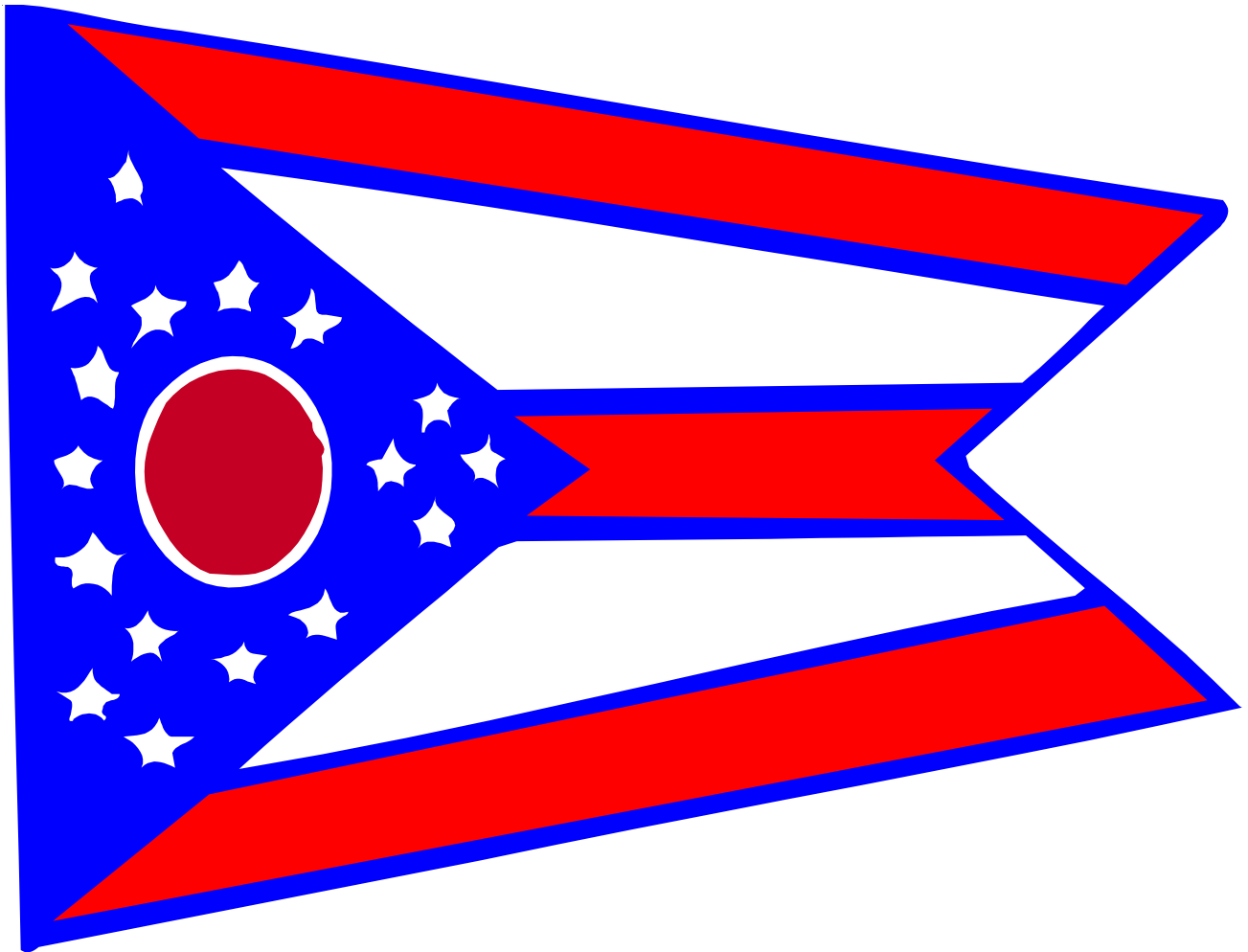


**INSTALLATION ACTION PLAN  
For  
RAVENNA ARMY  
AMMUNITION PLANT**

**FY05 as of May 2004**



30% post-consumer material paper



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# Statement of Purpose

The purpose of the Installation Action Plan (IAP) is to outline the total multi-year restoration program for an installation. The plan will define Installation Restoration Program (IRP) requirements and propose a comprehensive approach and associated costs to conduct future investigations and remedial actions at each Area of Concern (AOC) at the installation.

In an effort to coordinate planning information between the IRP manager, major army commands (MACOMs), installations, executing agencies, regulatory agencies, and the public, an IAP has been completed for the Ravenna Army Ammunition Plant (RVAAP). The IAP is used to track requirements, schedules and tentative budgets for all major Army installation restoration programs.

All site-specific funding and schedule information has been prepared according to projected overall Army funding levels and is therefore subject to change during the document's annual review. Under current project funding, all remedies will be in place at the RVAAP by the end of FY 2013.

## **The following agencies contributed to the formulation and completion of this Installation Action Plan:**

Engineering & Environment, Inc.

Management Solutions

Ohio Environmental Protection Agency

Ohio Army National Guard

Ravenna Army Ammunition Plant

US Army Corp of Engineers, Louisville

US Army Environmental Center

# Acronyms & Abbreviations

<b>AEDB-R</b>	Army Environmental Database - Restoration
<b>AEHA</b>	(United States) Army Environmental Hygiene Agency
<b>AOC</b>	Area of Concern
<b>bgs</b>	below ground surface
<b>BRAC</b>	Base Realignment and Closure Action
<b>CERCLA</b>	Comprehensive Environmental Response Compensation and Liability Act (1980)
<b>CERCLIS</b>	CERCLA Information System
<b>CHPPM</b>	(United States Army) Center for Health Promotion and Preventive Medicine
<b>COEC</b>	Constituent of Ecological Concern
<b>COPC</b>	Chemical of Potential Concern
<b>DD</b>	Decision Document
<b>DoD</b>	U.S. Department of Defense
<b>DOT</b>	Department of Transportation
<b>DSERTS</b>	Defense Site Environmental Restoration Tracking System (Now AEDB-R)
<b>EPA</b>	Environmental Protection Agency
<b>ERA</b>	Ecological Risk Assessment
<b>ER,A</b>	Environmental Restoration, Army (formally called DERA)
<b>FPRI</b>	Fixed Price Remediation with Insurance
<b>FS</b>	Feasibility Study
<b>FY</b>	Fiscal Year
<b>GOCO</b>	Government-Owned, Contractor-Operated
<b>HMX</b>	octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazacine
<b>IAP</b>	Installation Action Plan
<b>IRA</b>	Interim Removal Action
<b>IRP</b>	Installation Restoration Program
<b>LAP</b>	Load, Assemble and Pack
<b>LL</b>	Load Line
<b>LTM</b>	Long Term Monitoring
<b>MACOM</b>	Major Command
<b>MCL</b>	Maximum Contaminant Level
<b>MMRP</b>	Military Munitions Response Program
<b>NACA</b>	National Advisory Committee on Aeronautics
<b>NCP</b>	National Oil and Hazardous Substances Pollution Contingency Plan
<b>NE</b>	Not Evaluated
<b>NEPA</b>	National Environmental Policy Act
<b>NFA</b>	No Further Action
<b>NGB</b>	National Guard Bureau
<b>NPDES</b>	National Pollutant Discharge Elimination System
<b>NPL</b>	National Priorities List
<b>OBG</b>	Open Burning Ground
<b>ODOW</b>	Ohio Department of Wildlife
<b>OE</b>	Ordnance and Explosives
<b>OEPA</b>	Ohio Environmental Protection Agency
<b>OHARNG</b>	Ohio Army National Guard
<b>OSC</b>	Operations Support Command
<b>PA</b>	Preliminary Assessment
<b>PBC</b>	Performance Based Contracting
<b>PCB</b>	Polychlorinated Biphenyls
<b>POL</b>	Petroleum, Oil & Lubricants
<b>RA</b>	Remedial Action
<b>RA(C)</b>	Remedial Action - Construction

# Acronyms & Abbreviations

<b>RA(O)</b>	Remedial Action - Operation
<b>RAB</b>	Restoration Advisory Board
<b>RCRA</b>	Resource Conservation and Recovery Act
<b>RD</b>	Remedial Design
<b>RDX</b>	hexahydro-1,3,5-trinitro-1,3,5-triazine
<b>REM</b>	Removal
<b>RI</b>	Remedial Investigation
<b>RIP</b>	Remedy in Place
<b>ROD</b>	Record of Decision
<b>RRSE</b>	Relative Risk Site Evaluation
<b>RTLS</b>	Ravenna Training and Logistics Site
<b>RVAAP</b>	Ravenna Army Ammunition Plant
<b>SAIC</b>	Science Application International Corporation
<b>SI</b>	Site Inspection
<b>SVOC</b>	Semi-Volatile Organic Compounds
<b>SWMU</b>	Solid Waste Management Unit
<b>TAPP</b>	Technical Assistance for Public Participation
<b>TNT</b>	2,4,6-trinitrotoluene
<b>TPH</b>	Total Petroleum Hydrocarbons
<b>USACE</b>	United States Army Corps of Engineers
<b>USACHPPM</b>	United States Army Center for Health Promotion and Preventive Medicine
<b>USAEC</b>	United States Army Environmental Center
<b>USAEHA</b>	United States Army Environmental Hygiene Agency (changed to USACHPPM)
<b>USATHMA</b>	United States Army Toxic and Hazardous Materials Agency (replaced by AEC)
<b>UST</b>	Underground Storage Tank
<b>UXO</b>	Unexploded Ordnance
<b>VOC</b>	Volatile Organic Compounds
<b>WBG</b>	Winklepeck Burning Ground

<b>STATUS</b>	RVAAP is not a NPL site. RVAAP had submitted a Part B permit application to U. S. and Ohio Environmental Protection Agencies. The application covered the installation's interim status RCRA sites. The permit application was withdrawn during the 3rd quarter of FY94. The installation is currently negotiating Director's Findings and Orders with the Ohio EPA to cover future hazardous waste activities needed for closure of RVAAP. These orders will establish a CERCLA (risk) based decision framework for all remaining work at ER,A eligible sites.		
<b>NUMBER OF SITES:</b>	51 AEDB-R sites (PBC sites have been reopened, and a "PBC tracking site established) 33 Active ER,A Eligible Sites 4 Sites under PBC 18 Response Complete under ER,A 19 MMRP Sites		
<b>DIFFERENT SITE TYPES:</b>	3 Burn Areas	1 Contaminated Building	
	1 Contaminated Soil Pile	3 Disposal Pit/Dry Wells	
	1 Firing Range	2 Industrial Discharges	
	3 Landfills	1 Pistol Range	
	1 Pesticide Shop	4 Storage Areas	
	6 Spill Site Area	9 Surface Impoundment/Lagoons	
	6 Waste Treatment Plants	2 Underground Storage Tanks	
	3 Other (RVAAP-17, 35, 38)	3 Above Ground Storage Tanks	
	1 Explosive Ordnance Disposal Area		
	1 Unexploded Munitions/Ordnance		
<b>CONTAMINANTS OF CONCERN:</b>	Explosives, Heavy Metals, Propellants, Pesticides (PCBs), SVOCs, VOCs		
<b>MEDIA OF CONCERN:</b>	Groundwater, Soil, Surface Water, Sediment		
<b>COMPLETED REM/IRA/RA:</b>	RVAAP-47, Building T-5301 IRA		
<b>CURRENT IRP PHASES (per funding):</b>	RI/FS at 15 sites PBC at 4 sites	RD at 2 sites	LTM at 3 sites
<b>PROJECTED IRP PHASES (per funding):</b>	RI/FS at 21 sites RA(O) at 1 site	RD at 17 sites LTM at 25 sites	RA at 19 sites PBC at 4 sites
<b>IDENTIFIED POSSIBLE REM/IRA/RA:</b>	RVAAP-05, 06, 08 (PCB), 09 (PBC), 10 (PBC), 11 (PBC), 12, 13, 16, 19, 33, 36, 38, 39, 40, 41, 42, 43, 45, 46, 49, 50		
<b>DURATION:</b>	YEAR OF IRP INCEPTION:	1989	
	PROJECTED COMPLETION DATE OF ALL RAs:	2013	
	YEAR OF IRP COMPLETION	2015+	

# Installation Information

**SITE DESCRIPTION:**

The Ravenna Army Ammunition Plant (RVAAP) is located on 21,419 acres in Portage and Trumbull Counties, Ohio. Warren, Ohio is located 7 miles to the east of RVAAP and Kent, Ohio is located 15 miles to the west. The Operations Support Command (OSC) transferred control and operation of 16,164 acres to the National Guard Bureau in May 1999. In March 2002, an agreement was signed to immediately transfer an additional 3,774 uncontaminated acres to the National Guard with the remaining acreage to be transferred as restoration of the AOCs is completed.

**COMMAND ORGANIZATION:**

**INSTALLATION:** Ravenna Army Ammunition Plant, Commander's Representative and National Guard Bureau

**INSTALLATION MODIFIED CARETAKER CONTRACTOR:** Toltest Inc.

**IRP EXECUTING AGENCIES:**

**INVESTIGATION PHASE:** U.S Army Corps of Engineers, Louisville District

**ACTION PHASE:** U.S Army Corps of Engineers, Louisville District

**REGULATORY PARTICIPATION:**

**FEDERAL:** U.S. Environmental Protection Agency, Region V

**STATE:** Ohio Environmental Protection Agency (Ohio EPA)

**REGULATORY STATUS:**

- RCRA Interim Part A Permit

- Signing of the Orders will also transfer regulation of the RCRA groundwater unit at Ramsdell Quarry and Open Demolition Area #2 and all media at the Deactivation Furnace to the CERCLA program. The source of most contamination at or adjacent to the sites originates from unregulated activities that took place from 1940 to 1980. Cleanup of the sites will be more efficient once the sites are placed under a single regulatory program.



# Installation Description

## HISTORY

RVAAP is a government-owned, contractor-operated (GOCO) U.S. Army BRAC facility. In FY 1993, the mission of RVAAP was changed from inactive-maintained to modified caretaker status (limited mission). Toltest, Inc. is the current modified caretaker contractor. The current mission is storage of bulk explosives and propellants. The installation is contained within an 11 mile long, 3.5 mile wide tract and is bounded by State Route 5, the Michael J. Kirwan Reservoir, and the CSX System Railroad on the south; State Route 534 on the east; the Garrettsville and Berry roads on the west; and the Conrail Railroad on the north.

In August 1940, a tract of land covering 25,000 acres was purchased by the United States Government in the northeastern part of Ohio in Portage and Trumbull counties. Construction of the plant started in September 1940 with the Hunkin-Conkey Construction Company as the principal contractor, Wilbur Watson and Associates as the principal engineers, and the Atlas Powder Company as the operating contractor and consultant. The facility was completed and commenced operations during December 1941/January 1942, with the primary missions of depot storage and ammunition loading. To accomplish these two missions, the installation was divided into two separate units, the Portage Ordnance Depot and the Ravenna Ordnance Plant. The Portage Ordnance Depot's primary mission was depot storage of munitions and components, while the Ravenna Ordnance Plant's mission was ammunition loading. In August 1943, the installation was redesignated the Ravenna Ordnance Center, and again in November 1945 as the Ravenna Arsenal.

Facilities were operated by the Atlas Powder Company from September 1940 until the end of World War II. The operation of the plant was turned over to the Ordnance Department. From 1946 to 1949, the ammonium nitrate line was operated by the Silas Mason Company for the production of ammonium nitrate fertilizer.

The plant was placed in standby status in 1950 and operations were limited to renovation, demilitarization, and normal maintenance of equipment, along with storage of ammunition and components.

Beginning in April 1951, facility operations were contracted with Ravenna Arsenal, Inc., a subsidiary of the Firestone Tire and Rubber Company of Akron, Ohio.

The plant was reactivated during the Korean Conflict for the loading and packing of major caliber shells and components. In July 1954, the Plum Brook Ordnance Works of Sandusky, Ohio and the Keystone Ordnance Works of Meadville, Pennsylvania were made satellites to Ravenna. All production ended in August 1957, and in October 1957, the installation was again placed in a standby condition. The Plum Brook Plant ceased to be under the jurisdiction of Ravenna in March 1958. The Keystone Ordnance Works was transferred to the General Services Administration in July 1959.

Rehabilitation work started in October 1960 to establish facilities in the ammonium nitrate line for the processing and explosive melt-out of bombs. These operations commenced in January 1961, thereby establishing the first operation of this type in the ammunition industry. In July 1961, the plant was again deactivated and in November 1961, the installation was divided once again. The industrial portion was redesignated as the Ravenna Ordnance Plant and the entire facility was designated the Ravenna Army Ammunition Plant. The RVAAP was once again reactivated in May 1968 to load, assemble, and pack (LAP) munitions on three load lines and two component lines in support of the Southeast Asian Conflict. These facilities were subsequently deactivated in August 1972. A mission for the demilitarization of the M71A1 90MM projectile extended from June 1973 until March 1974.

In October 1982, the Physics International Company, a subsidiary of Rockcor, Inc., purchased Ravenna Arsenal, Inc. from the Firestone Company. In June 1985, Rockcor Inc. was purchased by the Olin Corporation.

Demilitarization of various munitions continued on a periodic basis through 1992. In FY 1993, the installation's status changed from inactive-maintained to modified caretaker. On October 1, 1998, R&R International, Inc. took over as the installation's contractor (R&R was later replaced by Toltest, Inc).

The Operations Support Command (OSC) transferred control and operation of 16,164 acres to the National Guard Bureau in May 1999. In March 2002, an agreement was signed to immediately transfer an additional

# Installation Description

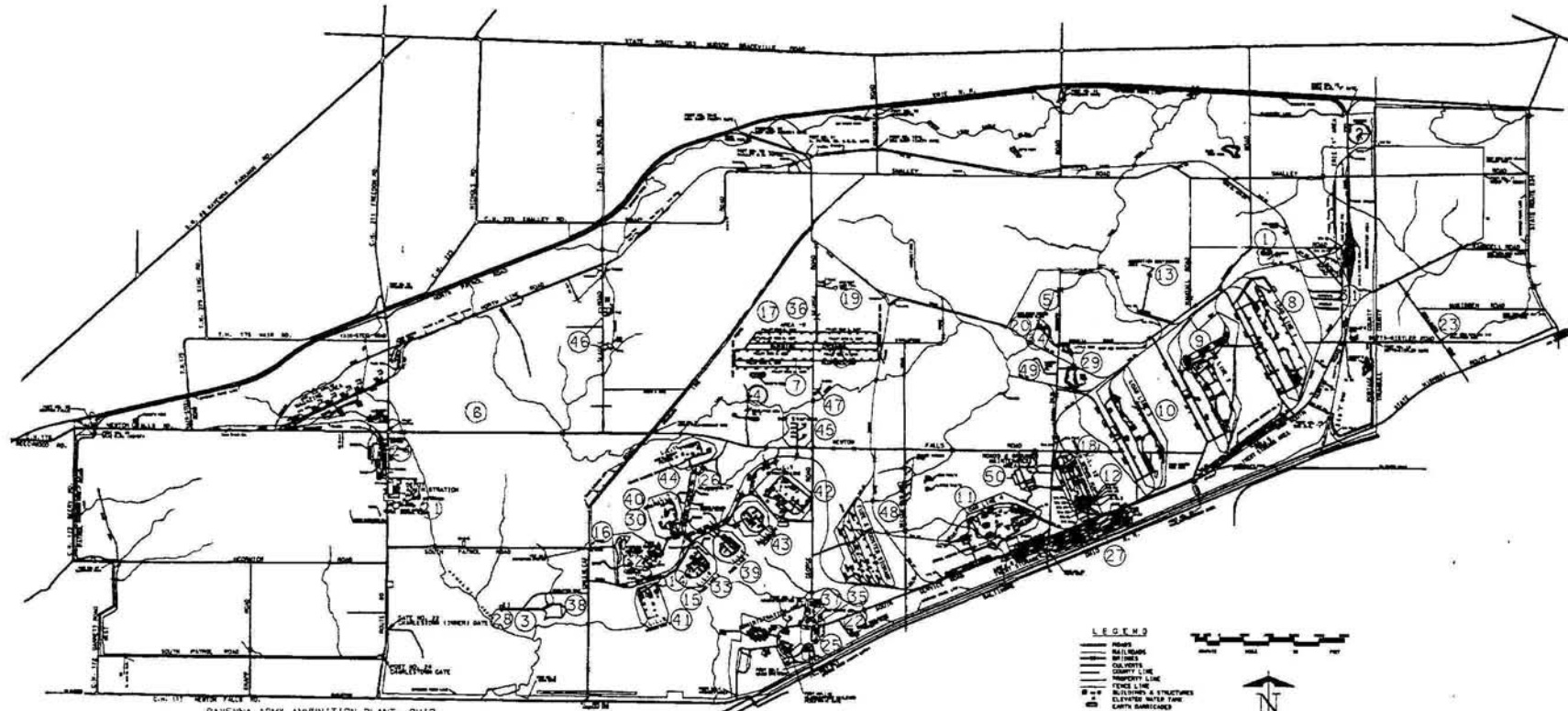
3,774 uncontaminated acres to the National Guard with the remaining acreage to be transferred as restoration of the AOCs is completed.

## **REGULATORY STATUS**

RVAAP is not on the U.S. EPA NPL, although it is in the U.S. EPA's CERCLIS database. Management of the IRP sites follows CERCLA requirements. There are a number of other regulatory programs addressing other non-IRP sites.

RVAAP received a RCRA Part A permit in 1980 for the storage and treatment of off-spec munitions and munitions-related waste. RVAAP submitted a RCRA Part B permit application in 1992 for the installation's Open Burning and Open Detonation Grounds and a hazardous waste storage building. The permit application was withdrawn during the 3rd quarter of FY 1994. The closure of the storage units and the open burn trays in Winklepeck Burning Grounds was completed and approved in 1998. Three 90-day hazardous waste storage areas were also officially closed.

A closure plan was developed for the Demolition Area #2 (RVAAP-04) in 1998, but has been reconsidered at this time. The site has been used since 1941 for treatment of explosive waste and ordnance by burning and detonation. The need for a treatment unit, to support the IRP and other projects, to detonate unexploded ordnance (UXO) was not known at the time the plan was developed. Subsequently, UXO has been found at several areas at RVAAP. Some of the areas are associated with IRP sites, while others are strictly a UXO concern. More UXO will almost certainly be found during future environmental investigations, remediation activities, and National Guard exercises. These circumstances have demonstrated the need for the use of a previously permitted RCRA unit where UXO can be detonated. The Army and Ohio EPA are currently developing Director's Findings and Orders to authorize continued use of Demolition Area #2 for purposes of supporting environmental restoration. Ravenna Army Ammo Plant will close the Demolition Area #2 RCRA unit when it is no longer needed to support restoration and closure of the installation.



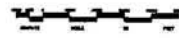
RAVENNA ARMY AMMUNITION PLANT, OHIO

ENVIRONMENTAL AREAS OF CONCERN

- |  |   |                                       |
|--|---|---------------------------------------|
| 1. RAMSELL QUARRY LANDFILL                     | 20. SAND CREEK SEWAGE TRT PLANT             | 39. LOAD LINE 5 / FUZE LINE 1         |
| 2. ERIE BURNING GROUNDS                        | 21. DEPOT SEWAGE TRT PLANT                  | 40. LOAD LINE 7 / BOOSTER LINE 1      |
| 3. DEMOLITION AREA #1                          | 22. GEORGE ROAD SEWAGE TRT PLANT            | 41. LOAD LINE 8 / BOOSTER LINE 2      |
| 4. DEMOLITION AREA #2                          | 23. UNIT TRAINING SITE - WASTE OIL TANK     | 42. LOAD LINE 9 / DETONATOR LINE      |
| 5. WINKLEPECK BURNING GROUNDS                  | 24. RESERVE UNIT MAINT AREA WASTE OIL TANK  | 43. LOAD LINE 10 / PERCUSSION ELEMENT |
| 6. C BLOCK QUARRY                              | 25. BLDG 1034 MOTOR POOL WASTE OIL TANK     | 44. LOAD LINE 11 / ARTILLERY PRIMER   |
| 7. BLDG 1601 HAZ WASTE STORAGE                 | 26. FUZE & BOOSTER AREA SETTLING TANKS      | 45. WET STORAGE AREA                  |
| 8. LOAD LINE 1                                 | 27. BLDG 854 - PCB STORAGE                  | 46. BLDG S 7-15 AND 7-16              |
| 9. LOAD LINE 2                                 | 28. MUSTARD AGENT BURIAL SITE               | 47. BLDG T-5301 DECONTAMINATION       |
| 10. LOAD LINE 3                                | 29. UPPER & LOWER COBBS POND COMPLEX        | 48. ANCHOR TEST AREA                  |
| 11. LOAD LINE 4                                | 30. LOAD LINE 12 PINK WATER TREATMENT PLANT | 49. CENTRAL BURN PITS                 |
| 12. LOAD LINE 12                               | 31. DRE PILE RETENTION POND                 | 50. ATLAS SCRAP YARD                  |
| 13. BUILDING 1200                              | 32. LOAD LINE 8                             | 51. DUMP ALONG PARIS-WINDHAM ROAD     |
| 14. LOAD LINE 8 - EVAPORATION UNIT             | 33. SAND CREEK DISPOSAL ROAD LANDFILL       |                                       |
| 15. LOAD LINE 6, PINK WATER TREATMENT FACILITY | 34. SAND CREEK DISPOSAL ROAD LANDFILL       |                                       |
| 16. FUZE & BOOSTER BURN PITS/LANDFILL          | 35. BLDG 1037 - LAUNDRY WASTEWATER SUMP     |                                       |
| 17. DEACTIVATION FURNACE                       | 36. PISTOL RANGE                            |                                       |
| 18. LOAD LINE 12 PINK WATER TRT PLANT          | 37. BLDG T - 4452 PESTICIDE STORAGE         |                                       |
| 19. LANDFILL NORTH OF WINKLEPECK BG            | 38. NACA TEST AREA                          |                                       |

LEGEND

- ROADS
- RAILROADS
- UTILITY LINES
- COUNTY LINE
- PROPERTY LINE
- FENCE LINE
- ELEVATED WATER TANK
- CAMP BARRACKS



RAVENNA ARMY AMMUNITION PLANT

OPERATED BY RAVENNA AMMUNITION PLANT, OHIO  
RAVENNA ARSENAL, INC.

APPROVED	SIGNATURE	DATE	TITLE
SAFETY			GENERAL AREA MAP
TECHNICAL			
PRODUCTION			
ENGINEERING			
GENERAL			
COORDINATING			
OFFICIAL			
REF. DWG. NO.			ENGR.
DATE / YEAR			SCALE
			A=1400.00

APRIL, 1999

# Contamination Assessment

The contamination at RVAAP originated from past industrial activities associated with the production and demilitarization of large caliber shells, gravity bombs, and parts for these munitions. RVAAP produced munitions during World War II and the Korean and Vietnam Wars. The industrial operations at RVAAP consisted of 12 production areas known as Load Lines. Load Lines 1 through 4 (melt-pour Lines) were the primary sources of secondary explosives contamination such as TNT, HMX and RDX, which were melted and poured into shell and bomb cavities. Load Line 1 and 12 were used for demilitarization of shells. Load Line 1 was used to produce and recondition tank mines. Workers would periodically use steam and hot water to hose down equipment and the floors and walls of buildings contaminated with explosive dust, spills, and vapors. The explosive-contaminated water from the cleaning, known as "pink water", then drained out doorways and through floor drains onto the soils surrounding the buildings or was discharged into open ditches or ponds after being filtered through saw dust to remove suspended explosives. Waste explosives from the melt pour Lines were routinely disposed of by open burning and detonation at other sites on the installation.

Load Lines 5 through 11 (fuze and booster) were used to manufacture fuzes, primers, and boosters while Load Line 12 housed the ammonium nitrate plant. Potential contaminants in Lines 5 through 11 include lead azide, mercury fulminate, lead styphnate, black powder, heavy metals, TNT, and Composition B. The amount of explosives used at the fuze and booster Lines was much less than that used at the melt-pour Lines because of the types of small munitions components being made there. Also, the operations did not create as much waste and were cleaner due to the special handling procedures needed when working with the highly shock and heat sensitive primary explosives. Load Line 12 produced ammonium nitrate for explosives, fertilizers and aluminum chloride. It also was periodically used for demilitarization projects involving the melt-out of TNT and other secondary explosives from the cavities of bombs and shells. As in the other melt pour Lines, these activities resulted in pink water being released to the soils, ditches, and ponds in and around the Line. Other types of contaminated sites associated with past industrial activities at RVAAP include landfills, testing facilities, dumps, burial sites, a pistol range, storage facilities, a scrap yard, and decontamination buildings. Although not present at every one of these sites, the contaminants of potential concerns include primary and secondary explosives, propellants, heavy metals, volatile and semivolatile organics, PCBs, and pesticides. Industrial activities ceased in 1992 when RVAAP was declared excess.

RVAAP started the IRP in 1989. Currently there are 33 active sites and 4 PBC sites in the program. The sites were given a RRSE rating of high, medium, or low based on the results of limited sampling in 1996 and 1998. Sampling has been done of the soil, sediment, surface, and groundwater at many of the high sites and a some of the medium sites as part of the remedial investigation process during the past 7 years.

Preliminary well sampling, conducted by Ohio EPA in 1997 and 1998, showed no off-post explosives contamination of residential wells.

A Phase I RI examined 11 high priority sites identified as RVAAP-04, 05, 08, 09, 10, 11, 12, 13, 18, 19, and 29. A final RI report was issued in 1997. The study concluded that Load Lines 1-4, and 12 appeared to be the most contaminated, contaminants were probably not migrating far from the sources in significant concentrations, and the RRSE score of three sites (RVAAP-13, 19, 29) should be lowered to medium. The report recommended further study in the form of a Phase II RI at these sites to determine the nature, extent and significance of contamination.

Investigation of Winklepeck Burning Grounds (WBG) is the furthest along of all the AOCs. The 200-acre site has high explosives and heavy metals soil contamination at many of the 70 burn pads. The concentrations are highest on the pads in the northeast and northwest. Soils at seven of the pads were identified as having significant risk for humans for at least one of the seven evaluated receptors. Significant soil contamination has been found to a depth of 6 feet at some of the most heavily used pads. Soils contamination between the pads was occasionally found. The study identified at least one animal species at every pad that would be potentially at risk. A field truthing ecological study of WBG was started in order to further evaluate the results of the screening risk assessment. It is nearing completion. Low levels of explosives were detected in the groundwater at two wells and the sediment at WBG. No COPCs were identified for human or ecological receptors exposed to

# Contamination Assessment

surface water.

Phase II field sampling has been completed at the four melt-pour lines (load lines 1 through 4). A final report for Load Line 1 and preliminary-draft reports for Load Lines 2, 3 and 4, and the draft final report for LL-12 have been issued. Results have for the most part confirmed initial beliefs that explosives and heavy metals are the most common contaminants and are generally located immediately around buildings and in the ditches and ponds draining the sites. Less common contaminants include PCBs and propellants. These same contaminants have been detected in the water and sediment within the storm sewers in the past. On-post wells located to the southeast of Load Line 2 near the perimeter have shown trace amounts of explosives. Of the fuze and booster Lines, only Load Line 11 has undergone extensive sampling to determine the nature and extent of contamination. Although a report has not been issued, the data indicates some heavy metals and some PCBs, and other organics exceed background levels. Very low levels of explosives were sporadically detected. High lead levels have been detected in the sediment from the sanitary sewers. Surface and sediment samples indicate significant levels of contaminants are not migrating from the site. This is consistent with the results from limited SI sampling of Load Lines 6, 9, and 10 in the spring of 2002 and the RRSE data collected in 1996 and 1998 for the other fuze and booster Lines. The preliminary-draft RI reports for Load Lines 2, 3 and 4 are under review.

Varying amounts of RI data are also available for some of the other AOCs used to support the main production activities. Limited data available from earlier efforts again show explosives and heavy metals to be the principle contaminants at sites used to burn, dump, or bury explosive waste from the Load Lines. These contaminants are most frequently found in the soils at Demolition Area #2 and Erie Burning Grounds, areas used to detonate and burn waste explosives. Erie has in recent years existed as a shallow impoundment and wetlands, resulting in explosives, metals and some organics being detected in the surface water and sediment at and downstream of the site. Explosives have been detected in the RCRA groundwater well samples taken at OD 2 where large amounts of UXO and OE scrap are still present.

Data currently being evaluated for the Cobb Ponds, which were settling basins for Load Line 3 and 12 effluent, indicate low levels of explosives, organics, and metals. Generally, contaminants are not present in the ground and surface water. After completion of a UXO removal operation at OD 1, confirmation samples of the soils had no detections of explosives and some metals were only slightly above background. The explosive RDX (below reporting limit) was detected at very low levels in the surface water downstream of the site near the installation boundary. Central Burn Pits, an area used to burn electrical components, dunnage, and other non explosive waste, has shown significant detections of lead, arsenic, antimony, cyanide, silver, and pesticides in the soil. Lead, cyanide, arsenic, and pesticides were noted in the sediment while surface and groundwater had slightly elevated arsenic. The data is currently being evaluated and a report is expected to be completed in spring 2004.

In 2003, a Performance Based Contract (PBC) was awarded to Shaw Environmental to complete the soil remediation at Load Lines 1, 2, 3 and 4. Remedial investigation at Load Lines 2, 3 and 4 will be completed; remedial technologies will be screened and an approved method will be selected and implemented to eliminate any threat to human health or the environment from accessible contaminated soils and sediments. Ravenna AAP was one of the first Army installations to implement PBC, the Army's newest strategy to accelerate clean up programs nationwide. The project will result in an interim remedy. Additional investigations of the soils under the inaccessible portions of the buildings will be needed. Results of the investigations will be used to determine if additional remedial action is needed to make the sites safe for training by the OARNG.

# Previous Studies

Title	Author	Date
Installation Assessment of Ravenna Army Ammunition Plant. Report No. 132	USATHMA	Nov-78
Ravenna Army Ammunition Plant RCRA Facility Assessment Draft RR/VSI Report	Jacobs Engineering Group, Inc.	Oct-89
Hazardous Waste Management Study No. 37-26-0442-84: Phase 2 of AMC Open Burning/Open Detonation Groundwater Evaluation	USAEHA OSC/Specpro	Oct-89
Facility-Wide Safety and Health Plan for the Ravenna Army Ammunition Plant	OSC/mkm	Feb-96
Preliminary Assessment for the Characterization of Areas of Contamination	OSC/mkm	Feb-96
Action Plan for the Ravenna Army Ammunition Plant	OSC/mkm	Mar-96
Facility-Wide Sampling and Analysis Plan for the Ravenna Army Ammunition Plant	OSC/Specpro	Apr-96
Phase 1 Remedial Investigation Sampling and Analysis Plan Addendum for High Priority Areas of Concern for the Ravenna Army Ammunition Plant	OSC/Specpro	Jul-96
Phase 1 Remedial Investigation Site Safety and Health Plan Addendum for High Priority Areas of Concern for the Ravenna Army Ammunition Plant	OSC/mkm	Jul-96
Investigation-Derived Waste Characterization and Disposal Plan for the Phase I RI of High Priority Areas of Concern at RVAAP	USACE OSC/mkm	Dec-96
Public Meeting Briefing - Phase I RI of High Priority AOCs at the RVAAP	USACE	Sep-97
Quality Control Plan for the phase II RI for Winklepeck Burning Grounds at RVAAP	USACE	Jan-98
Sampling and Analysis Plan Addendum for the Phase II Remedial Investigation for Winklepeck Burning Grounds at the Ravenna Army Ammunition Plant	SAIC	Jan-98
Remedial Investigation Report for the Phase I Remedial Investigation of High Priority Areas of Concern at the Ravenna Army Ammunition Plant. Volume I Main Text	SAIC	Feb-98
Remedial Investigation Report for the Phase I Remedial Investigation of High Priority Areas of Concern at the Ravenna Army Ammunition Plant. Volume II Appendixes A-K	SAIC	Feb-98
Geophysical Survey Results of Mustard Agent Burial Site at RVAAP, Edition 2	USACE	Mar-98
Safety and Health Plan Addendum for the Phase II Remedial Investigation of the Winklepeck Burning Grounds and Determination of Facility-Wide Background	SAIC	Apr-98
Geophysical Survey Results of mustard Agent Burial Site 1 at RVAAP, Edition 1	USACE	Apr-98
SAP Addendum for the Phase II RI of the Winklepeck Burning Grounds and Determination of facility-Wide Background at the RVAAP	USACE	Apr-98
RCRA Closure Field Investigation Report for the Deactivation Furnace Area, Open Detonation Area, Building 1601, and Pesticides Building at RVAAP	USACE	Jun-98
SAP and SSHP Addendum for the Groundwater Investigation of the Former Ramsdell Quarry Landfill	USACE	Jun-98
Hazardous Medical Waste Study RRSE for Newly Added Sites at RVAAP	USACE	Oct-98
October 1998 Quarterly Monitoring Report, Ramsdell Quarry Groundwater Investigation	USACE	Oct-98
Initial Phase Report Groundwater Investigation Ramsdell Quarry at RVAAP	USACE	Jan-99
Initial Phase Report, Groundwater Investigation, Ramsdell Quarry Landfill	USACE	Jan-99
February 1999 Quarterly Monitoring Report, Ramsdell Quarry Groundwater Investigation	USACE	Feb-99
Quarterly Monitoring Report, Ramsdell Quarry Groundwater Investigation	USACE	Apr-99
Phase II RI Report for the Winklepeck Burning Grounds at RVAAP	USACE	Aug-99
Sampling and Analysis Plan Addendum No. 1 for the Phase II RI of Load Line	USACE	Aug-99
SAP Addendum No. 1 for the Phase II RI Load Line 1	USACE	Aug-99
Environmental Information Management Needs Assessment	USACE	Sep-99
SAP Addendum No. 1 for Phase 1 RI of Demo Area 1 at RVAAP	USACE	Oct-99
SSHP Addendum No. 1 for Phase I RI of Demo Area 1 at RVAAP	USACE	Oct-99

# Previous Studies

Title	Author	Date
Draft- Vegetation Methods for Ground-Truthing of Ecological Risk at Winklepeck Burning Grounds at the RVAAP, Draft	USACE	Dec-99
Small Mammal Methods for Ground-Truthing of Ecological Risk at Winklepeck Burning Grounds at the RVAAP	USACE	Dec-99
Sampling and Analysis Plan for the Interim Removal Action, Decontamination and Demolition of Building T-5301(AOC 47)	OSC	Feb-00
Site Specific Safety and Health Plan for the Interim Removal Action, Decontamination and Demolition of Building T-5301 (AOC 47)	OSC	Feb-00
Work Plan & Sampling and Analysis for the Bioremediation Pilot Study for Soils from Former Bldg. FJ 904 at Load Line 12 (AOC 12)	OSC	Mar-00
Draft-Final Completion Report for the Bioremediation Pilot Study for Soils from Former Bldg. FJ 904 at Load Line 12 (AOC 12)	OSC	Mar-00
SAP and SSHP Addendum No. 2 for the Biological Measurements at Winklepeck Burning Grounds at RVAAP	USACE	May-00
Facility-Wide SAP and Facility-Wide SSHP for Environmental Investigations for RVAAP	USACE	Jul-00
Report Groundwater Investigation at Ramsdell Quarry at RVAAP	USACE	Aug-00
Sampling and Analysis Plan Addendum No. 2 for the Phase II RI of Load Line 1	USACE	Sep-00
SAP for Phase II RI Load Line 12 at RVAAP	USACE	Sep-00
SSHP for Phase II RI Load Line 12 at RVAAP	USACE	Sep-00
OE/UXO Locating, Removal and Disposal at the Open Detonation Area #2	OSC	Sep-00
Work Plan for the Remedial Investigation at Load Line 11 (AOC 44)	OSC	Oct-00
Site Safety and Health Plan for the Remedial Investigation at Load Line 11 (AOC 44)	OSC	Oct-00
Sampling and Analysis Plan for the Remedial Investigation at Load Line 11 (AOC 44)	OSC	Oct-00
Work Plan for the Remedial Investigation at Load Line 11 (AOC 44)	OSC	Oct-00
Site Safety and Health Plan for the Remedial Investigation at Load Line 11 (AOC 44)	OSC	Oct-00
Sampling and Analysis Plan for the Remedial Investigation at Load Line 11 (AOC 44)	OSC	Oct-00
Work Plan for the Remedial/Design Removal Action of the Paris-Windham Road Dump (AOC 51)	OSC	Apr-01
Work Plan for the Phase II Remedial Investigation at Central Burn Pits	OSC	Aug-01
Sampling and Analysis for the Phase II Remedial Investigation at Central Burn Pits	OSC	Aug-01
Site Safety and Health Plan for the Phase II Remedial Investigation at Central Burn Pits	OSC	Aug-01
Work Plan for the Interim Removal Action, Decontamination and Demolition of Building T-5301(AOC 47)	OSC	Feb-00
Work Plan for the Interim Removal Action at Load Line 11 (AOC 44)	OSC	Jan-01
Sampling and Analysis for the Interim Removal Action at Load Line 11 (AOC 44)	OSC	Jan-01
Site Specific Safety and Health Plan for the Interim Removal Action at Load Line 11 (AOC 44)	OSC	Jan-01
Work Plan for the Phase II Remedial Investigation at Upper & Lower Cobbs Pond	OSC	Jul-01
Sampling and Analysis for the Phase II Remedial Investigation at Upper & Lower Cobbs Pond	OSC	Jul-01
Site Safety and Health Plan for the Phase II Remedial Investigation at Upper & Lower Cobbs Pond	OSC	Jul-01
Closure Report for the Interim Removal Action, Decontamination and Demolition of Building T-5301 (AOC 47)	OSC	Jul-01

# Previous Studies

Title	Author	Date
Draft Compliance Monitoring Program for the Open Detonation Area #2	OSC	Jun-01
Draft Groundwater Quality Assessment Program Report for the Ramsdell Quarry Landfill	OSC	Nov-01
Sampling and Analysis Addendum for the Remedial/Design Removal Action of the Paris-Windham Road Dump (AOC 51)	OSC	Apr-02
Site Specific Safety and Health Plan for the Remedial/Design Removal Action of the Paris-Windham Road Dump (AOC 51)	OSC	Apr-02
Sampling and Analysis Addendum for the Remedial/Design Removal Action at the Sand Creek Disposal Road Landfill (AOC 34)	OSC	Apr-02
Work Plan for the Remedial/Design Removal Action at the Sand Creek Disposal Road Landfill (AOC 34)	OSC	Apr-02
Site Specific Safety and Health Plan for the Remedial/Design Removal Action at the Sand Creek Disposal Road Landfill (AOC 34)	OSC	Apr-02
Interim Removal Action for Load Line #11		Apr-02
OE/UXO Removal and Interim Removal Action Report for the Open Demolition Area #1		Apr-02
Sampling and Analysis Plan Addendum #3, Biological Measurements at the Winklepeck Burning Grounds	SAIC	May-02
Work Plan and Sampling and Analysis Plan Agenda for the Phase II Remedial Investigation of Demolition Area 2	SAIC	Jun-02
Technical Memorandum, Human Health and Ecological Risk Assessment Approach for the Load Line 1 and Load Line 2 Phase II Remedial Investigations- Revised Final	SAIC	Aug-02
RVAAPs Facility Wide Human Health Risk Work Plan- Draft	CELRL	Sep-02
RVAAPs Facility Wide Ecological Risk Work Plan- Draft	CELRL	Oct-02
Report on the Biological Field Truthing Effort and Winklepeck Burning Grounds- Draft Final	SAIC	Nov-02
RVAAPs Facility Wide Surface Water Assessment Work Plan- Draft	CELRL	Dec-02
Conceptual Plan For a Facility-Wide Groundwater Monitoring Program Plan For the RVAAP	Spec Pro	Aug-03
Final Sampling and Analysis Plan Addendum for the Remedial Investigation at Load Line #6	MKM	Sep-03
Final Sampling and Analysis Plan Addendum for the Remedial Investigation at Load Line #9	MKM	Sep-03
Final Safety and Health Plan for the Remedial Investigation of Load Lines #6, and #9	MKM	Sep-03
Sampling & Analysis Plan Addenda for the Phase I/Phase II Remedial Investigation of the Fuze & Booster Quarry Landfill/Ponds at the RVAAP	Spec Pro	Oct-03
Safety and Health Plan for the Phase I/Phase II Remedial Investigation of the Fuse & Booster Quarry Landfill/Ponds at the RVAAP	Spec Pro	Oct-03
Final Work Plan for the Remedial Design/Removal Action at the Paris-Windham Road Dump	MKM	Nov-03
Final Work Plan for the Remedial Design/Removal Action at the Sand Creek Dump	MKM	Nov-03
Final Phase II Remedial Investigatin Report for the Winklepeck Burning Grounds at the RVAAP (with revised executive summary)	SAIC	Jun-03
Draft Final Phase II Remedial Investigation Report for Load Line 12 at the RVAAP	SAIC	Oct-03
Final Phase II Remedial Investigation Report for Load Line 1at the RVAAP	SAIC	Jun-03
Preliminary Draft Phase II Remedial Investigation Report for Load Line 2 at the RVAAP	SAIC	May-03
Preliminary Draft Phase II Remedial Investigation Report for Load Line 3 at the RVAAP	SAIC	May-03



# Previous Studies

Title	Author	Date
Preliminary Draft Phase II Remedial Investigation Report for Load Line 4 at the RVAAP	SAIC	May-03
Preliminary Draft Supplemental Baseline Human Health Risk Assessment for Load Line 1 Alternative Receptors at the RVAAP	SAIC	May-03
Final Facility Wide Ecological Risk Work Plan	CELRL	Apr-03
Draft Facility Wide Human Health Risk Work Plan (Final Due Dec 03)	CELRL	Apr-03
Final Sampling and Analysis Plan Addendum No. 1 for the Phase II Remedial Investigation of the Erie Burning Grounds at the RVAAP	SAIC	Oct-03
Final Site Safety and Health Plan Addendum No. I for the Phase II Remedial Investigation of the Erie Burning Grounds at the RVAAP	SAIC	Oct-03
Final Sampling and Analysis Plan Addendum No. 1 for the Phase I Remedial Investigation of the Ramsdell Quarry Landfill at the RVAAP	SAIC	Oct-03
Final Site Safety and Health Plan Addendum No. I for the Phase I Remedial Investigation of the Ramsdell Quarry Landfill at the RVAAP	SAIC	Oct-03
Final RVAAP Facility Wide Surface Water Assessment Work Plan	CELRL	Jan-03
Ravenna Army Ammunition Plant Community Relations Plan	CELRL	Sep-03

**ER,A ELIGIBLE  
ACTIVE AEDB-R SITES**

# RAMSDELL QUARRY LANDFILL

## SITE DESCRIPTION

The Ramsdell Quarry Landfill is an unlined, 10-acre landfill in the bottom of an abandoned quarry. Water is ponded in the northern end of the quarry. During the period 1946 to 1950, the site was used as a surface-burning site to thermally treat waste explosives and napalm bombs. No historical information has been located for the period of 1950-1976. Since 1976, the site has been used strictly as a non-hazardous solid waste landfill. A portion of the site was permitted as a sanitary landfill by the state of Ohio from 1978 until its closure in 1990. The landfill is regulated under RCRA while the remaining portion of the quarry is regulated under CERCLA.

Because this unit is unlined, there is potential for releases from the landfill to surrounding soils and groundwater. Five groundwater monitoring wells were installed around the landfill perimeter in 1988. The wells are monitored on a regular basis as part of the landfill closure requirements. New wells were installed in 1998 to further investigate the nature and extent of groundwater contamination at the landfill. A report of findings was published in October 1998. Low levels of explosives and metals have been detected in groundwater.

Additional wells were installed and soil, sediment and surface water samples were taken in fall 2003 to further determine the nature and extent of the contamination of the CERCLA portion of the quarry. A preliminary draft report on the findings is expected by spring 2004.

## PROPOSED PLAN

Complete RI (funded in FY04). LTM will follow. Future use by the OHARNG will be restricted access. Land Use Controls will be needed.

## STATUS

**RRSE RATING:**

High

**CONTAMINANTS:**

Explosives, Metals

**MEDIA OF CONCERN:**

Soil, Groundwater

**COMPLETED IRP PHASE:**

PA/SI

**CURRENT IRP PHASE:**

RI/FS

**FUTURE IRP PHASE:**

RI/FS, LTM

# RVAAP-02

## ERIE BURNING GROUNDS

### SITE DESCRIPTION

This 35 acre AOC was used to thermally treat munitions by open burning on the ground surface. Bulk, obsolete, off-spec propellants, conventional explosives, rags, and large explosive-contaminated items were treated at this location. The ash residue from the burns was left at the AOC. UXO is present at the site. Waste constituents of concern at this location include RDX, TNT, and heavy metals. There is a potential for release of contaminants from this unit to the surrounding soils, surface water/sediment and groundwater. This site is in a wetland area.

The PA/SI was completed in 1989. Phase I RI field work was conducted at this site in July 1999. The final report was completed in 2001. It was determined that additional groundwater sampling was needed.

Phase II RI fieldwork including groundwater, soil and sediment samples was completed in fall 2003. This report is expected in summer 2004.

### STATUS

**RRSE RATING:**

High

**CONTAMINANTS:**

Explosives, Metals, SVOCs

**MEDIA OF CONCERN:**

Soil, Groundwater, Surface Water, Sediment

**COMPLETED IRP PHASE:**

PA/SI

**CURRENT IRP PHASE:**

RI/FS

**FUTURE IRP PHASE:**

RI/FS, LTM

### PROPOSED PLAN

Complete Phase II RI report. Long Term Monitoring will follow. Future use by the OHARNG will be restricted access. Land Use Controls will be needed.

# RVAAP-04

## OPEN DEMOLITION AREA #2

### SITE DESCRIPTION

This AOC was used since 1948 to detonate large caliber munitions and off-spec bulk explosives that could not be deactivated or demilitarized by any other means due to their condition. Detonation was performed in a backhoe-dug pit with a minimum depth of 4 ft. After detonation, metal parts were picked up and removed from the site. The CERCLA (IRP) portion of the site is ~25 acres in size. Contaminants of concern at this site are white phosphorus, explosives, and heavy metals. Sand Creek bisects the site.

A Phase I RI was completed for the site in February 1998. The RI found explosives, particularly TNT, and several inorganics including cadmium, lead and mercury in both the surface and subsurface soils. Concentrations of inorganic compounds in sediment appear to be within site-wide background values. Groundwater is being investigated under the Phase II RI.

There is a smaller 1.5 acre area regulated under RCRA on the north side of Sand Creek, which was regularly used until 1992 for demolition activities. This area is not eligible for ER,A funding. A USAEHA geotechnical study was conducted at this site in 1992, with minor amounts of contamination being detected in the soils. Four groundwater monitoring wells were installed at the AOC as part of the USAEHA study. The wells are currently sampled on a quarterly basis. Low levels of explosives have been periodically detected in RCRA wells. Non-IRP funding was used in 1999 and 2000 to remove UXO/OE to a depth of 4 ft in the area of the 1.5 acre RCRA unit.

IRP funds are being used to characterize and properly handle any contaminated soils within the eligible areas.

In summer 2002, the Phase II RI field work was completed to better delineate the north side and delineate the south side of the AOC.

Work at this site is likely to be eligible for the Military Munitions Response Program (MMRP).

Facility-wide surface water and sediment sampling is being funded under this site, to evaluate the overall biological integrity of surface water by watershed. Draft report due April 2004.

### PROPOSED PLAN

Prepare a RI report (draft expected in spring 2004). LTM will follow. Land Use Controls will be required. Future OHARNG use will be restricted access. Any bank stabilization, fencing, and UXO removal work is expected to be funded from the BRAC program.

### STATUS

**RRSE RATING:**

High

**CONTAMINANTS:**

Explosives, Metals

**MEDIA OF CONCERN:**

Soil, Groundwater, Surface Water, Sediment

**COMPLETED IRP PHASE:**

PA/SI, Phase I RI (1998)

**CURRENT IRP PHASE:**

RI/FS

**FUTURE IRP PHASE:**

RI/FS , LTM

# WINKLEPECK BURNING GROUNDS

## SITE DESCRIPTION

The total burning ground area consists of 200 acres and has been in operation since 1948. Prior to 1980, open burning was carried out in pits, pads, and sometimes on the roads within the 200 acre area. Burning was conducted on the bare ground and the ash was abandoned at the site. Prior to 1980, wastes treated in the area included RDX, antimony sulfide, Composition B, lead azide, TNT, propellants, black powder, waste oils, sludge from the load lines, domestic wastes and small amounts of laboratory chemicals. Munitions and explosive constituents (MEC) (primarily scrap metal) are present at the AOC. UXO may be present. From 1980 to 1998, burns of scrap explosives, propellants and explosive-contaminated materials were conducted in raised refractory-lined trays within a 1.5 acre area.

The Part B permit application covering the active portion of the site was withdrawn in 1994. The burn trays along with the 90-day storage unit, Building 1601, were closed in accordance with Ohio EPA guidance in 1998.

The Phase II RI Report includes facility-wide background levels, as well as human health and ecological risk assessments. Additional field studies were conducted in FY00 at Winklepeck and RVAAP reference locations to more accurately define the risk to ecological receptors at the site. The Draft Ecological Field Truthing report was submitted in April 2001. This Eco report has undergone revisions and is currently undergoing finalization. Phase III RI fieldwork was completed in fall 2000, the preliminary draft report was submitted in January 2004. The data will be used along with data from previous studies to evaluate remedial alternatives. The proposed future land use is a Mark 19 (grenade machine gun) Range. Soils remediation is expected for explosives and heavy metals due to unacceptable human health risks. Explosive contamination has been found in some monitoring wells.

## STATUS

**RRSE RATING:**

High

**CONTAMINANTS:**

Explosives, Metals

**MEDIA OF CONCERN:**

Soil, Groundwater

**COMPLETED IRP PHASE:**

PA/SI

**CURRENT IRP PHASE:**

RI/FS, RD (funded)

**FUTURE IRP PHASE:**

RA, LTM

## PROPOSED PLAN

Finalize RI/FS reports. There will be some MEC, including UXO, removal in 2004 with non-IRP funds. A RD/RA of soil removal following this removal is planned. LTM will follow.

The future use of this site will be as an impact area for a training range for the Mk 19 (grenade machine gun). This site has an increased priority for action in order to expedite property transfer to the National Guard Bureau.

**C BLOCK QUARRY**

**SITE DESCRIPTION**

This AOC is an abandoned borrow pit approximately 0.3 acres in size. The AOC was used as a disposal area for annealing process wastes (chromic acid) for a short time during the 1950s. Liquid wastes were apparently dumped on the ground in the pit bottom. The AOC is now heavily forested with trees of 1 ft diameter or larger. Waste constituents of concern include chromium, lead, and mercury.

A detailed sampling investigation of the soils from this unit in 1986 detected no metals above RCRA-regulated levels.

In the fall of 2001, additional samples were taken. Metals, including hexavalent chromium and organics were detected in soil above screening levels. The amount of contaminated soil is larger than previously expected. Groundwater has not been sampled.

**STATUS**

**RRSE RATING:**

Low

**CONTAMINANTS:**

Metals, Organics

**MEDIA OF CONCERN:**

Soil, Groundwater

**COMPLETED IRP PHASE:**

PA/SI

**CURRENT IRP PHASE:**

RI/FS

**FUTURE IRP PHASE:**

RI/FS, RD, RA, LTM

**PROPOSED PLAN**

A RI will be completed. A RD/RA such as soil removal may be needed. Land Use Controls and LTM are expected.

## SITE DESCRIPTION

From approximately 1941 to 1971, wash-down water and wastewater from the load line operations were collected in concrete sumps, pumped through sawdust filtration units and then discharged to a settling pond. Building wash-down water from the melt-pour buildings was also swept out through doorways onto the ground surrounding the buildings. The settling pond was an unlined earthen impoundment ~1 acre in size. Water from the impoundment was discharged to a surface stream that exited the installation. This area was also used as a demil area. Contaminants of concern at this unit are explosive compounds and heavy metals (including lead, chromium, and mercury). There is a high potential for releases from this unit to the soils, surface water/sediment and groundwater. Most above ground structures were demolished during 2000. Environmental controls were used during the demolition activities to prevent migration of contaminants to the environment.

The RI sampling (1999-2000) found high levels of explosives in the soil around the melt-pour and preparation buildings. Groundwater has low levels of explosives and metals. Preliminary screening of the contaminant levels indicates that the sediments may cause an ecological risk. Surface water did not show any significant contamination. The RI report was finalized in June 2003.

A PBC contract was awarded to Shaw Environmental in Sept 2003 to complete all phases through LTM at LL1, 2, 3 and 4 for all soils and some sediments. The PMP has been completed. The supplemental human health risk assessment for Load Line 1 has been completed.

## PROPOSED PLAN

Final: All concrete wall and foundations and walkways will be removed. Flushing and grouting or removal of the underground utilities will be done as needed. This may be accomplished with non-ER,A funds.

The project will result in an interim remedy. Additional investigations of the soils under the inaccessible portions of the buildings will be needed. Results of the investigations will be used to determine if additional remedial action is needed to make the sites safe for training by the OHARNG.

Future plans include completion of the RI/FS at all 4 sites. Soil removal is proposed.

Future land use will involve armored vehicle maneuver, with accompanying disturbance to a depth of four feet.

## STATUS

**RRSE RATING:** High

**CONTAMINANTS:**

Explosives, Metals, SVOCs, VOCs  
Propellents

**MEDIA OF CONCERN:**

Soil, Groundwater, Surface Water,  
Sediment

**COMPLETED IRP PHASE:**

PA/SI, RI

**CURRENT IRP PHASE:**

PBC

**FUTURE IRP PHASE:**

PBC



**SITE DESCRIPTION**

From approximately 1941 to 1971, building wash-down water and wastewater from the load line operations were collected in concrete sumps, pumped through sawdust filtration units and then discharged to a settling pond. Building wash-down water from the melt-pour buildings was also swept out through doorways onto the ground surrounding the buildings. The settling pond was an unlined triangular-shaped pond ~2 acres in size and 6 to 8 ft deep. Water from the impoundment was discharged to a surface stream that exited the installation. Contaminants of concern at this unit are explosive compounds and heavy metals (ex., lead, chromium, cadmium, and mercury). There is a high potential for releases from this unit to the soils, surface water/sediments and groundwater.

A Phase I RI was completed in 1998. Explosives and metals were the most common soil contaminants. Organics, PCBs, propellants and pesticides were also detected. Low levels of some contaminants were found in the groundwater at this site. Fieldwork for a Phase II RI to further determine the nature and extent of the contamination was completed in 2001. A preliminary draft of the findings was submitted in May 2003 with regulatory review completed in June 2003.

Thermal decomposition of the building walls and foundations is being conducted (with non-ER,A funds).

**PROPOSED PLAN**

A PBC contract was awarded to Shaw Environmental in Sept 2003 to complete all phases through LTM at LL1, 2, 3 and 4 for all soils and some sediments.

Final: All concrete wall and foundations and walkways will be removed. Flushing and grouting or removal of the underground utilities will be done as needed.

The project will result in an interim remedy. Additional investigations of the soils under the inaccessible portions of the buildings will be needed. Results of the investigations will be used to determine if additional remedial action is needed to make the sites safe for training by the OHARNG.

Future land use will involve armored vehicle maneuver, with accompanying disturbance to a depth of four feet.

Costs are covered under Load Line 1 (RVAAP-08).

**STATUS**

**RRSE RATING:**

High

**CONTAMINANTS:**

Explosives, Metals, SVOCs, VOCs

**MEDIA OF CONCERN:**

Soil, Groundwater, Surface Water, Sediment

**COMPLETED IRP PHASE:**

PA/SI, RI

**CURRENT IRP PHASE:**

PBC

**FUTURE IRP PHASE:**

PBC

**SITE DESCRIPTION**

From approximately 1941 to 1971, building wash-down water and wastewater from the load line operations were collected in concrete sumps, pumped through sawdust filtration units and then discharged to a drainage ditch leading to a settling pond. Building wash-down water from the melt-pour buildings was also swept out through doorways onto the ground surrounding the buildings. Contaminants of concern at this unit are explosive compounds and heavy metals (ex., lead, chromium, and mercury). There is a high potential for releases from this unit to the soils, surface water/sediment and groundwater.

A Phase I RI was completed in 1998. Explosives and metals were the most common soil contaminants. Organics, PCBs, propellants and pesticides were also detected. Low levels of some contaminants were found in the groundwater at this site. Fieldwork for a Phase II RI to further determine the nature and extent of the contamination was completed in 2001. A preliminary draft RI report was submitted in May 2003 with regulatory review completed in June 2003.

Thermal decomposition of the building walls and foundations will be conducted (with non-ER,A funds).

A PBC contract was awarded to Shaw Environmental in Sept 2003 to complete all phases through LTM at LL1, 2, 3 and 4 for all soils and some sediments.

**PROPOSED PLAN**

Final: All concrete wall and foundations and walkways will be removed. Flushing and grouting or removal of the underground utilities will be done as needed. This may be accomplished with non-ER,A funds.

The project will result in an interim remedy. Additional investigations of the soils under the inaccessible portions of the buildings will be needed.

Future land use will involve armored vehicle maneuver, with accompanying disturbance to a depth of four feet.

Costs are covered under Load Line 1(RVAAP-08).

**STATUS**

**RRSE RATING:**

High

**CONTAMINANTS:**

Explosives, Metals, SVOCs, VOCs

**MEDIA OF CONCERN:**

Soil, Groundwater, Surface Water, Sediment

**COMPLETED IRP PHASE:**

PA/SI, RI

**CURRENT IRP PHASE:**

PBC

**FUTURE IRP PHASE:**

PBC

## SITE DESCRIPTION

From approximately 1943 to 1971, building wash-down water and waste water from the load line operations were collected in concrete sumps, pumped through sawdust filtration units and then discharged to a settling pond. Building wash-down water from the melt-pour buildings was also swept out through doorways onto the ground surrounding the buildings. The settling pond was an unlined triangular-shaped pond ~2 acres in size and 6 to 8 feet deep. Water from the impoundment was discharged to a surface stream that exited the installation. Contaminants of concern at this unit are explosive compounds and heavy metals (ex., lead, chromium, cadmium). There is a high potential for releases from this unit to the soils, surface water/sediment and groundwater.

A Phase I RI was completed in 1998. Explosives and metals were the most common soil contaminants. Organics, PCBs, propellants and pesticides were also detected. Low levels of some contaminants were found in the groundwater at this site. Fieldwork for a Phase II RI to further determine the nature and extent of the contamination was completed in 2001. A preliminary draft RI report was submitted in May 2003 with regulatory review completed in June 2003.

Thermal decomposition of the building walls and foundations will be conducted (with non-ER,A funds).

A PBC contract was awarded to Shaw Environmental in Sept 2003 to complete all phases through LTM at LL1, 2, 3 and 4 for all soils and some sediments.

## PROPOSED PLAN

Final: All concrete wall and foundations and walkways will be removed. Flushing and grouting or removal of the underground utilities will be done as needed. This may be accomplished with non-ER,A funds.

The project will result in an interim remedy. Additional investigations of the soils under the inaccessible portions of the buildings will be needed.

Future land use will involve armored vehicle maneuver, with accompanying disturbance to a depth of four feet.

Costs are covered under Load Line 1 (RVAAP-08).

## STATUS

**RRSE RATING:**

Medium

**CONTAMINANTS:**

Explosives, Metals, SVOCs, VOCs

**MEDIA OF CONCERN:**

Soil, Groundwater, Surface Water,  
Sediment

**COMPLETED IRP PHASE:**

PA/SI, RI

**CURRENT IRP PHASE:**

PBC

**FUTURE IRP PHASE:**

PBC

## SITE DESCRIPTION

From 1941-43 and 1946, ammonium nitrate was produced at this site. From 1949 to 1993, munitions were periodically demilitarized with building wash-down water and waste water from the bomb melt out facility operations being collected in a house gutter system, and flowing through a piping system to two stainless steel tanks. The first tank was used for settling and the second tank was used for filtration. Prior to the 1980s, the water leaked under the building and ponded there. Building wash-down water from Building 904 was also swept out through doorways onto the ground surrounding the building. After 1981, the water was treated in the Load Line 12 wastewater treatment system (RVAAP-18). Contaminants of concern at this unit are explosive compounds and heavy metals. There is a high potential for releases from this unit to the soils, surface water/sediment and groundwater. The original pink water treatment plant servicing Building 904 was officially closed as of May 2000.

A composting pilot study (IRA) using soils contaminated with explosives from the area of Building F-904 was started in 2000. The report from this pilot bioremediation project is final. Samples of environmental media were collected in the fall of 2000. The Phase II RI was finalized in 2004.

High levels of nitrates were detected in the groundwater. Metals and explosives were detected in the soil, sediment and groundwater. Metals were detected in surface water.

## PROPOSED PLAN

Complete the RI/FS. A RD/RA such as soil removal may be needed. Land Use Controls and LTM are expected. Flushing and grouting or removal of the underground utilities will be done as needed. This will be accomplished with non-ER,A funds.

## STATUS

**RRSE RATING:**

High

**CONTAMINANTS:**

Explosives, Metals, Nitrates

**MEDIA OF CONCERN:**

Soil, Groundwater, Surface Water, Sediment

**COMPLETED IRP PHASE:**

PA/SI, RI, IRA

**CURRENT IRP PHASE:**

RI/FS

**FUTURE IRP PHASE:**

RI/FS, RD, RA, LTM

# BUILDING 1200 DILUTION/SETTLING POND

## SITE DESCRIPTION

From approximately 1941 to 1971, ammunition was demilled at this building by steaming munitions rounds. The steam decontamination generated pink water, which drained to a man-made ditch. The ditch discharged into a 0.5-acre sedimentation pond, and the overflow from this pond discharged into Sand Creek. Contaminants of concern at this unit are explosive compounds and heavy metals (including lead, chromium, and mercury). There is a potential for releases from this unit to the soils, surface water/sediment and groundwater.

Limited explosives and metals contamination was detected in the ditch and settling ponds during the Phase I RI.

## STATUS

**RRSE RATING:**

Low

**CONTAMINANTS:**

Explosives, Metals

**MEDIA OF CONCERN:**

Soil, Groundwater, Surface Water, Sediment

**COMPLETED IRP PHASE:**

PA/SI, RI

**CURRENT IRP PHASE:**

RI/FS

**FUTURE IRP PHASE:**

RI/FS, RD, RA, LTM

## PROPOSED PLAN

A RI will be completed. Thermal treatment of buildings will be conducted (non-E,RA funds). A RD/RA such as soil removal may be needed. Land Use Controls and LTM are expected.

All foundations and footings (to 1 ft bgs) will be removed. This will be accomplished with non-ER,A funds.

# FUZE AND BOOSTER QUARRY LANDFILL/PONDS

## SITE DESCRIPTION

This AOC operated during the period 1945 through 1993. The site consists of three ponds in an abandoned rock quarry. The ponds are 20 to 30 ft deep and are separated by earthen berms. Prior to 1976, the quarry was reportedly used for open burning and as a landfill. The debris from the burning/landfill was reported to have been removed during pond construction. From 1976-93, spent brine regenerate and sand filtration backwash water from one of the RVAAP drinking water treatment plants was discharged into the ponds. This discharge was regulated under a NPDES permit. In 1998, this AOC was expanded to include three other shallow settling ponds and two debris piles, bringing the site to ~45 acres. The lands adjacent to the quarry were utilized as an impact area to test 40mm projectiles and to incinerate/deactivate fuze and booster components.

Constituents of concern include explosive compounds and heavy metals. There is a potential for release of contaminants to the groundwater, soils and surface water/sediment from this AOC.

The Phase II RI field work was completed in November 2003. Perchlorates were discovered in two surface water samples (preliminary results).

## STATUS

**RRSE RATING:**

High

**CONTAMINANTS:**

Explosives, Metals

**MEDIA OF CONCERN:**

Soil, Groundwater, Surface Water, Sediment

**COMPLETED IRP PHASE:**

PA/SI

**CURRENT IRP PHASE:**

RI/FS

**FUTURE IRP PHASE:**

RI/FS, RD, RA, LTM

## PROPOSED PLAN

Complete RI/FS, including additional perchlorate sampling. A RD/RA of sediment and/or debris removal may be needed. Land Use Controls will be needed. Future OHARNG land use will be for mounted training, with no digging.

## NORTH OF WINKLEPECK BURNING GROUNDS

### SITE DESCRIPTION

This is a 5 to 10 acre unlined landfill used for general plant refuse (sanitary wastes, possibly also explosive wastes and ash residue). It was used from 1969 until 1976 and has minimum soil cover. This landfill is upgradient of a wetland area.

The Phase I RI sampling and trenching were completed in 1996. Low levels of metals (above background), pesticides, PCBs and SVOCs, were detected in soil. Low levels of metals were detected in sediment.

### STATUS

**RRSE RATING:**

Low

**CONTAMINANTS:**

Metals, SVOCs, Pesticides, PCBs

**MEDIA OF CONCERN:**

Soil, Groundwater, Surface Water, Sediment

**COMPLETED IRP PHASE:**

PA/SI, RI

**CURRENT IRP PHASE:**

RI/FS

**FUTURE IRP PHASE:**

RI/FS, RD, RA, RA(O), LTM

### PROPOSED PLAN

A RI/FS will be completed. Approximately 2.5 acres of the site will receive a cover, after consolidation of other material. Land Use Controls and LTM are expected.

# MUSTARD AGENT BURIAL SITE

## SITE DESCRIPTION

This unit is a possible mustard agent burial site ~15 x 18 ft and is triangularly shaped. In 1969, records indicate that an EOD Unit had excavated a suspected mustard agent burial site near the west end of the NACA runway. One 190 liter (50 gallon) drum and seven rusty canisters were recovered. All recovered items were empty and no contamination was discovered. Following this excavation, an unidentified and undocumented source reported that the site had not been correctly identified and was actually in an adjacent area.

This additional area (~15 x 18 ft) is located southwest of the original area. The area is now marked by Seibert (reflective) stakes. Two non-intrusive, geophysical surveys (EM-31, and EM-61) of the site were completed in 1998. Several areas were identified with metallic responses. Some, if not all, may be related to cultural features at or near the surface. Soil samples taken in 1998 found no thiodiglycol (mustard breakdown product). There was no sign of disturbed soils or numerous buried metallic objects that would clearly delineate a formal burial site.

## STATUS

**RRSE RATING:**

Low

**CONTAMINANTS:**

Mustard Agent

**MEDIA OF CONCERN:**

Soil, Groundwater, Surface Water

**COMPLETED IRP PHASE:**

PA/SI,

**CURRENT IRP PHASE:**

RI

**FUTURE IRP PHASE:**

RI

## PROPOSED PLAN

Groundwater samples will be collected to test for mustard breakdown products (FY04). No remedial action is anticipated other than to permanently mark the site.



# RVAAP-29 UPPER & LOWER COBB PONDS

## SITE DESCRIPTION

The Upper and Lower Cobb Pond complex consists of two unlined ponds that received discharges from Load Lines 3 and 12 explosive waste water treatment systems from 1941 through 1971. Upper Cobb Pond is ~5 acres in size and Lower Cobb Pond is ~4 acres in size.

The Phase I RI found low levels of explosives in sediment; no contaminants were found in the surface water. The Phase II RI field work was completed in the summer 2001. Soil, sediment, surface water and groundwater were sampled. The Preliminary Draft Report is expected to be submitted in spring 2004.

This site is partially addressed under the Facility-Wide Surface Water sampling program.

## STATUS

**RRSE RATING:**

Medium

**CONTAMINANTS:**

Explosives, Metals, Aluminum Chloride

**MEDIA OF CONCERN:**

Soil, Groundwater, Surface Water,  
Sediment

**COMPLETED IRP PHASE:**

PA/SI

**CURRENT IRP PHASE:**

RI/FS

**FUTURE IRP PHASE:**

LTM

## PROPOSED PLAN

Prepare and submit the RI report. No remedial action is expected. LTM may follow. Land Use Controls will be needed. OHARNG future use will be dismantled training, without digging.

# RVAAP-32

## 40 MM FIRING RANGE

### SITE DESCRIPTION

This site was used as a test firing range for 40 mm projectiles during the late 1960s and early 1970s. This AOC was reported by former workers at RVAAP to have been a test firing range for munitions. The dates of this operation were from 1969-71. No original file documentation exists for the operation. UXO is suspected at this ~2-acre site.

The site is now covered with pole timber. Soil samples collected by CHPPM in 1996, detected arsenic and cadmium above the RRSE screening concentrations.

Additional samples were taken in fall 2003. Results are expected in spring of 2004.

### STATUS

**RRSE RATING:**

Medium

**CONTAMINANTS:**

Metals

**MEDIA OF CONCERN:**

Soil

**COMPLETED IRP PHASE:**

PA/SI

**CURRENT IRP PHASE:**

RI/FS

**FUTURE IRP PHASE:**

RC

### PROPOSED PLAN

RI sampling, including UXO precautions, will be completed, followed by closeout. Land Use Controls will be needed. OHARNG future use is mounted training with no digging.

### SITE DESCRIPTION

This unit, also known as the Firestone Test Facility, was reported by former workers at RVAAP to have been a security classified experimental test facility for munitions. Shaped charges were constructed and tested for the Department of Defense. The site consists of a pond (underwater test chamber) and several buildings (~45 acres). The dates of operation are not known. No original file documentation exists for this site. The contaminants of potential concern are lead azide, TNT, RDX, other explosives and metals.

Soil samples collected by CHPPM in 1996, detected antimony, copper and lead above the RRSE screening concentrations. All but four of the buildings were thermally treated and structures were removed in 2003. The Phase I RI field work was completed in November 2003. Preliminary draft report due spring 2004.

### STATUS

**RRSE RATING:**

Medium

**CONTAMINANTS:**

Lead Azide, Explosives, Metals

**MEDIA OF CONCERN:**

Soil, Groundwater, Surface Water, Sediment

**COMPLETED IRP PHASE:**

PA/SI

**CURRENT IRP PHASE:**

RI/FS

**FUTURE IRP PHASE:**

RI/FS, RD, RA, LTM

### PROPOSED PLAN

Complete RI. A RD/RA, such as soil removal may be needed. LTM will follow. Land Use Controls will be needed. OHARNG future use will be mounted training, with no digging.

All foundations and footings (to 1 ft bgs) will be removed. Flushing and grouting or removal of the underground utilities will be done as needed. This will be accomplished with non-ER,A funds.

# SAND CREEK DISPOSAL ROAD LANDFILL

## SITE DESCRIPTION

This AOC was reported by former workers at RVAAP to have been an open dump for concrete, wood, asbestos debris, lab bottles, 55-gallon drums and fluorescent light tubes. Debris is at the surface, but covered by vegetation. The AOC is ~2.7 acres and located adjacent to Sand Creek. The dates of operation of this unit are not known, but are believed to be around the 1950s. No original file documentation exists. The debris is eroding into Sand Creek.

Arsenic was detected in sediment at levels above the RRSE screening concentrations. Soil samples were taken by the USACE in September 2001 to further refine the RRSE. Arsenic (87ppm), benzo(a)pyrene (0.322ppm), benzo(a)anthracene (0.347ppm), benzo(b)fluoranthene (0.446ppm) and indeno(1,2,3-cd)pyrene were detected at significant concentrations. The high RRSE rating was confirmed by this sampling event.

Soil and debris removal (IRA) was completed in summer 2003. The draft report is expected in Spring 2004.

## STATUS

**RRSE RATING:**

High

**CONTAMINANTS:**

Heavy Metals, Asbestos, PAHs

**MEDIA OF CONCERN:**

Soil, Groundwater, Surface Water, Sediment

**COMPLETED IRP PHASE:**

PA/SI, RI/FS, RD, RA

**CURRENT IRP PHASE:**

IRA, LTM

**FUTURE IRP PHASE:**

LTM

## PROPOSED PLAN

Complete the IRA report and closure documentation. OHARNG future use will be dismantled training, with no digging. All facility-wide project funding will be tracked under the LTM phase for this site.

# RVAAP-36 PISTOL RANGE

## SITE DESCRIPTION

This AOC was used by the installation security force for pistol qualification. Bullets were fired into the embankment. The unit size is 350 x 150 ft. No original file documentation exists for this site.

CHPPM samples detected lead in the soil at a maximum concentration of 4,309 ppm.

## STATUS

**RRSE RATING:**

Medium

**CONTAMINANTS:**

Lead

**MEDIA OF CONCERN:**

Soil, Surface Water, Sediment

**COMPLETED IRP PHASE:**

PA/SI

**CURRENT IRP PHASE:**

RI/FS (funded)

**FUTURE IRP PHASE:**

RA, RD

## PROPOSED PLAN

A RI/FS will be completed, followed by site close out. The top foot of the backstop berm will be removed (500 cy).

# RVAAP-38 NACA TEST AREA

## SITE DESCRIPTION

This is an approximately 12.4 acre AOC that was used as an aircraft test area. Surplus military aircraft were crashed into a barrier, using a fixed rail attached to the aircraft landing gear, in an attempt to develop crashworthy fuel tanks and/or high flashpoint fuel. Some of the aircraft were buried at the site after the tests. Demo Area #1, RVAAP-03, is located within the RVAAP-38 boundary.

Phase I RI samples were taken in October 1999. The Phase I RI was completed in 2000 and finalized in fall 2001. Low levels of metals, inorganics and VOCs were detected in soil. Nitrocellulose was detected in the sediment, but is believed to be attributed to RVAAP-03, which is located adjacent to the NACA Test Area. All follow on work including LTM for RVAAP-03 will be conducted under this AOC.

## STATUS

**RRSE RATING:**

Medium

**CONTAMINANTS:**

Metals, Inorganics, VOCs

**MEDIA OF CONCERN:**

Soil, Groundwater, Surface Water,  
Sediment

**COMPLETED IRP PHASE:**

PA/SI

**CURRENT IRP PHASE:**

RI/FS

**FUTURE IRP PHASE:**

RI/FS, RD, RA, LTM

## PROPOSED PLAN

A RI/FS will be completed. A RD/RA such as soil removal may be needed. Land Use Controls and LTM are expected.

# RVAAP-39 LOAD LINE 5

## SITE DESCRIPTION

This AOC was a load line that operated from 1941 to 1945 to produce fuzes for artillery projectiles. Load line 5 was deactivated and its equipment removed in 1945.

The relative risk site evaluation was completed in 1998 by USACHPPM. Surface soils were found to have a maximum lead concentration of 2,800 ppm. Explosives were not detected in any samples taken by USACHPPM.

Screening groundwater data collected for RVAAP-26, Fuze and Booster Area Settling Tanks during the first RRSE, was used to score the groundwater pathway at the AOC. Groundwater was collected from an approximate depth of 12 ft, adjacent to the settling tank, next to Building 1F-3.

## STATUS

**RRSE RATING:**

Medium

**CONTAMINANTS:**

Explosives, Metals

**MEDIA OF CONCERN:**

Soil, Groundwater, Surface Water,  
Sediment

**COMPLETED IRP PHASE:**

PA/SI

**CURRENT IRP PHASE:**

RI/FS

**FUTURE IRP PHASE:**

RI/FS, RD, RA, LTM

## PROPOSED PLAN

A RI will be completed. Thermal treatment of buildings will be conducted (non-E,RA funds). A RD/RA such as soil removal may be needed. Land Use Controls and LTM are expected.

All foundations and footings (to 1 ft bgs) will be removed. Flushing and grouting or removal of the underground utilities will be done as needed. This will be accomplished with non-ER,A funds.

# RVAAP-40 LOAD LINE 7

## SITE DESCRIPTION

This AOC was used to assemble booster charges for artillery projectiles between 1941 and 1945. Load Line 7 was deactivated and the equipment was removed in 1945. The LL-7 was used again in 1969 and 1970 to produce 40mm projectiles, and between 1989 and 1993 the LL-7 Pink Water Treatment Plant was in operation.

The relative risk site evaluation was completed in 1998 by USACHPPM. The surface soil and groundwater pathways are considered complete. Six surface soil samples were collected from outside of the production buildings and analyzed for explosives and metals. The sampling locations were selected based on the production use. Emphasis was placed on areas around production and explosive storage buildings. One sediment sample was originally going to be collected from one of the settling ponds at the AOC, but no settling ponds or other sediment pathways were evident. One screening groundwater sample was collected north-northwest of Building 1B-2 (down gradient by surface topography) and analyzed for explosives and metals. The groundwater was collected from between 8 and 9 feet bgs. Significant concentrations of lead (maximum 2,000 ppm) and low concentrations of explosives, HMX, RDX and 2,4,6 TNT, were found in the surface soils.

## STATUS

**RRSE RATING:**

Low

**CONTAMINANTS:**

Explosives, Metals

**MEDIA OF CONCERN:**

Soil, Groundwater, Surface Water,  
Sediment

**COMPLETED IRP PHASE:**

PA/SI

**CURRENT IRP PHASE:**

RI/FS

**FUTURE IRP PHASE:**

RI/FS, RD, RA, LTM

## PROPOSED PLAN

A RI will be completed. Thermal treatment of buildings will be conducted (non-E,RA funds). A RD/RA such as soil removal may be needed. Land Use Controls and LTM are expected.

All foundations and footings (to 1 ft bgs) will be removed. Flushing and grouting or removal of the underground utilities will be done as needed. This will be accomplished with non-ER,A funds.



## SITE DESCRIPTION

This AOC was used to assemble booster charges for artillery projectiles between 1941 and 1945. Load Line 8 was deactivated and the equipment was removed in 1945.

The relative risk site evaluation was completed in 1998 by USACHPPM. The surface soil, groundwater and sediment pathways are considered complete. Five surface soil samples and one groundwater sample were collected from outside of the assembly buildings and analyzed for explosives and metals. The sampling locations were selected based on assembly use. Sample point selection emphasized production and explosives storage buildings. One sediment sample was collected from the small (approximately 10 feet in diameter) settling pond at the AOC and analyzed for the same compounds. No surface water was collected from the settling pond since this would be an intermittent source, and is not significant for the purpose of the RRSE. The subsurface soil used to estimate the groundwater pathway was collected approximately 60 feet north-northwest of Building 2B-1 (downgradient by surface topography). Lead was found in the surface soil at a maximum concentration of 1,000 ppm. No explosives were detected.

## STATUS

**RRSE RATING:**

Medium

**CONTAMINANTS:**

Explosives, Metals

**MEDIA OF CONCERN:**

Soil, Groundwater, Surface Water,  
Sediment

**COMPLETED IRP PHASE:**

PA/SI

**CURRENT IRP PHASE:**

RI/FS

**FUTURE IRP PHASE:**

RI/FS, RD, RA, LTM

## PROPOSED PLAN

A RI will be completed. Thermal treatment of buildings will be conducted (non-E, RA funds). A RD/RA such as soil removal may be needed. Land Use Controls and LTM are expected.

All foundations and footings (to 1 ft bgs) will be removed. Flushing and grouting or removal of the underground utilities will be done as needed. This will be accomplished with non-ER, A funds.

## SITE DESCRIPTION

This AOC operated from 1941 to 1945 to produce detonators. Load Line 9 was deactivated and its equipment removed in 1945.

The relative risk site evaluation was completed in 1998 by USACHPPM. The surface soil and groundwater pathways are considered complete. Six surface soil samples were collected from outside of the production buildings and analyzed for explosives and metals. The sampling locations were selected based on the production use. Emphasis was placed on the buildings that were used to process and store the lead azide and tetryl. One sediment sample was originally going to be collected from one of the settling ponds at the AOC, but no settling ponds or other sediment pathways were evident. Subsurface soil data collected for RVAAP-26, Fuze and Booster Area Settling Tanks during the first RRSE, was used to score the groundwater pathway at the AOC. The subsurface soil used to estimate the groundwater pathway was collected adjacent to the settling tank on the east side of Building DT-5. Lead was the only contaminant that exceeded the RRSE standard concentration in the surface soil. No explosives were detected during the RRSE sampling.

Limited samples taken in 2000 detected low levels (below 2%) of lead azide in sediment and surface water in the sumps. The buildings were thermally treated and the remaining structures removed in 2003. The Phase I RI field work was completed in November 2003. The Preliminary Report is due in spring 2004.

## STATUS

**RRSE RATING:**

Medium

**CONTAMINANTS:**

Explosives, Metals

**MEDIA OF CONCERN:**

Soil, Groundwater, Surface Water,  
Sediment

**COMPLETED IRP PHASE:**

PA/SI

**CURRENT IRP PHASE:**

RI/FS

**FUTURE IRP PHASE:**

RI/FS, RD, RA, LTM

## PROPOSED PLAN

Complete RI/FS. A RD and RA, such as soil removal and Land Use Controls may be needed.

All foundations and footings (to 1 ft bgs) will be removed. Flushing and grouting or removal of the underground utilities will be done as needed. This will be accomplished with non-ER,A funds.

OHARNG future use will be mounted training, with no digging.

## SITE DESCRIPTION

This AOC operated from 1941 to 1945 to produce percussion elements. Load Line 10 was placed on standby in 1945. From 1951 to 1957, LL-10 produced primers and percussion elements. From 1969 to 1971, LL-10 was used again to produce primers. It has been inactive since.

The relative risk site evaluation was completed in 1998 by USACHPPM. The surface soil and groundwater pathways are considered complete. Six surface soil samples were collected from outside of the production buildings and analyzed for explosives, metals and cyanide. The sampling locations were selected based on the production use. Emphasis was placed on those buildings that were used to produce or store the explosives. LL10 is the only load line known to have lead thiocyanate, so cyanide was added to the list of analytes. One sediment sample was originally going to be collected from one of the settling ponds at the AOC, but no settling ponds or other sediment pathway were evident. Antimony (maximum 600 ppm) and lead (maximum 3,100 ppm) were detected in the surface soil at levels above the RRSE standard concentrations. Small amounts of explosives (2,4,6 TNT, 4am 2,6 DNT and 2am 4,6 DNT) were detected in the surface soil. Subsurface soil data collected for RVAAP-26, Fuze and Booster Area Settling Tanks during the first RRSE, was used to score the groundwater pathway at the AOC. The subsurface soil used to estimate the groundwater pathway was collected adjacent to the settling tank on the west site of Bldg PE-6.

## STATUS

**RRSE RATING:**

Medium

**CONTAMINANTS:**

Explosives, Metals

**MEDIA OF CONCERN:**

Soil, Groundwater

**COMPLETED IRP PHASE:**

PA/SI

**CURRENT IRP PHASE:**

RI/FS

**FUTURE IRP PHASE:**

RI/FS, RD, RA, LTM

## PROPOSED PLAN

A RI will be completed. Thermal treatment of buildings will be conducted (non-E,RA funds). A RD/RA such as soil removal may be needed. Land Use Controls and LTM are expected.

All foundations and footings (to 1 ft bgs) will be removed. Flushing and grouting or removal of the underground utilities will be done as needed. This will be accomplished with non-ER,A funds.

**SITE DESCRIPTION**

This AOC operated from 1941 to 1945 to produce primers for artillery projectiles. Load Line 11 was placed on standby in 1945. From 1951 to 1957, LL-11 was used to produce primers and fuzes.

The relative risk site evaluation was completed in 1998 by USACHPPM. The surface soil, groundwater and sediment pathways are considered complete. Five surface soil samples were collected from outside of the production buildings and analyzed for explosives and metals. The sampling locations were selected based on the production use. Emphasis was placed on those buildings that were used to produce and store explosives. One sediment sample was collected and analyzed for the same parameters. The sediment sample was collected from a drainage ditch running north from the load line. Data collected for RVAAP-26, Fuze and Booster Area Settling Tanks during the first RRSE, was used to score the groundwater pathway at the AOC. The subsurface soil used to estimate the groundwater pathway was collected adjacent to the settling tank immediately to the east of Building AP-3. Arsenic was detected in the sediment slightly above the RRSE ecological screening concentration. Lead was the only contaminant found in the surface soil with a maximum concentration of 11,000ppm.

In 2001, the lead-lined sumps, lead contaminated sediments, and solvent contaminated soils were removed during an IRA in 2001. The report was received in Spring 2004, and undergoing review. Some of the sewer lines were also permanently plugged with grout to prevent migration of contaminants. The RI field work was conducted in FY01. The preliminary report is expected in the spring of 2004.

Note: No perchlorate was detected in groundwater. The detection limit was 4 ppb.

**STATUS**

**RRSE RATING:**

High

**CONTAMINANTS:**

Explosives, Metals, VOCs

**MEDIA OF CONCERN:**

Soil, Groundwater, Sediment

**COMPLETED IRP PHASE:**

PA/SI

**CURRENT IRP PHASE:**

RI/FS (funded), LTM

**FUTURE IRP PHASE:**

LTM

**PROPOSED PLAN**

Complete the RI. Thermal treatment of buildings will be conducted. No remediation is expected. LTM will follow. OHARNG land use will be mounted training, with no digging. Land Use Controls will be needed.

All foundations and footings (to 1 ft bgs) will be removed. Flushing and grouting or removal of the underground utilities will be done as needed. This will be accomplished with non-ER,A funds.

# RVAAP-45 WET STORAGE AREA

## SITE DESCRIPTION

This AOC was used from 1941 to 1945 to store (in igloos) lead azide, mercury fulminate and tetryl. The product was stored in water-filled drums. There is no documentation concerning any spills in the area. The surface soil pathway is considered complete.

Five surface soil samples were collected from the AOC and analyzed for explosives and metals. One sample was collected outside the door, just off of the edge of the concrete pad from each of the five buildings used for storage, or from the soil immediately below a discharge from a floor drain. The most significant contaminant concentrations were from lead (3,100ppm), mercury (49ppm) and cadmium (41ppm).

The buildings were thermally treated in spring 2003.

## STATUS

**RRSE RATING:**

Low

**CONTAMINANTS:**

Metals, Lead Azide, Mercury Fulmate, Tetryl

**MEDIA OF CONCERN:**

Soil

**COMPLETED IRP PHASE:**

PA/SI

**CURRENT IRP PHASE:**

RI/FS

**FUTURE IRP PHASE:**

RI/FS, RD, RA

## PROPOSED PLAN

A RI/FS will be completed. A RD/RA such as soil removal may be needed. Land Use Controls are expected. OHARNG future use will be for Dismounted Training - Digging (7').

All foundations and footings (to 1 ft bgs) will be removed. This will be accomplished with non-ER,A funds.

# RVAAP-46

## BLDG F-15 & F-16

### SITE DESCRIPTION

These buildings were used during World War II, the Korean Conflict and Vietnam War to test miscellaneous explosives. Quantities and exact dates of testing are unknown.

The surface soil and sediment pathways are considered completed at this AOC. Four surface soil samples were collected from the AOC and analyzed for explosives and metals. Two samples were collected just outside of the foundations of each of the buildings. One sediment sample was collected in a drainage ditch leading to Sand Creek near Building F-16. Soil samples showed slightly elevated levels of lead (maximum 430 ppm) and arsenic (maximum 28 ppm). Arsenic was also detected in the sediment at a maximum concentration of 9 ppm, approximately 1.5 times the ecological RRSE screening concentration.

### STATUS

**RRSE RATING:**

High

**CONTAMINANTS:**

Explosives, Metals

**MEDIA OF CONCERN:**

Soil, Sediment

**COMPLETED IRP PHASE:**

PA/SI

**CURRENT IRP PHASE:**

RI/FS

**FUTURE IRP PHASE:**

RI/FS, RD, RA

### PROPOSED PLAN

A RI/FS will be completed. Thermal treatment of buildings will be conducted (non-E,RA funds). A RD/RA such as soil removal may be needed. Land Use Controls are expected.

All foundations and footings (to 1 ft bgs) will be removed. Flushing and grouting or removal of the underground utilities will be done as needed. This will be accomplished with non-ER,A funds.

# RVAAP-48 ANCHOR TEST AREA

## SITE DESCRIPTION

Limited information is known about this research and development area. It is believed that the site was used for testing of explosively driven soil anchoring devices. The dates of use for this AOC are unknown. It currently consists of several dirt mounds with a nearby sand pit (~6 x 30ft). There is some metal debris in the area.

The surface soil and groundwater pathways are considered complete. Five soil samples and one Geoprobe groundwater sample were collected from around the dirt mound and in the sand pit. These were analyzed for metals and explosives as part of the USACHPPM study. Arsenic was detected in the groundwater at a maximum concentration of 14.4 ppb; arsenic was also detected in the soil.

## STATUS

**RRSE RATING:**

Medium

**CONTAMINANTS:**

Explosives, Metals

**MEDIA OF CONCERN:**

Soil, Groundwater, Sediment

**COMPLETED IRP PHASE:**

PA/SI

**CURRENT IRP PHASE:**

RI/FS

**FUTURE IRP PHASE:**

RI/FS, LTM

## PROPOSED PLAN

A RI will be completed. Land Use Controls and LTM are expected. OHARNG future use will be for Mounted Training - No Digging.

# RVAAP-49 CENTRAL BURN PITS

## SITE DESCRIPTION

This approximately 20 acre AOC was used for the burning of non-explosive scrap materials. The dates of operation for the AOC are unknown.

The surface soil and groundwater pathways are considered complete. Five surface soil samples were collected and analyzed for SVOCs, PCBs, herbicides, explosives and metals. One subsurface soil sample was collected and analyzed for the same compounds plus VOCs. The subsurface soil used to estimate the groundwater pathway was collected from the eastern limit (downhill side) of the main disturbed area. The USACHPPM sampling detected significant levels of antimony (maximum 9,000 ppm), arsenic (maximum 30 ppm) and lead (maximum 2,200 ppm) in the soil.

Field work for the Phase I RI was done in summer 2001. The Phase I RI preliminary draft is expected in spring 2004.

## STATUS

**RRSE RATING:**

High

**CONTAMINANTS:**

VOCs, SVOCs, PCBs, Herbicides, Metals

**MEDIA OF CONCERN:**

Soil, Groundwater, Surface Water, Sediment

**COMPLETED IRP PHASE:**

PA/SI

**CURRENT IRP PHASE:**

RI/FS

**FUTURE IRP PHASE:**

RI/FS, RD, RA, LTM

## PROPOSED PLAN

A FS will be completed. A RD/RA of soil removal may be required, followed by LTM. OHARNG future use will be dismantled training, with no digging. Land Use Controls are needed.



# RVAAP-50 ATLAS SCRAP YARD

## SITE DESCRIPTION

This AOC is the site of an old construction camp (approximately 150 acres) built to house workers during the construction of the plant. Facilities were demolished following World War II. Since that time, the area has been used as a scrap yard for miscellaneous materials. UXO is present at the southwest corner of the site.

Preliminary samples detected low levels of PAHs in soil and metals in one screening groundwater sample.

Non-IRP sorting and removal of OE and OE scrap at the site has been partially completed. Soil samples showed levels of benzo(a)pyrene (maximum 22 ppm), and dibenzo(a,h)anthracene (maximum 7.3 ppm) above the human RRSE standard concentrations.

## STATUS

**RRSE RATING:**

Medium

**CONTAMINANTS:**

Explosives, Metals, SVOCs, VOCs, PCBs, Herbicides

**MEDIA OF CONCERN:**

Soil, Groundwater, Surface Water, Sediment

**COMPLETED IRP PHASE:**

PA/SI

**CURRENT IRP PHASE:**

RI/FS

**FUTURE IRP PHASE:**

RI/FS, RD, RA, LTM

## PROPOSED PLAN

A RI will be completed. A RD/RA such as soil removal may be needed. Land Use Controls and LTM are expected. OHARNG future use will be for Mounted Training - No Digging.

# DUMP ALONG PARIS-WINDHAM RD.

## SITE DESCRIPTION

This AOC is an area adjacent to Sand Creek that was used as an open dump for miscellaneous materials including transite siding, lab bottles and drums. The site is 400 x 20 x ~3 ft deep. The dates of operation for the dump are unknown, but aerial photos show the site in the 1950s.

The surface soil and sediment pathway are considered complete. Three surface soil samples and one sediment sample were collected and analyzed for SVOCs, explosives and metals. Soil samples were taken by USACE in September 2001 to further refine the RRSE. The most significant contaminants were organics including benzo(a)anthracene (3.45 ppm), benzo(a)pyrene (3.38 ppm), benzo(b)fluoranthene (4.65 ppm), chrysene (2.91 ppm) and Indeno(1,2,3-cd)pyrene (2 ppm). The high RRSE rating was confirmed by this sampling event.

A soil and debris removal action was completed in fall 2003. A preliminary draft report has been submitted and reviewed. The final report is expected in Spring 2004.

## STATUS

**RRSE RATING:**

High

**CONTAMINANTS:**

Explosives, Metals, SVOCs

**MEDIA OF CONCERN:**

Soil, Groundwater, Surface Water, Sediment

**COMPLETED IRP PHASE:**

PA/SI, RI/FS, RD

**CURRENT IRP PHASE:**

RA (funded), RC

**FUTURE IRP PHASE:**

RC

## PROPOSED PLAN

Complete the RA report and closure documentation. Land Use Controls are required. OHARNG future use is dismantled training, with no digging.

# **RESPONSE COMPLETE SITES**

## OPEN DEMOLITION AREA #1

### SITE DESCRIPTION

This is a 6 acre AOC that was used for the purpose of thermal treatment of munitions by burning and detonation. The AOC consists of a circular 1 to 1.5 ft berm surrounding a grassy area ~1 to 1.5 acres in size and a pushout area. Operations took place in ~8 foot deep unlined pits. The whole AOC is within the NACA Test Area (RVAAP-38). Contaminants of concern at this AOC include explosive compounds and metals. There is potential for release of contaminants from this unit to the surrounding soils and groundwater. Munitions fragments, including scrap metal, small arms primers, and fuzes, were found outside the bermed area. The AOC was operational from 1941 through 1949 (Jacobs Engineering 1989).

The Phase I RI field work was completed at the site in Oct 1999 and was finalized in 2002. An IRA was started in Nov 2000 and was conducted along with a project funded by OSC to remove UXO from the site. The purpose of the IRA was to remove obvious surface contamination that could pose an immediate risk to human health and the environment. These hot spots are located primarily in an area outside the horseshoe where munitions and scrap were pushed after detonation. The IRA field work was completed in Jul 2001, removing ~83,000 lbs of ordnance explosive waste and UXO.

Groundwater monitoring at this AOC will be addressed under NACA Test Area (RVAAP-38).

### STATUS

**RRSE RATING:**

High

**CONTAMINANTS:**

Explosives, Metals

**MEDIA OF CONCERN:**

Soil

**COMPLETED IRP PHASE:**

PA/SI, RI, IRA

**CURRENT IRP PHASE:**

RC

## BLDG. 1601 HAZARDOUS WASTE STORAGE

### SITE DESCRIPTION

This site is not eligible for ER,A funds.

This is a RCRA storage facility for solid ash residue and spent activated carbon. It was operated under interim status from 1980 to 1998. No hazardous wastes are currently being stored in the building. The Part B permit application covering the facility was withdrawn during 1994. The building is a 20 by 22 foot concrete igloo. Wastes stored in this building were containerized in 55 gallon DOT drums. There is little potential for contamination resulting from operation of this unit. Closure plans were approved and implemented in 1998.

This site has been officially closed by Ohio EPA.

### STATUS

**RRSE RATING:**

Low

**CONTAMINANTS:**

Metals

**MEDIA OF CONCERN:**

Soil

**COMPLETED IRP PHASE:**

PA/SI

**CURRENT IRP PHASE:**

RC - 1989

## LOAD LINE 6 EVAPORATION UNIT

### SITE DESCRIPTION

This site is not eligible for ER,A funds

From 1981 through 1987, tenant operations at this load line generated building wash down and wastewater, which was discharged into an 18 x 14 x 4 foot concrete tank. This unit was closed under a NPDES closure in 1989. The closure required removal of all contaminated soils associated with the unit. Soil sampling conducted after removal of soils confirmed clean closure of this unit.

This site is RC because it is not eligible for IRP funding.

### STATUS

**RRSE RATING:**

NE

**CONTAMINANTS:**

Explosives, PCB

**MEDIA OF CONCERN:**

Soil

**COMPLETED IRP PHASE:**

PA/SI

**CURRENT IRP PHASE:**

RC - 1989

## LOAD LINE 6 TREATMENT PLANT

### SITE DESCRIPTION

This was an active unit in operation since 1987 by Physics International, which closed in 1993. The unit consists of dual activated carbon units for filtration of pink water generated from load line operations. The wastewater treatment system discharged under an NPDES-permitted discharge to the RVAAP sanitary sewer system. Contaminants of concern at this unit are explosive compounds. There is a low potential for releases from this unit.

This site is RC under the IRP because it's not eligible for IRP funding.

### STATUS

**RRSE RATING:**

Low

**CONTAMINANTS:**

Explosives

**MEDIA OF CONCERN:**

Soil

**COMPLETED IRP PHASE:**

PA/SI

**CURRENT IRP PHASE:**

RC - 2000

# RVAAP-17 DEACTIVATION FURNACE

## SITE DESCRIPTION

This site is not eligible for ER,A funds.

This unit is a No. 2 oil-fired horizontal rotary retort furnace used for the deactivation of small munition items. It was operated from 1960 through 1983.

The furnace is currently undergoing closure under a RCRA closure plan. Sampling during closure activities indicates heavy metals contamination to the soils surrounding the furnace area. The closure plan calls for the removal of all contaminated soils associated with the unit. Closure plans have been submitted to Ohio EPA. The buildings were demolished and properly disposed of in October and November 1999.

This site in RC because it is not eligible for IRP funding.

## STATUS

**RRSE RATING:**

High

**CONTAMINANTS:**

Metals

**MEDIA OF CONCERN:**

Soil

**COMPLETED IRP PHASE:**

PA/SI

**CURRENT IRP PHASE:**

RC - 1989

# RVAAP-18 LOAD LINE 12 PINK WASTE WATER TREATMENT

## SITE DESCRIPTION

This site is not eligible for ER,A funds.

This is an active unit, consisting of dual mode activated carbon filters for the treatment of explosive-contaminated wastewater. This unit was operated from 1982 to 1999. The wastewater treatment discharge was regulated under the NPDES permitted discharge system. Contaminants of concern included explosive compounds. The plant and the associated demil building (904) were closed and demolished under the supervision of Ohio EPA in the fall of 1999. A final closure letter was issued by EPA in May 2000.

## STATUS

**RRSE RATING:**

Low

**CONTAMINANTS:**

Explosives

**MEDIA OF CONCERN:**

Soil, Groundwater

**COMPLETED IRP PHASE:**

PA/SI, RI

**CURRENT IRP PHASE:**

RC - 1997

# SAND CREEK SEWAGE TREATMENT PLANT

## SITE DESCRIPTION

This site is not eligible for ER,A funds.

This is an inactive domestic sewage treatment plant regulated under an NPDES discharge permit. This plant is no longer needed by the installation under modified caretaker status, and was closed in FY 1993 in accordance with EPA requirements. There is a low potential for releases to the soil and groundwater from this unit.

This site in RC because it is not eligible for IRP funding.

## STATUS

**RRSE RATING:**

NE

**CONTAMINANTS:**

Explosives, PCB

**MEDIA OF CONCERN:**

Soil, Groundwater

**COMPLETED IRP PHASE:**

PA/SI

**CURRENT IRP PHASE:**

RC - 1989

# DEPOT SEWAGE TREATMENT PLANT

## SITE DESCRIPTION

This site is not eligible for ER,A funds.

This is an inactive domestic sewage treatment plant regulated under an NPDES discharge permit. This plant is no longer needed by the installation under modified caretaker status and was closed in FY 1993 in accordance with EPA requirements. There is a low potential for releases to the soil and groundwater from this unit.

This site in RC because it is not eligible for IRP funding.

## STATUS

**RRSE RATING:**

NE

**CONTAMINANTS:**

Metals

**MEDIA OF CONCERN:**

Soil, Groundwater

**COMPLETED IRP PHASE:**

PA/SI

**CURRENT IRP PHASE:**

RC - 1989

# GEORGE ROAD SEWAGE TREATMENT PLANT

## SITE DESCRIPTION

This site is not eligible for ER,A funds.

This is an inactive domestic sewage treatment plant regulated under an NPDES discharge permit. The plant was closed in FY93 in accordance with EPA requirements. There is a low potential for releases to the soil and groundwater from this unit.

This site in RC because it is not eligible for IRP funding.

## STATUS

**RRSE RATING:**

NE

**CONTAMINANTS:**

Metals

**MEDIA OF CONCERN:**

Soil

**COMPLETED IRP PHASE:**

PA/SI

**CURRENT IRP PHASE:**

RC - 1989

# UNIT TRAINING EQUIPMENT SITE UST

## SITE DESCRIPTION

This site is not eligible for ER,A funds.

This unit was a underground storage tank for waste oil used by a RVAAP tenant organization. The PA/SI was completed in 1989. The tank, and any associated contaminated soil, were removed in 1989 by the OARNG. Documentation of the removal will be provided to Ohio EPA for final closure by OHARNG.

This site in RC because it is not eligible for IRP funding.

## STATUS

**RRSE RATING:**

Medium

**CONTAMINANTS:**

Waste Oil

**MEDIA OF CONCERN:**

Soil

**COMPLETED IRP PHASE:**

PA/SI, RA

**CURRENT IRP PHASE:**

RC - 1989



## RVAAP-24 WASTE OIL TANK

### SITE DESCRIPTION

This site is not eligible for ER,A funds.

This unit is an above-ground storage tank, without secondary containment, for waste oil from the vehicle maintenance operations of an RVAAP tenant organization located in the Depot Area, Bldg. U4, of RVAAP. The tank was used from 1983 to 1993. The contents were emptied and the tank has remained inactive. Contaminants of concern include petroleum and metals. There is a potential for release of contaminants to the surrounding soils and groundwater from this unit.

This site in RC because it is not eligible for IRP funding.

### STATUS

**RRSE RATING:**

Low

**CONTAMINANTS:**

Waste Oil

**MEDIA OF CONCERN:**

Soil, Groundwater

**COMPLETED IRP PHASE:**

PA/SI

**CURRENT IRP PHASE:**

RC - 1989

## RVAAP-25 BLDG. 1034 MOTOR POOL AST

### SITE DESCRIPTION

This site is not eligible for ER,A funds.

This unit is an inactive above-ground storage tank used to store waste oil from RVAAP vehicle maintenance operations. Use of the tank began in 1974 and was emptied of all contents in FY93 and remains inactive. Contaminants of concern include petroleum and metals. There is a low potential for release of contaminants to the surrounding soils and groundwater from this unit.

This site in RC because it is not eligible for IRP funding.

### STATUS

**RRSE RATING:**

Low

**CONTAMINANTS:**

Waste Oil

**MEDIA OF CONCERN:**

Soil, Groundwater

**COMPLETED IRP PHASE:**

PA/SI

**CURRENT IRP PHASE:**

RC - 1989

## FUZE BOOSTER AREA SETTLING TANKS

### SITE DESCRIPTION

The fuze and booster area covers ~450 acres and includes load lines 5, 6, 7, 8, 9, 10 and 11. These load lines were used for the manufacture of miscellaneous fuzes, boosters, primers, detonators and percussion elements from 1941 through 1971. Within the line areas are 14 concrete underground storage tanks and 1 concrete above ground storage tank which were used as settling basins for explosive-contaminated waste water. The tanks were emptied, cleaned and covered in 1971.

Contaminants of concern from these units are explosives, lead, lead azide, lead styphnate, mercury, and unknown compounds. Shallow monitoring wells were installed in 1981 around the perimeter of the fuze and booster area. Subsequent sampling of the wells did not detect heavy metals in the groundwater. The wells were eventually destroyed by frost heave.

This site is RC, because each LL became its own AOC.

### STATUS

**RRSE RATING:**

Medium

**CONTAMINANTS:**

Explosives, Metals

**MEDIA OF CONCERN:**

Soil, Groundwater, Surface Water

**COMPLETED IRP PHASE:**

PA/SI

**CURRENT IRP PHASE:**

RC - 2000

## BUILDINGS 854, PCB STORAGE

### SITE DESCRIPTION

This unit consists of a 50 x 250 ft. area within a wood framed building used for the storage of PCB contaminated materials. All PCB contaminated material was removed from the building and the interior decontaminated to non-detection limits in the summer of 1998.

Ohio EPA issued a closure letter for this site on September 1, 1999.

### STATUS

**RRSE RATING:**

NE

**CONTAMINANTS:**

PCBs

**MEDIA OF CONCERN:**

Soil

**COMPLETED IRP PHASE:**

PA/SI

**CURRENT IRP PHASE:**

RC - 1989

# RVAAP-30 LL7 TREATMENT PLANT

## SITE DESCRIPTION

This AOC is an inactive dual activated carbon pink waste water treatment unit that was used by Physics International from 1989 through 1992. The discharge from the unit was regulated under the NPDES permit system. Contaminants of concern associated with this unit include explosive compounds.

This site is RC because it is not eligible for IRP funding.

## STATUS

**RRSE RATING:**

Low

**CONTAMINANTS:**

Explosives

**MEDIA OF CONCERN:**

Soil

**COMPLETED IRP PHASE:**

PA/SI

**CURRENT IRP PHASE:**

RC - 2000

# RVAAP-31 ORE PILE RETENTION POND

## SITE DESCRIPTION

This unit consists of a small pond constructed to prevent potentially contaminated surface runoff from strategic manganese and chromium ore piles from entering a receiving stream. The pond was constructed in the mid-1950s. There is a potential for release of contaminants from this unit to the surrounding soils, groundwater and surface water/sediment.

This site is RC because it is not eligible for IRP funding.

## STATUS

**RRSE RATING:**

Low

**CONTAMINANTS:**

Manganese, Chromium

**MEDIA OF CONCERN:**

Soil, Groundwater, Surface Water

**COMPLETED IRP PHASE:**

PA/SI

**CURRENT IRP PHASE:**

RC - 2000

# 1037 BUILDING - LAUNDRY WASTEWATER SUMP

## SITE DESCRIPTION

This AOC consists of a concrete sump that was used as a settling tank for RVAAP laundry facilities. This sump was in operation from the early 1940s until 1992. No original file documentation exists for this site.

This site is RC because it is not eligible for IRP funding.

## STATUS

**RRSE RATING:**

Medium

**CONTAMINANTS:**

Explosives, Metals

**MEDIA OF CONCERN:**

Soil, Groundwater

**COMPLETED IRP PHASE:**

PA/SI

**CURRENT IRP PHASE:**

RC - 2000

# PESTICIDE BUILDINGS S-4452

## SITE DESCRIPTION

This unit consists of a 12.2 x 6.1 meter (40 x 20 ft) wooden structure with a crawl space, which housed various pesticides. A 6.1 x 3.6 meter (20 x 12 ft) pesticide mixing area was also located in a gravel area outside of the building. This unit was in use from the 1970s until 1993. An empty can with chlorinate residue and a hand sprayer were found in the building crawl space. No original file documentation exists for this site.

The building and soil were removed from the site and properly disposed of in the fall of 1999 in accordance with Ohio EPA guidance and recommendations. No pesticides were detected in the soil following remediation.

This site is RC because it is not eligible for IRP funding.

## STATUS

**RRSE RATING:**

Low

**CONTAMINANTS:**

Synthetic organic compounds

**MEDIA OF CONCERN:**

Soil, groundwater

**COMPLETED IRP PHASE:**

PA/SI

**CURRENT IRP PHASE:**

RC - 1996

## SITE DESCRIPTION

This building was used to clean and decontaminate explosives and propellants from small, miscellaneous production equipment. Quantities and dates of testing are unknown, but should correspond to the dates of production (intermittent from World War II to Vietnam).

The PA/SI was completed in 1998. The surface soil and sediment pathways are considered complete. The surface water pathway is not considered complete because the ditch no longer has water in it. Two surface soil samples were collected outside of the roll-up door adjacent to the concrete floor and one sediment sample was collected from the drainage ditch outside that drains to Sand Creek. All of the samples were analyzed for metals and explosives. A IRA was completed in FY2000. No industrially related contaminants were found in the soil during the confirmation sampling. Lead was detected in the sediment of Sand Creek at levels slightly above the facility background level.

Ohio EPA has issued a letter stating no further action (under ER,A) is needed at this site provided the elevated lead found in the sediment is addressed during the facility-wide surface water investigation.

## STATUS

**RRSE RATING:**

High

**CONTAMINANTS:**

Explosives, Metals

**MEDIA OF CONCERN:**

Soil, Sediment

**COMPLETED IRP PHASE:**

PA/SI, RD, RA

**CURRENT IRP PHASE:**

RC - 2001

## PAST MILESTONES

1990

PA, Installation 38 AOCs

1996

PA/RI Action Plan

Phase I RI High Priority Sites

1998

Phase II RI Winklepeck Burning Grounds Field Work Complete/Draft Report under Review

Facility-wide Background Field Work Complete/Draft Report currently under Review

RRSE for 13 new sites Field Work Complete/Draft Report Currently Under Review

1999

RI - Phase II Erie Burning Grounds

RI - Phase II NACA Test Area

RI - Phase II Open Demolition Area #1

2000

IRA - LL 12/ Bioremediation Pilot Study Demonstration Complete

RI - Phase II Erie Burning Grounds Draft Report Completed/ Under Review

RI - Phase I NACA Test Area Field Work/Draft Report Completed/Under Review

RI - Phase I Open Demolition Area #1 Field Work/Draft Report Completed/ Under Review

RI - Winklepeck Open Burning Grounds Ecological Risk Assessment Field Work Complete

IRA - Building 5301 Completed/No Further Action Status

Facility-Draft Revision to Wide SAP and HSP completed

2001

RI - Phase I Load Line 11 Field Work Complete

RI - Phase II Load Line 1, 12 Field Work Complete

FS - Winklepeck Field Work Completed

RI - Phase I Load Line 11 Field Work Completed

IRA - Open Demolition Area #1 Fieldwork Completed

RI - Load Lines 2,3,4 Fieldwork (Phase II) Completed

RI - Central Burn Pits Phase I Fieldwork Completed

RI - Upper & Lower Cobb Ponds Phase I Fieldwork Completed

2002

RI- Phase II Open Demolition Area #2 Fieldwork Completed

- Work Plans completed for the IRAs at Paris Windham Road Dump (RVAAP-51) and Sand Creek Disposal Road Landfill (RVAAP-34)

- IRA reports for Open Demolition Area #1 (RVAAP-03) and Load Line 11 (RVAAP-44) issued

- Work Plans for Open Demolition Area #2 completed

- Draft Final Report for Winklepeck Burning Grounds Biological Field Truthing project issued.

- Work Plans issued for Facility-wide Human Health and Ecological Risk Assessments issued.

- Draft Work Plans for Facility-wide surface water assessment issued

2003

PBC for soil/sediment at Load Lines 1, 2, 3 and 4

RI- Field work for LL 6 & 9 and the Fuze & Booster Quarry Landfill Pond Completed

## PROJECTED MILESTONES

2013

All Remedies In Place (RIP)

2015+

Long-term Monitoring Complete

## NO FURTHER ACTION SITES

The following sites currently require no further action under the ER,A program.

RVAAP-26	FUZE BOOSTER AREA SETTLING TANKS	2000
RVAAP-27	BUILDING 854, PCB STORAGE	1989
RVAAP-47	BUILDING T-5301	2001

The following sites are not eligible for ER,A funds and will be addressed under other programs.

RVAAP-07	BLDG 1601 HAZ WASTE STORAGE	1989
RVAAP-14	LOAD LINE 6 EVAPORATION UNIT	1989
RVAAP-15	LOAD LINE 6 TREATMENT PLANT	2000
RVAAP-17	DEACTIVATION FURNACE	1989
RVAAP-18	LOAD LINE 12 WWT PLANT	1997
RVAAP-20	SAND CREEK STP	1989
RVAAP-21	DEPOT STP	1989
RVAAP-22	GEORGE RD STP	1989
RVAAP-23	UNIT TRAINING EQUIPMENT SITE UST	1989
RVAAP-24	WASTE OIL TANK	1989
RVAAP-25	BUILDING 1034 MOTOR POOL AST	1989
RVAAP-30	LL7 TREATMENT PLANT	2000
RVAAP-31	ORE PILE RETENTION POND	2000
RVAAP-35	1037 BLDG - LAUNDRY WASTEWATER SUMP	2000
RVAAP-37	PESTICIDE BUILDING S-4452	1996

# Ravenna Army Ammo Plant IAP Schedule

Current Phase

Future Phase

AEDB-R #	SITE TITLE	PHASE	FY05	FY06	FY07	FY08	FY09	FY10+
RVAAP-01	Ramsdell Quarry Landfill (H)	RI/FS						
		LTM						
RVAAP-02	Erie Burning Grounds (H)	RI/FS						
		LTM						
RVAAP-04	Demolition Area #2 (H)	RI/FS						
		LTM						
RVAAP-05	Winklepeck Burning Grounds (H)	RI/FS						
		RD						
		RAC						
		LTM						
RVAAP-12	Load Line 12 (H)	RI/FS						
		RD						
		RAC						
		LTM						
RVAAP-16	Fuze and Booster Quarry Landfill/ Pond (H)	RI/FS						
		RD						
		RAC						
		LTM						
RVAAP-34	Sand Creek Disposal Road Landfill (H)	LTM						
RVAAP-44	Load Line 11 (H)	RI/FS						
		LTM						
RVAAP-46	Bldg F-15 & F-16 (H)	RI/FS						
		RD						
		RAC						
		LTM						
RVAAP-49	Central Burn Pits (H)	RI/FS						
		RD						
		RAC						
		LTM						
RVAAP-51	Dump Along Paris Windham Rd. (H)	LTM						
RVAAP-29	Upper & Lower Cobbs Ponds (M)	LTM						
RVAAP-33	Load Line 6 Fuze and Booster (M)	RI/FS						
		RD						
		RAC						
		LTM						
RVAAP-36	Pistol Range (M)	RI/FS						
		RD						
		RAC						
		LTM						
RVAAP-38	NACA Test Area (M)	RI/FS						



# Ravenna Army Ammo Plant IAP Schedule

Current Phase

Future Phase

AEDB-R #	SITE TITLE	PHASE	FY05	FY06	FY07	FY08	FY09	FY10+
		RD						
		RAC						
		LTM						
RVAAP-39	Load Line 5 Fuze and Booster (M)	RI/FS						
		RD						
		RAC						
		LTM						
RVAAP-41	Load Line 8 Fuze and Booster (M)	RI/FS						
		RD						
		RAC						
		LTM						
RVAAP-42	Load Line 9 Fuze and Booster (M)	RI/FS						
		RD						
		RAC						
		LTM						
RVAAP-43	Load Line 10 Percussion Element (M)	RI/FS						
		RD						
		RAC						
		LTM						
RVAAP-48	Anchor Test Area (M)	RI/FS						
		LTM						
RVAAP-50	Atlas Scrap Yard (M)	RI/FS						
		RD						
		RAC						
		LTM						
RVAAP-06	C Block Quarry (L)	RI/FS						
		RD						
		RAC						
		LTM						
RVAAP-13	Bldg. 1200 (L)	RI/FS						
		RD						
		RA						
		LTM						
RVAAP-19	Landfill North of Winklepeck Burning Ground (L)	RI/FS						
		RD						
		RAC						
		LTM						
RVAAP-28	Mustard Agent Burial Site (L)	RI/FS						
		LTM						
RVAAP-40	Load Line 7 Fuze and Booster (L)	RI/FS						
		RD						
		RAC						
		LTM						

# Ravenna Army Ammo Plant IAP Schedule

Current Phase

Future Phase

AEDB-R #	SITE TITLE	PHASE	FY05	FY06	FY07	FY08	FY09	FY10+
RVAAP-45	Wet Storage Area (L)	RI/FS						
		RD						
		RAC						
		LTM						

# Remediation Activities

## Past REM/IRA/RA

- RVAAP-03, Open Demo Area #1
- RVAAP-12, Load Line 12 IRA- Composting
- RVAAP-34 IRA- Waste removal 2002
- RVAAP-47, Building T-5301 IRA
- RVAAP-51 IRA- Waste removal 2002

## Current REM/IRA/RA

- None

## Future REM/IRA/RA

RVAAP-05, 06, 08, 09 (PBC), 10 (PBC), 11 (PBC), 12, 13, 16, 19, 33, 36, 38, 39, 40, 41, 42, 43, 45, 46, 49, 50

# Community Involvement

The RVAAP Restoration Advisory Board (RAB) was established in 1996 and has 25 members consisting of 23 community members and 2 non-community members. The community members include a township appointee from each of the surrounding 6 townships, one representative appointed by the Trumbull County Commissioners, a representative appointed by the Portage County Commissioners, and 15 members chosen from the general public. One of the community members is elected as a community co-chair by majority vote. The two non-community members include a representative of the Ohio EPA and an Army installation co-chair appointed by the installation. A RAB operating procedure was adopted by all members on February 19, 1997. A copy can be found in the RVAAP technical library, as well as two public repositories.

The RVAAP RAB generally meets every two to three months depending on the need for relevant issues to be addressed. All meetings are open to the public and are rotated among public places within the townships around the installation. Current topics are addressed at the meetings and a speaker is generally featured. There have been presentations by the Ohio Department of Health addressing health issues related to the cleanup; by the contractors that are performing remediation work; by WES on the explosive uptake by vegetation; Corps of Engineers describing newly identified contaminated sites; and the Army Center for Health Promotion and Preventative Medicine to explain the rating of AOCs for funding and the process of performing ecological and human health risk assessments. The minutes of all RAB meetings are recorded. All meetings are announced in the local media. A tour for RAB members and the media has been conducted each summer to view AOCs where work is underway. The latest tour was held on July 27, 2002. Regular RAB meetings were held during the past year covering such topics as Guaranteed Fixed Price Remediation (now called PBC) at LLs 1-4, progress of the remedial investigations at Open Demo Area #2 and Fuze and Booster Quarry Ponds/Landfill and thermal decontamination at excess production buildings. A summer tour was not held in 2003 due to the lack of interest.

All IRP records are made available to the RAB members and any other interested parties through the two local libraries. A web site where all IRP and other RVAAP documents will be available is currently under development. RVAAP publishes the semiannual Community Access Newsletters to keep the public up to date on all IRP and other environmental work at RVAAP. The RAB received \$25,000 for technical assistance for public participation (TAPP) (technical review) in April 1999. They recently received a second TAPP grant of \$25,000. This funding was used to review the Ecological Field Truthing report for Winklepeck Burning Grounds. The review of the report by the TAPP provider and the RAB were favorable.

In 2003, a Community Relation Plan was written to facilitate communication, identify issues of concern and serve as a guide for public involvement goals and objectives. The plan outlines the many ways that Ravenna AAP involves the community in the restoration activities, including through the RAB, site tours and issuance of fact sheets and newsletters.