

Draft

**Proposed Plan
for Soil, Sediment, and Surface Water at
RVAAP-48 Anchor Test Area**

**Ravenna Army Ammunition Plant
Ravenna, Ohio**

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

Prepared for:



**US Army Corps
of Engineers®**

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

Prepared by:



**SAIC Engineering of Ohio
8866 Commons Boulevard
Twinsburg, Ohio 44087**

February 7, 2012

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14. ABSTRACT This Proposed Plan for the Anchor Test Area presents remedial alternatives and the preferred alternative for remedy of soil within Anchor Test Area. Permanent surface water and sediment are not present on the area of concern; therefore, remedial alternatives only address soil. The preferred remedial alternative (Alternative 2: Attain National Guard Training and Residential Land Uses) involves the removal of shallow surface soil with chemical contamination above the cleanup goal for unrestricted (National Guard Training and Residential) land uses and disposal off-site at a licensed disposal facility. Removal will be conducted at location ATAss-005M under this alternative. There are no chemicals of concern in deep surface soil and subsurface soil; therefore, no further action is recommended for these media.							
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Draft

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

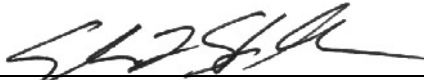
Prepared by:

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8866 Commons Boulevard
Twinsburg, Ohio 44087

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CONTRACTOR STATEMENT OF INDEPENDENT TECHNICAL REVIEW

Science Applications International Corporation (SAIC) has completed the *Proposed Plan for Soil, Sediment, and Surface Water at RVAAP-48 Anchor Test Area* at the Ravenna Army Ammunition Plant, Ravenna, Ohio. Notice is hereby given that an independent technical review has been conducted that is appropriate to the level of risk and complexity inherent in the project. During the independent technical review, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of data quality objectives; technical assumptions; methods, procedures, and materials to be used; the appropriateness of data used and level of data obtained; and reasonableness of the results, including whether the product meets the customer's needs consistent with law and existing United States Army Corps of Engineers (USACE) policy.



Sharon Stoller
Study/Design Team Leader

2/6/12

Date



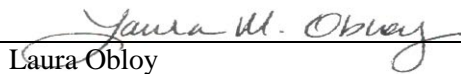
Jed Thomas, P.E.
Independent Technical Review Team Leader

2/6/12

Date

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

Internal SAIC Independent Technical Review was conducted on the Preliminary Draft version of this document. Subsequent versions of this document (e.g., Draft and Final) incorporated changes based on the technical reviews of USACE, the Ohio Army National Guard, and the Ohio Environmental Protection Agency. Internal SAIC Independent Technical Review comments are recorded on a Document Review Record per SAIC quality assurance procedure QAAP 3.1. This Document Review Record is maintained in the project file. Changes to the report addressing the comments have been verified by the Study/Design Team Leader. As noted above, all concerns resulting from independent technical review of the project have been considered.



Laura Obloy
Principal w/ A-E firm

2/6/12

Date

DOCUMENT DISTRIBUTION
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for Soil, Sediment, and Surface Water at
RVAAP-48 Anchor Test Area
Ravenna Army Ammunition Plant
Ravenna, Ohio

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Mark Patterson, RVAAP Facility Manager	2	2
Glen Beckham, USACE – Louisville District	1	1
Mark Nichter, USACE – Louisville District	1	1
Mark Eldridge, USAEC	0	1
REIMS	0	1
Kevin Jago, SAIC	1	1
Jed Thomas, SAIC	1	1
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NGB = National Guard Bureau
OHARNG = Ohio Army National Guard
REIMS = Ravenna Environmental Information Management System
RVAAP = Ravenna Army Ammunition Plant
SAIC = Science Applications International Corporation
USACE = United States Army Corps of Engineers
USAEC = United States Army Environmental Command

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55 **LIST OF ACRONYMS**

56

57 amsl Above Mean Sea Level

58 AOC Area of Concern

59 ARAR Applicable or Relevant and

60 Appropriate Requirements

61 bgs Below Ground Surface

62 CERCLA Comprehensive Environmental

63 Response, Compensation, and

64 Liability Act

65 COC Chemical of Concern

66 CUG Cleanup Goal

67 ERA Ecological Risk Assessment

68 EU Exposure Unit

69 FS Feasibility Study

70 FWCUG Facility-Wide Cleanup Goal

71 GRA General Response Action

72 HHRA Human Health Risk Assessment

73 LUC Land Use Control

74 NCP National Oil and Hazardous

75 Substances Pollution Contingency

76 Plan

77 NFA No Further Action

78 O&M Operation and Maintenance

79 OHARNG Ohio Army National Guard

80 Ohio EPA Ohio Environmental Protection

81 Agency

82 PCB Polychlorinated Biphenyl

83 PP Proposed Plan

84 RAFLU Reasonable and Anticipated

85 Future Land Use

86 RAO Remedial Action Objective

87 RI Remedial Investigation

88 ROD Record of Decision

89 RVAAP Ravenna Army Ammunition Plant

90 SRC Site-related Contaminant

91 SVOC Semi-Volatile Organic Compound

92 TNT 2,4,6-Trinitrotoluene

93 USACE United States Army Corps of

94 Engineers

95 VOC Volatile Organic Compound

96 USEPA United States Environmental

97 Protection Agency

1 **1.0 INTRODUCTION**

2
3 This Proposed Plan (PP) presents the preferred
4 alternative to achieve a remedy for soil within
5 Anchor Test Area at the Ravenna Army
6 Ammunition Plant (RVAAP) in Ravenna,
7 Ohio (Figure 1). Anchor Test Area is
8 designated as RVAAP-48. This PP presents
9 remedial alternatives developed in the
10 *Remedial Investigation/Feasibility Study*
11 *Report for Soil, Sediment, and Surface Water*
12 *at RVAAP-48 Anchor Test Area* (USACE
13 2012) and provides rationale for selecting the
14 preferred alternative. Permanent surface water
15 and sediment are not present on the area of
16 concern (AOC); therefore, remedial
17 alternatives only address soil. Groundwater
18 will be addressed in a separate decision under
19 the RVAAP Facility-Wide Groundwater AOC
20 (RVAAP-66).

21
22 The U.S. Army, in consultation with the Ohio
23 Environmental Protection Agency (Ohio EPA),
24 issues this PP. This PP provides the public
25 with information to comment upon the
26 selection of an appropriate response action.
27 The remedy will be selected for Anchor Test
28 Area after review and consideration of all
29 comments submitted during the 30-day public
30 comment period. Therefore, the public is
31 encouraged to review and comment on all
32 alternatives presented in this PP.

33
34 The U.S. Army is issuing this PP as part of its
35 public participation responsibilities under
36 Section 117(a) of the Comprehensive
37 Environmental Response, Compensation, and
38 Liability Act (CERCLA) of 1980, as amended
39 by the Superfund Amendments and
40 Reauthorization Act of 1986 and
41 Section 300.430(f)(2) of the National Oil and
42 Hazardous Substances Pollution Contingency
43 Plan (NCP) (40 *Code of Federal Regulations*
44 300). Selection and implementation of a
45 remedy will also be consistent with the
46 requirements of the Ohio EPA *Director's*
47 *Final Findings and Orders*, dated June 10,
48 2004.

49
50 This PP summarizes information that can be
51 found in greater detail in the Remedial

52 Investigation/Feasibility Study (RI/FS) report
53 (USACE 2011) and other documents contained
54 in the Administrative Record file for Anchor
55 Test Area. The U.S. Army encourages the
56 public to review these documents to gain a
57 more comprehensive understanding of the
58 AOC and activities that have been conducted
59 to date.
60

Public Comment Period:

Month XX, 2012 to Month XX, 2012

Public Meeting:

The U.S. Army will hold an open house and public meeting to present the preferred alternative and additional details presented in the *Remedial Investigation/Feasibility Study Report for Soil, Sediment, and Surface Water at RVAAP-48 Anchor Test Area* (USACE 2012). Oral and written comments will also be accepted at the meeting. The open house and public meeting are scheduled for [] PM, [], 2012, at the **Newton Falls Community Center, 52 East Quarry Street, Newton Falls, Ohio 44444.**

61
62 **2.0 RVAAP DESCRIPTION AND**
63 **BACKGROUND**
64

65 The current RVAAP consists of 1,260 acres
66 scattered throughout the Ohio Army National
67 Guard (OHARNG) Camp Ravenna Joint
68 Military Training Center, hereafter referred to
69 as Camp Ravenna. Camp Ravenna is in
70 northeastern Ohio within Portage and
71 Trumbull Counties, approximately 3 miles
72 (4.8 km) east-northeast of the city of Ravenna
73 and approximately 1 mile (1.6 km) northwest
74 of the city of Newton Falls (Figure 1). The
75 RVAAP portions of the property are located
76 solely within Portage County. RVAAP and
77 Camp Ravenna occupy a parcel of property
78 approximately 11 miles (17.7 km) long and
79 3.5 miles (5.6 km) wide bounded by State
80 Route 5, the Michael J. Kirwan Reservoir, and
81 the CSX System Railroad on the south;
82 Garrett, McCormick, and Berry roads on the
83 west; the Norfolk Southern Railroad on the
84 north; and State Route 534 on the east

1 (Figures 1 and 2). Camp Ravenna is
2 surrounded by several communities: Windham
3 on the north, Garrettsville 6 miles (9.6 km) to
4 the northwest, Newton Falls 1 mile (1.6 km) to
5 the southeast, Charlestown to the southwest,
6 and Wayland 3 miles (4.8 km) to the south.

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

20
21 Former industrial operations at RVAAP
22 consisted of 12 munitions-assembly facilities
23 referred to as “load lines.” Load Lines 1
24 through 4 were used to melt and load 2,4,6-
25 trinitrotoluene (TNT) and Composition B into
26 large-caliber shells and bombs. The operations
27 on the load lines produced explosive dust,
28 spills, and vapors that collected on the floors
29 and walls of each building. Periodically, the
30 floors and walls were cleaned with water and
31 steam. Following cleaning, the wastewater,
32 containing TNT and Composition B, was
33 known as “pink water” for its characteristic
34 color. Pink water was collected in concrete
35 holding tanks, filtered, and pumped into
36 unlined ditches for transport to earthen settling
37 ponds. Load Lines 5 through 11 were used to
38 manufacture fuzes, primers, and boosters.
39 Potential contaminants in these load lines
40 include lead compounds, mercury compounds,
41 and explosives. From 1946 to 1949, Load
42 Line 12 was used to produce ammonium
43 nitrate for explosives and fertilizers prior to
44 use as a weapons demilitarization facility.

45
46 In 1950, the facility was placed on standby
47 status and operations were limited to
48 renovation, demilitarization, and normal
49 maintenance of equipment, along with storage
50 of munitions. Production activities were
51 resumed from July 1954 to October 1957 and

52 again from May 1968 to August 1972. In
53 addition to production missions, various
54 demilitarization activities were conducted at
55 facilities constructed at Load Lines 1, 2, 3,
56 and 12. Demilitarization activities included
57 disassembly of munitions and explosives melt-
58 out and recovery operations using hot water
59 and steam processes. Periodic demilitarization
60 of various munitions continued through 1992.

61 62 **3.0 ANCHOR TEST AREA** 63 **DESCRIPTION AND BACKGROUND** 64

65 Anchor Test Area is located in the south-
66 central portion of RVAAP (Figure 2).
67 Although operational information about
68 Anchor Test Area is relatively limited, the
69 AOC was used for the research, development,
70 and testing of explosively driven soil
71 anchoring devices. The dates of use for
72 Anchor Test Area are unknown; although, it is
73 believed that testing activities did not occur
74 until after 1961.

75
76 The former testing operations area of Anchor
77 Test Area is about 0.5 acres, based on
78 historical information and investigations
79 conducted to date. The RVAAP *Installation*
80 *Action Plan* lists the AOC as 2 acres; however,
81 this acreage includes the access road and
82 surrounding areas that were not within the
83 former area of testing operations.

84
85 The following environmental reports have
86 been completed for Anchor Test Area:

- 87
88 • *Relative Risk Site Evaluation for Newly*
89 *Added Sites* (USACHPPM 1998);
90
91 • *Characterization of 14 AOCs at the*
92 *Ravenna Army Ammunition Plant* (MKM
93 2007); and
94
95 • *Remedial Investigation/Feasibility Study*
96 *for Soil, Sediment, and Surface Water at*
97 *the RVAAP 48 Anchor Test Area* (USACE
98 2012).
99
100

1 **4.0 AREA OF CONCERN**
2 **CHARACTERISTICS**

3
4 The AOC characteristics, nature and extent of
5 contamination, and conceptual site model are
6 based on the various investigations conducted
7 from 1998 through 2010.

8
9 Ground elevations across Anchor Test Area
10 range from approximately 930 ft above mean
11 sea level (amsl) to 1,004 ft amsl. No
12 permanent surface water features are present at
13 the AOC. Surface water occurs only
14 intermittently as overland storm water runoff
15 associated with heavy rainfall events and
16 generally flows towards a wetland located 500
17 ft to the south. The wetland drains to the south
18 through an unnamed stream, which enters the
19 west branch of the Mahoning River. The key
20 surface features at the AOC are remnants of
21 the former sandpit (approximately 12 ft by 36
22 ft) and several dirt mounds that functioned as
23 blast walls. A portion of a cement culvert is
24 visible in one of the dirt mounds.

25
26 Silty clay glacial sediment overlies sandstone
27 bedrock at Anchor Test Area, except where
28 disturbed by RVAAP activities. Bedrock was
29 not encountered in the shallow borings at the
30 AOC.

31
32 No groundwater monitoring wells are present
33 in the AOC. The generalized regional
34 groundwater flow direction in the vicinity of
35 the AOC is towards the east.

36
37 Surface soil from 0-1 ft below ground surface
38 (bgs) at Anchor Test Area contains the
39 majority of the site-related contaminants
40 (SRCs). The prevalent SRCs detected in
41 surface soil were 10 inorganic chemicals and 4
42 semi-volatile organic compounds (SVOCs).
43 The highest concentrations of inorganic
44 chemicals were generally observed near a
45 cement culvert, the former sand pit area, and in
46 the vicinity of the former blast wall mounds
47 surrounding the sand pit. Explosives,
48 propellants, volatile organic compounds
49 (VOCs), pesticides, and polychlorinated
50 biphenyls (PCBs) were not identified as SRCs
51 in surface soil.

52 Subsurface soil deeper than 1 ft bgs contained
53 substantially fewer detected SRCs than surface
54 soil. Two VOCs, one SVOC, and two
55 inorganic chemicals were identified as SRCs.
56 The VOCs and SVOC were detected in soil
57 samples collected at a soil boring located
58 within the former sand pit area. The two
59 metals (cadmium and silver) were present in
60 the subsurface soil samples throughout the
61 AOC. No trends were evident, and both
62 metals occurred within a narrow range of
63 concentrations. Explosives, propellants,
64 pesticides, and PCBs were not detected in
65 subsurface soil.

66
67 Sediment and surface water samples were not
68 collected because these media are not present
69 in the AOC.

70
71 The potential for soil contaminants to migrate
72 to groundwater was modeled and presented in
73 the RI/FS report (USACE 2012). Modeling
74 evaluated the potential for leaching of
75 contaminants from soil to groundwater and if
76 contaminants could potentially migrate from
77 Anchor Test Area to the closest surface water
78 feature (e.g., the wetland area southeast of the
79 AOC). Modeling results indicate arsenic could
80 potentially leach from soil to groundwater at
81 concentrations above United States
82 Environmental Protection Agency (USEPA)
83 regional screening levels and RVAAP
84 groundwater facility-wide cleanup goals
85 (FWCUGs). Arsenic was the only constituent
86 with the potential to leach. However, arsenic
87 was not predicted to migrate from Anchor Test
88 Area and reach the nearby wetland at
89 concentrations above screening levels.

90
91 **5.0 SCOPE AND ROLE OF**
92 **RESPONSE ACTION**

93
94 The Reasonable and Anticipated Future Land
95 Use (RAFLU) of the Anchor Test Area is
96 National Guard Training. Specifically, the
97 AOC will be used for dismounted training,
98 which may include some digging. The
99 representative receptor for this RAFLU is the
100 National Guard Trainee. The response action
101 evaluated alternatives to attain this RAFLU for
102 soil. Sediment and surface water are not

1 present at this AOC. Although Residential
2 Land Use is not anticipated at RVAAP or this
3 AOC, the response action also evaluated an
4 unrestricted land use. The National Guard
5 Trainee and Resident Farmer (Adult and
6 Child) receptors were evaluated as
7 representative receptors for unrestricted land
8 use.

9
10 The preferred alternative for a groundwater
11 remedy will be addressed under the RVAAP
12 Facility-Wide Groundwater AOC as a separate
13 decision. However, the selected remedy for
14 soil at Anchor Test Area must also be
15 protective of groundwater.

16 **6.0 SUMMARY OF HUMAN AND** 17 **ECOLOGICAL RISKS**

18
19
20 A human health risk assessment (HHRA) was
21 performed to identify chemicals of concern
22 (COCs) and provide a risk management
23 evaluation to determine COCs requiring
24 remediation based on potential risks to human
25 receptors.

26
27 The exposure units (EUs) evaluated in the
28 HHRA were shallow surface soil (0-1 ft bgs),
29 deep surface soil (1-4 ft bgs), and subsurface
30 soil (4-7 ft bgs) for the National Guard Trainee
31 and surface soil (0-1 ft bgs) and subsurface soil
32 (1-13 ft bgs) for the Resident Farmer. COCs
33 were determined for each EU based on
34 guidance established in *Facility-Wide Human*
35 *Health Cleanup Goals* (USACE 2010), herein
36 referred to as the FWCUG Report.

37
38 Arsenic was the only COC identified in shallow
39 surface soil (0-1 ft bgs) for both the National
40 Guard Trainee and the Resident Farmer in the
41 HHRA (USACE 2012). No COCs were
42 identified in deep surface soil for the National
43 Guard Trainee and subsurface soil for the
44 Resident Farmer.

45
46 Arsenic is present above the cleanup goals
47 (CUGs) for both the National Guard Trainee
48 and Resident Farmer in shallow surface soil (0-
49 1 ft bgs) near the cement culvert at location
50 ATAss-005M (Figure 3). Due to arsenic
51 concentrations at this location, evaluation of

52 remedial alternatives was recommended in the
53 FS.

54
55 Ecological habitat in Anchor Test Area is
56 made up of approximately 0.5 acres and
57 consists of forest and shrubs. The vegetation
58 provides habitat for birds, mammals, insects,
59 and other organisms. There are no ditches,
60 streams, ponds, or wetlands on the AOC.

61
62 Currently, there are no federally-listed species
63 or critical habitats on RVAAP property. State-
64 endangered, state-threatened, state species-of-
65 concern, and state special-interest species have
66 been identified at RVAAP. Anchor Test Area
67 has not been previously surveyed for rare
68 species.

69
70 The ecological risk assessment (ERA) for
71 Anchor Test Area evaluated the risk to plants
72 and animals from contaminants in soil. The
73 results indicated that inorganic chemicals (such
74 as mercury and manganese) are present, but
75 the estimated risk is low and the potentially
76 affected resources are not ecologically
77 important (i.e., no rare species and no wetland
78 areas). Based on field observations conducted
79 by biologists during the RI, all habitat types
80 appear to be healthy and functioning. The
81 ERA concluded there are no important or
82 significant ecological resources at Anchor Test
83 Area, and the recommendation was no further
84 action (NFA) for protection of ecological
85 resources.

86 **7.0 REMEDIAL ACTION** 87 **OBJECTIVE**

88
89
90 The remedial action objective (RAO)
91 references CUGs that are considered protective
92 of human health and the environment under
93 current land use and RAFLU. The RAO for
94 this remedy is to prevent National Guard
95 Trainee exposure to identified COCs above
96 CUGs in soil, prevent adverse ecological
97 effects from previous AOC activities, and
98 prevent negative groundwater impacts from
99 contaminant migration from source media
100 (e.g., soil). Ohio EPA policy for remedial
101 actions is to attain a target risk of 1E-05 and a
102 hazard index of 1. Arsenic was identified as a

1 COC in shallow surface soil. A CUG of 15.4
 2 mg/kg for arsenic was established from the
 3 FWCUG Report (USACE 2010). The CUG for
 4 arsenic achieves the target risk and hazard
 5 index levels for the National Guard Trainee,
 6 and is also protective for the Resident Farmer.
 7

8 The response action addresses arsenic in
 9 shallow surface soil (0-1 ft bgs) at location
 10 ATAss-005M to protect the National Guard
 11 Trainee and Resident Farmer, which will allow
 12 for unrestricted land use. There are no COCs
 13 in deep surface soil and subsurface soil.
 14 Surface water and sediment are not present at
 15 the AOC. Remediation of soil to protect
 16 ecological and groundwater resources is not
 17 necessary. However, remediation to protect
 18 human receptors at risk from arsenic will
 19 benefit ecological resources and will reduce
 20 the potential for contaminant migration to
 21 groundwater. Table 1 presents the CUGs for
 22 the soil under this remedy.
 23
 24

Table 1. COCs and Cleanup Goals for Unrestricted (National Guard Training and Residential) Land Use at Anchor Test Area

Media	COC	Cleanup Goal (mg/kg)
Shallow Surface Soil (0-1 ft bgs)	Arsenic	15.4
Deep Surface Soil (1-4 ft bgs)	None	None
Subsurface Soil (1-13 ft bgs)	None	None

bgs = Below Ground Surface
 COC = Chemical of Concern

25
 26 **8.0 SUMMARY OF FEASIBILITY**
 27 **STUDY ALTERNATIVES**
 28

29 The following general response actions
 30 (GRAs) were considered in the FS for
 31 remediation of contaminated soil at Anchor
 32 Test Area:
 33

- 34 • No action;
- 35 • Land use controls (LUCs) and five-year
- 36 reviews;
- 37 • Removal;

- 38 • Treatment; and
- 39 • Disposal and handling.

40
 41 Technologies under each GRA were screened
 42 and selected for their ability to reduce
 43 exposure to contaminants in soil. Because soil
 44 contains chemical contamination above CUGs,
 45 the technologies were evaluated for their
 46 ability to remove or reduce contaminants in the
 47 shortest timeframe.
 48

49 Technologies selected under these GRAs were
 50 combined into the following two alternatives
 51 for detailed analysis. Costs were estimated for
 52 each alternative.
 53

54 **8.1 Alternative 1 – No Action**
 55

56 *Cost: \$0*
 57

58 This remedial alternative provides no further
 59 remedial action and is required under the NCP
 60 as a baseline for comparison with other
 61 remedial alternatives. Under this alternative,
 62 there is no reduction in toxicity, mobility, or
 63 volume of contaminated soil. Access
 64 restrictions and environmental monitoring
 65 would be discontinued. Anchor Test Area
 66 would have no legal, physical, or
 67 administrative LUCs. Environmental
 68 monitoring would not be performed. Five-year
 69 reviews would not be conducted in accordance
 70 with CERCLA 121(c).
 71

72 **8.2 Alternative 2 – Attain National Guard**
 73 **Training and Residential Land Uses**
 74

75 Actions for each medium within Anchor Test
 76 Area for this alternative are as follows:
 77

- 78 • Shallow Surface Soil (0-1ft bgs) –
- 79 excavation with off-site disposal;
- 80 • Deep Surface Soil (1-4 ft bgs) – NFA;
- 81 • Subsurface Soil (1-13 ft bgs) – NFA;

82 *Estimated Implementation Cost: \$93,967*
 83 *30-yr Operation and Maintenance (O&M)*
 84 *Cost: \$0*
 85 *Estimated Total Cost: \$93,967*

1 This remedial alternative involves the removal
2 of shallow surface soil with chemical
3 contamination above the CUG for unrestricted
4 land use (represented by National Guard
5 Trainee and Resident Farmer) and disposal off-
6 site at a licensed facility. There are no COCs
7 in deep surface soil and subsurface soil for
8 National Guard Trainee and Resident Farmer;
9 therefore, NFA is recommended for these
10 media.

11
12 Under this alternative, shallow surface soil (0-
13 1 ft bgs) will be excavated. Soil that exceeds
14 the arsenic CUG at location ATAss-005M will
15 be removed (Figure 3) by mechanical
16 equipment and disposed off-site. Confirmation
17 samples will be collected along excavation
18 sidewalls. Confirmation samples will not be
19 collected from the excavation floor because
20 there was no identified risk in the soil below 1
21 ft bgs. The excavated areas will be backfilled
22 with clean soil and re-vegetated.

23
24 Successful implementation of this alternative
25 will allow unrestricted future land use
26 (represented by the National Guard Trainee
27 and Resident Farmer). There is no O&M
28 period following the remedial action because
29 unrestricted land use is achieved. The U.S.
30 Army and OHARNG will not be required to
31 develop and implement LUCs. Five-year
32 reviews in accordance with CERCLA 121(c)
33 will not be required following the remedy.

34 35 **9.0 EVALUATION OF FEASIBILITY** 36 **STUDY ALTERNATIVES** 37

38 The alternatives were evaluated with respect to
39 the nine comparative analysis criteria, as
40 outlined by CERCLA (Table 2). The nine
41 criteria are categorized into three groups:
42 threshold criteria, primary balancing criteria,
43 and modifying criteria. These criteria are as
44 follows.

45
46 Threshold Criteria – must be met for the
47 alternative to be eligible for selection as a
48 remedial option.

49
50 1. Overall protection of human health
51 and the environment.

52 2. Compliance with applicable or
53 relevant and appropriate requirements
54 (ARARs).
55

56 Balancing Criteria – used to weigh major
57 trade-offs among alternatives.
58

59 3. Long-term effectiveness and
60 permanence.

61 4. Reduction of toxicity, mobility, or
62 volume through treatment.

63 5. Short-term effectiveness.

64 6. Implementability.

65 7. Cost.
66

67 Modifying Criteria – may be considered to the
68 extent that information is available during
69 development of the FS but can be fully
70 considered only after public comment on this
71 PP.

72
73 8. State acceptance.

74 9. Community acceptance.
75

1
2 **Table 2. CERCLA Evaluation Criteria**

Overall Protection of Human Health and the Environment – considers whether or not an alternative provides adequate protection and describes how risks posed through each pathway are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) – considers how a remedy will meet all the applicable or relevant and appropriate requirements of other federal and state environmental statutes and/or provide grounds for invoking a waiver.

Long-term Effectiveness and Permanence – considers the magnitude of residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time once cleanup goals (CUGs) have been met.

Reduction of Toxicity, Mobility, or Volume Through Treatment – considers the anticipated performance of the treatment technologies that may be employed in a remedy.

Short-term Effectiveness – considers the speed with which the remedy achieves protection, as well as the potential to create adverse impacts on human health and the environment that may result during the construction and implementation period.

Implementability – considers the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement the chosen solution.

Cost – considers capital costs and operation and maintenance costs associated with the implementation of the alternative.

State Acceptance – indicates whether the state concurs with, opposes, or has no comment on the preferred alternative.

Community Acceptance – will be addressed in the Record of Decision (ROD) following a review of the public comments received on the remedial investigation (RI) report, focused feasibility study (FS) report, and the Proposed Plan (PP).

3
4 The comparative analysis evaluates the relative
5 performance of Alternatives 1 and 2 with
6 respect to each of the nine criteria. Identifying

7 the advantages and disadvantages of each
8 alternative with respect to each other, helps to
9 identify the relative strengths of the preferred
10 alternative. These strengths, combined with
11 risk management decisions made by the U.S.
12 Army and Ohio EPA, as well as input from the
13 community, will serve as the basis for
14 selecting the remedy.

15
16 Table 3 summarizes the comparative analysis
17 of remedial alternatives for Anchor Test Area
18 from the FS. Criterion 1 (Overall
19 Protectiveness of Human Health and the
20 Environment) is rated either “protective” or
21 “not protective.” Criterion 2 (Compliance with
22 Applicable or Relevant and Appropriate
23 Requirements) is rated either “compliant” or
24 “not compliant.” The remaining seven criteria
25 are rated as “high,” “medium,” or “low.” A
26 rating of high indicates the alternative
27 performs the best, and a rating of low indicates
28 the alternative performs the worst. For
29 example, an alternative with a high cost will be
30 scored low under Criterion 7, Cost.

31
32 Alternative 1 (No Action) will provide no
33 protection of human health or the environment
34 from the AOC contaminants beyond current
35 conditions. No effort will be taken to prevent or
36 minimize human or ecological exposure to
37 contaminated soil. Concentrations of
38 contaminants could pose future risk to both the
39 National Guard Trainee and Resident Farmer.

40
41 Alternative 2 (Attain National Guard Training
42 and Residential Land Uses) provides a high
43 degree of overall protectiveness and long-term
44 effectiveness and permanence for the RAFLU
45 by removing contaminated soil and is also
46 protective for unrestricted land use. The
47 mobility of COCs is reduced for Alternative 2
48 given the excavated soil is disposed of at an
49 off-site facility equipped with engineering
50 controls. Alternative 2 presents short-term risk
51 to workers, the community, and the
52 environment during excavation and
53 transportation of soil. Alternative 2 can be
54 readily and quickly implemented at a
55 comparatively low cost.

56

**10.0 PREFERRED FEASIBILITY
STUDY ALTERNATIVE**

The U.S. Army, in consultation with Ohio EPA, is recommending Alternative 2 (Attain National Guard Training and Residential Land Uses) be implemented as the remedial action at Anchor Test Area. Alternative 1 (No Action) was also evaluated. However, since the threshold criteria Overall Protectiveness of Human Health and the Environment is not protective, the No Action alternative was eliminated from consideration.

Alternative 2 is protective for the RAFLU and is also protective for unrestricted land use. This alternative is cost effective and can be performed in a timely manner. Based on the available risk assessment information, the preferred alternative will achieve the RAO.

Mitigation measures (e.g., dust control, storm water controls, site housekeeping activities, and covering and cleaning haul trucks) during excavation activities will minimize and/or eliminate all potential risks to workers and the community. Because Alternative 2 will attain a requisite level of protectiveness for soil for unrestricted land use (represented by the National Guard Trainee and Resident Farmer), LUCs and five-year reviews will not be required following the remedy.

This recommendation is not a final decision. The U.S. Army, in consultation with Ohio EPA, will select the remedy for Anchor Test Area after reviewing and considering all comments submitted during the 30-day public comment period.

Table 3. Comparative Analysis of Remedial Alternatives

NCP Evaluation Criteria	Alternative 1 – No Action		Alternative 2 – Attain National Guard Training and Residential Land Uses	
	<i>Result</i>		<i>Result</i>	
Threshold Criteria				
1. Overall Protectiveness of Human Health and the Environment	Not protective		Protective	
2. Compliance with ARARs	Compliant		Compliant	
Balancing Criteria				
3. Long-term Effectiveness and Permanence	Low	1	High	3
4. Reduction of Toxicity, Mobility, or Volume through Treatment	Low	1	Medium	2
5. Short-term Effectiveness	High	3	Medium	2
6. Implementability	High	3	Medium	2
7. Cost	High	3	Medium	2
Balancing Criteria Score	11		11	

AOC = Area of Concern
 ARAR = Applicable or Relevant and Appropriate Requirement
 NCP = National Oil and Hazardous Substances Pollution Contingency Plan

1 **11.0 COMMUNITY PARTICIPATION**

2
3 **11.1 Community Participation**

4
5 Public participation is an important component
6 of the remedy selection. The U.S. Army and
7 Ohio EPA are soliciting input from the
8 community on the preferred alternative. The
9 comment period extends from _____, 2012, to
10 _____, 2012. This period includes a public
11 meeting at which the U.S. Army will present this
12 PP as agreed to by Ohio EPA. The U.S. Army
13 will accept both oral and written comments at
14 this meeting.
15

**POINT OF CONTACT FOR
WRITTEN COMMENTS**

Facility Manager
Ravenna Army Ammunition Plant
Building 1037
8451 State Route 5
Ravenna, Ohio 44266-9297
Office: (330) 358-7311
Fax: (330) 358-7314

16
17
18 **11.2 Public Comment Period**

19
20 The 30-day comment period is from _____,
21 2012, to _____, 2012, and provides an
22 opportunity for public involvement in the
23 decision-making process for the proposed
24 action. The public is encouraged to review and
25 comment on this PP. All public comments will
26 be considered by the U.S. Army and Ohio EPA
27 before selecting a remedy. During the
28 comment period, the public is encouraged to
29 review documents pertinent to Anchor Test
30 Area.
31

32 This information is available at the
33 Information Repository and online at
34 www.rvaap.org. To obtain further
35 information, contact the RVAAP Facility
36 Manager.
37

38 **11.3 Written Comments**

39
40 If the public would like to comment in writing
41 on this PP or other relevant issues, please
42 deliver comments to the U.S. Army at the
43 public meeting or mail written comments
44 (postmarked no later than _____, 2012).
45

46 **11.4 Public Meeting**

47
48 The U.S. Army will hold an open house and
49 public meeting on this PP on _____, 2012, at
50 _____ PM, in the **Newton Falls Community**
51 **Center, 52 East Quarry Street, Newton Falls,**
52 **Ohio, 44444** to accept comments. This
53 meeting will provide an opportunity for the
54 public to comment on the proposed action.
55 Comments made at the meeting will be
56 transcribed.
57

INFORMATION REPOSITORIES

Reed Memorial Library

167 East Main Street
Ravenna, Ohio 44266
(330) 296-2827

Hours of operation:

9AM – 8PM Monday – Friday

9AM – 5PM Saturday

1PM – 5PM Sunday (between Labor Day
and Memorial Day)

Newton Falls Public Library

204 South Canal Street
Newton Falls, Ohio 44444
(330) 872-1282

Hours of operation:

10AM – 8PM Tuesday - Friday

9AM – 5PM Friday and Saturday

58
59
60 **11.5 U.S. Army Review of Public**
61 **Comments**

62
63 The U.S. Army will review the public's
64 comments as part of the process in reaching a
65 final decision for the most appropriate action
66 to be taken.
67

1 The Responsiveness Summary, a document
2 that summarizes the U.S. Army's responses to
3 comments received during the public comment
4 period, will be included in the Record of
5 Decision (ROD). The U.S. Army's final
6 choice of action will be documented in the
7 ROD. The ROD will be added to the RVAAP
8 Administrative Record and Information
9 Repositories.

10

ADMINISTRATIVE RECORD FILE

RVAAP

Building 1037
8451 State Route 5
Ravenna, Ohio 44266-9297
(330) 358-7311
Fax: (330) 358-7314

Note: Access is restricted to the Ravenna
Army Ammunition Plant (RVAAP), but the
file can be obtained or viewed with prior
notice to RVAAP.

11

12

GLOSSARY OF TERMS

13

14

15 **Administrative Record:** a collection of
16 documents, typically reports and
17 correspondence, generated during site
18 investigation and remedial activities.
19 Information in the Administrative Record
20 represents the information used to select the
21 preferred alternative. It is available for public
22 review at the Ravenna Army Ammunition
23 Plant, Building 1037; call (330) 358-7311 for
24 an appointment.

25

26 **Comprehensive Environmental Response,
27 Compensation, and Liability Act
28 (CERCLA):** a federal law passed in 1980,
29 commonly referred to as the Superfund
30 Program. It provides liability, compensation,
31 cleanup, and emergency response in
32 connection with the cleanup of inactive
33 hazardous substance release sites that endanger
34 public health or the environment.

35

36 **Chemical of Concern (COC):** chemical
37 substances specific to an area of concern that
38 potentially pose significant human health or

39 ecological risks. COCs are typically further
40 evaluated for remedial action.

41

42 **Ecological Receptor:** a plant, animal, or
43 habitat exposed to an adverse condition.

44

45 **Exposure Unit (EU):** a location or area where
46 a receptor may move at random and come into
47 contact with an environmental medium (e.g.,
48 soil, surface water, and/or sediment).

49

50 **Feasibility Study (FS):** a CERCLA document
51 that reviews and evaluates multiple remedial
52 technologies under consideration at a site. It
53 also identifies the preferred remedial action
54 alternative.

55

56 **Human Receptor:** a hypothetical person,
57 based on current or potential future land use,
58 who may be exposed to an adverse condition.
59 For example, a National Guard Trainee is
60 considered to be the most sensitive human
61 receptor under future restricted land use in this
62 Proposed Plan (PP).

63

64 **National Oil and Hazardous Substances
65 Pollution Contingency Plan (NCP):** the set
66 of regulations that implement CERCLA and
67 address responses to hazardous substances and
68 pollutants or contaminants.

69

70 **Record of Decision (ROD):** a legal record
71 signed by the U.S. Army and Ohio
72 Environmental Protection Agency. It
73 describes the cleanup action or remedy
74 selected for a site, the basis for selecting that
75 remedy, public comments, responses to
76 comments, and the estimated cost of the
77 remedy.

78

79 **Remedial Action Objective (RAO):** these
80 specific goals, developed from the evaluation
81 of applicable or relevant and appropriate
82 requirements, are to be protective of human
83 health and the environment.

84

85 **Remedial Investigation (RI):** CERCLA
86 investigation that involves sampling
87 environmental media, such as air, soil, and water,
88 to determine the nature and extent of
89 contamination and to calculate human health and

1 environmental risks that result from the
2 contamination.

3
4 **Responsiveness Summary:** a section of the
5 ROD where the U.S. Army documents and
6 responds to written and oral comments
7 received from the public about the PP.

8
9 **Risk Assessment:** an evaluation that
10 determines potential harmful effects, or lack
11 thereof, posed to human health and the
12 environment due to exposure to chemicals
13 found at a CERCLA site.

14
15 **Target Risk:** the Ohio Environmental
16 Protection Agency (2009) identifies 1E-05 as a
17 target for cancer risk for carcinogens and an
18 acceptable target hazard index of 1 for
19 non-carcinogens.

20

21

21 REFERENCES

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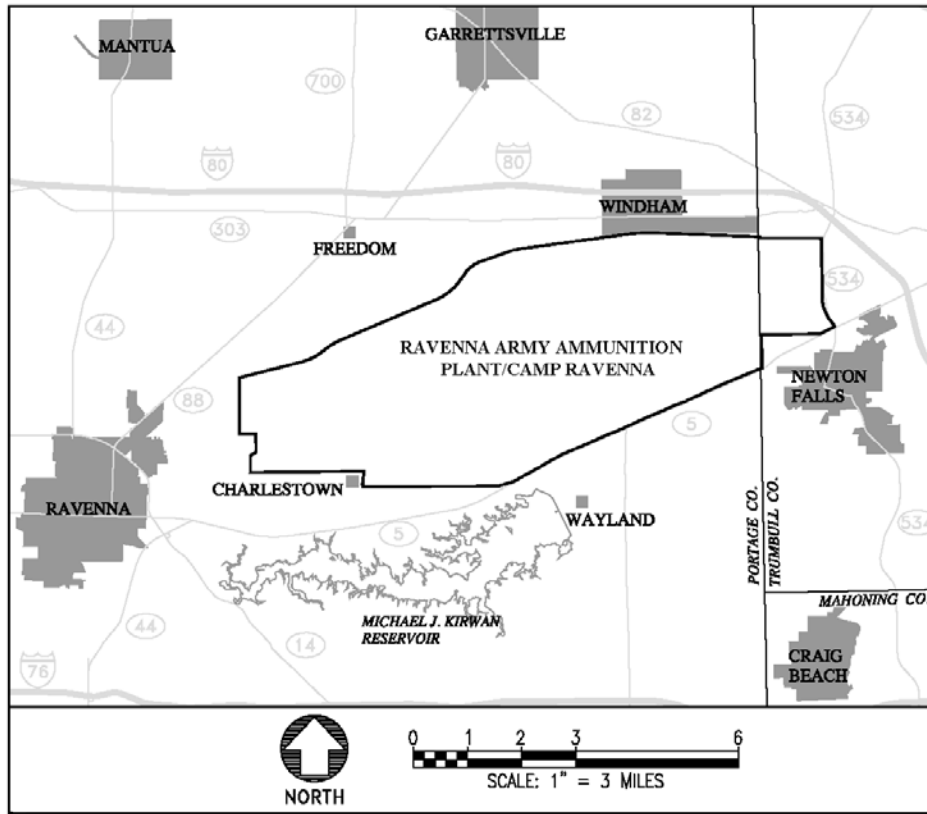
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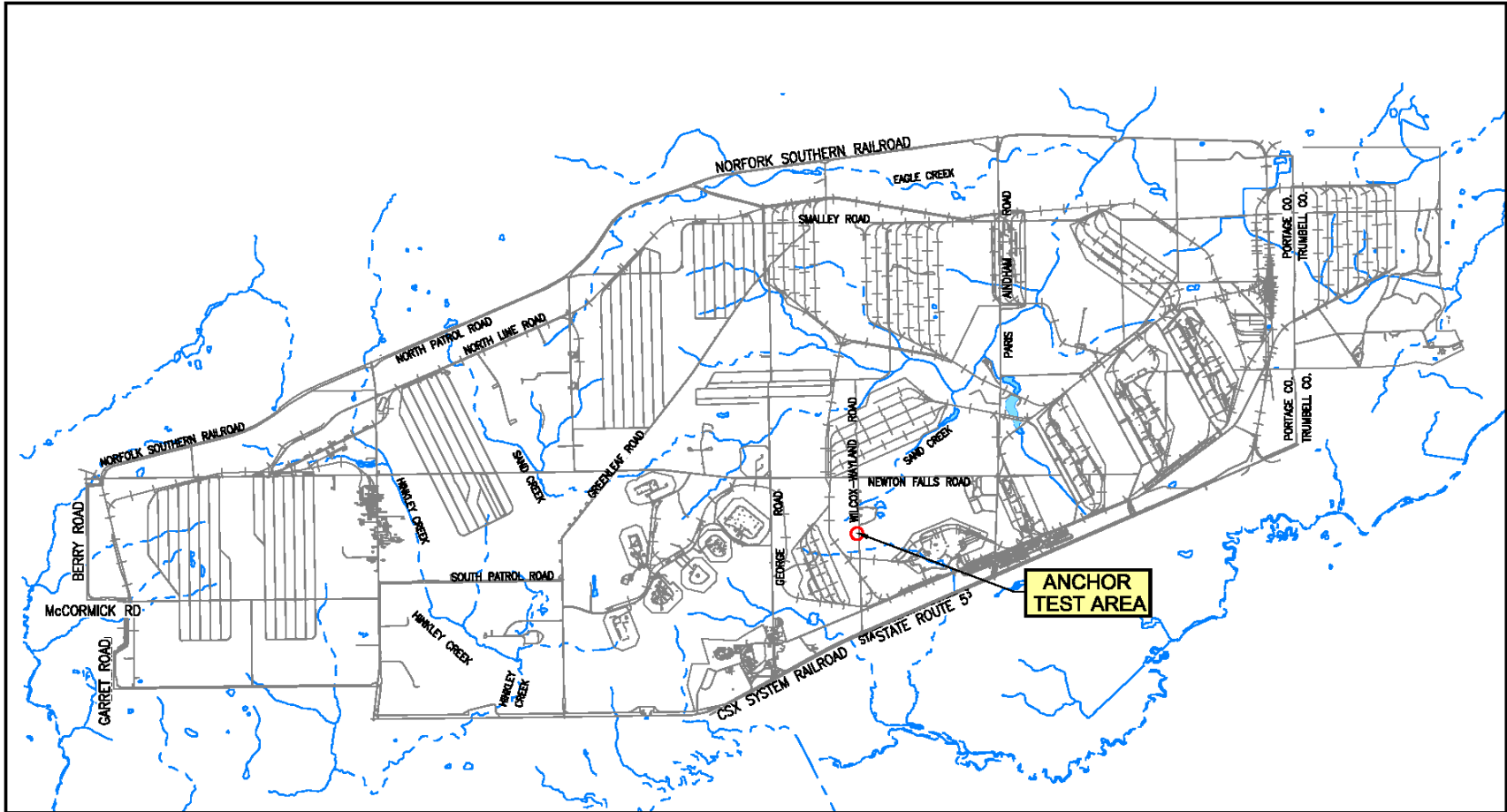
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52 1998. *Relative Risk Site Evaluation for Newly*
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56 1998.

FIGURES



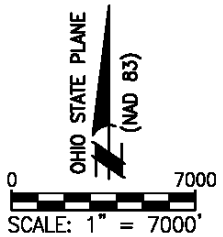
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Figure 1. General Location and Orientation of RVAAP/Camp Ravenna



LEGEND:

- ===== ASPHALT ROAD
- RAILROAD TRACKS
- FENCE LINE
- STREAMS



US Army Corps of Engineers
Louisville District

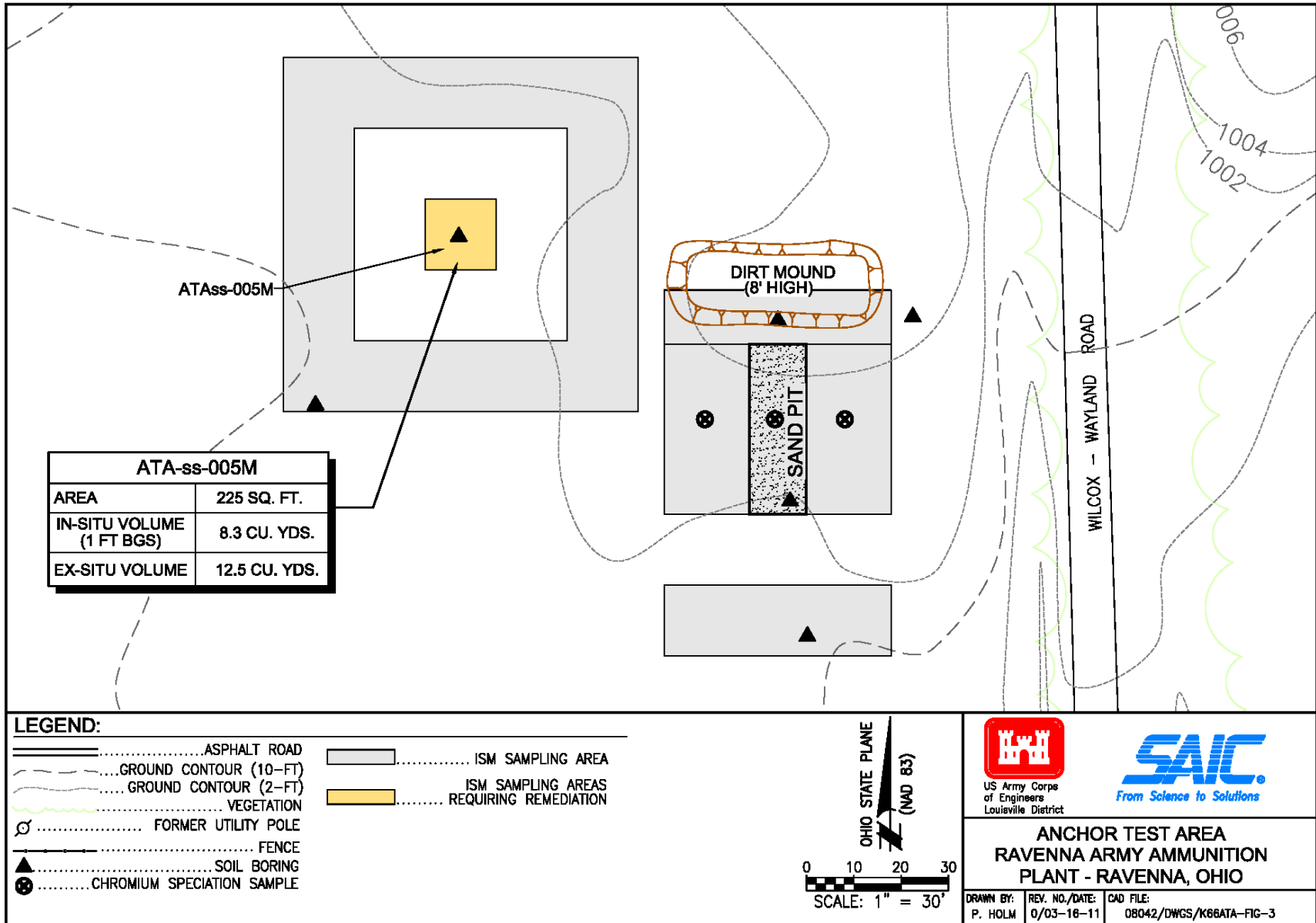


**ANCHOR TEST AREA
RAVENNA ARMY AMMUNITION
PLANT - RAVENNA, OHIO**

DRAWN BY: P. HOLM	REV. NO./DATE: 0/03-18-11	CAD FILE: 08042/DWGS/K66ATA-FIG-2
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1
2

Figure 2. RVAAP/Camp Ravenna Installation Map



1

Figure 3. Anchor Test Area Site Features