Final

Remedial Design
for Soil, Sediment, and Surface Water
at RVAAP-13 Building 1200 and RVAAP-48 Anchor Test Area

Ravenna Army Ammunition Plant
Ravenna, Ohio

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

Prepared for:

United States Army Corps of Engineers
Louisville District

Prepared by:

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

August 22, 2014

REPORT DOCUMENTATION PAGE

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at RVAAP-13 Building 1200 and RVAAP-48 Anchor Test Area
Ravenna Army Ammunition Plant
Ravenna, Ohio

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None

14. ABSTRACT

This remedial design presents the plan for implementing Alternative 2 in accordance with the approved Record of Decisions for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200 and RVAAP-48 Anchor Test Area. This design outlines procedures for excavation and removal of contaminated surface soil within each area of concern (AOC). Implementation of this remedial design will result in attainment of CERCLA closure for soil, sediment, and surface water at both AOCs for the future land use (Military Training) or Unrestricted (Residential) Land Use.

15. SUBJECT TERMS

Remedial cleanup goals, remedial objectives, remedial design, contamination, excavation, disposal

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			Mark Nichter
NA	NA	NA	NA	86	19b. TELEPHONE NUMBER *(Include area code)* 502-315-6375

CONTRACTOR STATEMENT OF INDEPENDENT TECHNICAL REVIEW

Leidos has completed the Remedial Design for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200 and RVAAP-48 Anchor Test Area 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.

Rich Sprinzl, PE
Study/Design Team Leader

05/02/2014
Date

Jed Thomas, PE
Independent Technical Review Team Leader

05/02/2014
Date

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

Internal Leidos Independent Technical Review was conducted on the Preliminary Draft version of this document. Subsequent versions of this document (e.g., Draft and Final) will incorporate 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

05/02/2014
Date

OhioEPA

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

August 7, 2014

Mr. Brett Merkel
Army National Guard Directorate
ARNGD-ILE Clean UP
111 South George Mason Drive
Arlington, VA 22203

Re: Approval for the "Draft Remedial Design for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200 and RVAAP-48 Anchor Test Area, Former Ravenna Army Ammunition Plant, Ravenna, Ohio," Dated May 16, 2014 Building 1200 – (Work Activity No. 267000859191), Anchor Test Area – (Work Activity No. 26700085192)

Dear Mr. Merkel:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR), has received and reviewed the document entitled, "Draft Remedial Design for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200 and RVAAP-48 Anchor Test Area, Former Ravenna Army Ammunition Plant, Ravenna, Ohio," dated May 16, 2014. This document, received by Ohio EPA's NEDO on May 27, 2014, was prepared by the U.S. Army Corps of Engineers (USACE) Louisville District, by Leidos Engineering of Ohio, Inc.

Ohio EPA has reviewed this documentation and has found no significant deficiencies. Please provide a revised document or replacement pages within 30 days, in accordance with the Findings and Orders for RVAAP.

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

cc: Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office, Newton Falls
Haney/Harris, Camp Ravenna Environmental Office, Vista Sciences, Newton Falls
Gregory F. Moore, USACE, Louisville District

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Final

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for Soil, Sediment, and Surface Water
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Volume One - Main Report and Attachments
Version 1.0

Ravenna Army Ammunition Plant
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August 22, 2014

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Ravenna Army Ammunition Plant
Ravenna, Ohio

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ARNG = Army National Guard
OHARNG = Ohio Army National Guard
Ohio EPA CO = Ohio Environmental Protection Agency Central Office
Ohio EPA NEDO = Ohio Environmental Protection Agency Northeast District Office
REIMS = Ravenna Environmental Information Management System
USACE = United States Army Corps of Engineers

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ACRONYMS AND ABBREVIATIONS

AASHTO	American Association of State Highway and Transportation Officials
ACM	Asbestos-containing Material
AOC	Area of Concern
ARAR	Applicable and Relevant or Appropriate Requirement
ARNG	Army National Guard
bgs	below ground surface
BMP	Best Management Practice
Camp Ravenna	Camp Ravenna Joint Military Training Center
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	Chemical of Concern
COR	Contracting Officer's Representative
CQAP	Construction Quality Assurance Plan
CRM	Cultural Resources Manager
CUG	Cleanup Goal
ERA	Ecological Risk Assessment
FSA	Field Staging Area
FWSAP	Facility-wide Sampling and Analysis Plan
ft	feet
FWCUG	Facility-wide Cleanup Goal
FWSHP	Facility-wide Safety and Health Plan
IDW	Investigation-derived Waste
ISM	Incremental Sampling Method
mg/kg	milligrams per kilogram
mph	miles per hour
MRS	Munitions Response Site
OHARNG	Ohio Army National Guard
Ohio EPA	Ohio Environmental Protection Agency
PBA	Performance-based Acquisition
PCB	Polychlorinated Biphenyl
PPE	Personal Protection Equipment
QA	Quality Assurance
QC	Quality Control
RAO	Remedial Action Objective
RD	Remedial Design
ROD	Record of Decision
RVAAP	Ravenna Army Ammunition Plant
SSHO	Site Safety and Health Officer
SSHP	Site Safety and Health Plan
SVOC	Semi-volatile Organic Compound

ACRONYMS AND ABBREVIATIONS (CONTINUED)

TCLP	Toxicity Characteristic Leaching Procedure
USACE	United States Army Corps of Engineers
U.S. Army	United States Department of the Army
USP&FO	United States Property and Fiscal Officer
VOC	Volatile Organic Compound

1.0 INTRODUCTION

Leidos Engineering of Ohio, Inc. (formerly part of SAIC) has been contracted by the U.S. Army Corps of Engineers (USACE), Louisville District to provide environmental services to achieve response complete, remedy in place, or site closeout at the Building 1200 (RVAAP-13) and Anchor Test Area (RVAAP-48) areas of concern (AOCs) within the former Ravenna Army Ammunition Plan (RVAAP) in Ravenna, Ohio. This Remedial Design (RD) describes the requirements to implement the selected remedies at these AOCs. The selected remedies are documented in the following:

- *Record of Decision for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200* (USACE 2014a)
- *Record of Decision for Soil, Sediment, and Surface Water at RVAAP-48 Anchor Test Area* (USACE 2014b)

This work is being performed in accordance with USACE, Louisville District, Multiple Award Remediation Contract W912QR-04-D-0028, Delivery Order No. 0001, under a Performance-based Acquisition (PBA). In addition, planning and performance of all work elements is being conducted in accordance with the requirements of the Ohio Environmental Protection Agency (Ohio EPA) *Director's Final Findings and Orders* dated June 10, 2004 (Ohio EPA 2004).

1.1 PURPOSE

This RD details the requirements and procedures needed to implement the selected remedial action alternatives specified in the respective records of decision (RODs). The anticipated land use for the Building 1200 and Anchor Test Area AOCs is Military Training. The selected remedial alternative to attain remedy for soil, sediment, and surface water at each AOC is Alternative 2: Attain Unrestricted (Residential) Land Use. Therefore, the selected remedies at both AOCs meet and exceed remedial action objectives (RAOs) for the anticipated land use.

The RODs specify that soil in specific areas containing chemical contamination exceeding cleanup goals (CUGs) should be remediated to a level protective of human health. No remedial actions were required for sediment or surface water to be protective of human health, the environment, or to protect groundwater at the AOCs. Sediment and surface water do not exist at Anchor Test Area.

The AOCs were combined in this RD because of their similar selected alternatives, anticipated land use, and how each AOC will be remediated. Specific elements of the remedial actions described in this RD apply to both AOCs and include:

- Excavating contaminated surface soil exceeding CUGs at each AOC;
- Transporting and disposing contaminated soil at an off-site permitted disposal facility;
- Confirming CUGs for surface soil have been attained; and
- Restoring excavated areas to neighboring or original contours and conditions.

1.2 SCOPE

The overall program goal of the Installation Restoration Program is to clean up previously contaminated land at the former RVAAP to an acceptable level of risk as resources and mission requirements allow. This RD addresses chemical contamination in surface soil at the Building 1200 and Anchor Test Area AOCs. Once the RAOs and CUGs are met during the implementation of this RD, soil, sediment, and surface water will be considered protective for Unrestricted (Residential) Land Use, which includes Military Training future land use. This RD does not address groundwater, which is being evaluated as a separate AOC on a facility-wide basis.

The scope of this RD is to present a plan to excavate and dispose surface soil [0-1 ft below ground surface (bgs)] containing chemical concentrations exceeding CUGs specified in the RODs. This RD presents results from the RD sampling specified within the selected alternatives. The estimated removal quantities presented in the RODs were approximately 225 cubic yards (*ex situ*) at the Building 1200 AOC and 12.5 cubic yards (*ex situ*) at Anchor Test Area. The RD sampling presented in this RD was conducted to provide waste profile data to the disposal facility and to further refine the excavation volumes.

Remedial activities will be overseen by USACE and implemented by Leidos and the chosen Leidos remedial construction subcontractor (herein referred to as "Subcontractor"). Leidos (under contract with USACE) is responsible for excavation, characterization, and disposal of contaminated soil. Implementation of these activities will meet the requirements of the *Facility-wide Sampling and Analysis Plan for Environmental Investigations* (FWSAP) (USACE 2011a), the *Facility-wide Safety and Health Plan for Environmental Investigations* (FWSHP) (USACE 2011b), and this RD.

1.3 FACILITY DESCRIPTION

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 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 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.

1.4 BUILDING 1200 AOC BACKGROUND INFORMATION AND PREVIOUS INVESTIGATIONS

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 1-3. From 1941 to 1971, three buildings served as a quality assurance (QA) 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.

Since 1989, the Building 1200 AOC has been included in various assessments and investigations including:

- Resource Conservation and Recovery Act 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 Remedial Investigation (PBA08 RI) was implemented to supplement historical data available for the AOC and support development of the *Remedial Investigation/Feasibility Study Report for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200* (USACE 2012a). Sampling results 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. A human health risk assessment (HHRA) and ecological risk assessment (ERA) were conducted to document chemicals of concern (COCs) that may pose potential risks to human health and the environment resulting from exposure to contamination at the Building 1200 AOC. Manganese was the only human health COC identified in surface soil (0-1 ft bgs). No COCs were identified for subsurface soil (1-13 ft bgs), sediment, or surface water. The ERA concluded with a Level II Screening Level ERA, recommending no further action from the ecological perspective. The contaminant fate and transport evaluation indicated soil remediation was not warranted to protect groundwater resources.

The CUG for manganese in surface soil was developed in the feasibility study to support the remedial alternative selection process for soil remediation. The remedial alternatives were developed by combining general response actions, technology types, and process options retained from screening remedial technology/process options. Remedial alternatives assured adequate protection of human health and the environment, achieved RAOs, met Applicable and Relevant or Appropriate Requirements (ARARs), and permanently and significantly reduced the volume, toxicity, and/or mobility of the COCs. Remedial alternatives were evaluated against the nine Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) criteria (overall protection of human health and the environment; compliance with ARARs; long-term effectiveness and permanence; reduction of toxicity, mobility, or volume through treatment; short-term effectiveness; implementability; cost; state acceptance; and community acceptance) and were compared against one another as part of the selection process.

The recommended alternative in the feasibility study [and further modified in the *Proposed Plan for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200* (USACE 2013a) and approved in the *Record of Decision for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200* (USACE 2014a)] was Attain Unrestricted (Residential) Land Use. This alternative involved removing shallow surface soil (0-1 ft bgs) at locations B12ss-016M, B12ss-017M, and B12ss-022M that exceeded the CUG for manganese (1,450 mg/kg).

1.5 ANCHOR TEST AREA BACKGROUND INFORMATION AND PREVIOUS INVESTIGATIONS

Anchor Test Area is approximately 0.5 acres and is located approximately 50-75 ft west of Wilcox-Wayland Road and 2,500 ft south of Newton Falls Road (Figures 1-2 and 1-4). Although operational information is relatively limited about this former research and development area used by The Firestone Tire and Rubber Company Defense Research Division, it is believed that the area was used for testing explosives-driven soil anchoring devices. These devices were typically metal rods driven into the ground and attached via a cable to stabilize structures or anchor them to the ground. The dates of use for this AOC are unknown; however, a 1961 drawing shows the final design for the AOC; therefore, it is likely it was not active until after the early 1960s. Aerial photographs from 1966 confirm the construction of AOC features, but it is unknown whether Anchor Test Area was active at the time of the photographs.

The distinct surface features of the AOC are the former blast wall dirt mounds and a nearby sandpit. The anchor tests were likely performed within the 12 by 36 ft sandpit. The adjacent dirt mounds functioned as blast walls. One mound is approximately 8-10 ft high while the others are only 1-2 ft high. The dirt mounds are still observable, although the mounds are overgrown with vegetation and small trees. The sandpit is no longer visually distinct due to vegetative growth. Metal debris is visible in the area, and a section of cement culvert can be seen in one of the dirt mounds. Based upon the culvert's location and orientation, it is suspected the culvert was previously identified as the dirt-covered, 55-gallon, open-end drum used for powder storage in the original 1961 Anchor Test Area drawing.

The AOC is currently heavily overgrown with trees, shrubs, and tall grass. The immediate surrounding area is forested except for: (1) a wetland approximately 100 ft away on the east side of Wilcox-Wayland Road within a separate watershed; and (2) a wetland approximately 500 ft south within the same watershed. The wetland to the south is drained by an unnamed stream south that flows east into the Load Line 4 Pond. Load Line 4 Pond effluent exits the installation's southern boundary and flows approximately 1.5 stream miles to the south where it confluences with the West Branch River. Because the AOC is located on the southern edge of a small topographic high, any surface water not percolating to groundwater flows south directly into the wetland.

Anchor Test Area has been included in various assessments and investigations conducted including:

- Relative Risk Site Evaluation for Newly Added Sites (USACHPPM 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 development of the *Remedial Investigation/Feasibility Study Report for Soil, Sediment, and Surface Water at RVAAP-48 Anchor Test Area* (USACE 2012b). Sampling results 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. An HHRA and ERA were conducted to document COCs that may pose potential risks to human health and the environment resulting from exposure to contamination at the Anchor Test Area. Arsenic was the only human health COC identified in surface soil (0-1 ft bgs). No COCs were identified for subsurface soil (1-13 ft bgs), sediment, or surface water. In addition, the ERA concluded there is sufficient justification to recommend no further action from the ecological perspective. The contaminant fate and transport evaluation indicated soil remediation was not warranted to protect groundwater resources.

The CUG for arsenic in surface soil was developed in the feasibility study to support the remedial alternative selection process for soil remediation. The remedial alternatives were selected by combining general response actions, technology types, and process options retained from screening remedial technology/process options. Remedial alternatives assured adequate protection of human health and the environment, achieved RAOs, met ARARs, and permanently and significantly reduced the volume, toxicity, and/or mobility of the COCs. Remedial alternatives were evaluated against the nine CERCLA criteria (overall protection of human health and the environment; compliance with ARARs; long-term effectiveness and permanence; reduction of toxicity, mobility, or volume through treatment; short-term effectiveness; implementability; cost; state acceptance; and community acceptance) and were compared against one another as part of the selection process.

The approved alternative in the *Record of Decision for Soil, Sediment, and Surface Water at RVAAP-48 Anchor Test Area* (USACE 2014b) was Attain Unrestricted (Residential) Land Use. This alternative involved removing shallow surface soil (0-1 ft bgs) at location ATAss-005M at Anchor Test Area that exceeded the CUG for arsenic (15.4 mg/kg).

1.6 COMMUNITY INVOLVEMENT AND REGULATORY APPROVAL

The *Proposed Plan for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200* (USACE 2013a) and *Proposed Plan for Soil, Sediment, and Surface Water at RVAAP-48 Anchor Test Area* (USACE 2013b) were presented to the public on August 7, 2013. A 30-day public comment period was conducted from July 25, 2013 to August 23, 2013 and a public meeting was held on August 7, 2013 so the public could provide comments for consideration as part of the remedy selection process at each AOC. The Army did not receive any verbal comments during the public meeting or written during the public comment period.

1.7 REMEDIAL DESIGN ORGANIZATION

This RD is comprised of a work plan, design drawings, and specifications. The work plan is organized as follows:

- Section 2: presents the project organization and coordination;
- Section 3: outlines RAOs and CUGs;
- Section 4: describes the waste profile and RD sampling;
- Section 5: discusses construction mobilization and site preparation;
- Section 6: describes soil removal activities;
- Section 7: presents the confirmation sampling procedure;
- Section 8: summarizes site restoration activities;
- Section 9: discusses waste profiling and disposal activities;
- Section 10: presents the Construction Quality Assurance Plan (CQAP); and
- Section 11: lists the references used in the document.
- Attachments:
    A. Construction Forms and Checklists
    B. Waste Profile and Remedial Design Sampling Results
    C. IDW Characterization Report
    D. Design Drawings

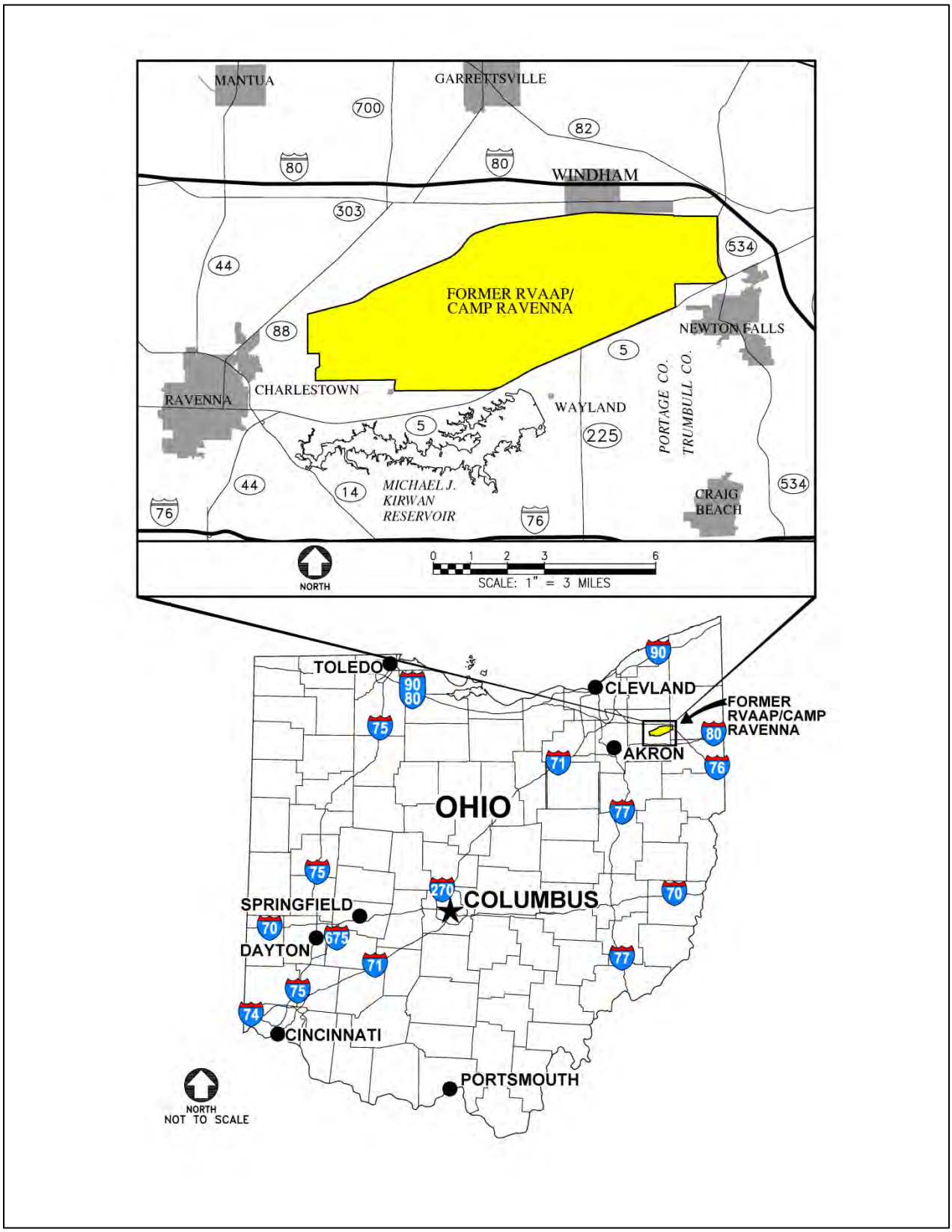

Figure 1-1. General Location and Orientation of Camp Ravenna

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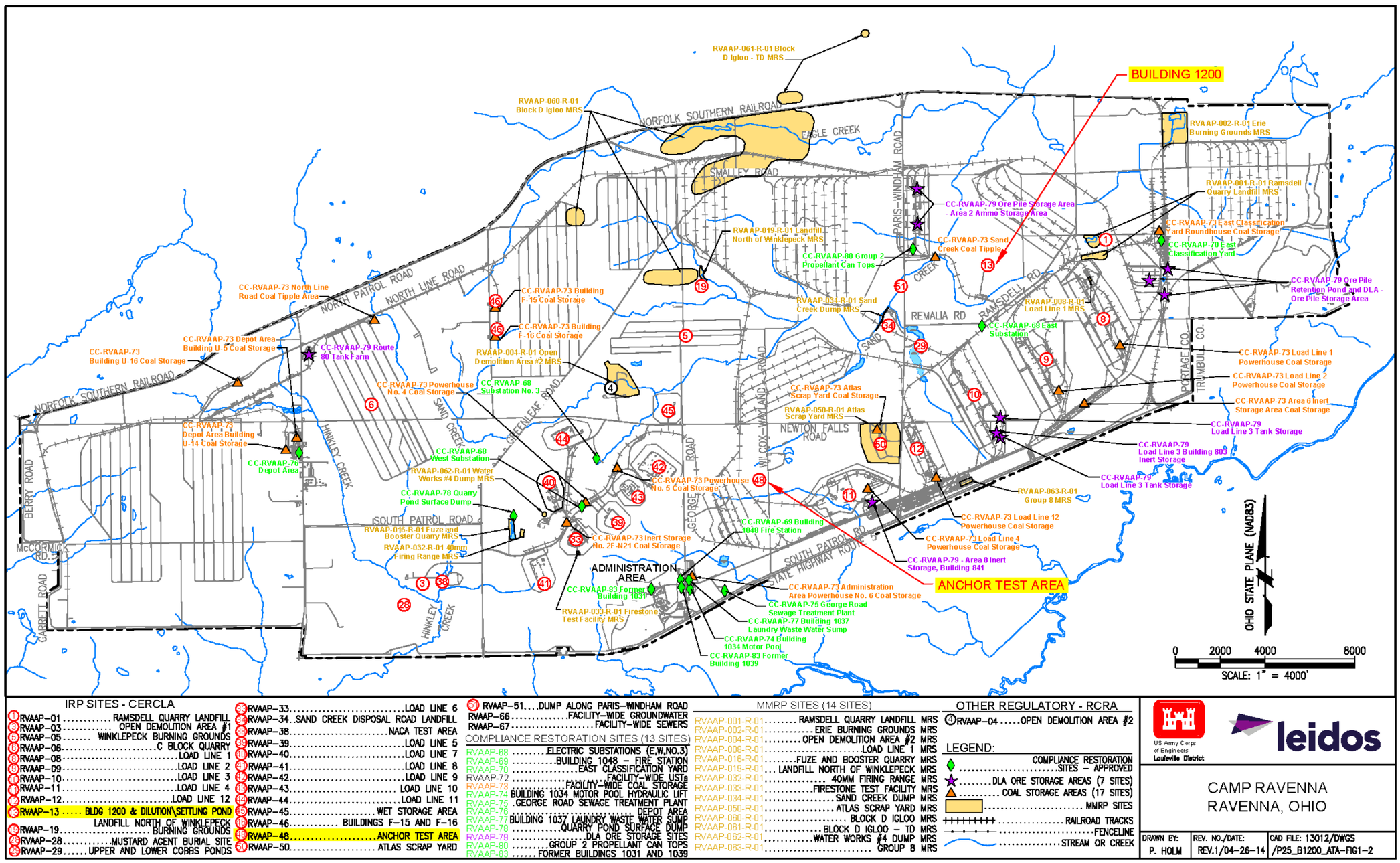

IRP SITES - CERCLA

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

COMPLIANCE RESTORATION SITES (13 SITES)

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

MMRP SITES (14 SITES)

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

OTHER REGULATORY - RCRA

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

LEGEND:

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

US Army Corps of Engineers Louisville District

leidos

CAMP RAVENNA
RAVENNA, OHIO

DRAWN BY:	REV. NO./DATE:	CAD FILE: 13012/DWGS
P. HOLM	REV.1/04-26-14	/P25_B1200_ATA-FIG1-2

Figure 1-2. Camp Ravenna Installation Map

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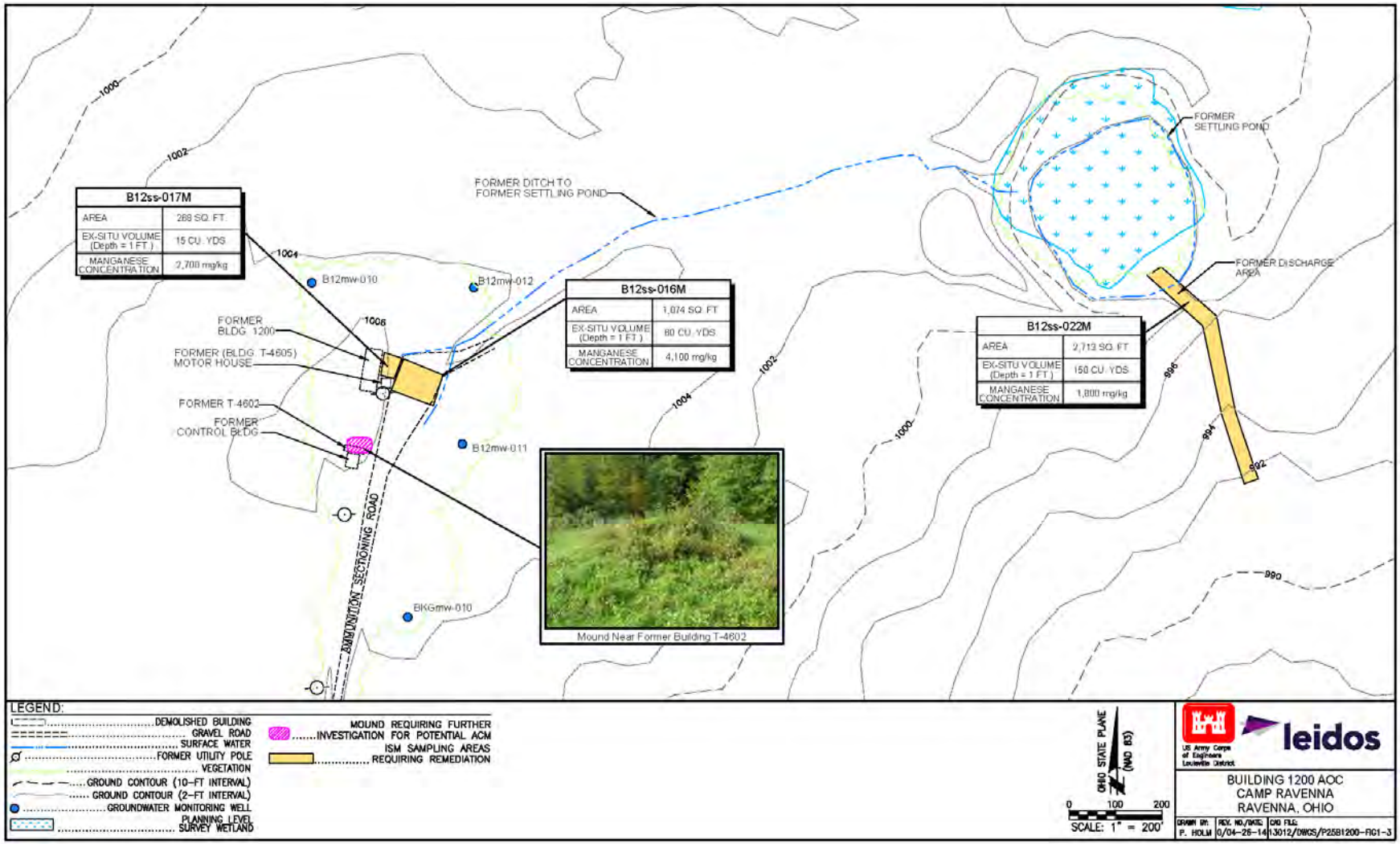

Figure 1-3. Features of Building 1200

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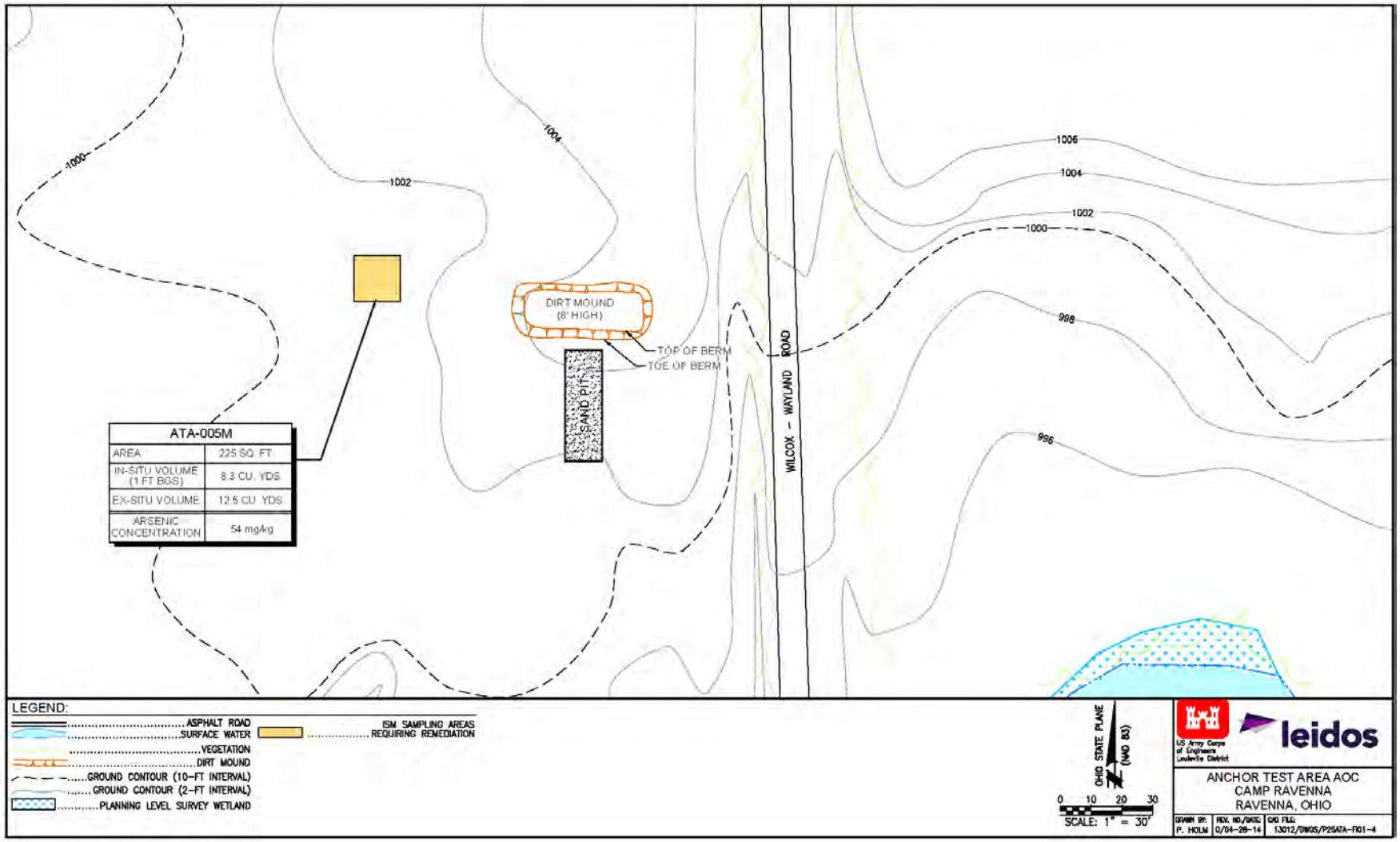

Figure 1-4. Features of Anchor Test Area

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2.0 PROJECT ORGANIZATION AND COORDINATION

This section presents the project organization and describes the project team coordination. The U.S. Department of the Army (U.S. Army) is the lead agency for this remedial action and is responsible for implementation. The USACE Louisville District has implementation and technical oversight responsibility on behalf of the U.S. Army. Ohio EPA is the regulatory authority governing work on this remedial action. Leidos is the primary contractor responsible for implementing this RD. Leidos will select and procure a qualified subcontractor to excavate, transport, and dispose of contaminated soil. An organizational chart for implementing the RD is presented in Figure 2-1. Key personnel responsibilities are summarized below.

2.1 USACE CONTRACTING OFFICER'S REPRESENTATIVE

The USACE Contracting Officer's Representative (COR) duties include overseeing Leidos to ensure work is completed in accordance with the contract and this RD.

2.2 ARNG/OHARNG REPRESENTATIVE

The Army National Guard (ARNG)/OHARNG Representative is a representative from the OHARNG or ARNG who will be responsible for signing waste profiles, manifests, and necessary permits. The ARNG/OHARNG Representative will also assist in coordinating between Leidos and Ohio EPA.

2.3 OHIO ENVIRONMENTAL PROTECTION AGENCY

Ohio EPA is the regulatory agency for this project and will review project documents and ensure that the RD and remedial action are completed in accordance with RD and regulatory requirements.

2.4 LEIDOS PROJECT MANAGER

The Leidos Project Manager manages, implements, and ensures the quality of this RD and remedial action. The Leidos Project Manager provides oversight to guarantee all contractual requirements are properly satisfied. This individual confirms all project goals and objectives are met in a high-quality and timely manner. The Leidos Project Manager is responsible for tracking project schedule and informing the USACE COR of any deviations to the project schedule. The Leidos Project Manager provides the USACE COR with notifications of project implementation information regarding any QA and non-conformance issues for this remedial action.

2.5 LEIDOS PROJECT ENGINEER

The Leidos Project Engineer is the liaison between the Leidos Project Manager and the Leidos Construction Manager whose responsibilities include overseeing technical aspects of the implementation, conducting advance planning, managing the field project team (including the Leidos

Construction Manager and Subcontractor), and reviewing reports. The Leidos Project Engineer is also the primary technical point of contact for the U.S. Army.

2.6 LEIDOS CONSTRUCTION MANAGER

The Leidos Construction Manager also serves as the Field Operations Manager, as defined in Section 3.4 of the FWSAP (USACE 2011a). The Leidos Construction Manager is responsible for project control and implementing remedial activities in accordance with this RD. The Leidos Construction Manager is responsible for overseeing the Subcontractor, adhering to QA/quality control (QC) field procedures and the Site Safety and Health Plan (SSHP), coordinating with Army personnel and the USACE COR, managing any investigation-derived wastes (IDW), conducting field documentation, and preparing field change orders, if required.

2.7 LEIDOS QUALITY ASSURANCE/QUALITY CONTROL OFFICER

The Leidos QA/QC Officer coordinates with the Leidos Construction Manager to ensure the requirements of the RD CQAP and Facility-wide Quality Assurance Project Plan, Part II of the FWSAP (USACE 2011a) are achieved and ensures inspections are performed in accordance with both plans.

The Leidos QA/QC Officer also provides QC of sampling and sample handling (including sample custody, field testing, and coordinating QA/QC of the laboratory), and ensures the required submittals are on time and of high quality. The Leidos QA/QC Officer is responsible for reviewing and approving variances during field activities before work continues and designing and supervising the implementation of audit/surveillance plans. The Leidos QA/QC Officer is responsible for completing a Non-conformance Report that documents when activities do not comply with the approved procedures or specifications within this RD. A copy of this report is presented in Attachment A. The Leidos QA/QC Officer reports directly to the Leidos Project Manager and informs the Leidos Project Manager and Leidos Construction Manager of all information and decisions reported.

2.8 LEIDOS HEALTH AND SAFETY MANAGER

The Leidos Health and Safety Manager establishes health and safety policies and procedures that support project and office activities and verifies safe work practices and conditions. The Leidos Health and Safety Manager ensures these policies are, at a minimum, in accordance with the FWSHP (USACE 2011b). The Leidos Health and Safety Manager reports directly to the Leidos Project Manager and will inform the Leidos Construction Manager of all information and decisions reported.

2.9 SUBCONTRACTOR CONSTRUCTION MANAGER

The Subcontractor Construction Manager implements specific contracted components of this RD. The Subcontractor Construction Manager is responsible for properly performing specified remedial activities in accordance with this RD, adhering to QA/QC field procedures and the CQAP,

implementing the SSHP, coordinating field personnel activities, and preparing field documentation. The Subcontractor Construction Manager reports directly to the Leidos Construction Manager.

2.10 SUBCONTRACTOR SITE SAFETY AND HEALTH OFFICER

The Subcontractor Site Safety and Health Officer (SSHO) is responsible for implementation and adherence to the SSHP. The Subcontractor SSHO will verify and approve that the specified health and safety procedures outlined in the SSHP adequately protect on-site personnel during field activities. The Subcontractor SSHO will ensure that health and safety procedures are modified to meet changing needs, if required. The Subcontractor SSHO will ensure all on-site personnel (including visitors) strictly adhere to the SSHP during field activities conducted for the duration of the project. The Subcontractor SSHO reports to the Subcontractor Construction Manager and the Leidos Construction Manager.

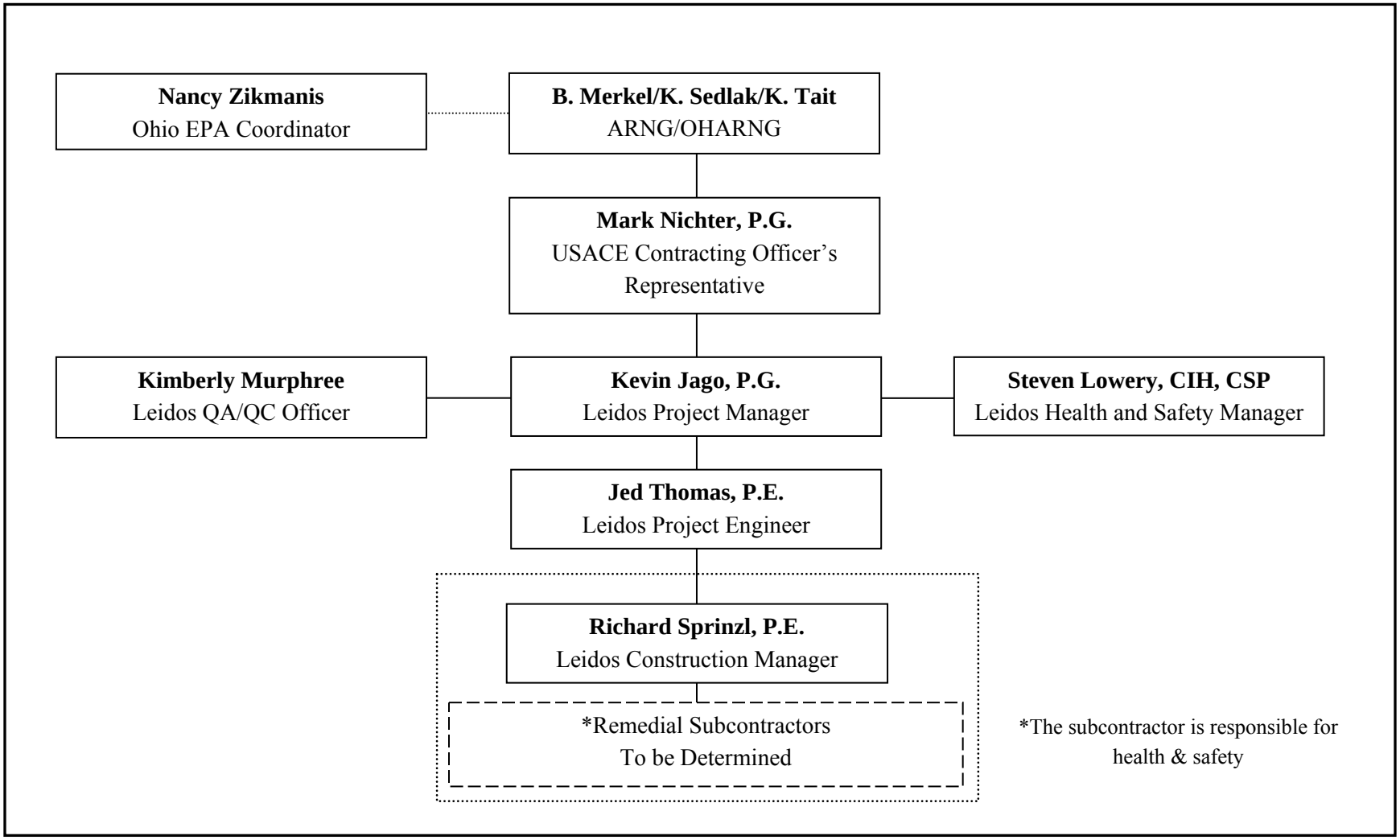

Figure 2-1. Organizational Chart for Implementing the Remedial Design

3.0 REMEDIAL ACTION OBJECTIVES AND CLEANUP GOALS

This section describes the RAOs and CUGs for the selected remedy. RAOs specify requirements the remedial action must fulfill to protect human health and the environment under current and reasonably anticipated future land use scenarios. The CUGs are the chemical concentrations required to achieve the RAOs.

3.1 BUILDING 1200 AOC

3.1.1 Remedial Action Objective

The RAO for the Building 1200 AOC is to prevent: (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). The selected remedy [Alternative 2: Attain Unrestricted (Residential) Land Use] attains these RAOs by remediating manganese in soil to a depth of 1 ft bgs at locations B12ss-016M, B12ss-017M, and B12ss-022M shown on Figure 1-3. No remedial actions were required for sediment or surface water, and no remedial actions were required to be protective of the environment or protect groundwater.

3.1.2 Remedial Action Cleanup Goal

Table 3-1 presents the CUG to attain Unrestricted (Residential) Land Use for the Building 1200 AOC. The HHRA identified manganese in surface soil (0-1 ft bgs) as a COC for the National Guard Trainee and Resident Farmer. Consequently, surface soil (0-1 ft bgs) at locations B12ss-016M, B12ss-017M, and B12ss-022M require remediation to attain the future land use (Military Training) or 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 Farmer. The COCs, CUGs, and locations requiring remediation are presented in Table 3-1.

3.2 ANCHOR TEST AREA

3.2.1 Remedial Action Objective

The RAO for Anchor Test Area is to prevent: (1) National Guard Trainee exposure to COCs above CUGs in soil; (2) adverse ecological effects from previous AOC activities; and (3) negative groundwater impacts from contaminant migration from source media (e.g., soil). The selected remedy [Alternative 2: Attain Unrestricted (Residential) Land Use] attains these RAOs by remediating arsenic in soil to a depth of 1 ft bgs at location ATAss-005M shown on Figure 1-4. Sediment and surface water do not exist at Anchor Test Area. No remedial actions were required for soil to be protective of the environment or protect groundwater.

Table 3-1. Summary of COCs, CUGs, and Locations Requiring Remedy at Building 1200 AOC

Media	Chemicals of Concern	Cleanup Goals	Location and Depth Requiring Remediation (Manganese Concentration)
Surface Soil[1]	Manganese	1,450 mg/kg[2]	B12ss-016M (4,100 mg/kg), B12ss-017M (2,700 mg/kg), B12ss-022M (1,800 mg/kg) 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 Farmer 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 CUG 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.

3.2.2 Remedial Action Cleanup Goal

Table 3-2 presents the CUG to attain Unrestricted (Residential) Land Use for Anchor Test Area. The HHRA identified arsenic in surface soil (0-1 ft bgs) as a COC for the National Guard Trainee and Resident Farmer. Consequently, surface soil (0-1 ft bgs) at location ATAss-005M requires remediation to attain the future land use (Military Training) or 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 Farmer. The COCs, CUGs, and locations requiring remediation are presented in Table 3-2.

Table 3-2. Summary of COCs, CUGs, and Locations Requiring Remedy at Anchor Test Area

Media	Chemicals of Concern	Cleanup Goals	Location and Depth Requiring Remediation (Arsenic Concentration)
Surface Soil[1]	Arsenic	15.4 mg/kg[2]	ATAss-005M (54 mg/kg) at 0-1 ft bgs
Subsurface Soil	None	Not applicable	Not applicable

[1] Includes surface soil (0-1 ft bgs) for the Resident Farmer and deep surface soil (0-4 ft bgs) for the National Guard Trainee. Because 0-1 ft bgs samples were collected using Incremental Sampling Methods (ISM) and the 1-4 ft bgs samples were collected using discrete sampling, these intervals were evaluated separately.

[2] The cleanup goal for arsenic is the Ravenna Army Ammunition Plant facility-wide background value for surface soil (0-1 ft bgs).

ft bgs = feet below ground surface

mg/kg = milligram per kilogram

4.0 WASTE PROFILE AND REMEDIAL DESIGN SAMPLING

This section summarizes sampling activities conducted at each AOC to 1) profile soil that will be excavated as non-hazardous or hazardous for waste disposal facility acceptance criteria; 2) refine areas and volumes of soil to be excavated to achieve CUGs established in the RODs; and 3) refine potential removal volume, if necessary, for the 4 ft high mound near the footprint of former Building T-4602 at the Building 1200 AOC. These activities were performed to meet the alternative elements specified in the respective feasibility studies and were executed in accordance with the *PBA 2008 Supplemental Investigation Sampling and Analysis Plan Addendum No. 1* (USACE 2009). These activities were conducted during two different field events (December 2013 and February 2014). This section provides location-specific details of the RD sampling and characterization activities.

4.1 WASTE PROFILE SAMPLING

Leidos field personnel collected waste profile samples from three soil removal areas, one representing the soil to be removed from the ditch south of the Building 1200 former settling pond discharge area, one from the removal area just east of former Building 1200, and one from the removal area at Anchor Test Area. Incremental Sampling Method (ISM) and discrete samples were collected from each soil removal area for off-site laboratory analysis as presented in Table 4-1. Each ISM sample was analyzed for toxicity characteristic leaching procedure (TCLP) metals, TCLP semi-volatile organic compounds (SVOCs), TCLP pesticides, TCLP herbicides, total cyanide, and polychlorinated biphenyls (PCBs). Each discrete sample was analyzed for TCLP volatile organic compounds (VOCs), total sulfide, pH and reactivity. Procedures for sampling are presented in the following sections.

Table 4-1. Waste Profile Sampling Analytical Requirements

Parameter[a]	Methods
TCLP (Metals, Pesticides, Herbicides, SVOCs)	SW-846 1311/6010/7470/8270/8081
Total Cyanide	SW-846 7.3.3
Total Sulfide[b]	SW-846 7.3.4
PCBs	SW-846 8082
Flashpoint [b]	SW-846 1030
pH[b]	SW-846 9040, 9045
TCLP (VOCs)[b]	SW-846 1311/8260

[a] Additional parameters (i.e., paint filter test) may be required by the waste disposal facility. The waste disposal facility has not been selected at the time of this design.
[b] Samples were collected as discrete samples and did not undergo laboratory ISM Processing.
Project Quantitation Levels will be in accordance with the Facility-Wide Sampling and Analysis Plan (USACE 2011a)
ISM = Incremental Sampling Method
PCB = polychlorinated biphenyl
SVOC = semi-volatile organic compound
TCLP = toxicity characteristic leaching procedure
VOC = volatile organic compound

4.1.1 Incremental Sampling Method for Waste Profile Sampling

Each ISM sample consisted of no less than 30 aliquot samples, providing a 95% statistical confidence level that the analytical result represents a mean concentration for that area. The corners (or boundaries) of each designated ISM sample area was located using a digital global positioning system and marked using wooden stakes or pin flags. Approximately equal sample volume aliquots were collected randomly using decontaminated small-diameter push probes (≤ 1 inch in diameter). This instrument was used to manually dig into the soil to the required depth designated for the sampling location. Any point within the boundary of the ISM sample area was a possible location to collect an aliquot, and each point had an equal chance of being selected.

All sample aliquots collected from each ISM sample area were placed in a container for transport to the approved off-site laboratory: TestAmerica, North Canton, Ohio. Each ISM sample was dried, sieved, and finely ground by the off-site laboratory and then analyzed for the specified non-volatile constituents. Field duplicate QC samples were not collected for waste profile analyses.

4.1.2 Discrete Sampling for Waste Profile Sampling

Three discrete samples were collected at 0-1 ft bgs from a random location within the soil removal area using the bucket hand auger method. The surface soil was directly packed into a sample jar and was not be composited or further processed in the field. Discrete samples were analyzed for TCLP VOCs, total sulfide, pH and reactivity. The discrete samples were collected in a manner that minimized volatilization during the sample collection process. Discrete samples did not undergo drying, sieving, or grinding prior to analyses.

4.1.3 Waste Profile Sample Results

To establish a waste profile, the results of TCLP analyses were compared against the maximum concentrations of contaminants for toxicity characteristic in 40 *Code of Federal Regulations* 261.24 and Ohio Administrative Code 3745-51-24. Detected concentrations for total cyanide and total sulfide were evaluated to determine whether soil was characteristically hazardous or regulated waste. Flashpoint and pH were also evaluated. A summary of the waste profile data is below.

1.) All TCLP metals, VOCs, SVOCs, herbicides, cyanide, and sulfides were below the laboratory reporting limits.
2.) All PCBs were below the Toxic Substance Control Action level of 25-50 mg/kg that would require re-classification of the waste.
3.) Flashpoint was below 180 degrees F.
4.) The pH of the soil was between 5.2-8.8.

Based on these data, the excavated soil at the Building 1200 and Anchor Test Area AOCs would be classified as non-hazardous waste. The final classification for disposal will be verified by the licensed

disposal facility and documented on the appropriate waste profile during the remedial action procurement process.

4.2 REMEDIAL DESIGN SAMPLING

RD samples were collected at both AOCs to further refine areas and volumes of soil requiring removal to be protective of achieve CUGs as established in the ROD. The three ISM areas (B12ss-016M, B12ss-017M, and B12ss-022M) identified in the Building 1200 ROD for surface soil (0-1 ft bgs) removal were further subdivided for purposes of the RD sampling. Nine surface soil (0-1 ft bgs) samples (three from each planned removal area) were collected using ISM and sent for off-site laboratory analysis of manganese using method SW-846 6010B (Figure 4-1).

One ISM area (ATAss-005M) was identified in the ATA ROD for surface soil (0-1 ft bgs) removal for Anchor Test Area. Four ISM areas had surface soil (0-1 ft bgs) samples that were collected. Each of the four ISM area samples were sent for off-site laboratory analysis of arsenic using method SW-846 6010B (Figure 4-2). Procedures for sampling are presented in the following section, as well as in Section 5.6.2 of the FWSAP (USACE 2011a).

4.2.1 Incremental Sampling Method for Remedial Design Sampling

The waste profile samples were collected using ISM as described in Section 4.1.1. Each ISM sample was dried, sieved, and finely ground by the off-site laboratory and then analyzed for the specified non-volatile constituents. Field duplicate QC samples were collected for additional RD sampling at a frequency of 10 percent (i.e., one per AOC).

4.2.2 Remedial Design Sample Results

Sample results were compared to remediation CUGs specified in the RODs for each AOC. The comparison of sample results against the manganese CUG at the Building 1200 AOC is presented in Table 4-2 and Figure 4-1. The comparison of sample results exceeding the arsenic CUG at Anchor Test Area are presented in Table 4-3 and Figure 4-2. If the ISM sample results were above the CUG, the ISM sample area will require soil removal with confirmation sampling. If the ISM sample results were below the CUG, soil removal is not anticipated in this area.

4.3 BUILDING 1200 MOUND REMEDIAL DESIGN SAMPLING

An ISM sample (B12ss-051M-0012-SO) was collected from a 4 ft high by 21 foot long by 13 ft wide mound near the footprint of former Building T-4062 (Figure 1-3) to determine potential additional soil volumes for disposal in the event removal was necessary. The ISM sample was analyzed for the RVAAP full-suite analytes (Table 4-4). One discrete VOC grab sample was also collected. Sample results were screened against the facility-wide background values and Resident Receptor (Adult/Child) FWCUGs, as presented in Attachment B. No results exceeded the screening criteria.

Table 4-2. Sample Results and Cleanup Goal Comparison Building 1200

Station	Sample ID	Manganese Concentration (mg/kg)	Concentration Exceed Manganese CUG of 1450 mg/kg?
B12ss-041M	B12ss-041M-0001-SO	690	No
B12ss-042M	B12ss-042M-0002-SO	3600	Yes
B12ss-043M	B12ss-043M-0004-SO	3600	Yes
B12ss-044M	B12ss-044M-0005-SO	4400	Yes
B12ss-045M	B12ss-045M-0006-SO	3500	Yes
B12ss-046M	B12ss-046M-0007-SO	550	No
B12ss-047M	B12ss-047M-0008-SO	1900	Yes
B12ss-048M	B12ss-048M-0010-SO	1500	Yes
B12ss-049M	B12ss-049M-0011-SO	1500	Yes

B12 = Building 1200
CUG = Cleanup Goal

Table 4-3. Sample Results and Cleanup Goal Comparison Anchor Test Area

Station	Sample ID	Arsenic Concentration (mg/kg)	Concentration Exceed Arsenic CUG of 15.4 mg/kg?
ATAss-021M	ATAss-021M-0001-SO	35	Yes
ATAss-022M	ATAss-022M-0002-SO	12	No
ATAss-023M	ATAss-023M-0003-SO	25	Yes
ATAss-024M	ATAss-024M-0005-SO	9.9	No

ATA = Anchor Test Area
CUG = Cleanup Goal

As discussed in Section 4.3 of the *Remedial Investigation/Feasibility Study Report for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200* (USACE 2012a), the initial asbestos visual inspection did not identify any asbestos on the ground surface at the AOC. However, the inspection recommended further investigation of the mound near the footprint of former Building T-4602. During sampling of the mound, 30 push-probe aliquots were collected and visually examined. In addition, five test pits along the sides and top of the mound were excavated with a shovel to the base of the mound, and the surface of the mound was cleared of snow and vegetation to allow for visual inspection. No building debris or construction materials were observed in the push probes, on the surface of the mound, or in the test pits. One test pit (located at the top of the mound approximately 2 ft below the surface) had a few wood fragments similar in size and appearance to a broken survey stake. The entire mound is comprised of clean, well sorted sandy soil and roots from the vegetation growing on the mound.

The mound was determined to have no chemical contamination exceeding the facility-wide background values and Resident Receptor (Adult/Child) facility-wide cleanup goals (FWCUGs) and contained no building material to indicate the mound may have suspect asbestos-containing material

(ACM). Therefore, remedial actions will not need to account for any additional associated soil removal and waste disposal volumes.

Table 4-4. Building 1200 Mound Characterization Analytical Requirements

Parameter	Methods
Volatile Organics	SW-846 8260B/5021
Semi-volatile Organics	SW-846 3540c/3541/8270C
TAL Metals +Hg	SW-846 6010B/7470A
Explosives	SW-846 8330B
Propellants (Nitroguanidine, Nitrocellulose)	8330 Mod/8332 Mod; 9056 Mod/EPA 353.2 Mod
Pesticides	SSW-846 3540C/3541C/8081A
PCBs	SW-846 8082

A-E = Architect-Engineer
TAL = Target Analyte List

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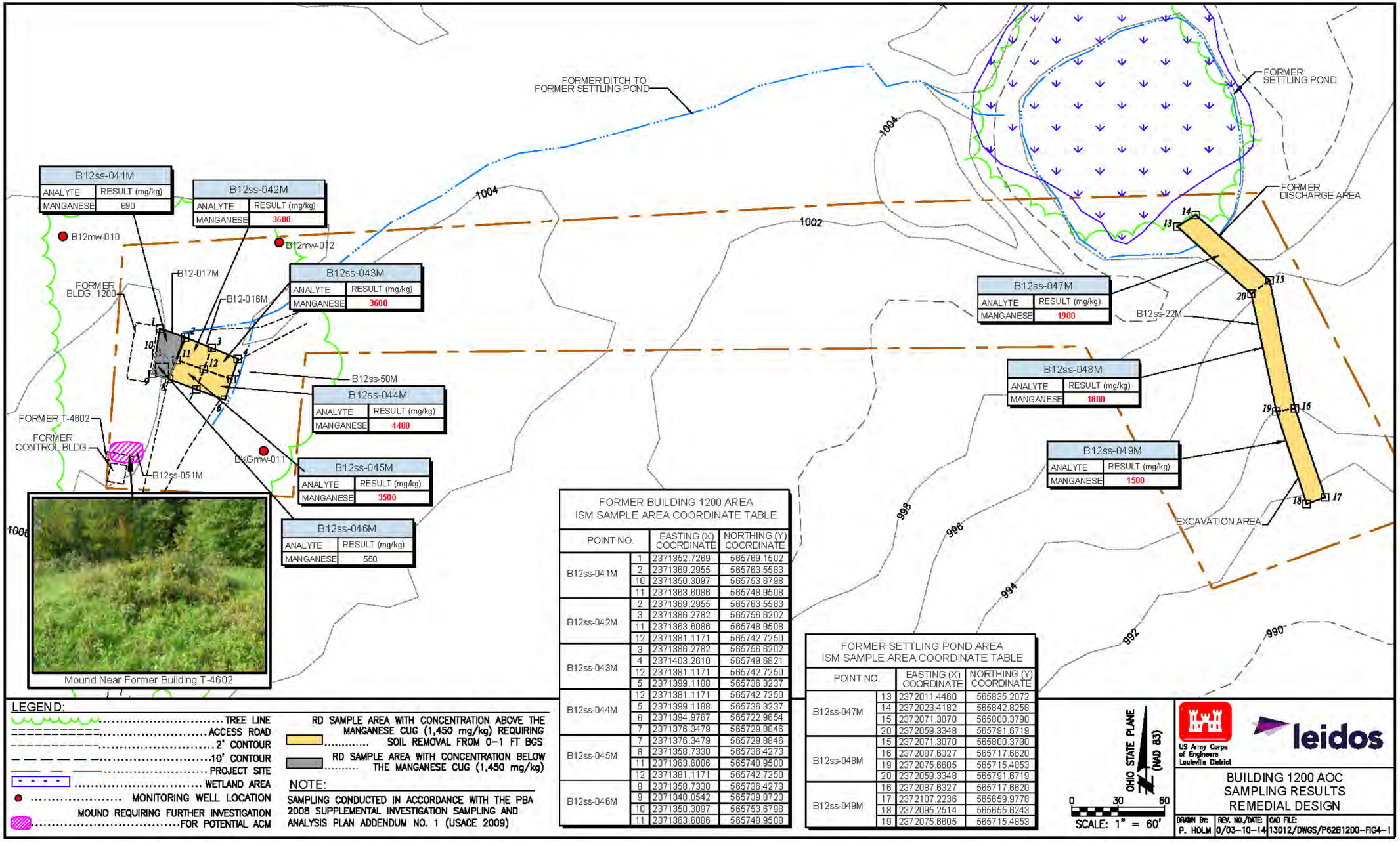

Figure 4-1. Building 1200 Remedial Design and Characterization Sample Results

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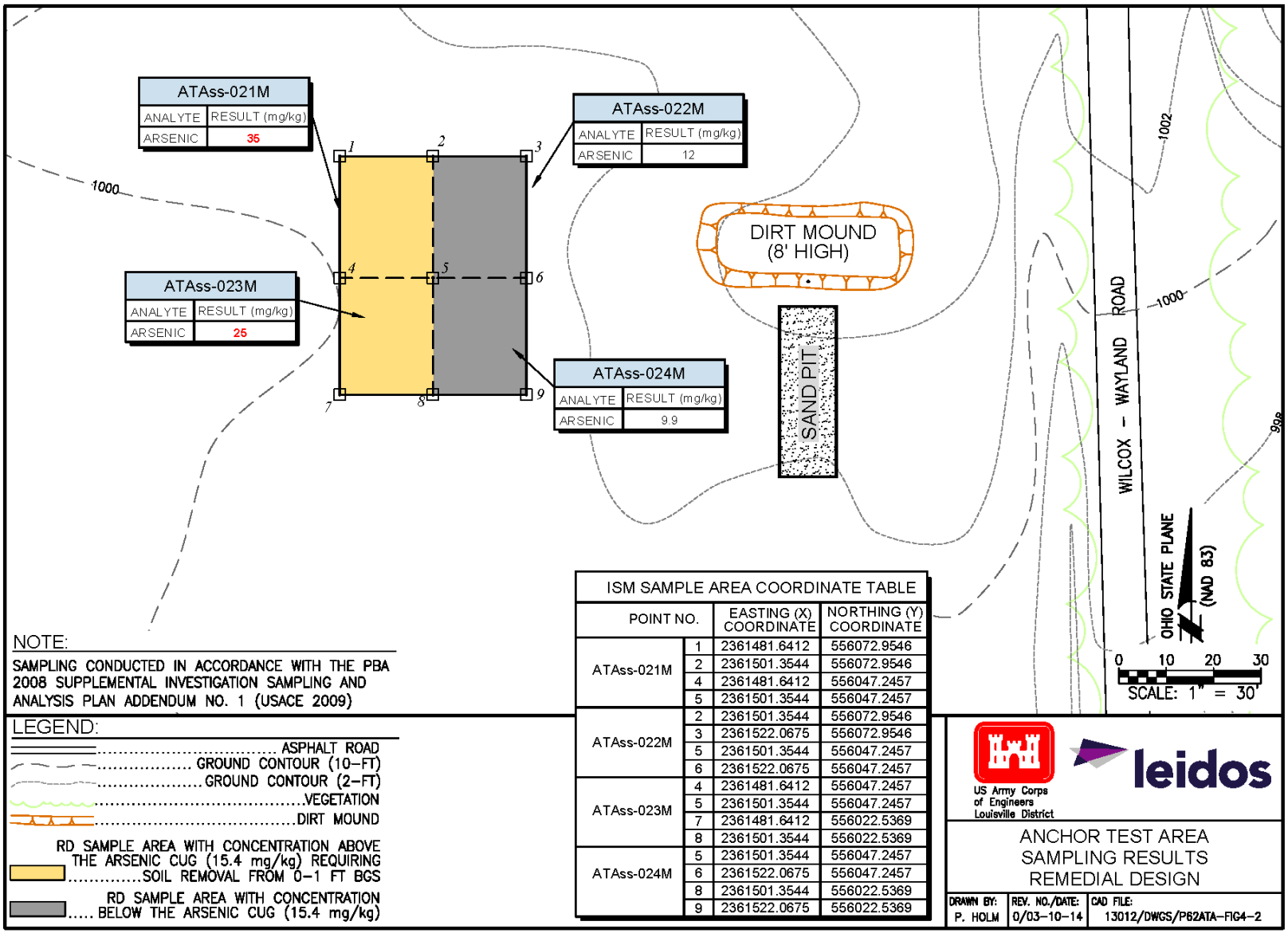

Figure 4-2. Anchor Test Area Remedial Design and Characterization Sample Results

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5.0 CONSTRUCTION MOBILIZATION

This section describes construction mobilization and site preparation activities required to implement this RD. Design drawings (Attachment D) detailing remedial action requirements are referenced as appropriate throughout this section.

5.1 SITE PREPARATION

This section describes site preparation activities that must be performed by the Subcontractor prior to beginning construction activities at each project site. Site preparation activities consist of several elements designed to maximize access to the project sites and prevent migration of soil during construction, including:

- Utility survey and clearance;
- Establishing site controls and site access;
- Setting up construction support facilities;
- Vegetation clearing; and
- Implementing storm water controls.

5.1.1 Utility Survey and Clearance

The Subcontractor will notify Leidos and OHARNG Department of Public Works and Utilities office prior to initiating remedial activities to allow sufficient time for a utility clearance to be conducted at each project site by appropriate OHARNG personnel. Any identified utilities (underground and aboveground) will be maintained as determined by the ARNG/OHARNG Representative.

In the event an unmarked utility is discovered during remedial activities, all work will stop immediately and the ARNG/OHARNG Representative, USACE COR, and Leidos Project Manager will be notified immediately. U.S. Army personnel will determine the disposition of the discovered utility. U.S. Army personnel and Leidos will collaborate on any necessary actions in order to continue remedial activities. If the discovery of an unmarked utility results in a change to the scope, objectives, or schedule of this RD, Leidos will notify the USACE COR for concurrence on proposed revisions and/or corrective actions.

The Building 1200 AOC is not located within or near a Munitions Response Site (MRS). Anchor Test Area is an MRS that has achieved no further action during the Military Munitions Response Program Site Investigation.

5.1.2 Site Control and Access

OHARNG will grant site access and the Subcontractor will control the project sites during remedial activities. The project sites will be controlled at ingress and egress points. Site controls will include:

- Controlling access to the project sites by signage, requiring visitors to sign in, and putting caution tape around excavation areas;
- Erecting signs at locations indicated on Attachment D, Drawing C-5 to expedite deliveries, maintain traffic flow, promote safety, and prevent interference with other Camp Ravenna operations; and
- Adhering to Camp Ravenna traffic rules.

The Subcontractor will comply with all Ohio and Camp Ravenna traffic rules. The Subcontractor will not exceed the posted speed limit of 35 miles per hour (mph) during daylight hours and 25 mph at night while on Camp Ravenna main roads, except 20 mph near Camp Ravenna Main Gate and training areas. A speed limit of 10 mph on the project access road will be maintained. At no time will the Camp Ravenna main roads be blocked by the Subcontractor during remediation activities. Traffic flow must be maintained on at least half of the roadway at all times. Prior to starting any activity that will obstruct traffic flow, approval will be obtained from Camp Ravenna Range Control, the ARNG/OHARNG Representative, and the Leidos Construction Manager.

Using two-way radios and cell phones is permitted at Camp Ravenna. Workers at Building 1200 and Anchor Test Area project sites must be able to contact Camp Ravenna Range Control at all times.

5.1.2.1 Facility Access Protocol

All personnel and vehicles must enter Camp Ravenna through the main entrance (8451 State Route 5, Ravenna, OH 44266) and are subject to search and inspection. Weapons, lighters (or similar fire starters), and alcoholic beverages are prohibited within Camp Ravenna; prohibited items may be left with security while on site. Security personnel will confiscate prohibited items discovered during inspections.

Facility access requests will be made through Vista Sciences Corporation. Vista Sciences Corporation will coordinate facility access approval through the OHARNG. All personnel approved to enter Camp Ravenna must provide a government-issued identification (e.g., driver's license, passport) at the entrance.

5.1.2.2 Site Access Protocol

All supervisors, workers, and site visitors entering the project sites must provide training records specified in the SSHP (separate addendum to this RD) prior to entering the project site and/or exclusion zones. Site visitors arriving throughout the day must: 1) undergo a briefing by the Leidos Construction Manager and Subcontractor SSHO; and 2) provide necessary training records and documentation prior to approaching or entering the exclusion zone. All site visitors must be approved by the Leidos Construction Manager and Subcontractor SSHO to enter the project sites and/or exclusion zones.

5.1.2.3 Access to Building 1200 Project Site

The Building 1200 project site will be accessed from Remalia Road by an "on-road haul route," which is a combination of Ammunition Sectioning Road and an unimproved road between Building 35-812 to the Building 1200 project site (Attachment D, Drawing C-5). The Subcontractor will maintain the on-road haul route to allow haul trucks and heavy equipment to traverse safely and efficiently. The Subcontractor will use northern portion of the on-road haul route as a loading area (Attachment D, Drawing C-3).

5.1.2.4 Access to Anchor Test Area Project Site

The Anchor Test Area project site will be accessed from an unimproved road (Wilcox-Wayland Road) located off of Newton Falls Road (Attachment D, Drawing C-5). Wilcox-Wayland Road will be considered the "on-road haul route" for this project site. This route will also be used for truck loading immediately adjacent to the project site. Wilcox-Wayland Road is washed out and closed immediately south of the project site; therefore, the road cannot be accessed from South Service Road. The Subcontractor will maintain the access road to allow haul trucks and heavy equipment to traverse safely and efficiently.

5.1.3 Construction Support Facilities

Construction support facilities for this RD may include:

- Sanitary facility;
- Equipment staging area; and
- Fueling areas.

Locations for these facilities will be determined in the field by the Leidos Construction Manager and approved by OHARNG. Fueling activities, if necessary, will be performed over secondary contaminant (e.g., drip pan, spill pallet). All necessary control measures and spill equipment will be established and maintained, as specified in Section 10.4.1.

5.1.4 Vegetation Clearing

Vegetation clearing will be coordinated with OHARNG. Clearing and grubbing will be required to facilitate equipment access and surface soil removal at both AOCs (Attachment D, Drawings C-3 and C-4). Clearing and grubbing will primarily involve felling and removing only trees necessary to conduct soil removal, establish access via the off-road haul route, and provide branch clearing on access roads. Trees greater than 4 inches in diameter will be cut and stacked neatly at the project sites away from remedial activities (Attachment D, Drawings C-3 and C-4). Trees less than 4 inches in diameter shall be cut into manageable pieces and chipped. Wood chips will be spread as mulch over the off-road haul truck routes at each AOC by the Subcontractor during site restoration (Section 8.0).

Tree stumps and associated roots within the limits of excavation will be removed and disposed with the contaminated surface soil.

5.2 STORM WATER POLLUTION PREVENTION

5.2.1 Storm Water Control Best Management Practices

The total area of construction within each project site is anticipated to be below the 1 acre threshold to obtain coverage under the National Pollutant Discharge Elimination System Construction Storm Water Permit No. OHC000002. However, best management practices (BMPs), such as silt fence and straw bale check dams, will be employed during implementation of this RD.

The Subcontractor will install storm water controls prior to initiating soil removal activities in accordance with this section of the RD, as detailed on Attachment D, Drawings C-3 and C-4. BMPs will be employed to protect excavation areas from storm water run-on and run-off. Erosion and sedimentation controls will include non-structural and structural BMPs, which conform to "*Rainwater and Land Development, Ohio's Standards for Storm Water Management*" (ODNR 2006).

Non-structural BMPs to be employed at the project sites include:

- Minimizing disturbance;
- Phasing construction operations; and
- Maintaining good housekeeping practices.

Structural BMPs to be employed at the project sites include:

- Improving roadways/haul routes;
- Installing a temporary dam; and
- Installing silt fencing and straw check dam.

To further minimize the potential for erosion and sediment run-off, no work will be performed during periods of inclement weather, as determined by the Leidos Construction Manager.

5.2.1.1 Improving Roadways/Haul Routes

If visible dust is being generated by equipment on roadways or haul routes, dust suppression measures (e.g., wetting) will be employed. The Subcontractor will be responsible for maintaining the access road and haul truck route throughout the project (e.g., ensure it is free of mud). Any improvements made to the access road shall remain in place after restoration activities are complete.

5.2.1.2 Haul Truck Inspection

The Subcontractor will inspect haul truck tires prior to leaving the project site or entering paved roads. If necessary, mud will be cleaned off tires with hand tools (e.g., shovel, broom, brush). Removed mud/soil will be returned to the project site.

5.2.1.3 Building 1200 Former Settling Pond Temporary Dam

The former settling pond at the Building 1200 AOC discharges via an outlet channel to the southeast, which includes the excavation area B12ss-022M. Prior to excavation activities, the Subcontractor shall assess the weather forecast and the amount of standing water in the former settling pond to determine if it is necessary to install a temporary dam (sandbags, temporary cofferdam, earthen dam, or an equivalent watertight barrier) immediately north of the excavation area, and south of the wetland boundary, as shown in Attachment D, Drawing C-3. If storm water accumulates in the former settling pond to the top of the temporary dam, then water will be filtered through a sediment bag and discharged to a location downgradient of the excavation area. The Subcontractor will provide the approximate volume of rainwater released from the former settling pond to the Leidos Construction Manager. The Leidos Construction Manager will track releases on the "Release of Rainwater Form" (Attachment A), which will be submitted to the OHARNG Environmental Office. During excavation activities, any water accumulation in contact with an open excavation will be considered contact water and will be pumped and managed in accordance with Section 5.2.2.

5.2.1.4 Silt Fencing and Straw Check Dam

The Subcontractor will install silt fencing or straw check dam at the project sites as specified in Attachment D, Drawings C-3 and C-4. The location of the silt fencing and straw check dams may change based on field conditions and results of the RD sampling, as directed by the Leidos Construction Manager. In general, silt fencing will be installed between excavation areas and existing drainage ditches and around stockpiles on level contours. Straw check dams will be installed within drainage ditches downgradient of excavation areas. The silt fence will undergo inspections in accordance with Section 10.4.2.

5.2.2 Excavation Water Management

Excavation water is considered any water that accumulates in an excavation and comes into contact with unearthed surface soil containing contaminants above CUGs during soil removal activities. Measures will be taken to prevent generation of excavation water. For example, at the end of the workday and during inclement weather, open excavation areas and stockpiled excavation soil will be covered with 10-mil thick plastic and weighed down with sandbags to prevent soil migration in the event of rain, high winds, or contact water.

In the event that excavation water is generated, the Subcontractor will have a temporary water storage tank on standby, ready to mobilize to the appropriate project site. The Subcontractor will be

responsible for pumping excavation water to a temporary water storage tank located in the equipment staging area. The temporary water storage tank will be staged in secondary containment and stored in order to avoid streams and water bodies. The Subcontractor will also be responsible for sampling and disposing the excavation water in accordance with Section 9.0 of this RD.

5.2.3 Non-Contact Storm Water Management

Storm water that accumulates at the project site during excavation activities that does not contact unearthed contaminated surface soil may be discharged over the ground surface so it does not create construction difficulties or ponding. This non-contact storm water may be discharged through a sediment bag to remove uncontaminated sediment that may accumulate in storm water. An instance in which non-contact water would accumulate at the project site would be water that accumulates on the covered excavation area or in the storage tank's secondary containment during a storm event. The Leidos Construction Manager will track any non-contact storm water releases on the "Release of Rainwater Form" (Attachment A).

5.2.4 Erosion Control Schedule

Erosion/sedimentation control features will remain in place until the project site is restored in accordance with Section 8.0. Storm water control inspections will be performed daily by the Subcontractor during construction activities. After site restoration has been completed, these inspections will be performed once every week until 70 percent vegetation cover has been achieved and erosion controls can be removed, as specified in Section 8.5 of this RD. The Subcontractor will also inspect the storm water controls within 24 hours of any rain event greater than 0.5 inches. For rain events lasting longer than 24 hours, the Subcontractor will also inspect storm water controls at least every 24 hours of the event and within 24 hours of the event ending. These inspections will be performed in accordance with the CQAP in Section 10.0 of this RD.

5.3 DUST AND WIND CONTROLS

All excavations, access roads, and other work areas within the project sites will be maintained free from soil that could cause a hazard or nuisance. Dust generation activities may occur during clearing and grubbing, and material excavation, handling, and transportation. Dust control will be maintained by keeping traffic on improved roads, maintaining the posted speed limit, and applying water as required. The Subcontractor will employ water spraying/misting for dust control if airborne dust is observed. Water used for dust control will be clean (i.e., potable water obtained from an approved off-site source).

During instances of high winds resulting in excessive dust, additional dust control measures or work stoppage may be required. The Subcontractor SSHO will be responsible for visual dust monitoring. At a minimum, visual monitoring of fugitive dust emissions will be conducted daily during representatively normal operating conditions.

5.4 GOOD HOUSEKEEPING

Good housekeeping practices are designed to maintain a clean and orderly work environment. Good housekeeping measures will include at a minimum:

- Pick up and dispose garbage and sanitary waste material regularly;
- Conduct daily equipment and material inspections for leaks and/or conditions that could potentially lead to a discharge of a petroleum product, chemical or waste;
- Perform preventative maintenance on equipment to ensure it is in proper operation and to detect potential leaks before they occur; and
- Ensure that spill cleanup procedures outlined in Section 13.1.2 of the FWSHP (USACE 2011b) are understood by employees, contractors, and/or subcontractors and that established storage areas are away from streams and water bodies. The storage area will also be away from direct traffic routes to prevent accidental spills.

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6.0 SURFACE SOIL REMOVAL ACTIVITIES

This section describes the remedial activities to be performed in support of this RD:

- Perform land survey;
- Excavate contaminated surface soil;
- Implement storm water controls; and
- Decontaminate equipment.

Design drawings (Attachment D) detailing remedial action requirements for performing surface soil removal and associated activities are referenced as appropriate throughout this section.

6.1 LAND SURVEY

Prior to starting excavation activities, the Subcontractor will establish the initial horizontal limits of excavation by land survey for each removal area, which will be further refined as described in Section 4.1. The excavation limits will be demarcated in accordance with Attachment D, Drawings C-3 and C-4.

A final land survey will be performed to record the horizontal and vertical limits when soil removal activities are complete.

6.2 EXCAVATION

This section describes excavation activities for removing contaminated surface soil within the Building 1200 and Anchor Test Area AOCs. The limits of excavation are presented in Attachment D, Drawings C-3 and C-4. Soil will be removed from 0-1 ft bgs from locations B12ss-047M, B12ss-048M, and B12ss-049M along the former settling pond discharge area at the Building 1200 AOC; B12ss-041M, B12ss-042M, B12ss-043M, B12ss-044M, B12ss-045M, and B12ss-046M; and from locations ATAss-021M and ATAss-023M at Anchor Test Area. The current estimated ex situ volume of surface soil is 210 and 22 cubic yards at Building 1200 and Anchor Test Area AOCs, respectively.

6.2.1 Excavation Activities

Excavation activities will be executed to reduce contaminated surface soil handling and will include:

- Excavating contaminated surface soil to a minimum of 1 ft bgs, as the exposure to the COCs above CUGs is within the 0-1 ft bgs interval;
- Stockpiling surface soil; and
- Loading surface soil into haul trucks for transfer to disposal facility.

Soil removal will be accomplished using conventional construction equipment such as backhoes, excavators, and front-end loaders. An off-road haul truck will be used to transport surface soil

removed from the former settling pond discharge area and Anchor Test Area to a designated lined stockpile area (Section 6.2.2).

Impermeable covers will be used by the Subcontractor to cover exposed surface soil at the end of each work day and during periods of inclement weather. The covers will be used on the excavation areas and soil stockpiles. The impermeable covers will be secured with sand bags (or equivalent).

Excavation equipment will be staged or operated from non-contaminated areas only. The Subcontractor will ensure heavy equipment does not enter the excavation area. It is anticipated only the excavator bucket and off-road haul truck bed will require decontamination.

During the loading process, care will be taken to not overfill trucks or spill surface soil on the sides of the trucks. Haul trucks will be positioned over plastic sheeting to capture any surface soil spilled during loading. Trucks will be inspected for surface soil on the exterior of the truck bed. Surface soil will be brushed off and captured prior to the truck exiting the loading area. All on-road truck loads will be covered while en route to the disposal facility. On-road haul trucks transporting hazardous or non-hazardous waste will be lined as required by the disposal facility along with any other specific federal or state requirements (e.g., placarding).

6.2.2 Surface Soil Stockpiling Area

A stockpiling area for excavated surface soil will be necessary for soil removal activities. The excavated surface soil at Building 1200 will be staged within excavation limits of the excavations adjacent to the former Building 1200 until trucks are available for loading. If necessary, additional stockpiling will occur adjacent to these excavation areas or the on-road haul route. The excavated surface soil at Anchor Test Area will be stockpiled near Wayland-Wilcox Road prior to loading the on-road haul truck. The stockpiling areas will be lined and covered with impermeable plastic sheeting. Existing soils below stockpiled surface soil will be excavated and sampled in accordance with Section 7.3 of this RD.

6.3 UNEXPECTED MATERIALS

If any unsafe or unexpected site condition or material (e.g., unexploded ordnance, building debris, ACM, drums, cylinders) is encountered during any phase of the soil removal activities, work will stop immediately and the Leidos Project Manager, USACE COR, and ARNG/OHARNG Representative will be notified immediately. The condition will be assessed in accordance with procedures outlined in the SSHP (separate addendum to this RD), and a joint determination will be made regarding continuation of remedial activities. Work will not resume until approval has been granted by the USACE COR. If the discovery results in a change to the scope, objectives, or schedule of this RD, Leidos will notify the USACE COR for concurrence on proposed revisions and/or corrective actions.

With any ground disturbing activity, there is always the potential for an inadvertent discovery of human remains, funerary objects, or any other potential historical or archaeological finds. If such

items are encountered during the restoration activities, excavation will immediately stop and the OHARNG Cultural Resources Manager (CRM), Leidos Project Manager, USACE COR, and ARNG/OHARNG Representative will be notified. If the CRM is not available, the discovery will be reported to OHARNG Range Control.

The CRM or OHARNG Range Control will collect and secure any artifacts or remains identified for analysis or curation, as appropriate. Human remains will not be disturbed or removed. Excavation activities will not resume until the OHARNG Standard Operation Procedures for inadvertent discovery of cultural material is completed and the project site has been released by the OHARNG CRM.

6.4 DECONTAMINATION OF EXCAVATION EQUIPMENT

Contact with contaminated surface soil will be actively minimized. The Subcontractor will implement measures to prevent material being tracked from the excavation. Equipment used to excavate and haul contaminated surface soil will be decontaminated prior to contact with backfill materials, being relocated to the other project site, or demobilization. Equipment that comes into contact with contaminated surface soil will be decontaminated as follows:

- The excavator bucket will be placed over the haul truck and washed with a pressure washer. Limited amounts of liquids (i.e., less than 30 gallons) will be used for decontamination activities performed over haul trucks. The Subcontractor will ensure free water is not present in the haul truck and there are no liquids escaping the truck bed. The Subcontractor will not use any liquid for decontamination that could potentially change the chemical profile of the contaminated surface soil (such as adding solvents or pH).
- If additional excavation equipment is used during remedial activities, the Subcontractor will designate and install a plastic-lined sandbag bermed area. Excavation equipment will be placed within the bermed area lined with plastic sheeting and cleaned as described below.
    - All loose soil will be removed using a stiff-bristle brush or other device to dislodge visible soil.
    - Equipment will be steam cleaned using potable water.
    - Equipment will be allowed to air dry as long as possible.
    - Equipment will be placed on clean plastic if immediate use is anticipated or will be wrapped in plastic to prevent contamination if longer-term storage is required.
    - Loose soil and wash water will be mixed with excavated surface soil and placed into a haul truck for disposal (decontamination liquids will consist of less than 30 gallons per truck and will not change the chemical profile of the excavated material).

At the end of each work day and during periods of non-operation (e.g., weekends), the excavator bucket will be wrapped with 6-mil (minimum thickness) low density polyethylene sheeting and bound using duct tape and/or wire in sufficient manner to prevent exposure to weather elements.

Prior to releasing construction equipment from the project site, the Subcontractor SSHO or designee will visually inspect (and document) construction equipment with specific attention to:

- Tires and wheels or tracks (as applicable);
- Undercarriage (frame, axles); and
- Exterior surfaces (including steps, running boards).

7.0 CONFIRMATION SAMPLING

This section describes the process to confirm that the remedial activities meet established CUGs. The purpose of confirmation sampling is to provide data to confirm that the contaminated soil has been removed from the project site and the remaining excavation footprint has soil below CUGs. Confirmation sampling consists of two components:

1.) Sample collection and analyses; and
2.) Comparison against the CUGs.

7.1 CONFIRMATION SAMPLE COLLECTION

When the excavation activities described in Section 6.2 are complete, the Building 1200 and Anchor Test Area excavation areas will be sampled using ISM to ensure CUGs are attained. One ISM sample will be collected from each excavation sidewall and floor. The final confirmation sampling scheme will be determined by the Leidos Construction Manager, as the excavation footprint will not be known until the soil removal is complete.

7.2 CONFIRMATION SAMPLING PROCEDURES

Confirmation sampling will be conducted using ISM with decontaminated small-diameter push probes (or equivalent, such as a disposable plastic scoop), as described in Section 4.1.1. Ten percent of the confirmation samples will have duplicate QC samples collected as replicate ISM samples, requiring separate soil ISM samples from the same area.

Figure 7-1 presents the sample identifying information that will be used. The confirmation samples collected will be considered surface soil samples (0-1 ft bgs) for identification purposes. Samples will be identified sequentially using the identification number system consistent with the remedial investigations. If a sample is not collected or is reassigned to a different location, a specific reason and notation will be noted in the project field logbook.

Table 7-1 presents the baseline sample identification listing. Analytical results of manganese at the Building 1200 AOC and arsenic at Anchor Test Area will be compared against the CUGs.

The sampling and analysis requirements and anticipated sample quantities and methods are summarized in Table 7-2. Project Quantitation Levels (chemical concentration precision levels) will be in accordance with the FWSAP (USACE 2011a).

7.3 STOCKPILING AREA CONFIRMATION SAMPLING

When remedial activities are complete and all soil is removed from the stockpiling areas, the ground surface in the soil stockpiling areas will be scraped using an excavator. One ISM confirmation sample will be collected from the footprint of each soil stockpiling area in the Building 1200 and Anchor Test

Area AOCs and analyzed for manganese and arsenic, respectively (Section 4.1.1). If the confirmation sample in the stockpiling areas exceeds the CUGs, additional excavation and confirmation sampling will be conducted until the concentrations are below the CUGs.

7.4 CONFIRMATION OF CLEANUP GOAL

The CUG for manganese at the Building 1200 AOC is 1,450 mg/kg. The CUG for arsenic at Anchor Test Area is 15.4 mg/kg. The results of the confirmation samples will be compared to the CUGs. If the confirmation sample results on the sidewalls exceed the CUGs, the following steps will take place:

1.) The sidewall at that specific ISM sample area will be expanded laterally to an extent prescribed by the Leidos Construction Manager to a depth of 1 ft bgs or greater; and
2.) Confirmation sample(s) will be collected at the discretion of the Leidos Construction Manager, who will determine if multiple confirmation samples will be collected from the additional excavation area. The Leidos Construction Manager will create spacing for the sample areas and document which areas are represented by specific ISM samples.

Site restoration activities will occur after ISM sample areas and stockpiling areas are confirmed to be at or below CUGs. Restoration activities will commence upon approval from the Leidos Construction Manager in conjunction with the USACE COR, ARNG/OHARNG Representative, and Ohio EPA.

Sample Station Location Identification: XXXmm-NNN(n)-####-tt

XXX = Area Designator
B12 = Building 1200
ATA = Anchor Test Area

mm = Sample Location Type
cs = Confirmation Soil Sample Location

NNN = Sequential Sample Location Number
Unique, sequential number for each sample location beginning with the initial investigation sample stations and extending into any subsequent investigative phases (i.e., 001 – 999)

(n) = Special Identifier
Optional use (as needed) to identify special sample matrices or sample location characteristics
M = Incremental Sampling Method Sample

= Sequential Sample Identification Number
Unique, sequential number for each sample beginning with the initial investigation sample locations and extending into any subsequent investigative phases (i.e., 0001 – 9999)

tt = Sample Type
SO = Soil Sample
FD = Field Duplicate

Figure 7-1. Sample Identification System

Table 7-1. Sample Identification for Confirmation Sampling

Area of Concern	Station	Sample ID	Manganese	Arsenic
Building 1200	B12cs-051M (excavation floor)	B12cs-051M-####-SO	1	NA
Building 1200	B12cs-052M (sidewall)	B12cs-052M-####-SO	1	NA
Building 1200	B12cs-053M (sidewall)	B12cs-053M-####-SO	1	NA
Building 1200	B12cs-054M (sidewall)	B12cs-054M-####-SO	1	NA
Building 1200	B12cs-055M (sidewall)	B12cs-055M-####-SO	1	NA
Building 1200	B12cs-022M (excavation floor)	B12cs-022M-####-SO	1	NA
Building 1200	B12cs-056M (sidewall)	B12cs-056M-####-SO	1	NA
Building 1200	B12cs-057M (sidewall)	B12cs-057M-####-SO	1	NA
Building 1200	B12cs-058M (sidewall)	B12cs-058M-####-SO	1	NA
Building 1200	B12cs-059M (sidewall)	B12cs-059M-####-SO	1	NA
Anchor Test Area	ATAcs-026M (excavation floor)	ATAcs-026M-####-SO	NA	1
Anchor Test Area	ATAcs-027M (sidewall)	ATAcs-027M-####-SO	NA	1
Anchor Test Area	ATAcs-028M (sidewall)	ATAcs-028M-####-SO	NA	1
Anchor Test Area	ATAcs-029M (sidewall)	ATAcs-029M-####-SO	NA	1
Anchor Test Area	ATAcs-030M (sidewall)	ATAcs-030M-####-SO	NA	1

Sample Identifier #### will be chosen during field implementation to ensure a duplicate number is not used.
ATA = Anchor Test Area
B12 = Building 1200
cs = Confirmation Soil Sample
ISM = Incremental Sampling Method
M = ISM Soil Sample
NA = Not applicable

Table 7-2. Estimated Sampling and Analytical Requirements

Parameter	Methods	Field Samples	Field Duplicate Samples	Total A-E Samples
Manganese, Total	SW-846 6010B	10	1	11
Arsenic, Total	SW-846 6010B	5	1	6

A-E = Architect-Engineer

8.0 SITE RESTORATION

Site restoration will begin after the analytical results of the confirmation samples confirm CUGs have been achieved. The Subcontractor will restore the project sites to the required conditions set forth in Attachment D, Drawings C-3 and C-4. At a minimum, this will include:

- Placing two 6-inch courses of No. 3 coarse aggregate (AASHTO M43) in the Building 1200 former settling pond drainage ditch for erosion control;
- Grading and backfilling the other excavation areas at Building 1200 and Anchor Test Area to existing contours to maintain drainage;
- Grading, seeding, and mulching disturbed areas between excavation areas, off-road haul truck routes, and stockpiling areas; and
- Removing erosion controls and the temporary dam, if applicable, placed at the Building 1200 project site once vegetation is established.

8.1 RE-GRADING AND BACKFILL

The bottom of the excavation areas will be backfilled, compacted, and graded to original contours to maintain drainage. One exception is the Building 1200 settling pond drainage ditch, which will be backfilled with No. 3 coarse aggregate (AASHTO M43) to existing contours. Where necessary, ruts and depressions within the project sites (e.g., truck loading area, equipment movement areas, and construction support area) will be re-graded. The Subcontractor will use approved backfill material for site restoration activities. If the backfill material is insufficient to support re-vegetation (e.g., clayey soil), a minimum of 4 inches of vegetative cover (e.g., topsoil) will be placed on top of the backfill material prior to seeding and mulching.

The backfill will come from a source (Charlestown Sand & Gravel) that was previously sampled and approved for use by Ohio EPA. However, if additional backfill is required, the Subcontractor will identify an off-site source of backfill. Per Ohio EPA guidance, one ISM sample will be collected by Leidos for every 4,000 cubic yards of backfill or vegetative cover used. This quantity of backfill or vegetative cover must come from the same source or an additional sample must be collected. The samples will be analyzed for the parameters identified in Table 8-1. The backfill and vegetative cover must be approved by Ohio EPA. Project Quantitation Levels will be in accordance with the FWSAP (USACE 2011a).

8.2 REMOVAL OF PLACED STONE

Although not anticipated, any stone placed on haul truck routes will remain in place for future use by OHARNG.

Table 8-1. Borrow Source Sampling Analytical Requirements

Parameter	Methods
VOCs, TCL	SW-846 5030/8260B
SVOCs, TCL	SW-846 3540/8270C
Pesticides, TCL	SW-846 3540/8081A
PCBs	SW-846 3540/8082
Explosives	SW-846 3540/8330
Nitroglycerin	SW-846 3540/8330
Nitroguanidine	SW-846 3540/8330 Modified
Nitrocellulose	MCAWW353.2 Modified
Metals, TAL	SW-846 6010B/6010A/7471
pH	SW-846 9040/9045

PCB = Polychlorinated Biphenyl
SAP = Sampling and Analysis Plan
SVOC = Semi-Volatile Organic Compound
TAL = Target Analyte List
TCL = Target Compound List
VOC = Volatile Organic Compound

Table 8-2. Facility-Wide Background Criteria for Surface Soils

Parameter	Background Criteria (mg/kg)	Parameter	Background Criteria (mg/kg)	Parameter	Background Criteria (mg/kg)
Aluminum	17,700	Cobalt	10.4	Nickel	21.1
Antimony	0.96	Copper	17.7	Potassium	927
Arsenic	15.4	Cyanide	0	Selenium	104
Barium	88.4	Iron	23,100	Silver	0
Beryllium	0.88	Lead	26.1	Sodium	123
Cadmium	0	Magnesium	3,030	Thallium	0
Calcium	15,800	Manganese	1,450	Vanadium	31.1
Chromium	17.4	Mercury	0.036	Zinc	61.8

[a] Background concentrations for 0-1 ft bgs from final facility-wide background concentrations, published in the *Phase II Remedial Investigation Report for Winklepeck Burning Grounds* (USACE 2001).
mg/kg = Milligrams per Kilogram

8.3 FINAL GRADING

Final grading will be performed to match surrounding elevations to prevent ponding of water and prevent erosion (Attachment D, Drawings C-3 and C-4). The final grade of the excavation area, as well as all areas disturbed during remedial activities, will be approved by the Leidos Construction Manager and ARNG/OHARNG Representative.

8.4 RE-VEGETATION

All disturbed areas must be seeded within seven days following excavation, backfilling, and final grading activities. The Anchor Test Area project site and all off-road haul truck routes will be seeded with the Camp Ravenna-approved mixture presented in Table 8-3. Fertilizer and lime are not needed for seeding with native seed mixes.

Table 8-3. Shaded, Partial Sun, Openings in Woods Seed Mixture for Camp Ravenna

Seed Type	Mixture %
Deertongue (*Panicum clandestinum*)	31.0%
Virginia wild rye (*Elymus virginicus*)	25%
Nodding Wild Rye (*Elymus Canadensis*)	25%
Big Bluestem (*Andropogon gerardii*)	10%
Side-Oats Grama (*Bouteloua curtipendula*)	9%
Specifications: Broadcast at 30 lbs/acre. Add 20 lbs/acre of Annual Rye Grass (*Lolium multiflorum*) to the broadcast mix. Mulch with a minimum of 3 bales of straw per 1,000 square feet	

The Subcontractor will use a Camp Ravenna-approved "open area" seed mixture for permanent cover for open areas of the Building 1200 project site disturbed during remedial activities. Table 8-4 presents the seed mixture and application specifications.

Table 8-4. Open Area Seed Mixture for Camp Ravenna

Seed Type	Mixture %
Nodding Wild Rye (*Elymus Canadensis*)	23.5%
Virginia wild rye (*Elymus virginicus*)	25%
Little Bluestem (*Schizachyrium scoparium*)	22%
Partridge Pea (*Chamaecrista fasciculate*)	18.75%
Thin-leaved Coneflower (*Rudbeckia triloba*)	7.75%
Brown fox sedge (*Carex vulpinoidea*)	1.5%
Black-eyed Susan (*Rudbeckia hirta*)	1.5%
Specifications: Broadcast at 18 lbs/acre. Add 20 lbs/acre of Annual Rye Grass (*Lolium multiflorum*) to the broadcast mix Mulch with a minimum of 3 bales of straw per 1,000 square feet.	

Areas left idle longer than 21 days, but scheduled for disturbance within the same growing season, shall have annual rye grass (*Lolium multiflorum*) spread at 30 lbs/acre and mulch with a minimum of three bales of straw per 1000 square feet.

Other effective materials may be used; including specialized seeding products/technologies such as seed impregnated fiber matting. Any product or technology used for seeding shall meet the seeding requirements presented in Table 8-3 and applicable Ohio EPA storm water pollution prevention controls.

8.5 REMOVAL OF EROSION CONTROLS

Sediment and erosion controls will remain in place until the grass is established with a density of at least 70 percent coverage in all disturbed construction areas, in accordance with Ohio Rainwater and Land Development guidance (ODNR 2006). Project sites will be inspected weekly until construction areas achieve at least 70 percent vegetation coverage. Once seeded areas achieve the required coverage, erosion control measures will be removed and disposed.

9.0 WASTE PROFILING AND DISPOSAL

This section describes waste profiling, transportation, and waste disposal activities that will be performed in support of implementing this RD. Waste includes remedial waste (e.g., excavated surface soil and excavation water) and any IDW generated during sampling activities. All waste will be properly handled, labeled, characterized, and managed in accordance with Section 8.0 of the FWSAP, federal and state of Ohio Large-Quantity Hazardous Waste Generator Requirements, and the OHARNG Hazardous Waste Plan and Waste Management Guidelines. All waste will be appropriately accounted for as soon as possible and prior to conclusion of the project. Any shipment of solid or hazardous waste off site will comply with all appropriate federal and state laws.

9.1 WASTE STREAM IDENTIFICATION

Waste generated during remedial activities will be managed in order to prevent the potential release of contamination. The following types of waste may be generated:

- Vegetation;
- Excavated surface soil;
- Decontamination fluids from sampling activities;
- Sanitary waste;
- Contact waste [e.g., personal protection equipment (PPE), plastic tarps, ground cloths];
- Excavation water (i.e., storm water in direct contact with impacted surface soil); and
- Decontamination fluids from excavation activities.

No surface soil IDW is anticipated during the collection of surface soil pre-confirmation and characterization samples. The entire volume of surface soil collected for these samples will be shipped to the laboratory. The laboratory will be responsible for disposing remaining surface soil.

In general, proper waste minimization procedures will be employed to limit the volume of waste generated. These procedures will include:

- Reusing materials;
- Utilizing disposable sampling tools that do not require decontamination;
- Minimizing the volume of decontamination fluids;
- Minimizing contact with potentially contaminated materials;
- Minimizing foot and vehicle traffic through potentially contaminated areas; and
- Utilizing good housekeeping practices.

9.2 WASTE STREAM MANAGEMENT

Table 9-1 presents and discusses each potential waste stream for this RD. Characteristics for each waste stream include: the point of generation, on-site staging and processing, characterization requirements, and method of final disposition.

9.3 INVESTIGATION-DERIVED WASTE FIELD STAGING

A Field Staging Area (FSA) will be designated at the beginning of field activities and approved by the ARNG/OHARNG Representative. A centralized FSA will be established for staging all drums of IDW (if any). The FSA will be managed according to the requirements of Section 8.3 of the FWSAP (USACE 2011a). Any excavation water will be containerized in a storage tank staged proximate to the removal areas in the event water accumulates in the excavated area.

Final inventories of IDW will be taken and provided to the ARNG/OHARNG Representative by the Leidos Construction Manager. All non-hazardous liquid waste not transported off the facility within 30 days following project completion will require secondary containment. Any soil/sediment or liquid waste identified as hazardous through process knowledge or characterization must be staged in the designated OHARNG 90-day hazardous waste storage area and managed in accordance with facility requirements, as described in Section 8.3 of the FWSAP (USACE 2011a).

9.4 WASTE CONTAINERIZATION AND LABELING

All waste storage containers will be a suitable size, leak proof, and constructed of materials compatible with the contained materials. Waste storage containers will be properly labeled prior to placement of material.

The Subcontractor will be responsible for providing new Department of Transportation approved containers for liquid IDW. The Leidos Construction Manager will be responsible for waste profiling, container labeling, and coordinating transportation and final disposal at a state of Ohio or federal approved treatment, storage, or disposal facility of all decontamination liquids. The ARNG/OHARNG Representative will sign all waste profiles and waste manifests for disposing project IDW at the approved disposal facility.

Table 9-1. Waste Profiling and Disposal

Waste Stream Identification	Point of Generation	On-Site Staging and Processing	Characterization Requirements	Final Disposition
Vegetation (Trees and Shrubs)	In the area of excavation, vegetation will be cut to a height of no greater than 3 inches above the ground surface.	Trees greater than 4 inches in diameter will be cut and stacked neatly at the AOC away from remedial activities. Trees less than 4 inches in diameter shall be cut into manageable pieces and chipped.	No characterization required.	Roots and root balls within the excavation footprint and wood chips used on site for absorbent material will be considered potentially contaminated material and disposed with excavated surface soil. Wood chips not used for absorbent material will be spread as mulch over the disturbed areas of the AOC by the Subcontractor.
Excavated Surface Soil	Surface soil will be generated during excavation and remedial activities at Building 1200 and Anchor Test Area.	Excavated surface soil will be directly loaded into on-road haul trucks or stockpiled on plastic liners. Truck beds will be lined as required by state, Federal Department of Transportation (DOT), or disposal facility requirements.	Characterization sampling of surface soil will be performed prior to mobilization and excavation activities. Samples will be analyzed for TCLP to determine classification of wastes (hazardous, non-hazardous).	Excavated surface soil will be removed and transported from the AOCs by a licensed waste disposal contractor and disposed at an approved disposal facility permitted by the state of Ohio to accept the waste. Non-hazardous waste manifests will be signed by the ARNG/OHARNG Representative.
Decontamination Fluids (Sampling Activities)	In the event that disposable plastic scoops cannot be used during sampling, stainless-steel spoons, soil probes, and bowls will be used to collect samples. These tools require decontamination between samples resulting in fluid generation.	Due to the anticipated small quantity generated, all IDW liquid will be combined and contained in a labeled DOT approved 55-gallon closed-top drum.	One representative sample will be collected and characterized in accordance with Section 8.4 of the FWSAP.	Decontamination fluids will be removed and transported from the IDW staging area by a licensed waste disposal contractor and disposed at an approved disposal facility permitted to accept the waste. Non-hazardous waste manifests will be signed by the ARNG/OHARNG Representative

Table 9-1. Waste Profiling and Disposal (continued)

Waste Stream Identification	Point of Generation	On-Site Staging and Processing	Characterization Requirements	Final Disposition
Sanitary Waste, Non-contaminated (i.e. garbage, paper waste, silt fence, PPE that does not come into contact with non-hazardous materials, and non-indigenous solids)	Primarily generated by personnel working at the project sites during remedial activities.	Collected daily in plastic-lined trash cans and moved to a designated area as specified in Section 8.3 of the FWSAP.	No characterization required, as material is considered non-hazardous waste.	Disposed in a licensed solid waste disposal facility in accordance with local, state, and federal regulations.
Contact Waste (PPE, gloves, boot covers, plastic sheeting)	Generated by site activities in which disposable materials come in contact with contaminated media.	Collected daily in plastic-lined trash cans and moved to a designated area as specified in Section 8.3 of the FWSAP.	Characterized in accordance with Section 8.4 of the FWSAP. Currently this material is considered non-hazardous waste, as the soil undergoing removal is considered non-hazardous waste (pending waste profile sampling).	Contact waste will be disposed in accordance with Section 8.5 of the FWSAP (USACE 2011a). It will be disposed as either sanitary waste or as a non-hazardous waste in a permitted waste facility.
Excavation Water	Generated in excavation area during rain events.	Accumulated excavation water will be pumped into a temporary water storage tank with secondary containment. It is anticipated that no excavation water will accumulate, or at most, minimal quantities will accumulate given the nominal footprint and depth of the excavation area and the excavation footprint will be covered during inactivity.	If characterization sampling results of surface soil indicate low concentrations of analytes, Ohio EPA may waive characterization sampling of excavation water. Should characterization sampling of excavation water be required, excavation water will be analyzed for parameters presented in Table 1-1 of FWSAP Quality Assurance Project Plan (USACE 2011a).	The Ohio EPA will determine the method of disposal from the following three choices: (1) land application (according to land application guidelines) [a]; (2) sanitary sewer disposal [b], or (3) discharge to a suitable waste disposal facility with approval from U.S. Army/Leidos. Sediment collected in the bottom of the tank will be disposed as excavated surface soil.

Table 9-1. Waste Profiling and Disposal (continued)

Waste Stream Identification	Point of Generation	On-Site Staging and Processing	Characterization Requirements	Final Disposition
Decontamination Fluids from Excavation Equipment	Generated as a result of decontamination of excavation equipment during and after all excavation remedial activities.	Decontamination of excavation equipment using potable water will be conducted over the truck bed of the final haul truck upon completion of the final haul/excavation activities. The amount of water used will be minimized so water accumulation in the haul truck will not exceed the requirements of the disposal facility or leak during transport. Should there be a requirement for an equipment decontamination pad, water generated from this activity will be collected and stored with excavation water.	No characterization required.	Minimal amounts of decontamination water will be disposed in the haul truck along with excavated surface soil.

[a] The guidelines for land application of excavation water are as follows:

- Discharge will only occur in a grassy, well-vegetated area of the AOC (Building 1200 or Anchor Test Area) from which it was generated;
- Discharge rates will be kept at a minimum to reduce any ponding or puddling (a spreader bar may be utilized);
- Discharge will not be released directly into surface water (e.g., creeks, ditches, streams); and
- Any accidental release to a surface water body shall be immediately reported to Ohio EPA.

[b] Should sample results be within sewer water pre-treatment standards, results will be submitted to the Portage County Water and Sewer District or other wastewater disposal agency for treatment approval.

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All IDW containers will be labeled prior to placing IDW in them. All IDW containers (e.g., drums and tanks) will be labeled in accordance with Section 7.2 of the FWSAP (USACE 2011a). Each IDW container will be labeled to ensure easy identification and proper management. Prior to placing IDW into a container, a "pending analysis" label containing the following information will be affixed to the outside of the container:

- Project name;
- Contents;
- Date waste was first placed into the container;
- Source location(s); and
- Emergency contact name and telephone number.

All IDW containers will be closed and stored in the FSA approved by OHARNG. Liquid IDW containers will be filled to a maximum of 66 percent of the container volume and will be placed on spill containment pallets. All IDW containers and pallets will be covered with a weather-proof tarp. All IDW containers will be inspected to ensure no leaks or releases occur during use. An orange construction fence will be installed around the IDW storage area.

Any non-contaminated sanitary trash will be contained separately in a plastic-lined standard trash can with lid. Non-contaminated sanitary trash will be disposed offsite through a commercial municipal waste service provided by the Subcontractor.

9.5 TRANSPORTATION, STORAGE, AND DISPOSAL

The management, transportation, and disposal of all waste streams will be coordinated by the Leidos Construction Manager with the Camp Ravenna Environmental Office. All transportation paperwork for soil (manifests or shipping papers) and on-road haul truck placards will be prepared by the Subcontractor Construction Manager in accordance with federal, state, and local regulatory requirements, and disposal facility requirements. All transportation paperwork for decontamination fluids (manifests or shipping papers) will be obtained by the Subcontractor Construction Manager. A draft of the transportation paperwork containing "base" information that includes applicable waste code(s) will be submitted to the ARNG/OHARNG Representative for review and approval a minimum of one week prior to shipping any material. The ARNG/OHARNG Representative will sign all waste profiles and waste manifests for disposing project wastes at an approved facility. The approved transportation paperwork will then be completed as appropriate by the Subcontractor Construction Manager or designee in the field during excavation activities. The Camp Ravenna Environmental Office will be responsible for custody of manifest copies and submittal to Ohio EPA as part of the biannual reporting for hazardous waste generation and management as applicable.

Contaminated surface soil loaded into on-road haul trucks will be transported by licensed waste haulers to U.S. Army and Leidos approved licensed off-site disposal facilities. All other waste types (e.g., IDW, other materials, and excavation water) will be managed by the Subcontractor in compliance with all federal, state, and local laws. All transportation requirements, including proper

labeling, placarding, and weight limits will be followed. All manifests, shipping documents, and disposal facility approval letters will be provided to the Leidos Construction Manager and incorporated into the Remedial Action Report (Section 10.7.2).

10.0 CONSTRUCTION QUALITY ASSURANCE PLAN

This section presents the CQAP. The CQAP describes the inspection procedures and documentation required to ensure excavation, disposal, and restoration activities occur according to the requirements of this RD.

Protocols for reporting test results, certifying compliance with construction requirements, correcting construction deficiencies, and documenting such corrections are provided. This section also addresses the review and documentation requirements necessary to comply with the site restoration details contained herein.

10.1 RESPONSIBILITY AND AUTHORITY

10.1.1 Responsibility

The organizational chart presented in Figure 2-1 outlines the management structure that will be used to implement the excavation and disposal activities in accordance with this RD. The functional responsibilities of key personnel were described in Section 2.1. Personnel assignments to each position were based on the following:

- Qualifications;
- Experience; and
- Training.

The Leidos QA/QC Officer and Leidos Construction Manager, in coordination with the USACE COR, will ensure that completed remedial activities conform to the RD, design drawings, specifications, and any necessary permit conditions. The Leidos Project Manager will verify completion of these activities.

The Leidos Construction Manager will monitor excavation, disposal, and site restoration activities. The Leidos Construction Manager or designee will be on site during work activities to ensure that all components of this RD are fulfilled.

10.1.2 Administration and Operation

The QA/QC organization is administered by the Leidos QA/QC Officer in concert with the Leidos Construction Manager. The Leidos Construction Manager will be supported by the Subcontractor Construction Manager and technical staff (engineers, scientists, and technicians) as necessary.

All vendors supplying materials used for site restoration and storm water control will supply materials from manufacturing facilities with established QC programs. Results of the manufacturer QC procedures will be submitted to the Leidos QA/QC Officer for review, evaluation, and documentation prior to beginning field activities.

10.2 PERSONNEL QUALIFICATIONS

All QA/QC personnel will be properly trained for their job function. The Leidos Construction Manager is key to the inspection and certification program. The Leidos Construction Manager will have demonstrated knowledge of specific construction practices relating to earthwork, regulations and specifications, observation and testing procedures, and documentation procedures. The Leidos Construction Manager will also be experienced in performing similar duties on previous jobs where comparable construction activities took place.

10.3 DAILY PLANNING BRIEFINGS

At the start of the project, the Subcontractor will participate in a pre-work briefing on objectives, health and safety, proposed deviations, and project schedule with the Leidos Construction Manager.

In addition to daily tailgate briefings conducted in accordance with the SSHP, all on-site personnel will participate in daily planning briefings led by the Subcontractor Construction Manager to determine the plan of action for the work day. This briefing will, at a minimum, include the following:

- A discussion of the planned activities for the work day;
- Planned area of excavation;
- Weather considerations;
- Deliveries;
- Transportation schedule;
- Schedule forecast; and
- Issues which would result in an impact to the project.

The USACE COR and ARNG/OHARNG Representative, or authorized designees are invited to attend the pre-work briefing and any daily safety or planning briefings.

10.4 INSPECTION ACTIVITIES

Inspections will be completed to verify acceptability of materials, prevent spills, and assess effectiveness of storm water and dust generation controls. The scope and frequency of each type of inspection is described below.

10.4.1 Spill Control

The Leidos Construction Manager will conduct daily inspections to verify spill equipment is maintained and no spills have occurred. The Leidos Construction Manager will be notified if any visual or olfactory indicators of equipment leaks or spills are encountered during soil removal activities. The Subcontractor will provide all necessary on-site spill equipment (e.g., granulated clay, absorbent blankets, PPE, shovels, containers). All on-site workers will maintain good housekeeping

practices (as discussed in Section 5.4). Spills will be responded to as presented in Section 13.1.2 of the FWSHP and the Camp Ravenna Spill Contingency Plan. In the event of a spill or leak, the employee making the discovery will immediately notify the Subcontractor SSHO and Leidos Construction Manager. These spills can include, but are not limited to, releases of fuels, lubricants, and hydraulic fluids.

The Leidos Construction Manager will ensure the spill is reported to the OHARNG. The Leidos Construction Manager will notify Camp Ravenna Range Control and ensure the incident is documented on a Camp Ravenna Spill Incident Reporting Form (Attachment A).

10.4.2 Storm Water Controls

Prior to construction activities, the Subcontractor will install and inspect all storm water controls (including the collection system for any excavation water encountered) and document proper placement in accordance with the requirements of this RD, and associated drawings (Attachment D) and specifications. Any water (e.g., storm water) in contact with an open excavation will be collected, containerized, sampled, characterized, and managed by the Subcontractor.

All employees will practice due diligence to prevent any damage to the storm water control measures. The Subcontractor will conduct routine walkovers during normal operations to evaluate the integrity of the storm water controls. Any deficiencies will be immediately corrected and documented in the daily report. Storm water controls will be inspected by the Subcontractor on a daily basis. After remedial activities are completed, storm water controls will be inspected once per week, within 24 hours of a storm event (0.5 inches or greater), and at least every 24 hours during extended rain events.

10.4.3 Dust Control

Dust generation activities may occur during excavation, material handling, and equipment movement on paved and unpaved roads. The Subcontractor will minimize dust generation by keeping vehicles on improved roads, limiting speeds to 10 mph maximum on access roads, and applying water for dust suppression purposes as required. Water used for dust control will be clean (e.g., obtained from off-site sources with approval of the Leidos Construction Manager and U.S. Army Representative). Engineering controls will be implemented to minimize the potential for dust generation. The Subcontractor SSHO will conduct daily inspections during representatively normal operating conditions as described in Section 5.3 and the SSHP (separate addendum to this RD).

10.4.4 Survey

Upon completing excavation and disposal activities, the excavation areas at the Building 1200 and Anchor Test Area AOCs will be surveyed to document the vertical and horizontal extents of the removal activities. The survey of excavation extents will be included as as-built drawings in the Remedial Action Report (Section 10.7.2). The horizontal and vertical survey tolerance will be ±0.1 ft. The excavation coordinates are in Ohio State North American Datum 83 ft.

10.4.5 Site Restoration

Once excavation activities have been completed and approved by the Leidos Construction Manager, excavations will be backfilled and graded to match adjacent contours in conjunction with the ARNG/OHARNG Representative and Ohio EPA. The Subcontractor Construction Manager will submit characterization data for materials to be brought on the project site (e.g., backfill, topsoil) a minimum of seven days prior to placing materials. The Leidos Construction Manager will review material certifications for the backfill material, vegetative cover, and seed in accordance with Section 8.0 and Attachment D, Drawings C-3 and C-4. The Subcontractor Construction Manager will obtain and apply the seeding mixture as prescribed within Section 8.4.

10.5 SPILL RESPONSE

Spills will be responded to as presented in the Camp Ravenna Spill Contingency Plan. In the event of a spill or leak, the employee making the discovery will immediately notify the Subcontractor SSHO and Leidos Construction Manager. These spills can include, but are not limited to, releases of fuels, lubricants, and hydraulic fluids. The Leidos Construction Manager will inform OHARNG Range Control of all spills. The on-site spill kit will be utilized to clean up the spill or outside resources will be utilized in the event of a large or reportable quantity spill.

10.6 CONFIRMATION REQUIREMENTS

10.6.1 Confirmation Sampling

Confirmation sampling will be performed in accordance with Section 7.0 of this RD and the FWSAP (USACE 2011a) to demonstrate achievement of the CUGs. Confirmation samples from the Building 1200 AOC will be analyzed for manganese, and confirmation samples from Anchor Test Area will be analyzed for arsenic. Analyses will be conducted by an approved off-site analytical laboratory.

10.6.2 Verification of Achievement of Performance Criteria

The Leidos Construction Manager will confirm the confirmation sample results meet the CUGs. The USACE COR and ARNG/OHARNG Representative will be notified of the evaluations and results. If any sample does not meet the CUGs, the evaluation will include a description of the additional excavation based on the approach described in Section 7.4. Confirmation sampling results will be included in the Remedial Action Report (Section 10.7.2).

10.7 Documentation

10.7.1 Field Documentation

This project will include daily inspection and quality summary reports, which will be signed and dated by the Leidos Construction Manager, or designee.

The daily reports may include:

- Summary of activities performed at the project site;
- Daily Subcontractor inspection activities (e.g., storm water controls, spill-control barriers, equipment staging/fueling areas);
- Weather information;
- Deviations from the approved RD;
- Problems encountered during field activities;
- Subcontractor submittals; and/or
- Subcontractor certifications (e.g., health and safety records).

Copies of the construction activity forms, checklists, and daily quality summary reports are included in Attachment A.

10.7.2 Remedial Action Report

Upon completion of remedial activities, a Remedial Action Report will be prepared by Leidos. The Remedial Action Report will document:

- Activities conducted to implement the remedial action;
- The project was performed in accordance with this RD (i.e., complied with requirements, technical specifications, construction drawings, and other relevant contract documents), and all applicable regulations, including surface water and air regulations;
- Any approved field variances from this RD (e.g., unforeseen site condition, change in material);
- Corrective actions; and
- Achievement of CUGs.

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