE

The U.S. Department of the Army (Army) is the lead agency and has chosen the selected remedy for Load Line 5 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. 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, concurred with the *Remedial Investigation Report for Soil, Sediment, and Surface Water at RVAAP-39 Load Line 5* (USACE 2016a) (herein referred to as the Load Line 5 RI Report) and *Proposed Plan for Soil, Sediment, and Surface Water at RVAAP-39 Load Line 5* (USACE 2016b) (herein referred to as the Load Line 5 PP). The Remedial Investigation (RI) Report evaluated contaminated soil, sediment, and surface water at Load Line 5 and recommended no further action for these media. The decision that no further action is required for soil, sediment, and surface water at Load Line 5 satisfies the requirements of the Ohio EPA *Director's Final Findings and Orders*, dated June 10, 2004 (Ohio EPA 2004).

C DESCRIPTION OF THE SELECTED REMEDY

No further action is necessary for soil, sediment, and surface water at Load Line 5 for Unrestricted (Residential) Land Use. Consequently, no further action is necessary for the future use of the site (Military Training). Groundwater at Load Line 5 will be addressed under future CERCLA decisions.

Land use controls will not be implemented as part of this decision, as no CERCLA-related chemicals of concern (COCs) were identified in soil, sediment, or surface water for the Resident Receptor.

D STATUTORY DETERMINATIONS

The recommendation of no further action for soil, sediment, and surface water is protective of human health and the environment and meets the statutory requirements for cleanup standards established in Section 121 of CERCLA. Because the CERCLA-related contamination present in soil, sediment, and surface water at Load Line 5 does not pose a potential risk to human health or the environment, five-year reviews will not be required.

E AUTHORIZING SIGNATURE

16 Mar 2018

Erik T. Gordon
COL, GS
I&E, Army National Guard

Date

PART II: DECISION SUMMARY

A SITE NAME, LOCATION, AND DESCRIPTION

When the RVAAP Installation Restoration Program (IRP) began in 1989, RVAAP (CERCLIS Identification Number OH5210020736) was identified as a 21,419-acre installation. In 2002 and 2003, OHARNG surveyed the property and the total acreage of the property was found to be 21,683 acres. The RVAAP IRP encompasses investigation and cleanup of past activities over the entire 21,683-acre former RVAAP.

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). The Army is the lead agency for any remediation, decisions, and applicable cleanup at Load Line 5. These activities are being funded and conducted under the IRP. Ohio EPA is the supporting state regulatory agency.

Camp Ravenna is located in northeastern Ohio within Portage and Trumbull counties, approximately 4.8 km (3 miles) east-northeast of the city of Ravenna and approximately 1.6 km (1 mile) northwest of the city of Newton Falls. 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.

Camp Ravenna is a parcel of property approximately 17.7 km (11 miles) long and 5.6 km (3.5 miles) wide, bounded by State Route 5 and the CSX System Railroad on the south; Garret, McCormick, and Berry roads on the west; the Norfolk Southern Railroad on the north; and State Route 534 on the east (see Figures 1 and 2). Camp Ravenna is surrounded by several communities: Windham 11.2 km (7 miles) to the north, Garrettsville 9.6 km (6 miles) to the north, Newton Falls 1.6 km (1 mile) to the southeast, Charlestown 3.6 km (6 miles) to the southwest, and Wayland 4.8 km (3 miles) to the south.

Load Line 5 (formerly known as Fuze Line #1) is approximately 39 acres and is located on the south side of Fuze and Booster Road, west of Load Line 10, and east of Load Line 6 in the south-central portion of Camp Ravenna (Figure 2). The distinct surface features of the AOC, shown on Figure 3, include a one-lane asphalt road that enters the AOC from the northwest and surrounds the locations of the former production buildings. The AOC boundary encompasses the former production area (FPA) and non-production area (NPA) exposure units. The FPA consists of 11.1 acres and is in the central portion of the AOC. The FPA encompasses the locations of the former production and storage buildings. The NPA is 27.1 acres and includes the areas between the FPA and AOC fence. The FPA and NPA are depicted on Figure 4.

All buildings, including slabs and foundations, were removed in 2006 and 2007. Remaining features at Load Line 5 include a one-lane asphalt road and bordering drainage ditches. The Load Line 5 AOC fence is still in place, but it is not currently maintained.

B SITE HISTORY AND ENFORCEMENT ACTIVITIES

RVAAP was constructed in 1940 and 1941 for depot storage and ammunition assembly/loading and placed on standby status in 1950. The primary purpose of the former RVAAP was to load medium and major caliber artillery ammunition (i.e., bombs, mines, fuze and boosters, primers, and percussion elements) and store finished components. Load Lines 5 through 11 produced fuzes, boosters, primers, detonators, and percussion elements.

Load Line 5 is a 39-acre fenced AOC located south of Fuze and Booster Road in the south-central portion of Camp Ravenna (Figure 2). From 1941–1945, Load Line 5 operated at full capacity as a finished product assembly line to produce fuzes for artillery projectiles. With the exception of a mercury fulminate primer that was loaded and assembled at Load Line 5 and black powder used in fuzes, all primary explosive products were delivered to Load Line 5 as sealed, finished sub-assemblies (e.g., detonators from Load Line 9).

Load Line 5 was deactivated at the end of World War II, and the process equipment was removed. Load Line 5 has not been used since 1945, and no historical information exists to indicate Load Line 5 was used for any other processes other than producing fuzes. No fuel storage tanks were present at the AOC during operations. Additionally, no fuel materials were used operationally at Load Line 5 and no burning was conducted (USACE 2016a).

There have been no CERCLA enforcement actions related to Load Line 5.

C COMMUNITY PARTICIPATION

Using the RVAAP community relations program, the 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 the following:

- **Restoration Advisory Board –** The 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 the progress with decision makers. Board meetings are generally held two to three times per year and are open to the public.
- **Community Relations Plan –** The *Community Relations Plan* (Vista 2017) is maintained to establish processes to keep the public informed of activities at RVAAP. The plan is available in the Administrative Record at Camp Ravenna.
- **Internet Website –** The Army established an internet website in 2004 for RVAAP. It is accessible to the public at www.rvaap.org.

In accordance with CERCLA Section 117(a) and National Oil and Hazardous Substances Pollution Contingency Plan Section 300.430(f)(2), the Army released the Load Line 5 PP (USACE 2016b) to the public on June 12, 2017. The proposed plan (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 radio stations, television stations, and newspapers (e.g., *Youngstown Vindicator*, *Warren Tribune-Chronicle*, *Akron Beacon Journal*, and *Ravenna Record Courier*), as specified in the Community Relations Plan. The notice of availability initiated the 30-day public comment period beginning June 12, 2017 and ending July 12, 2017.

The Army held a public meeting on June 27, 2017 at the Shearer Community Center, 9355 Newton Falls Road, Ravenna, Ohio 44266 to present the PP. At this meeting, representatives of the Army provided information and were available to answer any questions. A transcript of the public meeting is available to the public and has been included in the Administrative Record. Responses to any verbal comments received at this meeting and written comments received during the public notification period are included in the Responsiveness Summary, which is Part III of this ROD.

The Army considered public input from the public meeting on the PP when selecting the remedy.

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 are not anticipated to cause risks to human health or the environment. No IRP cleanup activities have been performed at Load Line 5 to date.

This ROD addresses soil, sediment, and surface water. The CERCLA-related contamination at Load Line 5 is at concentrations considered protective of human health and does not represent a risk to the environment. Therefore, these media are already protective for Unrestricted (Residential) Land Use, and the program goal of the IRP at RVAAP has been met for Load Line 5.

Potential impacts to groundwater from soil (e.g., contaminant leaching) were evaluated in the RI Report, as protectiveness to groundwater was included in the fate and transport analysis. However, groundwater will be evaluated as an individual AOC for the entire facility (designated as RVAAP-66) under the Facility-wide Groundwater Monitoring Program (FWGWMP).

E SITE CHARACTERISTICS

This section presents site characteristics, nature and extent of contamination, and the conceptual site model for Load Line 5. These characteristics and findings are based on investigations conducted from 1978–2010 and are further summarized in the Load Line 5 RI Report (USACE 2016a).

E.1 Physical Characteristics

This section describes the topography/physiology, geology, hydrogeology, and ecological characteristics of Camp Ravenna and Load Line 5 that were key factors in identifying the potential contaminant transport pathways, receptor populations, and exposure scenarios to evaluate human health and ecological risks.

E.1.1 Topography/Physiography

The topography of Camp Ravenna is gently undulating with an overall decrease in ground elevation from a topographic high of approximately 1,220 ft above mean sea level (amsl) in the far western portion of the facility to low areas at approximately 930 ft amsl in the far eastern portion. Ground surface elevations across Load Line 5 range from approximately 1,112–1,130 ft amsl. The northwestern portion of Load Line 5 is a topographic high that slopes downward to the topographic low in the southeastern portion of the AOC (Figure 3).

Load Line 5 is located south of Fuze and Booster Road in the south-central portion of Camp Ravenna (Figure 2). All buildings, including slabs and foundations, were removed in 2006 and 2007. Soil near former production buildings was extensively disturbed during building demolition activities. The work areas were re-graded, cavities were filled with approved fill dirt as needed, and the area was vegetated in 2007 (LES 2007). Remaining features at Load Line 5 include a one-lane asphalt road that enters the AOC from the northwest and surrounds most of the FPA and access roads within the AOC (Figure 4). The Load Line 5 AOC fence is still in place, although it is not currently maintained.

Surface water at Load Line 5 occurs intermittently as storm water runoff within constructed or natural drainage ditches or conveyances throughout the AOC. Surface water drainage generally follows the topography of Load Line 5, flowing radially outward into ditch conveyances that surround the FPA. Three wetlands are located within Load Line 5. Two wetlands (a 0.01-acre, scrub-shrub wetland and a 0.02-acre, forested wetland) are in the northeastern portion of the AOC. These wetlands are seasonally inundated. The largest wetland, a 0.30-acre forested wetland referred to as the Load Line 5 wetland in the Load Line 5 RI Report (USACE 2016a), is in the northwest portion of the AOC and is regularly inundated/saturated. The closest perennial feature to receive the majority of the surface drainage from Load Line 5 is an unnamed tributary located approximately 500 ft southeast of the AOC boundary. The tributary flows in a southeast direction to its confluence with the west branch of the Mahoning River (Figure 3).

E.1.2 Geology

Deposits of the Wisconsin-aged Lavery Till in the western portion of the facility and the younger Hiram Till and associated outwash deposits overlie bedrock at Camp Ravenna in the eastern two-thirds of the facility. Unconsolidated glacial deposits vary considerably in their character and thickness across Camp Ravenna, from zero in some of the eastern portions of the facility to an estimated 150 ft in the south-central portion.

Load Line 5 is located within Hiram Till glacial deposits (Figure 5). The soil type found at this AOC is the Mahoning silt loam (0–2% slopes). Mahoning silt loam is a gently sloping, poorly drained soil formed in silty clay loam or clay loam glacial till, generally where bedrock is greater than 6 ft below ground surface (bgs). Much of the native soil at Camp Ravenna was disturbed during construction activities in former production and operational areas of the facility. Mahoning silt loam has low permeability with rapid runoff and seasonal wetness (USDA 2010).

The Sharon Sandstone Conglomerate Unit of the Pennsylvanian Pottsville Formation is the primary bedrock beneath Camp Ravenna. Bedrock formations at Load Line 5 include the Sharon Shale, Massillion Sandstone, and Mercer Member (Winslow et al. 1966) (Figure 6). Bedrock was encountered at Load Line 5 from 21–28 ft bgs during monitoring well installation activities as part of the Characterization of 14 AOCs (MKM 2007).

E.1.3 Hydrogeology

Six monitoring wells are present at Load Line 5, which were installed in 2004 during the Characterization of 14 AOCs (MKM 2007). Initial depths to groundwater encountered during groundwater monitoring well installation varied from 11–19 ft bgs. Water level elevations at the AOC ranged from 1,107.35–1,107.48 amsl (18.33–22.03 ft below top of casing) with the highest elevation at the unconsolidated well LL5mw-004. Potentiometric data indicate the groundwater table occurs within unconsolidated soil throughout the AOC (USACE 2016a). The groundwater flow pattern at Load Line 5 is to the southwest.

E.1.4 Ecology

The ecological risk assessment (ERA) in the Load Line 5 RI Report (USACE 2016a) concluded that the wetlands are the only important ecological resource at the AOC (Figure 7). However, the wetlands are not a significant ecological resource, as contaminants are not present at levels of ecological concern in the largest wetland and are not likely present at levels of ecological concern in the smaller wetlands given the surrounding surface soil incremental sampling methodology concentrations and site topography. There are no streams or perennial ponds present at Load Line 5.

Five terrestrial vegetation communities are present within the Load Line 5 habitat boundaries: HU1 (dry, early-successional herbaceous field); FU2 [American beech (*F. grandifolia*)/oak (*Quercus spp.*)/maple (*Acer spp.*) forest alliance]; FU3 [White oak (*Q. alba*)/Northern red oak (*Q. rubra*)/Hickory (*Carya spp.)* forest alliance]; FU5 (mixed, cold-deciduous, successional forest); and SU1 (dry, mid-successional, cold-deciduous shrubland) (Figure 7).

The northern long-eared bat (*Myotis septentrionalis*; endangered species) exists at Camp Ravenna. There are no other federally listed species and no critical habitat occurs on Camp Ravenna. Load Line 5 has not been previously surveyed for federal- or state-listed species; however, there have been no documented sightings of state-listed, federally listed, threatened, or endangered species at the AOC (OHARNG 2014).

E.2 Site Investigations

In 1978, the U.S. Army Toxic and Hazardous Materials Agency conducted an Installation Assessment of RVAAP to review the potential for contaminant releases at multiple former operations areas, as documented in *Installation Assessment of Ravenna Army Ammunition Plant* (USATHAMA 1978). This assessment indicated historical operations at Load Line 5 may have utilized lead azide or lead styphnate, which are primary explosives. The *Relative Risk Site Evaluation for Newly Added Sites*

(USACHPPM 1998) indicated additional potential contaminants at Load Line 5, based on operation history, include black powder, mercury fulminate, and heavy metals (lead, chromium, mercury, and arsenic) from munitions assembly activities; volatile organic compounds (VOCs) from former Building 1F-15 that was utilized for paint storage; polychlorinated biphenyls (PCBs) from on-site transformers; and polycyclic aromatic hydrocarbons (PAHs) from former Building 1F-2, which was used as a heater house.

Since 1978, Load Line 5 has been included in various historical assessments and investigations conducted at the former RVAAP. The following environmental investigations have been completed for Load Line 5:

- Installation Assessment of Ravenna Army Ammunition Plant (USATHAMA 1978);
- Resource Conservation and Recovery Act Facility Assessment (Jacobs 1989);
- Preliminary Assessment for the Characterization of Areas of Contamination (USACE 1996);
- Relative Risk Site Evaluation for Newly Added Sites (USACHPPM 1998);
- 2004 Characterization of 14 AOCs (MKM 2007);
- 2007 Investigation of the Under Slab Surface Soils (USACE 2009); and
- 2010/2012 2008 Performance-based Acquisition Remedial Investigation (PBA08 RI) (USACE 2016a).

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, as summarized in the Load Line 5 RI Report (USACE 2016a).

E.3 Nature and Extent of Contamination

Analytical results obtained during the 2004 Characterization of 14 AOCs, 2007 Investigation of Under Slab Surface Soil, and 2010/2012 PBA08 RI effectively characterized the nature and extent of contamination at the AOC. Figure 8 presents the sample locations. Based on previous information and the summary below, it can be concluded that the vertical and horizontal extent of contamination is defined, and no further sampling is needed to evaluate Load Line 5 (USACE 2016a).

With the exception of two sample locations, all PAH concentrations in samples collected in 2004, 2007, and 2010 were less than the Resident Receptor (Adult and Child) facility-wide cleanup goals (FWCUGs). Two locations slightly exceeded the benzo(a)pyrene Resident Receptor (Adult and Child) FWCUGs with concentrations of 0.53 mg/kg at LL5ss-064M and 0.5 mg/kg at LL5ss-069M. The PAHs and inorganic chemicals varied in concentration, but no focused area of contamination was identified. The human health risk assessment (HHRA) and ERA further evaluated if these chemicals posed an unacceptable risk to potential receptors (USACE 2016a).

Explosives were a main potential contaminant from previous use of the site. Sites where explosives were identified as potential contaminants from previous use [hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX) and 2,4,6-trinitrotoluene (TNT)] were thoroughly evaluated, including around former process buildings and across the AOC as a whole. No explosives or propellants were detected in subsurface

soil, sediment, or surface water at Load Line 5. Seven surface soil sample locations had detections of explosives or propellants, but the detected concentrations were below the Resident Receptor (Adult and Child) FWCUG at a target risk (TR) of 1E-06, hazard quotient (HQ) of 0.1.

Building 1F-15 was the only building at Load Line 5 whose purpose was paint storage. The 2004 Characterization of 14 AOCs sample LL5ss-030 and 2007 Investigation of Under Slab Surface Soil sample LL5ss-047D were the two primary samples collected at or near this building footprint. Neither of these primary samples had detectable VOC concentrations (USACE 2016a).

Historical records indicated three transformers serviced all buildings at the AOC. Surface soil sample LL5ss-005M associated with Building 1F-8 had a detected concentration of PCB-1254 at 0.038 mg/kg, which was below the screening level (SL) (0.12 mg/kg). All other samples analyzed for PCBs had non-detectable concentrations (USACE 2016a).

The Load Line 5 wetland was evaluated with sediment and surface water samples collected at location LL5-078 in 2010 and a sediment sample collected at LL5-086 in 2012. No explosives were detected in the Load Line 5 wetland sediment from the sample collected, and only nitrocellulose was detected at a small, estimated concentration of 2.1J mg/kg, which is below the SL (19,000,000 mg/kg). The surface water sample did not have detected explosives or propellants. All inorganic chemicals in sediment and surface water in the Load Line 5 wetland had concentrations below their respective SLs, with the exception of aluminum in sediment. Although aluminum was not previously associated with historical operations, the concentration in the Load Line 5 sediment sample LL5sd-078 of 14,900 mg/kg was above the background concentration (13,900 mg/kg) and exceeded the SL (3,496 mg/kg). While SVOCs were detected in sediment, all the concentrations were below the SLs. No SVOCs were detected in surface water at Load Line 5. No pesticides or PCBs were detected in sediment or surface water, and the only detected VOC was toluene, detected at a low, estimated concentration of 0.00022J mg/L in surface water.

Surface water and wet sediment samples were collected at potential exit points from the Fuze and Booster Hill area (which includes Load Lines 5 through 11) and near the southern boundary of Camp Ravenna to determine nature and extent. Four surface water and co-located composite wet sediment samples were collected from these areas in order to characterize current conditions and assess potential exit pathways from the area. The Load Line 5 RI Report (USACE 2016a) evaluated two of these samples (FWSsd/sw-102 and FWSsd/sw-103) that are southeast of Load Line 5. No explosives or propellants were detected in the Fuze and Booster Hill area sediment samples. Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX) and RDX were detected at FWSsw-103 at concentrations that are well below the Resident Receptor (Adult and Child) FWCUG at a TR of 1E-06, HQ of 0.1. Cobalt was the only inorganic chemical detected above the background concentration and exceeded the SL at the two sediment sample locations; however, the concentrations were below the regional SL at a TR of 1E-05, HQ of 1. No inorganic chemicals were detected above SLs in the two surface water samples collected from the Fuze and Booster Hill area, and no SVOCs were detected in sediment or surface water. The VOC toluene was detected in sediment at location FWSsd-103 at an estimated concentration of 0.00041J mg/kg. No other VOCs, pesticides, or PCBs were detected in sediment or surface water at these sample locations.

E.4 Conceptual Site Model

Conceptual site model elements are discussed in this section, including primary and secondary contaminant sources and release mechanisms, contaminant migration pathways and discharge or exit points, and potential human receptors and ecological resources.

E.4.1 Primary and Secondary Contaminant Sources and Release Mechanisms

No primary contaminant sources (e.g., operational facilities) are currently located at Load Line 5. All buildings, including slabs and foundations, were removed in 2006 and 2007. Remnant contamination in soil and sediment is considered a secondary source of contamination. The potential mechanisms for contaminant releases from secondary sources at Load Line 5 include:

- Eroding soil matrices with sorbed chemicals and mobilization in overland surface water storm runoff during heavy rainfall conditions,
- Dissolving soluble chemicals and transport in perennial surface water conveyances and intermittent surface water runoff,
- Re-suspending contaminated sediment during periods of high flow with downstream transport within the surface water system, and
- Leaching contaminants to groundwater.

E.4.2 Contaminant Migration Pathways and Exit Points

The potential for soil and sediment contaminants to impact groundwater was evaluated in a fate and transport evaluation presented in the Load Line 5 RI Report (USACE 2016a). Contaminants in surface soil may migrate to surface water via drainage ditches in the dissolved phase following a storm event, or as particulates in storm water runoff.

Maximum SRC concentrations identified in surface and subsurface soil were evaluated using a series of generic screening steps to identify initial contaminant migration chemicals of potential concern (CMCOPCs). These CMCOPCs for soil were further evaluated using the Seasonal Soil Compartment model to predict leaching concentrations and identify final CMCOPCs based on RVAAP facility-wide background criteria and the lowest risk-based screening criteria among U.S. Environmental Protection Agency (USEPA) maximum contaminant levels, USEPA tap water regional SLs, or RVAAP groundwater FWCUGs for the Resident Receptor Adult. Final CMCOPCs were evaluated using the Analytical Transient 1-, 2-, and 3-Dimensional (AT123D) model to predict groundwater mixing concentrations beneath source areas and concentrations at the nearest downgradient groundwater receptor to the AOC (e.g., stream). Maximum SRC concentrations in sediment were evaluated using an analytical solution to identify final CMCOPCs for evaluation using AT123D. The AT123D modeling results were evaluated with respect to AOC groundwater monitoring data, as well as model limitations and assumptions, to identify chemicals to be retained as contaminant migration COCs (USACE 2016a).

Conclusions of the soil and sediment screening, leachate modeling, and groundwater modeling are as follows:

- The AT123D model predicted maximum future groundwater concentrations for the final soil CMCOPCs selenium, 4-nitrotoluene, naphthalene, and beta-hexachlorocyclohexane to exceed groundwater screening criteria beneath soil source area; however, none of these CMCOPCs were predicted to be above their respective groundwater criteria at the downgradient receptor locations (unnamed tributary to the Mahoning River and unnamed tributary to Sand Creek).
- AT123D predicted groundwater concentrations of the final sediment CMCOPC hexachlorobenzene also exceeded groundwater screening criteria in groundwater beneath its source; however, it was not predicted to be above criteria in the downgradient receptor location.

Evaluation of modeling results with respect to current AOC groundwater data and model limitations indicate that identified CMCOPCs are not currently impacting groundwater beneath the source areas and that modeling assumptions are conservative.

All SRCs identified in surface soil, subsurface soil, and sediment at Load Line 5 were evaluated through the stepwise fate and transport evaluation. All SRCs were eliminated as posing future impacts to groundwater, and no further action is necessary for surface soil, subsurface soil, and sediment to protect groundwater (USACE 2016a). Groundwater will be further evaluated under the FWGWMP.

E.4.3 Potential Human Receptors and Ecological Resources

In February 2014, the Army and Ohio EPA amended the risk assessment process to address changes in the RVAAP restoration program. The *Final Technical Memorandum: Land Uses and Revised Risk Assessment Process for the RVAAP Installation Restoration Program* (ARNG 2014) identified the following three Categorical Land Uses and Representative Receptors to be considered during the RI phase of the CERCLA process.

1. Unrestricted (Residential) Land Use – Resident Receptor (Adult and Child) (formerly called Resident Farmer).
2. Military Training Land Use – National Guard Trainee.
3. Commercial/Industrial Land Use – Industrial Receptor (USEPA Composite Worker).

An evaluation using Resident Receptor (Adult and Child) FWCUGs was used to provide an Unrestricted (Residential) Land Use evaluation. Unrestricted (Residential) Land Use is considered protective for all categories of Land Use at Camp Ravenna. Additional human health receptors associated with Camp Ravenna are the National Guard Trainee and Industrial Receptor. No COCs were identified as requiring remediation to be protective for the Resident Receptor or Unrestricted (Residential) Land Use. The receptor is assumed to be exposed to surface soil from 0–1 ft bgs and subsurface soil from 1–13 bgs.

There are no streams or perennial ponds at the AOC; however, aquatic resources, including three wetlands (0.33 acres), are present at Load Line 5. 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, or locally important ecological places do not exist. Groundwater is not considered an exposure medium for ecological receptors on the AOC given its depth and occurrence within bedrock, and there are no discharge points (e.g., springs, seeps) that would represent potential exposure points (USACE 2016a).

F CURRENT AND POTENTIAL FUTURE LAND USES

Load Line 5 is currently managed by Army National Guard/OHARNG. The AOC is not currently being utilized for training purposes. The future use of Load Line 5 is Military Training. The Resident Receptor was evaluated in the 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.

G SUMMARY OF SITE RISKS

The HHRA and ERA estimated risks to human receptors and ecological resources; identified exposure pathways; COCs and chemicals of potential ecological concern (COPECs), 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 Load Line 5 RI Report (USACE 2016a) and Load Line 5 PP (USACE 2016b) located in the Administrative Record and Information Repositories.

G.1 Human Health Risk Assessment

An HHRA was performed to identify COCs and provide a risk management evaluation to determine if remediation is required under CERCLA based on potential risks to human receptors. The media evaluated in the HHRA for the Resident Receptor (Adult and Child) were surface soil (0–1 ft bgs), subsurface soil (1–13 ft bgs), sediment, and surface water.

No COCs were identified for the Resident Receptor (Adult and Child) in sediment or surface water. Aluminum was identified as the only sediment chemical of potential concern. However, the detected concentrations were below the Resident Receptor (Adult and Child) FWCUG at a TR of 1E-05, HQ of 1 (73,798 mg/kg) and was not considered a COC.

No COCs were identified in subsurface soil at Load Line 5. Four PAHs [benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenz(a,h)anthracene] were identified as COCs for the Resident Receptor (Adult and Child) in surface soil, as they contribute to a sum-of-ratio greater than one at two sample locations (LL5ss-064M and LL5ss-069M). At these two locations, only benzo(a)pyrene concentrations exceeded the Resident Receptor (Adult and Child) FWCUG at a TR of 1E-05, HQ of 1. Location LL5ss-069M had a benzo(a)pyrene concentration of 0.5 mg/kg and location LL5ss-064M had a benzo(a)pyrene concentration of 0.53 mg/kg. Both locations are below the 2017 USEPA resident soil regional screening level (RSL) of 1.1 mg/kg. These low levels of PAHs can be

attributed to the adjacent asphalt access road. PAHs were not identified as COCs for potential remediation in these two incremental sampling methodology sample areas.

The HHRA did not identify COCs from previous Army activities requiring remediation under CERCLA to be protective of the Resident Receptor (Adult/Child) (USACE 2016a).

G.2 Ecological Risk Assessment

The ecological habitat in Load Line 5 consists of 39 acres of herbaceous field (grasses), forest, and shrubs. There are no streams or perennial ponds at the AOC; however, aquatic resources, including three wetlands (0.33 acres), are present at Load Line 5. The vegetation provides a habitat for birds, mammals, insects, and other organisms. Intermittent surface water flows in small drainage ditches bordering the roads and within the FPA. During most of the year, there is no water in the drainage ditches; however, there is sufficient precipitation at Camp Ravenna to maintain aquatic habitat at Load Line 5, as evidenced by the presence of wetlands. The vegetation types present at Load Line 5 are found elsewhere near the AOC, at Camp Ravenna, and in the ecoregion.

The northern long-eared bat (*Myotis septentrionalis*; federally threatened) exists at Camp Ravenna. There are no other federally listed species or critical habitats on Camp Ravenna. Load Line 5 has not been previously surveyed for federal- or state-listed species; however, there have been no documented sightings of state-listed, federally listed, threatened, or endangered species at the AOC (OHARNG 2014).

The ERA was conducted in accordance with the *Guidance for Conducting Ecological Risk Assessments* (Ohio EPA 2008). The ERA evaluated chemical contamination to determine if it posed a risk to the environment. The ERA incorporated available data to identify integrated COPECs. Nineteen integrated soil COPECs, one integrated sediment COPEC, and no integrated surface water COPECs that were identified in the Level I ERA at Load Line 5.

Ecological resources at Load Line 5 were compared to the list of important ecological places and resources (USACE 2016a). Based on the 39 criteria defining important places as identified by the Army and Ohio EPA, the wetlands were identified as an important ecological resource at Load Line 5. Contaminants are not present in the larger 0.33-acre wetland, and the soil concentrations and topography surrounding the smaller wetlands indicate that contaminants are not likely present at levels of ecological concern. Therefore, these wetlands are not considered significant ecological resources. Consequently, the ERA for Load Line 5 concluded with a Level I Scoping Level Risk Assessment, with a recommendation of no further action to be protective of important ecological receptors (USACE 2016a).

H DOCUMENTATION OF NO SIGNIFICANT CHANGE

The Load Line 5 PP (USACE 2016b) was released for public comment on June 12, 2017. Feedback received from the public during the public comment period and public meeting are presented in Part III of this ROD. The PP recommended no further action for soil, sediment, and surface water at Load

Line 5. No significant changes were necessary or appropriate following the conclusion of the public comment period.

PART III: RESPONSIVENESS SUMMARY FOR PUBLIC COMMENTS ON THE ARMY PROPOSED PLAN FOR RVAAP-39 LOAD LINE 5

A OVERVIEW

On June 12, 2017, the Army released the *Proposed Plan for Soil, Sediment, and Surface Water at RVAAP-39 Load Line 5* (USACE 2016b) for public comment. A 30-day public comment period was held from June 12, 2017 to July 12, 2017. The Army hosted a public meeting on June 27, 2017 to present the PP and take questions and comments from the public for the record. This public comment period and public meeting also included PPs for Load Lines 6, 8, and 11.

For soil, surface water, and sediment at Load Line 5, the Army recommended no further action. During the public meeting, Ohio EPA concurred with the recommendation of no further action. Comments provided during the public comment period and public meeting are summarized in the following section.

The community voiced no objections to the no further action recommendation. All public input was considered during the selection of the final remedy for soil, surface water, and sediment at Load Line 5 in this ROD.

B SUMMARY OF PUBLIC COMMENTS AND LEAD AGENCY RESPONSES

The following subsections summarize the oral and written comments provided during the public comment period and public meeting. The Army's responses provided below are considered final upon approval of the Final ROD.

B.1 Oral Comments from Public Meeting

Comment 1: If the report indicates that a chemical group (e.g., VOCs, explosives, PCBs) is not detected at the site, does that mean there was zero detection of all of the chemicals within that specific chemical group?
Response: If the report indicates that a chemical group is not detected at the site, it means that all chemicals analyzed as part of the chemical group had concentrations below the laboratory method detection limits (MDL). These laboratory MDLs were at low enough concentrations to ensure nature and extent of contamination and risk can be thoroughly evaluated at a site.

Comment 2: Was there a functional commonality among the various load lines that used chromium? If chromium was used, was it in the hexavalent chromium form?
Response: Chromium is a potential contaminant from operational history. Chromium was extensively analyzed for at Load Line 5, as 60 surface soil samples and 13 subsurface soil samples were analyzed for chromium. The chromium concentrations were predominantly at or near the concentrations in which chromium naturally occurs in the respective media. As part of the chromium analysis, Load

Line 5 was sampled to specifically assess the predominant form of chromium (trivalent or hexavalent) that occurs at the site. It was determined that hexavalent chromium (maximum concentration of 1.6 mg/kg) is not of concern at Load Line 5, and trivalent chromium is the predominant form of chromium. All concentrations were below the applicable risk levels for trivalent chromium.

Comment 3: It would be helpful for the public for full-sheet maps to be provided in the slideshow package handouts.
Response: Agree. Future presentations will have full-sheet maps provided as part of the handouts provided to the public.

Comment 4: What are the interim land use controls that are used at these sites (Load Lines 5, 6, 8, and 11)?
Response: The Army is currently controlling/restricting the sites during the completion of the CERCLA process. Based on the RIs and subsequent analysis, the current recommendation is to allow for Unrestricted (Residential) Land Use at each site.

Comment 5: Are the land use controls considering the possibility of tampering with, or vandalism of the monitoring wells?
Response: The groundwater wells will continue to be used as part of the Facility-wide Groundwater Monitoring Program conducted at the former RVAAP. While the Army controls Camp Ravenna and implements the Facility-wide Groundwater Monitoring Program, the potential for tampering or vandalism of the wells is low, as the wells are locked and the facility currently has a perimeter fence. When the program discontinues use of the wells, the wells will be abandoned per all appropriate rules and regulations.

B.2 Written Comments

No written comments were received during the public comment period.

C TECHNICAL AND LEGAL ISSUES

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

PART IV: REFERENCES

ARNG (Army National Guard) 2014. *Final Technical Memorandum: Land Uses and Revised Risk Assessment Process for the Ravenna Army Ammunition Plant (RVAAP) Installation Restoration Program, Portage/Trumbull Counties, Ohio*. Memorandum between ARNG-ILE Cleanup and the Ohio Environmental Protection Agency. February 2014.

Jacobs (Jacobs Engineering Group, Inc.) 1989. *Resource Conservation and Recovery Act Facility Assessment, Preliminary Review/ Visual Site Inspection Ravenna Army Ammunition Plant Ravenna, Ohio*. October 1989.

LES (Lakeshore Engineering Services Inc.) 2007. *Project Completion Report: Munitions Response for the Demolition of Load Lines 5, 7, Building 1039, Transite Removal at Building T-1604, Removal of Remaining Concrete and Miscellaneous Debris at Load Lines 6, 9, and 11 at the Ravenna Army Ammunition Plant, Ravenna, Ohio*. December 2007.

MKM (MKM Engineers, Inc.) 2007. *Characterization of 14 AOCs at Ravenna Army Ammunition Plant.* March 2007.

OHARNG (Ohio Army National Guard) 2014. *Integrated Natural Resources Management Plan at the Camp Ravenna Joint Military Training Center, Portage and Trumbull Counties, Ohio.* December 2014.

Ohio EPA (Ohio Environmental Protection Agency) 2004. *Director's Final Findings and Orders for the Ravenna Army Ammunition Plant*. June 2004.

Ohio EPA 2008. *Guidance for Conducting Ecological Risk Assessments (Ohio EPA). Division of Emergency and Remedial Response*. April 2008.

USACE (U.S. 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 2009. *Final Investigation of the Under Slab Surface Soils, Post Slab and Foundation Removal at RVAAP-39 Load Line 5, RVAAP-40 Load Line 7, RVAAP-41 Load Line 8, and RVAAP-43 Load Line 10, Version 1.0, Ravenna Army Ammunition Plant, Ravenna, Ohio*. January 2009.

USACE 2016a. *Remedial Investigation Report for Soil, Sediment, and Surface Water at RVAAP-39 Load Line 5, Former Ravenna Army Ammunition Plant Portage and Trumbull Counties, Ohio.* June 2016.

USACE 2016b. *Proposed Plan for Soil, Sediment, and Surface Water at RVAAP-39 Load Line 5, Former Ravenna Army Ammunition Plant Portage and Trumbull Counties, Ohio*. December 2016.

USACHPPM (U.S. Army Center for Health Promotion and Preventive Medicine) 1998. *Relative Risk Site Evaluation for Newly Added Sites at the Ravenna Army Ammunition Plant, Ravenna, Ohio*. Hazardous and Medical Waste Study No. 37-EF-5360-99. October 1998.

USATHAMA (U.S. Army Toxic and Hazardous Materials Agency) 1978. *Installation Assessment of Ravenna Army Ammunition Plant,* Records Evaluation Report No. 132. 1978.

USDA (U.S. Department of Agriculture) 2010. Soil Map of Portage County, Version 4. Website: www.websoilsurvey.nrcs.usda.gov. January 2010.

Vista (Vista Sciences Corporation) 2017. *Community Relations Plan for the Ravenna Army Ammunition Plant Restoration Program*. March 2017.

Winslow, J.D., and G.W. White, 1966. *Geology and Ground-water Resources of Portage County, Ohio. Geological Survey Professional Paper 511*. 1966.

FIGURES

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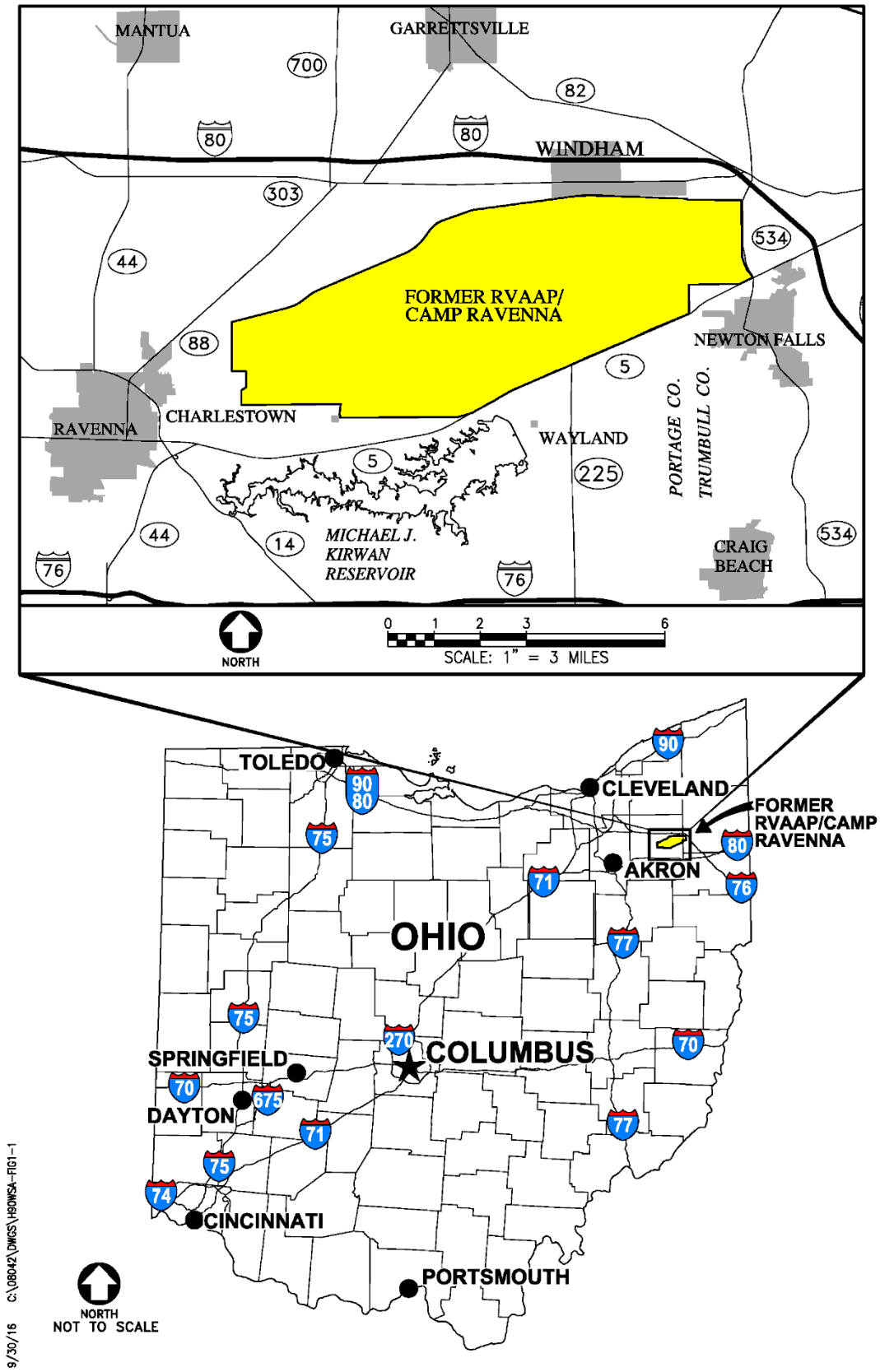


Figure 1. General Location and Orientation of RVAAP/Camp Ravenna

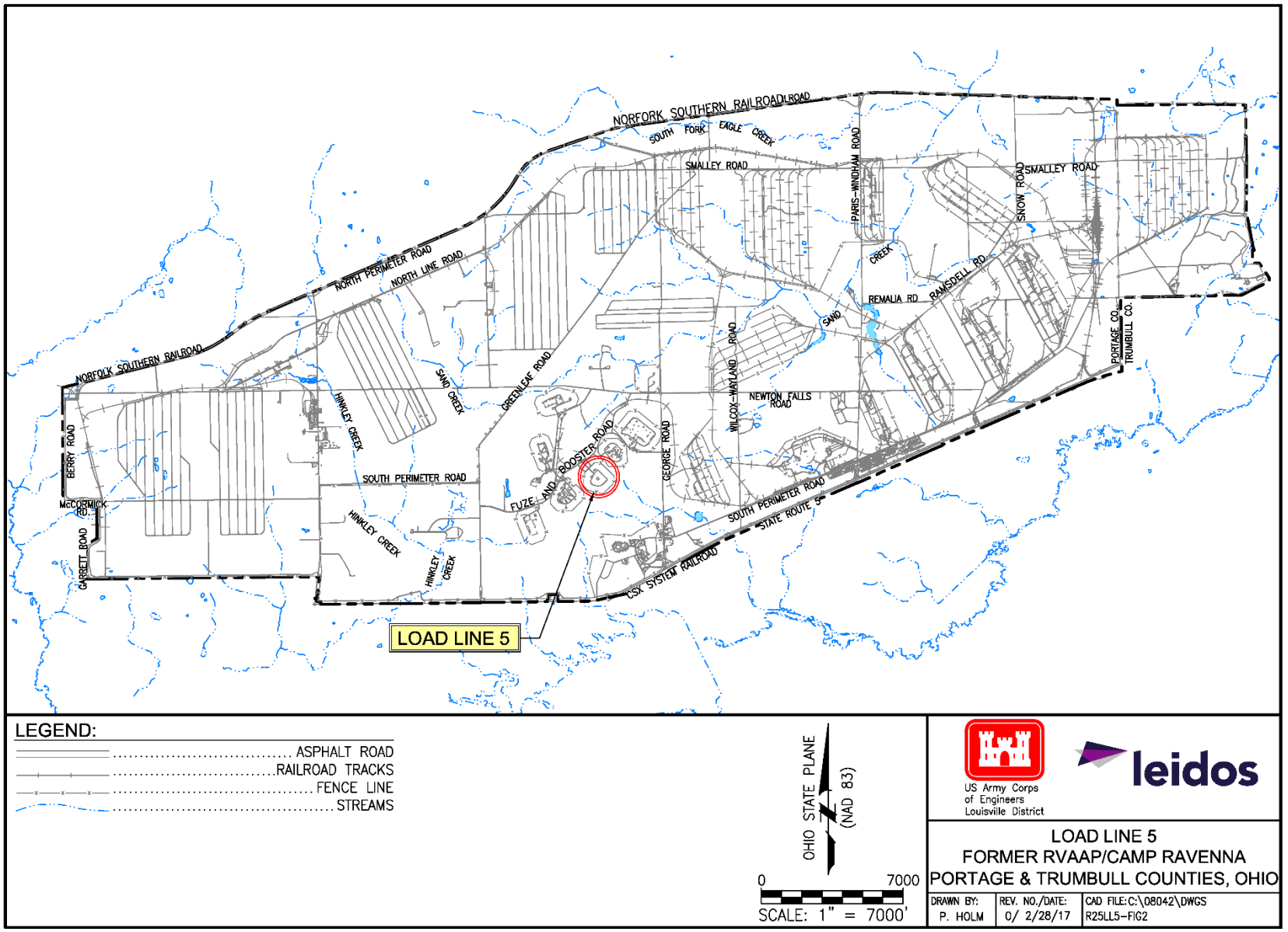
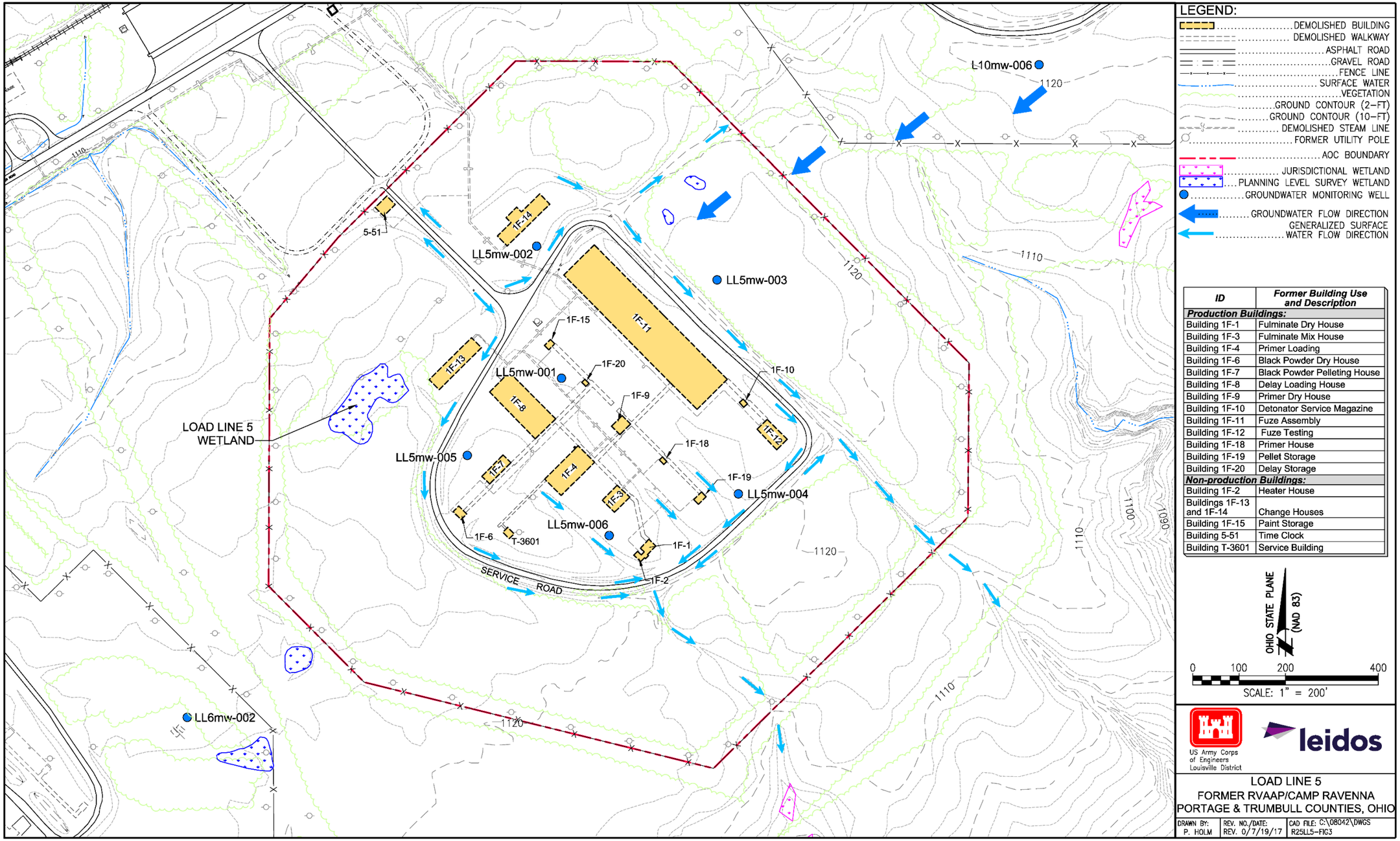
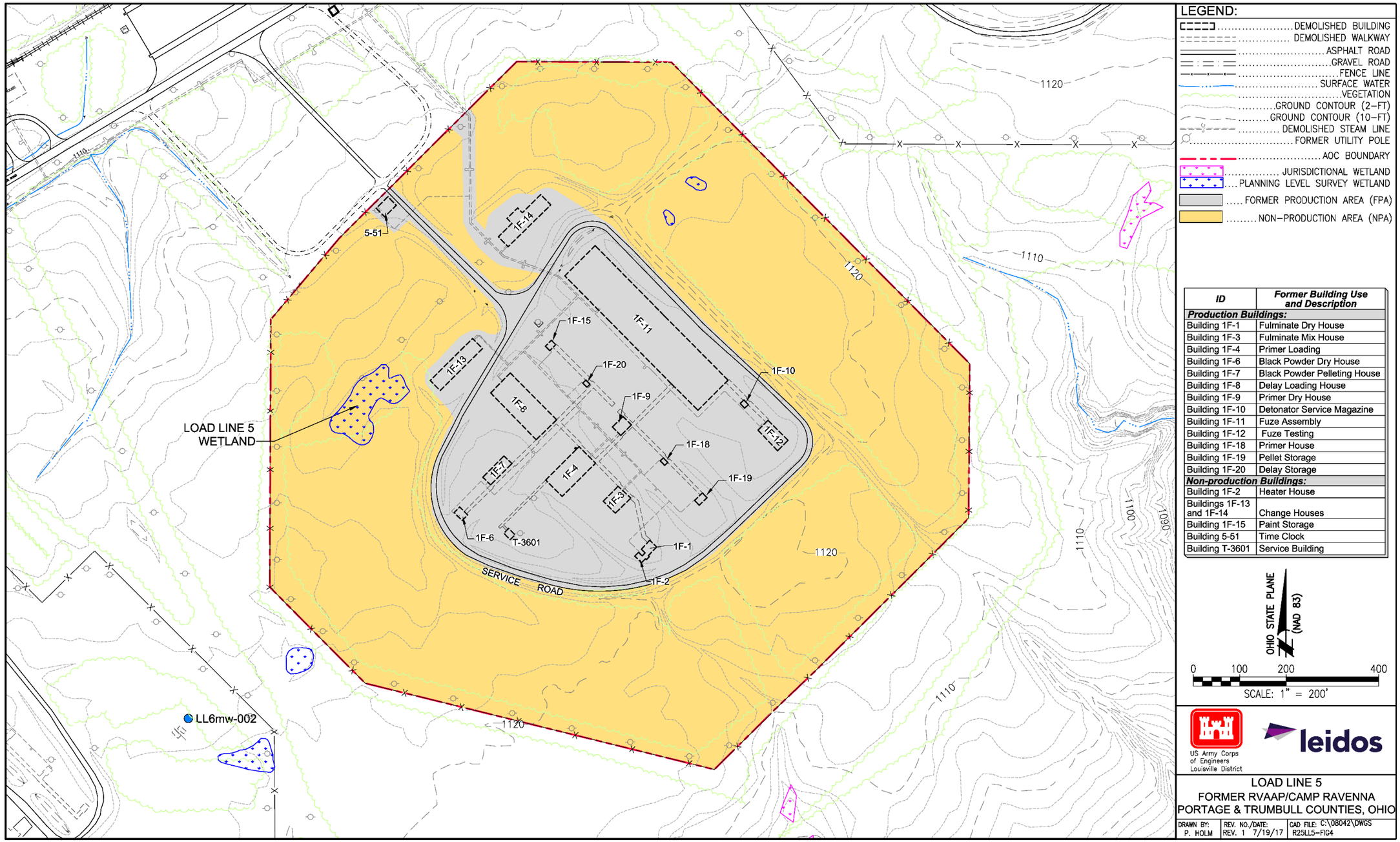


Figure 2. Camp Ravenna Installation Map



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

Figure 3. Load Line 5 Site Features



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Building 1F-11	Fuze Assembly
Building 1F-12	Fuze Testing
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Building 1F-20	Delay Storage
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Building 1F-2	Heater House
Buildings 1F-13 and 1F-14	Change Houses
Building 1F-15	Paint Storage
Building 5-51	Time Clock
Building T-3601	Service Building

Figure 4. Load Line 5 Exposure Units

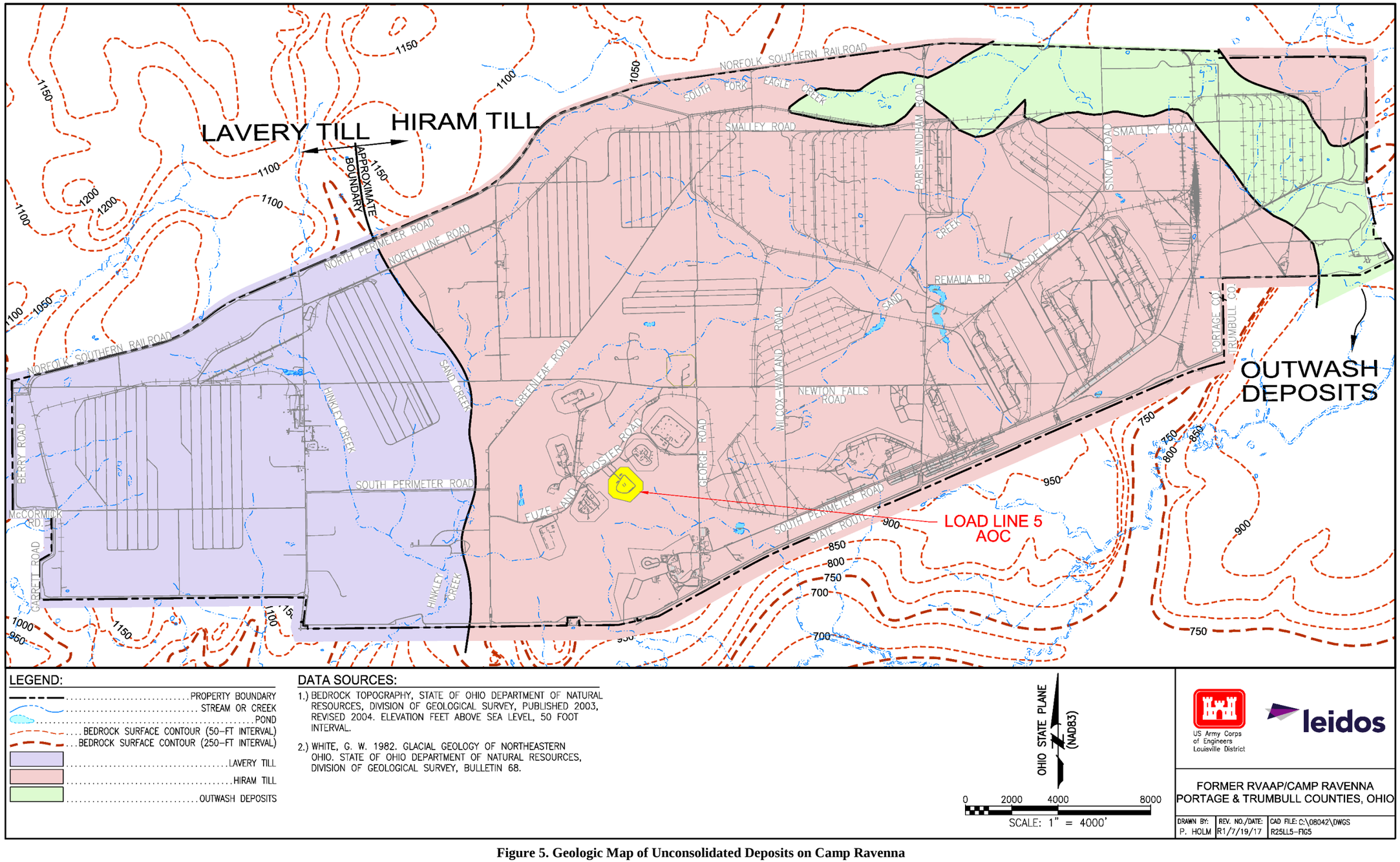

Figure 5. Geologic Map of Unconsolidated Deposits on Camp Ravenna

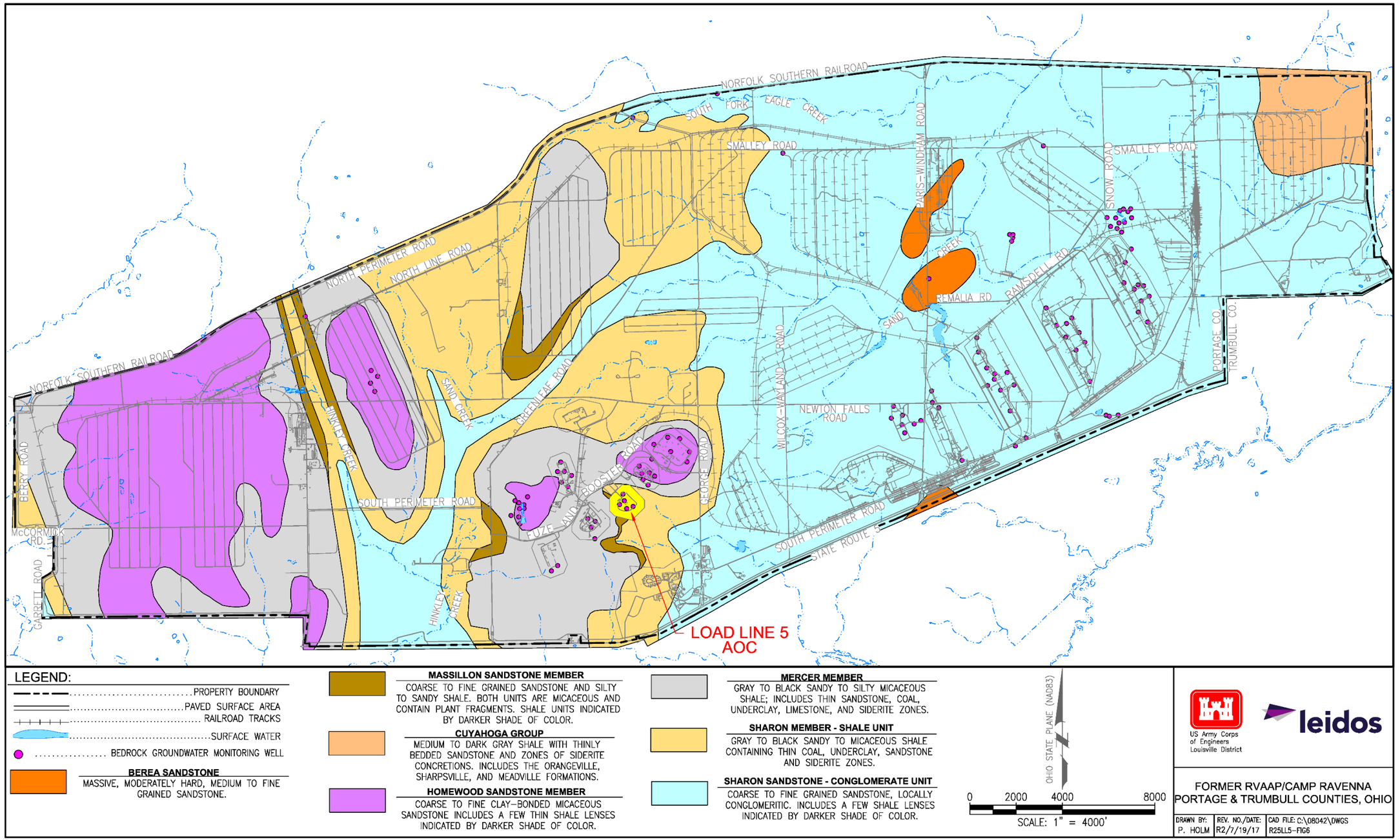

Figure 6. Geologic Bedrock Map and Stratigraphic Description of Units on Camp Ravenna

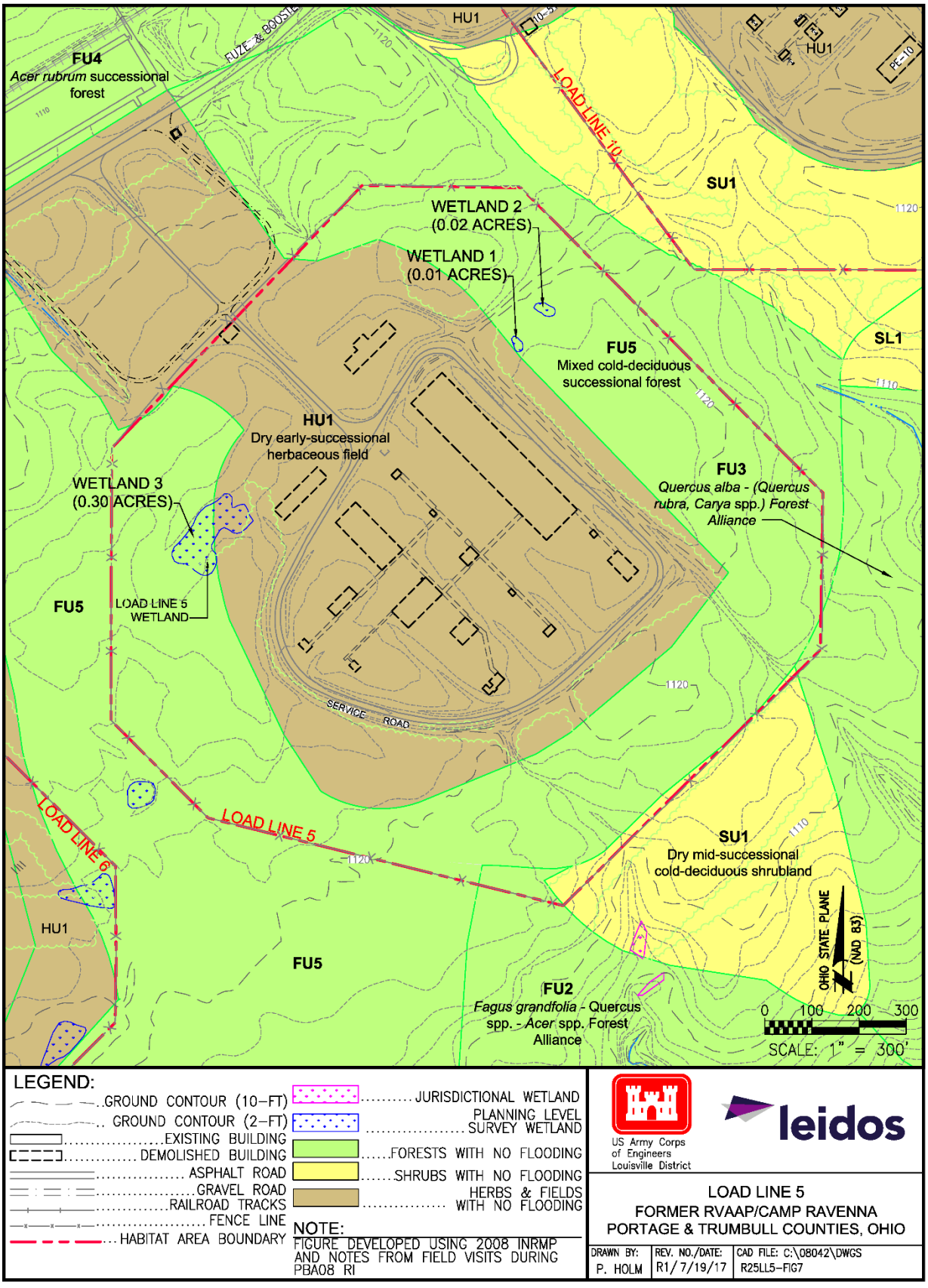

Figure 7. Natural Resources Inside and Near Habitat Area at Load Line 5

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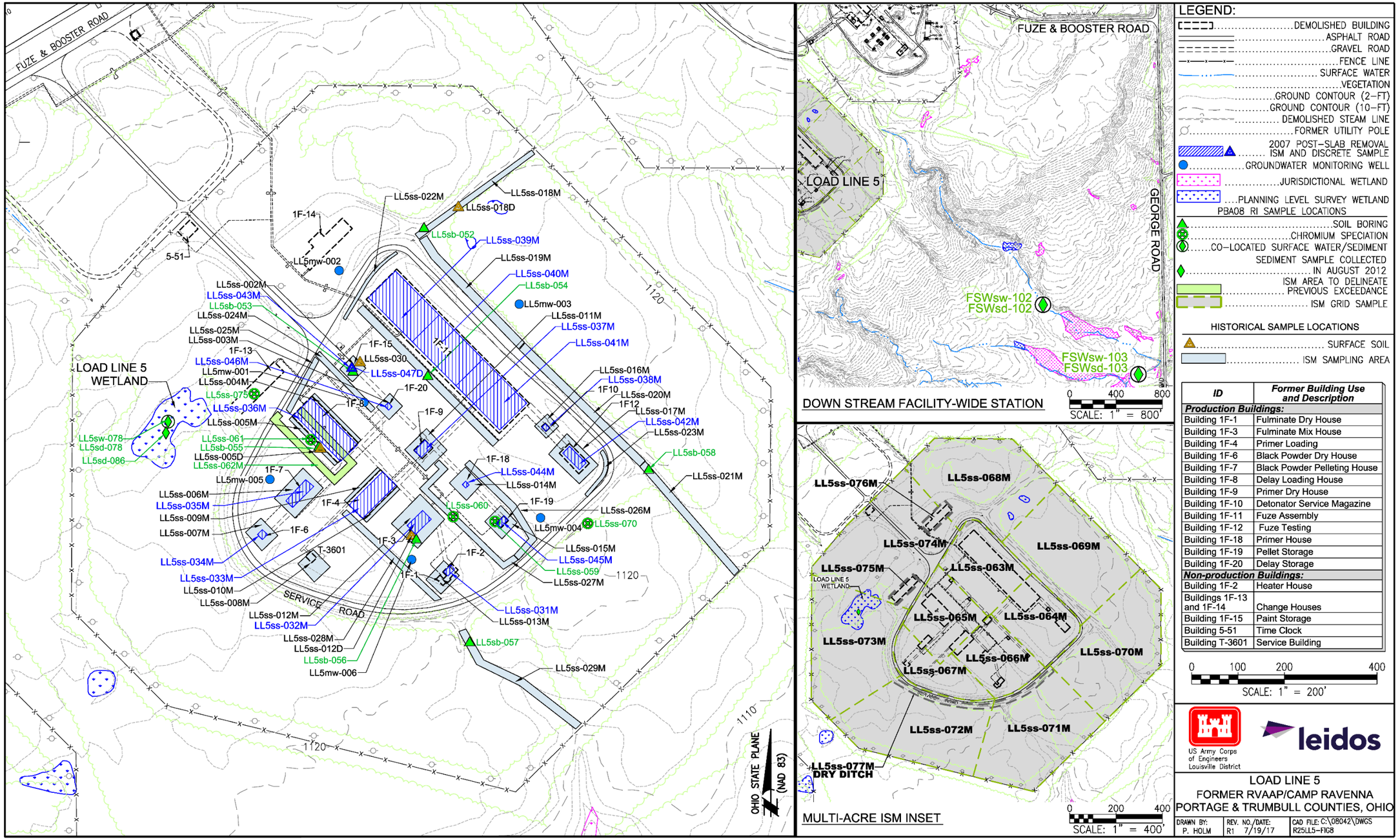

LEGEND:

- DEMOLISHED BUILDING
- ASPHALT ROAD
- GRAVEL ROAD
- FENCE LINE
- SURFACE WATER
- VEGETATION
- GROUND CONTOUR (2–FT)
- GROUND CONTOUR (10–FT)
- DEMOLISHED STEAM LINE
- FORMER UTILITY POLE
- 2007 POST–SLAB REMOVAL ISM AND DISCRETE SAMPLE
- GROUNDWATER MONITORING WELL
- JURISDICTIONAL WETLAND
- PLANNING LEVEL SURVEY WETLAND

PBA08 RI SAMPLE LOCATIONS

- SOIL BORING
- CHROMIUM SPECIATION
- CO–LOCATED SURFACE WATER/SEDIMENT
- SEDIMENT SAMPLE COLLECTED IN AUGUST 2012
- ISM AREA TO DELINEATE PREVIOUS EXCEEDANCE
- ISM GRID SAMPLE

HISTORICAL SAMPLE LOCATIONS

- SURFACE SOIL
- ISM SAMPLING AREA

ID	Former Building Use and Description
Production Buildings:	
Building 1F-1	Fulminate Dry House
Building 1F-3	Fulminate Mix House
Building 1F-4	Primer Loading
Building 1F-6	Black Powder Dry House
Building 1F-7	Black Powder Pelleting House
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Building 1F-2	Heater House
Buildings 1F-13 and 1F-14	Change Houses
Building 1F-15	Paint Storage
Building 5-51	Time Clock
Building T-3601	Service Building

0 100 200 400
SCALE: 1" = 200'

US Army Corps of Engineers Louisville District

leidos

LOAD LINE 5
FORMER RVAAP/CAMP RAVENNA
PORTAGE & TRUMBULL COUNTIES, OHIO

DRAWN BY:	REV. NO./DATE:	CAD FILE: C:\08042\DWGS
P. HOLM	R1 7/19/17	R25LL5–FIG8

Figure 8. Load Line 5 Sample Locations

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ATTACHMENT A

OHIO EPA COMMENTS

Ohio Environmental Protection Agency

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

December 12, 2017

Mr. Mark Leeper
Team Lead
Cleanup/Restoration Branch
Army National Guard Directorate
111 South George Mason Drive
Arlington, VA 22204

Re: US Army Ammunition PLT RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
267000859099

Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties. "Responses to Comments on the Draft, Record of Decision for Soil, Sediment, and Surface Water at RVAAP-39, Load Line 5" Dated November 13, 2017

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Responses to Comments on the Draft, Record of Decision for Soil, Sediment, and Surface Water at RVAAP-39 Load Line 5" for the Ravenna Army Ammunition Plant (RVAAP), Portage/Trumbull Counties. This document is dated and was received at Ohio EPA, Northeast District Office (NEDO) on November 13, 2017.

All comments have been adequately addressed. Please incorporate the responses in the Final Record of Decision (ROD) and forward to Ohio EPA.

Please note for the Final LL-5 ROD and all future RODs, it would be helpful to clarify under the "Summary of Public Comments and Lead Agency Responses" section to add that responses to all oral and written comments are finalized in the Final ROD approval.

If you have any questions, please call me at (330) 963-1207.

Sincerely,

Vicki Deppisch
Hydrogeologist/Project Coordinator
Division of Environmental Response and Revitalization

VD/nvr

cc: Katie Tait, OHARNG RTLS
Gail Harris, VISTA Sciences Corp.
Craig Coombs, USACE
Kevin Sedlak, OHARNG RTLS
Rebecca Shreffler, VISTA Sciences Corp.

ec: Bob Princic, Ohio EPA, NEDO DERR
Rodney Beals, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO DERR
Mark Leeper, ARNG
Nat Peters, USACE

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

November 13, 2017

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Ms. Vicki Deppisch
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, RVAAP-39 Load Line 5, Responses to Comments on the Draft Record of Decision (Work Activity No. 267-000-859-099)

Dear Ms. Deppisch:

The Army appreciates your time and comments (dated September 13, 2017, received September 21, 2017) on the *Draft Record of Decision for Soil, Sediment, and Surface Water at RVAAP-39 Load Line 5*. Enclosed for your review are responses to your comments. Upon the final resolution of these responses to comments, the Army will distribute the final version of this document.

Please contact the undersigned at (703) 607-7955 or mark.s.leeper.civ@mail.mil if there are issues or concerns with this submission.

Sincerely,

Mark Leeper
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Bob Princic, Ohio EPA, NEDO
Rod Beals, Ohio EPA, NEDO
Tom Schneider, Ohio EPA, SWDO
Kevin Sedlak, ARNG, Camp Ravenna
Katie Tait, OHARNG, Camp Ravenna
Craig Coombs, USACE Louisville
Nathaniel Peters, II, USACE Louisville
Jed Thomas, Leidos
Gail Harris, Vista Sciences Corporation

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, RVAAP-39 Load Line 5 (Work Activity No. 267-000-859-099)

Ohio EPA General Comment:
Although detailed, the Draft Record of Decision (ROD) is inconsistent with the language, issues, statements, etc. in the approved Final Proposed Plan (PP). Please compare the Final PP to the Draft DD and change the DD to be consistent with the Final PP. Please incorporate this approach in all forthcoming RODs. The following are some examples and comments:

Army Response: Agree. The Army will compare the Final Proposed Plan with the Record of Decision and assess consistency and incorporate this approach in forthcoming Records of Decision.

Comment 1:
Page 8, lines 30 & 31 state: "The predominant site-related contaminants (SRCs) in surface and subsurface soil at Load Line 5 were PAHs, which were observed in all surface soil samples analyzed across the entire AOC." This sentence, without referring to the detected levels, is misleading and open to interpretation. Please rephrase, delete or qualify this statement in the same sentence.

Army Response: Agree. The sentence referenced has been deleted.

Comment 2:
Page 11, line 21 and/or other appropriate text: Please add "The ground water will be further evaluated under the Facility Wide Groundwater Monitoring Program (FWGWMP)" and other appropriate text areas.

Army Response: Agree.

The following paragraph has been added to the end of Part II, Section D Scope and Role of Response Actions:

> "Potential impacts to groundwater from soil (e.g., contaminant leaching) were evaluated in the RI report, as protectiveness to groundwater was included in the fate and transport analysis. However, groundwater will be evaluated as an individual AOC for the entire facility (designated as RVAAP-66) under the Facility-wide Groundwater Monitoring Program (FWGWMP)."

Text on page 11, line 21 has been revised as follows:

> "All SRCs identified in surface soil, subsurface soil, and sediment at Load Line 5 were evaluated through the stepwise fate and transport evaluation. All SRCs were eliminated as posing future impacts to groundwater, and no further action is necessary for surface soil, subsurface soil, and sediment to protect groundwater (USACE 2016a). Groundwater will be further evaluated under the FWGWMP."

Comment 3:
Page 12, lines 32-41, HHRA: This paragraph discusses PAHs. Please refer to language in Final PP. Please remove the reference that PAHs may represent background. The use of background for PAHs was discussed, resolved and eliminated in previous RI comment letters. A strong weight-of-evidence

approach is acceptable, provided it includes information such as the sampling location is located adjacent to an asphalt road or parking lot, the sample location cannot be attributable to previous historical information, etc. Please revise this paragraph and refer to the final PP.

Army Response: Agree. Consistent with the text in the final Proposed Plan, the text has been revised as follows:

> "No COCs were identified for the Resident Receptor (Adult and Child) in subsurface soil, sediment, or surface water. Four PAHs [benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenz(a,h)anthracene] were identified as COCs for the Resident Receptor (Adult and Child) in surface soil, as they contribute to a sum-of-ratio greater than one at two sample locations (LL5ss-064M and LL5ss-069M). At these two locations, only benzo(a)pyrene concentrations exceeded the Resident Receptor (Adult and Child) FWCUG at TR of 1E-05, HQ of 1. Location LL5ss-069M had a benzo(a)pyrene concentration of 0.5 mg/kg and location LL5ss-064M had a benzo(a)pyrene concentration of 0.53 mg/kg. Both locations are below the 2017 USEPA Resident Soil RSL of 1.1 mg/kg. These low levels of PAHs can be attributed to the adjacent asphalt access road. PAHs were not identified as COCs for potential remediation in these two incremental sampling methodology sample areas."

Comment 4:
Page 13, Section G.2, Ecological Risk: Please add the name of the Ohio EPA reference document that was used to conduct the Ecological Risk evaluation in the appropriate text area.

Army Response: The third paragraph in Section G.2 has been revised as follows. Also, the Ohio EPA 2008 reference is added to Part IV: References.

> "The ERA was conducted in accordance with the *Guidance for Conducting Ecological Risk Assessments* (Ohio EPA 2008). The ERA evaluated chemical contamination to determine…"

Comment 5:
Page 13. Section H, Documentation of No Significant Change: Please add to this paragraph how many public comments were submitted, if the content of the comments affected any significant change, and if not, then "no significant change" was necessary or appropriate after the public comment period.

Army Response: Section H has been revised as follows:

> "The Load Line 5 PP (USACE 2016b) was released for public comment on June 12, 2017. Feedback received from the public during the public comment period and public meeting are presented in Part III of this ROD. The PP recommended no further action for soil, sediment, and surface water at Load Line 5. No significant changes were necessary or appropriate following the conclusion of the public comment period."

Comment 6:
Public Comment #1: It would have been helpful to the commenter to have added that no chemical was detected above the Method Detection Limit (MDL) and explain that the MDL is a very low level below any action level.

Army Response: Agree. The response to Public Comment #1 has been revised as follows:

> "If the report indicates that a chemical group is not detected at the site, it means that all chemicals analyzed as part of the chemical group had concentrations below the laboratory method detection limits (MDL). These laboratory MDLs were at low enough concentrations to ensure nature and extent of contamination and risk can be thoroughly evaluated at a site."

Comment 7:
Public Comment #5: It would have been helpful to the commenter to have stated that each monitoring well is locked and the entire site is fenced which would deter the potential for tampering or vandalism of the wells.

Army Response: Agree. The response to Public Comment #5 has been enhanced as follows:

> "Response: The groundwater wells will continue to be used as part of the Facility-wide Groundwater Monitoring Program conducted at the former RVAAP. While the Army controls Camp Ravenna and implements the Facility-wide Groundwater Monitoring Program, the potential for tampering or vandalism of the wells is low, as the wells are locked and the facility currently has a perimeter fence. When the program discontinues use of the wells, the wells will be abandoned per all appropriate rules and regulations."

Ohio Environmental Protection Agency

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

September 13, 2017

Mr. Mark Leeper
Team Lead
Cleanup & Restoration Branch
Army National Guard Directorate
111 South George Mason Drive
Arlington, VA 22204

Re: US Army Ammunition PLT RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
267000859099

Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties. "Draft, Record of Decision for Soil, Sediment, and Surface Water at RVAAP-39, Load Line 5," Dated August 10, 2017

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Draft, Record of Decision for Soil, Sediment, and Surface Water at RVAAP-39 Load Line 5" for the Ravenna Army Ammunition Plant (RVAAP), Portage/Trumbull Counties. This document is dated August 10, 2017 and was received at Ohio EPA, Northeast District Office (NEDO) on August 16, 2017.

Although detailed, the Draft Record of Decision (ROD) is inconsistent with the language, issues, statements, etc. in the approved Final Proposed Plan (PP). Please compare the Final PP to the Draft DD and change the DD to be consistent with the Final PP. Please incorporate this approach in all forthcoming RODs.

The following are some examples and comments:

Page 8, lines 30 & 31 state: "The predominant site-related contaminants (SRCs) in surface and subsurface soil at Load Line 5 were PAHs, which were observed in all surface soil samples analyzed across the entire AOC." This sentence, without referring to the detected levels, is misleading and open to interpretation. Please rephrase, delete or qualify this statement in the same sentence.

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Page 13, Section G.2, Ecological Risk: Please add the name of the Ohio EPA reference document that was used to conduct the Ecological Risk evaluation in the appropriate text area.

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Public Comment #5: It would have been helpful to the commenter to have stated that each monitoring well is locked and the entire site is fenced which would deter the potential for tampering or vandalism of the wells.

If you have any questions, please call me at (330) 963-1207.

Sincerely,

Vicki Deppisch

Vicki Deppisch
Hydrogeologist/Project Coordinator
Division of Environmental Response and Revitalization

VD/nvr

cc: Katie Tait, OHARNG RTLS
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