Final Action Memorandum
CC RVAAP-78 Quarry Pond Surface Dump at Former Ravenna Army Ammunition Plant

Camp James A. Garfield
Portage and Trumbull Counties, Ohio

Project No. 118064-CC RVAAP-78

March 5, 2020

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Final Action Memorandum
CC RVAAP-78 Quarry Pond Surface Dump at
Former Ravenna Army Ammunition Plant/
Camp James A. Garfield Joint Military Training Center (CJAG)
Portage and Trumbull Counties, Ohio

This Action Memorandum presents the selected alternative (Alternative 2 - *Excavation with Off-site Disposal*) as recommended in the Engineering Evaluation and Cost Analysis (EE/CA) (USACE, 2019) for the CC RVAAP-78 Quarry Pond Surface Dump area of concern (AOC) at the Camp James A. Garfield (CJAG) (formerly the Ravenna Army Ammunition Plant - RVAAP) in Portage and Trumbull counties, Ohio. The U.S. Army is the lead agency under the Defense Environmental Restoration Program (DERP) at the Ravenna Army Ammunition Plant, and developed this Action Memorandum consistent with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as amended, and consistent with the National Oil and Hazardous Substances Contingency Plan (NCP). This decision document will be incorporated into the larger Administrative Record file for the former Ravenna Army Ammunition Plant, which is available for public view at 1438 State Route 534 SW, Newton Falls, Ohio 44444.

This document, presenting a selected Alternative 2 Excavation and Offsite Disposal with a present worth cost estimate of $518,200 (in base year 2019 dollars) is approved by the undersigned, pursuant to:

- Memorandum, ACSIM, DAIM-ZB, subject: Army Decision Document Guidance, 1 Jun 18;
- Memorandum, ACSIM, DAIM-ZA, subject: Redelegation of Decision Document Signature Authority, 26 Oct 17; and
- Memorandum, ASA IE&E, SAIE, subject: Decision Document Policy, 18 Jan 17.

APPROVED:

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TABLE OF CONTENTS

LIST OF FIGURES & TABLES iv

ACRONYMS AND ABBREVIATIONS v

SECTION 1: INTRODUCTION 1

2.2 PREVIOUS INVESTIGATIONS AND DETAILS 6

2.2.1 Chronological Property Summary 6
2.2.2. Military Operations 7
2.2.3 Summary of Previous Investigations 7

2.3 CURRENT STATUS AND STATE / LOCAL AUTHORITIES ROLES 9

SECTION 3: STATEMENT OF BASIS AND JUSTIFICATION 12

SECTION 4: THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT AND STATUTORY AND REGULATORY AUTHORITIES 13

4.1 INTRODUCTION 13

4.2 HEALTH RISKS 13

SECTION 5: ENDANGERMENT DETERMINATION 15

SECTION 6: IDENTIFICATION OF ALTERNATIVES 16

6.1 INTRODUCTION 16

6.2 ALTERNATIVE 1: NO ACTION 16

6.3 ALTERNATIVE 2: EXCAVATION AND OFF-SITE DISPOSAL 16

6.4 CONTRIBUTION TO REMEDIAL PERFORMANCE 17

6.5 COSTS – EE/CA 17

6.6 OUTCOME 17

6.7 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARS) 17

6.7.1 Introduction 17
6.7.2 Potential Chemical-Specific ARARS 19
6.7.3 Potential Action-Specific ARARS 20
6.7.4 Potential Location-Specific ARARS 21

SECTION 7: AGENCY COORDINATION AND PUBLIC INVOLVEMENT 22

SECTION 8: RESPONSIVENESS SUMMARY 23

SECTION 9: PROPOSED ACTIONS AND ESTIMATED COSTS 24

9.1 DESCRIPTION 24
9.2 COSTS 25
9.3 EXCAVATION, REMOVAL, AND DISPOSAL 26
9.4 CONFIRMATION SAMPLING AND SITE RESTORATION 27

SECTION 10: EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN 28

SECTION 13: REFERENCES 31

ATTACHMENT 1: APPENDIX C: ESTIMATED COST DETAILS FROM THE 2019 EE/CA 33

LIST OF FIGURES & TABLES

Figure 1-1. General Location and Orientation of the Former RVAAP. 4

Figure 1-2. Location of the Compliance Restoration Sites. 5

Figure 2-1. Layout of CC RVAAP-78 and Debris Pile C Boring Locations and surface soil sample locations (Figure 6-1 from the 2016 SI). Locations of the subsurface soil borings at Debris Pile C and the surface soil locations at Debris Piles A, B, and C. Sample location C78SB-021M-0001-SO is shown as Soil Boring C-1 in Debris Pile C. 10

Figure 2-2. Decision Units and Test Pit Locations at CC RVAAP-78 from the 2018 SI Addendum. 11

Table 9-1. Estimated Volumes of Debris, Surface Soil and Subsurface Soil Requiring Removal at CC RVAAP-78. 25

ACRONYMS AND ABBREVIATIONS

ACM	asbestos-containing material
ARNG	Army National Guard
AOC	Area of Concern
bgs	below ground surface
BSV	background screening value
CC	Army Environmental Compliance-Related Cleanup Program
CERCLA	Comprehensive Environmental, Response, Compensation, and Liability Act
C&DD	construction and demolition debris
CJAG	Camp James A. Garfield
CSM	conceptual site model
DERR	Division of Environmental Response and Revitalization
DGM	digital geophysical mapping
DOD	U.S. Department of Defense
DPT	direct-push technology
DU	Decision unit
EPA	U.S. Environmental Protection Agency
FS	feasibility study
FWSAP	Facility-Wide Sampling and Analysis Plan
FWCUG	facility-wide cleanup goal
ft	Feet (foot)
ft^2	Square feet (foot)
GPS	global positioning system
HRR	Historical Record Review
IRP	Installation Restoration Program
ISM	incremental sampling method
kg	kilogram
LDR	Land Disposal Restrictions
MDC	maximum detected concentration
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
mm	millimeter
NESHAP	National Emissions Standards for Hazardous Air Pollution
NGB	National Guard Bureau
NTCRA	Non-time Critical Removal Action
OAC	Ohio Administrative Code
OHARNG	Ohio Army National Guard
Ohio EPA	Ohio Environmental Protection Agency
PA	preliminary assessment
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PRG	Preliminary Remediation Goal
RA	removal action

RD	remedial design
RI	remedial investigation
ROD	record of decision
RSL	regional screening level
RVAAP	Former Ravenna Army Ammunition Plant
SAP	sampling and analysis plan
SI	site inspection
SLERA	screening level ecological risk assessment
SVOC	semivolatile organic compound
TBC	To Be Considered
USP&FO	United States Property and Fiscal Officer
USACE	U.S. Army Corps of Engineers
USACHPPM	U.S. Army Center for Health Promotion & Preventative Medicine
USAEC	U.S. Army Environmental Command
VOC	volatile organic compound
yd^3	cubic yard

SECTION 1: INTRODUCTION

1.1 PURPOSE

The United States Army Corps of Engineers, Louisville District (USACE) prepared this Action Memorandum to document approval for the selection of Alternative 2 - *Excavation and Off-site Disposal)* as recommended in the Engineering Evaluation and Cost Analysis (EE/CA) (USACE, 2019). The EE/CA was completed for the CC RVAAP-78 Quarry Pond Surface Dump area of concern (AOC) at the Camp James A. Garfield Joint Military Training Center (CJAG) (formerly the Ravenna Army Ammunition Plant - RVAAP) in Portage and Trumbull counties, Ohio. This is a non-time-critical removal action (NTCRA) (DOE, 1998 and USEPA, 2000). As demonstrated in the EE/CA, the removal action will effectively address removal of the asbestos-containing material (ACM)/soil by removing Debris Piles A, B, and the surface of Debris Pile C; the subsurface soil at with asbestos fibers at Debris Pile C in the area around sample C78SB-021M-0001-SO; and the ACM/soil from subsurface soil sample at the Test Pit 5 – 78 TPA-TP5 (in a location around Debris Pile A) at CC RVAAP-78 AOC. Only asbestos fibers in soil and ACM were identified as requiring removal. No chemicals of concern (COCs) were identified in soil, surface water, or sediment. No chemicals of ecological concern were identified for the AOC.

The U.S. Army is the lead agency under the Defense Environmental Restoration Program (DERP) at the former Ravenna Army Ammunition Plant, and developed this Action Memorandum consistent with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as amended, and consistent with the National Oil and Hazardous Substances Contingency Plan (NCP). This decision document will be incorporated into the larger Administrative Record file for the former Ravenna Army Ammunition Plant, which is available for public view at CJAG, 1438 State Route 534 SW, Newton Falls, Ohio 44444.

In addition, an Information Repository of current information and final documents is available to any interested reader at the following libraries:

Reed Memorial Library
167 East Main Street
Ravenna, Ohio 44266

Newton Falls Public Library
204 South Canal Street
Newton Falls, Ohio 44444-1694

The RVAAP Restoration Program has an online resource for restoration news and information. This website can be viewed at www.rvaap.org.

1.2 GENERAL FACILITY DESCRIPTION

The former RVAAP (Federal Facility Identification [ID] No. OH5210020736) is federally owned and is located in northeastern Ohio within Portage County and Trumbull County, approximately 3 miles east-northeast of the city of Ravenna (**Figures 1-1 and 1-2**). The Installation is

approximately 11 miles long and 3.5 miles wide. It is bounded by State Route 5, the Michael J. Kirwan Reservoir, and the CSX System Railroad on the south; Garrett, McCormick, and Berry Roads on the west; the Norfolk Southern Railroad on the north; and State Route 534 on the east (**Figure 1-2**). The Installation is surrounded by several communities: Windham on the north, Garrettsville 6 miles to the northwest, Newton Falls 1 mile to the southeast, Charlestown to the southwest, and Wayland 3 miles to the south.

As of September 2013, administrative accountability for the entire 21,683-acre facility has been transferred to the United States Property and Fiscal Officer (USP&FO) for Ohio and the property subsequently licensed to the Ohio Army National Guard (OHARNG) for use as a military training site, Camp James A. Garfield. The restoration program at the former RVAAP involves cleanup of former production/operational areas throughout the facility related to activities that were conducted there.

1.3 FORMER RVAAP OPERATIONAL HISTORY AND MISSION

Constructed in 1940, production at the former RVAAP began in December 1941, with the primary missions of depot storage and ammunition loading. The Installation was divided into two separate units: the Portage Ordnance Depot and the Ravenna Ordnance Plant. The depot's primary mission was storage of munitions and components, while the mission of the ordnance plant was loading and packing major caliber artillery ammunition and the assembly of munitions-initiating components that included fuzes, boosters, and percussion elements. In August 1943, the Installation was re-designated as the Ravenna Ordnance Center, and in November 1945, it was re-designated as the Ravenna Arsenal.

Industrial operations at the former RVAAP consisted of 12 munitions-assembly facilities referred to as "load lines." Operations on the load lines produced explosive dust, spills, and vapors that collected on the floors and walls of each building. Other load lines were used to manufacture fuzes, primers, and boosters. From 1946 to 1949, one facility (Load Line 12) was used to produce ammonium nitrate for explosives and fertilizers. Demilitarization activities were also conducted at RVAAP that included disassembly and extraction of explosive compounds from varied-sized military projectiles. Periodic demilitarization of various munitions continued through 1992.

Other areas at RVAAP were used for the burning, demolition, and testing of munitions. These burning and demolition grounds consisted of large parcels of open space or abandoned quarries. Principal contaminants include explosives, propellants, metals, and semivolatile organics.

The plant was placed in standby status in 1950 and reactivated during the Korean Conflict to load and pack major caliber shells and components. All production ended in August 1957, and in October 1957 the Installation again was placed in a standby condition. In October 1960 the ammonium nitrate line was renovated for demilitarization operations, which involved melting explosives out of bomb casings for subsequent recycling. These operations began in January 1961. In July 1961, the plant was deactivated again. In November 1961, the entire Installation designated as the former RVAAP.

In May 1968, loading, assembling, and packing munitions began on three load lines and two component lines to support the Southeast Asia conflict. These facilities were deactivated in August 1972. The destruction of M71A1 90-millimeter (mm) projectiles extended from June 1973 until March 1974. Demilitarization of various munitions was conducted from October 1982 through 1992.

Until 1993, the former RVAAP maintained the capability to load, assemble, and pack military ammunition. As part of the former RVAAP mission, the U.S. Army maintained inactive facilities in a standby status by keeping equipment in a condition to allow resuming production within prescribed limitations. In September 1993, the U.S. Army placed the former RVAAP in inactive caretaker status, which subsequently changed to modified caretaker status. The load lines and associated real estate were determined to be excess by the U.S. Army.

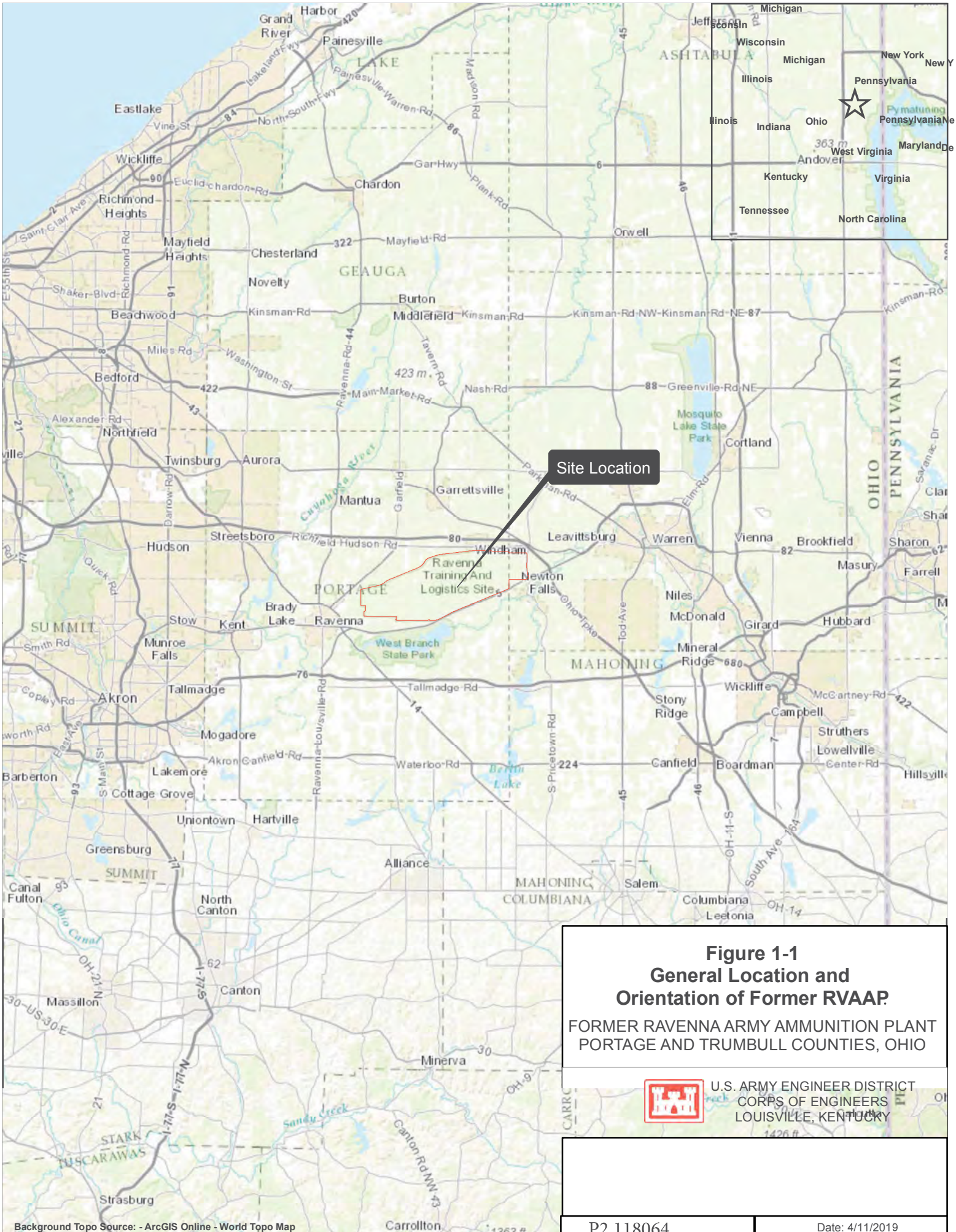

Figure 1-1
General Location and Orientation of Former RVAAP

FORMER RAVENNA ARMY AMMUNITION PLANT
PORTAGE AND TRUMBULL COUNTIES, OHIO

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
LOUISVILLE, KENTUCKY

P2 118064

Date: 4/11/2019

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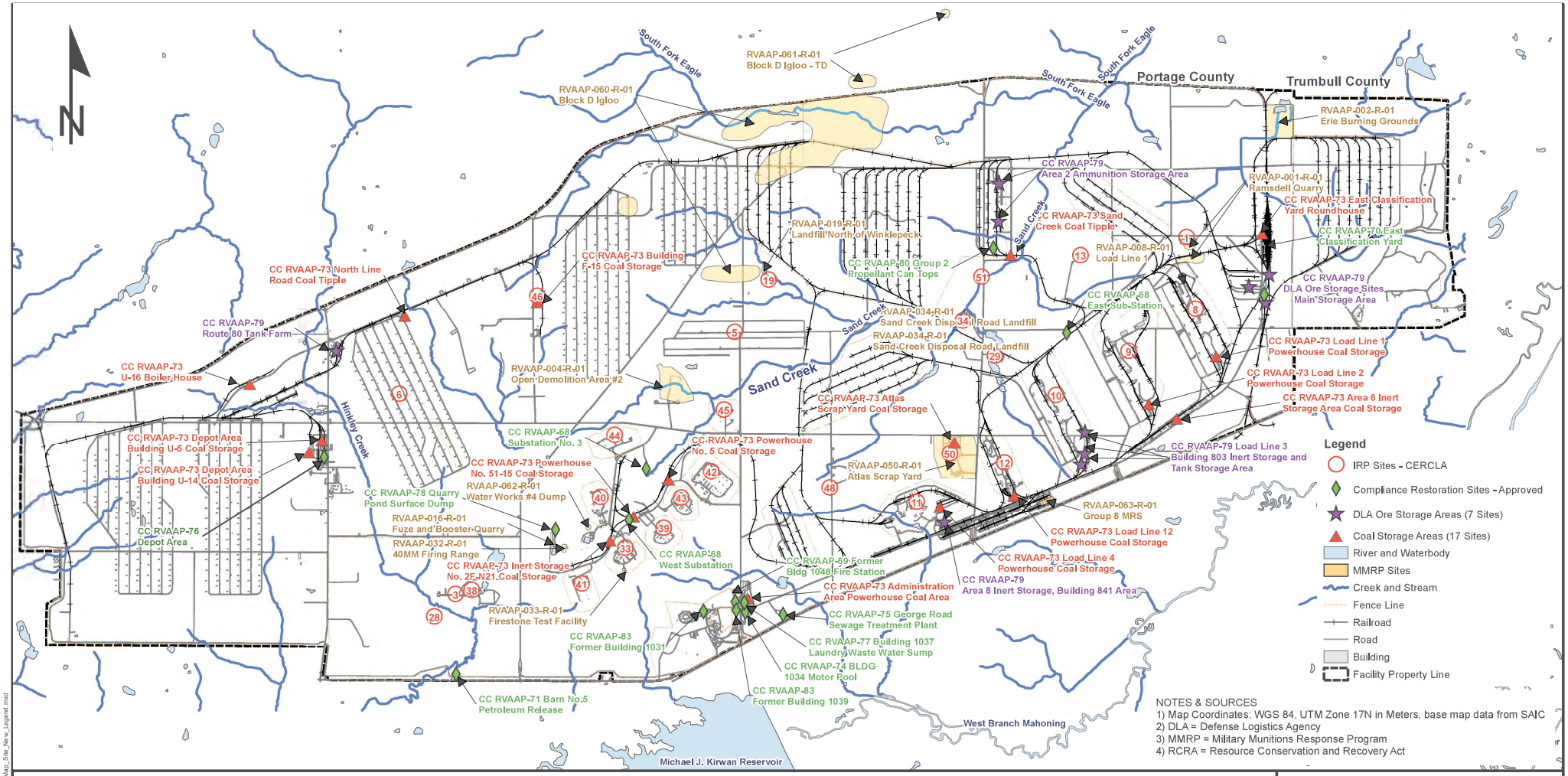

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U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
LOUISVILLE, KENTUCKY

Figure 1-2

Location of the Compliance Restoration Sites

FORMER RAVENNA ARMY
AMMUNITION PLANT PORTAGE
AND TRUMBULL COUNTIES, OHIO

SECTION 2: SITE DESCRIPTION AND HISTORY

2.1 CC RVAAP-78 SITE DESCRIPTION

The CC RVAAP-78 AOC is in the south-central portion of the facility, northeast of the intersection of South Patrol Road and Greenleaf Road. The AOC consists of steeply inclined rocky slopes. The former dumping was completed at the bases of the rocky slopes. There were three main areas where debris was dumped that are called debris piles. The debris is sporadically spread across these piles with most of the content of the debris piles being soil. The debris piles are located north, northwest, and northeast of the northern-most quarry pond within the adjacent Fuze and Booster Quarry Landfill/Ponds AOC (RVAAP-16). The dump areas called Debris Piles A and B are at the bases of steeply inclined rock slopes of the quarry. The third dump area, called Debris Pile C, is flatter and is adjacent to the northwest end of the northern-most pond within the AOC. The Debris Piles consist of soil with construction debris, scrap metal, cultural debris, and asbestos-containing material (ACM) (e.g. transite type roofing, sheeting, etc.) spread on top of the soil.

Debris Pile A is approximately 425 feet in length, varying in width from 18 to 68 feet. A second, smaller dump area at the base of a steeply inclined rock slope, defined as Debris Pile B, is approximately 296 feet in length and 24 feet wide (**Figures 2-1 and 2-2**). Debris Pile C is located along the northwestern corner of the northern-most quarry pond area with the debris area being approximately 120 feet by 45 feet (**Figures 2-1 and 2-2**).

In addition to the Debris Piles, a small area where materials appear to have been burned is located near where a rusted, 55-gallon drum was located within Debris Pile B. This drum was identified as Drum #1 and was properly removed and disposed as part of the 2016 Site Inspection (SI). This area was called an "apparent burn area" in the SI although there was no evidence besides charred ground and lack of vegetation to support that it was an actual burn area. A second rusted 55-gallon drum (Drum #2) was present within Debris Pile C and was also properly removed and disposed of during the SI investigations.

2.2 PREVIOUS INVESTIGATIONS AND DETAILS

Several previous investigations and other activities have been conducted at the CC RVAAP-78 AOC.

2.2.1 CHRONOLOGICAL PROPERTY SUMMARY

The adjacent AOC (RVAAP-16 Fuze and Booster Quarry Landfill/Ponds) was used as an explosive-contaminated sawdust burning area for Load Lines 6 and 11 from 1945 to 1949. In 1976, settling ponds were constructed, separated by earthen dams, with flow control gates for treating the spent brine regenerant and sand filtration backwash water from the Water Works 3 treatment plant, which treated groundwater from facility production wells (1976-1993). The debris was removed from the quarry bottom and transferred to either Ramsdell Quarry Landfill or one of the burning grounds in 1976. Historical operational information indicated that fuze, and booster assemblies, projectiles, residual ash, and sanitary wastes were burned or dumped in the quarry

prior to pond construction. Aerial photographs from 1952 show CC RVAAP-78 Quarry Pond Surface Dump. Aerial photographs from 1966, 1979, and 1981 show less vegetation in the area than what currently exists. Aerial photographs are provided in Appendix A of the 2016 SI.

2.2.2. MILITARY OPERATIONS

The Historical Records Review Report (HRRR) describes the types of materials that were dumped at CC RVAAP-78 Quarry Pond Surface Dump.

2.2.3 SUMMARY OF PREVIOUS INVESTIGATIONS

The following reports were completed for this AOC:

- Final Historical Records Review Report for 2010 Preliminary Assessment Compliance Restoration Sites CC-RVAAP-78 Quarry Pond Surface Dump & CC-RVAAP-80 Group 2 Propellant Can Tops(Prudent, 2011).

- Final Revised Site Inspection for Compliance Restoration Site CC-RVAAP-78 Quarry Pond Surface Dump (USACE, 2016).

- Final Site Inspection Addendum Report, CC-RVAAP-78 Quarry Pond Surface Dump (USACE, 2018).

- Final Engineering Evaluation/Cost Analysis: CC RVAAP-78 Quarry Pond Surface Dump (USACE, 2019)

The HRR indicated that there was a large amount of construction debris located between mainly Debris Pile A and Debris Pile B (referred to herein as the Test Pit Area). The HRR also noted the construction debris area (Test Pit Area) possibly extended westward to the road along the east side of the northernmost pond on the adjacent AOC (RVAAP-16).

Results from the SI showed ACM and construction debris in Debris Pile A and Debris Pile B, and asbestos fibers only in subsurface soil from Debris Pile C. The 2016 SI showed ACM was present in Debris Piles A and B, and one subsurface soil sample from Debris Pile C had 2% asbestos fibers. Construction debris and rubble were identified in Debris Pile C but no ACM was noted in the surface soil under the debris. The analytical results for surface soil in the 2016 SI showed samples had detections of various chemicals at concentrations greater than the Facility-wide Cleanup Goals (FWCUGs – see SAIC, 2010) for Unrestricted (Residential) Land Use as well as the observed presence of substantial amounts of transite and roofing materials in the debris that contains approximately 35% asbestos. The SI (USACE, 2016) concluded that additional remedial actions were warranted at the AOC to address the contamination (both chemical and ACM) in the three Debris Piles. The 2016 SI recommended that Debris Piles A, and B and potentially surface/subsurface soil at Debris Pile C be removed and disposed. No subsurface soil exists under Debris Pile A and Debris Pile B. Transite was observed in both Debris Piles A and B. Asbestos contents of 30 % and 40 % were detected in the transite samples from Debris Piles A and B, respectively, and the roofing sample from Debris Pile B had a result of 35 % asbestos. In the SI, all soil samples were analyzed for asbestos fibers. All the soil samples were non-detect or less

than 1 percent asbestos, except for sample C78SB-021M-0001-SO, one of the subsurface soil vertical ISM samples from Debris Pile C, which had a level of 2 percent asbestos fibers. The term ACM is used to refer to both building material with transite and other debris that contains asbestos while soil with asbestos is referred to as asbestos fibers. The following chemicals were identified as potential contamination (based on the maximum value compared to stringent residential screening criteria) from each Debris Pile:

- Debris Pile A - Surface Soil **(Table 6-1 in the SI Addendum, Appendix A):**
  - Metals: thallium.
  - Explosives/Propellants: 1,3-dinitrobenzene (qualified as a U value - non-detect).
  - SVOCs: 2-methyl-4,6-dinitrophenol (qualified as a UJ value) and benzo(a)pyrene.
- Debris Pile B - Surface Soil **(Table 6-2 in the SI Addendum, Appendix A):**
  - Metals: arsenic, chromium, and manganese.
  - Explosives/Propellants: 2,4,6-trinitrolouene (qualified as a J value - estimated).
  - SVOCs: 2-methyl-4,6-dinitro.phenol (qualified as a UJ value); bis(2-chloroethyl) ether; benzo(a)pyrene; and hexachloro-cyclopentadiene.
  - PCBs: Aroclor 1254 value was 0.21 mg/kg and screening value is 0.21 mg/kg).
- Debris Pile C - Surface Soil **(Table 6-3 in the SI Addendum, Appendix A):**
  - Metals: arsenic, chromium, manganese, nickel, and thallium.
  - SVOCs: 2-methyl-4,6-dinitrophenol (qualified as a UJ value); benz(a)anthracene; benzo(a)pyrene; bis(2-chloroethyl)ether; and hexachlorocyclopentadiene.
- Debris Pile C - Subsurface Soil **(Table 6-4 from the SI Addendum, Appendix A):**
  - Metals: cadmium and manganese.
  - SVOCs: 2-methyl-4,6-dinitrophenol (qualified as a UJ value); benz(a)anthracene; benzo(a)pyrene; benzo(b)fluoroanthene; bis (2-chloroethyl)ether; dibenz(a,h) anthracene; N-nitroso-di-n-propylamine; and hexachloro-cyclopentadiene.
  - PCBs: Aroclor 1254.

Because asbestos and potential chemical contamination were found in Debris Piles A, B, and C, the SI recommended additional remedial actions such as proceeding to an RI for further investigation. The SI also included a recommendation for an additional investigation of the area between Debris Piles A and B and the road adjacent to the east side of the northern-most pond.

The SI Addendum was completed to define the size of the Debris Piles and evaluate the Test Pit Area. Decision Units (DUs) were established to surround each debris pile at a distance of 30 ft in all directions (30-ft perimeter ring around the debris piles) to help establish the extent of the contamination in each pile since the SI already confirmed that chemical contamination was potentially present in all three Debris Piles, ACM was present in Debris Pile A and Debris Pile B, and asbestos fibers were present in the subsurface soil at one location under Debris Pile C **(Figures 2-1 and 2-2)**. The AOC was divided into three Decision Units (DUs) that surrounded the three debris piles and at an area between two of the debris piles referred to as the Test Pit Area. No contamination or asbestos were found in any of the three DUs surrounding the Debris Piles. Asbestos containing material was found only in Test Pit 5. The ACM was analyzed, and results indicated it contained 20 percent chrysotile. The SI Addendum recommended additional remedial actions at the AOC. It was recommended that removal action alternatives be evaluated in an EE/CA as the next phase in the CERCLA process.

The 2019 EE/CA evaluated two Removal Action Alternatives:

- Alternative 1 – No Action
- Alternative 2 – Excavation and Off-site Disposal.

Alternative 2 - *Excavation with Off-site Disposal to attain Unrestricted (Residential) Land Use* was the recommended action for the CC RVAAP-78 AOC. The asbestos -contaminated soil and debris at the AOC will be removed from the AOC at the former RVAAP facility, transported to a licensed, permitted asbestos disposal facility, and appropriately disposed. The removal areas will be sampled and restored with clean fill material and seeded.

Alternative 2 consists of excavation with off-site disposal of debris and comingled soil at Debris Piles A, B and C; removal of ACM and soil at Test Pit 5; and excavation and disposal of subsurface soil at C78SB-021M-0001-SO (1 to 5 feet bgs) to attain Unrestricted (Residential) Land Use. No long-term monitoring or five-year reviews will be required under CERCLA since the standards allowing Unrestricted (Residential) Land Use will be achieved. Approximately 2,773 yds^3 of debris/ACM (including soil estimated to be removed incidentally with the three Debris Piles, Test Pit 05, and the one subsurface soil sample under Debris Pile C) were estimated to be removed from the AOC for off-site disposal. The EE/CA estimated a cost of $518,200 for completion of the removal action. **Figures 2-1 and 2-2** provide the locations of the areas that require removal. **Appendix C** of the EE/CA included a detailed breakdown of the costs and other information used to calculate this estimate.

Besides the 2016 SI and SI Addendum, no additional investigations specific to CC RVAAP-78 Quarry Pond Surface Dump have been completed. However, multiple investigations have been conducted at the adjacent AOC (RVAAP-16 Fuze and Booster Quarry Landfill/Ponds). Various environmental data for soil and groundwater have been collected at RVAAP-16. Those investigations include sample locations in the vicinity of, and in some cases within, CC RVAAP-78 Quarry Pond Surface Dump (SpecPro, 2005).

2.3 CURRENT STATUS AND STATE / LOCAL AUTHORITIES ROLES

The CC RVAAP-78 Quarry Pond Surface Dump is located on CJAG/former RVAAP which is a military training site. The facility is federally owned; administrative accountability for the entire 21,683-acre facility was transferred to the USP&FO for Ohio, and subsequently licensed to the OHARNG for use as a military training site.

The RVAAP Restoration Program encompasses investigation and cleanup of past activities over the 21,683-acre facility. The Ohio Environmental Protection Agency (Ohio EPA) is the state regulatory agency. The Army coordinates with the Ohio EPA for investigations and remediation conducted under the Department of Defense (DOD) Installation Restoration Program (IRP). Additionally, the Ohio EPA Director's Final Findings and Orders (DFFO) dated June 10, 2004, acknowledges the Army's responsibility to address the site under CERLCA/NCP.

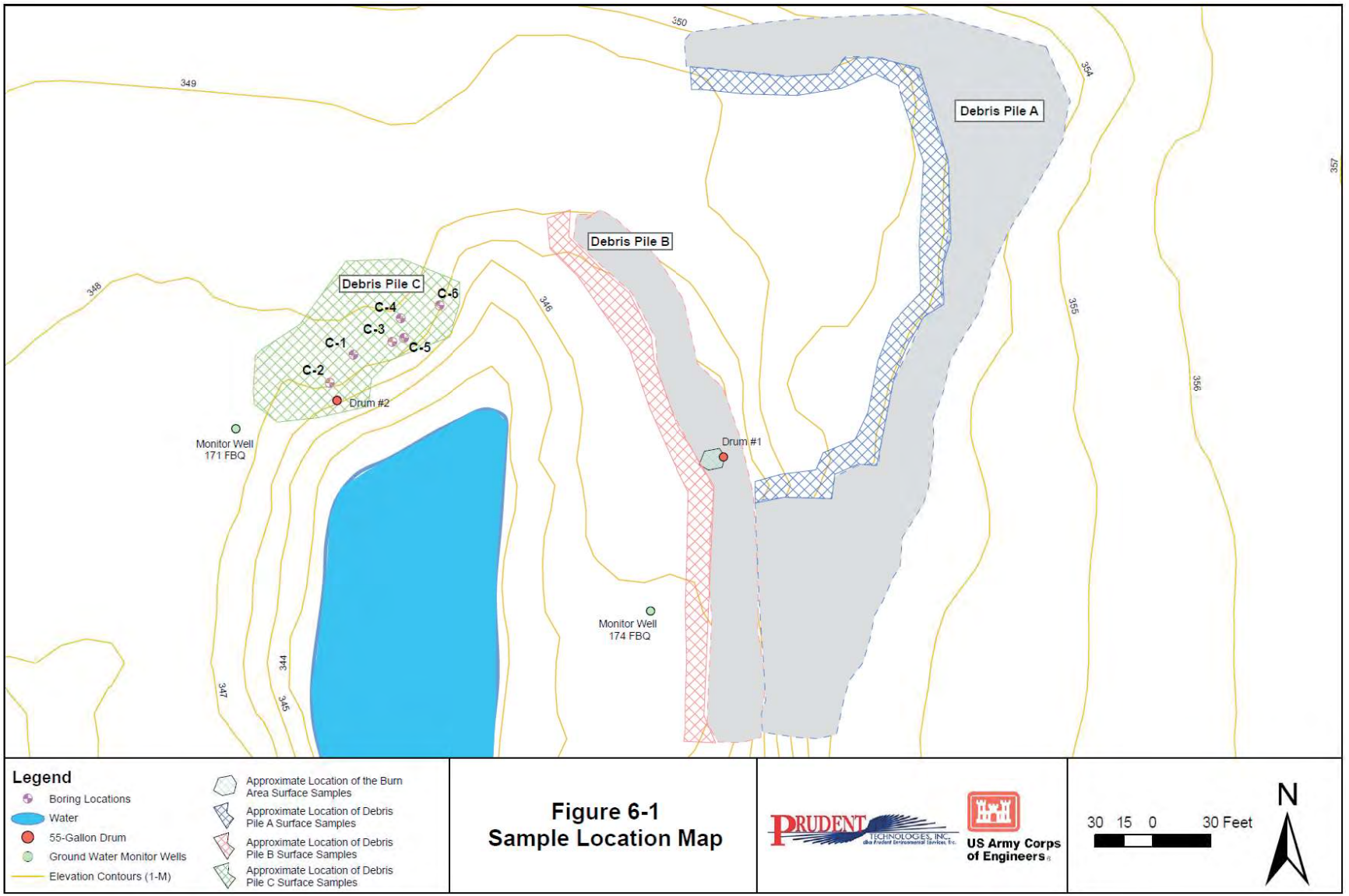

Figure 2-1. Layout of CC RVAAP-78 and Debris Pile C Boring Locations and surface soil sample locations (Figure 6-1 from the 2016 SI). Locations of the subsurface soil borings at Debris Pile C and the surface soil locations at Debris Piles A, B, and C. Sample location C78SB-021M-0001-SO is shown as Soil Boring C-1 in Debris Pile C.

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LEGEND

- Test Pit Location
- Test Pit Sample Location
- Decision Unit
- Debris Pile

NOTES & SOURCES

Map Source: ESRI World Imagery

TITLE

Figure 2-2 Decision Units and Test Pit Locations at CC RVAAP-78 from the 2018 SI Addendum

FORMER RAVENNA ARMY AMMUNITION PLANT PORTAGE AND TRUMBULL COUNTIES, OHIO

0 40 80 Feet

N

FIGURE

2-2

SECTION 3: STATEMENT OF BASIS AND JUSTIFICATION

The U.S. Army determined that the best Alternative was one without land use restrictions or controls to accommodate future military use. Therefore, the Unrestricted (Residential) Land Use was selected since this would not require any additional monitoring, restrictions, or Five Year Reviews.

The 2016 SI identified potential chemical contamination in Debris Pile C, ACM in Debris Piles A and B, and one soil sample from Debris Pile C had 2% asbestos fibers. Construction debris and rubble were identified in Debris Pile C, but no ACM was noted. The SI did not include any sampling or analysis of the area surrounding each of the Debris Piles. The SI concluded that the three Debris Piles should be removed and that additional sampling should be conducted for the areas surrounding each of the Debris Piles and an area known as the test pit area.

The 2018 SI Addendum showed that there was no chemical contamination or ACM/debris in the areas surrounding the three Debris Piles but did identify one location in the test pit area that contained ACM.

Because potential chemical contamination was identified in Debris Pile C, the EE/CA included a Chemical Evaluation of Soil (CES) to evaluate potential contamination in soil at Debris Pile C. The CES demonstrated that the maximum concentrations of chemicals detected in the surface soil at Debris Piles A and B, and the surface soil/ subsurface soil at Debris Pile C were not great enough to be of concern and did not require removal. The CES showed that none of the chemicals detected and identified as potential contamination in the 2016 SI need to be remediated or removed to achieve Unrestricted (Residential) Land Use.

Although no chemical contamination was identified for the AOC, the presence of the ACM presents a risk to users (current and future) of the site. The removal of ACM, debris, and soil containing asbestos fibers at the specific surface and subsurface soil locations would eliminate the potential risks to future users of the site and would achieve Unrestricted (Residential) Land Use.

SECTION 4: THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT AND STATUTORY AND REGULATORY AUTHORITIES

4.1 INTRODUCTION

As required by§ 300.415(b)(2)(i) of the NCP, actual or potential exposure to nearby human populations, animals or the food chain from hazardous substances or pollutants or contaminants in soil at the CC RVAAP-78 Quarry Pond Surface Dump are discussed below.

No chemical contamination was identified for the AOC. Therefore, no potential threat to the environment from an ecological perspective is present.

The threat that currently exists at the soil in the Debris Piles and specific localized areas at the AOC is from ACM and soil with asbestos fibers. The ACM and asbestos fibers pose potential risks to any current or future users (receptors) of the AOC. Removal of the ACM and specific areas where asbestos fibers were found will remove all threats to the current and future users, including Residential Receptors for Unrestricted (Residential) Land Use. Receptors may contact ACM and fibers mainly through inhalation when the asbestos fibers become airborne, if they are exposed.

4.2 HEALTH RISKS

Asbestos is a mineral fiber that occurs in rock and soil. Because low levels of asbestos fibers are present in soil, water, and air, everyone can be exposed to asbestos at some point in their life. Exposure to naturally occurring asbestos is minimal and generally does not pose a health risk.

Because of its fiber strength and heat resistance asbestos (ACM) has been used in a variety of building construction materials for insulation and as a fire retardant. However, if ACM deteriorates or is not properly contained during demolition or renovation, vehicle maintenance (brakes and clutches), or other activities where ACM occurs, asbestos fibers can be released and become airborne. The fibers can be inhaled into the lungs and remain there indefinitely.

When construction, demolition, mining, and manufacturing activities release asbestos into the environment, it contaminates the air (where it can be inhaled), water (where it can be ingested), and soil (where it can easily be disturbed and redistributed into the air). Asbestos can remain suspended in the air for long periods of time. It can be carried long distances by wind or water before settling, thus contaminating areas far away from its source. Asbestos does not break down or biodegrade, so it can pose a significant risk to humans.

Asbestos poses serious health risks to individuals who are exposed to high concentrations of fibers over a short period of time (acute exposure) or lower levels over a long period of time (chronic exposure).

Symptoms of illness may not occur until many years after exposure. Studies link the inhalation of asbestos fibers to an increased risk of fatal diseases including:

- lung cancer,
- mesothelioma, a rare form of cancer that is found in the thin lining of the lung, chest and the abdomen and heart, and
- asbestosis, a serious progressive, long-term, non-cancer disease of the lungs.

Asbestos fibers may be released into the air by the disturbance of ACM during product use, demolition work, building or home maintenance, repair, and remodeling. In general, exposure may occur only when the ACM is disturbed or damaged in some way to release particles and fibers into the air. Asbestos in soil is a risk: as soil dries and dust is formed, it can then be airborne. It also adheres to shoes and vehicles, and is therefore carried to other locations, and disperses as it dries. Considering the widespread use of asbestos in construction, the number of buildings demolished on sites for redevelopment, and the disturbance and movement of soil during site investigations, remediation, and redevelopment, there is cause for concern regarding the risks.

Breathing asbestos-containing air into the lungs is the exposure route of greatest concern. Some of the asbestos fibers reaching the lungs are eliminated in exhaled air and others are coughed from the lungs with mucus. The fibers reaching the deepest air passages of the lungs can produce the greatest damage.

The digestive system can be exposed to asbestos fibers from drinking water and mucus cleared from the lungs. A small number of fibers may penetrate the cells that line the digestive system, but only a few will reach the bloodstream. These fibers will be released in the urine. Asbestos fibers contacting the skin rarely pass through the skin into the body.

Exposure to asbestos increases your risk of developing lung diseases. That risk is made worse by smoking and using other inhalants. In general, the greater the exposure to asbestos, the greater the chance of developing harmful health effects.

Disease symptoms may take many years to develop following exposure. Asbestos-related conditions can be difficult to identify. Healthcare providers usually identify the possibility of asbestos exposure and related health conditions like lung disease by taking a thorough medical history. This includes looking at the person’s medical, work, cultural and environmental history.

SECTION 5: ENDANGERMENT DETERMINATION

Based on the results of the EE/CA, removal actions at the three Debris Piles; the sample location C78SB-021M-0001-SO (*SB 1) in Debris Pile C; and the location of Test Pit 05 require removal actions to address actual or threatened releases of ACM from this AOC that present an imminent and substantial endangerment to public health, or welfare, or the environment. The EE/CA showed that to eliminate ACM in soil to prevent any threat or endangerment to public health, or welfare, or the environment, several locations where contamination was found need to be removed. These locations were identified in the Risk Management Evaluation (**Section 3** of the EE/CA) and if they are removed, the Sand Creek AOC will meet the Unrestricted (Residential) Land Use requirements. The danger or risk may occur when human receptors contact the soil on the AOC if the removal action does not occur.

The removal action (excavation and off-site disposal) of three Debris Piles; the sample location C78SB-021M-0001-SO (*SB 1) in Debris Pile C; and the location of Test Pit 05 will prevent Resident Receptors from contacting ACM or contaminated soil.

The removal action selected in the EE/CA was considered protective because this action would remove all locations of soil where ACM or asbestos fibers were identified and pose a hazard/threat to the Residential Receptor. Once the removal action is fully implemented, there will be no remaining threats.

SECTION 6: IDENTIFICATION OF ALTERNATIVES

This section describes the removal action Alternatives developed for the CC RVAAP-78 AOC and the individual analysis of each.

6.1 INTRODUCTION

- Removal Action Alternatives should assure adequate protection of human health and the environment, achieve RAOs, meet ARARs, and if applicable, permanently and significantly reduce the volume, toxicity, and/or mobility of contaminants.

The two Alternatives considered in the EE/CA are:

- Alternative 1 – No Action
- Alternative 2 – Excavation and Off-site Disposal.

6.2 ALTERNATIVE 1: NO ACTION

The No Action Alternative is required for evaluation under the NCP. This alternative is the baseline to which other alternatives are compared. This Alternative assumes all current actions (e.g., access restrictions and environmental monitoring) are discontinued and assumes no future actions will take place to protect human receptors or the environment. Impacted media at the AOC would not be removed or treated.

6.3 ALTERNATIVE 2: EXCAVATION AND OFF-SITE DISPOSAL

Alternative 2 consists of excavation with off-site disposal of debris and comingled soil at Debris Piles A, B and C; removal of ACM and soil at Test Pit 5; and excavation and disposal of subsurface soil at C78SB-021M-0001-SO (1 to 5 feet bgs) to attain Unrestricted (Residential) Land Use. Other types of remedial actions will not allow Unrestricted (Residential) Land Use. No technology exists that can render the ACM or asbestos fibers in soil safe if it is left in place.

This remedial alternative requires coordinating remediation activities with Ohio EPA, OHARNG, and the ARNG. Coordinating with stakeholders during implementation of the excavation will minimize health and safety risks to on-site personnel and potential disruptions of CJAG activities. The time period to complete this remedial action is relatively short and will not include an O&M period, as an Unrestricted (Residential) Land Use scenario will be achieved. Components of this remedial alternative include:

- Waste characterization sampling,
- Remedial Design (RD),
- Soil excavation and off-site disposal of debris and comingled soil at Debris Piles A, B, C and Test Pit Area 05; and excavation and disposal of subsurface soil at C78SB-021M-0001-SO (1 to 5 feet bgs);
- Confirmation sampling for asbestos fibers in the remaining soil around C78SB-021M-0001-SO (1 to 5 feet bgs): and

- Restoration.

Excavating Debris Piles A, B, and C Test Pit 05; and the subsurface soil at C78SB-021M-0001-SO will allow the CC RVAAP-78 AOC to meet Unrestricted (Residential) Land Use. See **Figures 2-1 and 2-2** for sample locations. These locations were identified in the 2016 SI and the 2018 SI Addendum. The potential contamination identified in the documents was assessed in Section 3 (CES) of this EE/CA. No chemicals were identified in the soil that require remedial actions.

6.4 CONTRIBUTION TO REMEDIAL PERFORMANCE

No further action is required under CERCLA since Unrestricted (Residential) Land Use will be obtained after the removal action and disposal are completed.

6.5 COSTS – EE/CA

The present value cost to complete Alternative 2 is approximately $518,200 (in base year 2019 dollars). Costs include implementing the removal, off-site disposal, and site restoration. See Attachment 1 (**Appendix C** of the EE/CA) for a detailed description of Alternative 2 costs.

6.6 OUTCOME

Alternative 2 would be an effective method of removing and disposing of ACM, debris, and asbestos fibers in soil at the CC RVAAP-78 Quarry Pond Surface Dump. Excavation and off-site disposal are conventional technologies which can be readily implemented. This Alternative would also be effective for eliminating all debris and soil with asbestos fibers around the ACM. This Alternative would reduce hazards/threats and once implemented, CC RVAAP-78 AOC would meet Unrestricted (Residential) Land Use.

6.7 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARS)

Applicable or relevant and appropriate requirements (ARARs) are described in this section.

6.7.1 Introduction

The identification and evaluation of ARARs is an integral part of complying with CERCLA and SARA. As defined in the National Contingency Plan (NCP), applicable requirements are "those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under Federal or state law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstances at a CERCLA site" (40 Code of Federal Regulations [CFR] 300.5 [1995]). Requirements under Federal or state law may be either applicable or relevant and appropriate to CERCLA cleanup actions, but not both. In the latter case, requirements must be both relevant and appropriate to be ARARs. The Federal regulation must be selected when both a Federal and state ARARs are available or when two potential ARARs address the same issue (even if a state has authorization to administer the Federal program), unless the state has promulgated a more stringent requirement. "More stringent" also includes those state laws or programs that have no

Federal counterpart because "they add to the Federal law requirements that are specific to the environmental conditions in the State" (USEPA, 1989).

All CERCLA onsite remedial response actions must comply only with the substantive requirements of a regulation and not the administrative requirements (CERCLA § 121[e]). This position has been reaffirmed in the NCP (55 Federal Register [FR] 8756, March 8, 1990). Substantive requirements pertain directly to the actions or conditions at a site, and administrative requirements facilitate their implementation. Certain administrative requirements should be observed if they are useful in determining cleanup standards at the site (55 FR 8757, March 8, 1990). Offsite actions, on the other hand, are subject to the full requirements of the applicable standards or regulations, including all administrative and procedural regulations.

Although remedial actions for AOCs at National Priorities List sites must comply only with the substantive requirements of federal or state environmental regulations, the Ohio Revised Code does not provide a similar permit waiver for actions conducted under the Ohio EPA Remedial Response Program Policy. The Ohio EPA's Division of Emergency and Remedial Response (DERR) Policy DERR-00-RR-034 states, "it has been DERR's policy to require responsible parties to acquire and comply with all necessary permits, including the substantive and administrative requirements." However, a DFFO was entered into on June 10, 2004, that provided certain exemptions from the Ohio Administrative Code (OAC) administrative requirements and required groundwater monitoring and remediation at RVAAP to be performed under the CERCLA process. The DFFO includes provisions for compliance resulting in the potential negation of all provided exemptions within the DFFO in the event non-compliant activities are identified.

The selection of ARARs is dependent on the hazardous substances at a site, the physical site characteristics and geographic location. The actions selected as remedy, and are addressed by chemical-, location-, and action-specific ARARs, respectively, as described below:

- Chemical-specific---Chemical-specific requirements define acceptable exposure levels for specific hazardous substances and, therefore, may be used as a basis for establishing preliminary remediation goals (PRGs) and cleanup levels for chemicals of concern or those requiring remediation in the designated media. Chemical-specific ARARs and to-be-considered (TBC) criteria also are used to determine treatment and disposal requirements for removal actions. In the event a chemical has more than one requirement, the more stringent of the two requirements is used. There are no known promulgated Federal chemical-specific cleanup standards for soil. The TBC guidance pertaining to the cleanup objectives for soil include the USEPA RSLs) (USEPA, 2018). There are no chemicals that need the remediated at CC RVAAP-78 AOC. The chemical-specific ARARs would not be applicable to debris/ACM or asbestos fibers in soil.

- Location-specific---Location-specific ARARs set restrictions on the types of removal actions that can be performed based on the physical characteristics of the site or its immediate surroundings. In determining the use of the location specific ARARs for selection of remedial actions at CERCLA sites, the jurisdictional prerequisites of each regulation must be investigated. Alternative removal actions may be restricted or

precluded based on Federal and state laws for hazardous waste facilities or proximity to faults, floodplains, caves, salt-dome formations, salt-bed formations, underground mines, wetlands, wilderness areas, wildlife refuges, wildlife resources, and scenic rivers. None of the previous listed physical characteristics pertain to CC RVAAP-78 AOC or its immediate surroundings; therefore, no location specific ARARs pertain to this site.

- Action-specific---Action-specific ARARs are technology-based requirements that set controls or restrictions on the design, implementation, and performance levels of removal activities related to the management of hazardous substances, pollutants, or contaminants. Potential action specific ARARs are presented in **Appendix B** of the EE/CA. If no remedial action was selected under the CERCLA process, compliance with action specific ARARs would not be required.

In accordance with the NCP (40 Code of Federal Regulations [CFR] 300.415(j)) on-site removal actions conducted under CERCLA are required to meet ARARs "to the extent practicable, considering the exigencies of the situation." Shipments of contaminated soils and dry sediments will comply with Federal, State, and local rules, laws and regulations. In addition to the identified applicable and relevant or appropriate requirements (ARARs) for the selected action, the Army will comply with requirements applicable to off-site actions, such as Resource Conservation and Recovery Act (RCRA) hazardous waste transportation requirements under Ohio Administrative Code (OAC) 3745-52-20 to OAC 3745-52-33, and offsite treatment prior to land disposal as required by RCRA's land disposal restrictions under OAC 3745-270, including alternative land disposal restriction treatment standards for contaminated soil under OAC 3745-270-49.

In some cases, most ARARs will be chemical-specific. Action- or location-specific requirements will be ARARs to the extent that they establish standards addressing contaminants of concern that will remain at the AOC. In addition, CERCLA Section 121(d)(1) directs that remedial actions taken to achieve a degree of cleanup that is protective of human health and the environment are to be relevant and appropriate under the circumstances presented by the release. Accordingly, any chemical-, action-, or location-specific requirements will be ARARs to the extent that they ensure the degree of cleanup will be protective of human health and the environment under the circumstances presented by the release. An evaluation of the regulatory requirements has shown there are no chemical specific ARARs for the chemicals identified in various media at the AOC.

In summary, chemical-, action-, or location-specific requirements will be ARARs to the extent that they establish standards protective of human health and the environment for chemicals that will remain on site after the remedial action and ensure protection of site works and the environment during remedy implementation. Requirements identified as chemical-specific ARARs must ensure a degree of cleanup that is protective of human health and the environment under the circumstances presented by the release.

6.7.2 Potential Chemical-Specific ARARS

A review of the regulations indicated there are no potential chemical specific ARARs for any of the alternatives being considered in this EE/CA. No regulations were identified that included specific chemical concentrations or requirements that would be a potential ARAR to drive the

remedial action process. No chemical-specific ARARs are included in this EE/CA since there is no chemical contamination requiring removal action at the CC RVAAP-78 AOC.

6.7.3 Potential Action-Specific ARARS

Implementing an excavation and disposal alternative triggers potential ARARs associated with land disturbance and emission controls. The OAC 3745-15-07 requires that nuisance air pollution emissions be controlled. This includes controlling potential fugitive dust from excavation activities. In addition, any construction (i.e., soil disturbance activities that would encompass over 1 acre) would trigger the storm water requirements found at 40 CFR Part 450. These requirements mandate that erosion and sedimentation control measures be designed and implemented to control erosion and sediment runoff.

Because debris containing ACM was historically disposed at the AOC, the requirement to control visible emissions has been identified as a potential ARAR for all alternatives. The requirements found at OAC 3745-20-07(A) specify that no visible emissions may be allowed from inactive asbestos disposal sites. The potential emissions from CC RVAAP-78 are currently controlled due to: (1) existing vegetation; (2) the fact that the soil is not disturbed; and (3) the AOC not being utilized for training activities. In addition, the soil around where the ACM was identified did not contain asbestos fibers.

Because excavation would include generating and managing contaminated media, RCRA requirements would be considered potential ARARs for this activity. The RCRA requirements mandate that a generator must determine whether a material is (or contains in the case of environmental media) hazardous waste under OAC 3745-52-11. If a material is determined to be or contain a listed hazardous waste, or exhibits a hazardous waste characteristic, additional management requirements under RCRA must be followed as an ARAR under CERCLA.

These requirements include how hazardous waste is stored, treated, transported, and disposed. The RCRA requirements are generally not considered to be chemical-specific ARARs because they do not relate directly to the degree of cleanup or to specific chemicals. In addition to the substantive requirements associated with managing and storing material that is also RCRA hazardous waste (or found to contain such waste), some RCRA requirements prescribe standards for disposing hazardous material and prohibiting disposal of specific chemicals until they are treated to a specified level or by a specific treatment technology and minimum technical requirements for land disposal units.

The Ohio Administrative Code (OAC) 3745-20 contains regulations for controlling asbestos emissions from demolition and renovation projects. Ohio's regulations are consistent with U.S. EPA's National Emission Standards for Hazardous Air Pollutants (NESHAP) regarding asbestos. The regulations require that State of Ohio licensed asbestos abatement contractors do several things, such as provide a notification, conduct thorough inspections to determine the presence of asbestos, follow specific work practices, and ensure proper disposal of asbestos-containing material.

Shipments of contaminated soils will comply with federal, state, and local rules, laws and regulations. In addition to the identified ARARs for the selected action, the Army will comply with requirements applicable to off-site actions, such as Resource Conservation and Recovery Act (RCRA) hazardous waste transportation requirements under OAC 3745-52-20 to OAC 3745-52-33.

In the event solid waste material is found to be contaminated but not a RCRA hazardous waste, management and disposal of this material would be subject to the requirements associated with managing and disposing solid waste within the state of Ohio. The OAC Section 3745-27-05 requirements would be potential ARARs for disposing non-hazardous contaminated waste material generated during excavation and subsequent disposal at an off-site location. Potential action specific ARARs for the CC RVAAP 78 AOC are provided in **Appendix B** of the EE/CA.

6.7.4 Potential Location-Specific ARARS

Location-specific requirements include those established for potential remedial activities conducted within wetlands, within a floodplain area, or with respect to threatened and endangered species. Generally, for wetlands and floodplains, rules require alternatives to remedial activity within the sensitive area be pursued; if that is not feasible, adverse effects from any actions taken within the sensitive area must be mitigated to the extent possible. These requirements do not relate to specific chemicals nor do they further change the degree of cleanup in the sense of protecting human health or the environment from the effects of harmful substances. Rather, their purpose is to protect the sensitive areas (i.e., ecological areas or areas that include cultural resources and/or sites of historical/archeological significance) to the extent possible. Under CERCLA Section 121(d), relevance and appropriateness are related to the circumstances presented by the release of hazardous substances, with the goal of attaining a degree of cleanup and control of further release that ensures protection of human health and the environment. No potential location-specific ARARs were identified for the CC RVAAP-78 AOC.

In addition to the requirements identified as ARARs, any action taken by the federal government must be conducted in accordance with requirements established under the National Environmental Policy Act, Endangered Species Act, National Historic Preservation Act, and federal and state wetlands and floodplains construction and placement of material considerations, even though these laws and rules do not establish standards, requirements, limitations, or criteria relating to the degree of cleanup for chemicals remaining on site at the close of the response actions.

SECTION 7: AGENCY COORDINATION AND PUBLIC INVOLVEMENT

The Ohio EPA is the state regulatory agency for the restoration activities at the former RVAAP. The Army coordinated the preparation of the EE/CA with the Ohio EPA. The Ohio EPA approved the Final EE/CA (dated September 19, 2019) along with the selected Alternative 2 on September 25, 2019. The Final (approved) EE/CA was published for public review and comment as described in the following.

Community involvement is a necessary part of the CERCLA process. The NCP requires that a public notice describing the EE/CA and announcing a public comment period be published in a major local newspaper. In September 2019, the Army published the notice of availability of the Final EE/CA for public review. The notice of availability was published in two local newspapers. The public review period began on September 30, 2019 and ended October 31, 2019. The public comment period provided appropriate opportunity for the public to be involved in site-related decisions. No specific comments were received on the EE/CA from the public during the review period.

In addition to providing the EE/CA to the public for comment, CERCLA 42 U.S.C. 9617(a) requires that an Administrative Record be established "at or near the facility at issue." Relevant documents regarding the RVAAP Restoration Program have been made available to the public. The Administrative Record for this project is available at the following location:

Camp James A. Garfield Joint Military Training Center (CJAG)
Environmental Office
1438 State Route 534 SW
Newton Falls Ohio 44444
(614) 336-6136

Note: Access is controlled to Camp James A. Garfield, but the file can be viewed with prior notice.

An Information Repository of current information and final documents is also available to any interested reader at the following libraries:

Reed Memorial Library
167 East Main Street
Ravenna, Ohio 44266

Newton Falls Public Library
204 South Canal Street
Newton Falls, Ohio 44444-1694

The RVAAP Restoration Program has an online resource for documents, restoration news and information. This website can be viewed at www.rvaap.org.

SECTION 8: RESPONSIVENESS SUMMARY

No specific comments were received on the EE/CA from the public during the review period (September 30, 2019 to October 31, 2019).

SECTION 9: PROPOSED ACTIONS AND ESTIMATED COSTS

9.1 DESCRIPTION

Alternative 2 (Excavation and Off-site Disposal) is the recommended action for the CC RVAAP-78 AOC. The recommendation is based on the findings from the SI and the SI Addendum which demonstrated that ACM was present as well as two locations where asbestos fibers were found in the soil.

The Alternative 2 consists of excavation with off-site disposal of debris and comingled soil at Debris Piles A, B and C; removal of ACM and soil at Test Pit 5; and excavation and disposal of subsurface soil at C78SB-021M-0001-SO (1 to 5 feet bgs) to attain Unrestricted (Residential) Land Use. **Table 9-1** provides the estimated volumes of ACM/debris/soil to be excavated and disposed off-site.

Implementing these remedial technologies will meet the criteria for Unrestricted (Residential) Land Use. The evaluation of this Alternative assumes that the ACM/debris removal will also remove some soil incidentally.

This remedial alternative requires coordinating remediation activities with Ohio EPA, OHARNG, and the ARNG. Coordinating with stakeholders during implementation of the excavation will minimize health and safety risks to on-site personnel and potential disruptions of CJAG activities. The time period to complete this remedial action is relatively short and will not include an O&M period, as an Unrestricted (Residential) Land Use scenario will be achieved. Components of this remedial alternative include:

- Waste characterization sampling,
- Remedial Design (RD),
- Soil excavation and off-site disposal of debris and comingled soil at Debris Piles A, B, C and Test Pit Area 05; and excavation and disposal of subsurface soil at C78SB-021M-0001-SO (1 to 5 feet bgs);
- Confirmation sampling for asbestos fibers in the remaining soil around C78SB-021M-0001-SO (1 to 5 feet bgs): and
- Restoration.

Excavating Debris Piles A, B, and C Test Pit 05; and the subsurface soil at C78SB-021M-0001-SO will allow the CC RVAAP-78 AOC to meet Unrestricted (Residential) Land Use. See **Figures 2-1 and 2-2** for sample locations. These locations were identified in the 2016 SI and the 2018 SI Addendum. The potential contamination identified in the documents was assessed in Section 3 (CES) of this EE/CA. No chemicals were identified in the soil that require remedial actions.

Table 9-1 presents the calculations and values used to estimate the amount of debris/ACM and soil that needs to be properly excavated and disposed off-site. A total volume of 2,773 cubic yards (yds^3) was estimated. **Figures 2-1 and 2-2** show the locations of the three Debris Piles; the ISM samples taken around the three Piles in the SI Addendum; the sample location C78SB-021M-0001-SO (*SB 1) in Debris Pile C; and the location of Test Pit 05.

Table 9-1. Estimated Volumes of Debris, Surface Soil and Subsurface Soil Requiring Removal at CC RVAAP- 78.

Location	Average Length (ft)	Average Width (ft)	Depth (ft)	Volume (ft^3)	Volume (yd^3)
Debris Pile A	425	43	1.5	27,413	1,015
Debris Pile A – Surface Soil	425	43	0.6 (bgs)[a]	10,965	610[b]
Test Pit 5 – Subsurface Soil	10	10	1 - 2 (bgs)	200	11.1[b]
Debris Pile B	296	24	1.5	10,656	395
Debris Pile B – Surface Soil	296	24	0.6 (bgs)	4,260	240[b]
Debris Pile C	120	45	1.5	8,100	300
Debris Pile C – Surface Soil	120	45	0.6 (bgs)	3,240	180[b]
C78SB-021M-0001-SO	10	10	1 - 5 (bgs)	400	22.2[b]
			Total	**65,234**	**2,773**

Notes:
[a] bgs = below ground surface
[b] includes 25% constructability factor and 20% swell factor.
ft^3 = cubic feet.
ft = feet.
yd^3 = cubic yard.

9.2 COSTS

Cost analyses for the Alternative 2 includes an estimate of the capital cost in dollars, annual operation and indicates the period of time to complete the proposed action. The present value cost to complete Alternative 2 is approximately $518,200 (in base year 2019 dollars). Costs include implementing the removal, off-site disposal, confirmation sampling, and site restoration. See **Appendix C** of the EE/CA for a detailed description of Alternative 2 costs.

Any costs relative to the continued use and management of the AOC for military use are not a function of CERCLA or of the EE/CA and are not considered further.

Excavation of the three Debris Piles and specific locations along with will allow the CC RVAAP-78 AOC to meet Unrestricted (Residential) Land Use. These locations where the removal action is planned are presented in (**Figures 2-1 and 2-2**).

9.3 EXCAVATION, REMOVAL, AND DISPOSAL

Prior to any ground disturbance, erosion control material such as silt fences and straw bales will be installed to minimize sediment runoff from the excavation area. Dust generation will be minimized during excavation activities by keeping equipment movement areas and excavation areas misted with water. The health and safety of remediation workers, on-site CJAG employees, and the general public will be detailed in a site-specific health and safety plan. An Ohio EPA Notification of Renovation and Demolition (based on NESHAP standard) will also be required because of the potential for asbestos air emissions. The Notification requirement applies to abatement/removal of asbestos or ACMs.

To achieve a scenario in which the AOC is protective for Unrestricted (Residential) Land Use under CERCLA, soil will be removed from the proposed excavation locations stated above and shown on **Figure 2-1. Figure 2-2** shows all the sample locations that will be excavated for offsite disposal. Approximately 2,773 yds^3 of debris and soil will be removed from the excavation sites for disposal.

The excavated soil will be directly loaded onto trucks for off-site disposal at a licensed, permitted asbestos disposal facility. For cost estimation purposes, it is assumed that some of the surface soil beneath Debris Piles A, B, and C and at Test Pit Area 05 will be removed incidentally during the removal action. All debris at these three Piles and Test Pit Area 05 will be removed to ensure that all debris and ACM is removed. Additionally, these piles were assumed to average to be 1.5 feet tall. It is likely that this is an overestimate since the piles vary in depth and the surface soil varies. Once removed, all of the waste/soil will be disposed as asbestos waste per this EE/CA.

Soil and debris removal will be accomplished using conventional construction equipment such as backhoes, bulldozers, front-end loaders, and scrapers. Debris will be processed as needed to meet disposal facility requirements.

Soil will be hauled by truck to a licensed, permitted asbestos disposal facility. All trucks will be inspected and covered with tarps prior to exiting the CC RVAAP-78 AOC. Appropriate waste manifests will accompany each waste shipment. Only regulated and licensed transporters and vehicles will be used. All trucks will travel pre-designated routes within CJAG.

Excavated soil will be disposed at an existing off-site facility licensed and permitted to accept the characterized asbestos waste stream. The selection of an appropriate facility considers the type of waste, location, transportation options, and cost. Waste streams with different constituents and/or characteristics may be generated. Disposal cost savings can be made possible by utilizing specific disposal facilities for different waste streams, but all excavated soil is expected to be considered to contain asbestos.

Prior to any ground disturbance, the excavation area will be surveyed and demarcated by stakes. Erosion control material such as silt fences and straw bales will be installed to minimize sediment runoff. Dust generation will be minimized during excavation activities by keeping equipment movement areas and excavation areas misted with water. The health and safety of remediation

workers, OHARNG employees, and the general public will be covered in a site-specific health and safety plan. The volumes of debris/ACM and soil is provided in **Table 9-1**.

9.4 CONFIRMATION SAMPLING AND SITE RESTORATION

Upon completing the excavation, confirmation samples will be taken to verify the removal action was successful and all asbestos contamination was removed. The disturbed areas will be backfilled with clean fill (from an approved and tested source). After the area is backfilled and graded, workers will apply a seed mixture (as approved by OHARNG) and mulch. Restored areas will be inspected and monitored consistent with best management practices.

SECTION 10: EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

If Alternative 2 is not implemented, negative impacts to the current usability of the AOC for training purposes will occur. Alternative 2 as presented in the EE/CA, allows the OHARNG to remove the restrictions and use the AOC for training as needed or for Unrestricted (Residential) Land Use. Additionally, no more actions such as Five-Year Reviews would be required if the removal action is implemented.

This Alternative allows the AOC to be removed from the CERCLA process and used as needed. If this Alternative is not implemented, the AOC would remain in the CERCLA process and would require implementation and maintenance of Land Use Controls, and implementation of Five-Year Reviews. Additionally, if this Alternative is not implemented, the AOC will remain unsuitable for the mission-planned use.

SECTION 11: OUTSTANDING POLICY ISSUES AND ENFORCEMENT

11.1 OUTSTANDING POLICY ISSUES

There are no outstanding policy issues.

11.2 ENFORCEMENT

Camp James A. Garfield (inclusive of the CC RVAAP-78 AOC) is a federal facility that is licensed to the OHARNG for use as a military training site. The ARNG/OHARNG are responsible for continuing the management of the site per applicable Army Regulations, policies and CERCLA until the removal action is completed.

The Ohio EPA is the state regulatory agency that will oversee the NTCRA. Additional oversight and enforcement considerations from the Ohio EPA were addressed during preparation of the EE/CA. The EE/CA was prepared in consultation with Ohio EPA. Ohio EPA provided input during the ongoing investigation and report development process to ensure the removal action ultimately selected meets the needs of the state of Ohio and fulfills the requirements of the DFFO (Ohio EPA, 2004).

Because the AOC is located within CJAG, no additional enforcement components are needed. Once the removal action is completed, the AOC will meet requirements for Unrestricted (Residential) Land Use, so enforcement components will not be required.

SECTION 12: RECOMMENDATIONS

This Action Memorandum (Decision Document) represents the selected removal action for the CC RVAAP-78 on CJAG. Alternative 2: Excavation with Off-site Disposal to attain Unrestricted (Residential) Land Use is the recommended action for the CC RVAAP-78 AOC. The Debris Piles and all ACM/debris/soil at the AOC will be removed from the former RVAAP facility, transported to a licensed and permitted disposal facility, and appropriately disposed.

No long-term monitoring or five-year reviews would be required under CERCLA since Unrestricted (Residential) Land Use will be obtained. Any solid waste identified during excavation will be removed and properly disposed. Approximately 2,773 yds^3 of debris/ACM (including soil estimated to be removed incidentally with the three Debris Piles, Test Pit 05, and the one subsurface soil sample under Debris Pile C) will be removed from the AOC for off-site disposal. This removal will be conducted as an NTCRA and will achieve quick, protective results at the AOC and was determined to be cost effective (estimated $518,200). **Figures 2-1 and 2-1** provide the locations of the areas that require removal. **Appendix C** of the EE/CA includes breakdown of the costs and other information used to make this estimate and is included as **Attachment 1** of this Action Memorandum.

SECTION 13: REFERENCES

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ATTACHMENT 1: APPENDIX C: ESTIMATED COST DETAILS FROM THE 2019 EE/CA

Engineering Evaluation/Cost Analysis (EE/CA) for CC RVAAP-78
Quarry Pond Surface Dump – Cost Components.
Government and Contractor Total Costs

Item	Units	Value	Notes
Capital Costs			
Contract Award			
Government Cost	each	$15,000	
Action Memorandum			
Government Cost	each	$17,040	
PMP/QCP/Work Plan/HASP			
Contractor Cost	each	$36,100	
Oversight and Project Management	each	$4,000	
Debris/Soil Removal			
Contractor Cost (includes 3 subtasks below)	4,440 cu.yds. TOTAL	$386,060	Includes confirmation sampling, waste characterization, excavation, trucking, disposal, backfill, and site restoration
Confirmation Sampling	2 samples		$782
Waste characterization sampling and analysis	6 samples		$2,226
Mobilization/Demobilization, Excavation, Loading, Transportation, Offsite disposal, Standby, and Site Restoration	4,440 cu.yds		$383,050
Oversight and Project Management	each	$25,000	
Completion Report			
Contractor Cost	each	$32,000	
Oversight and Project Management	each	$3,000	
	TOTAL	**$518,200**	

*Overall Total Includes Government Contract Award and Oversight

EE/CA for CC RVAAP-78 Quarry Pond Surface Dump,
Former Ravenna Army Ammunition Plant (RVAAP)
Summary of Contractor Costs for Alternatives
Contractor Only Total Costs

CC RVAAP-78 Alternatives		Duration	Capital Cost	O&M Cost	Total
1	No Action	0	$0	$0	$0
2	Excavation and Off-site Disposal of Debris Piles A, B and C; incidental soil under A, B, and C; Test Pit 5; and Sample C78SB-021M-0001-SO	<1 yr	$454,458	$0	$454,458

Notes:

1. The base year of comparison and cost data will be CY2019.

2. Costs were estimated for comparison purposes only and are believed to be accurate within a range of -30% to +50%. Use of these costs for other purposes, including but not limited to, budgetary or construction cost estimating is not appropriate.

EE/CA for CC RVAAP-78 Quarry Pond Surface Dump,
Former Ravenna Army Ammunition Plant (RVAAP)
Summary of Removal Areas and Volumes

Locations Requiring Remediation	Media	Treatment Interval	Surface Area	In Situ		In situ with Constructability1		Ex situ1,2	
		(ft bgs)	(ft2)	Volume (ft3)	Volume (yd3)	Volume (ft3)	Volume (yd3)	Volume (ft3)	Volume (yd3)
Debris Pile A	Debris	Above grade	18,275	27,413	1,015.3	27,413[3]	1,015.3[3]	27,413[4]	1,015[4]
Debris Pile A	Surface Soil	0 - 0.6	18,275	10,965	406	13,706	508	16,447	610
Test Pit 5	Subsurface Soil	1 - 2	100	200	7.4	250	9.3	300	11.1
Debris Pile B	Debris	Above grade	7,104	10,656	395	10,656[3]	395[3]	10,656[4]	395[4]
Debris Pile B	Surface Soil	0 – 0.6	7,104	4,262	158	5,328	197	6,394	240
Debris Pile C	Debris	Above grade	5,400	8,100	300	8,100	300	8,100	300[4]
Debris Pile C	Surface Soil	0 – 0.6	5,400	3,240	120	4,050	150	4,860	180
C78SB-021M-0001-SO	Subsurface Soil	1 - 5	100	400	14.8	500	18.5	600	22.2
TOTALS					**2,416**				**2,773**

[1] Typically a constructability factor of 25% is used to account for over excavation, sloping of sidewalls, and addresses limitations of removal equipment.

[2] Includes 20% swell factor to account for expansion during excavation.

[3] Constructability factor does not apply to above-grade debris.

[4] Swell factor does not apply to above-grade debris.

EE/CA for CC RVAAP-78 Quarry Pond Surface Dump
Alternative 2 – Removal and Off-site Disposal
Key Parameters and Assumptions

Key Parameters and Assumptions:

Item	Unit	Value	Notes
Capital Cost			
Waste Characterization Sampling			
Samples	ea	6	Waste characterization includes 5 composite samples for the following: TCLP metals, TCLP herbicides, TCLP pesticides, TCLP VOCs, TCLP SVOCs, pH, Asbestos, PCBs, Flashpoint, Total Cyanide, Total Sulfide. Assumes 1 sampling technician at 16 hours to collect and ship samples.
Sampling Labor	hrs	16	
Sampling Labor	$/hr	$85	
Truck Rental / Gas	$/event	$180	1 truck x $80/day. Add $20 for gas.
Sample Materials	ea	6	
Sample Materials	$/ea	$35	Analyze samples for Asbestos (6 @ 136) and TCLP Metals (6 @ $180), RCRA Characteristics (6 @ $160).
Analytical Cost	$/event	$476	
Excavation			
Excavation Volume (In situ)	cy	2,416	Includes soil volume to be transported and disposed.
Excavation Volume (Ex situ)	cy	2,773	Ex situ volumes include 20% swell factor.
Volume to Weight Conversion	tons/cy	1.60	Includes soil mass to be transported and disposed.
Excavation Mass	tons	4,440	
Excavation Surface Area	sf	31,000	

EE/CA for CC RVAAP-78 Quarry Pond Surface Dump
Alternative 2 – Removal and Off-site Disposal
Key Parameters and Assumptions

Key Parameters and Assumptions:

Mobilization/Demobilization	ls	1,500	Includes mob/de-mob of excavation equipment.
Excavate Soils	day $/day	13 $5,000	Includes 2 cy excavator, 1-22 cy off highway truck, 1 O.E., 3 T.D., 1 L.S. spotter, 2 L.S. to prep trucks/and misc. Reduced productivity by 33% for loading trucks, precise excavations, and security/S&H requirements. Assume trucks are direct loaded. Average 200 cy/day and 1 day.
Standby Time	day $/day	3 900	Assume 3 days equipment standby while analysis is being performed. Assume no additional hot spot excavation.
Nonhazardous Waste and ACM	tons	2773	Based on shipping waste to American Landfill, Waynesburg,
Transport and Offsite Disposal	$/ton	$65	Ohio (approximately 80 mi RT). Assumes a minimum of 22 tons /load. Rate includes $16.60/ton tax from Portage County.
Confirmation Sampling			
Samples	ea	2	Includes 2 ISM or composite samples for confirmation of (Asbestos fibers)
Sampling Labor	hrs	4	Assumes 1 sampling technician at 4 hours to collect and ship samples.
Sampling Labor	$/hr	$85	
Truck Rental / Gas	$/event	$100	1 truck x $80/day. Add $20 for gas.
Sample Materials	ea	$35	
Sample Materials	$/ea	$272	Analyze samples for Asbestos (2@136).
Analytical Cost	$/event		
Restoration			
Native Soil Backfill	cy	80	Includes native soil backfill. Assume productivity has been reduced by 25% to account for security and safety requirements. Includes 12-in lift of native fill assuming 20% swell. Unclassified Fill, 6" Lifts, offsite Source @ 20 miles, includes delivery, spreading, and compaction.
Native Soil Backfill	$/cy	$40	
Seeding, Vegetative Cover	MSF	55	Seeding with mulch and fertilizer. Assume 1.25 acre is revegetated for restored areas and equipment damage.
Seeding, Vegetative Cover	$/MSF	$110	
Plans and Reports			
PMP/QCP	hrs	60	Includes Construction QC data and preparing report.
Work Plan & HASP/APP	hrs	320	
Corrective Action Completion Report	hrs	340	
Technical Labor	$/hr	95	

EE/CA for CC RVAAP-78 Quarry Pond Surface Dump
Alternative 2 – Removal and Off-site Disposal
Cost Estimate **Contractor Only Total Costs*

CAPITAL COST

Activity (unit)	Quantity	Unit Cost	Total
Waste Characterization Sampling			
Sampling Labor (hrs) Truck	16	$85.00	$1,360
Rental / Gas (event)	1	$180.00	$180
Sample Materials (ea)	6	$35.00	$210
Sample Analysis (event)	1	$476.00	$476
Soil Excavation			
Mobilization/Demobilization (ls)	1	$1,500.00	$1,500
Excavate Soil (days)	13	$5000.00	$65,000
Standby Time (day)	3	$900.00	$2,700
NonhazardousTransport and Offsite Disposal (ton)	4,440	$65.00	$288,600
Confirmation Sampling			
Sampling Labor (hrs) Truck	4	$85.00	$340
Rental / Gas (event)	1	$100.00	$100
Sample Materials (ea)	2	$35.00	$70
Sample Analysis (event)	1	$272.00	$272
Restoration			
Native Soil Backfill (cy)	480	$40.00	$19,200
Seeding, Vegetative Cover (MSF)	55	$110.00	$6,050
Documents			
PMP/QCP	1	$5,700	$5,700
Work Plan & HASP/APP	1	$30,400	$30,400
Corrective Action Completion Report	1	$32,000	$32,000