

Draft

**Remedial Design
for the
RVAAP-12 Load Line 12**

**Ravenna Army Ammunition Plant
Ravenna, Ohio**

July 13, 2009

**GSA Contract No. GS-10F-0076J
Delivery Order No. W912QR-05-F-0033**

Prepared for:



**US Army Corps
of Engineers®**

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

Prepared by:



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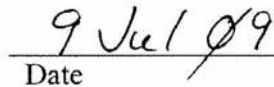
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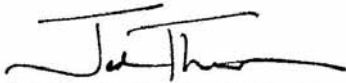
Science Applications International Corporation (SAIC) has completed the Draft Remedial Design for the RVAAP-12 Load Line 12 at the Ravenna Army Ammunition Plant, Ravenna, Ohio. Notice is hereby given that an independent technical review has been conducted that is appropriate to the level of risk and 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 USACE policy.



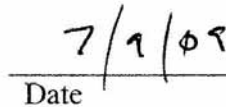
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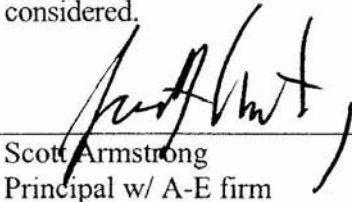


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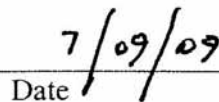
Significant concerns and the explanation of the resolution are as follows:

Internal SAIC Independent Technical Review comments are recorded on a Document Review Record per SAIC quality assurance procedure QAAP 3.1. This Document Review Record is maintained in the project file. Changes to the report addressing the comments have been verified by the Study/Design Team Leader.

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



Scott Armstrong
Principal w/ A-E firm



Date

Draft
Remedial Design for the
RVAAP-12 Load Line 12
Volume One - Main Report and Attachments
Version 1.0

Ravenna Army Ammunition Plant
Ravenna, Ohio

GSA Contract No. GS-10F-0076J
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Prepared for:
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July 13, 2009

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ACRONYMS AND ABBREVIATIONS

AASHTO	American Association of State Highway and Transportation Officials
AOC	Area of Concern
APE	Area of Potential Effect
ARAR	Applicable and Relevant or Appropriate Requirements
BGS	Below Ground Surface
BMP	Best Management Practice
Camp Ravenna	Camp Ravenna Joint Military Training Center
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
<i>CFR</i>	<i>Code of Federal Regulations</i>
COC	Constituent of Concern
COR	Contracting Officer's Representative
CQAP	Construction Quality Assurance Plan
DFFO	Director's Final Findings and Orders
DoD	U.S. Department of Defense
DOT	U.S. Department of Transportation
EPC	Exposure Point Concentration
FS	Feasibility Study
FSA	Field Staging Area
FWSHP	Facility-Wide Safety and Health Plan
GSA	U.S. General Services Administration
ICRMP	Integrated Cultural Resources Management Plan
IDW	Investigation-Derived Waste
INRMP	Integrated Natural Resources Management Plan
IRP	Installation Restoration Program
LL12	Load Line 12
LUC	Land Use Control
MEC	Munitions and Explosives of Concern
mg/kg	milligrams per kilogram
MI	Multi-Increment
mph	miles per hour
NCR	Non-Conformance Report
NELAC	National Environmental Laboratory Accreditation Conference
NFA	No Further Action
NGB	National Guard Bureau
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NW	Nationwide
OAC	Ohio Administrative Code
OHARNG	Ohio Army National Guard
Ohio EPA	Ohio Environmental Protection Agency
OHPO	Ohio Historic Preservation Office

ACRONYMS AND ABBREVIATIONS (CONTINUED)

ORAM	Ohio Rapid Assessment Method
OSHA	Occupational Safety and Health Administration
PAH	Polycyclic Aromatic Hydrocarbon
PBC	Performance Based Contract
PCB	Polychlorinated Biphenyl
PP	Proposed Plan
PPE	Personal Protective Equipment
QAPP	Quality Assurance Protection Plan
QA/QC	Quality Assurance/Quality Control
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RI	Remedial Investigation
ROD	Record of Decision
RRSE	Relative Risk Site Evaluation
RVAAP	Ravenna Army Ammunition Plant
SAIC	Science Applications International Corporation
SAP	Sampling and Analysis Plan
SSHO	Site Safety and Health Officer
SSHPP	Site Safety and Health Plan
SVOC	Semi-Volatile Organic Compound
SWP3	Storm Water Pollution Prevention Plan
TCLP	Toxicity Characteristic Leaching Procedure
TSD	Treatment, Storage, or Disposal
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USACHPPM	U.S. Army Center for Health Promotion and Preventative Medicine
UXO	Unexploded Ordinance
VOC	Volatile Organic Compound

1.0 INTRODUCTION

Science Applications International Corporation (SAIC) has been contracted by the U.S. Army Corps of Engineers (USACE), Louisville District, to provide environmental services in support of six (6) high priority areas of concern (AOCs) at the Ravenna Army Ammunition Plant (RVAAP) in Ravenna, Ohio. This Remedial Design (RD) describes the implementation process for the selected remedy at Load Line 12 (LL12) as stated in the *Record of Decision for Soil and Dry Sediment at Load Line 12 at the Ravenna Army Ammunition Plant, Ravenna, Ohio* (USACE 2009).

This work is being performed under a Performance-Based Contract (PBC) in accordance with U.S. General Services Administration (GSA) Environmental Advisory Services Contract GS-10-F-0076J. 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 (DFFO) dated June 10, 2004 (Ohio EPA 2004).

1.1 PURPOSE

The purpose of this RD is to detail implementation of the selected remedial action alternative specified in the *Record of Decision for Soil and Dry Sediment at the Load Line 12 (RVAAP-12) at the Ravenna Army Ammunition Plant, Ravenna, Ohio* (USACE 2009). This Record of Decision (ROD) specifies what is required to be addressed to remove chemical contamination in soil and dry sediment at LL12 that exceed cleanup goals for the most reasonably anticipated land use (National Guard Trainee and the Resident Subsistence Farmer). Dry sediment at LL12 in the Main Ditch was the only area requiring remediation for soil and dry sediment at LL12 to achieve goals for the anticipated land use. Therefore, the media addressed throughout this RD will be referred to as dry sediment.

Specific elements of the remedial action described in this RD are as follows:

- Excavate contaminated dry sediment at LL12;
- Transportation and disposal of contaminated dry sediment;
- Confirm risk-based cleanup goals for dry sediment have been attained;
- Restore excavated areas to neighboring or original contours and conditions; and
- Implement post-remedial action land use controls (LUCs).

1.2 SCOPE

The overall program goal of the Installation Restoration Program (IRP) is to clean up previously contaminated land at RVAAP to an acceptable level of risk as resources and mission requirements allow. LL12 is an AOC at RVAAP. This RD addresses chemical contamination in dry sediment at this AOC. Once the remedial action objectives and cleanup goals are met during the implementation of this RD, soil and dry sediment will be considered protective for the National Guard Trainee. This remedial design does not address other potentially-contaminated media.

1 Dry sediment is considered unconsolidated inorganic and organic material on the surface of the
2 ground that occasionally may be covered with water, usually following a precipitation event. Dry
3 sediment does not function as permanent habitat for aquatic organisms although it may serve as a
4 natural medium for the growth of terrestrial organisms. Dry sediment is essentially soil that due to its
5 location may be covered with water occasionally. The selected remedy is consistent with the stated
6 future action(s) to be performed at RVAAP.

7
8 The scope of this RD is to present a plan to excavate and dispose dry sediment containing
9 contaminant concentrations exceeding cleanup goals as specified in the ROD for LL12. The
10 estimated removal quantity presented in the ROD was 1,161 cubic yards. Since the development and
11 approval of the ROD, a high resolution land survey and sampling were performed in the Main Ditch.
12 This survey, sampling, and subsequent volume modeling resulted in an estimated volume requiring
13 removal of 706 cubic yards. Table 1-1 summarizes the most recent estimated quantities of dry
14 sediment that will be removed for LL12.

15
16 **Table 1-1. Estimated Removal Quantity for Dry Sediment**

Area of Concern	Volume		Mass
	(ft ³)	(yd ³)	(tons)
Load Line 12	19,062	706	1,130

17
18 Confirmation sampling will be conducted to ensure removal of all contaminated dry sediment
19 exceeding remedial cleanup goals. If a confirmation sample exceeds cleanup goals, additional dry
20 sediment will be excavated and the excavation area will be re-sampled. This process will continue
21 until cleanup goals are attained. Excavated areas will be restored in accordance with this RD.

22
23 Remedial activities will be implemented by USACE/SAIC and its subcontractors. SAIC (under
24 contract with the USACE) is responsible for the excavation, characterization, and disposal of
25 contaminated dry sediment. Implementation of these activities will meet the requirements of the
26 Facility-Wide Sampling and Analysis Plan (SAP) (USACE 2001a), the Facility-Wide Safety and
27 Health Plan (FWSHP) (USACE 2001b), and this RD.

28 29 **1.3 FACILITY DESCRIPTION**

30
31 When the RVAAP IRP began in 1989, RVAAP was identified as a 21,419-acre installation. The
32 property boundary was resurveyed by Ohio Army National Guard (OHARNG) over a 2-year period
33 (2002 and 2003) and the total acreage of the property was found to be 21,683.289 acres. As of
34 February 2006, a total of 20,403 acres of the former 21,683-acre RVAAP has been transferred to the
35 National Guard Bureau (NGB) and subsequently licensed to OHARNG for use as a military training
36 site.

37
38 The current RVAAP consists of 1,280 acres scattered throughout the OHARNG Camp Ravenna Joint
39 Military Training Center (Camp Ravenna). Camp Ravenna is in northeastern Ohio within Portage
40 and Trumbull Counties, approximately 4.8 km (3 miles) east-northeast of the City of Ravenna and

1 approximately 1.6 km (1 mile) northwest of the City of Newton Falls. The RVAAP portions of the
2 property are solely located within Portage County. RVAAP/Camp Ravenna is a parcel of property
3 approximately 17.7 km (11 miles) long and 5.6 km (3.5 miles) wide bounded by State Route 5, the
4 Michael J. Kirwan Reservoir, and the CSX System Railroad on the south; Garret, McCormick, and
5 Berry roads on the west; the Norfolk Southern Railroad on the north; and State Route 534 on the east
6 (Figures 1-1 and 1-2). Camp Ravenna is surrounded by several communities: Windham on the north;
7 Garrettsville 9.6 km (6 miles) to the northwest; Newton Falls 1.6 km (1 mile) to the southeast;
8 Charlestown to the southwest; and Wayland 4.8 km (3 miles) to the south.

9
10 When RVAAP was operational, Camp Ravenna did not exist and the entire 21,683-acre parcel was a
11 government-owned, contractor-operated industrial facility. The RVAAP IRP encompasses
12 investigation and cleanup of past activities over the entire 21,683 acres of the former RVAAP.
13 References to RVAAP in this document are considered to be inclusive of the historical extent of
14 RVAAP, which is inclusive of the combined acreages of the current Camp Ravenna and RVAAP,
15 unless otherwise specifically stated.

16 17 **1.4 LOAD LINE 12 DESCRIPTION AND HISTORY**

18
19 LL12 covers about 80 acres in the southeastern portion of RVAAP. Elevations across LL12 range
20 from approximately 970 to 987 ft. Silty to clayey soil and glacial sediments overlie shale bedrock at
21 LL12, except where disturbed by RVAAP activities. The majority of LL12 was re-graded and soil
22 was disturbed during demolition activities that occurred between 1998 and 2000. Soil in the former
23 production areas contains a mix of sandy fill, sand, ballast material, slag, and residual debris (e.g.,
24 metal, brick, and concrete). At LL12, the Main Ditch that bisects the central part of the AOC flows to
25 the north, into drainage ditches north of the AOC. The Main Ditch is heavily wooded. A stream
26 traverses LL12 from west to east and intercepts the Main Ditch near the northern boundary of the
27 AOC. Ultimately the drainage flows into the Cobbs Pond complex (Upper/Lower Cobbs Pond)
28 several hundred yards to the north of LL12. However, in recent years a beaver colony has
29 constructed dams north of LL12. These structures have prevented surface water drainage from the
30 AOC. As a result of these dams, stagnant water often resides within the Main Ditch and Active Area
31 Channel. Site features are presented in Figure 1-3 of the RD.

32
33 LL12 was originally known as the Ammonium Nitrate Plant and started operations on November 25,
34 1941. Structures related to the production of the ammonium nitrate were the Neutral Liquor Building
35 (Building FF-19) and seven evaporation/crystallization units (Buildings 900, 901, 902, 903, 904, 905,
36 and 906). Other structures, such as Water Works No. 2 and Power House No. 3 (Building FE-17),
37 housed support operations. The western half of the LL12 contained former production areas. The
38 eastern half was previously cleared, but did not contain any known production facilities. The
39 Remedial Investigations (RIs) also identified an area immediately north of the LL12 (informally
40 termed the Team Track Area) that was apparently used for offloading and staging of materials used in
41 LL12 production activities.

1 In May 1943, production of ammonium nitrate was terminated. From 1946 to 1950, a private
2 contractor leased LL12 to produce fertilizer-grade ammonium nitrate. From 1965 to 1967, a private
3 contractor leased Building FF-19 for the production of aluminum chloride. The U.S. Army terminated
4 the lease early due to environmental concerns related to air emissions and wastewater discharges to
5 Cobbs Ponds.

6
7 In June 1944, Buildings 900, 904, and 905 were converted for demilitarization of munitions. Rinsate
8 from demilitarization operations was initially allowed to flow out of the buildings and directly onto
9 the ground or to drainage ditches. In 1981, the LL12 Pink Water Treatment Plant was built to treat the
10 demilitarization effluent prior to discharge. After the termination of demilitarization operations, the
11 treatment plant was used under a National Pollutant Discharge Elimination System (NPDES) permit
12 to treat explosives-tainted storm water from LL12 and other RVAAP locations.

13
14 Currently, there are no above-grade structures remaining at the LL12. Demolition of Buildings 901,
15 902, 906, and FF-19 took place between 1973 and 1975. Building FN-54 (bagging and shipping
16 facility) was demolished in the 1980s. In 1999, approximately 1,500 ft³ of soil was removed from
17 four pits near Building 904 and taken to a former warehouse at Load Line 4 as part of an explosives
18 composting pilot study. Demolition of all remaining structures took place between 1998 and 2000. A
19 former blast berm near Building 903 was removed and used as fill/groundcover for areas around
20 Buildings 903 and FE-17.

21 22 **1.5 ANTICIPATED FUTURE LAND USE**

23
24 The U.S. Army intends to transfer LL12 to the NGB once remedial actions are complete. The NGB
25 will subsequently license the land to OHARNG for military training use. OHARNG has established
26 the future land use (mounted training, no digging) for LL12 based on anticipated training mission and
27 utilization of Camp Ravenna. This land use includes operation of wheeled and tracked vehicles.

28 29 **1.6 PREVIOUS ACTIVITIES**

30 31 **1.6.1 Relative Risk Site Evaluation**

32
33 A relative risk site evaluation (RRSE) was performed by the U.S. Army Center for Health Promotion
34 and Preventative Medicine (USACHPPM). The results of the RRSE (USACHPPM 1996) provided
35 the U.S. Army with qualitative and quantitative data to score sites, which provided the U.S. Army
36 with a basis for prioritizing cleanups and allocating funds. The scores can be “High,” “Medium,” or
37 “Low.” The evaluation gave LL12 a final score of “High.” Re-evaluation of the LL12 risk ranking
38 performed at the completion of the Phase I RI resulted in the AOC retaining its “High Risk” rating
39 (USACE 1998).

1 **1.6.2 Phase I/Phase II Remedial Investigations**

2
3 The Phase I RI for LL12 (USACE 1998) included sampling and analysis of surface soil (0-1 ft below
4 ground surface [BGS]), ditch sediment, and sediment from the Building 904 settling basin. The
5 Phase I RI results indicated concentrations of explosives, inorganics, and organic compounds
6 occurring in soil and dry sediment throughout the production area above risk-based screening values.

7 The Phase II RI for LL12 (USACE 2006) characterized the nature and extent of contamination
8 surface soil (0 to 1 ft BGS), subsurface soil (1 to 7 ft BGS), sediment, surface water, and
9 groundwater, and assessed the potential risk to human health and the environment resulting from
10 former operations at LL12. Arsenic was identified as a constituent of concern (COC) in dry sediment
11 for the National Guard Trainee at LL12. Calculated risk from this metal is primarily associated with
12 the very high dust loading factor and inhalation rate assumed for the National Guard Trainee.

13
14 Additional groundwater characterization was conducted in 2004 and was summarized in the *Phase II*
15 *Remedial Investigation Supplemental Report for Load Line 12* (USACE 2005).

16
17 **1.6.3 Feasibility Study**

18
19 Preliminary cleanup goals for soil and dry sediment were developed in the LL12 Feasibility Study
20 (FS) (USACE 2006) to support the remedial alternative selection process for dry sediment
21 remediation at LL12. A summary of the preliminary cleanup goals for the COCs identified for
22 evaluation is provided below in Table 1-2.

23
24 **Table 1-2. Feasibility Study Preliminary Cleanup Goal for Load Line 12 Soil and Dry Sediment**
25 **(National Guard Trainee)**

COC^{a,b}	Target Risk	Clean-up Goal (mg/kg)
Arsenic	1E-05	31

26 ^aSediment from the Main Ditch aggregate.

27 ^bTotal carcinogenic risk to a National Guard Trainee from contaminants in the Main Ditch was calculated as 1.8E-05. The
28 chemical hazard index was 0.23 (less than 1) indicating no unacceptable hazard.

29 COC – Chemical of concern.

30
31 Remedial alternatives were evaluated for contaminated dry sediment at LL12. The remedial
32 alternatives were selected by combining general response actions, technology types, and process
33 options retained from the screening processes described in the previous section. Remedial alternatives
34 assured adequate protection of human health and the environment, achieved Remedial Action
35 Objectives (RAOs), met Applicable and Relevant or Appropriate Requirements (ARARs), and
36 permanently and significantly reduced the volume, toxicity, and/or mobility of COCs.

37
38 The recommended alternative for LL12, as presented in the FS, was Excavation of Dry Sediment with
39 Offsite Disposal ~ National Guard Trainee Land Use. This alternative removes dry sediment from the
40 Main Ditch at LL12 that exceeds preliminary cleanup goals for the anticipated future land use
41 (National Guard Trainee). Figure 1-3 presents features of LL12, along with the FS modeled extents

1 of contamination in the Main Ditch, where it was anticipated that the extents of the dry sediment in
2 the Main Ditch will be excavated to 1 ft BGS to achieve the remedial cleanup goals.

3 4 **1.6.4 Community Involvement and Regulatory Approval**

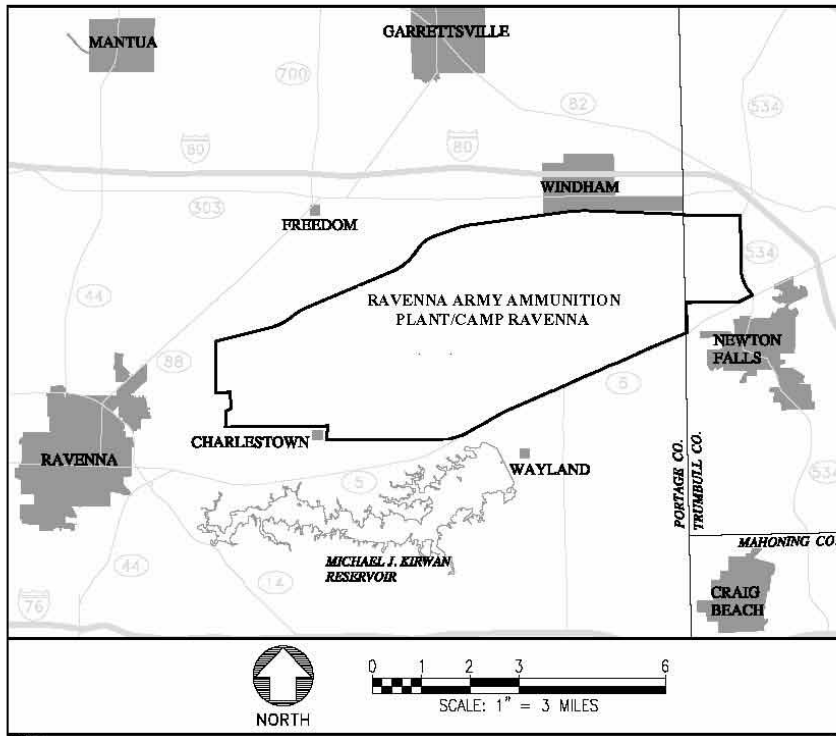
5
6 The *Proposed Plan for Soil and Dry Sediment at the Load Line 12 (RVAAP-12) at the Ravenna Army*
7 *Ammunition Plant* (USACE 2007) was presented to the public on April 4, 2007. A 30-day public
8 comment period was conducted until May 3, 2007. A public meeting was held presenting the
9 recommended alternative on April 10, 2007 in Newton Falls, Ohio. Comments were collected and
10 incorporated into a ROD.

11
12 The LL12 ROD (USACE 2009) documented the selected remedial action alternative to excavate and
13 dispose of dry sediment from the Main Ditch until the remedial action cleanup goal (presented in
14 Section 3 of this RD) was achieved. The ROD includes a Responsiveness Summary addressing
15 public comments received during the public comment period and public meeting.

16 17 **1.7 REMEDIAL DESIGN ORGANIZATION**

18
19 This RD is comprised of a work plan, design drawings, and specifications. The work plan is
20 organized as follows:

- 21
- 22 • Section 2: presents the project organization and coordination;
 - 23 • Section 3: outlines the remedial action objectives and cleanup goals;
 - 24 • Section 4: describes the dry sediment characterization sampling;
 - 25 • Section 5: discusses construction mobilization and site preparation;
 - 26 • Section 6: describes dry sediment remedial activities;
 - 27 • Section 7: presents the confirmation sampling procedure;
 - 28 • Section 8: summarizes site restoration activities;
 - 29 • Section 9: discusses waste characterization and disposal activities;
 - 30 • Section 10: presents the Construction Quality Assurance Plan (CQAP);
 - 31 • Section 11: discusses the post remedial action land use controls;
 - 32 • Section 12: summarizes the reporting requirements and project schedule; and
 - 33 • Section 13: lists the references used in the document.
 - 34 • Attachments:
 - 35 A. Site-Specific Health and Safety Plan (SSHP)
 - 36 B. Storm Water Pollution Prevention Plan (SWP3)
 - 37 C. Design Drawings
 - 38 D. Construction Forms and Checklists
 - 39 E. Land Use Controls for Soil and Dry Sediment at the RVAAP-12 Load Line 12

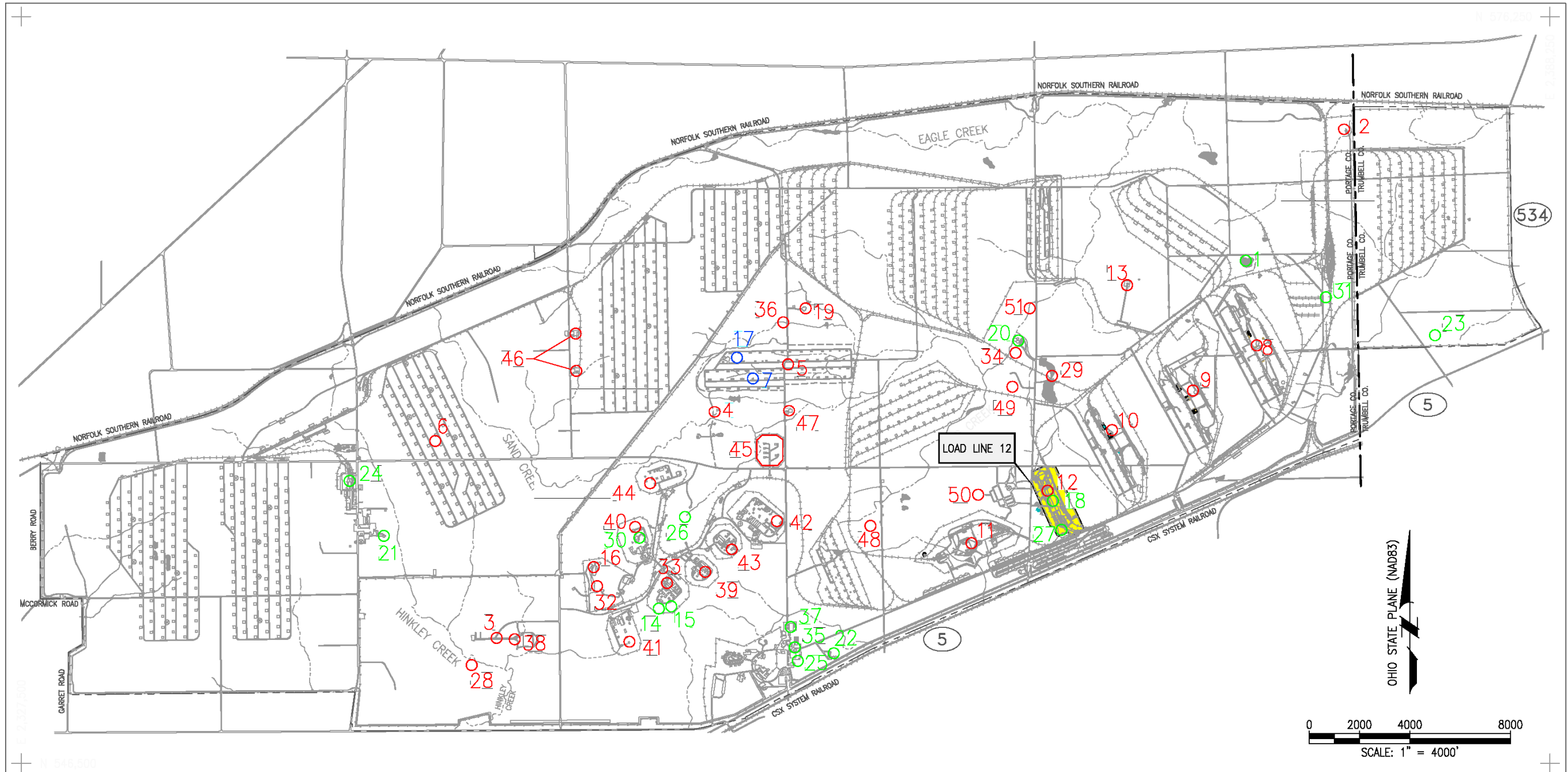


1
2

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

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LEGEND:

1..... RAMSDALL QUARRY LANDFILL	13..... BUILDING 1200 AND DILUTION/SETTLING POND	25..... BUILDING 1034 MOTOR POOL WASTE OIL TANK	37..... PESTICIDE STORAGE BUILDING T-4452	49..... CENTRAL BURN PITS
2..... ERIE BURNING GROUNDS	14..... LOAD LINE 6, EVAPORATION UNIT	26..... FUZE BOOSTER AREA SETTLING TANKS	38..... NACA TEST AREA	50..... ATLAS SCRAP YARD
3..... DEMOLITIONS AREA #1	15..... LOAD LINE 6, TREATMENT PLANT	27..... BUILDING 854 PCB STORAGE	39..... LOAD LINE 5/FUZE LINE 1	51..... DUMP ALONG PARIS-WINDHAM ROAD
4..... OPEN DEMOLITIONS AREA #2	16..... FUZE AND BOOSTER QUARRY LANDFILL/PONDS	28..... MUSTARD AGENT BURIAL SITE	40..... LOAD LINE 7/BOOSTER LINE 1 CERCLA
5..... WINKLEPECK BURNING GROUNDS	17..... DEACTIVATION FURNACE	29..... UPPER AND LOWER COBB'S POND COMPLEX	41..... LOAD LINE 8/BOOSTER LINE 2 RCRA
6..... C BLOCK QUARRY	18..... LOAD LINE 12 PINK WASTEWATER TREATMENT	30..... LOAD LINE 7 PINK WASTEWATER TREATMENT PLANT	42..... LOAD LINE 9/DETONATOR LINE OTHER REGULATORY
7..... BUILDING 1601 HAZARDOUS WASTE STORAGE	19..... LANDFILL NORTH OF WINKLEPECK BURNING GROUND	31..... ORE PILE RETENTION POND	43..... LOAD LINE 10/PERCUSSION ELEMENT RAILROAD TRACKS
8..... LOAD LINE 1 AND DILUTION/SETTLING POND	20..... SAND CREEK SEWAGE TREATMENT PLANT	32..... 40- AND 60-MM FIRING RANGE	44..... LOAD LINE 11/ARTILLERY PRIMER FENCE LINE
9..... LOAD LINE 2 AND DILUTION/SETTLING POND	21..... DEPOT SEWAGE TREATMENT PLANT	33..... FIRESTONE TEST FACILITY	45..... WET STORAGE AREA PROPERTY BOUNDARY
10..... LOAD LINE 3 AND DILUTION/SETTLING POND	22..... GEORGE ROAD SEWAGE TREATMENT PLANT	34..... SAND CREEK DISPOSAL ROAD LANDFILL	46..... BUILDINGS F-15 AND F-16 STREAM OR CREEK
11..... LOAD LINE 4 AND DILUTION/SETTLING POND	23..... UNIT TRAINING SITE WASTE OIL TANK	35..... BUILDING 1037 LAUNDRY WASTEWATER SUMP	47..... BUILDING T-5301 DECONTAMINATION	
12..... LOAD LINE 12	24..... RESERVE UNIT MAINTENANCE AREA WASTE OIL TANK	36..... PISTOL RANGE	48..... ANCHOR TEST AREA	

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
 US Army Corps of Engineers
 Louisville District
LOUISVILLE, KENTUCKY

RAVENNA ARMY AMMUNITION PLANT/CAMP RAVENNA

DRAWN BY: P.H. / S.D. REV. NO./DATE: REV. 2 / 07-27-04 CAD FILE: /00064/DWGS/R73SITE2

Figure 1-2. RVAAP/Camp Ravenna Installation Map

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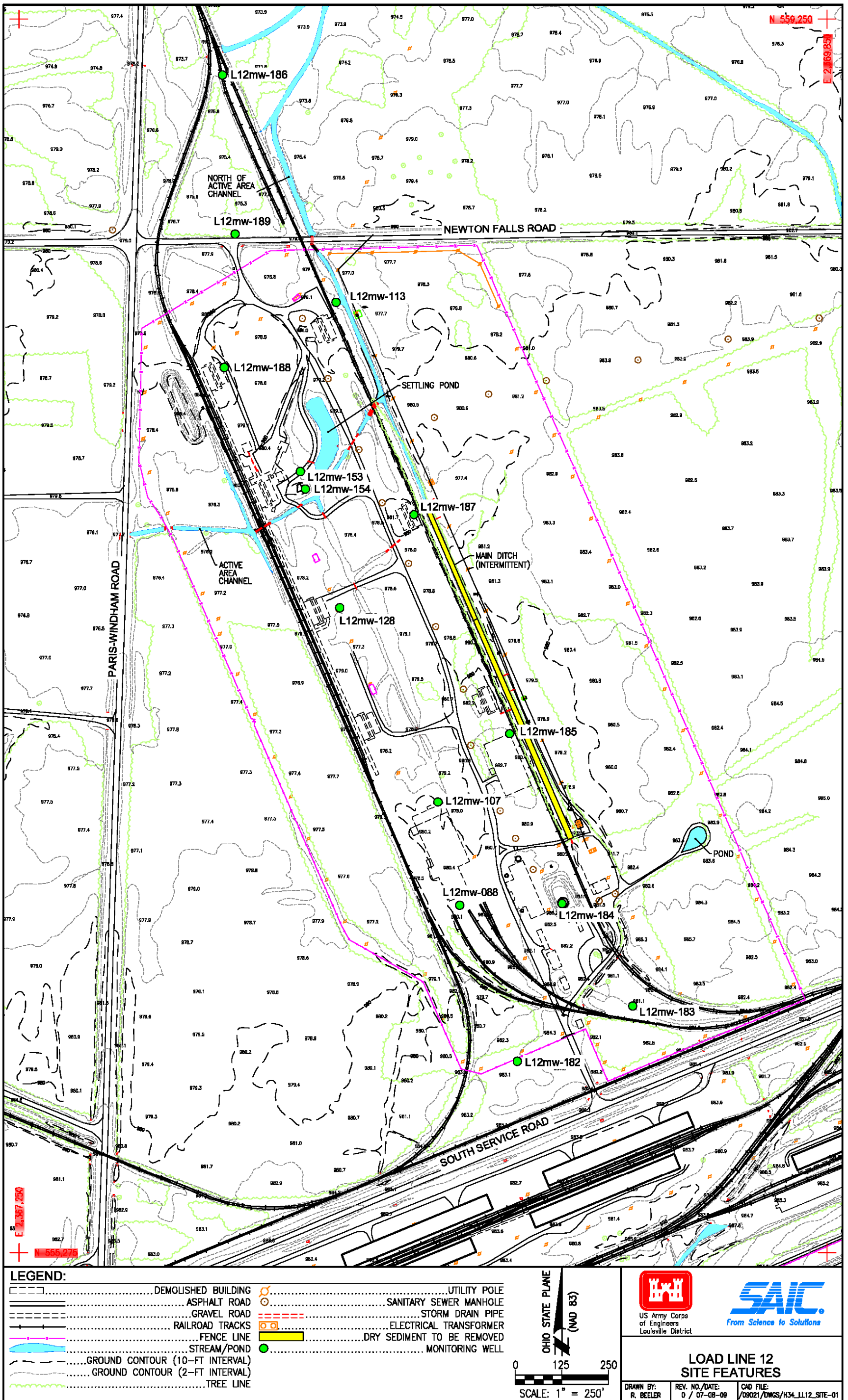


Figure 1-3. Features of Load Line 12

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2.0 PROJECT ORGANIZATION AND COORDINATION

This section presents the project organization and describes the project team coordination. This section also describes monthly reporting and participation in weekly contractor meetings at RVAAP by SAIC.

2.1 PROJECT ORGANIZATION

The U.S. Army is the lead agency for this remedial action and is responsible for its 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. SAIC is the primary contractor responsible for implementing this RD. SAIC will select and procure a qualified remedial subcontractor to excavate, transport, and dispose of contaminated dry sediment. An organizational chart for implementation of the RD is presented in Figure 2-1. Below is a summary of key personnel responsibilities.

2.1.1 USACE Contracting Officer's Representative

The USACE Contracting Officer's Representative (COR) duties include overseeing SAIC to ensure work is completed in accordance with the contract and this RD. The USACE COR also coordinates responses for any unexpected materials encountered.

2.1.2 RVAAP Facility Manager

The RVAAP Facility Manager is responsible to sign waste profiles, manifests, and necessary permits. The RVAAP Facility Manager will also assist in the coordination between SAIC and the RVAAP Operations and Maintenance Contractor (Vista Sciences Corporation).

2.1.3 Ohio EPA Project Coordinator

The Ohio EPA Project Coordinator will oversee the implementation of this RD and will verify all work completed by USACE or its agent (SAIC) meets regulatory requirements. The Ohio EPA Project Coordinator will be informed of project schedule and implementation deviations.

2.1.4 SAIC Project Manager

The SAIC Project Manager administers the management, implementation, and quality of this RD and remedial action. The Project Manager provides oversight to ensure all contractual requirements are properly satisfied. This individual ensures all project goals and objectives are met in a high-quality and timely manner. The Project Manager is responsible for tracking project schedule and informing the USACE COR and Ohio EPA Project Coordinator of any deviations to the project schedule. The Project Manager provides the Ohio EPA Project Coordinator: 1) notification of project

1 implementation, and 2) information regarding any quality assurance and non-conformance issues for
2 this remedial action.

3 4 **2.1.5 SAIC Technical Manager**

5
6 The SAIC Technical Manager manages the technical performance and quality of the remedial action.
7 The Technical Manager oversees the SAIC Construction Manager in meeting project goals and
8 objectives in a high quality and timely manner and reports to the SAIC Project Manager. In
9 coordination with the SAIC Construction Manager and the SAIC Quality Assurance/Quality Control
10 (QA/QC) Officer, the SAIC Technical Manager addresses issues including identification of non-
11 conformances and confirmation of achieving cleanup goals. Dependant upon the project complexity
12 and effort required, the SAIC Technical Manager and SAIC Construction Manager may be the same
13 person.

14 15 **2.1.6 SAIC Quality Assurance/Quality Control Officer**

16
17 The SAIC QA/QC Officer coordinates with the SAIC Construction Manager to ensure the
18 requirements of the RD CQAP and Facility-Wide Quality Assurance Protection Plan (QAPP) are
19 achieved and ensures inspections are performed in accordance with both plans.

20
21 The SAIC QA/QC Officer also provides quality control of sampling and sample handling (including
22 sample custody, field testing, and coordinating QA/QC of the laboratory), and ensures the required
23 submittals are on time and of high quality. The SAIC QA/QC Officer is responsible for reviewing
24 and approving variances during field activities before work continues; approving, evaluating, and
25 documenting the disposition of Non-Conformance Reports (NCR); and designing and supervising the
26 implementation of audit/surveillance plans. The SAIC QA/QC Officer reports directly to the SAIC
27 Project Manager and informs the SAIC Program Manager and SAIC Construction Manager of all
28 information and decisions reported.

29 30 **2.1.7 SAIC Health and Safety Manager**

31
32 The SAIC Health and Safety Manager establishes health and safety policies and procedures
33 supporting project and office activities, and verifies safe work practices and conditions. The SAIC
34 Health and Safety Manager ensures these policies are, at a minimum, in accordance with the Facility-
35 Wide SHP (USACE 2001b). The SAIC Health and Safety Manager reports directly to the SAIC
36 Project Manager and will inform the SAIC Technical Manager and SAIC Construction Manager of all
37 information and decisions reported.

38 39 **2.1.8 SAIC Construction Manager**

40
41 The SAIC Construction Manager, also serving the role as appropriate to the Field Operations
42 Manager as defined in Section 3.4 of the Facility-Wide SAP (USACE 2001a), is responsible for
43 project control and implementation of remedial activities in accordance with this RD. The SAIC

1 Construction Manager is responsible for subcontractor oversight, adherence to QA/QC field
2 procedures and the SSHP, coordination with RVAAP personnel and the USACE COR, management
3 of any investigation-derived wastes (IDW), field documentation, and preparation of field change
4 orders, if required. Should separate construction and technical management positions be necessary,
5 the SAIC Construction Manager will report directly to the SAIC Technical Manager.

6 7 **2.1.9 Subcontractor Construction Manager**

8
9 The Subcontractor Construction Manager implements specific contracted components of this RD.
10 The Subcontractor Construction Manager is responsible for the proper performance of specified
11 remedial activities in accordance with this RD, adherence to QA/QC field procedures and the CQAP,
12 implementation of the SSHP, coordination of field personnel activities, and field documentation. The
13 Subcontractor Construction Manager reports directly to the SAIC Construction Manager.

14 15 **2.1.10 Subcontractor Site Safety and Health Officer**

16
17 The Subcontractor Site Safety and Health Officer (SSHO) is responsible for implementation and
18 adherence of the SSHP. SSHO will verify and approve specified health and safety procedures
19 outlined in the SSHP adequately protect on-site personnel during field activities. SSHO will ensure
20 that health and safety procedure are modified to meet changing needs, if required. The SSHO will
21 ensure all on-site personnel (including visitors) strictly adhere to the SSHP throughout the field
22 activities conducted for the duration of the project. The SSHO reports to the Subcontractor
23 Construction Manager and the SAIC Construction Manager.

24 25 **2.1.11 MEC Avoidance Subcontractor**

26
27 Load Line 12 was designated as a No Further Action (NFA) AOC in the *Site Inspection Report for*
28 *Munitions Response Sites under the Military Munitions Response Program* (E2M 2008). However, a
29 Munitions and Explosives of Concern (MEC) Avoidance Subcontractor will be onsite during
30 remedial activities in the event MEC is encountered. The MEC Avoidance Subcontractor will be
31 responsible to ensure that MEC is either avoided or determine the appropriate measures for removal.
32 The USACE, Huntsville Support Center will review this RD to determine the qualifications and
33 number of unexploded ordnance (UXO)-qualified person(s) required on site to serve as the MEC
34 Avoidance Subcontractor. One certified UXO Technician II will be used; however, a safety backup
35 person must be available. The backup person does not have to be UXO-qualified.

36 37 **2.2 MONTHLY REPORTS**

38
39 A summary of field activities for this remedial action will be included in monthly reports issued per
40 the *Project Management Plan for the Six High Priority Areas of Concern* (SAIC 2005). The monthly
41 reports will include a status and summary of project activities.

1 **2.3 WEEKLY CONTRACTOR MEETING**

2
3 SAIC will participate in the RVAAP weekly coordination meetings from one week prior to and for
4 the duration of removal activities. The Subcontractor may participate in these meetings on an as-
5 needed basis. These weekly coordination meetings are typically held on Mondays in RVAAP
6 Building 1037.

7
8 **2.4 BI-WEEKLY SCHEDULE CALLS**

9
10 SAIC will participate in bi-weekly teleconferences with the Ohio EPA and the U.S. Army, per the
11 *Project Management Plan for the Six High Priority Areas of Concern* (SAIC 2005). SAIC will
12 communicate the progress of remedial actions at this meeting.

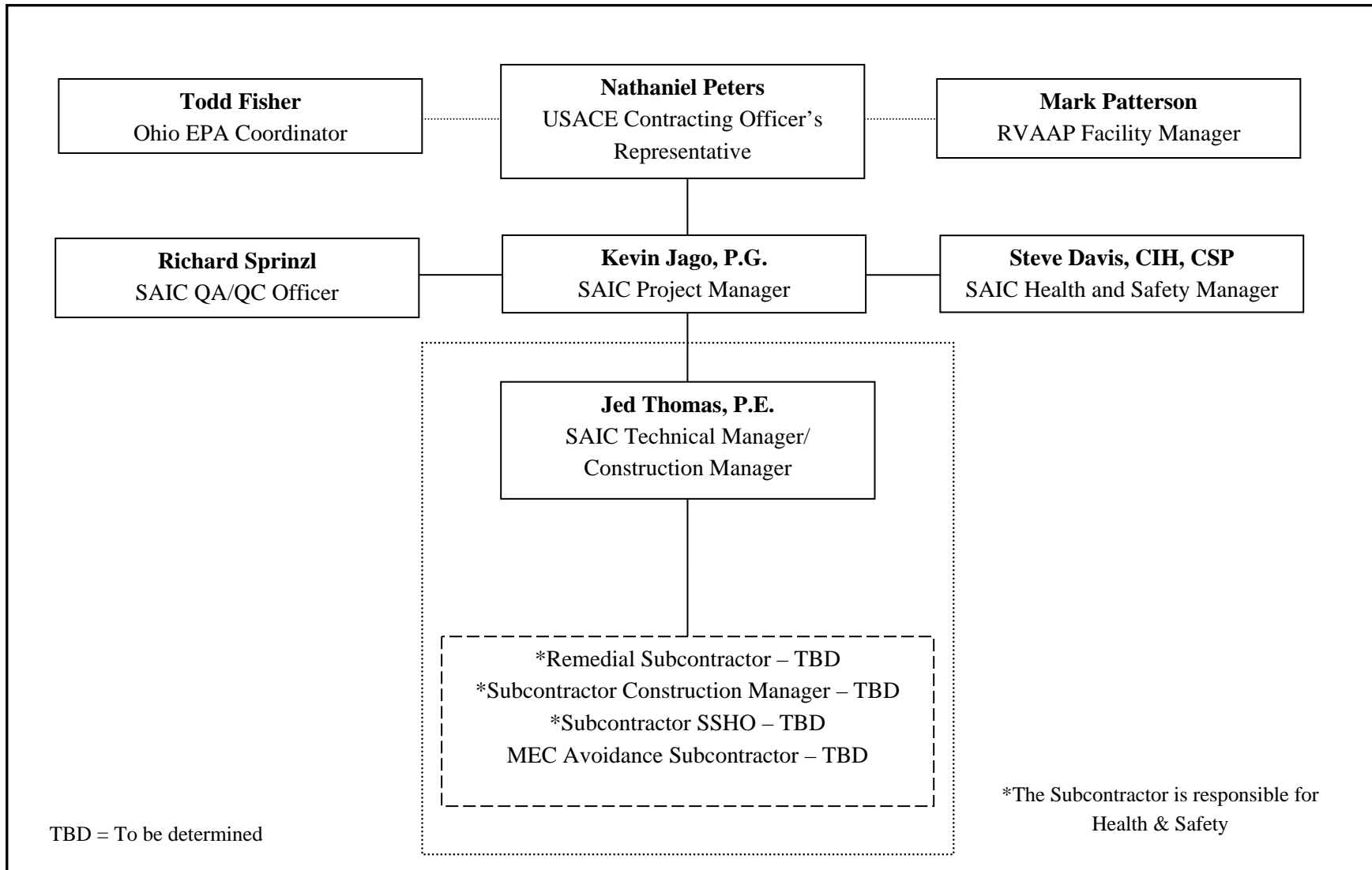


Figure 2-1. Organizational Chart for Implementation of the Remedial Design

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3.0 REMEDIAL ACTION OBJECTIVES AND CLEANUP GOALS

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

3.1 REMEDIAL ACTION OBJECTIVE

The RAO for LL12 is to prevent the National Guard Trainee from being exposed to contaminants in dry sediment that exceed the cleanup goals. The selected remedy will address dry sediment in the Main Ditch to a depth of 4 ft BGS given the potential disruption to soil and dry sediment to that depth under National Guard Trainee future land use. There are no soil COCs requiring remedial action to achieve the National Guard Trainee land use requirements.

3.2 REMEDIAL ACTION CLEANUP GOAL

The arsenic exposure point concentration (EPC) for dry sediment in the Main Ditch at LL12 is 410 mg/kg, which exceeds both the RVAAP Facility-Wide background value (20 mg/kg) and the cleanup goal for the National Guard Trainee (31 mg/kg). Based on the risk evaluation, dry sediment in the Main Ditch requires remediation. Table 3-1 presents the cleanup goal for LL12. Land use controls with respect to chemical contamination in soil and dry sediment will be required because the remedial action cleanup goal for the Resident Subsistence Farmer will not be achieved (Attachment E).

Table 3-1. COC and National Guard Trainee Cleanup Goal for Dry Sediment at LL12

COC ^{a, b}	Clean-up Goal (mg/kg)
Arsenic	31

^aDry sediment from the Main Ditch aggregate.

^bTotal carcinogenic risk to a National Guard Trainee from contaminants in the Main Ditch was calculated as 1E-05.

COC = Constituent of concern.

EPC = Exposure Point Concentration

mg/kg = milligrams per kilograms

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4.0 DRY SEDIMENT CHARACTERIZATION SAMPLING

On May 4, 2009, SAIC conducted dry sediment characterization sampling within the Main Ditch at LL12. The objectives of this characterization sampling included the following:

- 1.) Determine if dry sediment will be considered nonhazardous or hazardous waste; and
- 2.) Assist in estimating quantities of dry sediment requiring disposal to achieve cleanup goals as established in the ROD.

To accomplish these objectives, the Main Ditch (as modeled in the LL12 FS) was divided into four approximately equal segments [Multi-Increment (MI) Sample Areas]. These four MI Sample Areas are presented in Figure 4-1. The following sections describe the sampling methods, sampling results, and conclusions from this characterization sampling.

4.1 CHARACTERIZATION SAMPLE COLLECTION

SAIC field personnel collected characterization samples from four MI Sample Areas (L12-256M, L12-257M, L12-258M, and L12-259M) within the Main Ditch. One MI and one discrete sample were collected from each MI sample area for offsite laboratory analysis.

Procedures for sampling were presented in the *Technical Memorandum to Conduct Remedial Design Soil Sampling at RVAAP-01 Ramsdell Quarry Landfill, RVAAP-12 Load Line 12, and RVAAP-16 Fuze and Booster Quarry Landfill/Ponds* (issued to USACE, Ohio EPA, and OHARNG on April 1, 2009). The trowel/spoon method was used to collect dry sediment samples. The sampling was accomplished using disposable, sterilized plastic scoops. This instrument was used to manually dig into the subsurface material to the required depth designated for the sampling location (0 to 0.5 ft BGS for a sediment aggregate).

4.1.1 Multi-Increment Sampling for Characterization

An MI sample, a combined sample of multiple aliquots collected from random points, was collected from four MI Sample Areas (L12-256M, L12-257M, L12-258M, and L12-259M). Each MI Sample was analyzed for toxicity characteristic leaching procedure (TCLP) metals, TCLP semi-volatile organic compounds (SVOCs), TCLP Pesticides, TCLP Herbicides, Reactive Cyanide, Reactive Sulfide, and polychlorinated biphenyls (PCBs). In addition, each sample was analyzed for total arsenic, which was identified as the COC in dry sediment for the National Guard Trainee at LL12.

Each MI sample consisted of no less than 30 aliquot samples, which will provide a 95% statistical confidence level. Each aliquot sample was collected with a disposable, sterilized plastic scoop, and were of approximately equal volume. The aliquot samples were collected randomly from the surface of the MI Sample area.

1 All aliquot samples collected from each MI sample area were placed in a container for transport to a
 2 NELAC (National Environmental Laboratory Accreditation Conference) approved off-site laboratory.
 3 As part of the MI sample process, each MI sample was dried, sieved, finely ground by the off-site
 4 laboratory, and then analyzed for the specified constituent.

5
 6 **4.1.2 Discrete Sampling for Characterization**

7
 8 One discrete sample was collected from the middle of each MI Sample Area. The dry sediment was
 9 directly packed into a sample jar and sealed. These samples were analyzed for the TCLP Volatile
 10 Organic Compounds (VOCs). The discrete sample was collected in a manner to minimize
 11 volatilization during the sample collection process. This sample did not undergo the drying, sieving,
 12 and grounding prior to analysis.

13
 14 **4.1.3 Characterization Sample Identification**

15
 16 Specific sample identifying information that was used during the sampling effort is presented in Table
 17 4-1.

18
 19 **Table 4-1. Sample Identification for Waste Characterization Sampling**

Location	Sample ID	Arsenic, Total	TCLP ^a (VOCs)	TCLP (SVOCs, Metals, Pest, Herb)	Reactive Cyanide, Sulfide, and PCBs
L12-256M	L12sd-256M-0905-SD	1	0	1	1
L12-256M	L12sd-256-0906-SD	0	1	0	0
L12-257M	L12sd-257M-0907-SD	1	0	1	1
L12-257M	L12sd-257M-0907-FD	1	0	0	0
L12-257M	L12sd-257-0908-SD	0	1	0	0
L12-258M	L12sd-258M-0909-SD	1	0	1	1
L12-258M	L12sd-258-0910-SD	0	1	0	0
L12-259M	L12sd-259M-0911-SD	1	0	1	1
L12-259M	L12sd-259-0912-SD	0	1	0	0

20 Additional parameters (e.g., paint filter test) may be required by the waste disposal facility. The waste disposal
 21 facility has not been selected at the time of this design.

22 A field duplicate (FD) for L12-257M was collected and analyzed arsenic.

23 ^a Samples analyzed for VOCs will be collected as a discrete sample and will not undergo laboratory MI
 24 Processing (particle size reduction).

25 L12 = Load Line 12

26 Herb = Herbicides

27 MI = Multi-increment

28 PCB = polychlorinated biphenyl

29 Pest = Pesticides

30 SVOC = semivolatile organic compound

31 TCLP = toxicity characteristic leaching procedure

32 VOC = volatile organic compound

1 **4.2 CHARACTERIZATION SAMPLING RESULTS AND CONCLUSIONS**

2
3 A sample from each MI area was collected for the waste characterization analysis. The data for this
4 waste characterization analysis will not be provided in this RD, as this data is pertinent to the landfill
5 for classification purposes. A summary of the waste characterization data is below.

- 6
7 1.) All TCLP metals, VOCs, SVOCs, herbicides, cyanide, and sulfides were either
8 nondetectable, or below the reporting limits.
9 2.) PCB concentrations were nondetectable with the exception of Aroclor 1254. The detected
10 concentrations for Aroclor-1254 had a range of 0.042 – 0.270 mg/kg, which is below the
11 TSCA level of 25-50 mg/kg that would require re-classification of the waste.
12 3.) The pH of the dry sediment was between 5.2-6.8.

13
14 Based on these data, the excavated dry sediment within the Main Ditch at LL12 would be classified
15 as nonhazardous waste. The final classification of the dry sediment for disposal will be verified by the
16 licensed disposal facility and documented on the appropriate waste profile during the remedial action
17 procurement process.

18
19 Additionally, a MI sample from each of the four MI Sample Areas was analyzed for arsenic, as
20 arsenic is the COC for remediation specified in the ROD. Table 4-2 presents the results of these
21 samples.

22
23 **Table 4-2. Sample Results and Cleanup Goal Comparison**

Location	Sample ID	Arsenic Concentration (mg/kg)	Concentration Exceed Arsenic CUG of 31.0 mg/kg?
L12-256M	L12sd-256M-0905-SD	101	Yes
L12-257M	L12sd-257M-0907-SD	43.6	Yes
L12-257M	L12sd-257M-0907-FD	36.0	Yes
L12-258M	L12sd-258M-0909-SD	35.0	Yes
L12-259M	L12sd-259M-0911-SD	21.1	No

24 A field duplicate (FD) for L12-257M was collected and analyzed arsenic.

25 CUG = Cleanup Goal.

26 L12 = Load Line 12.

27
28 Below is a summary of these sampling results.

- 29
30 1.) The three southern MI areas within the Main Ditch (L12-256M, L12-257M, and L12-258M)
31 had concentrations exceeding the cleanup goal for arsenic in sediment. Arsenic
32 concentrations were progressively lower from the furthest upstream sample area (L12-256M),
33 adjacent to former Building FF-19, to sample area (L12-258M).
34 2.) The northernmost MI area (L12-259M) had an arsenic result below the cleanup goal. This is
35 also the furthest downstream location of the Main Ditch.

1 Based on this data, this RD will incorporate the removal and disposal of sediment in the three MI
2 areas exceeding the cleanup goal for arsenic (L12-256M, L12-257M, and L12-258M). The MI area
3 below the cleanup goal for arsenic (L12-259M) will not require further investigation or remediation
4 for dry sediment.

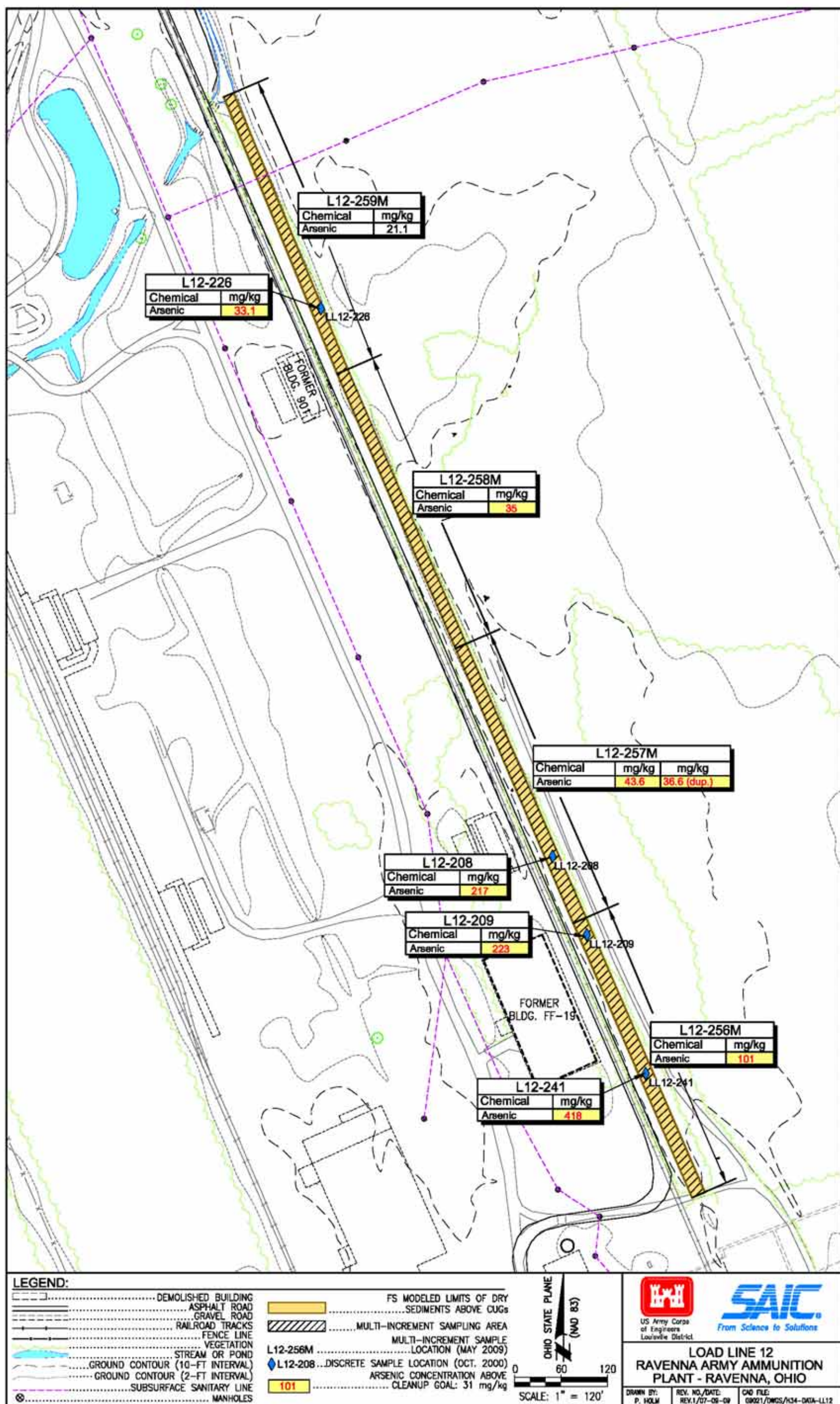


Figure 4-1. Load Line 12 Characterization Sample Locations and Results

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1 **5.0 CONSTRUCTION MOBILIZATION**

2
3 This section describes construction mobilization and site preparation activities required to implement
4 this RD. Design drawings (Attachment C) detailing remedial action requirements are referenced as
5 appropriate throughout this section.
6

7 The Subcontractor will prepare an addendum to the SSHP (Attachment A) in accordance with
8 USACE and Occupational Safety and Health Administration (OSHA) guidelines. SAIC will review
9 and approve the SSHP Addendum prior to the start of remedial activities. The final SSHP Addendum
10 will be distributed to the U.S. Army, Ohio EPA, OHARNG, and the RVAAP Administrative Record.
11

12 **5.1 PERMIT AND NOTIFICATION REQUIREMENTS**

13
14 Based on review of applicable requirements, the following permits and notifications are required for
15 remedial action:
16

- 17 • Notification and approval of remedial action by the U.S. Fish and Wildlife Service;
- 18 • Submittal of the State of Ohio Historic Preservation Office Project Summary Form;
- 19 • Ohio EPA NPDES Construction General Permit No. OHC000003;
- 20 • Notifications to the Ohio EPA; and
- 21 • Wetland Permit Requirements.
22

23 SAIC and the Subcontractor are responsible for meeting all permitting requirements per the State of
24 Ohio and the federal government. SAIC and the Subcontractor will prepare all signatory
25 documentation (e.g., permits and notifications) and submit to RVAAP or USACE representatives for
26 review. Waste profiles and manifests will be signed by the RVAAP Facility Manager.
27

28 **5.1.1 Endangered Species Protection**

29
30 Section (h) *Endangered Species Protection* of 40 *CFR* 6.302 prohibits federal agencies from
31 jeopardizing threatened or endangered species or adversely modifying habitats essential to their
32 survival. The U.S. Fish and Wildlife Service office in Reynoldsburg, Ohio will be informed of the
33 remedial activities prior to mobilization. The notification will state the implementation of this RD
34 will have no impact on federally-endangered or threatened species. The U.S. Fish and Wildlife
35 Service must approve the remedial activities prior to any implementation.
36

37 A site-wide Indiana bat survey was conducted at Camp Ravenna in January 2005 and was
38 documented in the *Training Site-Wide Survey for the Indiana Bat (Myotis sodalis) at the Ravenna*
39 *Training and Logistics Site, Portage and Trumbull Counties, Ohio, Final Report* (ESI 2005). The
40 survey identified six species of bats at Camp Ravenna but did not identify any Indiana bats.

1 The OHARNG has also completed extensive flora and fauna surveys which have included surveying
2 the Mitchell satyr butterfly (federally endangered), northern monkshood (federally threatened), and
3 eastern massasauga (federal candidate). No federally listed species have identified at Camp Ravenna.
4

5 **5.1.2 Protection of Historic Properties**

6
7 LL12 is located within an area identified on the disturbance map in the OHARNG Integrated Cultural
8 Resources Management Plan (ICRMP) as being highly disturbed by past construction activity. The
9 disturbance in such areas is considered so great that any historic properties, if present, would have
10 been destroyed or disturbed to the degree that they have lost historic integrity and have no value as
11 historic properties. The Area of Potential Effect (APE) for the remediation activities consists of the
12 previously-constructed drainage ditch and the immediate vicinity, and is within the previously
13 disturbed area.
14

15 Based on the past disturbance history of the APE, it is has been determined that there is no potential
16 for the remedial action to impact historic properties. A letter outlining the remedial action and the
17 determination of no affect on historic properties will be sent to the Ohio Historic Preservation Office
18 (OHPO) for their review and concurrence. Implementation of the remedial action will not take place
19 until the OHPO has reviewed and concurred with the determination.
20

21 With any ground disturbing activity there is always the potential of an inadvertent discovery of
22 human remains or funerary objects. If such items are encountered during the remedial action,
23 excavation will immediately stop and the OHARNG Cultural Resources Manager, USACE COR,
24 SAIC Project Manager, and RVAAP Facility Manager will be notified. Standard Operation Procedure
25 #6 in the OHARNG ICRMP will be implemented. Excavation will not resume until the site has been
26 released by the OHARNG Cultural Resources Manager.
27

28 **5.1.3 Ohio EPA Requirements**

29
30 The total area of construction associated with LL12 remedial activities is estimated to be
31 approximately 2.3 acres. Consequently, SAIC will develop a site-specific SWP3. Once reviewed by
32 USACE, SAIC will submit a Notice of Intent (NOI) prior to the start of construction activities under
33 the Ohio EPA NPDES Construction General Permit No. OHC000003. Required permitting will be
34 completed by SAIC, reviewed by USACE, and signed by SAIC and/or the Subcontractor prior to the
35 start of mobilization activities.
36

37 USACE/SAIC will notify Ohio EPA of the following:
38

- 39 • Initiation of construction activities (minimum 7 days prior);
- 40 • Selected disposal facility (minimum 5 days prior to shipping material off-site);
- 41 • Disposal options for collected storm water (if any) upon receipt of sample results; and
- 42 • Initiation of confirmation samples (minimum 2 days prior).

1 **5.1.4 Wetland Permit Requirements**

2
3 A wetlands and other waters delineation was conducted by EnviroScience, Inc. in November 2008.
4 Results of the this delineation are documented in *The Wetlands and Other Waters Delineation Report*
5 *for the Remedial Action at Ramsdell Quarry Landfill, Load Line 12 and Fuze and Booster Quarry*
6 *Landfill/Ponds* (EnviroScience 2008). The Main Ditch at LL12 was categorized as a stream with
7 relatively permanent water (due to upstream beaver dam), as well as, a Category 1 (ORAM)
8 palustrine emergent wetland. This report was submitted to the USACE - Pittsburgh District for
9 Jurisdictional Determination.

10
11 USACE-Pittsburgh District determined the wetland within the Main Ditch is jurisdictional waters.
12 Therefore the wetland falls under Federal Regulations. Per Federal Regulations and Nation Wide
13 Permit (NWP) 38, wetlands impacted by Comprehensive Environmental Response, Compensation,
14 and Liability Act (CERCLA) activities are exempt from permit requirements. Delineated wetlands
15 within LL12 are depicted on Attachment C, Drawing C-3.

16
17 **5.2 SITE PREPARATION**

18
19 This section describes the site preparation activities that must be performed by the Subcontractor
20 prior to beginning construction activities at the site. Site preparation activities consist of several
21 elements designed to maximize access to the site and prevent migration of soil and dry sediment
22 during construction, including:

- 23
24
- Utility survey and clearance;
 - Establishing site controls and site access;
 - Setting up construction support facilities;
 - Vegetation clearing;
 - Constructing dewatering and diversion berms; and
 - Installing erosion and sediment controls.
- 29
30

31 **5.2.1 Utility Clearance**

32
33 The Subcontractor will notify SAIC and the RVAAP Facility Manager a minimum of 28 calendar
34 days prior to initiating remedial activities to allow sufficient time for a utility clearance to be
35 conducted by appropriate RVAAP personnel. Any identified utilities (underground and
36 aboveground) will be maintained as determined by RVAAP Facility Manager.

37
38 In the event an unmarked utility is discovered during remedial activities, all work will stop
39 immediately and the RVAAP Facility Manager, USACE COR, and SAIC Project Manager will be
40 notified immediately. RVAAP personnel will determine the disposition of the discovered utility.
41 RVAAP personnel and SAIC will collaborate on any necessary actions in order to continue remedial
42 activities. If the discovery of an unmarked utility results in a change to the scope, objectives, or

1 schedule of this RD, SAIC will notify the USACE COR and Ohio EPA Project Coordinator for
2 concurrence on proposed revisions and/or corrective actions.

4 **5.2.2 MEC Clearance**

6 LL12 was identified as No Further Action in the Site Inspection Report for Munitions Response Sites
7 under the Military Munitions Response Program (E2M 2008). However, to ensure MEC will not
8 pose a safety or health threat, a certified UXO Tech II MEC Avoidance Subcontractor will be on-site
9 during mobilization and remedial activities.

11 Prior to remedial activities, the MEC Avoidance Subcontractor will be responsible for a MEC survey
12 of areas at LL12 that will be remediated and used to stage equipment to perform the remedial action.
13 The MEC Avoidance Subcontractor will identify items suspected of being MEC and will contact the
14 Subcontractor SSHO and SAIC Construction Manager upon discovery of MEC. The SAIC
15 Construction Manager will contact the SAIC Project Manager, the USACE COR, and the RVAAP
16 Facility Manager. In the event that MEC is identified in the area, activities will cease until the
17 Subcontractor takes active measures for removing the MEC and completes all activities as prescribed
18 in USACE Engineer Pamphlet (EP) 75-1-2.

20 **5.2.3 Site Control and Access**

22 The RVAAP Facility Manager will grant site access and the Subcontractor will control the site during
23 remedial activities. The project sites will be controlled at ingress and egress points. Site controls will
24 include:

- 26 • Controlling access to the project sites by signage, requiring visitors to sign-in, and putting
27 caution tape around the excavation areas;
- 29 • Erecting signs at locations indicated on Attachment C, Drawing C-6 to expedite deliveries,
30 maintain traffic flow, promote safety, and prevent interference with other RVAAP/Camp
31 Ravenna operations; and
- 33 • Adhering to RVAAP traffic rules.

35 The Subcontractor will comply with all Ohio and RVAAP traffic rules. The Subcontractor will not
36 exceed the posted speed limit of 35 miles per hour (mph) during daylight hours and 25 mph at night
37 while on RVAAP main roads. A speed limit of 10 mph on the project access road will be maintained.
38 At no time will the RVAAP main roads be blocked by the Subcontractor during remediation
39 activities. Traffic flow must be maintained on at least half of the roadway width at all times.
40 Approval, prior to starting any activity that will obstruct traffic flow, will be obtained from Camp
41 Ravenna, the RVAAP Facility Manager, and SAIC Construction Manager.

1 The use of two-way radios and cell phones is permitted at the RVAAP. The SAIC Construction
2 Manager will coordinate with RVAAP security to ensure that contact with Post 1 is maintained at all
3 times.

4 5 **5.2.3.1 Facility Access Protocol**

6
7 All personnel and vehicles must enter RVAAP through the main entrance (8451 State Route 5,
8 Ravenna, OH 44266) and are subject to search and inspection. Weapons, lighters (or similar fire
9 starters), and alcoholic beverages are prohibited within RVAAP; prohibited items may be left with
10 security while onsite. Security personnel will confiscate prohibited items discovered during
11 inspections.

12
13 SAIC will submit a roster of all personnel and subcontractors who will be working at RVAAP to the
14 RVAAP Operations and Maintenance Contractor in advance of field work. This roster will be
15 maintained and submitted to the RVAAP Operations and Maintenance Contractor. All personnel
16 approved to enter RVAAP must provide a government issued identification (e.g., driver's license,
17 passport) at the entrance. Upon entry and exit to RVAAP, each person is required to sign a roster
18 annotating the time of day and the area they are working at or visiting.

19 20 **5.2.3.2 Site Access Protocol**

21
22 All supervisors, workers, and site visitors entering the construction area must provide training records
23 specified in Table 5-1 of the SSHP (Attachment A) prior to entry of the construction area and/or
24 exclusion zones. Site visitors arriving throughout the day must: 1) undergo a briefing by the SAIC
25 Construction Manager and Subcontractor SSHO; and 2) provide necessary training records and
26 documentation prior to approaching or entering the exclusion zone. All site visitors must be approved
27 by the SAIC Construction Manager and Subcontractor SSHO to enter the construction area and/or
28 exclusion zones.

29 30 **5.2.4 Construction Support Facilities**

31
32 Construction support facilities for this RD may include:

- 33
- 34 • Sanitary facility;
 - 35 • Equipment staging area;
 - 36 • Access road improvements, and
 - 37 • Truck haul route/loading area improvements.
- 38

39 Locations for these facilities are presented on Attachment C, Drawing C-4.

1 **5.2.4.1 Access to Load Line 12**
2

3 LL12 will be accessed from a mixture of improved and unimproved roads located off of South
4 Service Road (Attachment C, Drawing C-6). The Subcontractor will maintain the access road to
5 allow haul trucks and heavy equipment to traverse safely and efficiently. If visible dust is being
6 generated by equipment, then dust suppression measures (e.g., wetting) will be employed. Additional
7 stone may be required to improve the existing access road to LL12.
8

9 The Subcontractor will use the former railroad bed, consisting of compacted ballast (crushed stone),
10 adjacent to the Main Ditch at LL12 as the haul truck route/loading area (Attachment C, Drawing C-
11 4). The Subcontractor will be responsible to remove any debris (e.g., track spikes) within the ballast
12 to prevent damage to construction vehicle tires. Additional stone will be placed and graded as
13 required to improve the railroad bed for truck loading and traffic. If areas where the existing access
14 road and railroad bed are significantly uneven, the Subcontractor will level the ground, apply one
15 layer of geotextile fabric and two 6-inch courses of crushed stone (AASHTO No. 2). The
16 Subcontractor will be responsible to maintain the access road and haul truck route throughout the
17 project (e.g., ensure it is free of mud). Any improvements made to the access road and haul truck
18 route shall remain in place at the completion of restoration activities at LL12.
19

20 Should the Subcontractor require additional space for stockpiling “clean” material (e.g., rip rap,
21 backfill) beyond the designated equipment staging area, the Subcontractor may temporarily pile
22 materials within the clearing and grubbing area (west side of ditch only) provided the material is used
23 within 24-hours of being placed and covered over night. If long term stockpile storage is needed, the
24 Subcontractor may install a fabric/rock pad south of the designated staging area. The pad will consist
25 of one layer of geotextile fabric and two 6-in courses of crushed stone. The Subcontractor shall cover
26 the material for the duration of storage and remove the fabric/rock pad at the completion of the
27 restoration activities.
28

29 **5.2.5 Fueling Areas**
30

31 Fueling activities will be required to take place at the Equipment Staging Area (Attachment C,
32 Drawing C-4). All necessary control measures and spill equipment will be established and
33 maintained, as specified in Section 10.4.1.
34

35 **5.2.6 Vegetation Clearing**
36

37 Clearing and grubbing will be required to facilitate equipment access, and dry sediment removal
38 (Attachment C, Drawing C-4). Clearing and grubbing will primarily involve felling and removing
39 trees located on and around the excavation areas and haul truck routes. Trees greater than four inches
40 in diameter will be cut and stacked neatly at LL12 away from remedial activities. Trees less than four
41 inches in diameter shall be cut into manageable pieces and chipped. Wood chips not used for
42 absorbent material will be spread over the AOC by the Subcontractor. Tree stumps and associated

1 roots within the limits of excavation shall be removed and disposed of with the contaminated dry
2 sediment.

3 4 **5.2.7 Vehicle Access Routes**

5
6 LL12 may be accessed from two improved roads, South Service Road (south side) and Newton Falls
7 Road (north side) (Attachment C, Drawing C-6). The Subcontractor will maintain and repair the
8 access roads to allow equipment to traverse safely and efficiently. Dust suppression measures (e.g.,
9 wetting) will be employed if visible dust is generated by equipment. Additional crushed stone may be
10 required to further improve the access road.

11 12 **5.3 STORM WATER POLLUTION PREVENTION**

13 14 **5.3.1 Storm Water Control Best Management Practices**

15
16 The Subcontractor will install storm water controls prior to initiating remedial activities in accordance
17 with this section of the RD, SWP3 (Attachment B) and as detailed on Attachment C, Drawing C-4.
18 Best management practices (BMPs) will be employed to protect the excavation area from storm water
19 run-on and run-off. Erosion and sedimentation controls will include both non-structural BMPs and
20 structural BMPs. Non-structural BMPs to be employed at the project site include:

- 21
- 22 • Minimizing disturbance;
 - 23 • Phasing of construction operations; and
 - 24 • Maintaining good housekeeping practices.
- 25

26 Structural BMPs to be employed at the site include:

- 27
- 28 • Improved roadways/haul routes;
 - 29 • Dewatering/diversion berms; and
 - 30 • Silt fencing.
- 31

32 To further minimize the potential for erosion and sediment run-off, no work will be performed during
33 periods of inclement weather, as determined by the SAIC Construction Manager. The excavation
34 areas will be opened and covered as quickly as possible during construction activities.

35 36 **5.3.1.1 Main Ditch Water Diversion**

37
38 The Main Ditch at LL12 discharges into the Active Area Channel which flows generally north and
39 ultimately discharges into Upper and Lower Cobbs Ponds (approximately 650 yards north of LL12).
40 Prior to excavation activities, the Subcontractor will install a plug in the discharging pipe at the
41 furthest upstream location of the Main Ditch. This plug will be inspected daily. Additionally, the
42 Subcontractor shall install dewatering berms (sandbags, temporary cofferdam, or an equivalent
43 watertight barrier) immediately north and south of the excavation area, as shown in Attachment C,

1 Drawing C-4, and remove all standing water from the excavation area. The water will be filtered
2 through a sediment bag and discharged into the Active Area Channel. During excavation activities,
3 any water accumulation in contact with an open excavation will be considered contact water, and will
4 be pumped and managed in accordance with Section 5.3.2. If the excavation extent encroaches on the
5 dewatering berm, the berm will be relocated accordingly.

6 7 **5.3.1.2 Silt Fencing**

8
9 The Subcontractor will install silt fencing as specified in Attachment C, Drawing C-4. In general, silt
10 fencing will be installed between active construction areas and existing wetlands on level contours.
11 The silt fence will undergo inspections in accordance with Section 10.4.2.

12 13 **5.3.2 Excavation Water Management**

14
15 Excavation water is considered any water that accumulates in an excavation and comes into contact
16 with unearthed dry sediment containing contaminants above the remedial cleanup goal during
17 construction activities. The Subcontractor will be responsible for pumping excavation water to a
18 temporary water storage tank to be located in the equipment staging area. The temporary water
19 storage tank will be staged and stored as to avoid streams and water bodies. The Subcontractor will
20 also be responsible for sampling and disposing the excavation water in accordance with Section 9.2.6
21 of this RD.

22 23 **5.3.3 Non-Contact Storm Water Management**

24
25 Storm water that accumulates at the construction site during excavation activities that does not
26 contact unearthed contaminated dry sediment may be discharged over the ground surface so it does
27 not create construction difficulties. This non-contact storm water may be discharged through a
28 sediment bag to remove uncontaminated sediment that may accumulate in storm water. An instance
29 in which non-contact water would accumulate at the site would be water that accumulates on the
30 covered excavation area during a storm event.

31 32 **5.3.4 Erosion Control Schedule**

33
34 Erosion/sedimentation control features will remain in place until completion of site restoration
35 activities as determined by the SAIC Construction Manager and approved by Ohio EPA. Inspection
36 of storm water controls will be performed by the Subcontractor on a daily basis during construction
37 activities. After site restoration has been completed, inspection of storm water controls will be
38 performed once every two weeks until 70 percent vegetation cover has been achieved and erosion
39 controls can be removed, as specified in Section 8.6 of this RD and the SWP3 (Attachment B). The
40 Subcontractor also will inspect the storm water controls within 24 hours of any rain event greater than
41 0.5 inches. For rain events lasting longer than 24 hours, the Subcontractor will also inspect storm
42 water controls at least every 24-hours of the event and within 24 hours of the event ending. These
43 inspections will be performed in accordance with the CQAP in Section 10 of this RD.

1 **5.4 DUST AND WIND CONTROLS**

2
3 All excavations, access roads, and all other work areas within the project boundaries will be
4 maintained free from soil that could cause a hazard or nuisance. Dust generation activities may occur
5 during clearing and grubbing, and material excavation, handling, and transportation. Dust control
6 will be maintained by keeping traffic on improved roads, maintaining the posted speed limit, and
7 applying water as required. The Subcontractor will employ water spraying/misting for dust control if
8 airborne dust is observed. Water used for dust control will be clean (i.e., obtained from RVAAP
9 sources with approval of the RVAAP Facility Manager or potable water obtained from an off-site
10 source). The use of additives will not be permitted.

11
12 During instances of high winds resulting in excessive dust, additional dust control measures or work
13 stoppage may be required. The Subcontractor SSHO will be responsible for visual dust monitoring.
14 At a minimum, visually monitoring of fugitive dust emissions will be conducted daily during
15 representatively normal operating conditions.

16
17 **5.5 GOOD HOUSEKEEPING**

18
19 Good housekeeping practices are designed to maintain a clean and orderly work environment. Good
20 housekeeping measures will include at a minimum:

- 21
- 22 • Regular pickup and disposal of garbage and sanitary waste material;
 - 23
 - 24 • Daily equipment and material inspections for leaks and/or conditions that could potential lead
25 to a discharge of a petroleum product, chemical or waste;
 - 26
 - 27 • Perform preventative maintenance on equipment to ensure it is in proper operation and to
28 detect potential leaks before they occur; and
 - 29
 - 30 • Ensure that spill cleanup procedures outlined in Section 12.1.2 of the Facility-Wide SHP
31 (USACE 2001b) are understood by employees, contractors, and/or subcontractors, and
32 establish storage areas are away from streams and water bodies. The storage area will also be
33 away from direct traffic routes to prevent accidental spills.

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1 **6.0 DRY SEDIMENT REMOVAL ACTIVITIES**

2
3 This section describes the remedial activities to be performed in support of this RD:
4

- 5 • Land survey;
- 6 • MEC Avoidance;
- 7 • Excavation of contaminated dry sediment;
- 8 • Storm water controls; and
- 9 • Equipment decontamination.

10
11 Design Drawings (Attachment C) detailing remedial action requirements for the performance of dry
12 sediment removal and associated activities are referenced as appropriate throughout this section.
13

14 If any unsafe or unexpected site condition or material (e.g., MEC) is encountered during any phase of
15 the remedial activities, work will stop immediately and the SAIC Project Manager, USACE COR,
16 and the RVAAP Facility Manager will be notified immediately. The condition will be assessed and a
17 joint determination will be made regarding continuation of remedial activities. Work will not resume
18 until approval has been granted by the USACE COR. If the discovery results in a change to the
19 scope, objectives, or schedule of this RD, SAIC will notify the USACE COR and the Ohio EPA
20 Project Coordinator for concurrence on proposed revisions and/or corrective actions.
21

22 **6.1 LAND SURVEY**

23
24 Prior to the start of excavation activities, a surveyor will establish the initial horizontal limits of
25 excavation by land survey for each removal area. The excavation limits will be demarcated in
26 accordance with Attachment C, Drawing C-5.
27

28 **6.2 MEC AVOIDANCE**

29
30 MEC encounters are not anticipated during the implementation of this remedial action. However, to
31 ensure MEC will not pose a safety or health threat, a MEC Avoidance Subcontractor will be on-site
32 during mobilization and remedial activities.
33

34 The MEC Avoidance Subcontractor (a U.S. Army and/or Department of Defense [DOD] certified
35 UXO-technician II) will perform a clearance of the areas to be disturbed during remedial action. The
36 MEC Avoidance Subcontractor will provide personnel specifically trained in MEC identification,
37 explosive items, and/or ordnance. Prior to and during excavation activities, the on-site MEC
38 Avoidance Subcontractor will be responsible for 1) inspecting the excavation areas for the presence
39 of MEC; 2) identifying items suspected of being MEC; and 3) contacting the Subcontractor SSO
40 and SAIC Construction Manager of the discovery of MEC. The SAIC Construction Manager will
41 contact the SAIC Project Manager, the USACE COR, and the RVAAP Facility Manager. In the
42 event that a MEC is identified in the area, activities will cease until the MEC Avoidance
43 Subcontractor takes active measures for removing the MEC.

1 **6.3 EXCAVATION**

2
3 This section describes the excavation activities for the removal of dry sediment within the limits of
4 excavation. The limits of excavation for LL12, presented in Attachment C, Drawing C-4, are based
5 on visual observations of the extent of the removal areas in the Main Ditch, and a topographic survey
6 conducted of the area. The current estimated in situ volume of dry sediment is 706 cubic yards.

7
8 The initial excavation will extend approximately one foot horizontally and vertically beyond the
9 modeled extents of the ditch into native soil, this will be determined by visual observation. The
10 vertical extent of the excavation will cease if bedrock is encountered.

11
12 **6.3.1 General Sequence of Excavation**

13
14 The general sequence of excavation is as follows:

- 15
16 1.) Land survey will be performed to establish the MI Sample Areas (Attachment C, Drawing
17 C-5);
18
19 2.) Excavation of dry sediment (as presented on Attachment C, Drawing C-5);
20
21 3.) Excavated dry sediment will be directly loaded from the Main Ditch into on-road haul trucks.
22 Any stockpiling of contaminated dry sediment shall remain within the excavation boundary;
23
24 4.) Confirmation samples will be collected upon completion of excavation activities (Section 7);
25
26 5.) A land survey will be conducted to verify the final extent of excavation;
27
28 6.) Grading and backfill will occur upon approval from the SAIC Construction Site Manager;
29 and
30
31 7.) The site will be restored in accordance with Section 8.0 and Attachment C, Drawing C-7.
32

33 **6.3.2 Excavation Activities**

34
35 Excavation activities will be executed to reduce the handling of contaminated dry sediment and will
36 include:

- 37
38 • Dewatering the excavation area (if necessary);
39 • Excavating the contaminated dry sediment within the defined extent; and
40 • Loading dry sediment into haul trucks for transfer to disposal facility.
41

42 An Excavation Competent Person, as defined by OSHA, will be on-site during the excavation of the
43 Main Ditch to ensure the ground surface is stable during removal activities. If the ground surface is

1 not stable, shoring and/or sloping will be performed. At no time will personnel enter the excavation,
2 as confirmation sampling will be accomplished remotely as described in Section 7.1 of this RD. If an
3 event entry into the excavation does become necessary (e.g., to remove soil around existing sanitary
4 line, MEC), excavation water shall be removed, and the Subcontractor's Excavation Competent
5 Person must ensure that adequate controls are in place to protect personnel from cave-in. The side
6 slopes shall be graded to no less than 1½ H: 1 V (34⁰) or appropriate shoring will be installed.
7 Excavation cave-ins are not likely with an excavation of 1 ft into the ditch bottom.

8
9 The excavation area will be covered at the end of each work day. Impermeable covers will be used
10 by the Subcontractor to cover exposed dry sediment at the end of each work day and during periods
11 of inclement weather. The impermeable covers will be secured with sand bags (or equivalent).

12
13 Equipment will be staged or operated from non-contaminated areas only. The Subcontractor will
14 ensure heavy equipment does not enter the excavation area. It is anticipated only the excavator
15 bucket will require decontamination. Decontamination of the excavator bucket will be conducted in
16 accordance with Section 6.4 of this RD. If it is determined that excavation equipment will need to
17 enter the open excavation, the excavation equipment will be decontaminated in accordance with
18 Section 6.4 of this RD.

19
20 During the loading process, care will be taken to not overfill the trucks, or spill dry sediment on the
21 sides of the trucks. The haul trucks will be positioned over plastic sheeting to contain any dry
22 sediment spilled during loading. Trucks will be inspected for dry sediment on the exterior of the
23 truck bed. Dry sediment will be brushed off and captured prior to the truck exiting the loading area.
24 All truck loads will be covered while en route to the disposal facility. On-road haul trucks
25 transporting hazardous waste shall be lined as required by the disposal facility along with any other
26 specific federal or state requirements (e.g., placarding).

27
28 Confirmation samples will be collected prior to restoration of open excavations (Section 7). The
29 excavation areas will be restored in accordance with Section 8 of this RD upon approval from the
30 SAIC Construction Manager.

31
32 No suspect or unexpected materials, such as drums or cylinders, are anticipated during excavation
33 activities. If unexpected site condition or material is encountered during any phase of the remedial
34 activities, construction activities will stop immediately and be reassessed in accordance with
35 procedures outlined in the SSHP (Attachment A).

36 37 **6.3.3 Dry Sediment Staging Area**

38
39 A staging area for excavated dry sediment will not be necessary for the remedial activities at LL12
40 unless it determined that stockpiling is necessary to gain removal efficiency. The excavated dry
41 sediment will be staged within excavation limits of the Main Ditch until trucks are available for
42 loading. Existing soils below stockpiled dry sediment will be excavated and sampled in accordance
43 with Sections 6 and 7 of this RD.

1 **6.4 DECONTAMINATION**

2
3 Contact with contaminated dry sediment will be actively minimized. The Subcontractor will
4 implement measures to prevent the tracking of material from the excavation. Equipment used to
5 excavate and haul contaminated dry sediment will be decontaminated prior to contact with other
6 materials and prior to demobilization off-site. Equipment that comes into contact with contaminated
7 dry sediment will be decontaminated as follows:

- 8
- 9 • The excavator bucket will be placed over the haul truck and washed with a pressure washer.
10 Limited amounts of liquids (i.e., less than 30 gallons) will be used for decontamination
11 activities performed over haul trucks. The Subcontractor will ensure free water is not present
12 in the haul truck and there are no liquids escaping the truck bed. The Subcontractor will not
13 use any liquid for decontamination that could potentially change the chemical profile of the
14 contaminated dry sediment (such as, addition of solvents or pH).
 - 15
 - 16 • If additional excavation equipment is used during the remedial activities, the Subcontractor
17 shall designate and install a plastic-lined sandbag bermed area. Excavation equipment will be
18 placed within the bermed area lined with plastic sheeting and cleaned as described below.
 - 19
 - 20 • All loose dry sediment will be removed using a stiff-bristle brush or other device to dislodge
21 visible dry sediment.
 - 22
 - 23 • Steam clean equipment using potable water.
 - 24
 - 25 • Allow equipment to air dry as long as possible.
 - 26
 - 27 • Place equipment on clean plastic if immediate use is anticipated, or wrap in plastic to prevent
28 contamination if longer-term storage is required.
 - 29
 - 30 • Loose dry sediment and wash water will be mixed with excavated dry sediment and placed
31 into a haul truck for disposal (decontamination liquids will consist of less than 30-gallons per
32 truck and will not change the chemical profile of the excavated material).
 - 33

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

1 Prior to release of construction equipment from the site, the SSHO, or designee, will visually inspect
2 (and document) construction equipment with specific attention to:

3

- 4 • Tires and wheels or tracks (as applicable);
- 5 • Undercarriage (frame, axles);
- 6 • Exterior surfaces (including steps, running boards);
- 7 • Engine compartment; and
- 8 • Operator compartment.

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1 **7.0 CONFIRMATION SAMPLING**

2
3 This section describes the process to verify that the remedial activities meet the established cleanup
4 goals. The purpose of the confirmation sampling is to provide data to confirm that the remedial
5 activities discussed in the previous sections attained the cleanup goals. Confirmation sampling
6 consists of two components:

- 7
8 1.) Sample collection and analyses; and
9 2.) Evaluation/comparison against the cleanup goals.

10 11 **7.1 CONFIRMATION SAMPLE COLLECTION**

12
13 At the completion of the excavation activities described in Section 6.3, the LL12 excavation area will
14 be sampled in the three MI Sample Areas (L12-256M, L12-257M, and L12-258M). One MI sample
15 will be collected from within the excavation footprint, as depicted on Attachment C, Drawing C-5.

16
17 The MI samples will be collected, processed, and analyzed. The sampling will be conducted
18 remotely to ensure personnel do not enter the excavated areas. This remote sampling will be
19 accomplished either by use of a decontaminated stainless-steel attachment to the excavator, or by
20 using extension rods on a soil probe. No less than 30 aliquots will be collected from either of these
21 devices within the specified MI area.

22 23 **7.2 CONFIRMATION SAMPLING PROCEDURES**

24
25 All the dry sediment collected during the MI sampling for each MI Sample Area is composited into a
26 single sample and sent to a National Environmental Laboratory Accreditation Conference (NELAC)
27 approved off-site laboratory. The sample will be dried, sieved, finely ground, and analyzed for the
28 specified non-volatile constituent analyses. Sample grinding and analyses will be conducted at the
29 fixed-base laboratory.

30
31 Figure 7-1 presents the sample identifying information that will be used. The confirmation samples
32 collected will be considered dry sediment samples (0 to 0.5 ft BGS). Samples will be identified
33 sequentially using the identification number system consistent with the remedial investigations. If a
34 sample is not collected or is reassigned to a different location, a specific reason and notation will be
35 noted in the project field books.

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

XXX = Area Designator

L12 = Load Line 12

mm = Sample Location Type

sd = Sediment Sample Location

NNN = Sequential Sample Location Number

Unique, sequential number for each sample location beginning with Phase I RI 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 = Multi-increment Sample

= Sequential Sample Identification Number

Unique, sequential number for each sample beginning with Phase I RI locations and extending into any subsequent investigative phases (i.e., 0001 – 9999)

tt = Sample Type

SD = Sediment Sample

1

Figure 7-1. Sample Identification System

2

3

Table 7-1 presents the baseline sample identification listing. Analytical results of arsenic at LL12 will be compared against the cleanup goals.

4

5

6

Table 7-1. Sample Identification for LL12 Confirmation Sampling

Location	Station	Sample ID	Arsenic
MI Sample Area #1	L12-256M	L12sd-256M-####-SD	1
MI Sample Area #2	L12-257M	L12sd-257M-####-SD	1
MI Sample Area #3	L12-258M	L12sd-258M-####-SD	1

7

Sample Identifier #### will be chosen during field implementation to ensure a duplicate number is not used.

8

MI = Multi-increment

9

L12 = Load Line 12

10

11

The sampling and analysis requirement are summarized in Table 7-2, as well as, the anticipated sample quantities and methods. Project Quantitation Levels (chemical concentration precision levels) will be in accordance with the Facility-Wide Sampling and Analysis Plan (USACE 2001a).

12

13

1
2

Table 7-2. Sampling and Analytical Requirements

Parameter	Methods	Field Samples	Field Duplicate Samples	Site Source Water	Sampler Rinsates	Trip Blanks	Total A-E Samples	USACE QA Split Samples	USACE Trip Blanks
Arsenic, Total	SW-846 6010B	4	1	0	0	0	5	0	0

3 A-E = Architect-Engineer
4 QA = Quality Assurance
5 USACE – U.S. Army Corps of Engineers
6

7 **7.3 CONFIRMATION OF CLEANUP GOAL**

8
9 The cleanup goal concentration for arsenic at LL12 is 31 mg/kg. The results of the confirmation
10 samples will be compared to the cleanup goals. If the confirmation sample results exceed the cleanup
11 goal, the following steps will take place:

- 12
- 13 1.) Excavation of the ditch bottom at that specific MI Sample Area will be expanded to an extent
14 prescribed by the SAIC Construction Manager; and
 - 15
 - 16 2.) Confirmation sample(s) will be collected. It will be at the discretion of the SAIC
17 Construction Manager to determine if multiple confirmation samples will be collected from
18 the additional excavation area. The SAIC Construction Manager will create spacing for the
19 sample areas and document which areas are represented by specific MI samples.

20
21 Site restoration activities will occur as MI Sample Areas are confirmed not to exceed cleanup goals.
22 Initiation of restoration activities will commence upon the approval from the SAIC Construction
23 Manager in conjunction with the USACE COR and Ohio EPA.

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1 **8.0 SITE RESTORATION**

2
3 Site restoration will begin after the analytical results of the confirmation samples confirm remedial
4 action cleanup goals have been achieved. The Subcontractor will restore the site to the required
5 conditions set forth in Attachment C, Drawing C-7. At a minimum, this will include:
6

- 7 • Grading and backfilling (where necessary) side-slopes of the Main Ditch to no less than 1 ½
8 H : 1 V (34°);
9
- 10 • Backfilling, compacting and leveling the bottom of the Main Ditch to the existing grade to
11 maintain drainage. It should be noted the intent of compacting the backfill is to match the
12 existing grade, flow pattern and aesthetics of the Main Ditch and not to achieve a specific soil
13 density;
14
- 15 • Installing erosion control matting (e.g., mulch mat) and seed on disturbed side slopes of the
16 Main Ditch;
17
- 18 • Placing one 6-in course of rip rap (4 to 6 inch stone) in the bottom of the Main Ditch for
19 erosion control;
20
- 21 • Grading, seeding, and mulching construction disturbed areas between Main Ditch and
22 railroad bed;
23
- 24 • Installing a straw check dam at north end of excavated area within the Main Ditch; and
25
- 26 • Removing erosion controls once vegetation is established.
27

28 **8.1 RE-GRADING AND BACKFILL**

29
30 The bottom of the excavation area will be backfilled, compacted and graded to original contours to
31 maintain drainage. No less than one 6-in course of rip rap will be installed over the backfill to
32 prevent erosion. The side slopes of the Main Ditch shall be backfilled, and compacted in areas
33 (northern portion) where existing side slopes are greater than 2 H : 1 V. In the southern portion of the
34 Main Ditch, the side slopes shall be graded to no less than 1 ½ H : 1 V. Backfill material used for
35 side slopes shall be able support vegetation. In the event the selected backfill material will not, the
36 Subcontractor will place at least 4-inches of topsoil over the backfill. Attachment C, Drawing C-7
37 presents the contour specified for site restoration.
38

39 Where necessary, ruts and depressions within the Construction Boundary (e.g., truck loading area and
40 construction support area) will be re-graded. The Subcontractor will use approved backfill material
41 for site restoration activities. Should the backfill material not be sufficient to support re-vegetation
42 (e.g., clayey soil), a minimum of 4 inches of vegetative cover (e.g., topsoil) will be placed on the
43 backfill material prior to seeding and mulching.

1 The Subcontractor will identify an off-site source of backfill. Per Ohio EPA guidance, one MI
 2 sample will be collected by SAIC for every 4,000 cubic yards of backfill or vegetative cover used.
 3 This quantity of backfill or vegetative cover must come from the same source or an additional sample
 4 must be collected. The samples will be analyzed for the parameters identified in Table 8-1. The
 5 backfill and vegetative cover must be approved by Ohio EPA. Project Quantitation Levels will be in
 6 accordance with the Facility-Wide SAP (USACE 2001a).

7
 8 **Table 8-1. Borrow Source Sampling Analytical Requirements**
 9

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
Nitro-glycerine	SW-846 3540/8330
Nitro-guanadine	SW-846 3540/8330 Modified
Nitrocellulose	MCAWW353.2 Modified
Metals, TAL	SW-846 6010B/6010A/7471
pH	SW-846 9040/9045

10 PCB = polychlorinated biphenyl
 11 SAP = sampling and analysis plan
 12 SVOC = semivolatile organic compound
 13 TAL = target analyte list
 14 TCL = target compound list
 15 VOC = volatile organic compound

16
 17 **Table 8-2. RVAAP 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

18 mg/kg = milligram per kilogram
 19

20 **8.2 REMOVAL OF PLACED STONE**
 21

22 Any stone placed on the existing access roads or haul truck route at LL12 will not require removal.
 23 However, the Subcontractor will remove any stone placed used to expand the equipment and material

1 storage area. Removed stone may be placed and graded on the existing access roads or disposed off-
2 site.

3 4 **8.3 FINAL GRADING**

5
6 Final grading will be performed to match surrounding elevations, prevent ponding of water, and
7 prevent erosion (Attachment C, Drawing C-7). The final grade of the excavation area, as well as, all
8 areas disturbed during remedial activities will be approved by the SAIC Construction Manager.

9 10 **8.4 RE-VEGETATION**

11
12 All disturbed areas must be seeded within seven days following excavation, backfilling, and final
13 grading activities. The wetland areas shown in Attachment C, Drawing C-3 and the disturbed side
14 walls of the Main Ditch shall be seeded with the mixture presented in Table 8-3. The walls of the
15 Main Ditch shall be covered with erosion control matting (e.g., mulch mat) instead of straw.

16
17 **Table 8-3. Full-Sun Stream/Ditch Seed Mixture for RVAAP/Camp Ravenna**

Seed Type	Mixture %
Shallow/Lurid Sedge (<i>Carex lurida</i>)	10.0%
Blunt broom sedge (<i>Carex scoparia</i>)	10.0%
Fox sedge (<i>Carex vulpinoidea</i>)	20.0%
Riparian Wild Rye (<i>Elymus riparius</i>)	20.0%
Soft rush (<i>Juncus effuses</i>)	10.0%
Rice cutgrass (<i>Leersia oryzoides</i>)	5.0%
Great/Soft-stemmed Bulrush (<i>Schoenoplectus tabernaemontani</i>)	2.0%
Dark green bulrush (<i>Scirpus atrovirens</i>)	8.0%
Woolgrass (<i>Scirpus cyperinus</i>)	9.0%
Steeplebush (<i>Spiraea tomentosa</i>)	5.0%
Swamp milkweed (<i>Asclepias incarnate</i>)	0.5%
Blue Vervain (<i>Verbena hastate</i>)	0.5%

Specifications:

Broadcast at 15lbs/acre

Mulch with a minimum of 3 bales of straw per 1,000 square feet.

18
19 The Subcontractor will use a Camp Ravenna-approved “open area” seed mixture for permanent cover
20 for construction areas disturbed during field activities. Table 8-4 presents the seed mixture and
21 application specifications. Fertilizer and lime are not needed for seeding with native seed mixes.

1

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

Seed Type	Mixture %
Nodding Wild Rye (<i>Elymus Canadensis</i>)	23.5%
Virginia wild rye (<i>Elymus virginicus</i>)	25%
Little Bluestem (<i>Schizachyrium scoparium</i>)	22%
Partridge Pea (<i>Chamaecrista fasciculata</i>)	18.75%
Thin-leaved Coneflower (<i>Rudbeckia triloba</i>)	7.75%
Brown fox sedge (<i>Carex vulpinoidea</i>)	1.5%
Black-eyed Susan (<i>Rudbeckia hirta</i>)	1.5%

Specifications:

Broadcast @ 18 lbs/acre, drilled at 12 lbs/acre

Mulch with a minimum of 3 bales of straw per 1,000 ft²

2

3 Other effective materials may be used, including specialized seeding products/technologies such as
4 seed impregnated fiber matting. Any product or technology used for seeding the Main Ditch will
5 meet the seeding requirements presented in Tables 8-3 and 8-4 and applicable Ohio EPA storm water
6 pollution prevention controls.

7

8 **8.5 REMOVAL OF EROSION CONTROLS**

9

10 At the completion of the excavation, and prior to the removal of the dewatering berm/dam, the
11 Subcontractor will install a straw-bale check dam in the Main Ditch down gradient of the dewatering
12 berm to prevent sediment transport to the downgradient Active Area Channel. The check dam will
13 remain in place until grass coverage on the sidewalls of the Main Ditch is at least 70 percent
14 established. Other existing erosion control measures shall remain in place until the grass is
15 established with a density of at least 70 percent coverage, in accordance with Ohio Rainwater and
16 Land Development guidance. Once SAIC confirms that at least 70 percent coverage has been
17 achieved, the Subcontractor is responsible for the removal and disposal of all erosion controls
18 measures at that time.

1 **9.0 WASTE CHARACTERIZATION AND DISPOSAL**

2
3 This section describes waste characterization, transportation, and waste disposal activities that will be
4 performed in support of implementing this RD. Waste includes remedial waste (e.g., excavated dry
5 sediment and excavation water) and any IDW generated during sampling activities. All waste will be
6 properly handled, labeled, characterized, and managed in accordance with Section 7.0 of the Facility-
7 Wide SAP, Federal and State of Ohio Large-Quantity Hazardous Waste Generator Requirements, and
8 RVAAP's Installation Hazardous Waste Management Plan. All waste will be appropriately
9 accounted for as soon as possible and prior to conclusion of the project. Any shipment of solid or
10 hazardous waste off-site will comply with all appropriate federal and state laws.

11 12 **9.1 WASTE STREAM IDENTIFICATION**

13
14 Waste generated during remedial activities will be managed to prevent the potential release of
15 contamination. The following types of waste may be generated:

- 16
- 17 • Vegetation;
- 18 • Excavated dry sediment;
- 19 • Decontamination fluids from sampling activities;
- 20 • Sanitary waste;
- 21 • Personal protection equipment (PPE) and contact waste (e.g., plastic tarps, ground cloths);
- 22 • Excavation water, storm water or groundwater in direct contact with impacted dry sediment;
- 23 and
- 24 • Decontamination fluids generated during the decontamination of excavation equipment.
- 25

26 No dry sediment IDW is anticipated during the collection of dry sediment characterization samples.
27 The entire volume of dry sediment collected for these samples will be shipped to the laboratory. The
28 laboratory will be responsible for the ultimate disposition of remaining dry sediment.

29
30 In general, proper waste minimization procedures will be employed to limit the volume of waste
31 generated. These procedures will include:

- 32
- 33 • Re-use of materials that do not require decontamination;
- 34 • Utilization of disposable sampling tools that do not require decontamination;
- 35 • Minimization of the volume of decontamination fluids;
- 36 • Minimization of contact with potentially contaminated materials;
- 37 • Minimization of foot and vehicle traffic through potentially contaminated areas; and
- 38 • Utilization of good housekeeping practices.

1 **9.2 WASTE STREAM MANAGEMENT**

2
3 Table 9-1 presents and discusses each potential waste streams for this RD. Characteristics for each
4 waste stream include: the point of generation, on-site staging and processing, characterization
5 requirements, and method of final disposition.
6

7 **Table 9-1. Waste Characterization and Disposal**

Waste Stream Identification	Point of Generation	On-Site Staging and Processing	Characterization Requirements	Final Disposition
Surface Vegetation (Trees and Shrubs)	In area of excavation vegetation will be cut to a height of not greater than three inches above the ground surface.	Trees greater than four inches in diameter will be cut and stacked neatly at the AOC away from remedial activities. Trees less than four inches in diameter shall be cut into manageable pieces and chipped. Wood chips not used for absorbent material will be spread over the AOC by the Subcontractor.	No characterization required.	Roots and root balls within the excavation foot print and wood chips used on-site for absorbent material will be considered potentially contaminated material and disposed with excavated dry sediment.
Excavated Dry Sediment	Dry sediment will be generated during the excavation and remedial activities at LL12.	Excavated dry sediment will be directly loaded into on-road haul trucks. Truck beds will be lined as required by state, Federal Department of Transportation (DOT), or disposal facility requirements.	Characterization sampling of dry sediment will be performed prior to mobilization and excavation activities. Samples will be analyzed for TCLP to determine classification of wastes (hazardous, non-hazardous).	Excavated dry sediment will be removed from the AOC under a RVAAP signed manifest by a licensed waste disposal contractor and disposed at an approved disposal facility permitted by the state of Ohio to accept the waste.
Decontamination Fluids (Sampling Activities)	In the event that disposable plastic scoops can not be used during sampling, stainless-steel spoon and bowls will be used to collect samples. These tools require decontamination between samples resulting in the generation of fluids.	Due to the anticipated small quantity generated, all IDW liquid will be combined and contained in a labeled DOT approved 55-gal closed-top drum.	One representative sample will be collected and characterized in accordance with Section 7.4 of the Facility-Wide SAP	Removed from the AOC by a licensed waste disposal contractor and disposed at an approved disposal facility permitted to accept the waste.

8

Table 9-1. Waste Characterization 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, and non-indigenous solids)	Primarily generated by personnel working at the site during remedial activities.	Collected daily in plastic-lined trash cans and moved to a designated area as specified in Section 7.3 of the Facility-Wide SAP	No characterization required.	Disposed in a licensed solid waste disposal facility in accordance with local, state and federal regulations.
PPE (gloves, boot covers) and Contact Waste (plastic sheeting)	Generated by the site workers on a daily basis.	<p>PPE that comes into contact with hazardous material requires temporary disposal in 55-gallon drums and ultimate disposal at a permitted hazardous waste facility.</p> <p>PPE that does not come into contact with hazardous material will be collected in trash bags and disposed of daily in an RVAAP or project specific dumpster.</p>	Characterized in accordance with Section 7.4 of the Facility-Wide SAP. Generally, PPE will be characterized for disposal based upon the dry sediment it was in contact with.	PPE will be disposed of in accordance with Section 7.5 of the Facility-Wide SAP (USACE 2001a). It will be disposed of as either sanitary waste or as a permitted hazardous waste in a permitted hazardous waste facility.
Excavation Water	Potentially generated in excavation area during rain events.	<p>Accumulated excavation water will be pumped into a temporary water storage tank.</p> <p>Minimal quantities are anticipated given; the nominal footprint and depth of the excavation area, and the excavation footprint will be covered during inactivity.</p>	<p>If characterization sampling results of dry sediment indicate low concentrations of analytes, Ohio EPA may waive characterization sampling of excavation water.</p> <p>Should characterization sampling of excavation water be required; excavation water will be analyzed for parameters presented in Table 1-1 of FW SAP QAPP (USACE 2001a) ^c.</p>	<p>The Ohio EPA Project Coordinator will determine 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 RVAAP/SAIC.</p> <p>Sediment collected in the bottom of the tank will be disposed of as excavated dry sediment.</p>

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

Waste Stream Identification	Point of Generation	On-Site Staging and Processing	Characterization Requirements	Final Disposition
Decontamination Fluids (Excavation Equipment)	Generated as a result of decontamination of excavation equipment during and after all excavation remedial activities.	Decontamination of excavation equipment will be conducted over the truck bed of the final haul truck upon completion of the final haul excavation activities. The amount of water to be used will be minimized such that 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.	Decon water will be disposed of in the haul truck along with excavated dry sediment.

^aThe guidelines for land application of excavation water are as follows:

- Discharge will only occur in a grassy well vegetated area of the AOC (LL12) 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.

^bShould 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.

^cThe parameters include VOCs, SVOCs, pesticides, PCBs, explosives, nitroquandine, nitrocellulose, PAHs, metals (TAL), and cyanide.

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 RVAAP Facility Manager. A centralized FSA will be established for the staging of all drums of IDW. The FSA will be managed according to the requirements of Section 7.3 of the Facility-Wide SAP (USACE 2001a). 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 RVAAP Facility Manager by the SAIC Construction Manager. All non-hazardous liquid waste not transported off of the facility within 30

1 days following project completion will require secondary containment. Any soil/sediment or liquid
2 waste identified as hazardous through process knowledge or characterization must be staged in the
3 designated RVAAP 90-day hazardous waste storage area and managed in accordance with facility
4 requirements, as described in Section 7.3 of the Facility-Wide SAP (USACE 2001a).

6 **9.4 WASTE CONTAINERIZATION AND LABELING**

7
8 All waste storage containers will be of suitable size, leak proof, and constructed of materials
9 compatible with the materials to be contained. Waste storage containers will be properly labeled
10 prior to placement of material.

11
12 The Subcontractor will be responsible for providing new Department of Transportation (DOT)
13 approved containers for the liquid IDW. The Subcontractor will be responsible for the waste
14 characterization, container labeling, transportation and final disposal at a State of Ohio or Federal
15 approved treatment, storage, or disposal (TSD) facility of all decontamination liquids. The RVAAP
16 Facility Manager will sign all waste profiles and waste manifests for the disposal of project IDW to
17 approved disposal facility.

18
19 All IDW containers will be labeled prior to placing IDW in them. All IDW containers (drums) will
20 be labeled in accordance with Section 7.2 of the Facility-Wide SAP (USACE 2001a). Each IDW
21 container will be labeled to ensure easy identification and proper management. Prior to placing IDW
22 into a container, a "Pending Analysis" label containing the following information will be affixed to
23 the outside of the container:

- 24
- 25 • Project name;
 - 26 • Contents;
 - 27 • Date waste was first placed into the container;
 - 28 • Source location(s); and
 - 29 • Emergency contact name and telephone number.
- 30

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

1 Any non-contaminated sanitary trash will be contained separately in plastic-lined standard trash can
2 with lid. Non-contaminated sanitary trash will be disposed off-site through a commercial municipal
3 waste service provided.

4
5 **9.5 TRANSPORTATION, STORAGE, AND DISPOSAL**

6
7 The management, transportation, and disposal of all waste streams will be coordinated with RVAAP.
8 All transportation paperwork (manifests or shipping papers) and on-road haul truck placards will be
9 prepared by the Subcontractor Construction Manager in accordance with federal, state, and local
10 regulatory requirements, and disposal facility requirements. A draft of the transportation paperwork
11 containing "base" information will be submitted to RVAAP/SAIC for review and approval a
12 minimum of one week prior to shipment of any material. The approved transportation paperwork will
13 then be completed as appropriate by the SAIC Construction Manager in the field during excavation
14 activities. The RVAAP Facility Manager will be responsible for custody of manifest copies and
15 submittal to Ohio EPA and United States Environmental Protection Agency (USEPA) as part of the
16 annual reporting for RVAAP hazardous waste generation and management.

17
18 Contaminated dry sediment loaded into on-road haul trucks will be transported by licensed waste
19 haulers to RVAAP and SAIC approved licensed off-site disposal facilities. All transportation
20 requirements, including proper labeling, placarding, and weight limits will be followed. All
21 manifests, shipping documents, and disposal facility approval letters will be provided to SAIC and
22 incorporated into the Construction Report.

23
24 All other waste types (e.g., IDW, other materials, and excavation water) will be managed by the
25 Subcontractor in compliance with all federal, state and local laws. The RVAAP Facility Manager
26 will sign all waste profiles and waste manifests for the disposal of project wastes at an approved
27 facility. All manifests, shipping documents, and disposal facility approval letters will be provided to
28 SAIC.

10.0 CONSTRUCTION QUALITY ASSURANCE PLAN

2
3 This section presents the CQAP. The CQAP describes the inspection procedures and documentation
4 required to ensure excavation, disposal, and restoration activities occur according to the requirements
5 of this RD.

6
7 Protocols for reporting test results, certifying compliance with construction requirements, correcting
8 construction deficiencies, and documenting such corrections are provided. This section also
9 addresses the review and documentation requirements necessary to comply with the site restoration
10 details contained herein.

11 12 **10.1 RESPONSIBILITY AND AUTHORITY**

13 14 **10.1.1 Responsibility**

15
16 The organizational chart presented in Figure 2-1 outlines the management structure that will be used
17 to implement the excavation and disposal activities in accordance with this RD. Functional
18 responsibilities of key personnel were described in Section 2.1. The assignment of personnel to each
19 position was based on the following:

- 20
- 21 • Qualifications;
- 22 • Experience; and
- 23 • Training.

24
25 The SAIC QA/QC Officer and SAIC Construction Manager, in coordination with the USACE COR,
26 will ensure the completed remedial activities conform to the RD, design drawings, specifications, and
27 any necessary permit conditions. The SAIC Project Manager will verify completion of these
28 activities.

29
30 The SAIC Construction Manager will monitor excavation, disposal, and site restoration activities.
31 The SAIC Construction Manager or designee will be on-site during work activities to ensure that all
32 components of this RD are fulfilled.

33 34 **10.1.2 Administration and Operation**

35
36 The QA/QC organization is administered by the SAIC QA/QC Officer in concert with the SAIC
37 Construction Manager. The SAIC Construction Manager will be supported by the Subcontractor
38 Construction Manager and technical staff (engineers, scientists, and technicians) as necessary.

39
40 All vendors supplying materials used for site restoration and storm water control will supply materials
41 from manufacturing facilities with established QC programs. Results of the manufacturer QC
42 procedures will be submitted to the QA/QC Officer for review, evaluation, and documentation prior
43 to beginning field activities.

1 **10.2 PERSONNEL QUALIFICATIONS**

2
3 All QA/QC personnel will be properly trained for their job function. The SAIC Construction
4 Manager is key to the inspection and certification program. The SAIC Construction Manager will
5 have demonstrated knowledge of specific construction practices relating to earthwork, regulations and
6 specifications, observation and testing procedures, and documentation procedures. The SAIC
7 Construction Manager will also be experienced in performing similar duties on previous jobs in
8 which comparable construction activities took place.

9
10 **10.3 DAILY PLANNING BRIEFINGS**

11
12 At the start of the project, the Subcontractor will participate in a pre-work briefing on objectives,
13 health and safety, proposed deviations, and project schedule with the SAIC Construction Manager.

14
15 In addition to daily tailgate briefings conducted in accordance with the SSHP, the Subcontractor and
16 SAIC will participate in daily planning briefings to determine the plan of action for the work day.
17 This briefing will include at a minimum the following:

- 18
19 • A discussion of the planned activities for the work day;
20 • Planned area of excavation;
21 • Weather considerations;
22 • Deliveries;
23 • Transportation schedule;
24 • Schedule forecast; and
25 • Issues which would result in an impact to the project.

26
27 The USACE COR and RVAAP Facility Manager, or authorized designees will be invited to attend
28 the pre-work briefing and any daily safety or planning briefings.

29
30 **10.4 INSPECTION ACTIVITIES**

31
32 Inspections will be completed to verify acceptability of materials, prevent spills, and assess
33 effectiveness of storm water and dust generation controls. The scope and frequency of each type of
34 inspection is described below.

1 **10.4.1 Spill Control**

2
3 The SAIC Construction Manager will conduct daily inspections to verify spill equipment is
4 maintained and no spills have occurred. During excavation, if any visually or olfactory indicators
5 suggest the presence of potentially contaminated dry sediment, the employee will report to the SAIC
6 Construction Manager. The Subcontractor will provide all necessary on-site spill equipment (e.g.,
7 granulated clay, absorbent blankets, PPE, shovels, containers). All on-site workers will maintain
8 good housekeeping practices (as discussed in Section 5.5).

9
10 Spills will be responded to as presented in Section 12.1.2 of the Facility-Wide Safety and Health Plan
11 and the RVAAP Installation Spill Contingency Plan. In the event of a spill or leak, the employee
12 making the discovery will immediately notify the SSHO and the SAIC Construction Manager. These
13 spills can include, but are not limited to, releases of fuels, lubricants, and hydraulic fluids.

14
15 The SAIC Construction Manager will ensure the spill is reported to Camp Ravenna Operations and
16 RVAAP Army Staff as well ensure the incident is documented on a Camp Ravenna Spill Incident
17 Reporting Form.

18
19 **10.4.2 Storm Water Controls**

20
21 Prior to construction activities, the Subcontractor will install and inspect all storm water controls
22 (including the collection system for any excavation water encountered) and document proper
23 placement in accordance with the requirements of this RD, SWP3 (Attachment B), and associated
24 drawings (Attachment C) and specifications. Any water (e.g., storm water) in contact with an open
25 excavation will be collected, containerized, sampled, characterized, and managed by the
26 Subcontractor.

27
28 All employees will practice due diligence to prevent any damage to the storm water control measures.
29 The Subcontractor will conduct routine walkovers during normal operations to evaluate the integrity
30 of the storm water controls. Any deficiencies will be immediately corrected and documented in the
31 daily report. Inspection of storm water controls will be performed by the Subcontractor on a daily
32 basis. After remedial activities are completed, storm water controls will be inspected bi-weekly,
33 within 24 hours of a storm event (0.5 inches or greater), and at least every 24 hours during extended
34 rain events.

35
36 **10.4.3 Dust Control**

37
38 Dust generation activities may occur during excavation, material handling, and equipment movement
39 on paved and unpaved roads. The Subcontractor will minimize dust generation by keeping vehicles
40 on improved roads, limiting speeds to a 10 mph maximum on the access roads, and application of
41 water for dust suppression purposes as required. Water used for dust control will be clean (e.g.,
42 obtained from sources with approval of the SAIC Construction Manager or potable water obtained
43 from an off-site source). The use of additives will not be permitted. Engineering controls will be

1 implemented to minimize the potential for dust generation. The Subcontractor SSHO will conduct
2 daily inspections during representatively normal operating conditions as described in Section 5.4 and
3 the SSHP.

4 5 **10.4.4 Survey**

6
7 Upon completion of excavation and disposal activities, the Main Ditch will be surveyed to document
8 the vertical and horizontal extents of the removal activities. At a minimum, the survey will contain
9 the cross sections shown in Attachment C, Drawing C-5. An Ohio licensed surveyor will conduct a
10 survey of excavation extent to be included as as-built drawings in the Construction Report. The
11 horizontal and vertical survey tolerance will be ± 0.1 ft. The excavation coordinates are in Ohio State
12 NAD 83 ft.

13 14 **10.4.5 Site Restoration**

15
16 Once excavation activities have been completed and approved by the SAIC Construction Manager, in
17 conjunction with the USACE and Ohio EPA, excavation will be backfilled and graded to create the
18 original drainage pattern in the drainage ditch. The Subcontractor will submit data for materials to be
19 brought on site (e.g., backfill, topsoil) a minimum of 7 days calendar prior to placing materials.
20 USACE/SAIC will review material certifications for the backfill material, vegetative cover, and seed
21 in accordance with Section 7 and Attachment C, Drawing C-7. The Subcontractor will obtain and
22 apply the seeding mixture as prescribed within Section 8.5.

23 24 **10.5 SPILL RESPONSE**

25
26 Spills will be responded to as presented in Section 12.1.2 of the Facility-Wide Safety and Health Plan.
27 In the event of a spill or leak, the employee making the discovery will immediately notify the SSHO
28 and the SAIC Construction Manager. These spills can include, but are not limited to, releases of
29 fuels, lubricants, and hydraulic fluids. The SAIC Construction Manager will determine whether the
30 leak poses an environmental risk or will exceed the capacity of on-site personnel and equipment. In
31 the unlikely event that there is a probability that the spill will extend beyond the immediate area,
32 result in an environmental insult, or exceed the capabilities of the on-site personnel, the SAIC
33 Construction Manager will inform the local fire department and hazardous materials response team.
34 If this is not the case, the on-site spill kit will be utilized to clean up the spill.

35 36 **10.6 CONFIRMATION REQUIREMENTS**

37 38 **10.6.1 Confirmation Sampling**

39
40 Confirmation sampling will be performed in accordance with Section 7 of this RD and the Facility-
41 Wide SAP (USACE 2001a) to demonstrate achievement of the remedial cleanup goals. Confirmation
42 samples will be analyzed for arsenic concentrations at LL12 by an approved off-site analytical
43 laboratory.

1 **10.6.2 Verification of Achievement of Performance Criteria**

2
3 The SAIC Construction Manager will confirm the results meet the cleanup goals. The USACE COR
4 and Ohio EPA Project Coordinator will be notified of the evaluations and results. If any sample does
5 not meet the cleanup goals, the evaluation will include a description of the additional excavation
6 based on the approach described in Section 7.3. Confirmation sampling results will be included in the
7 Construction Report.

8
9 **10.7 DOCUMENTATION**

10
11 **10.7.1 Field Documentation**

12
13 This project will include daily inspection and quality summary reports, which will be signed and
14 dated by the SAIC Construction Manager. These reports will be submitted to the SAIC Project
15 Manager.

16
17 The daily reports may include:

- 18
19
- Summary of activities performed at the project site;
 - Daily Subcontractor Inspection activities (e.g., storm water controls, spill-control barriers,
21 equipment staging/fueling areas);
 - Weather information;
 - Departures from the approved RD;
 - Problems encountered during field activities;
 - Subcontractor submittals; and/or
 - Subcontractor certifications (e.g., health and safety records).
- 27

28 Copies of the construction activity forms, checklists and daily reports are included in Attachment D.

29
30 **10.7.2 Remedial Action Report**

31
32 Upon completion of remedial activities, a Construction Report will be prepared by SAIC. The
33 Construction Report will document:

- 34
- The project was performed in accordance with this RD (i.e., complied with requirements,
36 technical specifications, construction drawings, and other relevant contract documents), and
37 all applicable regulations, including surface water and air regulations;
 - Documentation of any approved field variances from this RD (e.g., unforeseen site condition,
40 change in material); and
 - Corrective actions and achievement of remedial goals.
- 42

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11.0 PROJECT SCHEDULE

Implementation of this RD will be contingent on its approval, and that of the Record of Decision for Soil and Dry Sediment at the Load Line 12 (RVAAP-12) at the Ravenna Army Ammunition Plant, Ravenna, Ohio (USACE 2009). The start date may change based on these approvals.

Generally, construction activities shall occur during daylight hours (i.e., 8:00 a.m. to 5:00 p.m.) on a 5-days per week schedule. Preparation of the Construction Report shall follow conclusion of site restoration activities. The anticipated project schedule is presented in Figure 11-1.

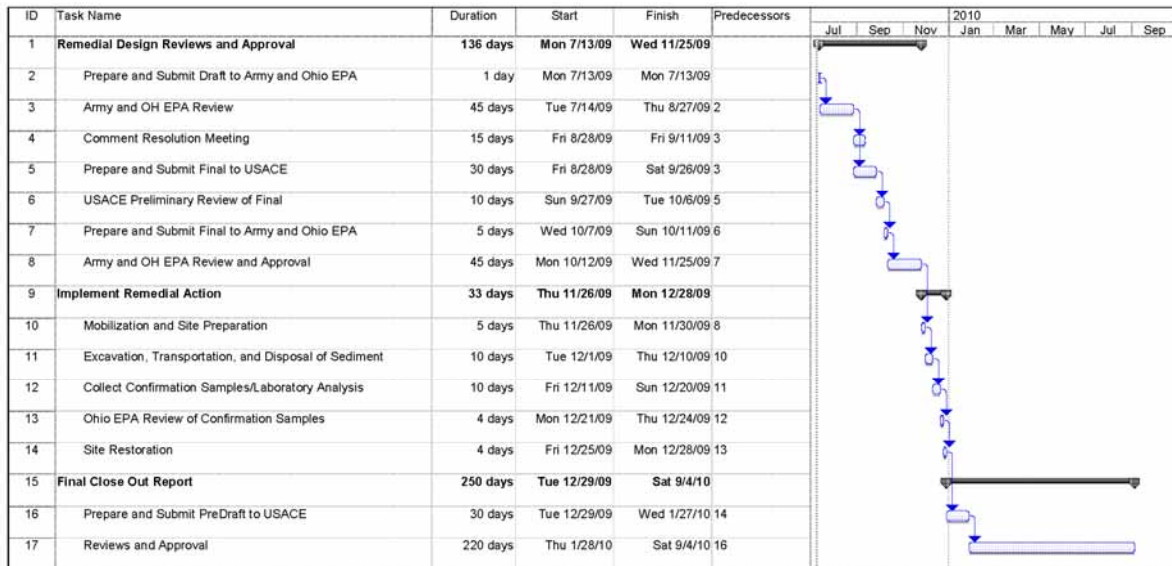


Figure 11-1. Project Schedule

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Attachment A

Site Safety and Health Plan for the Draft Remedial Design for RVAAP-12 Load Line 12

Ravenna Army Ammunition Plant,
Ravenna, Ohio

GSA Contract No. GS-10F-0076J
Delivery Order No. W912QR-05-F-0033

Prepared for:

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

Prepared by:

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July 13, 2009

APPROVALS

Draft

Site Safety and Health Plan
for the Remedial Design
for RVAAP-12 Load Line 12
at the
Ravenna Army Ammunition Plant,
Ravenna, Ohio

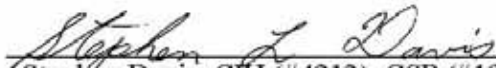
July 2009



July 8, 2009

Kevin Jago Phone 865-481-4614
SAIC Project Manager

Date



July 8, 2009

Stephen Davis, CIH (#4213), CSP (#10044), Phone 865-481-4755
SAIC Health and Safety Officer

Date

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ACRONYMS AND ABBREVIATIONS

1		
2		
3	ACGIH	American Conference of Governmental Industrial Hygienists
4	AOC	Area of Concern
5	Camp Ravenna	Camp Ravenna Joint Military Training Center
6	CIH	Certified Industrial Hygienist
7	COPC	Constituent of Potential Concern
8	CPR	Cardiopulmonary Resuscitation
9	CSP	Certified Safety Professional
10	EH&S	Environmental, Health and Safety
11	E&I	Engineering and Infrastructure
12	FBQ	Fuze and Booster Quarry
13	FS	Feasibility Study
14	FSHP	Facility Wide Safety and Health Plan
15	HAZWOPER	Hazardous Waste Operations and Emergency Response
16	H&S	Health and Safety
17	HTRW	Hazardous, Toxic, and Radioactive Waste
18	IDW	Investigation-Derived Waste
19	IRP	Installation Restoration Program
20	LL12	Load Line 12
21	MEC	Munitions and Explosives of Concern
22	MI	Multi-Increment
23	MSDS	Material Safety Data Sheet
24	NGB	National Guard Bureau
25	OE	Ordnance and Explosive
26	OEW	Ordnance and Explosive Waste
27	OHARNG	Ohio Army National Guard
28	Ohio EPA	Ohio Environmental Protection Agency
29	OJT	On-the-Job Training
30	OSHA	Occupational Safety and Health Administration
31	PCB	Polychlorinated Biphenyl
32	PID	Photoionization Detector
33	PPE	Personal Protective Equipment
34	ppm	parts per million
35	RA	Remedial Action
36	RI	Remedial Investigation
37	RRSE	Relative Risk Site Evaluation
38	RVAAP	Ravenna Army Ammunition Plant
39	SAIC	Science Applications International Corporation
40	SSHO	Site Safety and Health Officer
41	SSHP	Site Safety and Health Plan
42	TBD	To Be Determined
43	USACE	U.S. Army Corps of Engineers
44	UXO	Unexploded Ordnance

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1.0 INTRODUCTION

Science Applications International Corporation's (SAIC's) formal policy, stated in the Environmental, Health and Safety Program manual, is to take every reasonable precaution to protect the health and safety of our employees, the public, and the environment. To this end, the Ravenna Army Ammunition Plant (RVAAP) *Facility-Wide Safety and Health Plan* (FSHP) (USACE 2001) and this Site Safety and Health Plan (SSHP) collectively set forth the specific procedures required to protect SAIC and SAIC subcontractor personnel involved in the field activities. These plans are driven by requirements contained in the most current revisions of the U.S. Army Corps of Engineers (USACE) *Safety and Occupational Health Requirements for Hazardous, Toxic, and Radioactive Waste (HTRW) Activities*, ER-385-1-92, *Safety and Health Requirements for Munitions and Explosives of Concern*, EM-385-1-95, and the USACE *Safety and Health Manual*, EM-385-1-1, which are available online via the USACE web site. SAIC activities are also subject to the requirements of the SAIC Corporate Environmental, Health and Safety Program and associated procedures. In addition, subcontractors are responsible for providing their employees with a safe work place and nothing in these plans relieves such subcontractors of this responsibility. Subcontractors must have and use their own safety programs and plans in compliance with applicable regulations.

The FSHP addresses program issues and hazards and hazard controls common to the entire installation. This SSHP Addendum to the FSHP serves as the lower tier document addressing the hazards and controls specific to the Remedial Action (RA) at the Load Line 12 (LL12) (RVAAP-12). Copies of the FSHP and SSHP Addendum will be present at the work site during all fieldwork.

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2.0 FACILITY DESCRIPTION AND CONTAMINATION CHARACTERIZATION

2.1 FACILITY DESCRIPTION

When the RVAAP Installation Restoration Program (IRP) began in 1989, RVAAP was identified as a 21,419-acre installation. The property boundary was resurveyed by Ohio Army National Guard (OHARNG) over a 2-year period (2002 and 2003) and the total acreage of the property was found to be 21,683.289 acres. As of February 2006, a total of 20,403 acres of the former 21,683-acre RVAAP has been transferred to the National Guard Bureau (NGB) and subsequently licensed to OHARNG for use as a military training site.

The current RVAAP consists of 1,280 acres scattered throughout the OHARNG Camp Ravenna Joint Military Training Center (Camp Ravenna). Camp Ravenna is in northeastern Ohio within Portage and Trumbull Counties, approximately 4.8 km (3 miles) east-northeast of the City of Ravenna and approximately 1.6 km (1 mile) northwest of the City of Newton Falls. The RVAAP portions of the property are solely located within Portage County. RVAAP/Camp Ravenna is a parcel of property approximately 17.7 km (11 miles) long and 5.6 km (3.5 miles) wide bounded by State Route 5, the Michael J. Kirwan Reservoir, and the CSX System Railroad on the south; Garret, McCormick, and Berry roads on the west; the Norfolk Southern Railroad on the north; and State Route 534 on the east (Figure 1). Camp Ravenna is surrounded by several communities: Windham on the north; Garrettsville 9.6 km (6 miles) to the northwest; Newton Falls 1.6 km (1 mile) to the southeast; Charlestown to the southwest; and Wayland 4.8 km (3 miles) to the south.

When RVAAP was operational, Camp Ravenna did not exist and the entire 21,683-acre parcel was a government-owned, contractor-operated industrial facility. The RVAAP IRP encompasses investigation and cleanup of past activities over the entire 21,683 acres of the former RVAAP. References to RVAAP in this document are considered to be inclusive of the historical extent of RVAAP, which is inclusive of the combined acreages of the current Camp Ravenna and RVAAP, unless otherwise specifically stated.

The installation was active from 1941 to 1992. Activities included loading, assembling, storing, and packing military ammunition; demilitarization of munitions; production of ammonium nitrate fertilizer; and disposal of "off-spec" munitions. Various munitions were handled on the installation including artillery rounds of 90 mm or more and bombs up to 2,000 lbs.

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

1 **2.2 LOAD LINE 12 DESCRIPTION**
2

3 Load Line 12 covers about 80 acres in the southeastern portion of RVAAP. Load Line 12 was
4 originally known as the Ammonium Nitrate Plant and started operations on November 25, 1941.
5 Structures related to the production of the ammonium nitrate were the Neutral Liquor Building
6 (Building FF-19) and seven evaporation/crystallization units (Buildings 900, 901, 902, 903, 904, 905,
7 and 906). Other structures, such as Water Works No. 2 and Power House No. 3 (Building FE-17),
8 housed support operations. The western half of the LL12 contained former production areas. The
9 eastern half was previously cleared, but did not contain any known production facilities. The RIs also
10 identified an area immediately north of the LL12 (informally termed the Team Track Area) that was
11 apparently used for offloading and staging of materials used in Load Line 12 production activities.
12

13 In May 1943, production of ammonium nitrate was terminated. From 1946 to 1950, a private
14 contractor leased Load Line 12 to produce fertilizer-grade ammonium nitrate. From 1965 to 1967, a
15 private contractor leased Building FF-19 for the production of aluminum chloride. The U.S. Army
16 terminated the lease early due to environmental concerns related to air emissions and wastewater
17 discharges to Upper and Lower Cobbs Ponds.
18

19 In June 1944, Buildings 900, 904, and 905 were converted for demilitarization of munitions. Rinsate
20 from demilitarization operations was initially allowed to flow out of the buildings and directly onto
21 the ground or to drainage ditches. In 1981, the Load Line 12 Pink Water Treatment Plant was built to
22 treat the demilitarization effluent prior to discharge. After the termination of demilitarization
23 operations, the treatment plant was used under a National Pollutant Discharge Elimination System
24 permit to treat explosives-tainted storm water from Load Line 12 and other RVAAP locations.
25

26 Currently, there are no above-grade structures remaining at the LL12. Demolition of Buildings 901,
27 902, 906, and FF-19 took place between 1973 and 1975. Building FN-54 (bagging and shipping
28 facility) was demolished in the 1980s. In 1999, approximately 1,500 ft³ of soil was removed from
29 four pits near Building 904 and taken to a former warehouse at Load Line 4 as part of an explosives
30 composting pilot study. Demolition of all remaining structures took place between 1998 and 2000. A
31 former blast berm near Building 903 was removed and used as fill/groundcover for areas around
32 Buildings 903 and FE-17.
33

34 **2.3 PREVIOUS ACTIVITIES**
35

36 Previous investigations at LL12 include a Relative Risk Site Evaluation (RRSE); a Phase I and Phase
37 II Remedial Investigation (RI), which involved comprehensive sampling of soil, sediment,
38 groundwater, and surface water within the site to define the nature and extent of contamination at
39 LL12; a supplemental groundwater investigation; and a Feasibility Study (FS) to evaluate remedial
40 alternatives for LL12. No previous RAs have been conducted at LL12.

1 **2.4 PROJECT SCOPE**

2
3 The scope of the RA at LL12 is to remove dry sediment from a manmade ditch until the concentration
4 of arsenic is at or below the remedial cleanup goal of 31 mg/kg. To perform the scope outlined in the
5 remedial design, SAIC and subcontractors will perform the following tasks:

- 6
7
 - 8 • Site survey and utility clearance;
 - 9 • Mobilization (e.g., clearing and grubbing, installing rock, sandbag berm and storm water
10 controls);
 - 11 • Environmental multi-increment (MI) sampling of dry sediment within the ditch;
 - 12 • Excavation of dry sediment from the drainage ditch;
 - 13 • Transportation and disposal of contaminated dry sediment;
 - 14 • Confirmation MI sampling of dry sediment (to be accomplished remotely via excavation
15 bucket or other determined remote sampling method);
 - 16 • Survey of removal area;
 - 17 • Site restoration (e.g., grading, backfilling, compacting, seeding, and installation of storm
18 water controls); and
 - 19 • Demobilization.

20 Potential hazards posed by the planned tasks include injury from ordnance and explosives; lifting, and
21 strain hazards associated with operating soil sampling equipment; heavy equipment; noise;
22 excavation; excavation entry; fuel or decontamination solvent fires; chemical exposure; temperature
23 extremes; stinging/biting insects; poisonous plants; and snakes.

24
25 The potential for chemical overexposure appears to be very low, based on the nature of planned tasks
26 and review of available data. There is some potential for chemical exposures via the inhalation
27 pathway and dermal contact with contaminated dry sediment during sampling and excavation
28 activities. Potential airborne exposures will be visually monitored during sampling and excavation
29 activities. Sampling crews will use protective gloves to handle potentially contaminated materials,
30 and, if necessary, the Site Safety and Health Officer (SSHO) will upgrade the required personal
31 protective equipment (PPE) to prevent inhalation and/or dermal contact with potentially contaminated
32 materials. The SSHO will observe all site tasks during daily safety inspections and will use
33 professional judgment and appropriate monitoring results to determine if upgrading PPE is required.
34 A detailed analysis of these hazards and specific appropriate controls is presented in Table 3-2.

35
36 This remedial action will be performed in Level D PPE using chemical-resistant gloves when
37 handling potentially-contaminated materials. If one of several action levels is exceeded or the
38 potential for increased risk becomes apparent during the investigation, protective procedures,
39 including protective clothing, will be upgraded as necessary by the SSHO.

1 **2.5 CONTAMINANTS**

2
3 Table 2-1 lists constituents of potential concern (COPCs) and their respective maximum
4 concentrations detected in soil and dry sediment samples (discrete and MI) during previous remedial
5 investigations. Inclusion in this table indicates the potential to encounter a contaminant during the
6 remedial activities, but it does not necessarily indicate that the contaminant is present in sufficient
7 quantity to pose a health risk to workers.

8
9 **Table 2-1. LL12 Maximum Concentrations of Constituents of Potential Concern**

Analyte	Units	LL12 Maximum Detect
<i>Metals</i>		
Aluminum	mg/kg	197,000
Arsenic	mg/kg	418
Manganese	mg/kg	8700
<i>Organics-Explosives</i>		
2,4,6-Trinitrotoluene	mg/kg	1400
2,6-Dinitrotoluene	mg/kg	1.7
RDX	mg/kg	21
<i>PCBs</i>		
Aroclor-1016	mg/kg	3.3
Aroclor-1254	mg/kg	11
Aroclor-1260	mg/kg	8.2
<i>Organics-Semi-Volatile</i>		
Benz(a)anthracene	mg/kg	28
Benzo(a)pyrene	mg/kg	24
Benzo(b)fluoranthene	mg/kg	27
Dibenz(a,h)anthracene	mg/kg	3.2
Indeno(1,2,3-cd)pyrene	mg/kg	13

Data is from *Phase I and II Remedial Investigation Reports for Load Line 12 (RVAAP-12)*. Ravenna Army Ammunition Plant, Ravenna, Ohio. Delivery Order W912QR-05-F-0033, February 1998 and March 2004, and *Final Feasibility Study for Load Line 12 at Ravenna Army Ammunition Plant in Ravenna, Ohio*. March 2006.

Airborne contaminant concentration calculations were conducted using the maximum detected concentration. Results indicated that concentrations were too low to represent an airborne exposure health risk.

PCBs = Polychlorinated Biphenyls

3.0 HAZARD/RISK ANALYSIS

The purpose of the task hazard/risk analysis is to identify and assess potential hazards that may be encountered by personnel, and to prescribe required controls. Table 3-1, a general checklist of hazards that may be posed by this project, indicates whether a particular type of hazard is present. If additional tasks or significant hazards are identified during the work, this document will be modified by addendum or field change order to include the additional information.

Table 3-1. Hazards Inventory

Yes	No	Hazard
	X	Confined space entry
X		Excavation entry (excavation will be entered by subcontractor only)
X		Heavy equipment (drill rigs, backhoe)
X		Fire and explosion (fuels)
X		Electrical shock (utilities and tools)
X		Exposure to chemicals (contaminants and chemical tools)
X		Temperature extremes
X		Biological hazards (poison ivy, Lyme disease, West Nile disease)
	X	Radiation or radioactive contamination
X		Noise (excavation equipment, powered auger, drill rig)
X		Drowning
X		OE (potential to encounter unexploded ordnance)

OE = ordnance and explosives

Specific tasks are as follows:

- Excavation using heavy equipment performed by the Subcontractor;
- Remote dry sediment sampling performed by SAIC (potentially utilizing the excavator bucket);
- Vegetation clearing with chainsaws, machetes, and sling blades, as required, performed by the Subcontractor;
- Surveying performed by the Subcontractor;
- Investigation-derived waste handling and disposition performed by the Subcontractor; and
- Equipment decontamination performed by both SAIC and the Subcontractor.

3.1 POTENTIAL EXPOSURES

Prior sampling results indicate that the primary contaminant of concern at LL12 is arsenic. Table 3-2 contains information on the potential contaminant, as well as the reagents and chemicals that will be used for the project. It is important to note that the contaminants listed in Table 3-2 have been detected at a number of locations at RVAAP and might be expected to occur at any former operations

1 area. Exposure to chemical tools, such as corrosive sample preservatives, field laboratory reagents, or
2 flammable fuels is a possibility and will be controlled through standard safe handling practices.

3

4 **3.2 TASK-SPECIFIC HAZARD ANALYSIS**

5

6 Table 3-3 presents task-specific hazards, relevant hazard controls, and required monitoring, if
7 appropriate, for all of the planned tasks.

Table 3-2. Potential Exposures

Chemical^a	TLV/PEL/STEL/IDLH^b	Health Effects/ Potential Hazards^c	Chemical and Physical Properties^c	Exposure Route(s)^c
Arsenic	TLV/TWA: 0.005 mg/m ³ , A3 PEL/TWA: 0.010 mg/m ³ IDLH: 5 mg/m ³	Potential carcinogen per NIOSH, ulceration of nasal septum, dermatitis, gastrointestinal disturbances, peripheral neuropathy, respiratory irritation,	Silver-gray or tin-white, brittle, odorless solid FP: NA; IP: NA	Inhalation Absorption Ingestion Contact
Gasoline (used for fuel)	TLV/TWA: 300 ppm, A2 IDLH: Ca	Potential carcinogen per NIOSH, dizziness, eye irritation, dermatitis	Liquid with aromatic odor; FP: -45°F; VP: 38-300 mm UEL: 7.6% LEL: 1.4%	Inhalation Ingestion Absorption Contact
Hydrochloric acid (potentially used to preserve water samples or for equipment decontamination)	TLV: 5 ppm ceiling IDLH: 50 ppm	Irritation of eyes, skin, respiratory system	Liquid; VP: fuming; IP: 12.74 eV; FP: none	Inhalation Ingestion Contact
Liquinox (used for decontamination)	TLV/TWA: None	Inhalation may cause local irritation to mucus membranes	Yellow odorless liquid (biodegradable cleaner); FP: NA	Inhalation Ingestion
Methanol (potentially used for equipment decontamination)	TLV/TWA: 200 ppm Skin notation IDLH: 6000 ppm	Irritation of eyes, skin, respiratory system; headache; optic nerve damage	Liquid; VP: 96 mm; IP: 10.84 eV; FP: 52°F UEL: 36% LEL: 6.0 %	Inhalation Absorption Ingestion Contact

^aThe potential chemicals were obtained from the *Phase I and Phase II Remedial Investigation Reports* for LL12 (USACE 1998, 2004).

^bFrom 2008 Threshold Limit Values, *American Conference of Governmental Industrial Hygienists*.

^cFrom *NIOSH Guide to Chemical Hazards* web site.

A2 = suspected human carcinogen.

A3 = not classifiable as a human carcinogen.

Ca = potential occupational carcinogen.

eV = electron volts

FP = flash point

IDLH = immediately dangerous to life and health

IP = ionization potential

LEL = lower explosive limit

mm = millimeters

NA = not applicable

NIOSH = National Institute for Occupational Safety and Health.

PEL = permissible exposure limit.

ppm = parts per million

STEL = short-term exposure limit

TLV = threshold limit value

TWA = time-weighted average

UEL = upper explosive limit

VP = vapor pressure

Table 3-3. Hazards Analysis

Safety and Health Hazards	Controls	Monitoring Requirements
<i>Civil Surveys and Visual Surveys in Potentially Contaminated Areas</i>		
General safety hazards (moving equipment, slips, falls)	Level D PPE: long pants, shirts with sleeves, safety glasses, safety shoes or boots, and hard hats if overhead hazards are present (see Section 5.0 of the FSHP). Site-specific training, buddy system, proper housekeeping.	Daily safety inspections
Excavation Entry	Contractor will have an excavation competent person on-site per OSHA Excavation Standard 29 CFR 1926 subpart P. The excavation competent person will observe all site tasks during daily safety inspections and will use professional judgment and appropriate monitoring results to determine if excavation work is safe. The excavation competent person shall not at any time enter the excavation. Contractor personnel who enter the excavation shall follow OSHA Excavation Standard 29 CFR 1926 subpart P.	Daily safety inspections and visual surveys
Contact with OE	Pre-entry screening survey and continuous escort by OE specialist support following requirements of <i>Safety and Health Requirements for Munitions and Explosives of Concern (MEC)</i> , ER-385-1-95. On-site training in ordnance recognition for all field personnel. Withdrawal of all SAIC and subcontractor personnel from immediate area and field marking of suspect area if ordnance or suspected ordnance is discovered	Visual and instrument surveys for ordnance conducted by OE expert personnel
Exposure to chemicals	Nitrile or similar gloves for contact with potentially contaminated material. Gloves will be disposed after single use. Wash face and hands and any other exposed areas prior to taking anything by mouth. Hazardous waste site operations training and medical clearance. Site training must include hazards and controls for exposure to site contaminants and chemicals used on-site. MSDSs on-site. All chemical containers labeled to indicate contents and hazard.	None
Biological hazards (bees, ticks, Lyme disease, histoplasmosis, wasps, snakes, West Nile Virus)	PPE (boots, work clothes). Insect repellent on boots, pants, and elsewhere, as necessary, to repel ticks and mosquitoes. Pant legs tucked into boots or otherwise closed to minimize tick entry. Inspect for ticks during the day and at the end of each workday (see Section 9.0 of FSHP). Avoidance of accumulations of bird or bat droppings (see Section 9.0 of FSHP).	Visual survey

Table 3-3. Hazards Analysis (continued)

Safety and Health Hazards	Controls	Monitoring Requirements
Vehicle accidents	Compliance with E2I EH&S Procedure 110 "Vehicle Operation" to include verification of current drivers licenses, use of seat belts when vehicle is in motion, daily (undocumented) vehicle safety inspection, compliance with applicable laws and regulations, and defensive driving.	Verification of valid drivers licenses by FM
Temperature extremes	Administrative controls (see Section 8.0 of FSHP). Cooled (shaded) or warmed break area depending on the season. Routine breaks in established break area (see Section 8.0 of FSHP). Chilled drinks if temperature exceeds 70°F and warm drinks if temperature is below 50°F	Temperature measurements at least twice daily. Pulse rates at the start of each break if wearing impermeable clothing
Severe weather	Locate nearest severe weather shelter/strong structure before beginning fieldwork. Suspend fieldwork if lightning within 10 miles of site or tornado warning issued. Do not work in areas subject to flash flooding (arroyo, ditch, etc.) if rain is forecast in immediate area or upstream of site.	Visual observation for lightning, strong winds, or heavy rain. Check forecast prior to starting work daily.
Drowning	When possible, the water in the ditch will be released or pumped to a Frac Tank when accumulation poses a potential drowning hazard. Personal flotation device will be worn when working within 6 feet of water deeper than 3 feet.	The water depth in the ditch will be monitored.
<i>Dry Sediment Sampling Using Hand Augers or Scoops</i>		
General safety hazards (manual lifting, slips, falls)	Level D PPE: long pants, shirts with sleeves, safety boots, safety glasses, and work gloves for manual work (see Section 5.0 of FSHP). Buddy system. Site-specific training. Proper housekeeping.	Daily site safety inspections
Excavation Entry	Contractor will have an excavation competent person on-site per OSHA Excavation Standard 29 CFR 1926 subpart P. The excavation competent person will observe all site tasks during daily safety inspections and will use professional judgment and appropriate monitoring results to determine if excavation work is safe. The excavation competent person shall not at any time enter the excavation. Contractor personnel who enter the excavation shall follow OSHA Excavation Standard 29 CFR 1926 subpart P.	Daily safety inspections and visual surveys

Table 3-3. Hazards Analysis (continued)

Safety and Health Hazards	Controls	Monitoring Requirements
Contact with OE	On-site training in ordnance recognition for all field personnel. Clearance of sites by OE personnel for intrusive work. Continuous escort by OE personnel when in areas with potential to encounter OE. Withdrawal of all non-OE personnel if ordnance or suspected ordnance is discovered. Sampling of stations having known or suspected (i.e., red soil or raw product) explosives >10% (100,000 mg/kg) to be performed by OE technicians following applicable OE safety requirements.	Visual and instrument surveys by OE technicians following requirements of, <i>Safety and Health Requirements for Munitions and Explosives of Concern (MEC) ER-385-1-95</i>
Exposure to chemicals	Level D PPE plus nitrile or equivalent gloves for contact with contaminated material. Wash face and hands prior to taking anything by mouth. Stay upwind of any dust-generating activities. Dust suppression techniques (such as wetting area) as required. Hazardous waste site operations training and medical clearance. Site training must include hazards and controls for site contaminants and all chemicals used on-site. MSDSs for chemical tools on-site. Chemical containers labeled to indicate contents and hazard.	Visual observations for dust during dry sediment sampling activities
Temperature extremes	Administrative controls (see Section 8.0 of FSHP). Cooled (shaded) or warmed break area depending on the season. Routine breaks in established break area (see Section 8.0 of FSHP). Chilled drinks if temperature exceeds 70°F and warm drinks if temperature is below 50°F.	Temperature measurements at least twice daily. Pulse rates at the start of each break if wearing impermeable clothing
Severe weather	Locate nearest severe weather shelter/strong structure before beginning fieldwork. Suspend fieldwork if lightning within 10 miles of site or tornado warning issued. Do not work in areas subject to flash flooding (arroyo, ditch, etc.) if rain is forecast in immediate area or upstream of site.	Visual observation for lightning, strong winds, or heavy rain. Check forecast prior to starting work daily
Vehicle accidents	Compliance with E2I EH&S Procedure 110 “Vehicle Operation” to include verification of current drivers licenses, use of seat belts when vehicle is in motion, daily (undocumented) vehicle safety inspection, compliance with applicable laws and regulations, and defensive driving.	Verification of valid drivers licenses by FM
Lifting injuries	Compliance with E2I EH&S Procedure 150 “Manual Lifting” to limiting individual lifts by SAIC personnel to 50 pounds	Verification/observation of lifting by SAIC personnel by FM

Table 3-3. Hazards Analysis (continued)

Safety and Health Hazards	Controls	Monitoring Requirements
Biological hazards (bees, ticks, Lyme disease, histoplasmosis, wasps, snakes, West Nile Virus)	PPE (boots, work clothes). Insect repellent on boots, pants, and elsewhere, as necessary, to repel ticks and mosquitoes. Pant legs tucked into boots or otherwise closed to minimize tick entry. Snake chaps if working in overgrown areas. Inspect for ticks during the day and at the end of each workday (see Section 9.0 of FSHP). Avoidance of accumulations of bird or bat droppings (see Section 9.0 of FSHP).	Visual survey
Drowning	When possible, the water in the ditch will be released or pumped to a Frac Tank when accumulation poses a potential drowning hazard. Personal flotation device will be worn when working within 6 feet of water deeper than 3 feet.	The water depth in the ditch will be monitored.
<i>Vegetation Clearing with Chainsaws, Machetes, Sling Blades and Heavy Equipment</i>		
General safety hazards (contact with sharp edges, slips, falls)	Level D PPE: long pants, shirts with sleeves, safety boots, safety glasses, plus heavy-duty work gloves and hard hat (see Section 5.0 of FSHP). Buddy system. Site-specific training. Proper housekeeping. Only experienced operators. Personnel operating brush-clearing tools must maintain separation of at least 15 ft. Machetes equipped with lanyard and lanyard looped around wrist. Tools must be inspected daily and taken out of service if damaged. Exclusion zone if there is a potential for entry of unauthorized personnel.	Daily site safety inspections
Excavation Entry	Contractor will have an excavation competent person on-site per OSHA Excavation Standard 29 CFR 1926 subpart P. The excavation competent person will observe all site tasks during daily safety inspections and will use professional judgment and appropriate monitoring results to determine if excavation work is safe. The excavation competent person shall not at any time enter the excavation. Contractor personnel who enter the excavation shall follow OSHA Excavation Standard 29 CFR 1926 subpart P.	Daily safety inspections and visual surveys
Chainsaw kickback and related hazards	Chainsaw chaps and face shield as additional PPE. Saws must have automatic chain brake or kickback device. Idle speed adjusted so chain does not move when idling. Only experienced operators may use chainsaw. Saws must not be used to cut above shoulder height. Saws must be held with both hands when operating. Additional requirements at 385-1-1 Section 31.	Daily inspection
Noise (chainsaw)	Hearing protection \geq NRR 25 within 7.6 m (25 ft) of operating chainsaw or heavy equipment unless specific monitoring indicates noise exposure of less than 85 dBA	Daily safety inspections

Table 3-3. Hazards Analysis (continued)

Safety and Health Hazards	Controls	Monitoring Requirements
Fire (fuels)	Fuels stored in safety cans with flame arrestors. Bonding (metal to metal) and grounding during fuel transfers. Fuel storage areas marked with no smoking or open flames signs. Fire extinguishers in all fuel use areas. Gasoline-powered equipment turned off and allowed to cool for at least 5 min prior to fueling.	Daily safety inspection
Contact with OE	On-site training in ordnance recognition for all field personnel. Clearance of sites by OE personnel for intrusive work. Escort by OE personnel when in areas with potential to encounter OE. Withdrawal of all non-OE personnel if ordnance or suspected ordnance is discovered.	Visual and instrument surveys by OE technicians following requirements of <i>Safety and Health Requirements for Munitions and Explosives of Concern (MEC)</i> , ER-385-1-95
Exposure to chemicals	Level D PPE plus nitrile or equivalent gloves for contact with contaminated material. Wash face and hands prior to taking anything by mouth. Hazardous waste site operations training and medical clearance. Site training must include the hazards and appropriate controls for site contaminants and chemicals to be used or stored on-site. Chemical containers labeled to indicate contents and hazard. Medical clearance for hazardous waste work.	Visual observations for dust during vegetation clearing activities and daily safety inspection.
Temperature extremes	Administrative controls (see Section 8.0 of FSHP). Cooled (shaded) or warmed break area depending on the season. Routine breaks in established break area (see Section 8.0 of FSHP). Chilled drinks if temperature exceeds 70°F and warm drinks if temperature is below 50°F.	Temperature measurements at least twice per day. Pulse rates at the start of each break if wearing impermeable clothing
Severe weather	Locate nearest severe weather shelter/strong structure before beginning fieldwork. Suspend fieldwork if lightning within 10 miles of site or tornado warning issued. Do not work in areas subject to flash flooding (arroyo, ditch, etc.) if rain is forecast in immediate area or upstream of site.	Visual observation for lightning, strong winds, or heavy rain. Check forecast prior to starting work daily
Vehicle accidents	Compliance with E2I EH&S Procedure 110 “Vehicle Operation” to include verification of current drivers licenses, use of seat belts when vehicle is in motion, daily (undocumented) vehicle safety inspection, compliance with applicable laws and regulations, and defensive driving.	Verification of valid drivers licenses by FM
Lifting injuries	Compliance with E2I EH&S Procedure 150 “Manual Lifting” to limiting individual lifts by SAIC personnel to 50 pounds.	Verification/observation of lifting by SAIC personnel by FM.

Table 3-3. Hazards Analysis (continued)

Safety and Health Hazards	Controls	Monitoring Requirements
Biological hazards (bees, ticks, Lyme disease, histoplasmosis, wasps, snakes, West Nile Virus)	PPE (boots, work clothes). Insect repellent on boots, pants, and elsewhere, as necessary, to repel ticks and mosquitoes. Pant legs tucked into boots or otherwise closed to minimize potential for tick entry. Snake chaps if working in overgrown areas. Inspect for ticks during the day and at the end of each workday (see Section 9.0 of FSHP). Avoidance of accumulations of bird or bat droppings (see Section 9.0 of FSHP).	Visual survey
<i>Investigation-Derived Waste Handling</i>		
General hazards (lifting equipment, manual lifting, slips)	Level D PPE: long pants, shirts with sleeves, safety glasses, safety shoes or boots, heavy-duty gloves for materials handling, and hard hat if overhead hazards are present (see Section 5.0 of FSHP). Buddy system. Site-specific training. Proper housekeeping. Unnecessary personnel will stay well clear of operating equipment. Functional back-up alarm on fork trucks, Bobcats, trucks. Ravenna O&M contractor personnel will provide any required fork truck services in the IDW staging area (Building 1036). IDW movement from field sites to Building 1036 will be conducted by the drilling subcontractor using a backhoe equipped with forks and drum dollies. No personnel allowed under lifted loads. Lifts of greater than 50 lbs will be made with two or more personnel or with lifting equipment. Hazardous waste safety training. Compliance with EM 385-1-1 Sections 14 and 16.	Daily safety inspections of operations. Daily inspection of equipment to verify brakes and operating systems are in proper working condition
Excavation Entry	Contractor will have an excavation competent person on-site per OSHA Excavation Standard 29 CFR 1926 subpart P. The excavation competent person will observe all site tasks during daily safety inspections and will use professional judgment and appropriate monitoring results to determine if excavation work is safe. The excavation competent person shall not at any time enter the excavation. Contractor personnel who enter the excavation shall follow OSHA Excavation Standard 29 CFR 1926 subpart P.	Daily safety inspections and visual surveys
Contact with OE	On-site training in ordnance recognition for all field personnel. Clearance of sites by OE personnel for intrusive work. Continuous escort by OE personnel if working in areas with potential for OE. Withdrawal of all non-OE personnel if ordnance or suspected ordnance is discovered.	Visual and instrument surveys by OE technicians following requirements of <i>Safety and Health Requirements for Munitions and Explosives of Concern (MEC)</i> , ER-385-1-95

Table 3-3. Hazards Analysis (continued)

Safety and Health Hazards	Controls	Monitoring Requirements
Exposure to chemicals	Level D PPE plus nitrile or equivalent gloves for contact with contaminated material. Wash face and hands prior to taking anything by mouth. Hazardous waste site operations training and medical clearance. Site training must include hazards and controls for exposure to site contaminants and chemicals used on-site.	Daily safety inspections
Vehicle accidents	Compliance with E2I EH&S Procedure 110 “Vehicle Operation” to include verification of current drivers licenses, use of seat belts when vehicle is in motion, daily (undocumented) vehicle safety inspection, compliance with applicable laws and regulations, and defensive driving.	Verification of valid drivers licenses by FM
Lifting injuries	Compliance with E2I EH&S Procedure 150 “Manual Lifting” to limiting individual lifts by SAIC personnel to 50 pounds.	Verification/observation of lifting by SAIC personnel by FM
Fire (vehicle fuels and flammable contaminants)	Fuels stored in safety cans with flame arrestors. Bonding (metal to metal) and grounding during fuel transfers. Fuel storage areas marked with no smoking or open flames signs. Gasoline-powered equipment will be shut down and allowed to cool for 5 min before fueling. Fire extinguishers in all fuel use areas.	Daily safety inspection
Noise	Hearing protection within 7.6 m (25 ft) of any noisy drum moving equipment unless equipment-specific monitoring indicates exposures less than 85 dBA.	Daily safety inspections
Biological hazards (bees, ticks, Lyme disease, histoplasmosis, wasps, snakes, West Nile Virus)	PPE (boots, work clothes). Insect repellent on pants, boots, and elsewhere, as necessary, to repel ticks and mosquitoes. Pant legs tucked into boots or otherwise closed to minimize tick entry. Snake chaps if working in overgrown areas. Inspect for ticks during the day and at the end of each workday (see Section 9.0 of FSHP). Avoidance of accumulations of bird or bat droppings (see Section 9.0 of FSHP).	Visual survey
Electric shock	Identification and clearance of overhead utilities. GFCI for all electrical hand tools.	Visual survey of all work areas
Temperature extremes	Administrative controls (see Section 8.0 of FSHP). Cooled (shaded) or warmed break area depending on the season. Routine breaks in established break area (see Section 8.0 of FSHP). Chilled drinks if temperature exceeds 70°F and warm drinks if temperature is below 50°F.	Temperature measurements at least twice daily. Pulse rates at the start of each break if wearing impermeable clothing

Table 3-3. Hazards Analysis (continued)

Safety and Health Hazards	Controls	Monitoring Requirements
Severe weather	Locate nearest severe weather shelter/strong structure before beginning fieldwork. Suspend fieldwork if lightning within 10 miles of site or tornado warning issued. Do not work in areas subject to flash flooding (arroyo, ditch, etc.) if rain is forecast in immediate area or upstream of site.	Visual observation for lightning, strong winds, or heavy rain. Check forecast prior to starting work daily
<i>Equipment Decontamination (Water Washing)</i>		
General equipment decontamination hazards (water, slips, falls, equipment handling)	Level D PPE plus nitrile or PVC gloves (see Section 5.0 of FSHP). Face shield and Saranax or rain suit when operating steam washer. Site-specific training. Proper housekeeping.	Daily safety inspections
Noise (spray washer)	Hearing protection when washer is operating unless equipment-specific monitoring indicates that exposure is less than 85 dBA.	None
Exposure to chemicals	Level D PPE plus nitrile or equivalent gloves for contact with contaminated material. Wash face and hands prior to taking anything by mouth. Minimal contact. Hazardous waste site operations training and medical clearance. Site training must include hazards and controls for exposure to site contaminants and chemicals used on-site. MSDSs on-site. All chemical containers labeled to indicate contents and hazard.	None
Electric shock	Portable electrical hand tools and equipment must be connected through functional GFCIs.	Verification by FM
Vehicle accidents	Compliance with E2I EH&S Procedure 110 "Vehicle Operation" to include verification of current drivers licenses, use of seat belts when vehicle is in motion, daily (undocumented) vehicle safety inspection, compliance with applicable laws and regulations, and defensive driving.	Verification of valid drivers licenses by FM
Lifting injuries	Compliance with E2I EH&S Procedure 150 "Manual Lifting" to limiting individual lifts by SAIC personnel to 50 pounds.	Verification/observation of lifting by SAIC personnel by FM
Temperature extremes	Administrative controls (see Section 8.0 of FSHP). Cooled (shaded) or warmed break area depending on the season. Routine breaks in established break area (see Section 8.0 of FSHP). Chilled drinks if temperature exceeds 70 ⁰ F and warm drinks if temperature is below 50 ⁰ F.	Temperature measurements at least twice a day. Pulse rates at the start of each break if wearing impermeable clothing

Table 3-3. Hazards Analysis (continued)

Safety and Health Hazards	Controls	Monitoring Requirements
Severe weather	Locate nearest severe weather shelter/strong structure before beginning fieldwork. Suspend fieldwork if lightning within 10 miles of site or tornado warning issued. Do not work in areas subject to flash flooding (arroyo, ditch, etc.) if rain is forecast in immediate area or upstream of site.	Visual observation for lightning, strong winds, or heavy rain. Check forecast prior to starting work daily

Table 3-3. Hazards Analysis (continued)

Safety and Health Hazards	Controls	Monitoring Requirements
<i>Site Preparation, Excavation, Truck Loading, and Site Restoration using Heavy Equipment</i>		
General Safety hazards associated with excavation equipment	<p>Excavation subcontractor must have and operate their own safety programs, procedures, and practices. Excavation subcontractor will develop and implement procedures pertaining to excavation safety and subsurface asset and hazard avoidance. SAIC will review these procedures and ensure they are at least as protective as SAIC’s E2I EH&S Procedure 130 “Subsurface Asset and Hazard Avoidance” and Procedure 160 “Excavation Safety”. Compliance with E2I EH&S Procedure 130 “Subsurface Asset and Hazard Avoidance” will be conducted prior to excavation activities to prevent contact with buried utilities and or OE. Compliance with E2I EH&S Procedure 160 “Excavation Safety” will include a subcontractor excavation competent person, documented review of Procedure 160 by SAIC FM, daily inspection of excavation, no entry in trenches deeper than 4 feet without additional controls.</p> <p>Unnecessary personnel will stay well clear of operating equipment. Functional back-up alarm. Exclusion zone around excavation areas. Only experienced operators will be allowed to operate equipment. Hazardous waste safety training. Level D PPE including hardhat (see Section 5.0).</p>	<p>Daily safety inspections of operations.</p> <p>Initial and at least weekly inspections of excavation equipment</p>
Excavation Entry	<p>Contractor will have an excavation competent person on site per OSHA Excavation Standard 29 CFR 1926 subpart P. The excavation competent person will observe all site tasks during daily safety inspections and will use professional judgment and appropriate monitoring results to determine if excavation work is safe. The excavation competent person shall not at any time enter the excavation. Subcontractor personnel who enter the excavation shall follow OSHA Excavation Standard 29 CFR 1926 subpart P.</p>	<p>Daily safety inspections and visual surveys.</p>
Contact with OE	<p>Pre-entry screening survey and continuous escort by OE specialist support following requirements of <i>Safety and Health Requirements for Munitions and Explosives of Concern (MEC)</i>, ER-385-1-95. On-site training in ordnance recognition for all field personnel. Withdrawal of all SAIC and subcontractor personnel from immediate area and field marking of suspect area if ordnance or suspected ordnance is discovered</p>	<p>Visual surveys for ordnance conducted by OE expert personnel</p>

Table 3-3. Hazards Analysis (continued)

Safety and Health Hazards	Controls	Monitoring Requirements
Fire (vehicle fuels and flammable contaminants)	Fuels stored in safety cans with flame arrestors. Bonding and grounding during fuel transfers. Fuel storage areas marked with no smoking or open flames signs. Fire extinguishers in all fuel use areas.	Daily safety inspection. Combustible gas indicator if buried organic material or other source of flammable gas suspected
Noise	Hearing protection within 7.6 meters (25 feet) of backhoe or similar equipment unless equipment-specific monitoring indicates exposures less than 90 decibels.	Daily safety inspections
Exposure to chemicals	PPE (Level D) plus nitrile or equivalent gloves for contact with contaminated material. Washing face and hands prior to taking anything by mouth. Dust suppression techniques (such as wetting area) as required. Staying upwind of any dust-generating activities. Work stoppage or increased PPE during periods of high-winds. Minimal contact. Hazard communication training. MSDS for chemical tools on site. Chemical containers labeled to indicate contents and hazard. Medical clearance for hazardous waste work. Decontamination of potentially contaminated equipment prior to servicing.	Visual observations for dust during dry sediment removal activities
Biological hazards (bees, ticks, Lyme disease, histoplasmosis, wasps, snakes)	PPE (boots, work clothes). Insect repellent, as necessary. Pant legs tucked into boots or otherwise closed to minimize tick entry. Inspect for ticks during the day and at the end of each work day (See Section 9.0). Avoidance of accumulations of bird or bat droppings (See Section 9.0).	Visual survey
Electric shock	Identification and clearance of overhead and underground utilities per E2I EH&S Procedure 130.	Visual of all work areas.
Temperature extremes	Administrative controls (see Section 8.0). Cooled (shaded) or warmed break area depending on the season. Routine breaks in established break area (See Section 8.0). Chilled drinks if temperature exceeds 70 ⁰ F and warm drinks if temperature is below 50 ⁰ F.	Temperature measurements at least twice daily. Pulse rates at the start of each break if wearing impermeable clothing.
Severe weather	Locate nearest severe weather shelter/strong structure before beginning fieldwork. Suspend fieldwork if lightning within 10 miles of site or tornado warning issued. Do not work in areas subject to flash flooding (arroyo, ditch, etc.) if rain is forecast in immediate area or upstream of site.	Visual observation for lightning, strong winds, or heavy rain. Check forecast prior to starting work daily.

Table 3-3. Hazards Analysis (continued)

Safety and Health Hazards	Controls	Monitoring Requirements
Drowning	When possible, the water in the ditch will be released or pumped to a Frac Tank when accumulation poses a potential drowning hazard. Personal flotation device will be worn when working within 6 feet of water deeper than 3 feet.	The water depth in the ditch will be monitored.

E2I = Energy, Environment, & Infrastructure Business Unit
 EH&S = Environmental, Health and Safety
 FM = Field Manager
 FSHP = Facility Wide Safety and Health Plan
 GFCI = ground-fault circuit interrupter
 IDW = investigation-derived waste

MSDS = Material Safety Data Sheet
 NRR= Noise Reduction Rating
 OE = ordinance and explosives
 O&M = operations and maintenance
 PID= photoionization detector
 PPE = personal protective equipment

PVC = polyvinyl chloride
 RVAAP = Ravenna Army Ammunition Plant
 SAIC = Science Applications International Corporation
 UXO = unexploded ordnance

1 **4.0 STAFF ORGANIZATION, QUALIFICATIONS, AND**
2 **RESPONSIBILITIES**

3
4 This Section presents the personnel (and their associated telephone numbers) responsible for site
5 safety and health and emergency response. Table 4-1 identifies the SAIC and subcontractor staff who
6 will fill key roles. See the FSHP for information on the roles and responsibilities of key positions.

7
8 **Table 4-1. Staff Organization**

Position	Name	Phone
SAIC Health and Safety Manager	Steve Davis CIH, CSP	(865)481-4755
SAIC Project Manager	Kevin Jago	(865)481-4614
SAIC Construction Manager	Jed Thomas	(330)405-5802
Subcontractor Construction Supervisor	TBD	
Subcontractor Site Safety and Health Officer ¹	TBD	
MEC Avoidance Subcontractor	TBD	

9 ¹ Subcontractor Site Safety and Health Officer will be SSHO for all remedial activities.
10 CIH= Certified Industrial Hygienist
11 CSP = Certified Safety Professional
12 MEC = munitions and explosives of concern

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1 **5.0 TRAINING**

2
3
4

Training requirements, from Section 4.0 of the FSHP, are summarized in Table 5-1 and in Table 3-2.

5

Table 5-1. Training Requirements

Training	Worker	Supervisor	Site Visitor (exclusion zone)
HAZWOPER (40-hr, 3-day OJT)	√	√	√
HAZWOPER Annual Refresher (8 hr)	√	√	√
HAZWOPER Supervisors Training (8 hr)		√	
CPR and First Aid Training	√	√	
General Hazard Communication Training	√	√	√
Respiratory Protection Training (required only if respirators are worn)	√	√	√
Hearing Conservation Training (for workers in hearing conservation program)	√	√	√
Pre-entry Briefing	√	√	√
Site-Specific Hazard Communication (contained in pre-entry briefing)	√	√	√
Safety Briefing (daily and whenever conditions or tasks change)	√	√	√
Equipment-Specific Training (Equipment Operators)	√		
OSHA Excavation Competent Person Training		√	

6
7
8
9
10

- √ = required.
- HAZWOPER = Hazardous Waste Site Operations and Emergency Response.
- OJT = on-the-job training.
- OSHA = Occupational Safety and Health Administration
- CPR = Cardio Pulmonary Resuscitation

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1 **6.0 PERSONAL PROTECTIVE EQUIPMENT**

2

3 General guidelines for selection and use of PPE are presented in the FSHP. Specific PPE
4 requirements for this work are presented in the hazard/risk analysis section (Section 3.0).

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7.0 MEDICAL SURVEILLANCE

Medical surveillance requirements, as presented in Section 6.0 of the FSHP, are summarized in Table 7-1.

Table 7-1. Medical Surveillance Requirements

Baseline	Routine	Overexposure	Termination
Prior to work assessment	Every 12 months, unless greater frequency is deemed appropriate by attending physician. Not to exceed 2-year interval	Upon developing symptoms or where exposure limits have been exceeded or suspected to have been exceeded	Upon termination or re-assignment

All medical exams shall include (see Section 6.2 of the Facility Wide Safety and Health Plan):

- Medical/work history;
- Physical exam by physician;
- Audiometry;
- Blood screening and blood count;
- Chest x-ray, as specified by physician;
- Electrocardiogram, as specified by physician;
- Spirometry; and
- Urinalysis.

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1 **8.0 EXPOSURE MONITORING/AIR SAMPLING PROGRAM**

2
3 Assessment of airborne chemical concentrations will be performed, as appropriate, to ensure that
4 exposures do not exceed acceptable levels. Action levels, with appropriate responses, have been
5 established for this monitoring. In addition to the specified monitoring, the SSHO may perform or
6 require additional monitoring, such as organic vapor monitoring in the equipment decontamination
7 area or personnel exposure monitoring for specific chemicals. The deployment of monitoring
8 equipment will depend on the activities being conducted and the potential exposures. All personal
9 exposure monitoring records will be maintained in accordance with 29 *Code of Federal Regulations*
10 1910.20. The minimum monitoring requirements and action levels are presented in Table 8-1.

11
12 Most of the field activities are not expected to pose airborne exposure hazards for the following
13 reasons:

- 14
15 • With the exception of sampling equipment decontamination, which will be performed in a
16 well-ventilated building, work will be performed in open areas with natural ventilation; and
- 17 • The most probable contaminants (metals) are materials with relatively low vapor pressures
18 and exposure can be controlled through dust suppression techniques.

19 The SSHO will examine site conditions and will contact the Health and Safety Manager to initiate
20 monitoring if there is any indication of potential airborne exposure.

Table 8-1. Monitoring Requirements and Action Limits

Hazard or Measured Parameter	Area	Interval	Limit	Action	Tasks
Visible airborne dust potentially containing SRCs	All	Continuously	Visible dust generation	Stop work; use dust suppression techniques such as wetting surface	All
Airborne organics with PID or equivalent	Breathing zone 0.9 m [3 ft] from source or 0.36 m [14 in.] in front of employee's shoulder	From 1 to 3 ft below ground surface and if site conditions, such as discolored soil or chemical smells, indicate that monitoring is necessary	<5 ppm >5 ppm	Level D Withdraw and evaluate <ul style="list-style-type: none"> • evaluate need for PPE upgrade • identify contaminants • notify project manager and H&S manager 	Excavation with heavy equipment, hand auguring, power auguring, and other intrusive work
Noise	All areas perceived as noisy	Any area where there is some doubt about noise levels	85 dBA TWA and	Require the use of hearing protection	Hearing protection will be worn within the exclusion zone, around power augers, or other motorized equipment

H&S = health and safety
 PID = photoionization detector
 PPE = personal protective equipment
 ppm = parts per million

1 **9.0 HEAT/COLD STRESS MONITORING**

2

3 General requirements for heat/cold stress monitoring are contained in Section 8 of the FSHP.

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1 **10.0 STANDARD OPERATING SAFETY PROCEDURES**

2
3 Standard operating safety procedures are described in the FSHP. Dust generation activities may
4 occur during material excavation, handling, and transportation. Prior to the start of any ground/soil or
5 dry sediment disturbance activities (e.g., clearing and grubbing, excavating, grading), the area will be
6 misted with water to prevent the generation of dust. The SSHO will monitor all ground disturbance
7 activities to ensure dust is not being generated. In the event that any dust becomes visible, the
8 activity will cease and the area will be misted with water. During instances of high winds resulting in
9 excessive dust, and dust control measures do not prevent the generation of dust, work stoppage and/or
10 additional PPE may be required.

11
12 In addition, all access roads, and all other work areas within the project boundaries will be maintained
13 free from soil that could cause a hazard or nuisance. Dust control will be maintained by keeping
14 traffic on improved roads, maintaining the posted speed limit, and applying water as required. The
15 Subcontractor will employ water spraying/misting for dust control if airborne dust is observed.
16 Water used for dust control will be clean (i.e., obtained from RVAAP sources with approval of the
17 RVAAP Facility Manager, or potable water obtained from an off-site source). The use of additives
18 will not be permitted.

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1 **11.0 SITE CONTROL MEASURES**

2

3 Site control measures are described in Section 10 of the FSHP. No formal site control is expected to
4 be necessary for this work, as the work area is somewhat remote and bystanders are not anticipated.
5 The RVAAP installation is not open to the public, and only authorized personnel are allowed in
6 LL12. However, an exclusion zone will be established around the excavation as described in Sections
7 9.7 and 10.1 of the FSHP. If the SSHO determines that a potential exists for unauthorized personnel
8 to approach within 25 ft of a work zone or otherwise be at risk due to proximity, then additional site
9 controls will be established as described in the FSHP.

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1 **12.0 PERSONNEL HYGIENE AND DECONTAMINATION**

2

3 Personal hygiene and decontamination requirements are described Section 11.0 of the FSHP.

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13.0 EMERGENCY PROCEDURES AND EQUIPMENT

Emergency contacts, telephone numbers, directions to the nearest medical facility, and general procedures can be found in the FSHP. Table 13-1 presents the emergency phone numbers available for normal working hours (Monday through Friday, 8:00 am to 4:00 pm). All emergencies on-site will be coordinated first through **Guard Post 1 [(330) 358-2017]** who will coordinate the response. The SAIC field operations manager will remain in charge of all SAIC and subcontractor personnel during emergency activities. The SAIC field office will serve as the assembly point if it becomes necessary to evacuate the remedial location. During mobilization, the SSO will verify that the emergency information in the FSHP is correct.

Each field team shall have a cellular phone and/or a 2-way radio capable of contacting Guard Post 1 for communications purposes.

During field operations all on-site personnel shall have CPR/first aid training.

Table 13-1. Emergency Phone Numbers

Position	Phone
RVAAP Guard Post 1 (Police, Fire, Emergency Medical)	(330)358-2017
Camp Ravenna Operations/Range Control	(614) 336-6793 or (614) 336-6562
Hospital (Robinson Memorial, Ravenna)	(330) 297-2449/0811
RVAAP Facility Manager Mark Patterson	Office: (330) 358-7311
RVAAP Operation and Maintenance Contractor Jim McGee, Vista Sciences	Office: (330) 358-3005
USACE Tom Chanda	Office: (502) 315-6868
Ohio EPA, Todd Fisher	Office: (330) 963-1148
SAIC Project Manager, Kevin Jago Jed Thomas	Office: (865) 481-4614 Office: (330) 405-5802 Cell: (216) 214-2599
SAIC Health and Safety Personnel, Steve Davis CIH, CSP Heather Miller	(865) 481-4755 Office: (330) 405-5814 Cell: 330-573-8571

RVAAP = Ravenna Army Ammunition Plant

USACE = U.S. Army Corps of Engineers

Ohio EPA = Ohio Environmental Protection Agency

SAIC = Science Applications International Corporation, Inc.

CIH= Certified Industrial Hygienist

CSP = Certified Safety Professional

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1 **14.0 LOGS, REPORTS, AND RECORD KEEPING**

2

3 Logs, reports, and record keeping requirements are described in Section 13 the FSHP.

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1 **15.0 REFERENCES**

2

ACGIH (American Conference of Governmental Industrial Hygienists) 2008. *Threshold Limit Values*. 2008.

NIOSH (National Institute for Occupational Safety and Health) 2005. *NIOSH Pocket Guide to Chemical Hazards*. September 2005.

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16.0 FACILITY AND HOSPITAL MAPS

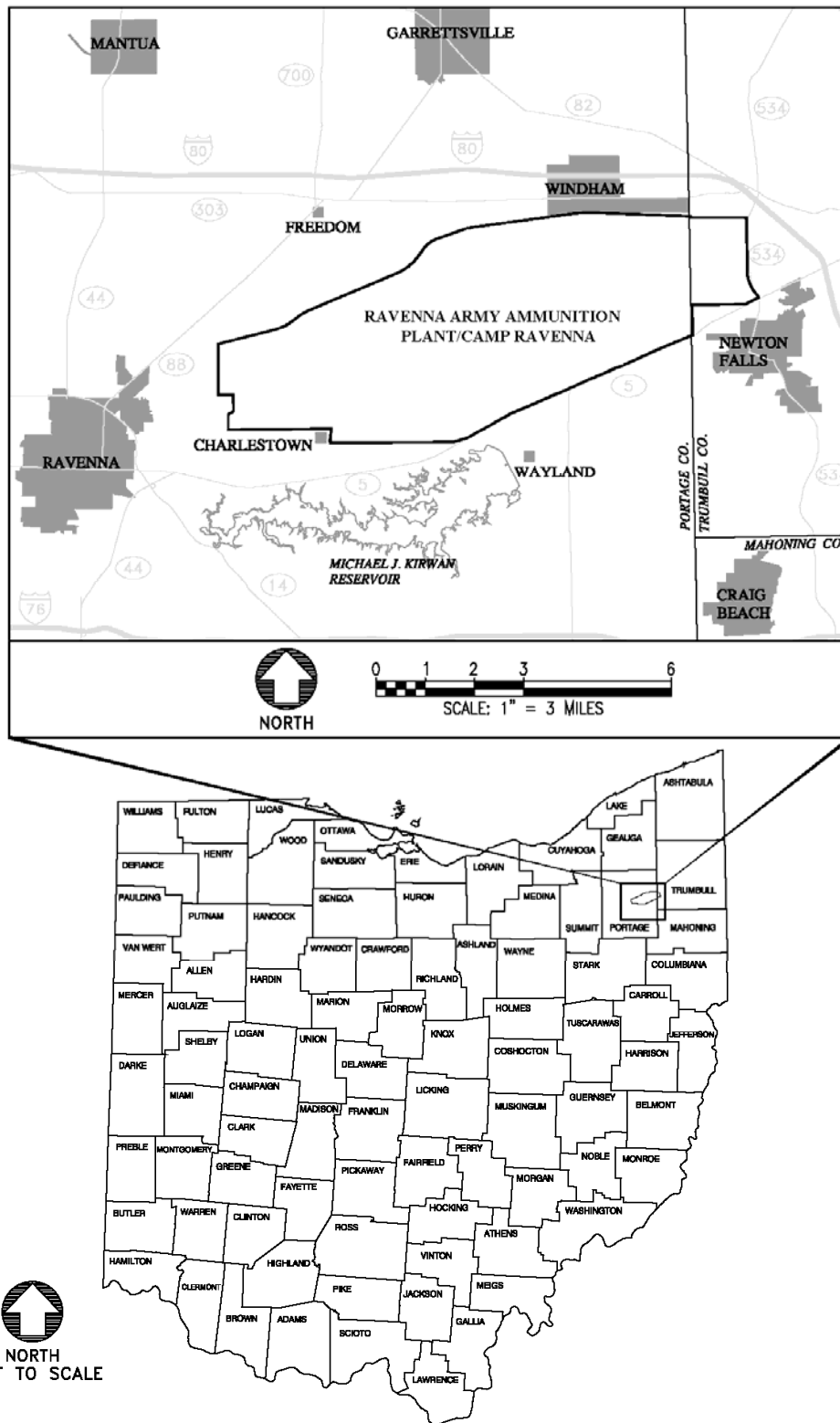


Figure 16-1. General Location and Orientation of RVAAP/Camp Ravenna

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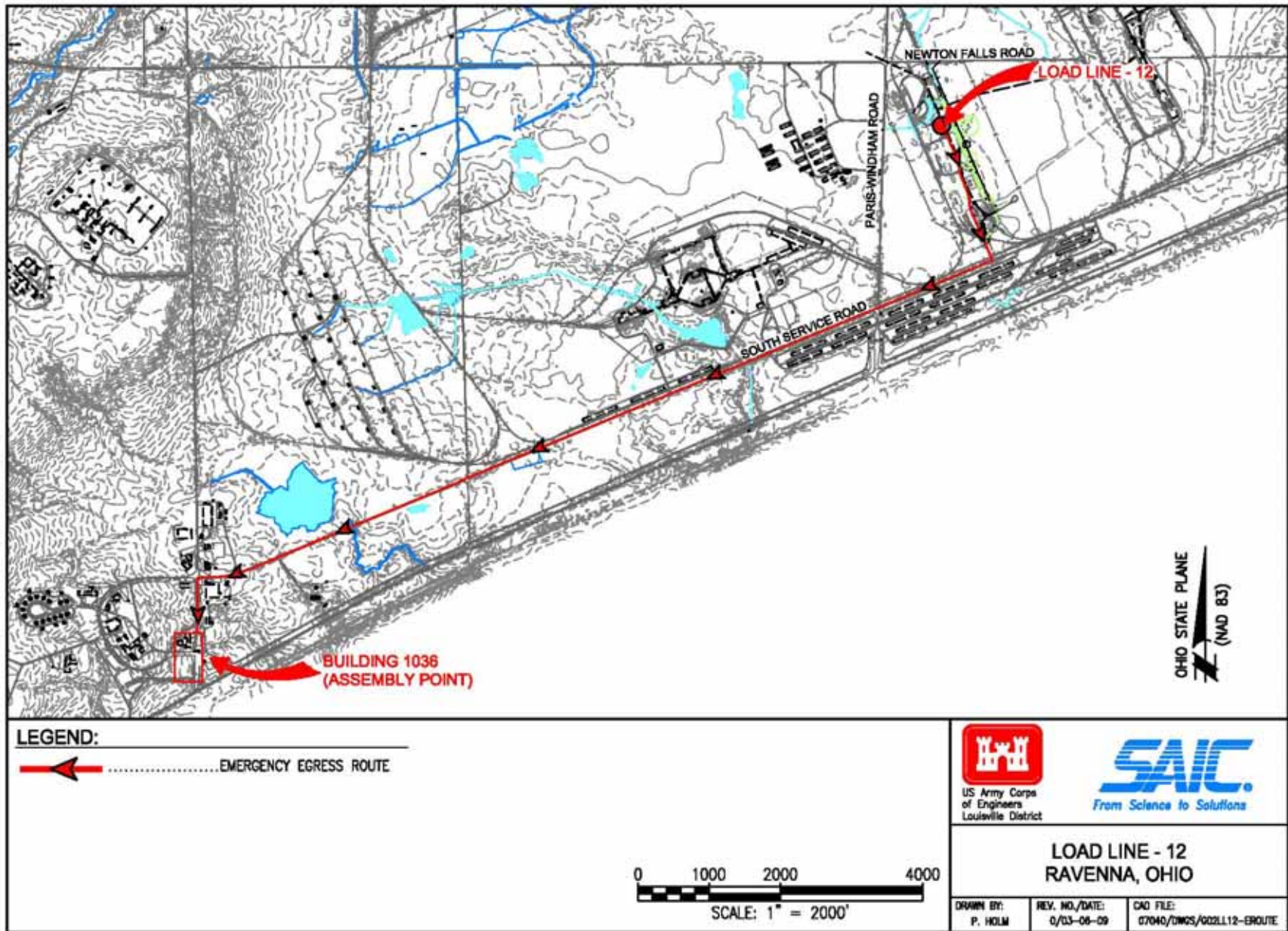


Figure 16-2. RVAAP/Camp Ravenna Site Map and Egress Route

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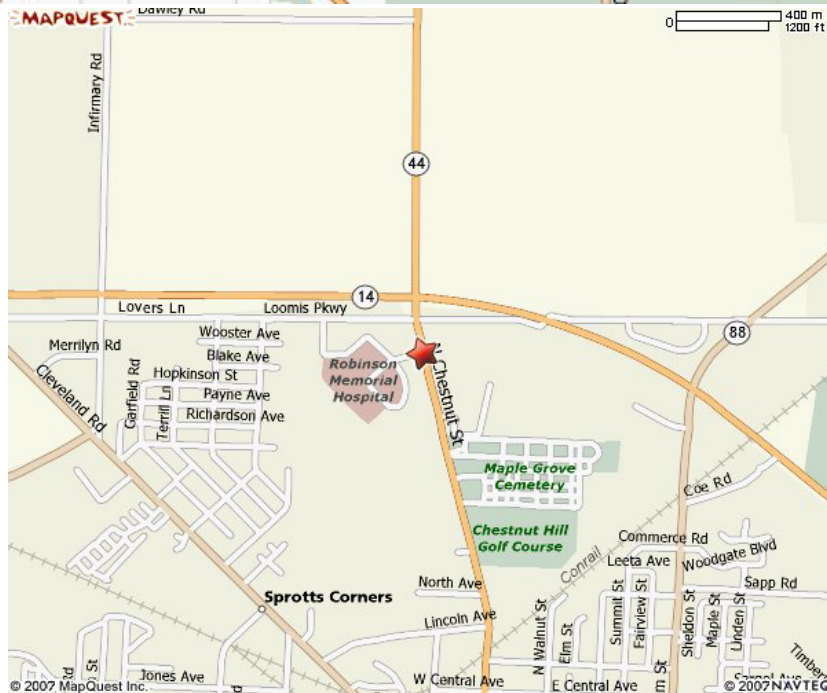
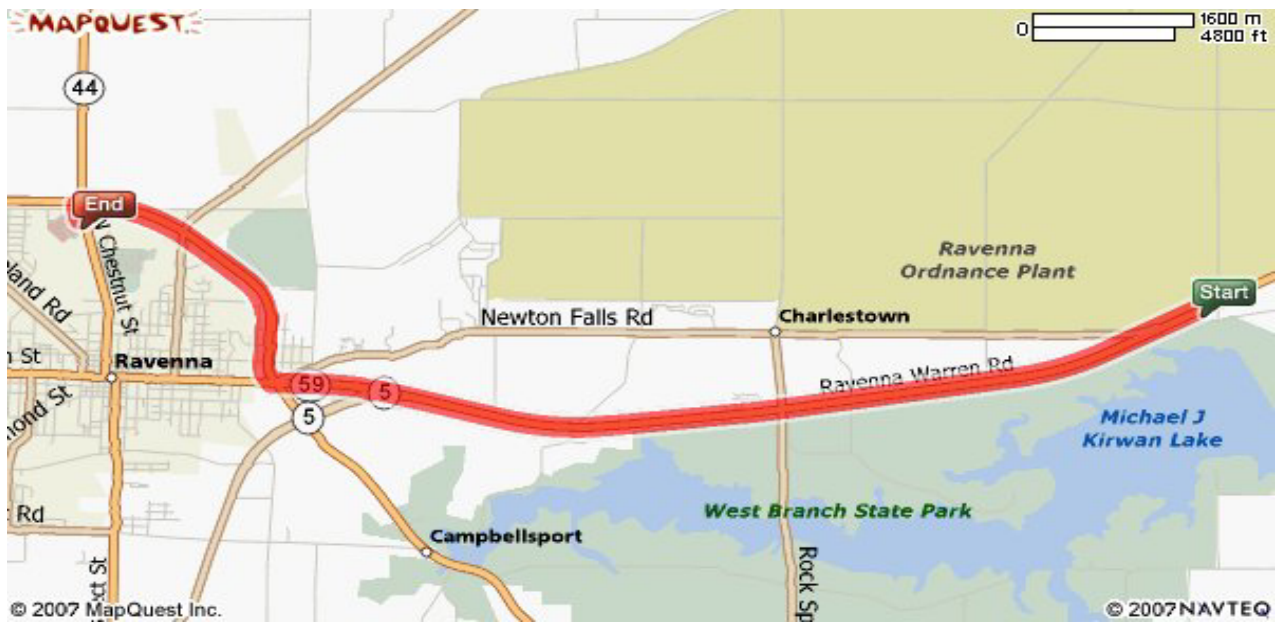


Figure 16-3. Route Map to Pre-Notified Medical Facility

Robinson Memorial Hospital

6847 N. Chestnut Street

Ravenna, Ohio

(330) 297-0811 or

(330) 297-2448

Directions: West (right) on State Route 5. Keep to right at Y-intersection onto OH-59 West. Turn Right onto OH-14/OH-44 at intersection. Turn Left onto North Chestnut St, just past GE plant. Hospital on right.

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Attachment B

Storm Water Pollution Prevention Plan for the Draft Remedial Design for the RVAAP-12 Load Line 12

Ravenna Army Ammunition Plant
Ravenna, Ohio

GSA Contract No. GS-10F-0076J
Delivery Order No. W912QR-05-F-0033

Prepared for:

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

Prepared by:

SAIC Engineering of Ohio, Inc.
8866 Commons Boulevard
Twinsburg, Ohio 44087

July 13, 2009

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Appendix A. Permit to Authorize Storm Water Discharges Associated with Construction Activities

ACRONYMS AND ABBREVIATIONS

AASHTO	American Association of Highway and Transportation Officials
amsl	Above Mean Sea Level
AOC	Area of Concern
BMP	Best Management Practices
Camp Ravenna	Camp Ravenna Joint Military Training Center
COC	Constituent of Concern
COR	Contract Officer Representative
CQAP	Construction Quality Assurance Plan
DFFO	Director's Final Findings and Orders
GSA	General Services Administration
IDW	Investigation-Derived Waste
IRP	Installation Restoration Program
LL12	Load Line 12
MEC	Munitions and Explosives of Concern
MI	Multi-Increment
NOI	Notice of Intent
NOT	Notice of Termination
ODNR	Ohio Department of Natural Resources
OHARNG	Ohio Army National Guard
Ohio EPA	Ohio Environmental Protection Agency
ORC	Ohio Revised Code
RD	Remedial Design
RVAAP	Ravenna Army Ammunition Plant
SAIC	Science Applications International Corporation
SWP3	Storm Water Pollution Prevention Plan
USACE	U.S. Army Corps of Engineers

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1 **1.0 INTRODUCTION**

2
3 Science Applications International Corporation (SAIC) has been contracted by the U.S. Army Corps
4 of Engineers (USACE), Louisville District, to provide environmental services in support of six (6)
5 high priority areas of concern (AOCs) at the Ravenna Army Ammunition Plant (RVAAP) in
6 Ravenna, Ohio. This work is being performed under a Performance-Based Contract (PBC) in
7 accordance with U.S. General Services Administration (GSA) Environmental Advisory Services
8 Contract GS-10-F-0076J. In addition, planning and performance of all work elements is being
9 conducted in accordance with the requirements of the Director’s Final Findings and Orders (DFFO)
10 dated June 10, 2004 (Ohio EPA 2004).

11
12 The Remedial Design (RD) describes the implementation process for the selected remedy for the
13 contaminated dry sediment at Load Line 12 (LL12). The remedial activities that will be performed as
14 specified in the RD will be approximately 2.31 acres. Therefore USACE/SAIC is required to develop
15 this Storm Water Pollution Prevention Plan (SWP3) under Ohio Environmental Protection Agency
16 (Ohio EPA) Permit No. OHC000003.

17
18 In accordance with Ohio Revised Code (ORC) 6111 and provisions of the federal Water Pollution
19 Control Act, this SWP3 has been prepared for proposed construction activities related to the
20 construction effort. The SWP3 is prepared in general conformance with Ohio EPA Authorization for
21 Storm Water Discharges Associated with Construction Activities permit requirements. Proposed Best
22 Management Practices (BMPs) shall conform to *Rainwater and Land Development* (ODNR 2006).
23 USACE shall submit a complete and accurate Notice of Intent (NOI) application form and
24 appropriate fee at least 21 days prior to the commencement of construction activity. In addition, the
25 procured Subcontractor shall submit a co-permittee NOI application form prior to the commencement
26 of construction activity. This SWP3 is an attachment to the RD and references the RD design
27 drawings. This SWP3 addresses control measures to be implemented as part of this design to
28 minimize storm water pollution from the construction activities.

29
30 **1.1 FACILITY DESCRIPTION**

31
32 When the RVAAP Installation Restoration Program (IRP) began in 1989, RVAAP was identified as a
33 21,419-acre installation. The property boundary was resurveyed by Ohio Army National Guard
34 (OHARNG) over a 2-year period (2002 and 2003) and the total acreage of the property was found to
35 be 21,683.289 acres. As of February 2006, a total of 20,403 acres of the former 21,683-acre RVAAP
36 has been transferred to the National Guard Bureau (NGB) and subsequently licensed to OHARNG for
37 use as a military training site.

38
39 The current RVAAP consists of 1,280 acres scattered throughout the OHARNG Camp Ravenna Joint
40 Military Training Center (Camp Ravenna). Camp Ravenna is in northeastern Ohio within Portage
41 and Trumbull Counties, approximately 4.8 km (3 miles) east-northeast of the City of Ravenna and
42 approximately 1.6 km (1 mile) northwest of the City of Newton Falls. The RVAAP portions of the
43 property are solely located within Portage County. RVAAP/Camp Ravenna is a parcel of property

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

7
8 When RVAAP was operational, Camp Ravenna did not exist and the entire 21,683-acre parcel was a
9 government-owned, contractor-operated industrial facility. The RVAAP IRP encompasses
10 investigation and cleanup of past activities over the entire 21,683 acres of the former RVAAP.
11 References to RVAAP in this document are considered to be inclusive of the historical extent of
12 RVAAP, which is inclusive of the combined acreages of the current Camp Ravenna and RVAAP,
13 unless otherwise specifically stated.

14 15 **1.2 LOAD LINE 12 DESCRIPTION AND HISTORY**

16
17 LL12 covers about 80 acres in the southeastern portion of RVAAP. Elevations across LL12 range
18 from approximately 970 to 987 ft amsl. Silty to clayey soil and glacial sediments overlie shale
19 bedrock at LL12, except where disturbed by RVAAP activities. A majority of LL12 was re-graded
20 and soil was disturbed during demolition activities that occurred between 1998 and 2000. Soil in the
21 former production areas contains a mix of sandy fill, sand, ballast material, slag, and residual debris
22 (e.g., metal, brick, and concrete). Surface water drainage flows generally from south to north across
23 LL12. At LL12, the Main Ditch that bisects the central part of the AOC flows from the north into
24 drainage ditches north of the AOC. The Main Ditch is heavily wooded. A stream traverses LL12
25 from west to east and intercepts the Main Ditch near the northern boundary of the AOC. Ultimately
26 the drainage flows into the Cobbs Pond complex (Upper/Lower Cobbs Pond) several hundred yards
27 to the north of LL12. However, in recent years a beaver colony has constructed dams north of LL12.
28 These structures have prevented surface water drainage from the AOC. As a result of these dams,
29 stagnant water often resides within the Main Ditch and Active Area Channel.

30
31 LL12 was originally known as the Ammonium Nitrate Plant and started operations on November 25,
32 1941. Structures related to the production of the ammonium nitrate were the Neutral Liquor Building
33 (Building FF-19) and seven evaporation/crystallization units (Buildings 900, 901, 902, 903, 904, 905,
34 and 906). Other structures, such as Water Works No. 2 and Power House No. 3 (Building FE-17),
35 housed support operations. The western half of the LL12 contained former production areas. The
36 eastern half was previously cleared, but did not contain any known production facilities.

37 38 **1.3 LOAD LINE 12 REMEDIAL ACTIVITIES**

39
40 LL12 has had multiple site investigations performed to determine the chemical contamination (if any)
41 and the nature and extent of contamination at LL12. Contaminated dry sediment was identified in the
42 Main Ditch at LL12. The contaminated dry sediment was characterized for waste disposal prior to

1 remedial activities in accordance with Section 4 of the RD. Table 1-1 presents estimated waste
2 quantities required for removal from the LL12 Main Ditch.

3
4

Table 1-1. Estimated Quantities of Waste

Waste Material	Surface Area	In situ Amounts	
		Volume ^a	Weight ^b
Dry Sediment (Main Ditch at LL12)	2,118 yd ²	706 yd ³	1,130 Tons

5 ^aExcavation to depth of 1 ft below ground surface (BGS)

6 ^bAssumes 1.6 tons/cubic yard soil density.

7

8 A remedial action will be performed at LL12 in accordance with the RD. The following activities
9 summarize elements of the remedial action:

10

- 11 • Excavate contaminated dry sediment from LL12;
- 12 • Transport and dispose of contaminated dry sediment;
- 13 • Confirm risk-based cleanup goals for dry sediment have been attained;
- 14 • Restore excavated areas to neighboring or original contours and conditions; and
- 15 • Implement post-remedial action land use controls (LUCs).

16

17 The remedial activities at LL12 will not impact adjacent wetlands. The area within the limits of
18 excavation will be dammed from down gradient surface water during excavation activities and
19 appropriate storm water controls will be implemented until the 70 percent density of vegetation is
20 achieved. Additionally storm water that comes in contact with the excavation area will be filtered,
21 containerized, and sampled to determine ultimate disposition.

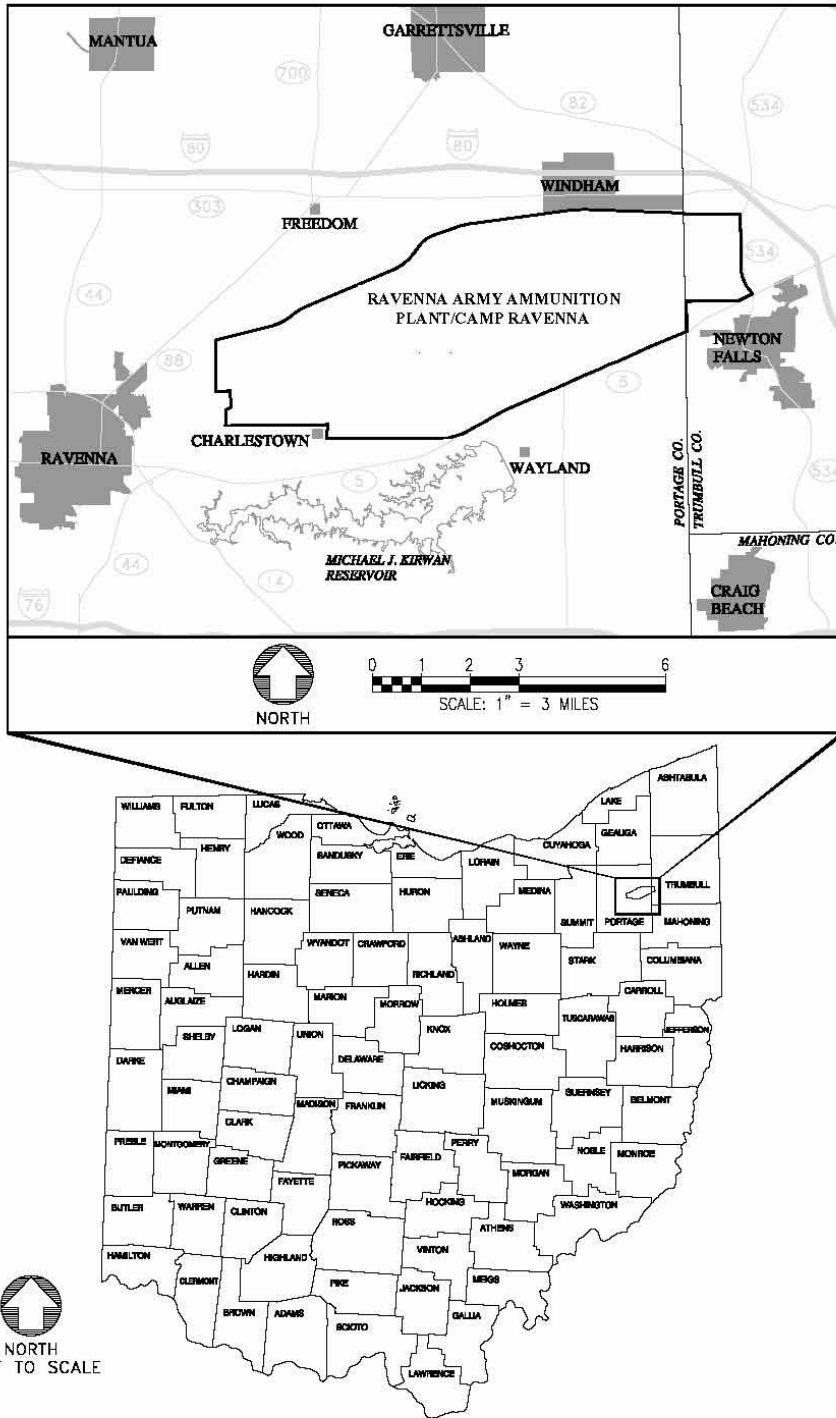
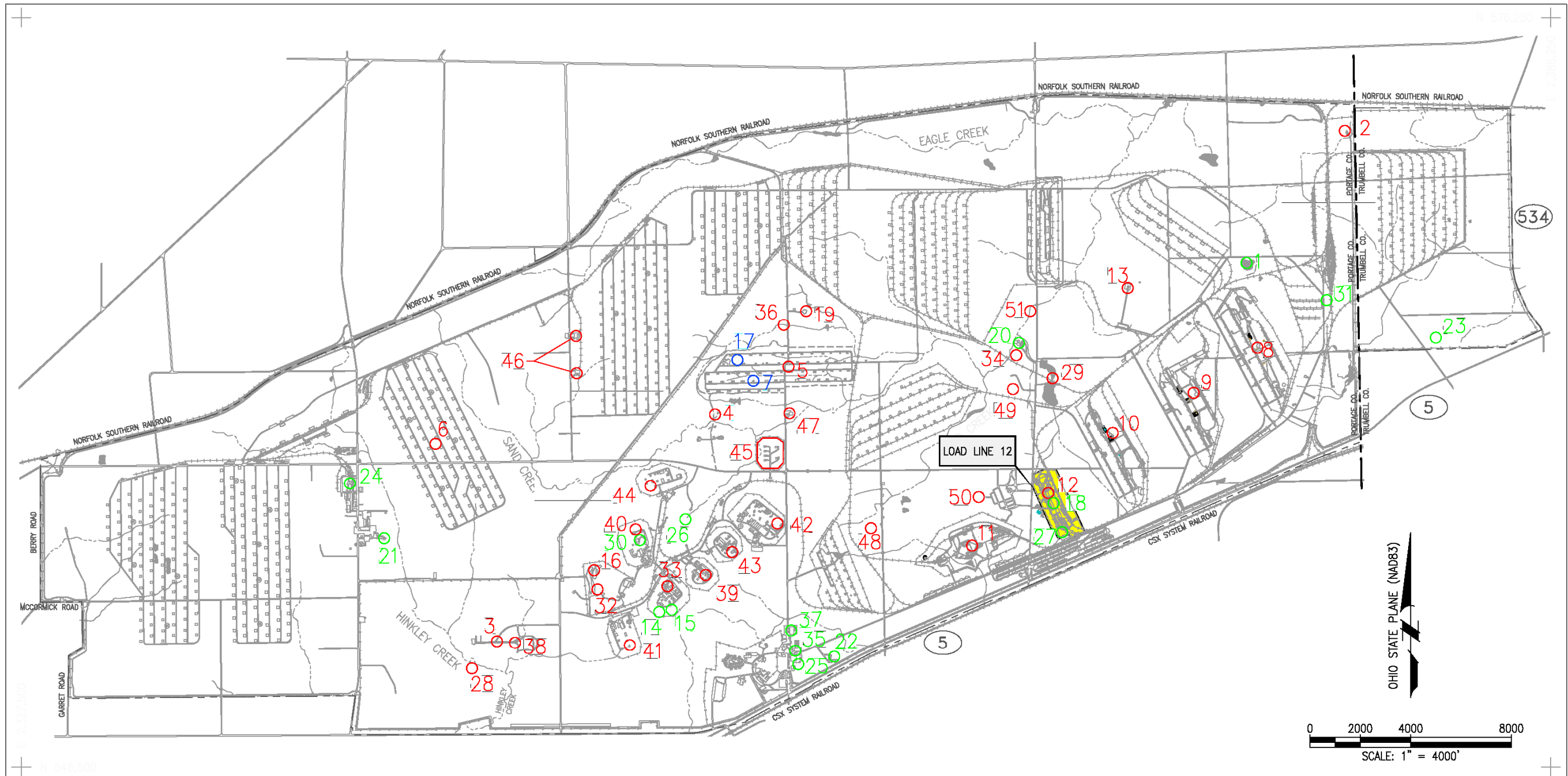



Figure 1-1. General Location and Orientation of RVAAP/Camp Ravenna

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LEGEND:			
1	RAMSDALL QUARRY LANDFILL	13	BUILDING 1200 AND DILUTION/SETTLING POND
2	ERIE BURNING GROUNDS	14	LOAD LINE 6, EVAPORATION UNIT
3	DEMOLITIONS AREA #1	15	LOAD LINE 6, TREATMENT PLANT
4	OPEN DEMOLITIONS AREA #2	16	FUZE AND BOOSTER QUARRY LANDFILL/PONDS
5	WINKLEPECK BURNING GROUNDS	17	DEACTIVATION FURNACE
6	C BLOCK QUARRY	18	LOAD LINE 12 PINK WASTEWATER TREATMENT
7	BUILDING 1601 HAZARDOUS WASTE STORAGE	19	LANDFILL NORTH OF WINKLEPECK BURNING GROUND
8	LOAD LINE 1 AND DILUTION/SETTLING POND	20	SAND CREEK SEWAGE TREATMENT PLANT
9	LOAD LINE 2 AND DILUTION/SETTLING POND	21	DEPOT SEWAGE TREATMENT PLANT
10	LOAD LINE 3 AND DILUTION/SETTLING POND	22	GEORGE ROAD SEWAGE TREATMENT PLANT
11	LOAD LINE 4 AND DILUTION/SETTLING POND	23	UNIT TRAINING SITE WASTE OIL TANK
12	LOAD LINE 12	24	RESERVE UNIT MAINTENANCE AREA WASTE OIL TANK
25	BUILDING 1034 MOTOR POOL WASTE OIL TANK	37	PESTICIDE STORAGE BUILDING T-4452
26	FUZE BOOSTER AREA SETTLING TANKS	38	NACA TEST AREA
27	BUILDING 854 PCB STORAGE	39	LOAD LINE 5/FUZE LINE 1
28	MUSTARD AGENT BURIAL SITE	40	LOAD LINE 7/BOOSTER LINE 1
29	UPPER AND LOWER COBB'S POND COMPLEX	41	LOAD LINE 8/BOOSTER LINE 2
30	LOAD LINE 7 PINK WASTEWATER TREATMENT PLANT	42	LOAD LINE 9/DETONATOR LINE
31	ORE PILE RETENTION POND	43	LOAD LINE 10/PERCUSSION ELEMENT
32	40- AND 60-MM FIRING RANGE	44	LOAD LINE 11/ARTILLERY PRIMER
33	FIRESTONE TEST FACILITY	45	WET STORAGE AREA
34	SAND CREEK DISPOSAL ROAD LANDFILL	46	BUILDINGS F-15 AND F-16
35	BUILDING 1037 LAUNDRY WASTEWATER SUMP	47	BUILDING T-5301 DECONTAMINATION
36	PISTOL RANGE	48	ANCHOR TEST AREA
49	CENTRAL BURN PITS	50	ATLAS SCRAP YARD
51	DUMP ALONG PARIS-WINDHAM ROAD		


U.S. ARMY ENGINEER DISTRICT
 US Army Corps of Engineers
 Louisville District
CORPS OF ENGINEERS
 LOUISVILLE, KENTUCKY

RAVENNA ARMY AMMUNITION PLANT/CAMP RAVENNA

DRAWN BY: P.H. / S.D. REV. NO./DATE: REV. 2 / 07-27-04 CAD FILE: /00064/DWGS/R73SITE2

Figure 1-2. RVAAP/Camp Ravenna Installation Map

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2.0 DESCRIPTION OF REMEDIAL ACTIVITIES

This section provides general site information related to storm water pollution prevention in accordance with permit requirements.

2.1 SEQUENCE OF MAJOR ACTIVITIES

Proper sequencing or phasing of major activities provides various site controls including limiting the amount of disturbed area at one time. For the purposes of this plan, site activities and general phasing are summarized as follows:

Phase I

- 1.) Notification and clearance of utilities;
- 2.) Preparation of site construction support area and installation of necessary storm water controls and BMPs (specified in Attachment C, Drawing C-4):
 - a. Prepare haul truck routes and truck loading areas.
 - b. Install silt fence and sandbag dams per specifications.
 - c. Prepare storm water temporary storage tank, hoses, and pump.
- 3.) Maintain Sediment and Erosion Controls.

Phase II

After sediment controls are installed and construction support areas are prepared, excavation can commence. The objective of phasing is to minimize disturbed areas and therefore minimize potential issues regarding excavation water or sediment laden run-off due to storm events. Phase II shall involve the following:

- 1.) Removal of contaminated dry sediment in the Main Ditch;
- 2.) Analytical confirmation of dry sediment removal;
- 3.) Survey limits of excavation;
- 4.) Backfill and grade excavation areas; and
- 5.) Maintain sediment and erosion controls.

Phase III

Site restoration activities will commence when excavation is complete and include the following:

- 1.) Final grading of backfilled excavation area;
- 2.) Installation of rip rap in bottom of Main Ditch;
- 3.) Installation of straw check dam in Main Ditch;
- 4.) Installation of erosion control matting and seeding on side slopes in Main Ditch;
- 5.) Grade 4 inches of topsoil over disturbed areas (if necessary);

- 1 6.) Seeding and mulching of entire disturbed area;
- 2 7.) Maintain silt fence and check dam until 70% vegetation is established, and
- 3 8.) Removal and disposal of storm water controls.

4
5 Actual phasing shall be determined with the aid of the Subcontractor Construction Supervisor, SAIC
6 Construction Manager, and USACE Contract Officer Representative (COR). Phasing is also
7 determined by the Subcontractor's schedule and weather conditions. Additional erosion and sediment
8 controls may be required as the project progresses. Subcontractor will be fully responsible for the
9 installation and maintenance of all required BMPs throughout the project.

10 11 **2.2 ESTIMATED TOTAL DISTURBED AREA**

12
13 The total construction area (limits of work) within LL12 to be disturbed is 2.31 acres and
14 approximately 25 percent (0.56 acres) of the area will undergo excavation, transport, and disposal.
15 The remaining construction area will be used for transportation (rock construction entrances, truck
16 loading areas, and access gravel road), equipment staging (roll-off containers, temporary storage
17 tanks, etc.), and areas needed for constructability and execution. These features are portrayed in
18 Attachment C, Drawing C-4.

19 20 **2.3 RUN-OFF COEFFICIENT**

21
22 Surface water drainage flows generally from south to north across LL12. A prominent drainage ditch
23 (Main Ditch) divides LL12 in half. The project area will be restored in accordance with Section 8 of
24 the RD. Existing access roads and former railroad bed will be used by haul trucks. No new
25 impervious areas will be left onsite following remedial activities. The existing impervious areas
26 (gravel and paved access roads) shall remain at project completion. The areas are classified as open
27 space for pre-construction and post-construction and will be given a runoff coefficient of 0.2 for both
28 scenarios in accordance with Table 1 in PartIII.G.2.e of the Ohio EPA Construction General Permit
29 No. OHC000003.

30 31 **2.4 LOAD LINE 12 SOIL**

32
33 Silty to clayey soil and glacial sediments overlie shale bedrock at LL12, except where disturbed by
34 RVAAP activities. A majority of LL12 was re-graded and soil was disturbed during demolition
35 activities that occurred between 1998 and 2000. Soil in the former production areas contains a mix of
36 sandy fill, sand, ballast material, slag, and residual debris (e.g., metal, brick, and concrete).

37 38 **2.5 RECEIVING STREAM**

39
40 Construction activities shall not impact the nearest receiving body of water (drainage ditches north of
41 the Main Ditch at LL12). The Main Ditch that bisects the central part of LL12 flows to the north, into
42 drainage ditches north of the AOC. The Main Ditch is heavily wooded. A stream traverses LL12
43 from west to east and intercepts the Main Ditch near the northern boundary of the AOC. Ultimately

1 the drainage flows into the Upper and Lower Cobbs Ponds several hundred yards to the north of
2 LL12. However, beaver activity has prevented drainage of the Main Ditch to the northern drainage
3 ditches. Clearing of riparian areas, vegetation, and trees shall be minimized during remedial
4 activities. Sediment and erosion controls shall be installed prior to earth disturbing activities to
5 minimize impacts to the adjacent wetland at LL12. Construction site storm water associated with
6 disturbed areas shall be collected in a temporary storage tank for characterization and proper disposal.

7 8 **2.6 COPY OF PERMIT**

9
10 A copy of the permit to authorize storm water discharges associated with construction activities will
11 be submitted as Appendix A of this plan when it is obtained.

12 13 **2.7 SITE MAP**

14
15 A SWP3 drawing (Attachment C, Drawing C-4) has been prepared in accordance with permit
16 requirements. The drawings address the following:

- 17
18 1.) Limits of earth disturbing activities;
19 2.) Existing topography;
20 3.) Surface water locations;
21 4.) Location of BMPs; and
22 5.) Storage areas and construction entrances.

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3.0 STORM WATER CONTROLS

This section describes the project site storm water controls to be implemented to minimize storm water pollution from the construction activities. This section discusses the following control practices and methods:

- Non-Structural
 - Preservation methods
 - Existing access roads
- Erosion Control Practices
 - Project phasing
 - Stabilization/seeding (temporary/permanent)
- Run-on and Run-off Control Practices
 - Excavation water storage tank
 - Dewatering berms (sandbags, cofferdams)
- Sediment Control Practices
 - Silt fence
 - Straw bale filters (check dam)
 - Improved haul truck routes

3.1 NON-STRUCTURAL PRESERVATION METHODS

The Subcontractor shall preserve the existing vegetation as much as feasible outside the limits of work. In addition, the Subcontractor shall perform the construction activities with an approach so as to limit the amount of land disturbed at one time. Site work shall only be conducted within the project limits.

3.2 EROSION CONTROL PRACTICES

Erosion control practices minimize the transport of soil particles by concentrated flows of water or wind. The following erosion control practices shall be employed as part of the construction activities at LL12:

- Project phasing; and
- Stabilization/seeding.

The Subcontractor shall install all erosion control BMPs at the site, as required.

1 As detailed in Section 2, project phasing is an important tool to minimize disturbed areas and in turn
2 minimize erosion. Stabilization of the excavated areas is regulated under the SWP3 requirements.

3
4 In addition, upon final grade, daylight slopes and drainage ditches shall be seeded and protected by
5 installing biodegradable erosion control matting (or equivalent technology) to minimize soil erosion
6 and seed bed migration caused by storm water flow (Attachment C, Drawing C-7).

7 8 **3.2.1 Temporary Seeding**

9
10 Temporary seeding may not be required due to the project schedule. Disturbed areas will be active
11 through project duration. However, if the SAIC Construction Manager determines that the permanent
12 seeding may not establish due to the time of year, an annual rye grass may be placed down in
13 disturbed areas to provide temporary cover.

14 15 **3.2.2 Permanent Seeding**

16
17 All disturbed areas must be seeded within seven days following excavation, backfilling, and final
18 grading activities. The wetland areas shown in Attachment C-Drawing C-3 and the disturbed side
19 walls of the Main Ditch shall be seeded with the mixture presented in Table 3-1. The walls of the
20 Main Ditch shall be covered with erosion control matting (e.g., mulch mat) instead of straw.

21
22 **Table 3-1. Full-Sun Stream/Ditch Seed Mixture for RVAAP/Camp Ravenna**

Seed Type	Mixture %
Shallow/Lurid Sedge (<i>Carex lurida</i>)	10.0%
Blunt broom sedge (<i>Carex scoparia</i>)	10.0%
Fox sedge (<i>Carex vulpinoidea</i>)	20.0%
Riparian Wild Rye (<i>Elymus riparius</i>)	20.0%
Soft rush (<i>Juncus effuses</i>)	10.0%
Rice cutgrass (<i>Leersia oryzoides</i>)	5.0%
Great/Soft-stemmed Bulrush (<i>Schoenoplectus tabernaemontani</i>)	2.0%
Dark green bulrush (<i>Scirpus atrovirens</i>)	8.0%
Woolgrass (<i>Scirpus cyperinus</i>)	9.0%
Steeplebush (<i>Spiraea tomentosa</i>)	5.0%
Swamp milkweed (<i>Asclepias incarnate</i>)	0.5%
Blue Vervain (<i>Verbena hastate</i>)	0.5%

Specifications:

Broadcast at 15lbs/acre

Mulch with a minimum of 3 bales of straw per 1,000 square feet.

23
24
25 The Subcontractor will use a Camp Ravenna-approved “open area” seed mixture for permanent cover
26 for construction areas disturbed during field activities. Table 3-2 presents the seed mixture and
27 application specifications. Fertilizer and lime are not needed for seeding with native seed mixes.

1

Table 3-2. Open Area Seed Mixture for RVAAP/Camp Ravenna

Seed Type	Mixture %
Nodding Wild Rye (<i>Elymus Canadensis</i>)	23.5%
Virginia wild rye (<i>Elymus virginicus</i>)	25%
Little Bluestem (<i>Schizachyrium scoparium</i>)	22%
Partridge Pea (<i>Chamaecrista fasciculate</i>)	18.75%
Thin-leaved Coneflower (<i>Rudbeckia triloba</i>)	7.75%
Brown fox sedge (<i>Carex vulpinoidea</i>)	1.5%
Black-eyed Susan (<i>Rudbeckia hirta</i>)	1.5%

Specifications:

Broadcast @ 18 lbs/acre, drilled at 12 lbs/acre

Mulch with a minimum of 3 bales of straw per 1,000 ft²

2

3 Other effective materials may be used, to include specialized seeding products/technologies such as
4 seed impregnated fiber matting. Any product or technology used for seeding the Main Ditch will
5 meet the seeding requirements presented in Tables 3-1 and 3-2 and applicable Ohio EPA storm water
6 pollution prevention controls.

7

8 **3.2.3 Mulching**

9

10 Straw mulch shall be applied at a rate necessary to uniformly cover all disturbed areas; a rate of three
11 bales per 1,000 ft² is considered sufficient. The purpose of mulching is to provide an environment for
12 seed germination. If inspections reveal germination has not occurred within 14 days of application,
13 re-seeding and re-mulching will be required. The restored Main Ditch at LL12 shall have erosion
14 control matting (e.g., excelsior Type I or equivalent) placed instead of straw mulch.

15

16 **3.2.4 Irrigation**

17

18 Irrigation shall be applied as required to ensure a healthy vegetative cover. Any bare areas shall be
19 re-seeded and re-mulched. Potable water for irrigation shall be obtained by the Subcontractor from
20 an approved off-site source. Final re-vegetation is achieved once a 70% cover is obtained in all
21 disturbed construction areas, in accordance with *Rainwater and Land Development* (ODNR 2006)
22 guidance, as determined by the SAIC Construction Manager and USACE COR. Once it is confirmed
23 that at least 70% cover has been achieved, the Subcontractor is responsible for removing and
24 disposing of erosion controls.

25

26 **3.3 RUN-ON/RUN-OFF CONTROL PRACTICES**

27

28 **3.3.1 Diversion Berms**

29

30 The Main Ditch at LL12 discharges into the Active Area Channel which flows generally north and
31 ultimately discharges into Upper and Lower Cobbs Ponds (approximately 650 yards north of LL12).
32 Prior to excavation activities, the Subcontractor will install a plug in the discharging pipe at the
33 furthest upstream location of the Main Ditch. This plug will be inspected daily. Additionally, the

1 Subcontractor shall install dewatering berms (sandbags, temporary cofferdam, or an equivalent
2 watertight barrier) immediately north and south of the excavation area, as shown in Attachment C-
3 Drawing C-4, and remove all standing water from the excavation area. The water will be filtered
4 through a sediment bag and discharged into the Active Area Channel. During excavation activities,
5 any water accumulation in contact with an open excavation will be considered contact water, and
6 pumped and managed in accordance with Section 5.3.2 of the RD. If the excavation extent encroaches
7 on a dewatering berm, the berm will be relocated accordingly.

8 9 **3.3.2 Excavation Water**

10
11 Any water that accumulates in the excavation and comes into contact with contaminated soil or dry
12 sediment, or other waste material shall be classified as “excavation water.” The Subcontractor shall
13 notify the SAIC Construction Manager of the presence of water in the excavation. Excavation water
14 shall be pumped to a temporary water storage tank provided by the Subcontractor. The Subcontractor
15 will be responsible for characterizing, labeling, transportation, and final disposal of the collected
16 water within the temporary storage tank in accordance with Section 9.2.6 of the RD. The
17 Subcontractor shall arrange for the disposition of the liquid at a suitable waste disposal facility with
18 prior approval from USACE/SAIC. The RVAAP Facility Manager will sign all waste profiles and
19 waste manifests for the disposal of project investigation-derived waste (IDW) to the approved
20 disposal facility.

21 22 **3.3.3 Soil Stockpiles**

23
24 Backfill may be stockpiled in the construction support area prior to backfilling the excavation area
25 and bounded by silt fence to prevent sediment migration.

26 27 **3.3.4 Dewatering Berm**

28
29 Downgradient of the excavation area of the Main Ditch at LL12, a dewatering berm/dam shall be
30 constructed of sandbags, earthen material, or temporary cofferdams, as depicted on Attachment C,
31 Drawing C-4. The dewatering berm/dam shall prevent water from back flowing from the northern
32 portion of the Main Ditch. Water inside the dewatering berm/dam, prior to excavation, shall be
33 pumped through a sediment filter bag to the other side. Excavation water captured during excavation
34 activities will be managed per Section 9.2.6 of the RD.

35 36 **3.4 SEDIMENTATION CONTROL PRACTICES**

37
38 Sediment control practices are employed to attempt to remove particles from run-off. The following
39 sediment controls shall be implemented:

- 40
- 41 • Silt fence;
- 42 • Straw bale filters; and
- 43 • Improved haul truck routes.

1 The Subcontractor shall install all sediment control BMPs at the site prior to beginning ground
2 disturbance, maintain all controls for the duration of the project, and provide additional controls as
3 required.

4 5 **3.4.1 Silt Fence**

6
7 Water resources shall be protected by the proper installation of silt fence. Silt fence shall be placed in
8 areas of sheet flow run-off on nearly level contours. Silt fence is not intended to treat concentrated
9 flows and shall not be placed across storm water conveyances. Silt fence shall be installed
10 downgradient of disturbed areas, and along the haul truck route to prevent runoff to surface waters
11 and the adjacent wetland areas at LL12 as depicted on Attachment C, Drawing C-4.

12
13 Approximately 2,300 linear feet of silt fence will be used during remedial activities. The silt fence
14 shall be removed and disposed once 70% vegetation is established and upon approval by the SAIC
15 Construction Manager and USACE COR.

16 17 **3.4.2 Haul Truck Routes**

18
19 LL12 will be accessed from a mixture of improved and unimproved roads located off of South
20 Service Road (Attachment C, Drawing C-6). The Subcontractor will reuse a former railroad bed
21 adjacent to the Main Ditch at LL12 as a haul truck route and loading area, which consists of existing
22 ballast material spread on the ground (Attachment C, Drawing C-3). Additional stone may be
23 required to further improve the haul truck route for truck loading and traffic. Haul trucks will
24 continue onto the improved road at the northern end of LL12. Haul trucks will exit LL12 through a
25 gate and onto Newton Falls Road. The haul truck route shall remain in place at the completion of
26 restoration activities at LL12.

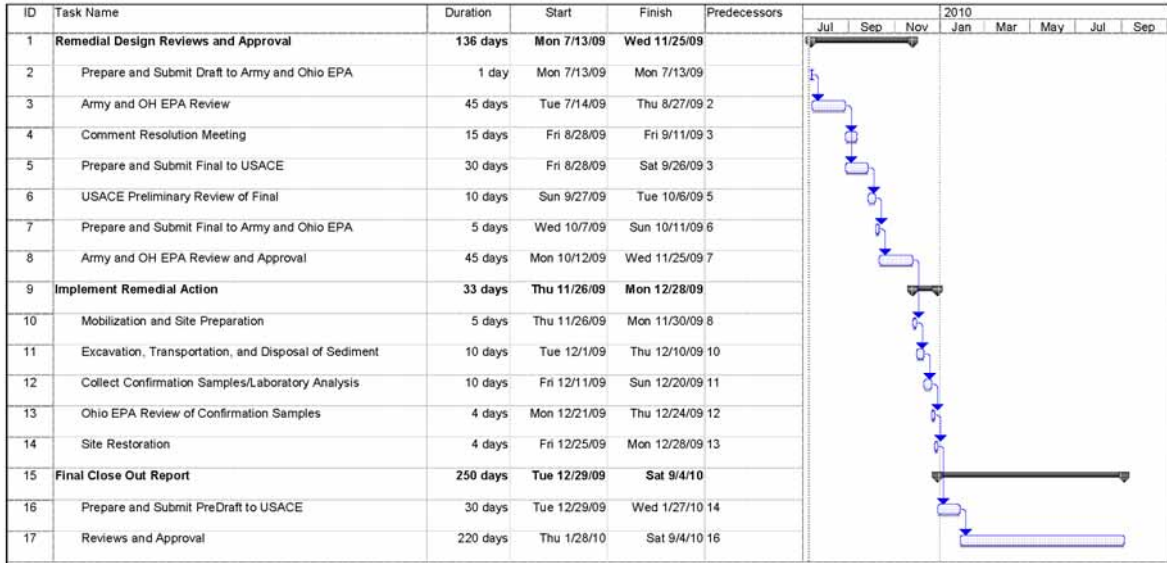
27 28 **3.5 IMPLEMENTATION SCHEDULE**

29
30 Implementation of this RD will be contingent on the approval of the *Record of Decision for Soil and*
31 *Dry Sediment at the Load Line 12 (RVAAP-12) at the Ravenna Army Ammunition Plant, Ravenna,*
32 *Ohio* (USACE 2009) and this RD. The start date may change based on these approvals.

33
34 The implementation schedule (Figure 3-1) for the RD presents an estimate timeline for
35 implementation.

- 36
37
- 38 • Site preparation/set-up;
 - 39 • Excavation and removal;
 - 40 • Confirmation sampling;
 - 41 • Site restoration;
 - 42 • Demobilization; and
 - Preparation of the Construction Report.

1 Generally, construction activities shall occur during daylight hours (i.e., 8:00 a.m. to 5:00 p.m.) on a
 2 5-days per week schedule. Preparation of the Construction Report shall follow conclusion of site
 3 restoration activities.
 4



5
6

Figure 3-1. Project Schedule

1 **4.0 MAINTENANCE AND INSPECTIONS**

2
3 This section describes the preventive maintenance and inspections that shall be performed to ensure
4 the storm water controls are properly maintained and to determine if repairs are needed.

5
6 **4.1 PREVENTIVE MAINTENANCE**

7
8 Preventive maintenance shall be performed on equipment to ensure proper operation and to detect
9 potential leaks before they occur. Good housekeeping practices shall be maintained at all times
10 during construction activities. All employees shall practice due diligence to prevent any damage to
11 the storm water control measures. Containers shall be provided at all necessary locations for the
12 collection of trash and general construction debris. Fueling activities shall be conducted at the
13 staging area away from storm water conveyances. If a mobile fuel truck is used to re-fuel
14 construction equipment, the truck shall be staged on secondary containment with spill response
15 supplies. The secondary containment area will be inspected daily.

16
17 **4.2 FUGITIVE DUST**

18
19 Construction vehicle speed can be a significant component of dust generation. Vehicle speeds shall
20 not exceed the posted speed limit. As an added control, dust suppressants shall be used to minimize
21 dust generation along the service road. Water may be sprayed lightly as not to produce run-off.
22 Surface gravel, when recommended, will reduce the source of dust emission by limiting the amount
23 of fine particles available for release. Excavation activities may also require dust suppressants. A
24 water mist shall be used in minimal quantities as not to produce run-off.

25
26 **4.3 DEWATERING**

27
28 It is anticipated that dewatering activities may be necessary within the excavation area at LL12.
29 Existing water within the limits of excavation will be pumped through a sediment bag to opposite side
30 of the constructed dewatering berm. All excavation water encountered shall be pumped into a
31 temporary storage tank. Dewatering activities shall not produce discharges of impacted or sediment
32 laden water to the ground surface.

33
34 **4.4 COVERS OR TARPS**

35
36 Impermeable covers or tarps shall also be provided by the Subcontractor at the construction site. The
37 covers shall be utilized as an additional aid to prevent storm water from contacting the contaminated
38 dry sediment. Tarps will be placed over all exposed contaminated dry sediment, and secured with
39 sand bags at the end of each day. Sand bags placed at the perimeter shall also serve as storm water
40 diversions to minimize run-on. The tarps shall be sized appropriately to minimize overlap within the
41 excavated area. Any overlaps in the tarps shall be secured together to form a watertight seal.

1 Run-off measures shall be evaluated and shall be installed to convey clean run-off from covers away
2 from bare soil and disturbed areas. All torn sheets shall be replaced. When covers are no longer
3 required they shall be completely removed and disposed of by the Subcontractor.

4 5 **4.5 STREET SWEEPING**

6
7 All public roadways shall remain sediment free. Transport of dry sediment off-site is to be
8 controlled. Primarily, this shall be accomplished by cleaning truck tires prior to leaving LL12.
9 Additionally, street sweeping may be required. Sweeping includes the collection and proper disposal
10 of transported soil. Soil shall not be dispersed along public roadways via brooming techniques. In
11 the event brooming techniques are used, all sediment shall be removed from the roadway by manual
12 techniques.

13 14 **4.6 SPILL PREVENTION**

15
16 Spills are a source of storm water contamination. All products shall be kept in original containers
17 unless they are not resealable. Original labels and material safety data sheets shall be retained for all
18 hazardous materials to be used for the project.

19
20 All on-site vehicles shall be monitored for leaks and receive regular preventive maintenance to reduce
21 the chance of leakage. Petroleum, oil, and lubricant products shall be sorted in tightly sealed
22 containers and clearly labeled. These containers shall be stored in secondary containment and be
23 inspected daily.

24
25 Spill cleanup procedures outlined in Section 12.1.2 of the Facility-Wide SHP (USACE 2001) and
26 pages 10 through 15 of the Installation Spill Contingency Plan (ISCP) (PIKA, 2009) shall be
27 understood by employees, contractors, and the Subcontractor.

28
29 Materials will be maintained in the established storage areas away from direct traffic routes to prevent
30 accidental spills. A spill response kit containing equipment compatible to the materials stored will be
31 maintained in the established storage area.

32
33 In the event of a material spill, upon discovery, on-site personnel will immediately:

- 34
35 1.) Stop the material from continuing to release if possible.
36 2.) Contain the material (e.g., diking or ditching, covering storm drains and catchment basins)
37 3.) Cleanup the material with chemicals, appropriate materials, and equipment. Items used may
38 include brooms, shovels, rags, absorbent materials (e.g., sand, sawdust), and plastic or metal
39 containers specifically designed for this purpose.
40 4.) Notify the security dispatcher (Guard Post 1) and the SAIC Construction Manager as soon as
41 possible.
42 5.) Complete necessary paperwork as required by the RVAAP ISCP (PIKA 2009) and OHARNG
43 Camp Ravenna Spill Plan.

1 During spill response activities, on-site personnel will wear appropriate protective clothing (e.g.,
2 goggles, gloves) to prevent contact with spilled materials. If hazardous conditions exist, response
3 activities will cease and personnel will move a safe distance from the area and await outside
4 emergency support.

5
6 **4.7 NON-SEDIMENT POLLUTION CONTROL**

7
8 Containers shall be provided for the collection of trash and general construction debris. No waste
9 materials shall be buried on-site. Fueling activities shall be conducted at the staging area away from
10 storm water conveyances. If a mobile fuel truck is used to re-fuel construction equipment, the truck
11 shall be staged on secondary containment with spill response supplies. The secondary containment
12 area will be inspected daily.

13
14 Good housekeeping practices include:

- 15
16 • Neat and orderly storage;
17 • Prompt clean up of spills; and
18 • Minimizing off-site tracking.

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5.0 INSPECTION OF CONTROLS AND PLAN REVISIONS

5.1 INSPECTION OF CONTROLS

Prior to construction activities, the Subcontractor will inspect all storm water controls (including the excavation water collection system) and document proper placement in accordance with the Construction Quality Assurance Plan (CQAP) in Section 10 of the RD. Daily inspections of all storm water controls shall be performed by the Subcontractor Construction Supervisor and documented on a *RVAAP Load Line 12 Remedial Action Daily Checklist*. The Subcontractor also shall inspect the storm water controls within 24 hours after any storm event greater than 0.5 inches of rain per 24 hour period (OHC000003 Part III.G.2.i). The inspection requirements include but not limited to the following items (as applicable):

- Construction entrances;
 - Locations where vehicles enter or exit the site shall be inspected for evidence of off-site sediment tracking.
- Non-sediment pollution control;
 - Disturbed areas and areas used for storage of materials that are exposed to precipitation shall be inspected for evidence of, or the potential for, pollutants.
- Silt fence applications;
- Dewatering and diversion berms;
- Discharge locations shall be inspected to determine whether erosion control measures are effective in preventing significant impacts to receiving waters;
- Any secondary containment; and
- Permanent soil stabilization.

Erosion and sediment control measures identified in the plan shall be observed to ensure they are functioning properly on a daily basis.

Qualified inspection personnel are those with documented knowledge and experience in the installation and maintenance of erosion and sediment controls as determined by the SAIC Construction Manager.

5.2 PLAN REVISIONS

Based on the results of the inspection, the SWP3 shall be revised as appropriate, but no later than 7 calendar days following the inspection. Revisions shall incorporate placement of new BMPs if necessary and any newly disturbed areas.

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1 **6.0 POST CONSTRUCTION**

2
3 **6.1 POST CONSTRUCTION STORM WATER MANAGEMENT**

4
5 After final grading, the site shall be re-vegetated. Re-vegetation shall be conducted in accordance
6 with Section 8.0 of the RD.

7
8 The site shall be inspected by the Subcontractor once every two weeks after re-vegetation efforts have
9 ceased. Storm water controls also will be inspected within 24 hours of a storm event (0.5 inches or
10 greater) and every 24 hours during extended rain events. These inspections ensure erosion controls
11 are effective. If vegetation has not taken root after one month, the areas shall be re-seeded. A total of
12 at least 70% vegetative cover is required prior to removal of erosion controls by the Subcontractor, as
13 determined by the SAIC Construction Manager and USACE COR.

14
15 **6.2 POST CONSTRUCTION BMPs**

16
17 Post-construction BMPs are not required for this project. Permanent alteration (adversely impacting)
18 the watershed and permanent installation of impervious surfaces are not proposed. The project site
19 shall be returned to a more natural condition and the watershed shall be improved.

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1 **7.0 NOTICE OF TERMINATION**

2

3 A Notice of Termination (NOT) shall be submitted following final stabilization of the disturbed areas.
4 Final stabilization includes a vegetative cover with a density of at least 70% and approval from SAIC
5 Construction Manager and USACE COR or designee. All temporary sediment control practices are
6 to be removed upon final stabilization.

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1 **8.0 CERTIFICATION**

2

3 *I certify under penalty of law that this document and all attachments were prepared under my*
4 *direction or supervision in accordance with a system designed to assure that qualified personnel*
5 *properly gathered and evaluated the information submitted. Based on my inquiry of the person or*
6 *persons who manage the system or those persons directly responsible for gathering the information,*
7 *the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I*
8 *am aware that there are significant penalties for submitting false information, including the*
9 *possibility of fine and imprisonment for known violations.*

10

Signed: _____ Date: _____

11

Signed: _____ Date: _____

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1 **9.0 CONTRACTORS CERTIFICATION**

2

3 *I certify under penalty of law that I understand the conditions of the general permit OHC000003 that*
4 *authorizes storm water discharges associated with construction activities and details presented in this*
5 *plan identified as part of this certification.*

6

Signed: _____ Date: _____

7

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1 **10.0 REFERENCES**

2

ODNR (Ohio Department of Natural Resources) 2006. *Rainwater and Land Development, Ohio's Standards for Stormwater Management, Land Development, and Urban Stream Protection.* 2006.

OHARNG (Ohio Army National Guard) 2005. *Ohio Army National Guard Approved Grass Seed Mixes for Temporary Cover and Site Closures.* June 2005.

Ohio EPA (Ohio Environmental Protection Agency) 2004. *Director's Final Findings and Orders in the matter of U. S. Department of the Army, Ravenna Army Ammunitions Plant.* June 2004.

PIKA 2009. *Installation Spill Contingency Plan (ISCP) for the Ravenna Army Ammunition Plant, Ravenna, Ohio.* January 2009.

USACE (U.S. Army Corps of Engineers) 2001. *Facility-wide Safety and Health Plan for Environmental Investigations at the Ravenna Army Ammunition Plant, Ravenna, Ohio.* March 2001.

USACE 2009. *Final Record of Decision for Load Line 12 (RVAAP-12) at the Ravenna Army Ammunition Plant, Ravenna, Ohio.* March 2009.

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APPENDIX A

**PERMIT TO AUTHORIZE STORM WATER DISCHARGES
ASSOCIATED WITH CONSTRUCTION ACTIVITIES**

(TO BE INCLUDED WHEN OBTAINED)

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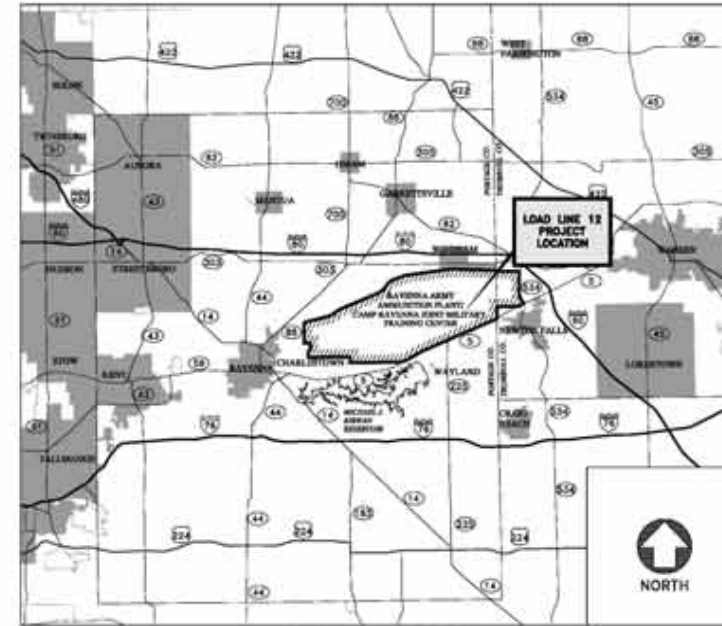
Attachment C. Design Drawings:

- C-1 – Title Sheet
- C-2 – General Notes
- C-3 – Existing Site Conditions
- C-4 – Construction Site Plan
- C-5 – Dry Sediment Removal and Sampling Plan
- C-6 – Traffic Management Plan
- C-7 – Site Restoration Plan
- C-8 – Construction Details

U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS RAVENNA ARMY AMMUNITION PLANT - LOAD LINE 12 REMEDIAL DESIGN



LOCATION MAP
NOT TO SCALE



VICINITY MAP
NOT TO SCALE

THIS REMEDIAL DESIGN ADDRESSES THE EXCAVATION AND OFF-SITE DISPOSAL OF APPROXIMATELY 708 CUBIC YARDS OF CONTAMINATED DRY SEDIMENT (IN SITU) FROM THE DRAINAGE DITCH (MAIN DITCH) LOCATED AT THE LOAD LINE 12 AREA OF CONCERN ON THE RAVENNA ARMY AMMUNITION PLANT/CAMP RAVENNA JOINT MILITARY TRAINING CENTER IN RAVENNA, OHIO.

SCOPE OF WORK



U.S. Army Engineer District
Corps of Engineers
Louisville, Kentucky



Science Applications International Corp.
Engineering of Ohio, Inc.
Twinsburg, Ohio

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DATE: 10/20/10	DRAWN BY: J. USM	CHECKED BY: J. USM	DESIGNED BY: J. USM
PROJECT NO. 10-000-001	SHEET NO. 1	SHEET TOTAL	SHEET TOTAL

LOAD LINE 12
REMEDIAL DESIGN

TITLE SHEET

PROJECT: US Army Corps of Engineers
Ravenna Army Ammunition Plant
Ravenna, Ohio

DRAWN BY: J. USM
CHECKED BY: J. USM
DESIGNED BY: J. USM



C-1

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2
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GENERAL NOTES

1. HEREINAFTER, THE TERM "SUBCONTRACTOR" IN THESE DESIGN DRAWINGS SHALL REFER TO THE ENTITIES (I.E., THE SUBCONTRACTOR AND/OR ITS SUBCONTRACTORS) IMPLEMENTING THE LL12 REMEDIAL DESIGN (RD) UNLESS OTHERWISE NOTED.
2. THE SUBCONTRACTOR SHALL COMPLETE ALL ACTIVITIES ASSOCIATED WITH THE PROJECT IN COMPLIANCE WITH APPLICABLE LOCAL, STATE, AND FEDERAL REGULATIONS AND REQUIREMENTS.
3. THE SUBCONTRACTOR SHALL EXECUTE ALL REMEDIAL ACTIVITIES IN ACCORDANCE WITH THE LL12 RD, DRAWINGS, SPECIFICATIONS, AND ATTACHMENTS.
4. THE SUBCONTRACTOR SHALL SUPPLY ALL EQUIPMENT, MATERIALS, AND LABOR TO PERFORM THE CONTRACT REQUIREMENTS INCLUDING ALL WORKER SAFETY EQUIPMENT.
5. THE SUBCONTRACTOR SHALL COMPLY WITH SITE ACCESS PROTOCOLS.
6. ACCESS TO RAVENNA ARMY AMMUNITION PLANT (RYAAP) SHALL BE THROUGH THE MAIN GATE (POST 1) LOCATED OFF STATE ROUTE 5. THIS GATE IS GUARDED AND SHALL REQUIRE ADDITIONAL TIME TO GAIN ACCESS. THE SUBCONTRACTOR SHALL BE REQUIRED TO ALLOW FOR DELAYS WITHOUT ADDITIONAL CHARGES TO RYAAP/SAC.
7. TOPOGRAPHIC MAPPING DATA IS BASED ON SURVEY AND AERIAL PHOTOGRAPH INFORMATION. MINOR DISCREPANCIES BETWEEN DRAWINGS AND ACTUAL FIELD CONDITIONS SHALL NOT BE CAUSE FOR ADDITIONAL PAYMENT. IT IS THE SUBCONTRACTOR'S RESPONSIBILITY TO VERIFY EXISTING CONDITIONS, ELEVATIONS, AND DIMENSIONS PRIOR TO THE START OF CONSTRUCTION AND NOTIFY SAIC OF CONFLICTS.
8. THE SUBCONTRACTOR SHALL INSTALL CONSTRUCTION SIGNS AT THE LOCATIONS INDICATED ON DRAWINGS C-6 PRIOR TO INITIATION OF SITE PREPARATION ACTIVITIES.
9. THE SUBCONTRACTOR SHALL CONTACT THE RYAAP FACILITY MANAGER AT LEAST 30 CALENDAR DAYS PRIOR TO CONSTRUCTION ACTIVITIES TO COORDINATE UTILITY SURVEY AND CLEARANCES. THE IDENTIFICATION AND LOCATION OF UTILITIES ON THESE DRAWINGS IS BASED ON BEST AVAILABLE INFORMATION AT TIME OF PREPARATION AND MAY NOT BE REPRESENTATIVE OF ACTUAL SITE CONDITIONS.
10. STORMWATER CONTROLS SHALL BE INSTALLED PRIOR TO INITIATION OF ANY CONSTRUCTION ACTIVITY THAT MAY CAUSE EROSION OR SEDIMENTATION. STORMWATER CONTROL MEASURES SHALL BE MAINTAINED AND REINSTALLED AS NECESSARY FOR THE DURATION OF CONSTRUCTION AND RESTORATION ACTIVITIES.
11. AT A MINIMUM THE SUBCONTRACTOR SHALL PLACE EROSION CONTROLS WHERE INDICATED ON THE DRAWINGS. ADDITIONAL CONTROLS MAY BE REQUIRED, DEPENDING ON SITE CONDITIONS. EROSION CONTROL MEASURES SHALL MEET ALL FEDERAL AND STATE REQUIREMENTS.
12. THE SUBCONTRACTOR MAY OBTAIN POTABLE WATER FOR CONSTRUCTION PURPOSES FROM EXISTING RYAAP FACILITIES. ANY HOSE CONNECTED TO A FIXED POTABLE WATER SUPPLY MUST BE EQUIPPED WITH BACKFLOW PREVENTION ON THE SUPPLY CONNECTION BEFORE CONNECTING THE HOSE. COORDINATION WITH THE RYAAP/SAC SHALL BE INITIATED DURING MOBILIZATION IN ORDER TO PROVIDE SUFFICIENT TIME TO OBTAIN ACCESS TO THE IDENTIFIED POTABLE WATER SUPPLY. POTABLE WATER SUPPLIES SHALL NOT BE ACCESSED WITHOUT CONSENT FROM RYAAP/SAC.
13. IF UNEXPECTED MATERIALS - SUCH AS MEC OR ARCHEOLOGICAL ARTIFACTS ARE DISCOVERED DURING REMEDIAL ACTIVITIES, THE SUBCONTRACTOR SHALL STOP WORK IMMEDIATELY AND NOTIFY RYAAP/SAC. THE SUBCONTRACTOR SHALL NOT RESUME WORK UNTIL APPROVAL IS GRANTED BY RYAAP/SAC AND THE SITE SAFETY AND HEALTH OFFICER.
14. SHOULD THE SUBCONTRACTOR DISCOVER UTILITIES NOT SHOWN ON THE DRAWINGS, EXCAVATION ACTIVITIES SHALL STOP IMMEDIATELY AND THE SUBCONTRACTOR SHALL DETERMINE THE DISPOSITION OF THE DISCOVERED UTILITY. THE SUBCONTRACTOR SHALL NOT RESUME WORK UNTIL APPROVAL IS GRANTED BY RYAAP/SAC AND THE SITE SAFETY AND HEALTH OFFICER.
15. NO WORK SHALL TAKE PLACE DURING INCLEMENT WEATHER (AS DETERMINED BY RYAAP/SAC) TO MINIMIZE THE POTENTIAL FOR EROSION AND SEDIMENT RUNOFF.
16. DURING INSTANCES OF HIGH WINDS, WHICH COULD RESULT IN EXCESSIVE DUST, RYAAP/SAC RESERVES THE RIGHT TO REQUIRE ADDITIONAL DUST CONTROL OR TO STOP WORK. THE SUBCONTRACTOR SHALL BE REQUIRED TO ALLOW FOR DELAYS WITHOUT ADDITIONAL CHARGES TO SAIC.
17. THE SUBCONTRACTOR SHALL NOT ALLOW HAUL TRUCKS TO TRACK SOIL/MUD ONTO PUBLIC OR RYAAP ROADWAYS. THE SUBCONTRACTOR SHALL INSPECT ALL HAUL TRUCKS WITHIN THE INSPECTION AREA BEFORE RELEASE TO PUBLIC ROADS. SOIL REMOVED FROM HAUL TRUCKS SHALL BE COLLECTED AND DISPOSED OF WITH EXCAVATED DRY SEDIMENT. ALL HAUL TRUCKS SHALL BE COVERED PRIOR TO DEPARTURE FROM THE PROJECT SITE.
18. THE SUBCONTRACTOR IS RESPONSIBLE FOR IMMEDIATELY REMOVING ANY MATERIAL SPILLED ON ROADWAYS OR TRACKED DURING IMPLEMENTATION OF THIS REMEDIAL DESIGN. THE SUBCONTRACTOR SHALL NOTIFY SAIC OF ANY OCCURRENCES.
19. THE SUBCONTRACTOR SHALL COORDINATE ALL WASTE MANAGEMENT ACTIVITIES WITH RYAAP/SAC. WASTE HANDLING AND DISPOSAL ACTIVITIES SHALL BE CONDUCTED IN ACCORDANCE WITH THIS REMEDIAL DESIGN, RYAAP REQUIREMENTS, AND APPLICABLE STATE AND FEDERAL REGULATIONS.
20. ALL EXCAVATED CONTAMINATED DRY SEDIMENT SHALL BE DISPOSED AT A REGULATED LANDFILL APPROVED BY RYAAP/SAC.
21. ALL HAUL TRUCKS TRAVELING ON PUBLIC ROADS SHALL HAVE A BILL OF LADING OR MANIFEST SIGNED BY THE RYAAP FACILITY MANAGER.
22. THE SUBCONTRACTOR RESPONSIBLE FOR IMPLEMENTING CONSTRUCTION ACTIVITIES SHALL BE REQUIRED TO PREPARE A SITE SPECIFIC HEALTH AND SAFETY PLAN IN ACCORDANCE WITH OCCUPATIONAL, SAFETY AND HEALTH ADMINISTRATION (OSHA) GUIDELINES. THE PLAN SHOULD BE SUBMITTED FOR REVIEW AT LEAST 20 CALENDAR DAYS PRIOR TO INITIATION OF ANY REMEDIAL ACTION ACTIVITIES. THE PLAN SHALL BE REVIEWED BY SAIC PRIOR TO INITIATION OF ANY REMEDIAL ACTION.
23. THE SUBCONTRACTOR SHALL BE RESPONSIBLE FOR FOLLOWING ALL RYAAP, FEDERAL, STATE, AND LOCAL SAFETY REQUIREMENTS FOR THE PROTECTION OF ALL PERSONS (INCLUDING EMPLOYEES) AND PROPERTY. IT IS ALSO THE SUBCONTRACTOR'S RESPONSIBILITY TO INITIAL, MAINTAIN, AND SUPERVISE ALL SAFETY REQUIREMENTS, PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK AND IN ACCORDANCE WITH THE LL12 SITE-SAFETY AND HEALTH PLAN (SSHP).
24. ALL SUBCONTRACTOR EMPLOYEES WORKING ON-SITE MUST ATTEND DAILY HEALTH AND SAFETY TAILGATE MEETINGS PRIOR TO THE START OF THE DAY'S CONSTRUCTION ACTIVITIES THAT WILL BE CONDUCTED BY THE SUBCONTRACTOR CONSTRUCTION SUPERVISOR AND THE SUBCONTRACTOR SITE SAFETY AND HEALTH OFFICER.
25. LOCKOUT/TAGOUT PROCEDURES SHALL COMPLY WITH OSHA REQUIREMENTS.
26. ALL ELECTRICAL WORK SHALL BE DONE IN ACCORDANCE WITH THE MOST CURRENT EDITION OF THE NATIONAL ELECTRIC CODE.
27. ALL FUEL AND/OR PETROLEUM PRODUCTS (I.E., LUBRICANTS) SHALL BE STORED AT THE EQUIPMENT STAGING AREA WITHIN SECONDARY CONTAINMENT. FUEL STORAGE CONTAINERS WILL BE DOUBLE LEAK-PROOF WITH A REGULATORY STANDARD AMOUNT OF FREE-BOARD. ALL FUEL CONTAINERS AND/OR TANKS WILL BE PROPERLY PLACED AND SECURED ACCORDING TO OSHA AND DOT REGULATIONS AND ADEQUATE SPILL CLEAN-UP EQUIPMENT AND MATERIALS WILL BE MAINTAINED AT THE FUEL-STORAGE SITE.
28. ALL STORM WATER CONTROLS AND PUMP EQUIPMENT SHALL BE INSPECTED DAILY AND REPAIRED/REPLACED AS NEEDED.
29. THE PROJECT SITE IS CONSIDERED TO BE THE LOAD LINE 12 (LL12) AREA OF CONCERN (AOC).
30. THE SUBCONTRACTOR WILL PROVIDE ALL NECESSARY ON-SITE SPILL EQUIPMENT (I.E. GRANULATED CLAY, ABSORBENT BLANKETS, PPE, SHOVELS, CONTAINERS). ALL SUBCONTRACTOR EMPLOYEES ON-SITE SHALL BE TRAINED ON PROPER USE OF SPILL EQUIPMENT AND CLEAN-UP OF IMPACTED MATERIAL IN THE EVENT OF A SPILL.
31. REMEDIAL DESIGN WORKPLAN AND SPECIFICATIONS SUPERSEDE DRAWINGS DETAILS IN EVENT OF CONFLICTS.
32. A UXO TECHNICIAN WILL BE ON-SITE THROUGHOUT THE REMEDIAL ACTIVITIES. THE UXO TECHNICIAN LEVEL OF QUALIFICATION WILL BE DETERMINED BY USACE. THE UXO TECHNICIAN WILL BE PROVIDED BY THE SUBCONTRACTOR.
33. A SPILL KIT, FIRST AID KIT, AND HEALTH AND SAFETY PLAN (HASP) SHALL BE MAINTAINED ON-SITE BY THE SUBCONTRACTOR DURING CONSTRUCTION ACTIVITIES. THE SUBCONTRACTOR IS RESPONSIBLE FOR KEEPING THE SPILL KIT AND FIRST AID KIT SUPPLIED AS NECESSARY.
34. PRIOR TO THE START OF DAILY CONSTRUCTION ACTIVITIES THE SITE HEALTH AND SAFETY OFFICER IN CONJUNCTION WITH THE UXO TECHNICIAN WILL CONDUCT AND RECORD DAILY TAILGATE MEETINGS ADDRESSING THE POTENTIAL HAZARDS ASSOCIATED WITH THE PLANNED CONSTRUCTION ACTIVITIES.
35. SUBCONTRACTOR SHALL PROVIDE A CERTIFICATION OF THE DECONTAMINATION OF ALL EXCAVATION EQUIPMENT PRIOR TO REMOVING THE EQUIPMENT FROM THE CONSTRUCTION SITE.
36. MANHOLE COVERS COULD POSSIBLY BE MISSING. SUBCONTRACTOR SHALL TAKE CARE NOT TO DISTURB EXISTING SANITARY & STORM WATER SEWER LINES.
37. SUBCONTRACTOR SHALL REMOVE ANY RAILROAD STAKES IN THE FORMER RAIL ROAD BED TO PROTECT EQUIPMENT/ TRUCKS. SUBCONTRACTOR COULD OVERLAY STONE TO COVER AT OWN RISK. SAIC IS NOT RESPONSIBLE FOR DAMAGE TO VEHICLES.

MATERIAL NOTES

1. COMMON FILL AND VEGETATIVE COVER - THE SUBCONTRACTOR SHALL IDENTIFY A SOURCE FOR OFF-SITE COMMON FILL AND VEGETATION COVER. FOR EVERY 4,000 CUBIC YARDS ONE MULTI-INCREMENT SAMPLE SHALL BE COLLECTED. THE SUBCONTRACTOR SHALL SUBMIT ANALYTICAL RESULTS TO SAIC A MINIMUM OF 7 DAYS PRIOR TO PLACEMENT. THE MATERIAL SHALL BE TESTED AND COMPARED AGAINST THE PARAMETERS LISTED IN SECTION 8.0 OF THE RD. PROPOSED OFF-SITE SOURCES MUST BE APPROVED BY OHIO EPA PRIOR TO USE. BACKFILL MUST BE CLEAN AND BE ABLE TO PROMOTE VEGETATION GROWTH. SAIC RESERVES THE RIGHT (AT NO ADDITIONAL COST TO SAIC) TO REJECT FILL MATERIAL IF MATERIAL IS NOT CONSIDERED CLEAN.
2. RECEIVED VEGETATIVE COVER SHALL NOT HAVE A PH LOWER THAN 5.0 OR HIGHER THAN 7.0 TESTED IN ACCORDANCE WITH ASTM D4972. SUBCONTRACTOR SHALL OBTAIN AND APPLY A PRESCRIBED SEEDING MIXTURE PLAN AS DESCRIBED IN SECTION 8.0 OF THE RD.
3. GEOTEXTILE - GEOTEXTILE FABRIC SHALL COMPLY WITH ODOT SPECIFICATION 712. MISCELLANEOUS MATERIALS, TYPE D (712.09).
4. EROSION AND SEDIMENTATION CONTROLS - PLACEMENT AND ANCHORING OF EROSION AND SEDIMENTATION CONTROLS SHALL BE COMPLETED IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS, DRAWING C-4, AND SANITARY AND LAND DEVELOPMENT MANUAL (SDMA 2008).

LEGEND FOR ALL DRAWINGS

- TREE LINE
- TREE
- FENCE
- FORMER RAILROAD BED
- ROADWAY
- 2' CONTOUR
- 10' CONTOUR
- DITCH
- CONSTRUCTION BOUNDARY
- SILT FENCE
- MULCH MAT
- POWER POLE & OVERHEAD ELECTRIC
- ELECTRICAL TRANSFORMER WITH FENCE
- WATER SUPPLY LINE
- FIRE HYDRANT
- POST INDICATOR VALVE
- SUBSURFACE SANITARY LINE
- MANHOLES
- STORM DRAIN PIPE
- SURVEY CONTROL POINT
- BENCHMARK
- MONITORING WELL
- WATER LEVEL
- CONCENTRATION OVER CLEANUP GOAL
- SANDBAGS
- STRAW CHECK DAM
- HAUL TRUCK TRAFFIC ROUTE
- FORMER BUILDING LOCATION
- BUILDING LOCATION
- WATER
- EQUIPMENT STAGING AREA & SANITARY FACILITIES
- IMPROVED ACCESS/HAUL TRUCK ROUTE
- GRADE, SEED & STRAW AREA
- 4" TO 6" STONE
- EXCAVATION AREA
- CLEAN BACKFILL
- CLEARING & GRUBBING
- WETLAND AREA
- GRADE, SEED & STRAW AREA
- GROUND SURFACE (UNDISTURBED)
- DETAIL WITH DRAWING SHEET NUMBER
- SECTION WITH DRAWING SHEET NUMBER
- PHOTOGRAPH NUMBER WITH VIEW DIRECTION

DRAWING INDEX

DRAWING NO.	DRAWING TITLE
C-1	TITLE SHEET
C-2	GENERAL NOTES
C-3	EXISTING SITE CONDITIONS
C-4	CONSTRUCTION SITE PLAN
C-5	DRY SEDIMENT REMOVAL AND SAMPLING PLAN
C-6	TRAFFIC MANAGEMENT PLAN
C-7	SITE RESTORATION PLAN
C-8	CONSTRUCTION DETAILS

LIST OF SPECIFICATIONS

1. OHIO ARMY NATIONAL GUARD APPROVED GRASS SEED MIXES FOR TEMPORARY COVER AND FINAL SITE CLOSURES (JUNE 2006)

ESTIMATED WASTE QUANTITIES

ESTIMATED IN SITU AMOUNTS			
WASTE MATERIAL	SURFACE AREA (YDS)	VOLUME (YD3)	WEIGHT (1) (TONS)
NONHAZARDOUS DRY SEDIMENT	2118	706	1130

ESTIMATED RESTORATION MATERIAL QUANTITIES

MATERIAL TYPE	QUANTITY
NO. 2 STONE	AS NEEDED
RP RAP	281 TONS (2)
FILL MATERIAL	APPROXIMATELY EQUAL TO EXCAVATED MATERIAL
SILT FENCE	2300 LINEAR FEET
MULCH BLANKET/FABRIC	8,703 SQ. FT. (3)
STRAW BALES	40 BALES (4)
WETLAND SEED	7 LBS (7)
GRASS SEED	18 LBS (5)

SURVEY CONTROL POINTS

POINT NO.	NORTHING	EASTING	ELEVATION
10005	356039.07	238897.18	882.18
10006	356241.55	238913.50	881.08
10007	357395.37	238974.08	878.03
10008	358039.70	2388436.08	878.36
10493	358518.07	2389171.01	880.46
10498	358701.50	2389032.30	877.73
10534	358686.61	2388891.24	877.54
10754	357211.86	238785.55	876.76
10888	357667.28	2388595.26	875.21
11063	358522.12	2388556.61	876.70

NOTES:

1. ASSUMES 1.8 TONS/CUBIC YARD SOIL DENSITY.
2. ASSUMING 100 LBS/Y².
3. ASSUMING A DISTURBED AVERAGE SINGLE SIDE SLOPE LENGTH 3.7 FT.
4. ASSUMING AN APPLICATION RATE OF 3 BALES PER 1,000 SQ. FT. FOR AREAS OTHER THAN MAIN DITCH.
5. ASSUMING AN APPLICATION RATE OF 30 LBS/ACRE. FOR AREAS OTHER THAN MAIN DITCH.
6. SUBCONTRACTOR SHALL VERIFY QUANTITIES.
7. ASSUMING AN APPLICATION RATE OF 15 LBS/ACRE.

LIST OF PERMITS AND NOTIFICATIONS

1. USFWS ENDANGERED SPECIES PROTECTION NOTIFICATION
2. OHIO PROTECTION OF HISTORIC PROPERTIES
3. MEC AVOIDANCE REVIEW BY USACE, HUNTSVILLE SERVICE CENTER
4. OHIO EPA NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) STORMWATER PERMIT NO. OH0600003
5. WETLAND NOTIFICATION

LIST OF SUBMITTALS

1. SITE SAFETY AND HEALTH PLAN (SSHP) ADDENDUM
2. STORM WATER POLLUTION PREVENTION PLAN (SWP3)
3. SHORTLL SAMPLE RESULTS
4. VEGETATIVE COVER (TOP SOIL) SAMPLE RESULTS
5. CONSTRUCTION REPORT
6. WASTE PROFILES
7. FINAL WASTE MANIFESTS FOR CONTAMINATED DRY SEDIMENT
8. CONFIRMATION SAMPLE RESULTS

DRAWING INDEX

DRAWING NO.	DRAWING TITLE
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C-6	TRAFFIC MANAGEMENT PLAN
C-7	SITE RESTORATION PLAN
C-8	CONSTRUCTION DETAILS

GENERAL NOTES

LOAD LINE 12
REMEDIAL DESIGN

GENERAL NOTES

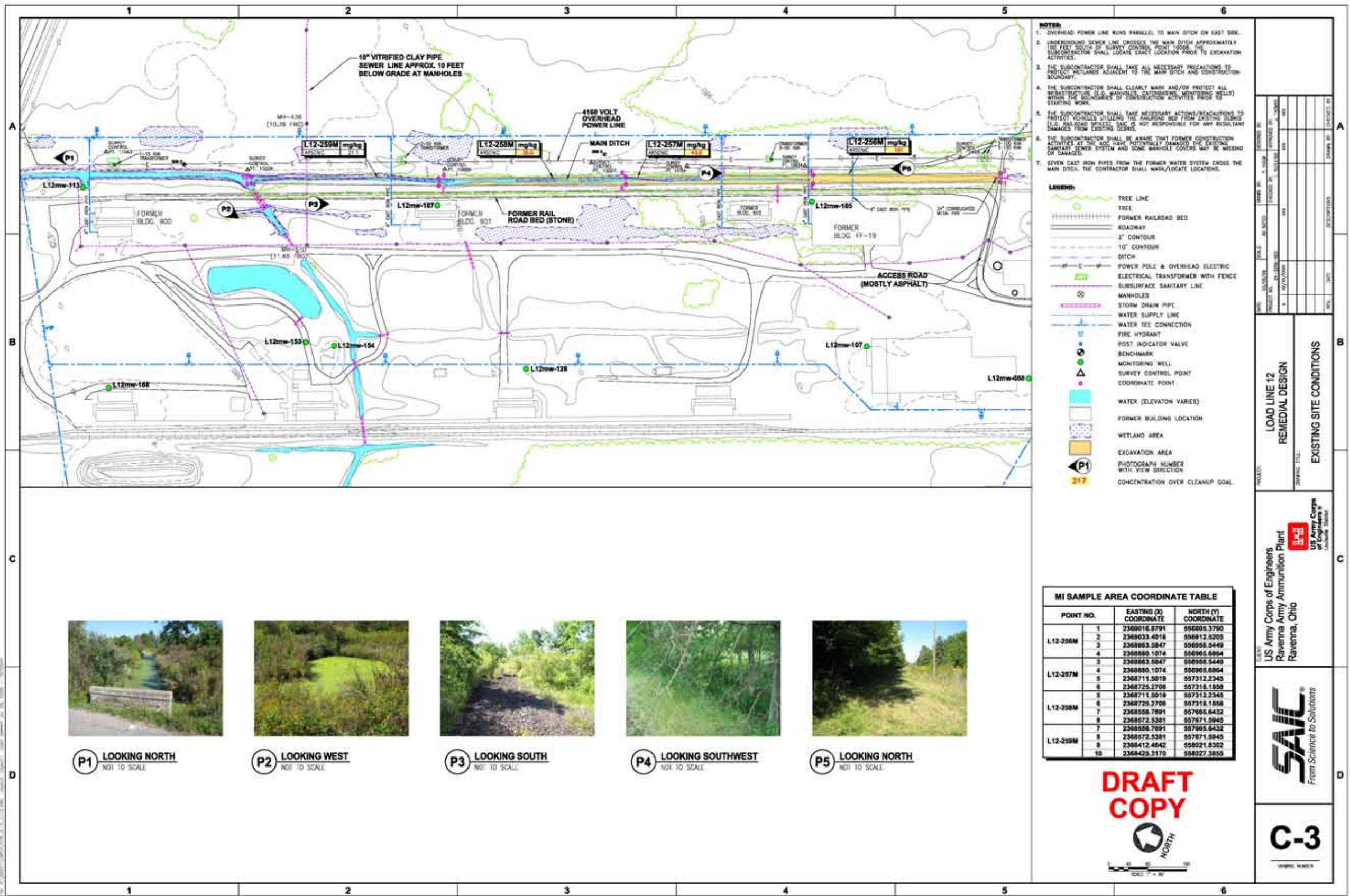
US Army Corps of Engineers
Ravenna Army Ammunition Plant
Ravenna, Ohio

SAIC
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C-2

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- NOTES:**
- OVERHEAD POWER LINE RUNS PARALLEL TO MAIN DITCH ON EAST SIDE.
 - UNDERGROUND SEWER LINE CROSSES THE MAIN DITCH APPROXIMATELY 100 FEET SOUTH OF SURVEY CONTROL POINT 1000B. THE SUBCONTRACTOR SHALL LOCATE EXACT LOCATION PRIOR TO EXCAVATION ACTIVITIES.
 - THE SUBCONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT WETLANDS ADJACENT TO THE MAIN DITCH AND CONSTRUCTION BOUNDARY.
 - THE SUBCONTRACTOR SHALL CLEARLY MARK AND/OR PROTECT ALL INFRASTRUCTURE (E.G. MANHOLES, CATCHBASINS, MONITORING WELLS) WITHIN THE BOUNDARIES OF CONSTRUCTION ACTIVITIES PRIOR TO EXCAVATION WORK.
 - THE SUBCONTRACTOR SHALL TAKE NECESSARY ACTIONS/REACTIONS TO PROTECT VEHICLES UTILIZING THE RAILROAD BED FROM EXISTING OBSTACLES (E.G. RAILROAD SPIKES). SDC IS NOT RESPONSIBLE FOR ANY RESULTANT DAMAGES FROM EXISTING OBSTACLES.
 - THE SUBCONTRACTOR SHALL BE AWARE THAT FORMER CONSTRUCTION ACTIVITIES AT THE AOC HAVE POTENTIALLY DAMAGED THE EXISTING SANITARY SEWER SYSTEM AND SOME MANHOLE COVERS MAY BE MISSING OR DAMAGED.
 - SEVEN CAST IRON PIPES FROM THE FORMER WATER SYSTEM CROSS THE MAIN DITCH. THE CONTRACTOR SHALL MARK/LOCATE LOCATIONS.

- LEGEND:**
- TREE LINE
 - TREE
 - FORMER RAILROAD BED
 - ROADWAY
 - 2' CONTOUR
 - 10' CONTOUR
 - DITCH
 - POWER POLE & OVERHEAD ELECTRIC
 - ELECTRICAL TRANSFORMER WITH FENCE
 - SUBSURFACE SANITARY LINE
 - MANHOLES
 - STORM DRAIN PIPE
 - WATER SUPPLY LINE
 - WATER TEE CONNECTION
 - FIRE HYDRANT
 - POST INDICATOR VALVE
 - BENCHMARK
 - MONITORING WELL
 - SURVEY CONTROL POINT
 - COORDINATE POINT
 - WATER (ELEVATION VARIES)
 - FORMER BUILDING LOCATION
 - WETLAND AREA
 - EXCAVATION AREA
 - PHOTOGRAPH NUMBER WITH VIEW DIRECTION
 - CONCENTRATION OVER CLEANUP GOAL

NO.	REVISION	SCALE	DATE	BY	CHKD	DESCRIPTION
1						
2						
3						
4						
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10						

**LOAD LINE 12
REMEDIAL DESIGN**

EXISTING SITE CONDITIONS

US Army Corps of Engineers
Ravenna Army Ammunition Plant
Ravenna, Ohio

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C-3
SHEET NUMBER

MI SAMPLE AREA COORDINATE TABLE

POINT NO.	EASTING (X) COORDINATE	NORTH (Y) COORDINATE	
L12-258M	1	2369016.8791	556805.3790
	2	2369033.4018	556812.5205
	3	2368963.5847	556956.5449
	4	2368885.1074	556965.8864
L12-257M	5	2368863.0847	556956.5449
	6	2368880.1074	556965.8864
	7	2368711.5019	557312.2345
	8	2368725.2708	557318.1858
L12-258M	9	2368711.5019	557312.2345
	10	2368725.2708	557318.1858
	11	2368508.7891	557665.6432
	12	2368572.5381	557671.5945
L12-259M	13	2368508.7891	557665.6432
	14	2368572.5381	557671.5945
	15	2368412.4642	558021.8302
	16	2368425.3170	558027.3855



P1 LOOKING NORTH
NOT TO SCALE

P2 LOOKING WEST
NOT TO SCALE

P3 LOOKING SOUTH
NOT TO SCALE

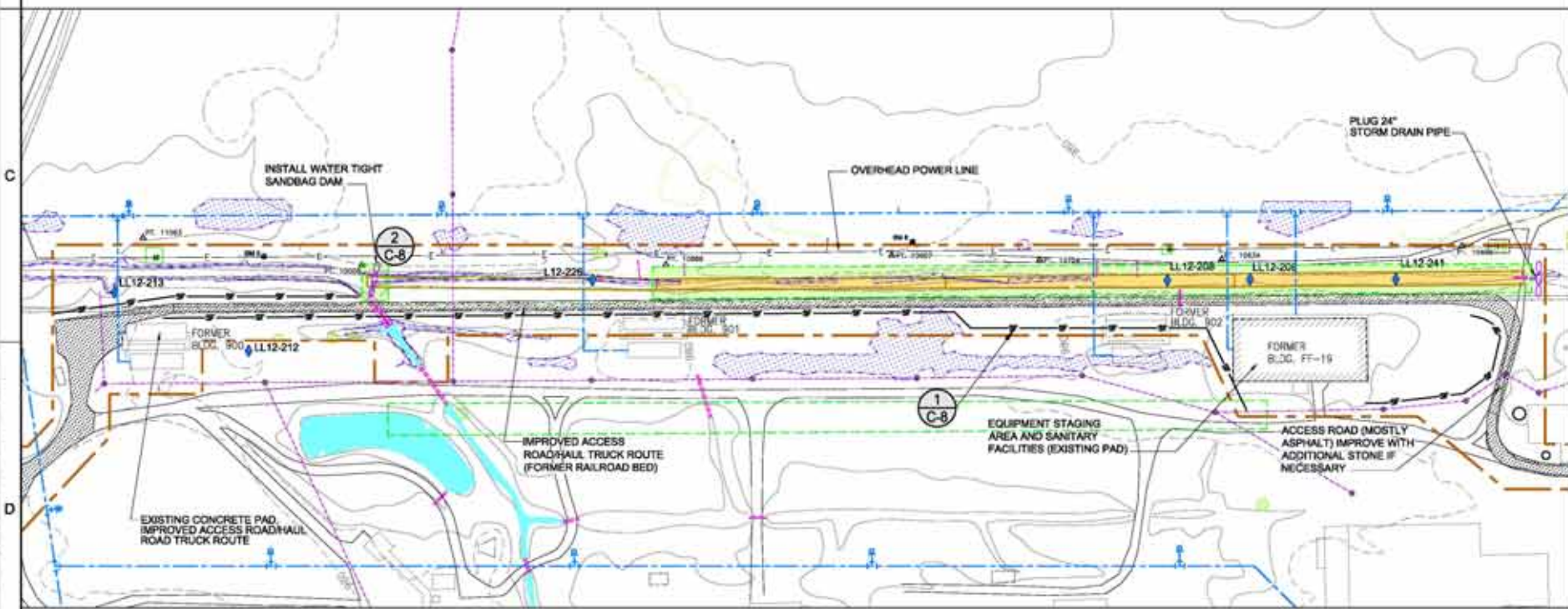
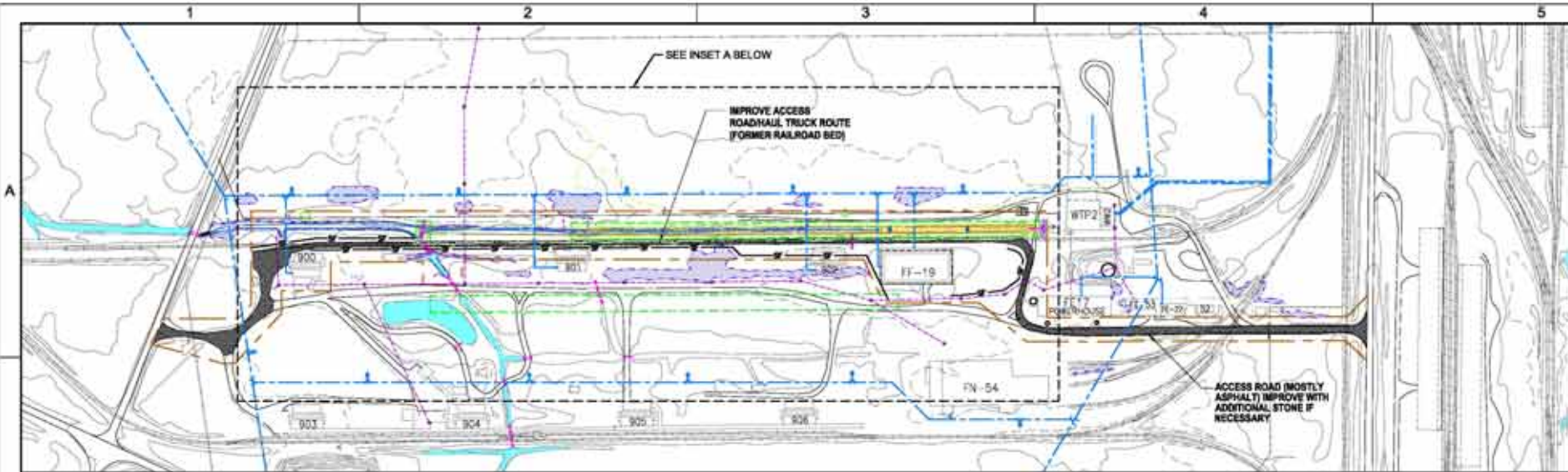
P4 LOOKING SOUTHWEST
NOT TO SCALE

P5 LOOKING NORTH
NOT TO SCALE

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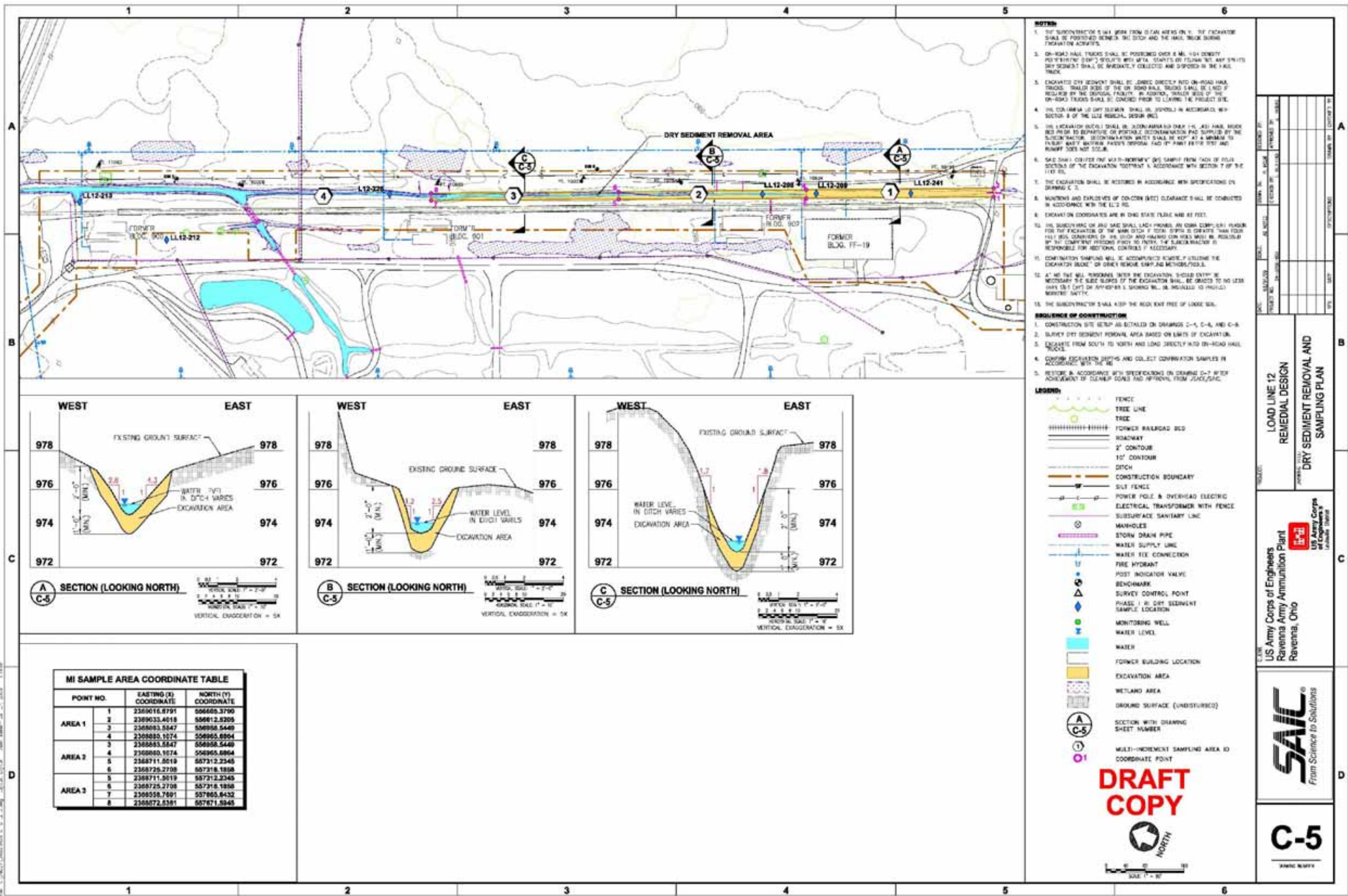


- NOTES:**
1. DRAWINGS AND NOTES SERVE ONLY AS GUIDELINES. ALL STORM WATER CONTROLS SHALL MEET OHIO'S "RAINWATER AND LAND DEVELOPMENT" STANDARDS.
 2. CONSTRUCTION ACTIVITIES SHALL NOT IMPACT THE DRAINAGE DITCHES NORTH OF THE MAIN DITCH OR ADJACENT WETLANDS.
 3. THE SUBCONTRACTOR WILL BE RESPONSIBLE FOR THE INSTALLATION AND MAINTENANCE OF ALL STORM WATER CONTROLS (I.E. TELL TUNCS, SANDBAG BARRIERS, ROCK CONSTRUCTION ENTRANCE, ETC.). DAILY INSPECTIONS SHALL BE CONDUCTED BY THE SUBCONTRACTOR. IN ADDITION, STORM WATER CONTROLS WILL BE INSPECTED WITHIN 24 HOURS OF A STORM EVENT GREATER THAN 0.5 INCHES.
 4. HAUL TRUCK ROUTE ALONG MAIN DITCH IS A FORMER RAILROAD BED WITH BALLAST STONE. THE SUBCONTRACTOR WILL BE RESPONSIBLE FOR REMOVING SPICES AND OTHER MATERIAL FROM THE BALLASTS TO PREVENT DAMAGE TO TRUCK TIRES.
 5. THE SUBCONTRACTOR SHALL CONSTRUCT TEMPORARY WATER TIGHT DAM SUCH AS A SANDBAG BARRIERS, EARTHEN BERM OR TEMPORARY EUTERDAMS ON THE NORTH END AND PLUG THE 24" CORRUGATED STEEL PIPE ON THE SOUTH END OF THE DITCH TO DEWATER THE REMOVAL AREA PRIOR TO REMOVAL ACTIVITIES. WATER SHALL BE PUMPED THROUGH SEDIMENT BAG PRIOR TO DISCHARGE TO DITCH.
 6. THE SUBCONTRACTOR SHALL CLEAR TREES AND VEGETATION IN AREAS NOTED ON THIS DRAWING. ROOT BALLS WITHIN THE EXCAVATION AREA SHALL BE REMOVED AND DISPOSED OF WITH EXCAVATED SOIL. REMOVED TREES AND VEGETATION SHALL BE MANAGED IN ACCORDANCE WITH SECTION 8 OF THE L112 80.
 7. EXCAVATION CONTACT WATER SHALL BE COLLECTED AND STORED IN A TANK PROVIDED BY THE SUBCONTRACTOR. THE TANK SHALL BE MAINTAINED AT THE DESIGNATED EQUIPMENT STAGING AREA. EXCAVATION WATER SHALL BE MANAGED IN ACCORDANCE WITH SECTION 8 OF THE 80.
 8. EQUIPMENT SHALL BE DECONTAMINATED IN A PORTABLE DECONTAMINATION PAD OR OVER THE EAST HAUL TRUCK BED. IF A DECONTAMINATION PAD IS NOT PROVIDED, IT SHALL BE SUPPLIED AND CONSTRUCTED BY THE SUBCONTRACTOR. THE LOCATION OF THE PAD SHALL BE DETERMINED BY THE SUBCONTRACTOR AND APPROVED BY USACE/SAIC.
 9. COLLECTED RAINWATER OR RUN-OFF WATER THAT IS LOADED WITH SEDIMENT (FROM THE EXCAVATION AREA OR FROM THE GROUND SURFACE) SHALL NOT BE DISCHARGED TO ANY WATER COURSE.
 10. EXCAVATION SHALL BE COVERED AT THE END OF EACH DAY AND DURING INCLEMENT WEATHER WITH IMPERMEABLE COVERS OR TARP. PROVIDED BY THE SUBCONTRACTOR AND SECURED WITH SANDBAGS. STORM WATER COLLECTED ON THE IMPERMEABLE EXCAVATION COVERS MAY BE DISCHARGED THROUGH SEDIMENT BAG OVER GROUND SURFACE.
 11. PIPING FOR EXCAVATION WATER SHALL BE PLACED ON EAST SIDE OF DIRT FENCE.
 12. SUBCONTRACTOR MAY USE AREA SOUTH OF EXISTING PAD FOR STOCKPILING CLEAR MATERIALS. SUBCONTRACTOR WILL INSTALL FABRIC/ROCK PAD PRIOR TO STOCKPILING MATERIALS.

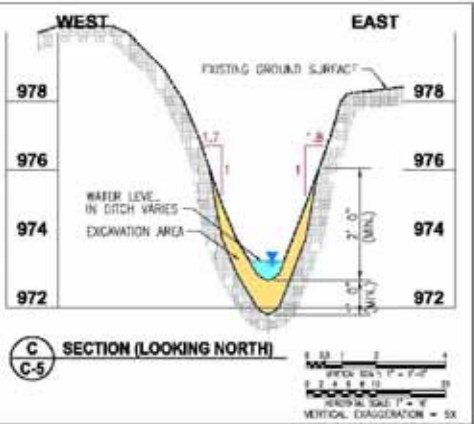
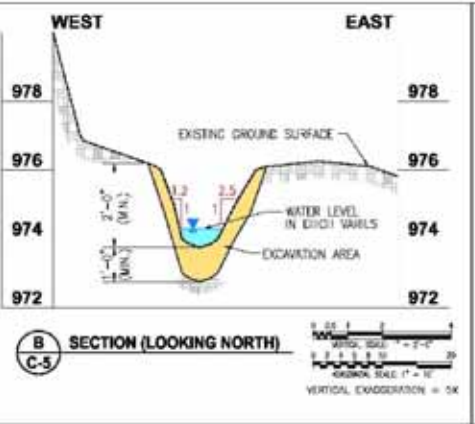
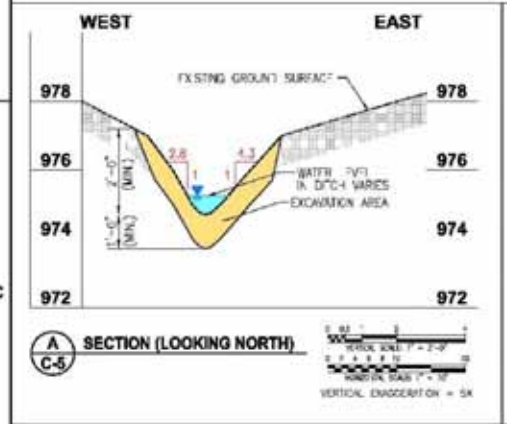
- LEGEND:**
- FENCE
 - TREE LINE
 - TREE
 - FORMER RAILROAD BED
 - ROADWAY
 - 3" CONTOUR
 - 10' CONTOUR
 - DITCH
 - CONSTRUCTION BOUNDARY
 - SILT FENCE
 - POWER POLE & OVERHEAD ELECTRIC
 - ELECTRICAL TRANSFORMER WITH FENCE
 - SUBSURFACE SANITARY LINE
 - MANHOLES
 - STORM DRAIN PIPE
 - WATER SUPPLY LINE
 - WATER TEE CONNECTION
 - FIRE HYDRANT
 - POST INDICATOR VALVE
 - BENCHMARK
 - SURVEY CONTROL POINT
 - PHASE 1 80 DRY SEDIMENT SAMPLE LOCATION
 - MONITORING WELL
 - WATER
 - FORMER BUILDING LOCATION
 - EQUIPMENT STAGING AREA & SANITARY FACILITIES
 - IMPROVED ACCESS/HAUL TRUCK ROUTE
 - EXCAVATION AREA
 - CLEARING & GRUBBING
 - WETLAND AREA
 - SANDBAGS
 - DETAIL WITH DRAWING SHEET NUMBER

DRAFT COPY

<p>LOAD LINE 12 REMEDIAL DESIGN</p> <p>CONSTRUCTION SITE PLAN</p> <p>US Army Corps of Engineers Ravenna Army Ammunition Plant Ravenna, Ohio</p> <p>SAIC From Science to Solutions</p> <p>C-4</p>	<p>DATE: 10/20/2023</p> <p>PROJECT NO: 12-12-208</p> <p>SCALE: 1" = 100'</p> <p>DATE: 10/20/2023</p> <p>PROJECT NO: 12-12-208</p> <p>SCALE: 1" = 100'</p> <p>DATE: 10/20/2023</p> <p>PROJECT NO: 12-12-208</p> <p>SCALE: 1" = 100'</p>	<p>DESIGNED BY: []</p> <p>CHECKED BY: []</p> <p>APPROVED BY: []</p> <p>DATE: 10/20/2023</p> <p>PROJECT NO: 12-12-208</p> <p>SCALE: 1" = 100'</p> <p>DATE: 10/20/2023</p> <p>PROJECT NO: 12-12-208</p> <p>SCALE: 1" = 100'</p>	<p>DATE: 10/20/2023</p> <p>PROJECT NO: 12-12-208</p> <p>SCALE: 1" = 100'</p> <p>DATE: 10/20/2023</p> <p>PROJECT NO: 12-12-208</p> <p>SCALE: 1" = 100'</p>
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- NOTES:**
- THE SUBCONTRACTOR SHALL KEEP FROM 10 FEET AWAY ON E. THE EXCAVATOR SHALL BE POSITIONED BETWEEN THE DITCH AND THE HAUL TRUCK DURING EXCAVATION ACTIVITIES.
 - ON-ROAD HAUL TRUCKS SHALL BE POSITIONED OVER 6 MIL. 10% DENSITY POLYETHYLENE (HDPE) SHEETS WITH AREA. SHEETS OF POLYETHYLENE WITH 50% DRY WEIGHT SHALL BE IMMEDIATELY COLLECTED AND DISPOSED IN THE HAUL TRUCK.
 - EXCAVATED DRY SEDIMENT SHALL BE LOADED DIRECTLY INTO ON-ROAD HAUL TRUCKS. TRUCKS SHALL BE POSITIONED OVER 6 MIL. 10% DENSITY POLYETHYLENE SHEETS WITH AREA. SHEETS OF POLYETHYLENE WITH 50% DRY WEIGHT SHALL BE IMMEDIATELY COLLECTED AND DISPOSED IN THE HAUL TRUCK.
 - THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL, STATE, AND FEDERAL AGENCIES.
 - THE EXCAVATION SHALL BE RESTORED TO ORIGINAL GRADE OR BETTER IN ACCORDANCE WITH SPECIFICATIONS ON DRAWING C-5.
 - MONITORING AND EXPOSURE OF CONCERN (MOC) CLEARANCE SHALL BE CONDUCTED IN ACCORDANCE WITH THE LL-2 R/L.
 - EXCAVATION ON COORDINATES ARE IN THIS STATE PLATE AND AS FEET.
 - THE SUBCONTRACTOR SHALL MAINTAIN ACCESS TO ALL EXISTING UTILITIES AND SHALL BE RESPONSIBLE FOR PROTECTING AND RESTORING ALL UTILITIES TO ORIGINAL OR BETTER CONDITION.
 - CONTINUATION SAMPLING WILL BE ACCORDING TO SECTION 7 OF THE EXCAVATION WORK OR OTHER REMOVE SAMPLING METHODS/PROCS.
 - A 10' MIN. WALL PENETRATES INTO THE EXCAVATION SHOULD EXIST. BE NECESSARY THE EXCAVATION SHALL BE DEEPER TO NO LESS THAN 10' (10' ON APPROX. 1. SHOWN WILL BE INDICATED AS PERMITTED) MINIMUM BATTERY.
 - THE SUBCONTRACTOR SHALL KEEP THE ROAD FREE OF LOOSE SOIL.
- SEQUENCE OF CONSTRUCTION:**
- CONSTRUCTION SITE SETUP AS DETAILED ON DRAWINGS C-1, C-2, C-3, C-4, AND C-5.
 - SURVEY DRY SEDIMENT REMOVAL AREA BASED ON LIMITS OF EXCAVATION.
 - EXCAVATE FROM SOUTH TO NORTH AND LOAD DIRECTLY INTO ON-ROAD HAUL TRUCKS.
 - CONFORM EXCAVATION DEPTHS AND COLLECT CONTINUATION SAMPLES IN ACCORDANCE WITH THE R/L.
 - RESTORE IN ACCORDANCE WITH SPECIFICATIONS ON DRAWING C-7 AFTER ACHIEVEMENT OF CLEANER SOILS AND APPROVAL FROM JEA/C/S/AC.



MI SAMPLE AREA COORDINATE TABLE

POINT NO.	EASTING (X) COORDINATE	NORTH (Y) COORDINATE	
AREA 1	1	2369016.8791	566605.3790
	2	2369033.4618	566612.5205
	3	2369053.3547	566608.5449
	4	2368850.1074	566605.6864
AREA 2	5	2368840.1074	566605.6864
	6	2368711.5619	567312.2345
	7	2368726.2708	567318.1856
AREA 3	8	2368711.5619	567312.2345
	9	2368726.2708	567318.1856
	10	2368558.7891	567465.8432
11	2368572.5391	567671.5245	

LEGEND:

- FENCE
- TREE LINE
- TRAIL
- FORMER RAILROAD BED
- ROADWAY
- 2' CONTOUR
- 10' CONTOUR
- DITCH
- CONSTRUCTION BOUNDARY
- SILT FENCE
- POWER POLE & OVERHEAD ELECTRIC
- ELECTRICAL TRANSFORMER WITH FENCE
- SUBSURFACE SANITARY LINE
- MANHOLES
- STORM DRAIN PIPE
- WATER SUPPLY LINE
- WATER TEE CONNECTION
- FIRE HYDRANT
- POST INDICATOR VALVE
- BENCHMARK
- SURVEY CONTROL POINT
- PHASE I & II DRY SEDIMENT SAMPLE LOCATION
- MONITORING WELL
- WATER LEVEL
- WATER
- FORMER BUILDING LOCATION
- EXCAVATION AREA
- WETLAND AREA
- GROUND SURFACE (UNDISTURBED)
- SECTION WITH DRAWING SHEET NUMBER
- MULTI-INCREMENT SAMPLING AREA ID COORDINATE POINT

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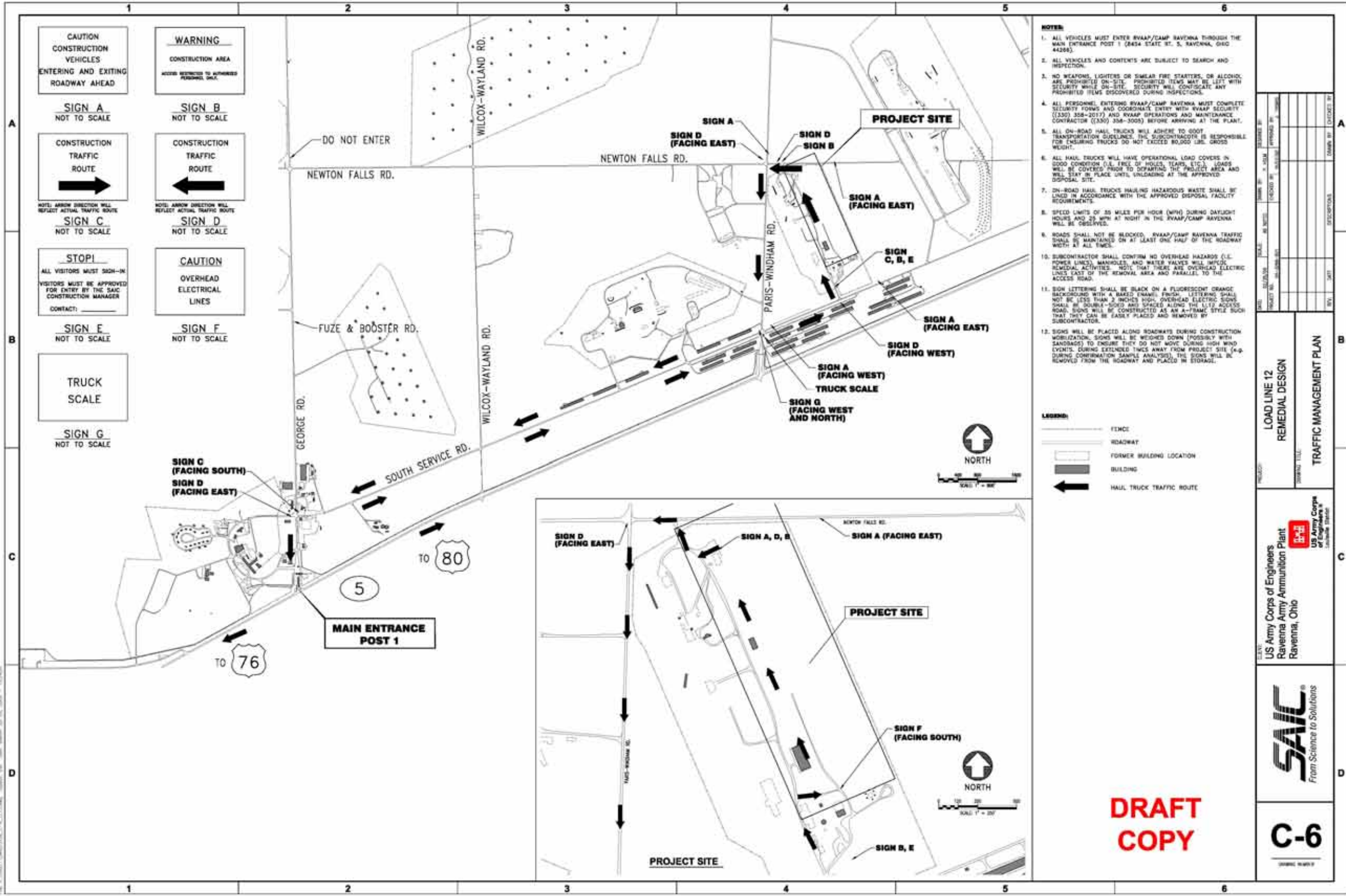
C-5
JANICE NUNY

LOAD LINE 12
REMEDIAL DESIGN
DRY SEDIMENT REMOVAL AND SAMPLING PLAN

US Army Corps of Engineers
Ravenna Army Ammunition Plant
Ravenna, Ohio

US Army Corps of Engineers
Contractor

DATE: 11/15/2017
PROJECT NO: 12-00000000
SHEET NO: 12-00000000
SCALE: AS SHOWN
DRAWN BY: JNUNY
CHECKED BY: JNUNY
APPROVED BY: JNUNY

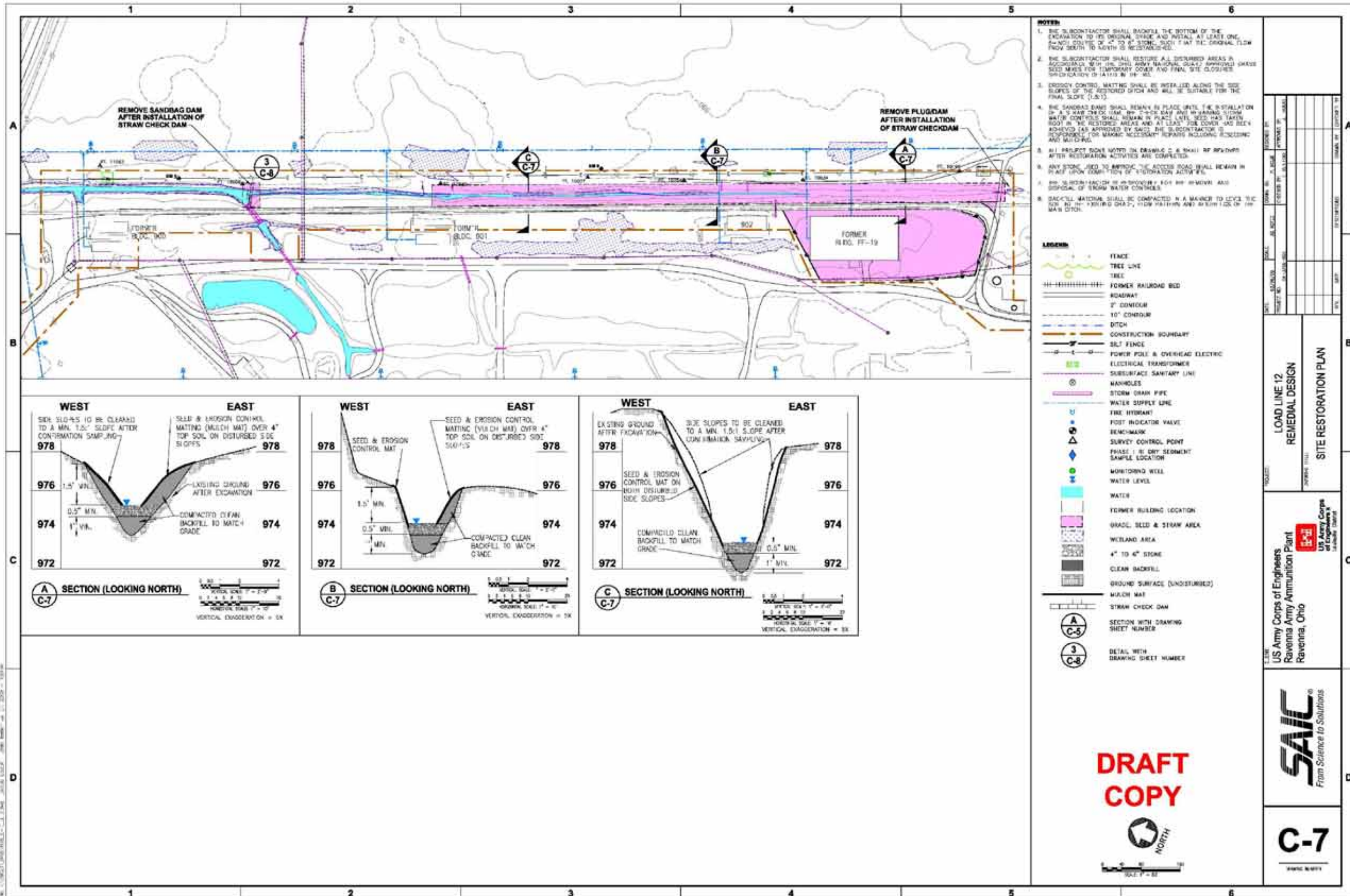


- NOTES:**
1. ALL VEHICLES MUST ENTER RVAAP/CAMP RAVENNA THROUGH THE MAIN ENTRANCE POST 1 (2634 STATE ST. S, RAVENNA, OHIO 44268).
 2. ALL VEHICLES AND CONTENTS ARE SUBJECT TO SEARCH AND INSPECTION.
 3. NO WEAPONS, LIGHTERS OR SIMILAR FIRE STARTERS, OR ALCOHOL, ARE PROHIBITED ON-SITE. PROHIBITED ITEMS MAY BE LEFT WITH SECURITY WHILE ON-SITE. SECURITY WILL CONFISCATE ANY PROHIBITED ITEMS DISCOVERED DURING INSPECTIONS.
 4. ALL PERSONNEL ENTERING RVAAP/CAMP RAVENNA MUST COMPLETE SECURITY FORMS AND COORDINATE ENTRY WITH RVAAP SECURITY ((330) 368-2017) AND RVAAP OPERATIONS AND MAINTENANCE CONTRACTOR ((330) 358-3008) BEFORE ARRIVING AT THE PLANT.
 5. ALL ON-ROAD HAUL TRUCKS WILL ADHERE TO GOVT. TRANSPORTATION GUIDELINES. THE SUBCONTRACTOR IS RESPONSIBLE FOR ENSURING TRUCKS DO NOT EXCEED 80,000 LBS. GROSS WEIGHT.
 6. ALL HAUL TRUCKS WILL HAVE OPERATIONAL LOAD COVERS IN GOOD CONDITION (I.E. FREE OF HOLES, TEARS, ETC.). LOADS WILL BE COVERED PRIOR TO DEPARTING THE PROJECT AREA AND WILL STAY IN PLACE UNTIL UNLOADING AT THE APPROVED DISPOSAL SITE.
 7. ON-ROAD HAUL TRUCKS HAULING HAZARDOUS WASTE SHALL BE LINED IN ACCORDANCE WITH THE APPROVED DISPOSAL FACILITY REQUIREMENTS.
 8. SPEED LIMITS OF 35 MILES PER HOUR (MPH) DURING DAYLIGHT HOURS AND 25 MPH AT NIGHT IN THE RVAAP/CAMP RAVENNA WILL BE OBSERVED.
 9. ROADS SHALL NOT BE BLOCKED. RVAAP/CAMP RAVENNA TRAFFIC SHALL BE MAINTAINED ON AT LEAST ONE HALF OF THE ROADWAY WIDTH AT ALL TIMES.
 10. SUBCONTRACTOR SHALL CONFIRM NO OVERHEAD HAZARDS (I.E. POWER LINES), MANHOLES, AND WATER VALVES WILL IMPED REMEDIAL ACTIVITIES. NOTE THAT THERE ARE OVERHEAD ELECTRIC LINES EAST OF THE REMOVAL AREA AND PARALLEL TO THE ACCESS ROAD.
 11. SIGN LETTERING SHALL BE BLACK ON A FLUORESCENT ORANGE BACKGROUND WITH A BARRIED ENAMEL FINISH. LETTERING SHALL NOT BE LESS THAN 3 INCHES HIGH. OVERHEAD ELECTRIC SIGNS SHALL BE DOUBLE-SIDED AND SPACED ALONG THE 11-12 ACCESS ROAD. SIGNS WILL BE CONSTRUCTED AS AN A-FRAME STYLE SIGN THAT THEY CAN BE EASILY PLACED AND REMOVED BY SUBCONTRACTOR.
 12. SIGNS WILL BE PLACED ALONG ROADWAYS DURING CONSTRUCTION MOBILIZATION. SIGNS WILL BE WEIGHED DOWN (POSSIBLY WITH SANDBALES) TO ENSURE THEY DO NOT MOVE DURING HIGH WIND EVENTS. DURING EXTENDED TIMES AWAY FROM PROJECT SITE (e.g. DURING CONFIRMATION SAMPLE ANALYSIS), THE SIGNS WILL BE REMOVED FROM THE ROADWAY AND PLACED IN STORAGE.

- Legend:**
- FENCE
 - ROADWAY
 - FORMER BUILDING LOCATION
 - BUILDING
 - HAUL TRUCK TRAFFIC ROUTE

<p>REVISIONS</p> <table border="1"> <thead> <tr> <th>NO.</th> <th>DATE</th> <th>DESCRIPTION</th> <th>BY</th> <th>CHKD BY</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>		NO.	DATE	DESCRIPTION	BY	CHKD BY																					<p>DESIGNED BY: _____</p> <p>CHECKED BY: _____</p> <p>DATE: _____</p>
NO.	DATE	DESCRIPTION	BY	CHKD BY																							
<p>LOAD LINE 12 REMEDIAL DESIGN</p>		<p>TRAFFIC MANAGEMENT PLAN</p>																									
<p>US Army Corps of Engineers Ravenna Army Ammunition Plant Ravenna, Ohio</p>		<p>US Army Corps of Engineers Ravenna Army Ammunition Plant Ravenna, Ohio</p>																									
<p>SAIC From Science to Solutions</p>		<p>C-6</p>																									

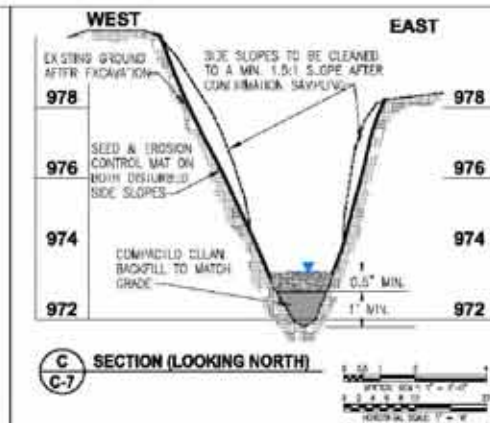
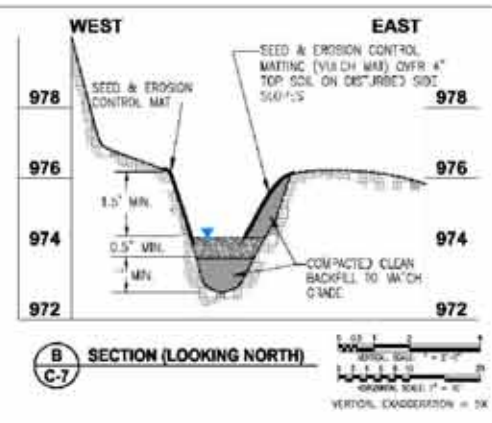
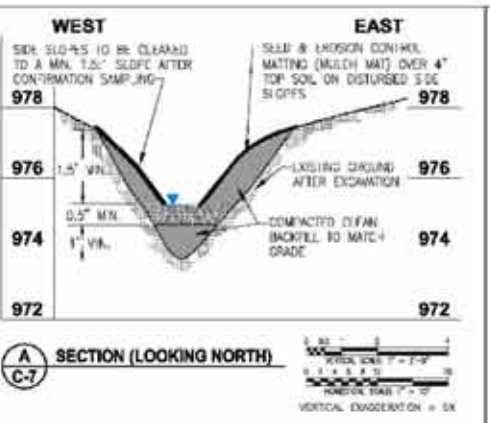
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- NOTES:**
1. THE SUBCONTRACTOR SHALL BACKFILL THE BOTTOM OF THE EXCAVATION TO ITS ORIGINAL GRADE AND INSTALL AT LEAST ONE 4" X 4" STONE COURSE OF 4" TO 8" STONE, SUCH THAT THE ORIGINAL FLOW FROM SOUTH TO NORTH IS RE-ESTABLISHED.
 2. THE SUBCONTRACTOR SHALL RESTORE ALL DISTURBED AREAS IN ACCORDANCE WITH THE US ARMY NATURAL QUALITY APPROVED SHRIKE SEED MIXES FOR TEMPORARY COVER AND FINAL SITE CLOSURES SPECIFICALLY D-1A1113 B OR 11-11.
 3. EROSION CONTROL MATTING SHALL BE INSTALLED ALONG THE SIDE SLOPES OF THE RESTORED DITCH AND SHALL BE SUITABLE FOR THE FINAL SLOPE (1.5:1).
 4. THE SANDBAG DAMS SHALL REMAIN IN PLACE UNTIL THE INSTALLATION OF A 3" X 6" TRUCK DAM, 8" X 2" CH DAM AND 16" HAWKING STORM WATER CONTROLS SHALL BE IN PLACE. SEED HAS TAKEN ROOT IN THE RESTORED AREAS AND AT LEAST 70% COVER HAS BEEN ACHIEVED (AS APPROVED BY SAIC). THE SUBCONTRACTOR IS RESPONSIBLE FOR MAKING NECESSARY REPAIRS INCLUDING RESEEDING AND MAINTENANCE.
 5. ALL EXISTING ROCK MATS ON DRAWING C-7 SHALL BE REPAIRED AFTER RESTORATION ACTIVITIES ARE COMPLETED.
 6. ANY STONE USED TO IMPROVE THE ACCESS ROAD SHALL REMAIN IN PLACE UPON COMPLETION OF RESTORATION ACTIVITIES.
 7. 18" X 18" X 14" (H x W x D) SANDBAGS SHALL BE MOVED AND DISPOSAL OF STORM WATER CONTROLS.
 8. BACKFILL MATERIAL SHALL BE COMPACTED IN A MANNER TO LEAVE THE SURFACE FINISHED TO 1" DIM TOLERANCE AND A MINIMUM 1.5:1 SIDE SLOPE.

LEGEND:

- FENCE
- TREE LINE
- TREE
- FORMER RAILROAD BED
- ROADWAY
- 2" CONTOUR
- 10" CONTOUR
- DITCH
- CONSTRUCTION BOUNDARY
- SILT FENCE
- POWER POLE & OVERHEAD ELECTRIC
- ELECTRICAL TRANSFORMER
- SUBSURFACE SANITARY LINE
- MANHOLES
- STORM DRAIN PIPE
- WATER SUPPLY LINE
- FIRE HYDRANT
- POST INDICATOR VALVE
- BENCHMARK
- SURVEY CONTROL POINT
- PHASE I & II DRY SEDIMENT SAMPLE LOCATION
- MONITORING WELL
- WATER LEVEL
- WATER
- FORMER BUILDING LOCATION
- GRAVEL SEED & STRAW AREA
- WETLAND AREA
- 4" TO 4" STONE
- CLEAN BACKFILL
- GROUND SURFACE (UNDISTURBED)
- MULCH MAT
- STRAW CHECK DAM
- SECTION WITH DRAWING SHEET NUMBER
- DETAIL WITH DRAWING SHEET NUMBER



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LOAD LINE 12
REMEDIAL DESIGN
SITE RESTORATION PLAN

US Army Corps of Engineers
Ravenna Army Ammunition Plant
Ravenna, Ohio

SAIC
From Science to Solutions

C-7

DATE: 01/20/2010 08:44:11 AM

Attachment D. Construction Forms and Checklists

RVAAP Load Line 12 Remedial Design

DAILY CHECKLIST	DATE:
------------------------	--------------

Days since last rainfall: _____ Amount of last rainfall: _____ Inches
 Approximate Temperature: _____ Weather Condition: _____
 Completed by: _____

Yes No N/A

DAILY TAILGATE SAFETY BRIEFING AND FORM COMPLETED

DAILY INSPECTIONS

SWP3 controls (berms, silt fence, inlet protection, etc.) Morning Inspection:

Time Completed: _____

Is standing water present?

Is excavation water present?

If yes, describe action: _____

Are there structural controls in place? If yes, complete table below.

Type of Control	Location of Control	Condition of Control	Sediment Depth (Inches)

Any Maintenance required: _____

Work to be performed by: _____ On or before: _____

General Work Area Inspection:

Time Completed: _____

Work area in good shape (e.g., no debris)? If no, describe actions taken.

RVAAP Load Line 12 Remedial Design

DAILY CHECKLIST

DATE:

Yes No N/A

- Main construction entrance free from soils? If no, describe actions taken.
- Is excavation covered nightly and during inclement weather? If no, describe actions taken.
- Is spill kit maintained onsite and inspected daily? If no, describe actions taken.
- Are fuel tanks stored with secondary containment? If no, describe actions taken.
- Is there continuous dust in construction area? If yes, describe actions taken.

Comments/Actions taken: _____

Equipment Inspection

Time Completed: _____

- Is Frac Tank near capacity (17,500 gallons)? If yes, describe actions taken.
- Is Frac Tank leaking? Is there evidence of wall failure? If yes, describe actions taken.
- Are pumps and hoses functioning properly, without leaks? If no, describe actions taken.
- Are excavation vehicles operating correctly? If no, describe actions taken.
- Are excavation vehicles safety features operation correctly? If no, describe actions taken.
- Are orange safety flags visible and clean on excavation equipment? If no, describe actions taken.
- Is there any visible leaking fluids (i.e. oil, hydraulic, coolants...)? If yes, describe actions taken.

Comments/Actions taken: _____

- Roll-off Boxes
- Trucks

Excavation Area Inspection

Time Completed: _____

Depth of excavation: _____ ft Width of excavation: _____ ft

Length of excavation: _____ ft Soil Type: _____

RVAAP Load Line 12 Remedial Design

DAILY CHECKLIST	DATE:
------------------------	--------------

Yes No N/A

- Crossing excavation prevented (> ft).
- Personnel kept away from sidewalls.
- Equipment and spoils at least two feet from edge.
- Cave in protection needed.
- Cave in protection adequate Type of Protection: _____
- Excavation sloped. If yes, what angle: _____.
- Water kept out of excavation. If no, describe actions taken.
- Excavation work WITHOUT entry. If no, contact Project Manager prior to entry for additional controls measures (i.e. safe entry exit, hazardous atmosphere).

PHOTOGRAPHS TAKEN

What was photographed	Number taken (photo log numbers)

DAILY MEASUREMENTS OF EXCAVATION AREA

- estimated volume/tons _____
- number of trucks _____

COMPLETED TRUCK INSPECTION FORMS

COORDINATE WITH CONTRACTOR ON NEXT DAY'S EXCAVATION PLAN

- Excavation area
- Number of trucks available
- Weather forecast

EXCAVATOR BUCKET WRAPPED IN POLY AND SECURED

DAILY COVER (EXCAVATION)

RVAAP Load Line 12 Remedial Design

DAILY CHECKLIST	DATE:
------------------------	--------------

Yes No N/A

- EQUIPMENT AND SAFETY FENCE SECURED AROUND EXCAVATION AREA**
- LOG BOOK COMPLETED**
- ARE SHIPPING PAPERS/MANIFESTS READY FOR NEXT WORK DAY**
- COMPLETED SWPS INSPECTION AFTER RAIN EVENT DURING WORKING HOURS.**

END OF DAY INSPECTION

- SWP3 controls (berms, silt fence, inlet protection, etc.) End of Day Inspection:**

Time Completed: _____

- Is standing water present?
- Is excavation water present?

If yes, describe action: _____

- Are there structural controls in place? If yes, complete table below.

Type of Control	Location of Control	Condition of Control	Sediment Depth (Inches)

Any Maintenance required: _____

Work to be performed by: _____ On or before: _____

QA By: _____

RVAAP Load Line 12 Remedial Design

DAILY REPORT		DATE:
Weather Condition	A.M.	
	P.M.	
Subcontractors On-Site		
Equipment On-Site		
Visitors On-Site		
Work Performed		
Unexpected Materials Encountered		
Soil Characteristics and Properties		
Schedule Status/Update		
Deviations from Approved Removal Plans and Specifications		
Summary of Communications		
Corrective Action and/or Recommendations for Corrective Action		
Comments		

Completed by: _____

QA by _____

**RVAAP Load Line 12 Remedial Design
Daily Tailgate Safety Brief Log**

Date: _____

Conducted by: _____

I have been briefed by the Site Safety and Health Officer or designated alternate on the potential safety hazards associated the following planned work activities for today:

- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____
- 6 _____
- 7 _____
- 8 _____
- 9 _____
- 10 _____
- 11 _____
- 12 _____
- 13 _____
- 14 _____
- 15 _____

Signature: _____ **Print Name:** _____

Signature: _____ **Print Name:** _____

Signature: _____ **Print Name:** _____

Signature: _____ **Print Name:** _____

Signature: _____ **Print Name:** _____

Signature: _____ **Print Name:** _____

Signature: _____ **Print Name:** _____

Signature: _____ **Print Name:** _____

Signature: _____ **Print Name:** _____

Signature: _____ **Print Name:** _____

Signature: _____ **Print Name:** _____

Signature: _____ **Print Name:** _____

SSHO Signature: _____

CAMP RAVENNA FIRST RESPONDER REPORTING FORM

(Print all information)

*Collect as much of the information on the top half of this form as possible before making initial notification.
Complete the top and bottom of the form before turning in to Camp Ravenna.*

Name of individual reporting spill: _____

When did the spill occur (Date and Time)? _____

Spill Location (Building or area name / number, indoors or out; if vehicle involved, type and bumper number):

What was spilled? _____ How much was spilled? _____

Rate at which material is currently spilling. _____

Extent of spill travel? _____

Did the spill reach water (ditch, creek, stream, pond, well head) _____

Number of injured personnel and type injuries, if applicable. _____

Do you need the Fire Department to respond to protect life, property, and environment? _____

Unit: _____ State: _____ Report Date & Time: _____

On Scene Coordinator Name and Grade: _____ Phone: _____

How did the spill occur (be specific). _____

What remedial action was taken? _____

Was soil and absorbent material generated? _____ How much? _____

What is the location of the soil and absorbents? _____

Was the Environmental Office contacted (yes or No, date and time)? _____

Who did you talk to in the Environmental Office? _____

Was the site cleared by the Env. Office (Yes or No, date and time)? _____

Who cleared the site (name and grade, date and time)? _____

***Initial information is critical. Get as much information as you can, but don't hesitate to make the initial notification if a spill is moving or worsening rapidly!
This form must be completed for all releases and turned-in to Camp Ravenna Range Control within 24 hours.***

FIRST RESPONDER SPILL/RELEASE RESPONSE ACTIONS

Units or contractors performing training or other operations at Camp Ravenna shall be responsible for adhering to the provisions identified in the Camp Ravenna Integrated Contingency Plans (ICP). A copy of the ICP may be obtained from the Camp Ravenna Environmental Supervisor. Following discovery of a spill (any size), the procedures outlined below shall be executed where applicable:

- 1. If necessary, initiate evacuation of the immediate area.**
 - 2. Notify Camp Ravenna Range Control via two-way radio or by calling (614) 336-6041 or (614)336-6562, and report information contained on the “First Responder Reporting Form” if it is known or can reasonably be determined. This form has been copied on the opposite side of this page.**
 - 3. Stop spill flow when possible without undue risk of personal injury.**
 - 4. If trained, contain the spill using available spill response equipment or techniques.**
 - 5. Make spill scene OFF LIMITS to unauthorized personnel.**
 - 6. Restrict all sources of ignition when flammable substances are involved.**
 - 7. Report to the OSC upon his/her arrival to the scene.**
 - 8. Turn in a completed copy of the First Responders Form to Camp Ravenna Range Control for ALL releases, even ones cleaned up by the reporter.**
-

TELEPHONE NUMBER

When Camp Ravenna Range Control is not available, the Camp Ravenna On-Scene Coordinator (OSC) must be contacted by the discoverer/first responder following a release if it is in water, at or above a reportable quantity (25 gallons or more), a hazardous or extremely hazardous substance, a hazardous waste, or involves fire, explosion, or is otherwise a major incident.

NAME	JOB TITLE	OFFICE	24 HOUR
Camp Ravenna Range Control	Operations and Training	(614)336-6041 or 6562	Contact Alternate
Tim Morgan (Primary OSC)	Environmental Supervisor	(614)336-6568	(330)322-7098
Katie Elgin	Environmental Specialist	(614)336-6136	Contact Alternate
SFC Chad Baucum	Range Operations	(614)336-6562	(330)575-6585
MAJ Richard Saphore	Logistics Officer	(614)336-6790	(614)593-1654
LTC Ed Meade	Garrison Commander	(614)336-6560	(614)307-0493

Off-site (from RTLS area code 614 phones)

- Windham Fire Department9-1-330- 326-2222
- Portage County Sheriff 9-1-330-296-5100
- Trumbull County Police, Fire Department and Hazmat..... 911

SEE REVERSE FOR FIRST RESPONDER REPORTING FORM

**RVAAP Load Line 12 Remedial Design
Health and Safety Plan Signature Log**

I have reviewed and understand the contents of the Health and Safety Plan. I hereby agree to comply with all the requirements outlined herein.

Signature: _____ **Date:** _____

Print Name: _____ **Agency:** _____

Signature: _____ **Date:** _____

Print Name: _____ **Agency:** _____

Signature: _____ **Date:** _____

Print Name: _____ **Agency:** _____

Signature: _____ **Date:** _____

Print Name: _____ **Agency:** _____

Signature: _____ **Date:** _____

Print Name: _____ **Agency:** _____

Signature: _____ **Date:** _____

Print Name: _____ **Agency:** _____

Signature: _____ **Date:** _____

Print Name: _____ **Agency:** _____

Signature: _____ **Date:** _____

Print Name: _____ **Agency:** _____

**RVAAP Load Line 12 Remedial Design
Site and Erosion Control Inspection Form**

Date: _____

Time: _____

Weather: (include days since last rainfall and amount in inches of last rainfall)

SILT FENCE INSPECTION

Are silt fences intact?

Yes No

If no, describe status when arrived at site and maintenance required for silt fences:

Percentage of grass cover at construction footprints? _____

Where photos taken at the site ?

Yes No

CHECK DAM INSPECTION

Is Check Dam intact?

Yes No

If no, describe status when arrived at site and maintenance required:

SITE INSPECTION

Is the site in good shape (e.g., no debris)?

Yes No

If no, describe status when arrived at site and maintenance required to improve site condition:

If site requires additional actions beyond what can be done during the inspection, please contact the Project Manager immediately to coordinate site improvements.

ADDITIONAL COMMENTS

Recorded By: _____ **Date:** _____

QC Checked By: _____ **Date:** _____

**RVAAP Load Line 12 Remedial Design
Site Restoration Inspection Form**

Date/Time: _____

Completed by: _____

SITE RESTORATION INSPECTION

Final grading completed and vegetative layer installed?

Yes No

Temporary SWP3 controls removed?

Yes No

Final SWP3 controls installed?

Yes No

Were all disturbed areas seeded/hydroseeded?

Yes No

Is seed established? (70% coverage is required)

Yes No

Is silt fencing intact?

Yes No

Signs of erosion (cracks/ruts/gullies/minimal grass coverage/slope failure)?

Yes No

Maintenance required for above issues:

**RVAAP Load Line 12 Remedial Design
Truck Inspection Form**

Date/Time: _____

Completed by: _____

Truck/License Number: _____ **Trucking Company:** _____

Type of Load Hazardous Waste Soil or Non-hazardous Waste Soil (circle one)

Is the truck lined (if required by disposal facility)? Yes No

Are all sides of truck and its wheels cleaned of all debris? Yes No
If no, describe actions taken.

Is the truck covered? Yes No

Is waste manifest (or shipping papers) completed and in the truck? Yes No

Comments:

Attachment E

Land Use Controls for Soil and Dry Sediment at the RVAAP-12 Load Line 12

Ravenna Army Ammunition Plant
Ravenna, Ohio

GSA Contract No. GS-10F-0076J
Delivery Order No. W912QR-05-F-0033

Prepared for:

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

Prepared by:

SAIC Engineering of Ohio, Inc.
8866 Commons Boulevard
Twinsburg, Ohio 44087

July 13, 2009

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1
2

ACRONYMS AND ABBREVIATIONS

AOC	Area of Concern
BGS	Below Ground Surface
Camp Ravenna	Camp Ravenna Joint Military Training Center
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	Chemical of Concern
CUG	Cleanup Goal
EPC	Exposure Point Concentration
FS	Feasibility Study
GIS	Geographic Information System
HHRA	Human Health Risk Assessment
IRP	Installation Restoration Program
LL12	Load Line 12
LUC	Land Use Control
MEC	Munitions and Explosives of Concern
MMRP	Military Munitions and Response Program
NGB	National Guard Bureau
NPDES	National Pollutant Discharge Elimination System
OHARNG	Ohio Army National Guard
Ohio EPA	Ohio Environmental Protection Agency
PMP	Property Management Plan
RAO	Remedial Action Objective
RD	Remedial Design
RI	Remedial Investigation
ROD	Record of Decision
RVAAP	Ravenna Army Ammunition Plant
U.S. Army	U.S. Department of Army
USACE	U.S. Army Corps of Engineers
UXO	Unexploded Ordnance

1.0 BACKGROUND

1.1 GENERAL FACILITY DESCRIPTION

When the Ravenna Army Ammunition Plant (RVAAP) Installation Restoration Program (IRP) began in 1989, the RVAAP was identified as a 21,419-acre installation. The property boundary was resurveyed by the Ohio Army National Guard (OHARNG) over a two year period (2002 and 2003) and the actual total acreage of the property was found to be 21,683.289 acres. As of February 2006, a total of 20,403 acres of the former 21,683-acre RVAAP have been transferred to the National Guard Bureau (NGB) and subsequently licensed to the OHARNG for use as a military training site – Camp Ravenna Joint Military Training Center (Camp Ravenna). The current RVAAP consists of 1,280 acres in various parcels throughout the OHARNG Camp Ravenna.

Camp Ravenna is in northeastern Ohio within Portage County and Trumbull County, approximately 3 miles (4.8 km) east-northeast of the city of Ravenna and approximately 1 mile (1.6 km) northwest of the city of Newton Falls. The RVAAP portions of the property are solely located within Portage County. Camp Ravenna is a parcel of property approximately 11 miles (17.7 km) long and 3.5 miles (5.6 km) wide bounded by State Route 5, the Michael J. Kirwan Reservoir, and the CSX System Railroad on the south; Garret, McCormick, and Berry roads on the west; the Norfolk Southern Railroad on the north; and State Route 534 on the east (see Figures 1-1 and 1-2). Camp Ravenna is surrounded by several communities: Windham on the north; Garrettsville 6 miles (9.6 km) to the northwest; Newton Falls 1 mile (1.6 km) to the southeast; Charlestown to the southwest; and Wayland 3 miles (4.8 km) to the south.

The entire 21,683-acre parcel was an industrial facility that was government-owned and contractor-operated when the RVAAP was operational (Camp Ravenna did not exist at that time). The RVAAP IRP encompasses investigation and cleanup of past activities over the entire 21,683 acres of the former RVAAP; therefore, references to the RVAAP in this document indicate the historical extent of the RVAAP, which is inclusive of the combined acreages of the current Camp Ravenna and RVAAP, unless otherwise specifically stated.

Camp Ravenna is used for training and related activities; including field operations and bivouac training, convoy training, equipment maintenance, and storage of heavy equipment. Approximately 1,280 acres of property remain under the control of RVAAP; this acreage includes areas of concern (AOCs) and active mission areas. As AOCs are remediated, transfer of the remaining acreage will occur for the purposes of the Camp Ravenna mission. Future uses of the land at RVAAP include mounted and dismounted maneuver training areas, development of ranges, as well as the construction of additional field support and cantonment facilities to support future training.

1.2 LOAD LINE 12 DESCRIPTION

Load Line 12 (LL12), designated as AOC RVAAP-12, covers about 80 acres in the southeastern portion of RVAAP (Figures 1-2 and 1-3). LL12 was originally known as the Ammonium Nitrate Plant and started operations on November 25, 1941. Structures related to the production of the ammonium nitrate were the Neutral Liquor Building (Building FF-19) and seven evaporation/crystallization units (Buildings 900, 901, 902, 903, 904, 905, and 906). Other structures, such as Water Works No. 2 and Power House No. 3 (Building FE-17), housed support operations. The western half of the AOC contained former production areas. The eastern half was previously cleared, but did not contain any known production facilities. The Remedial Investigations (RIs) also identified an area immediately north of the AOC (informally termed the Team Track Area) that was apparently used for offloading and staging of materials used in LL12 production activities.

In May 1943, production of ammonium nitrate was terminated. From 1946 to 1950, a private contractor leased LL12 to produce fertilizer-grade ammonium nitrate. From 1965 to 1967, a private contractor leased Building FF-19 for the production of aluminum chloride. The U.S. Department of Army (U.S. Army) terminated the lease early due to environmental concerns related to air emissions and wastewater discharges to Cobbs Ponds.

In June 1944, Buildings 900, 904, and 905 were converted for demilitarization of munitions. Rinsate from demilitarization operations was initially allowed to flow out of the buildings and directly onto the ground or to drainage ditches. In 1981, the LL12 Pink Water Treatment Plant was built to treat the demilitarization effluent prior to discharge. After the termination of demilitarization operations, the treatment plant was used under a National Pollutant Discharge Elimination System (NPDES) permit to treat explosives-tainted stormwater from LL12 and other RVAAP locations.

Currently, there are no above-grade structures remaining at the AOC. Demolition of Buildings 901, 902, 906, and FF-19 took place between 1973 and 1975. Building FN-54 (bagging and shipping facility) was demolished in the 1980s. In 1999, approximately 1,500 ft³ of soil was removed from four pits near Building 904 and taken to a former warehouse at Load Line 4 as part of an explosives composting pilot study. Demolition of all remaining structures took place between 1998 and 2000. A former blast berm near Building 903 was removed and used as fill/groundcover for areas around Buildings 903 and FE-17.

The following investigations have been completed for LL12:

- *Preliminary Assessment for the Characterization of Areas of Contaminations at the Ravenna Army Ammunition Plant, Ravenna, Ohio* (USACE 1996);
- *Phase I Remedial Investigation Report for the Phase I Remedial Investigation of High Priority Areas of Concern at the Ravenna Army Ammunition Plant, Ravenna Ohio* (USACE 1998);

- 1 • *Phase II Remedial Investigation Report for Load Line 12 at the Ravenna Army Ammunition*
2 *Plant, Ravenna, Ohio (USACE 2004);*
- 3 • *Characterization of 14 Areas of Concern at the Ravenna Army Ammunition Plant Ravenna,*
4 *Ohio (MKM 2007); and*
- 5 • *Phase II Remedial Investigation Supplemental Report for Load Line 12 at the Ravenna Army*
6 *Ammunition Plant, Ravenna, Ohio (USACE 2005a).*

7 The U.S. Army intends to transfer LL12 to NGB following the remediation of contaminated soil/dry
8 sediment. OHARNG plans to use LL12 for National Guard training. Specifically, the AOC will be
9 used for mounted training, which includes operation of wheeled and tracked vehicles.

10
11 An evaluation of alternatives was conducted to select remedies for shallow soil and dry sediment.
12 Dry sediment refers to unconsolidated inorganic and organic material on the surface of the ground
13 that occasionally may be covered with water, usually following a precipitation event. Dry sediments
14 are not covered with water for extended periods and typically dry within seven days. Dry sediments
15 do not function as permanent habitat for aquatic organisms, although they may serve as a natural
16 medium for the growth of terrestrial organisms. Dry sediment is essentially soil that, due to its
17 location, may be covered with water occasionally. The term soil used throughout this Land Use
18 Control (LUC) Remedial Design (RD) refers to soil and accumulated dry sediment. The evaluation of
19 the alternatives is documented in the *Feasibility Study for Load Line 12 (USACE 2006)*.

20
21 The Site Inspection Report (E2M 2008) for the Military Munitions Response Program (MMRP) at
22 RVAAP recommended no further action for LL12 with respect to unexploded ordnance (UXO) and
23 munitions and explosives of concern (MEC). However, MEC survey and clearance procedures will
24 be implemented during excavation activities as additional safety precautions.

25
26 The selected remedy for chemically contaminated soil consists of excavation and disposal of
27 contaminated soil identified within the Main Ditch at LL12. The selected alternative includes the
28 following:

- 29
30 • Clearing of vegetation;
- 31 • Excavation of contaminated soil above clean up goals (CUGs) to a depth of 4 ft below ground
32 surface (BGS);
- 33 • Handling and disposal of contaminated soil (above remedial goals) at an approved off-site
34 facility;
- 35 • Confirmatory sampling after excavation;
- 36 • Restoration of excavated areas by backfilling with clean fill material per the *Facility-Wide*
37 *Sampling and Analysis Plan for Environmental Investigations at the RVAAP (USACE 2001);*

- 1 • Implementation of LUCs (e.g., security procedures, installation perimeter fencing, markers,
2 and operational administrative controls) at LL12; and
- 3 • Conducting 5-year reviews and monitoring of the performance of the selected remedy (i.e.,
4 monitoring of the LUC effectiveness) as described in the LL12 Record of Decision (ROD)
5 (USACE 2009).

6
7 In addition, the selected alternative includes inspection and maintenance of the RVAAP/Camp
8 Ravenna perimeter fence.

10 **1.3 PURPOSE**

11
12 The purpose of this LUC RD is to outline a process for the implementation and maintenance of LUCs
13 as part of the remedial action at LL12. This LUC RD provides LUC performance objectives, the
14 LUCs to be used, and the LUC implementation actions.

16 **1.4 EXPOSURE ASSUMPTIONS AND ANTICIPATED LAND USE**

17
18 This baseline human health risk assessment (HHRA) summary documents the potential health risks to
19 humans resulting from exposure to contamination within LL12 at RVAAP if no remedial action was
20 taken. It provides the basis for taking action and identifies the contaminants and exposure pathways
21 that need to be addressed by the remedial action. Section G.1 of the ROD summarizes the results of
22 the baseline risk assessment presented in the Feasibility Study (FS) for LL12 at RVAAP (USACE
23 2006).

24
25 The RVAAP will be retained by the U.S. government (i.e., a federal facility) for use by the OHARNG
26 for military training. The HHRA identified the National Guard Trainee as the representative receptor
27 for the reasonably anticipated future land use. Three other receptors (Security Guard/Maintenance
28 Worker, Fire/Dust Suppression Worker, and Hunter/Trapper) were also considered under the planned
29 OHARNG future use. The National Guard Trainee is the most sensitive receptor under planned future
30 land use. Potential exposures for the remaining three receptors are less than the National Guard
31 Trainee and clean-up goals for the National Guard Trainee are also protective for these other
32 receptors. The Resident Subsistence Farmer (adult and child) provided a full comparative range of
33 risks for development and analysis of remedial alternatives. Risk information for other receptors is
34 located in the HHRA (USACE 2005b) and FS (USACE 2006).

35
36 The intended future land use for LL12 is for National Guard training. Specifically, this area will be
37 used for mounted training. Maneuver damage may occur up to 4 ft BGS. This future use is inclusive
38 of these receptor types: Trainee, Security Guard/Maintenance Worker, Hunter/Trapper, and Fire/Dust
39 Suppression Worker.

1 **1.5 SUMMARY OF RISKS NECESSITATING LAND USE CONTROLS**
2

3 A HHRA evaluated potential risks from current and predicted future exposures to soil and dry
4 sediment contaminants at LL12 (USACE 2005b). Currently, installation personnel visit the AOC
5 infrequently to conduct power line maintenance, perform timber harvesting, and check the status of
6 beaver dams. OHARNG plans to use LL12 for National Guard mounted training. The HHRA
7 evaluated the Security Guard/Maintenance Worker, Hunter/Trapper, Child Trespasser, National
8 Guard Trainee, Open Recreator, Open Industrial Worker, and Resident Farmer (adult and child) as
9 receptors to address a range of possible future land uses.

10
11 Nine soil and three dry sediment chemicals of concern (COCs) were identified for the National Guard
12 Trainee in the HHRA for LL12 (USACE 2005b). All of these COCs, except arsenic, were eliminated
13 from further consideration because the corresponding exposure point concentrations (EPCs) did not
14 exceed the clean-up goals. Also, the distribution of COCs in soil was limited to isolated occurrences
15 (e.g., no definite areas of contamination).

16
17 The remedial action objective (RAO) references clean-up goals and target risk levels that are
18 considered protective of human health under current and reasonably anticipated future use scenarios.
19 The RAO for this remedy is to prevent National Guard Trainee exposure to contaminants in soil and
20 dry sediment that exceed the clean-up goals to a depth of 4 ft BGS. Soil and dry sediment
21 contamination will be remediated to a maximum depth of 4 ft BGS because future land use will not
22 require disturbance of soil below that depth. The clean-up goals are presented in Section H, Table 2
23 of the ROD.

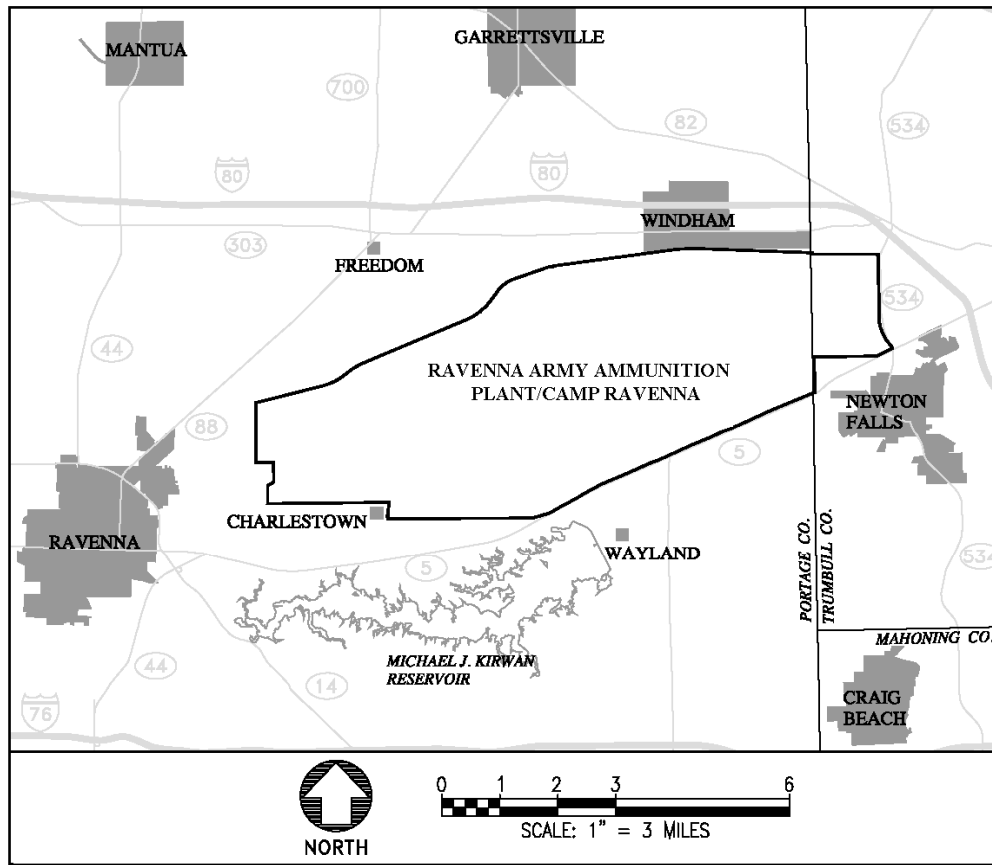
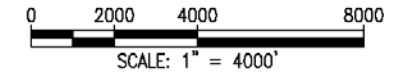
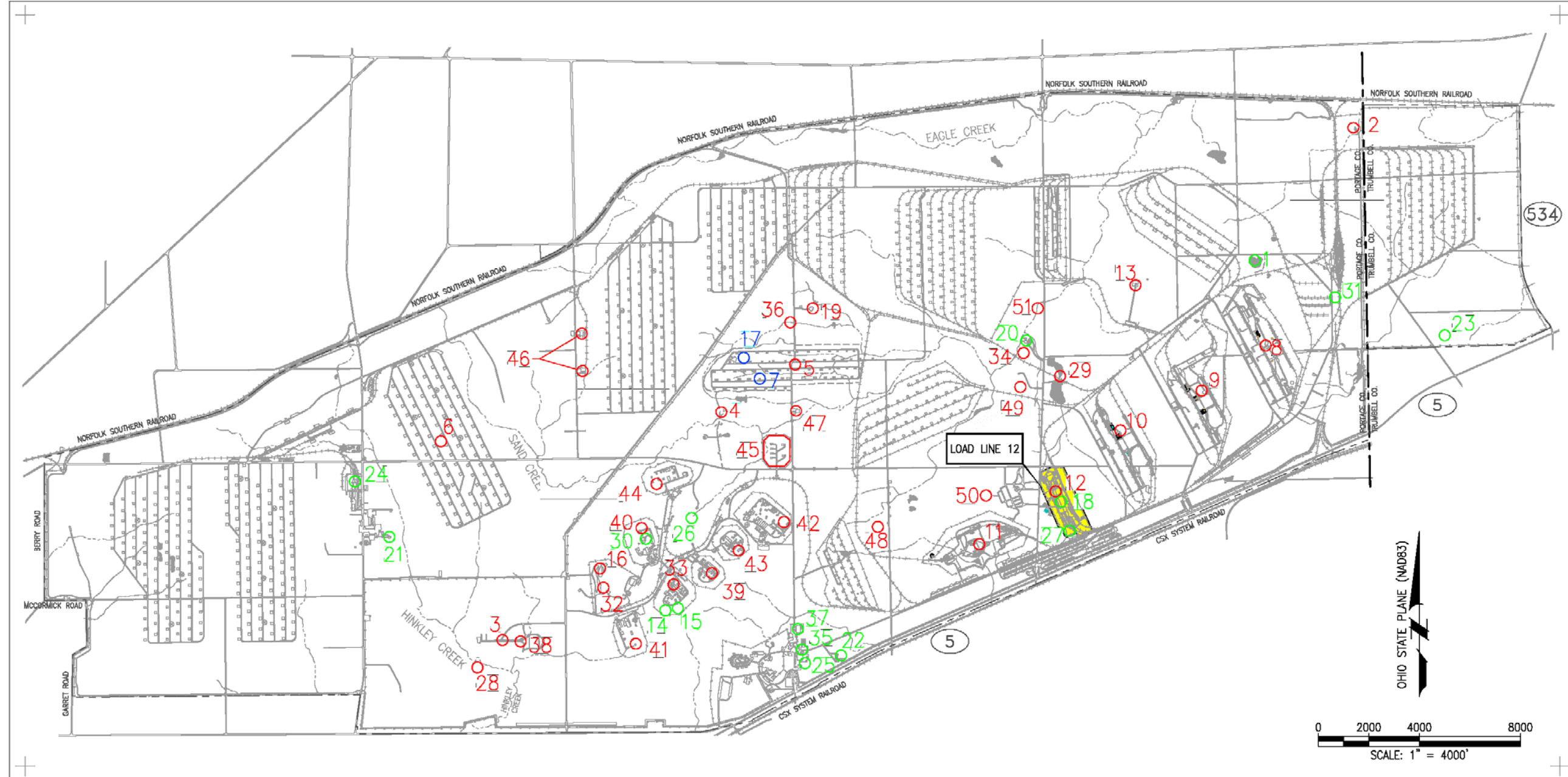


Figure 1-1. General Location and Orientation of the RVAAP/ Camp Ravenna

File: W:\CAD_Gov\Ravenna\PRC 2005\Location Map\RVAMP Site.dwg Layout: Load Line 12 User: willfameba Jun 20, 2007 - 10:02am



LEGEND:

1..... RAMSDELL QUARRY LANDFILL	13..... BUILDING 1200 AND DILUTION/SETTLING POND	25..... BUILDING 1034 MOTOR POOL WASTE OIL TANK	37..... PESTICIDE STORAGE BUILDING T-4452
2..... ERIE BURNING GROUNDS	14..... LOAD LINE 6, EVAPORATION UNIT	26..... FUZE BOOSTER AREA SETTLING TANKS	38..... NACA TEST AREA
3..... DEMOLITIONS AREA #1	15..... LOAD LINE 6, TREATMENT PLANT	27..... BUILDING 854 PCB STORAGE	39..... LOAD LINE 5/FUZE LINE 1
4..... OPEN DEMOLITIONS AREA #2	16..... FUZE AND BOOSTER QUARRY LANDFILL/PONDS	28..... MUSTARD AGENT BURIAL SITE	40..... LOAD LINE 7/BOOSTER LINE 1
5..... WINKLEPECK BURNING GROUNDS	17..... DEACTIVATION FURNACE	29..... UPPER AND LOWER COBB'S POND COMPLEX	41..... LOAD LINE 8/BOOSTER LINE 2
6..... C BLOCK QUARRY	18..... LOAD LINE 12 PINK WASTEWATER TREATMENT	30..... LOAD LINE 7 PINK WASTEWATER TREATMENT PLANT	42..... LOAD LINE 9/DETONATOR LINE
7..... BUILDING 1601 HAZARDOUS WASTE STORAGE	19..... LANDFILL NORTH OF WINKLEPECK BURNING GROUND	31..... ORE PILE RETENTION POND	43..... LOAD LINE 10/PERCUSSION ELEMENT
8..... LOAD LINE 1 AND DILUTION/SETTLING POND	20..... SAND CREEK SEWAGE TREATMENT PLANT	32..... 40- AND 60-MM FIRING RANGE	44..... LOAD LINE 11/ARTILLERY PRIMER
9..... LOAD LINE 2 AND DILUTION/SETTLING POND	21..... DEPOT SEWAGE TREATMENT PLANT	33..... FIRESTONE TEST FACILITY	45..... WET STORAGE AREA
10..... LOAD LINE 3 AND DILUTION/SETTLING POND	22..... GEORGE ROAD SEWAGE TREATMENT PLANT	34..... SAND CREEK DISPOSAL ROAD LANDFILL	46..... BUILDINGS F-15 AND F-16
11..... LOAD LINE 4 AND DILUTION/SETTLING POND	23..... UNIT TRAINING SITE WASTE OIL TANK	35..... BUILDING 1037 LAUNDRY WASTEWATER SUMP	47..... BUILDING T-5301 DECONTAMINATION
12..... LOAD LINE 12	24..... RESERVE UNIT MAINTENANCE AREA WASTE OIL TANK	36..... BUILDING 1037 LAUNDRY WASTEWATER SUMP	48..... ANCHOR TEST AREA

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
 US Army Corps of Engineers
 Louisville District
 LOUISVILLE, KENTUCKY

RAVENNA ARMY AMMUNITION PLANT/CAMP RAVENNA

DRAWN BY: P.H. / S.D. REV. NO./DATE: REV. 2 / 07-27-04 CAD FILE: /00064/DWGS/R73SITE2

Figure 1-2. RVAAP/ Camp Ravenna Installation Map

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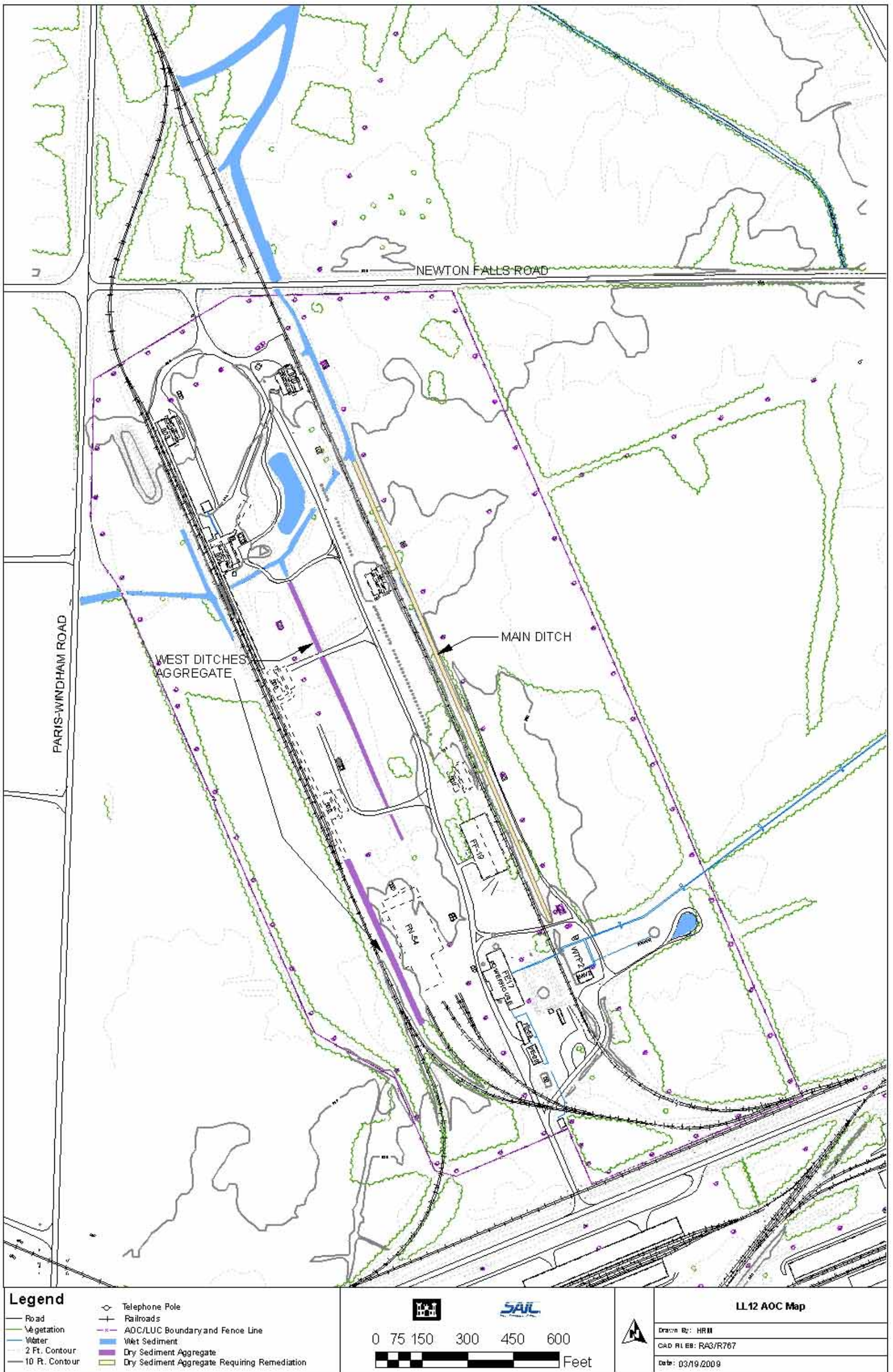


Figure 1-3. Load Line 12 Area of Concern Map

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2.0 LAND USE CONTROL OBJECT

The U.S. Army will implement LUCs to achieve the performance objectives listed below for LL12.

- 1.) Maintain the Camp Ravenna perimeter fence.
- 2.) Restrict future land use to National Guard mounted training.
- 3.) Maintain LUC training program.
- 4.) Limit activities to tracked and wheeled operations that are consistent National Guard mounted training scenario and other essential security, safety, and natural resources management activities.
- 5.) Prohibit digging beyond 4 ft BGS at LL12.

Figures 1-2 and 1-3 depict the LUC boundaries for LL12.

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1 **3.0 LAND USE CONTROLS**

2
3 This section provides a description of the LUCs, the logic for their selection, and implementation
4 actions. The U.S. Army or its representatives are responsible for implementation, inspection, periodic
5 reporting, and enforcement of the LUCs for LL12. As a condition of property transfer or lease, the
6 U.S. Army may require the transferee or lessee, with approval from the Ohio Environmental
7 Protection Agency (Ohio EPA), to assume responsibility for various implementation actions as
8 indicated below. Third party LUC responsibility will be incorporated into pertinent contractual and
9 property documentation, such as a purchase agreement, deed, lease, and an Ohio Environmental
10 Covenant. Although the U.S. Army may transfer primary responsibility for various implementation
11 actions to a third party, the U.S. Army shall remain ultimately responsible for remedy integrity. This
12 means that the U.S. Army remains responsible for addressing violations of LUCs. Should any LUC
13 be violated, the U.S. Army will ensure that appropriate actions are taken as soon as practicable to
14 terminate the offending land use and may initiate legal action to either compel action by a third
15 party(ies) and/or to recover the U.S. Army's costs for remedying any discovered LUC violation(s).

16
17 **3.1 LAND RESTRICTIONS AT LOAD LINE 12**

18
19 Land use of LL12 shall be limited by the maintenance of the existing Camp Ravenna perimeter fence,
20 which shall be a 6-foot chain-link fence topped with a v-shaped bracket slanting inward and outward
21 with a three-strand barbed wire bracket.

22
23 Land use shall be limited to use of LL12 for National Guard mounted training operations. Activities
24 at LL12 shall be limited to the following: tracked and wheeled vehicle operations and associated
25 training activities along with training area development and maintenance, maintaining the integrity of
26 monitoring wells, road and culvert repair, routine ditch maintenance, vegetation management
27 [mowing, brush and weed cutting, controlled burning, and herbicide application]); and compatible
28 natural resources management activities (including but not limited to such activities as flora and fauna
29 surveys, timber management to include timber stand improvement and forest products harvesting, soil
30 stabilization and erosion control, invasive/non-native species control, nuisance wildlife control,
31 drainage maintenance, wetland delineations, grassland management, and scientific research).

32
33 Duration of exposure shall be based upon the established National Guard Trainee exposure scenario
34 cited per person at 39 days per year at 24 hour per day for a maximum of 25 years (USACE 2005b).
35 All activities must be in compliance with established digging restrictions and established exposure
36 limits. All other uses of LL12 are prohibited, and the U.S. Army will cause appropriate notice to be
37 posted.

1 **3.2 DISTURBANCE RESTRICTIONS**

2

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

4

5 1.) Ground surface repairs, as required, resulting from maneuver damage.

6 2.) Routine maintenance of the roads, ditches and culverts.

4.0 IMPLEMENTATION ACTIONS

The U.S. Army shall perform the following implementation actions to ensure that the LUC objectives are met:

- Prepare geographic information system (GIS) data and a map indicating the location and dimensions of the AOC with the LUC location. Signage/markers will be placed in locations to identify the areas where the LUC applies.
- Incorporate environmental overlay and appropriate Ohio EPA notice procedures into the Property Management Plan (PMP).
- Through the PMP, prohibit digging or excavation activities beyond 4 ft BGS, except for: routine maintenance of roads, ditches and culverts, and ground surface repairs resulting from maneuvering damage.
- Through the PMP, maintain the Camp Ravenna perimeter fence and limit activities at LL12 to tracked and wheeled operations that are consistent with the National Guard mounted training scenario and other essential security, safety, and natural resource management activities.

If additional LUC-related RD documents are identified or prepared for proposed inclusion in the LL12 RD, the U.S. Army shall, upon review and approval by Ohio EPA, incorporate those documents as appropriate into the PMP, and provide copies to Ohio EPA.

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1 **5.0 MODIFICATION OR TERMINATION OF LUCS**

2
3 LUCs concerning disturbance of soil on LL12 are expected to remain in place indefinitely. LUCs
4 concerning restriction to National Guard mounted training use are expected to remain in place
5 indefinitely unless further action is taken to reduce the concentrations of hazardous substances in soil
6 to levels that allow for unlimited use and unrestricted exposure.

7
8 The U.S. Army shall not, without Ohio EPA approval, make a modification to any LUC. The U.S.
9 Army shall not, without Ohio EPA approval, make a land use change inconsistent with the LL12
10 ROD or this LUC RD. Likewise, the U.S. Army shall seek prior Ohio EPA approval before
11 commencing actions that may impact remedy integrity.

12
13 The U.S. Army shall not, without Ohio EPA approval, terminate a LUC. The decision to terminate
14 LUCs will be documented consistent with the National Oil and Hazardous Substances Pollution
15 Contingency Plan process for post-ROD changes.

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1 **6.0 MONITORING AND REPORTING**

2
3 Periodic monitoring of LUCs in the form of site inspections will be conducted by the U.S. Army to
4 confirm whether the LUCs remain effective and meet LUC objectives for continued remedy
5 protectiveness. Site inspections will be conducted as necessary, but not less than once per year.
6 Monitoring results will be reported in an annual LUC monitoring report, with changes in monitoring
7 frequency to be coordinated with and approved by Ohio EPA. The U.S. Army will provide (via mail)
8 each report to Ohio EPA.

9
10 The annual LUC monitoring report will evaluate the status and effectiveness of LUCs with a
11 description of how any LUC deficiencies or inconsistent uses were addressed. The annual LUC
12 monitoring reports will be used in the preparation of the Comprehensive Environmental Response,
13 Compensation, and Liability Act (CERCLA) 121(c) Five-Year Review. As part of the LUC
14 monitoring report, a written certification will be submitted stating whether or not the LUCs remain in
15 place and are effective.

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1 **7.0 CERCLA 121(C) FIVE-YEAR REVIEWS**

2
3
4
5
6
7
8
9

As part of the CERCLA Section 121(c) 5-Year remedy review process, the U.S. Army shall prepare a report evaluating the continued effectiveness of the remedy, including effectiveness of the LUCs and an assessment of whether there is a need to modify the LUCs. The U.S. Army will verify whether the LUCs continue to be properly documented and maintained. Each remedy review will evaluate whether conditions have changed due to contaminant attenuation, migration or other factors such as land use. If risk levels have changed since initial LUC implementation, LUC modification will be considered, which may include a change in monitoring frequency.

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1 **8.0 LUC ENFORCEMENT**

2
3 If the U.S. Army discovers any land use that is inconsistent with the LUCs or LUC objectives, or that
4 impairs the effectiveness of the remedial actions at LL12, the U.S. Army will notify Ohio EPA in
5 writing as soon as practicable but no later than ten (10) days after discovery, and will include a
6 written description of the inconsistent land use. Within ten (10) days after such notification, the U.S.
7 Army will provide Ohio EPA with information regarding what efforts or measures have or will be
8 taken to address the inconsistent land use.

9
10 The U.S. Army will work with Ohio EPA and if applicable, transferees/lessees of LL12 or any
11 portion thereof, to take appropriate action to enforce the LUCs or maintain remedy integrity. The
12 U.S. Army may take immediate action pursuant to its CERCLA authorities to prevent any perceived
13 risk(s) to human health or the environment. Any breach of the LUCs will be reported to the
14 appropriate civil authorities. Potential response measures include informal resolution with the owner
15 or violator, and the institution of judicial action under State property law or CERCLA.

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1 **9.0 LEASES AND PROPERTY TRANSFERS**

2
3 No later than sixty (60) days prior to leasing or transferring any portion of LL12 to another agency,
4 person, or entity (including federal to federal transfers), the U.S. Army shall provide written notice to
5 Ohio EPA of such intended lease or transfer. The notice shall identify the proposed lessee or
6 transferee and describe any additional mechanism(s) to be used for future LUC responsibilities after
7 lease or transfer.

8
9 As a condition of a lease, the U.S. Army will require that equivalent LUCs will be put into the terms
10 and conditions of the lease. The lease will prohibit the lessee from modification or termination of any
11 restrictions/ LUCs without prior U.S. Army concurrence and Ohio EPA approval.

12
13 As a condition of a transfer to another federal entity, the U.S. Army will require that equivalent LUCs
14 will be put into the terms and conditions of the transfer document. The transfer document will
15 prohibit the transferee and subsequent owners or users from modification or termination of the LUCs
16 without prior U.S. Army concurrence and Ohio EPA approval. The U.S. Army will consult with
17 Ohio EPA for input on the deed or transfer document language.

18
19 Furthermore, the transferee or lessee will be responsible for ensuring compliance with the LUCs.
20 However, the U.S. Army remains responsible for implementing, maintaining and monitoring the
21 remedial actions (including LUCs) before and after property lease or transfer.

22
23 In addition, concurrent with the lease or transfer of LL12 or any portion thereof from the U.S. Army,
24 information regarding the LUCs will be communicated in writing to the lessees or transferees and to
25 appropriate state and local agencies to ensure such agencies can factor such conditions into their
26 oversight and decision-making activities regarding the property. Should a problem with LUC
27 implementation, maintenance, monitoring, reporting or enforcement arise at a transferred or leased
28 property, the U.S. Army will work together with the transferee or lessee, and subsequent property
29 owner(s) and user(s), as well as Ohio EPA and appropriate local government representatives, to
30 resolve any LUC problems and to ensure expedient solutions.

31
32 If the U.S. Army intends to convey ownership of LL12 or any portion thereof to a non-federal entity,
33 the U.S. Army will require that, following review and approval by Ohio EPA, the transferee execute
34 and record an environmental covenant, in accordance with and pursuant to Ohio Revised Code §§
35 5301.80 to 5301.92 that establishes the LUCs as enforceable activity and use limitations under state
36 law.

37
38 If the U.S. Army becomes aware of an action that interferes with or violates an Environmental
39 Covenant, it will take action to resolve the matter in accordance with the enforcement procedures set
40 forth in the Environmental Covenant. The U.S. Army will notify Ohio EPA within three (3) days of
41 becoming aware of the violation. If the matter is not resolved, the U.S. Army will notify Ohio EPA
42 of the results of its resolution efforts (e.g., any corrective action) or proposal to resolve the matter
43 within ten (10) days of discovery of the violation.

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1 **10.0 RESPONSIBILITIES OF SUBSEQUENT OWNERS/ LESSEES**

2
3 In the event of property transfer or lease, the U.S. Army may require the transferee or lessee and
4 subsequent property owner(s) and user(s) to assume certain responsibilities for LUC implementation
5 actions described above, including maintenance, inspection, reporting and enforcement, with the
6 involvement of the appropriate state and/or local government representatives. The responsibilities
7 assumed by transferee(s) and subsequent owner(s) and user(s) shall be clearly documented in the
8 appropriate transfer/ lease documentation. The U.S. Army will continue to: (1) conduct all CERCLA
9 121(c) reviews; (2) notify the appropriate state and/or local government representatives of any known
10 LUC deficiencies or violations; (3) reserve the right to access the property to conduct any necessary
11 response; (4) reserve the authority to change, modify or terminate LUCs and any related deed or lease
12 provisions, with Ohio EPA approval; and, (5) remain responsible for remedy integrity. To the extent
13 permitted by law, a transfer deed shall require the LUCs imposed as part of a CERCLA remedy to run
14 with the land and bind all property owners and users to enforcement by the U.S. Army.
15

16 The transferee or lessee, as well as subsequent property owner(s) and user(s), will be responsible for
17 promptly notifying the U.S. Army, Ohio EPA, and local government representatives, of any
18 deficiencies or violations of LUCs and what efforts or measures have or will be taken to address the
19 deficiency within a reasonable time. Any violations of federal, state or local law will be reported to
20 the appropriate law enforcement authorities. If the transferee or lessee wants to (1) conduct
21 additional remediation, (2) change land use inconsistent with a deed or lease restriction, or (3) modify
22 or terminate a LUC, the transferee or lessee must first obtain written approval from the U.S. Army
23 and Ohio EPA and the property owner.

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1 **11.0 REFERENCES**

2

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