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14. ABSTRACT

The Work Plan Addendum identifies the activities to be performed by URS for their project to sample earth fill beneath floor slabs at Load Line 1 and other additional buildings at the Ravenna Army Ammunition Plant (RVAAP). The plan includes an approach and rationales for the sampling.

15. SUBJECT TERMS

RVAAP; Work Plan; Sub-Slab Sampling

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Final Work Plan Addendum #1

for the Sampling of Soils Below Floor Slabs and Remediation at RVAAP-08 Load Line 1 and Other Building Locations

Ravenna Army Ammunition Plant
8451 St. Route 5
Ravenna, OH 44266-9297

Contract No. W912QR-04-D-0025
Delivery Order No. 0006

Prepared for:
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August 3, 2009

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Technical Project Manager URS Group, Inc.	1	--

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Acronyms and Abbreviations

AOC	Area of Concern
BRACD	Base Realignment and Closure Division
CUG	Cleanup Goal
DNT	Dinitrotoluene, also 2,4-Dinitrotoluene
GPS	Global Positioning System
IDW	Investigation-Derived Waste
IROD	Interim Record of Decision
MARC	Multiple Award Remediation Contract
MI	Multi-increment
MKM	MKM Engineers, Inc.
Ohio EPA	Ohio Environmental Protection Agency
PCB	Polychlorinated biphenyl
PRG	Preliminary Remediation Goal
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
RDX	Royal Demolition Explosive also Hexahydro-1,3,5-trinitro-1,3,5-triazine
RI	Remedial Investigation
RVAAP	Ravenna Army Ammunition Plant
SOW	Scope of Work
SRC	Site-Related Contaminant
SVOC	Semivolatile Organic Compound

TNT	Trinitrotoluene, also 2,4,6-Trinitrotoluene
URS	URS Group, Inc.
USACE	United States Army Corps of Engineers
VOC	Volatile Organic Compound

1.1 PURPOSE AND SCOPE

URS Group, Inc. (URS) was contracted by the United States Army Corps of Engineers (USACE) to sample soils below floor slabs at Load Lines 2, 3, and 4 and to excavate and transport contaminated soils to Load Line 4 (Buildings G-1, G-1A, and G-3) at the Ravenna Army Ammunition Plant (RVAAP) under their Multiple Award Remediation Contract (MARC), Delivery Order 0006. As part of the Scope of Work (SOW) for Task Order 0006, a Work Plan to address all SOW activities was required. The Final Work Plan (URS, 2008a) was approved by the Ohio Environmental Protection Agency (Ohio EPA) on June 9, 2008.

Modification No. 2 to Delivery Order 0006 was issued by the USACE on August 28, 2008. The modification SOW contained a task to prepare a Work Plan Amendment to address sampling rationales to support sub-slab sampling at the following additional buildings:

- Load Line 1 (RVAAP-08)
- Buildings F-15 and F-16 (RVAAP-46)
- Building EB-803 (RVAAP-10, Load Line 3)
- Buildings G-1, G-1A, and G-3 (RVAAP-11, Load Line 4)

This Work Plan Addendum provides only the information relative to these buildings. Information on other areas and buildings from the approved Final Work Plan is not repeated in this addendum. Project requirements contained in the Final Work Plan will be implemented as approved unless modifications are included in subsequent sections of this addendum.

1.2 SITE DESCRIPTION AND BACKGROUND

No additional information is presented for the background and description of the RVAAP. The locations of buildings addressed by this addendum are shown on Figure 1-1.

The areas of concern (AOCs) for this work include Load Lines 1, 3 (RVAAP-10), 4 (RVAAP-11), and one other AOC (RVAAP-46). Figures 1-2 through 1-5 provides additional detail on the locations of the buildings. Industrial operations at the load lines are the same as described in the Final Work Plan. During 1961-1967, Load Line 1 was also the site of munition rehabilitation activities, consisting of dismantling, component replacing, and repainting of mines. Demilitarization of primers also occurred at this location.

Buildings F-15 and F-16 (RVAAP-46) are located west of Block D and east of Slagle Road (Figure 1-1). They were used during World War II, the Korean War, and the Vietnam War for the testing of miscellaneous explosives and propellants.

The work to be covered by URS' Delivery Order 0006 (as modified) is to evaluate potential contamination below the floor slabs and to excavate and transport contaminated earth fill materials above cleanup goals (CUGs) to a licensed disposal facility.

Legend

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

FENCE LINE
PROPERTY BOUNDARY
STREAM OR CREEK
BUILDING
ASPHALT ROAD
RAILROAD TRACKS
POND
SURVEY CONTROL POINT
AOC BOUNDARY
UNDERSLAB SAMPLING PROJECT AOC

BUILDING F–16
BUILDING F–15
EAGLE CREEK
SAND CREEK
SAND CREEK
HINKLEY CREEK
LOAD LINE 1
LOAD LINE 3
LOAD LINE 4

US Army Corps of Engineers

0 2000 4000 8000
SCALE IN FEET

N

MAP SOURCE:
RAVENNA ARMY AMMUNITION PLANT
RAVENNA, OHIO

URS

RAVENNA ARMY AMMUNITION PLANT
RAVENNA, OHIO

RAVENNA ARMY AMMUNITION PLANT FACILITY MAP

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K:\Projects\R\Ravenna AAP\13812319\DWGs\Figures\Work_Plan_Addendum_Final Figures\Ravenna-Fig 1-1 RVAAP Plant Facility Map.dwg User: jessica_cotton Jul 30, 2009 - 9:37am

CA-15
CA-17
CA-16
CA-14
CA-7
CA-21
CA-5
T4801
CB-13B
CB-13A
CB-13
CB-10
VP1,2,3
CB-4VP1
CB-9
CB-4
CB-4A
CB-4AVP1
CB-20
CB-25
CB-3
CB-801
CB-19
CB-2
CB-22
CB-12
CB-23
CB-8
1-51A
1-51

LEGEND

- BUILDING AND WALKWAY
- ASPHALT ROAD
- GRAVEL ROAD
- RAILROAD TRACKS
- FENCE LINE
- STREAM
- CONTOUR (2 FT. INTERVAL)
- CONTOUR (10 FT. INTERVAL)
- TREE OR TREELINE
- STEAM STANCHION
- VACUUM PUMP BAG HOUSE

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0 75 150 300
SCALE 1" ~ 300'

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RAVENNA ARMY AMMUNITION PLANT
RAVENNA, OHIO

SOIL SAMPLING UNDER FLOOR SLABS LOAD LINE 1 PLAN VIEW

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LEGEND

- BUILDING FOOTPRINT TO BE SAMPLED
- BUILDING AND WALKWAY
- ASPHALT ROAD
- GRAVEL ROAD
- RAILROAD TRACKS
- FENCE LINE
- CONTOUR (2 FT. INTERVAL)
- CONTOUR (10 FT. INTERVAL)
- TREE OR TREELINE
- STEAM STANCHION

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SCALE 1" ~ 300'

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RAVENNA ARMY AMMUNITION PLANT
RAVENNA, OHIO

SOIL SAMPLING UNDER FLOOR SLABS LOAD LINE 3 PLAN VIEW

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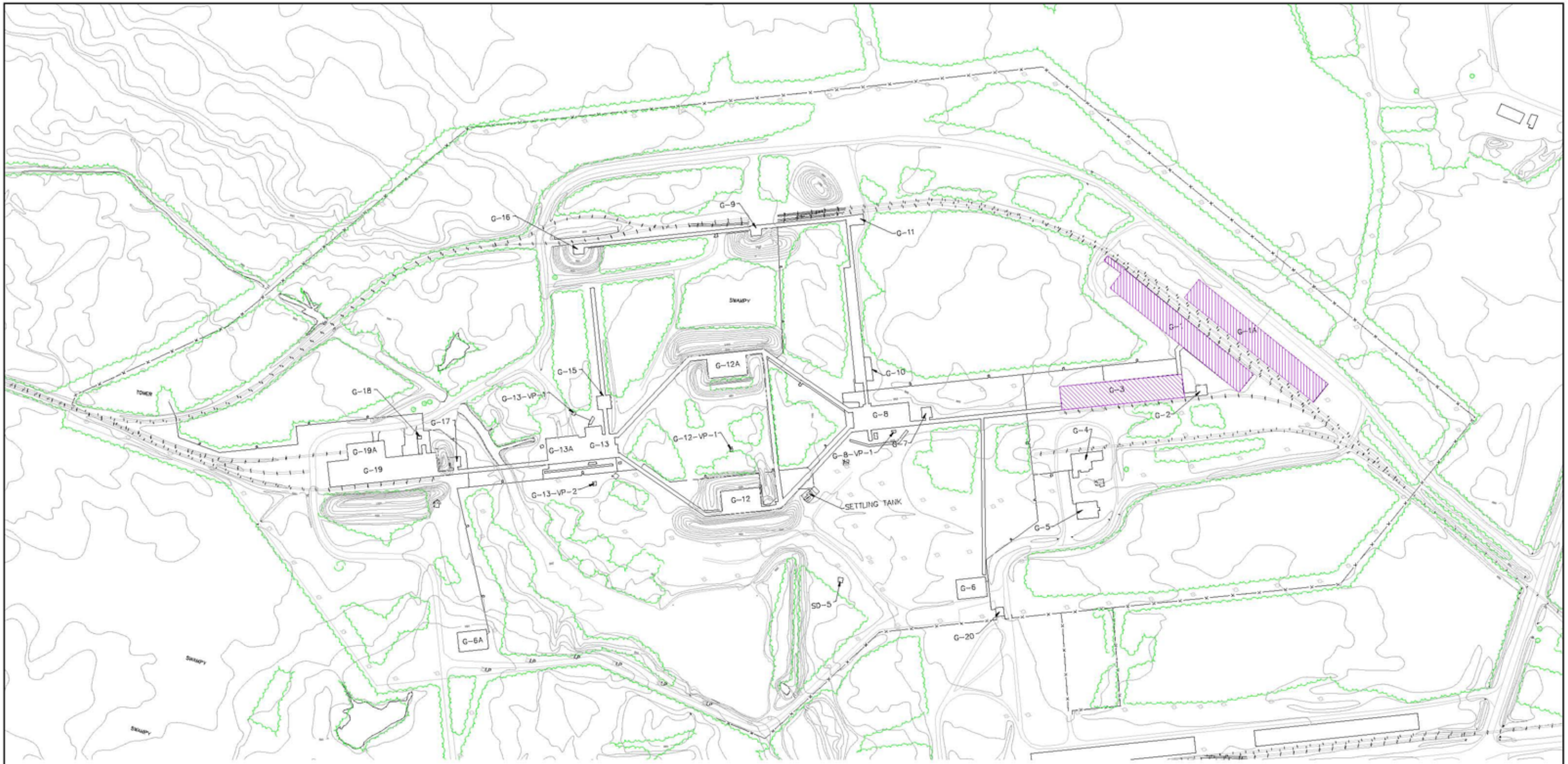

LEGEND

- BUILDING FOOTPRINT TO BE SAMPLED
- BUILDING AND WALKWAY
- ASPHALT ROAD
- GRAVEL ROAD
- RAILROAD TRACKS
- FENCE LINE
- CONTOUR (2 FT. INTERVAL)
- CONTOUR (10 FT. INTERVAL)
- TREE OR TREELINE
- STEAM STANCHION

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URS

RAVENNA ARMY AMMUNITION PLANT

RAVENNA, OHIO

SOIL SAMPLING UNDER FLOOR SLABS LOAD LINE 4 PLAN VIEW

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LEGEND

- BUILDING FOOTPRINT TO BE SAMPLED
- BUILDING AND WALKWAY
- ASPHALT ROAD
- GRAVEL ROAD
- RAILROAD TRACKS
- FENCE LINE
- CONTOUR (2 FT. INTERVAL)
- CONTOUR (10 FT. INTERVAL)
- TREE OR TREELINE
- STEAM STANCHION

US Army Corps of Engineers

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SCALE 1" ~ 200'

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URS

RAVENNA ARMY AMMUNITION PLANT
RAVENNA, OHIO

SOIL SAMPLING UNDER FLOOR SLABS BUILDINGS 5-15 AND F-16 PLAN VIEW

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1.3 NATURE AND EXTENT OF SUB-SLAB CONTAMINATION

Minimal sub-slab sampling was performed at Load Line 1 during the Phase II RI (SAIC, 2003). Soil samples were collected from beneath the floor slabs at six buildings (CB-4, CB-4A, CA-6, CA-6A, CB-10, and CB-13). The RI report concluded that the areas under the floor slabs showed little contamination. However, based upon data review and the Ohio EPA comments regarding the RI, no firm conclusions could be drawn from the limited amount of data obtained and the results. The nature and extent of sub-slab contamination was not fully delineated during the course of the RI.

No information was located describing any sub-slab sampling previously conducted at any of the other building locations included in this addendum.

The project description for the sub-slab sampling at Load Line 1 and the seven additional buildings was not substantively changed by the Modification No. 2 to Delivery Order 0006. The only substantive change is that soil determined to require removal will not be transported to Load Line 4 Buildings, but will, instead, be loaded, transported, and disposed at a licensed disposal facility in accordance with applicable state, federal, and local rules, laws, and regulations.

Most aspects of field screening for explosives, multi-increment (MI) sampling, and excavation of contaminated soil as described in the Final Work Plan will be followed similarly for Load Line #1 and the additional buildings. Any changes to the Final Work Plan are noted in following sections of this addendum.

During the review of this draft Work Plan Amendment and resolution of comments, the BRAC contractor began slab removal at Load Line 1 and the additional buildings. Modification 06 to Task Order 006 was executed on May 19, 2009, which required additional cover application at a number of high potential building footprints within 2 days of slab removal. Plastic cover was placed at building footprints CB-4, CB-4A, CA-6, CA-6A, CB-4VP1, CB-4AVP1, CB10-VP1, CB-10VP2, CB-10VP3, CA28, and CA28A. Additional plastic covering was applied within and outside footprints whenever staining was observed.

The appendices from the approved Final Work Plan (URS, 2008a) remain unchanged by this addendum, except for the addition of the buildings at Load Line 1, F-15, F-16, EB-803, G-1, G-1A, and G-3 to the project scope. The Work Plan appendices include:

- The Field Sampling Plan Addendum (Appendix A)
- The Quality Assurance Project Plan Addendum (Appendix B)
- The Site-Specific Health and Safety Plan (Appendix C)

All requirements contained in these plans will be adhered to in the sampling, analysis, and potential remediation for the additional building locations.

This section of the Final Work Plan describes the tasks that will be performed during the sampling and excavation. Any changes to those tasks are noted below.

3.1 PREMOBILIZATION

There are no changes to premobilization tasks for this additional field effort.

3.2 MOBILIZATION AND SITE PREPARATION

There are no changes to mobilization and site preparation tasks for this additional field effort.

3.3 PRE-SLAB REMOVAL SAMPLING

Pre-slab removal sampling was completed as described in the Final Work Plan, and is not part of this addendum.

3.4 WASTE PILE REMOVAL FROM BUILDINGS G-1 AND G-3

The waste pile removal from Buildings G-1 and G-3 was completed as part of the Final Work Plan, and is not part of this addendum.

3.5 COVERING OF THE REMOVED SLAB AREAS

There are some changes to the procedures for covering areas after slab removal. Modification 06 to Task Order 006 was executed on May 19, 2009, which required additional cover application at a number of high potential building footprints within 2 days of slab removal. Plastic cover was placed at building footprints CB-4, CB-4A, CA-6, CA-6A, CB-4VP1, CB-4AVP1, CB10-VP1, CB-10VP2, CB-10VP3, CA-28, and CA-28A. This plastic is inspected weekly and repaired or replaced if necessary. Additional plastic covering was applied within and outside footprints whenever staining is observed.

3.6 POST-SLAB REMOVAL SAMPLING

No changes to the overall, generalized sampling strategy are proposed for the additional buildings. Sampling will consist of both field screening (for two explosives) and confirmatory MI sampling for a wider suite of analytes.

Past Army experience at other ammunition plants indicates that there are certain process buildings within a load line that can be expected to have a greater potential for residual contamination than at other buildings. Based on information from the Joliet Army Ammunition Plant sampling results, and the results of the work at Load Lines 2, 3, and 4 earlier in 2008, the additional buildings were classified into three groups based on their likely potential for residual explosives contamination once floor slabs are removed. Twenty-one buildings were identified as high potential, 14 buildings were identified as medium potential, and 11 buildings were identified as low potential. Building classification rationales initially developed in the Final Work Plan were similarly applied for these additional buildings. Table 3-1 summarizes the building classifications.

Table 3-1
Classification of Buildings at Load Line 1 and Additional Building Locations
Ravenna Army Ammunition Plant
Ravenna, Ohio

High Potential for Explosives Contamination: Sampling Regime: Field Screening (4' Cores) and MI Confirmatory Sampling [1,2]	Medium Potential for Explosives Contamination Sampling Regime: 1 Field Screening Sample, MI Confirmatory Sampling	Low Potential for Explosives Contamination Sampling Regime: 1 Field Screening Sample, MI Confirmatory Sampling
CB-4 Melt Load (Propellants) (PCBs)	CB-2 Truck Maintenance (SVOCs)	CC-1 Powerhouse No. 1
CB-4A Melt Load (Propellants, PCBs, SVOCs)	CB-3 Shell Receiving (SVOCs, PCBs) [3]	CB-8 Change House
CA-6 Explosive Preparation (Propellants)	CB-4B Conveyor Drive House	CA-15 Change House
CA-6A Explosive Preparation (Propellants)	CA-5 Service	CB-20 Tool Storage
CB-4WN Washout Annex for Bldg. CB-4(Propellants)	CA-7 Service	CB-801 Inert Storage
CB-4WS Washout Annex for Bldg. CB-4 (Propellants)	CB-9 Service	1-51 Clock Alley
CB-4AWN Washout Annex for Bldg. CB-4A (Propellants)	CB-11 Service	1-51A Line Office
CB-4AWS Washout Annex for Bldg. CB-4A (Propellants)	CA-16 Service	T-4801 Boiler House
CB-10 Drill & Assembly and Munitions Rehabilitation (Propellants, PCBs)	CB-19 Electric Locomotive Service (SVOCs)	
CB-13/13A Packing & Shipping (Propellants)	CA-21 Service	*G-1 Inert Storage*
CB-13B Shipping Warehouse Annex (Propellants)	CB-25 Washout (to unknown source) [3]	*G-1A Inert Storage*
CA-14 Propellant Charge (Propellants)	CA-28 Elevator Machine House	*G-3 Receive and Paint*
CA-17 Propellant Charge Receiving (Propellants)	CA-28A Elevator Machine House	
CB-10VP1 Vacuum Pump House		
CB-10VP2 Vacuum Pump House	*EB-803 Inert Storage*	
CB-10VP3 Vacuum Pump House		
CB-4VP1 Vacuum Pump House		
CB-4AVP1 Vacuum Pump House		
F-15 Explosive and Propellant Testing (Propellants)		
F-16 Explosive and Propellant Testing (Propellants)		

(1) All confirmatory MI samples to be analyzed for explosives and metals. Additional analyses shown in parentheses on a building-by-building basis. Additional analyses to meet 10% full suite requirement are included in Table 3-5. Buildings not located at Load Line 1 are *italicized*.
(2) SVOCs: Semivolatile organic compounds; PCBs: Polychlorinated biphenyls
(3) Multiple field screening samples will be collected from this building footprint as described in Section 3.6.3.
(4) Inspections conducted during slab removal (April 21, 2009 through June 25, 2009) indicated that buildings CA-6VP1, CA-6AVP1 are not separate buildings but were incorporated as one slab with Building CA-6 and CA-6A. Buildings CB-12, CB-22 and CB-23 were not included in the slab removal project. Their footprints have been covered with hard fill. These five building footprints have been removed from the sampling scope.

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3.6.1 Rationales for Building Classification

3.6.1.1 Load Line 1

The Phase II RI for Load Line 1 concluded that the Explosives Handling Areas aggregate contained the highest concentrations and most extensive site-related contaminants (SRCs) within the load line (SAIC, 2003). The highest overall concentrations of explosive and propellant compounds in the soil were identified in the vicinity of the melt-pour buildings, Buildings CB-4/4A. The explosive preparation buildings, Buildings CA-6/6A were less contaminated relative to the melt-pour building areas. At the booster installation area (CB-10/13) the soil near the southeastern sides of the buildings was more heavily contaminated, suggesting that this is where the washdown effluent was directed (SAIC, 2003). Nitrocellulose was detected frequently across the entire load line production area.

At the demilitarization processing area (Buildings CB-14, and CB-17), minimal explosives contamination was detected in soil as well as lesser metal contamination. Lead, however, was elevated at some sampling stations in both surface and subsurface soil.

Buildings related to storage and maintenance facilities and the water tower area were relatively uncontaminated. The highest metal concentrations were associated with slag on the railroad bed and paint in the area of the water tower.

No explosives or propellants were detected in areas not associated with production (i.e., the perimeter) indicating minimal migration of contamination from the production area. Table 3-2 summarizes the Phase II RI findings for Load Line 1.

Based on the above RI information and the pattern of results of the sub-slab sampling at Load Lines 2, 3, and 4, the 19 buildings previously associated with explosives production are assigned the high potential sampling category. The service, storage, and maintenance buildings are assigned the medium potential sampling category; the perimeter buildings are assigned the low potential category.

3.6.1.2 Other Additional Buildings

Buildings F-15 and F-16 are defined as AOC RVAAP-46. These buildings were used to test miscellaneous explosives and propellants; however, details regarding the testing are unknown. Both buildings were characterized as part of the 14 AOC project (MKM, 2007). Over 20 metals and one organic compound (benzo(a)pyrene at 0.11 mg/kg) were detected in soil at levels above both RVAAP background and residential screening values. These two buildings are assigned the high potential sampling category.

At Load Line 3, the area near Building EB-803 was evaluated during the Phase II RI as part of the Preparation and Receiving Areas Aggregate (Shaw, 2004a). Explosives and propellants were detected in soil adjacent to the building. All of the explosives concentrations were less than 1 mg/kg. There were pervasive, variable detections of inorganics at this location. Low detections of polychlorinated biphenyls (PCBs) were also noted. Based on this information, Building EB-803 is assigned to the medium potential sampling category.

Table 3-2
Summary of Previous Investigative Findings
Ravenna Army Ammunition Plant
Ravenna, Ohio

Unit	Explosives and Propellants	Inorganics	SVOCs	VOCs	PCBs	Pesticides
Load Line 1 (Phase II RI)						
Melt-pour Buildings and Bulk Explosives preparation Areas (Includes Buildings CB-4, CB-4A, CA-6, CA-6A)	Surface soil: Area around CB-4A most heavily contaminated with both explosives and propellants. Explosives preparation buildings less contaminated. HMX and RDX detected frequently at CB-4A, but not at CB-4. Nitrocellulose detected frequently; maximum concentration at CB-4A (388 mg/kg). Subsurface soil: Explosive detections concentrated around melt-pour buildings. However, highest TNT was 4,500 mg/kg at CA-6A (1 to 3 ft). HMX and RDX maximum concentrations (8.1 and 58 mg/kg, respectively) at CB-4A. Nitrocellulose only propellant detected (maximum concentration of 29.3 mg/kg at CA-6A).	Surface soil: Highest metal concentrations at CB-4A. Barium, chromium, copper, lead, mercury, and zinc consistently elevated above background levels. Subsurface soil: Concentrations of metals generally lower than in surface soils. Barium, beryllium, cadmium, chromium, copper, lead, mercury, selenium, and zinc detected above background. Cyanide detected at the two melt-pour buildings (maximum concentration of 1.2 mg/kg).	Surface soil: 21 SVOCs detected sporadically across area. Most frequent detection was fluoranthene. Maximum concentration was 2.9 mg/kg at CA-4A.	Surface soil: Four VOCs detected at low levels. Maximum TCE concentration was 0.0067 mg/kg; maximum 1,2-DCE was 0.018 mg/kg (at CB-4).	Surface soil: PCB-1254 average concentration of 69.92 mg/kg. Maximum concentrations of 1,100 mg/kg at CB-4.	Surface soil: Eleven pesticides detected, maximum concentrations at CB-4. DDE was highest detection at 6.7 mg/kg.

Table 3-2 Continued

Unit	Explosives and Propellants	Inorganics	SVOCs	VOCs	PCBs	Pesticides
Booster Installation Area (Includes Buildings CB-10 and CB-13)	Surface soil: Southeast sides of buildings more heavily contaminated with explosives. Highest TNT was 230 mg/kg at CB-10. Nitrocellulose detected at a maximum concentration of 46.5 mg/kg. Subsurface soil: Only subsurface soil sample with explosive/propellant detections was collected in ditch near CB-13.	Surface soil: Average concentrations of chromium, copper, lead, and zinc above background. Subsurface soil: Antimony, barium, cadmium, chromium, copper, lead, mercury, selenium, and zinc detected above background at CB-13. Highest subsurface metal values on the load line, principally in ditch near CB-13.	Surface soil: Sixteen SVOCs all with average concentrations less than 0.3 mg/kg.	Surface soil: Five VOCs detected; only 1,2-DCE detected consistently. Maximum concentration was 0.0072 mg/kg.	Surface soil: PCB-1254 detected in three samples near CB-10 with a maximum concentration of 2.4 mg/kg.	Surface soil: Six pesticides detected at low levels.
Demilitarization Processing Area (Includes Buildings CA-14, CA-15, and CA-17)	Surface soil: Minimal explosives contamination detected. Subsurface soil: Only one detection of explosives (TNT/DNT) at concentrations less than 1 mg/kg and one detection of a propellant (nitrocellulose at 8.8 mg/kg) at CA-17.	Surface soil: Less metals contamination when compared with other production areas. Marginal exceedances above background. Elevated lead at some locations in both surface and subsurface soil. Subsurface soil: Cadmium, lead, and zinc exceeded background at CA-17.	Surface soil: 20 SVOCs detected; average concentrations ranged from 0.16 to 0.65 mg/kg. PAHs above 1 mg/kg: detected in two samples: benzo(b) fluoranthene (1.1 mg/kg) and fluoranthene (1.4 mg/kg). Samples were at CA-17 and CA-14, respectively.	Surface soil: Three VOCs detected; maximum concentration of 1,2-DCE was 0.0031 mg/kg near CA-17.	Surface soil: PCB-1254 detected in all samples. Maximum concentration was 4.7 mg/kg.	Surface soil: Seven pesticides detected at low levels. Highest detection was for endrin aldehyde (0.3 mg/kg).

Table 3-2 Continued

Unit	Explosives and Propellants	Inorganics	SVOCs	VOCs	PCBs	Pesticides
Load Line Storage and Maintenance Facilities (Includes Buildings CB-3, CB-801)	Surface soil: Detection of explosives sporadic and variable. Maximum TNT concentration was 1.2 mg/kg. Subsurface soil: No explosives or propellants detected.	Surface soil: Highest metal concentrations associated with slag on the railroad bed and paint residue in water tower area. Subsurface soil: No samples collected.	Surface soil: Twenty-two SVOCs, primarily PAHs. Fluoranthene detected at 39 mg/kg at CB-3.	Surface soil: Three VOCs detected and low concentrations. 1,2-DCE detected in all samples; maximum concentration of 0.0079 mg/kg.	Surface soil: Low levels of PCBs detected in two samples. Maximum concentration of PCB-1254 was 0.69 mg/kg.	Surface soil: Eight compounds detected at levels less than 1 mg/kg. Highest detected concentration was for endrin aldehyde at 0.21 mg/kg.
Nonproduction Area (Change Houses, and perimeter areas, and water tower)	Surface soil: No explosives or propellants detected. Subsurface soil: No explosives or propellants detected in one random-grid perimeter area sample.	Surface soil: Copper, lead, and zinc detected at levels greater than two times background at change house locations. Subsurface soil: No metal detections above background in single perimeter area sample.	Surface soil. Several SVOCs detected at change houses at levels less than 1 mg/kg.	Surface soil: Methylene chloride and toluene detected at very low concentrations (0.0019 to 0.0031 mg/kg) at change houses.	Surface soil: PCB-1254 detected at 0.11 mg/kg in one sample at change house CB-23.	Surface soil: Two pesticides detected at low levels at change houses (0.0014 to 0.0016 mg/kg).
Load Line 3 (Phase II RI)						
Preparation and Receiving Areas Aggregate (includes Building EB-803)	Explosives and propellants detected immediately adjacent to Building 803 (surface soil). All concentrations less than 1 mg/kg. Nitrocellulose present at a concentration of 29.9 mg/kg. No explosive compounds detected in subsurface soil greater than 1 mg/kg.	Surface soil: highest concentrations of inorganics west side of Building EB-803 Subsurface soil: at or near background levels	Surface: Low concentrations of PAHs (i.e., less than 1 mg/kg).	None.	Surface: Widely detected at low concentrations. Higher on west side of EB-803.	Surface: Low concentrations of pesticides.
Load Line 4						
Preparation and Receiving Areas Aggregate (includes Buildings G-1/1A and -3)	Surface Soil: explosives not detected. Nitrocellulose at low concentrations in one sample	Surface and subsurface soil: inorganics most pervasive site-related contaminants.	Surface soil: Low concentrations of PAHs, clustered near Building G-4	VOCs generally absent.	Surface soil: PCBs clustered near Building G-4 (48 mg/kg).	Surface soil: No pesticides were detected.

Table 3-2 Continued

Unit	Explosives and Propellants	Inorganics	SVOCs	VOCs	PCBs	Pesticides
Buildings F-15/F-16 (Characterization Report)						
Not applicable. Eighteen MI samples collected from surface soil in the vicinity of the two buildings.	No explosives detected above screening levels (i.e., Region 9 residential preliminary remediation goals). Nitrocellulose detected at a maximum concentration of 2.1 mg/kg.	Most inorganics detected above RVAAP background, but not above screening levels, (except for arsenic and aluminum).	Several PAHs detected, but at low concentrations (not above 1 mg/kg).	Not detected.	Not detected.	Not detected.

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At Load Line 4, Buildings G-1, G-1A, and G-3 were included in the Preparation and Receiving Areas Aggregate for this load line (Shaw, 2004b). No explosives were detected in these areas. The other potential SRCs were not detected, or were detected at relatively low levels in the soil. Based on this information, these three buildings are assigned the low potential category.

3.6.2 Work Sequencing

There are no changes to the work sequencing activities from the Final Work Plan.

3.6.3 Field Screening

There are no significant changes to the field screening activities from the Final Work Plan. Any changes to the previously approved screening protocol are noted below. Field screening samples will be collected within a 2-week field investigation period. The field investigation will be scheduled within 2 weeks of Work Plan approval.

At most low and medium potential buildings one field screening sample will be collected from the most obvious area of explosive contamination. Load Line 1 buildings were canvassed on September 5, 2008, to inventory and map any sources of obvious preferential pathways for sub-slab contamination, such as drains or sumps. At two medium potential buildings additional areas for field screening were identified. At Building CB-25 one field screening sample will be collected from the center of the building footprint and three additional samples will be collected from the sump on the near west side and along the piping run to the sump. At Building CB-3 one field screening sample will be collected from the center of the building footprint and three additional samples will be collected near the drain pipes at the northwestern portion of the footprint. Two of the drains are painted yellow indicating a possible explosive function. Approximate locations for these discrete field screening samples are shown on Figure 3-1.

During the previous sub-slab sampling at Load Lines 2, 3, and 4, it was observed that photoreactions occurred several days after slab removal. This reaction turned the soil in some areas of the building footprints a pink or reddish color, which would indicate a potential area of contamination. As slabs were removed from the additional buildings, inspections occurred during the 2-day required timeframe. Plastic cover was applied on most high potential building footprints and whenever staining was observed. An additional inspection will occur at the beginning of the field screening/MI sampling in order to bias samples toward areas that are visually contaminated. Advance notice of this inspection will be given to the stakeholders. Until sampling commences, the plastic covered areas will be inspected on a weekly basis and any new areas of staining covered as needed.

For the buildings considered high potential for residual explosive contamination, multiple 4-foot cores (five discrete samples per core) will be used to collect samples for TNT and RDX explosive field screening analysis. Table 3-3 shows the planned number of cores for each of these buildings and the approximate dimensions of the slabs; Figures 3-2 through 3-7 show the approximate core locations within each building footprint. During the September 5, 2008, inspection of Load Line 1 slabs, core locations were selected to bias sampling toward floor drains, holes in the slabs, electrical conduits, or other areas where preferential migration of contaminants may have occurred. At Building CB-13B, a core was biased toward the remnants

LEGEND

- LL1 PROPOSED SAMPLES
- BUILDING FOOTPRINT TO BE SAMPLED
- ASPHALT ROAD/WALKWAY
- GRAVEL ROAD
- RAILROAD TRACKS
- CONTOUR (2 FT. INTERVAL)
- CONTOUR (10 FT. INTERVAL)
- TREE OR TREELINE
- SUMP/FILTER BED

US Army Corps of Engineers

0 12.50 25 50
SCALE 1" ~ 50'

URS

RAVENNA ARMY AMMUNITION PLANT
RAVENNA, OHIO

SOIL SAMPLING UNDER FLOOR SLABS

ADDITIONAL DISCRETE FIELD SCREENING SAMPLES
BUILDINGS CB-3 AND CB-25

DRAWN BY:	CHECKED BY:	PROJECT No:	DATE:	FIGURE No:	PAGE No:
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Table 3-3
High Potential Buildings Planned for 4-Foot Core Sampling
Ravenna Army Ammunition Plant
Ravenna, Ohio

Bldg. Number	Building Type	Slab Area, sq. ft.	Number of Core Locations [(1)]	Remarks
Load Line 1 Buildings				
CB-4	Melt Load	21,288	12	Samples biased toward external scuppers, vitrified clay tile drains.
CB-4A	Melt Load	21,288	12	Samples biased toward external scuppers, vitrified clay tile drains.
CB-4VP1	Vacuum Pump House	100	1	Bias core locations toward any visual contamination.
CB-4AVP1	Vacuum Pump House	100	1	Bias core locations toward any visual contamination.
CA-6	Explosives Preparation	1,485	5	Samples biased to two drain locations.
CA-6A	Explosives Preparation	1,485	5	Samples biased to two drain locations.
CB-4WN	Washout Annex	865	2	Samples biased toward external scuppers, vitrified clay tile drains.
CB-4WS	Washout Annex	272	2	Samples biased toward external scuppers, vitrified clay tile drains.
CB-4AWN	Washout Annex	865	2	Samples biased toward external scuppers, vitrified clay tile drains.
CB-4AWS	Washout Annex	272	2	Samples biased toward external scuppers, vitrified clay tile drains.
CB-10	Drill Assembly	22,757	12	Bias two locations to drain and hole in slab.
CB-10VP1	Vacuum Pump House	138	1	Bias core locations toward any visual contamination.
CB-10VP2	Vacuum Pump House	138	1	Bias core locations toward any visual contamination.
CB-10VP3	Vacuum Pump House	138	1	Bias core locations toward any visual contamination.
CB-13/13A	Packing/Shipping	47,294	13	None
CB-13B	Shipping Annex	32,354	13	Bias four locations to rail siding and test area.
CA-14	Propellant Charge	22,300	15	Bias toward numerous perforated areas and drains.
CA-17	Propellant Charge Receiving	7,575	10	Bias toward electrical conduits on west side of slab
Additional Buildings				
F-15	Explosives and Propellant Testing	7,200	4	None
F-16	Explosives and Propellant Testing	7,200	4	None

[(1)]Approximate core locations are shown on Figures 3-1 through 3-7. Planned core depth of 4 feet. Five field screening samples will be collected from each core: at the top, from three portions distributed to best represent the materials in the core, and at the bottom. These samples will be analyzed for TNT and RDX in the field laboratory.

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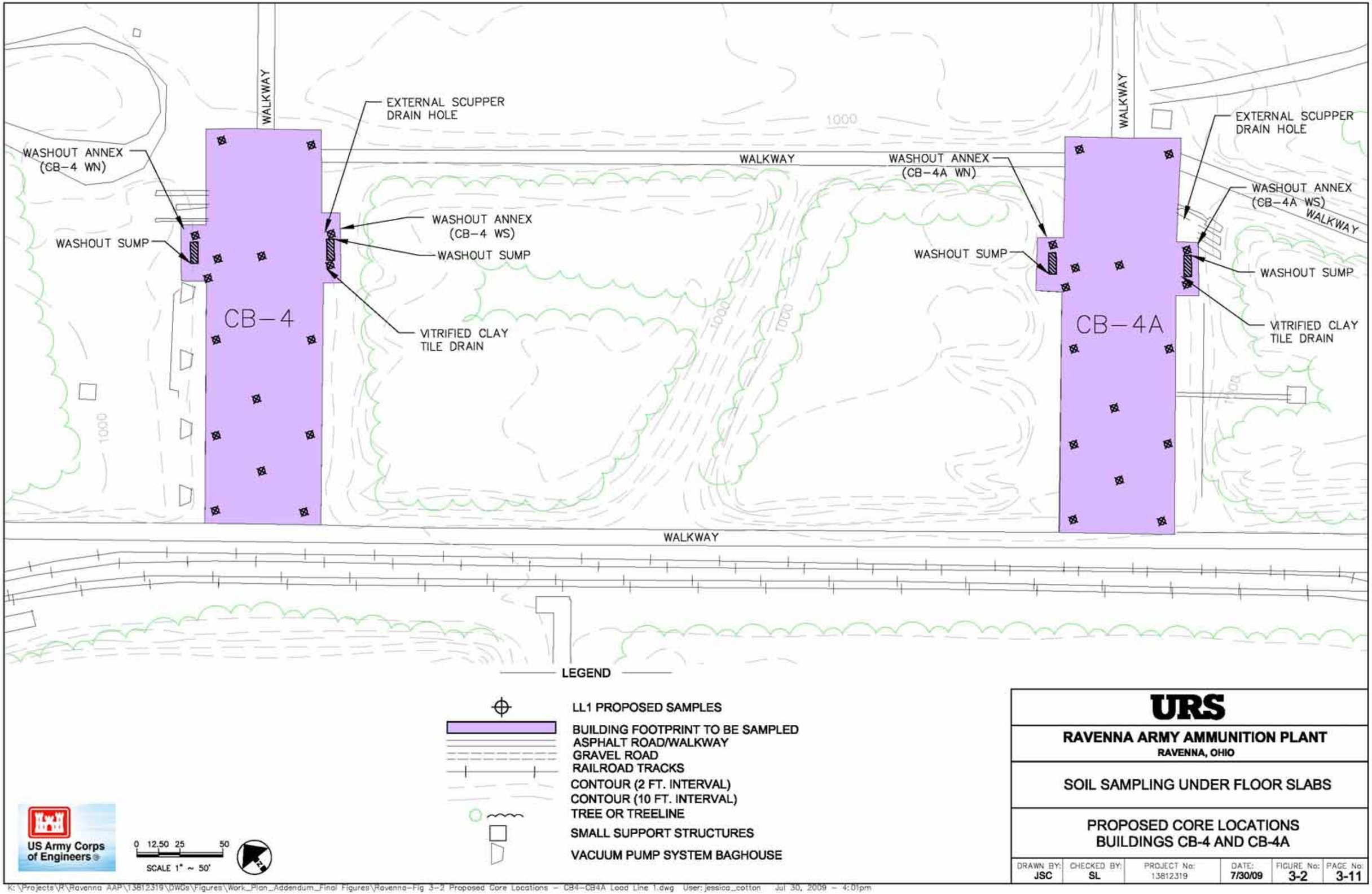

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RAVENNA ARMY AMMUNITION PLANT
RAVENNA, OHIO

SOIL SAMPLING UNDER FLOOR SLABS

PROPOSED CORE LOCATIONS BUILDINGS CB-4 AND CB-4A

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990

DRAIN

DRAIN

CB–6

DRAIN

DRAIN

CB–6A

1000

LEGEND

LL1 PROPOSED SAMPLES

BUILDING FOOTPRINT TO BE SAMPLED

ASPHALT ROAD / WALKWAY

GRAVEL ROAD

RAILROAD TRACKS

CONTOUR (2 FT. INTERVAL)

CONTOUR (10 FT. INTERVAL)

TREE OR TREELINE

US Army Corps of Engineers

0 12.50 25 50

SCALE 1" ~ 50'

URS

RAVENNA ARMY AMMUNITION PLANT
RAVENNA, OHIO

SOIL SAMPLING UNDER FLOOR SLABS

PROPOSED CORE LOCATIONS
BUILDINGS CB-6, CB-6A

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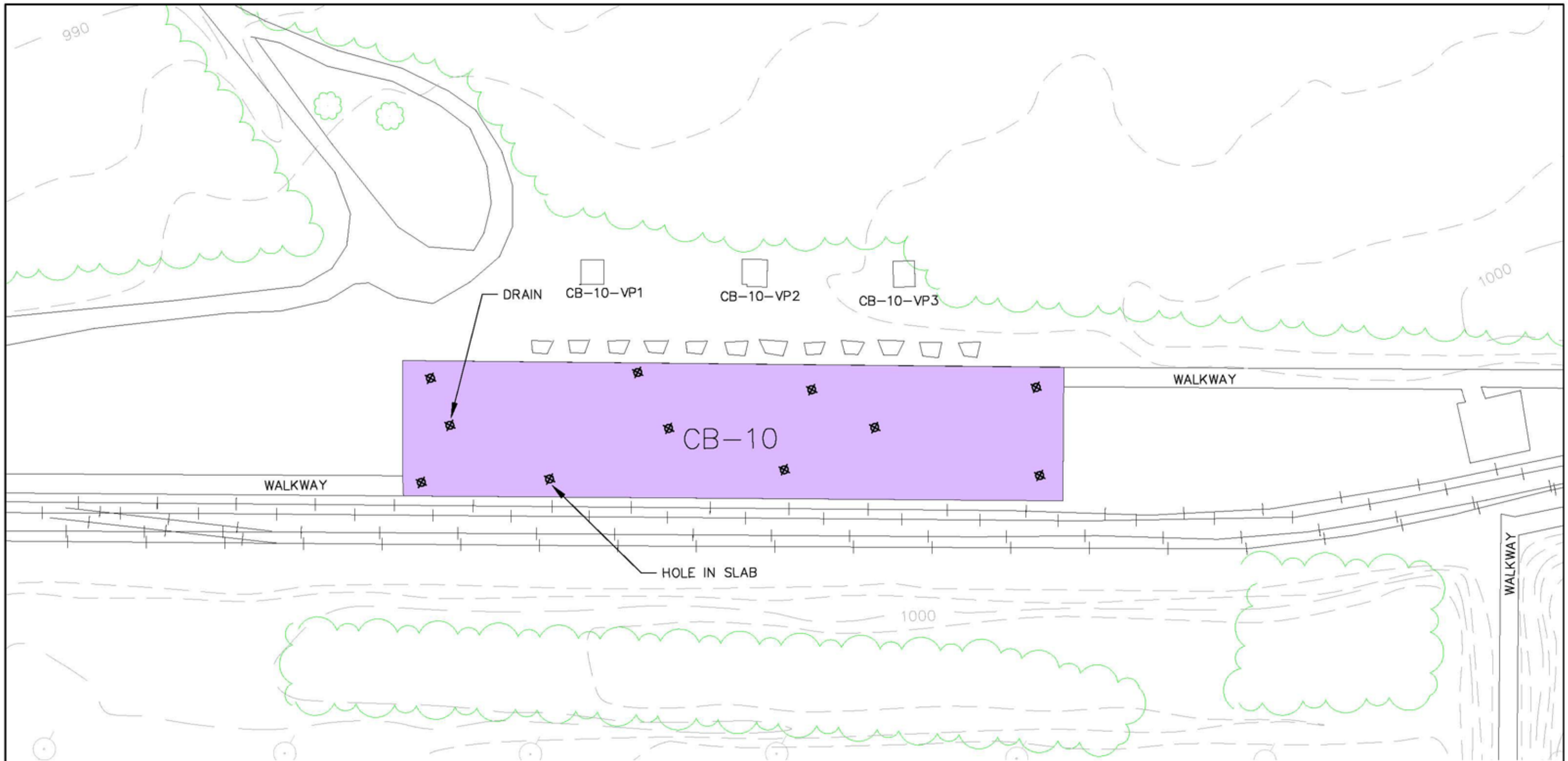

LEGEND

- LL1 PROPOSED SAMPLES
- BUILDING FOOTPRINT TO BE SAMPLED
- ASPHALT ROAD / WALKWAY
- GRAVEL ROAD
- RAILROAD TRACKS
- CONTOUR (2 FT. INTERVAL)
- CONTOUR (10 FT. INTERVAL)
- TREE OR TREELINE
- STEAM STANCHION
- VACUUM PUMP SYSTEM BAGHOUSE
- VACUUM PUMP HOUSE

US Army Corps of Engineers®

0 12.50 25 50

SCALE 1" ~ 50'

URS

RAVENNA ARMY AMMUNITION PLANT
RAVENNA, OHIO

SOIL SAMPLING UNDER FLOOR SLABS

PROPOSED CORE LOCATIONS
BUILDING CB -10

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992

990

WALKWAY

RAIL SIDING

TEST AREA
(FUNCTION UNKNOWN)

CB-13B

CB-13A

CB-13

WALKWAY

996

LEGEND

LL1 PROPOSED SAMPLES

BUILDING FOOTPRINT TO BE SAMPLED

ASPHALT ROAD / WALKWAY

GRAVEL ROAD

RAILROAD TRACKS

CONTOUR (2 FT. INTERVAL)

CONTOUR (10 FT. INTERVAL)

TREE OR TREELINE

SMALL SUPPORT STRUCTURES

SMALL SUPPORT STRUCTURES

US Army Corps of Engineers

0 12.50 25 50

SCALE 1" ~ 50'

URS

RAVENNA ARMY AMMUNITION PLANT
RAVENNA, OHIO

SOIL SAMPLING UNDER FLOOR SLABS

PROPOSED CORE LOCATIONS
BUILDINGS CB-13, CB-13A, CB-13B

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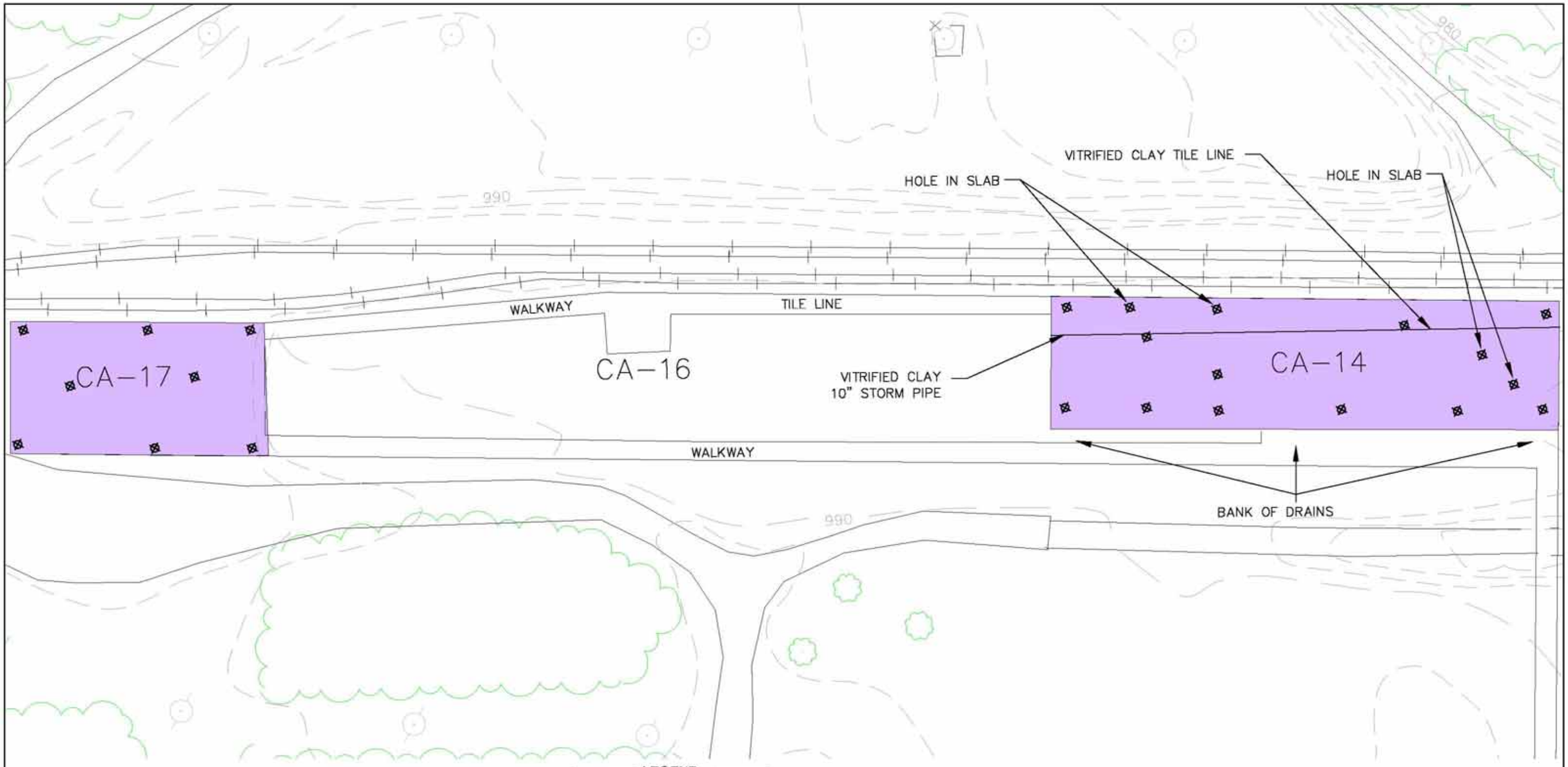

LEGEND

- LL1 PROPOSED SAMPLES
- BUILDING FOOTPRINT TO BE SAMPLED
- ASPHALT ROAD
- GRAVEL ROAD
- RAILROAD TRACKS
- CONTOUR (2 FT. INTERVAL)
- CONTOUR (10 FT. INTERVAL)
- TREE OR TREELINE
- STEAM STANCHION

US Army Corps of Engineers

0 12.50 25 50

SCALE 1" ~ 50'

URS

RAVENNA ARMY AMMUNITION PLANT
RAVENNA, OHIO

SOIL SAMPLING UNDER FLOOR SLABS

PROPOSED CORE LOCATIONS
BUILDINGS CA-14 AND CA-17

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LEGEND

- BUILDING FOOTPRINT TO BE SAMPLED
- BUILDING AND WALKWAY
- ASPHALT ROAD
- GRAVEL ROAD
- RAILROAD TRACKS
- CONTOUR (2 FT. INTERVAL)
- CONTOUR (10 FT. INTERVAL)
- TREE OR TREELINE
- STEAM STANCHION
- PROPOSED SAMPLES
- SUPPORT BUILDING

US Army Corps of Engineers®

0 50 100 200

SCALE 1" ~ 200'

URS

RAVENNA ARMY AMMUNITION PLANT
RAVENNA, OHIO

PROPOSED CORE LOCATIONS
BUILDINGS 5-15 AND F-16

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of containment and an exhaust hood (i.e., the test area).

Global Positioning System (GPS) coordinates of these areas were used in preparing these figures, and the figures can be inputted directly into the GPS device. Therefore, the biased areas will be easily located after the slabs are removed. The GPS coordinates for the building features are listed in Table 3-4. Field adjustments to the coring locations once the slabs are removed may be made upon approval of USACE and Ohio EPA.

It is anticipated that groundwater or refusal may be encountered before 4 feet is reached at some of the coring locations. The water table and bedrock surface may be encountered at less than 2 feet below ground surface at many locations throughout Load Line 1. Core samples will be collected every foot (until groundwater or refusal) under these circumstances.

Results from the core samples will be evaluated both laterally and vertically so that the area of impact can be delineated. These findings will be reviewed with both the USACE and Ohio EPA in order to determine excavation volumes. These volumes will be excavated and transported to a licensed disposal facility in accordance with applicable regulations.

3.6.4 Final Sampling

As long as there are no exceedances of the TNT or RDX cleanup values measured by the field screening tests, the final (or confirmatory) sampling will be done after completion of the screening sampling. If there are field screening exceedances, the final sampling will occur on the excavated surface after removal is complete. Table 3-5 summarizes the sampling scheme for each building included in this addendum, including both the analytical groups and those samples designated for either quality assurance (QA) or quality control (QC) samples. The MI sampling areas for some buildings are combined with other buildings based on their proximity and similarity of former use.

At four locations (CA-17, CA-14, CB-4 and CB-4A), additional MI samples will be collected, biased toward sub-slab features that could be indicative of releases. At the melt pour buildings, the area near the scuppers and sumps will be included in an additional MI sample. At Building CA-14, the additional MI will include the area along the entire building perimeter, approximately 8 to 10 feet inside the footer. At Building CA-17, the additional MI sample area will include the western perimeter along the electrical conduit locations.

At several locations, a discrete sample will be collected for volatile organic compound (VOC) analysis. In accordance with the *Facility-Wide QAPP*, 10% of the samples collected will be analyzed for the full analytical suite for RVAAP (defined as VOCs, semivolatile organic compounds (SVOCs), TAL metals, hexavalent chromium, propellants, PCBs, and pesticides).

Based upon conditions experienced during the sampling conducted at Load Lines 2, 3, and 4, water may accumulate on the building footprint prior to the final soil sampling. The decision on how to collect the required soil samples will be made on a case by case basis by conferring with the USACE and Ohio EPA. The decision will be subject to such considerations as evaporation/infiltration potential, timeframe in which sampling was initially to occur, depth of water, and whether or not the water is on plastic.

Table 3-4
Coordinates for Building Footprint Features, Load Line 1
Ravenna Army Ammunition Plant
Ravenna, Ohio

Point Name	Description	LATITUDE	LONGITUDE	NORTHING	EASTING
CA-17	West side, electrical conduits	41.123119	-81.01104	565243.921	2375817.36
CA-14-1	Bank of Drains, south end	41.122509	-81.010589	564632.889	2376172.792
CA-14-2	Drain	41.122522	-81.010612	564645.656	2376154.631
CA-14-3	Drain	41.12254	-81.010624	564663.472	2376145.2
CA-14-4	Drain	41.122556	-81.010636	564679.963	2376135.784
CA-14-5	Drain	41.122574	-81.010649	564697.616	2376125.816
CA-14-6	Drain	41.122595	-81.010662	564719.074	2376115.787
CA-14-7	Bank of Drains, north end	41.12261	-81.01067	564733.778	2376108.897
CA-14-8	Drain	41.122684	-81.010651	564808.74	2376122.35
CA-14-8h	Hole in slab	41.122675	-81.010669	564799.279	2376108.954
CA-14-9h	Hole in slab	41.122661	-81.010659	564785.653	2376116.702
CA-14-10h	Hole in slab	41.122598	-81.010593	564722.548	2376167.912
CA-14-11h	Hole in slab	41.122573	-81.0106	564697.865	2376163.391
CA-14-12h	Hole in slab	41.122544	-81.010599	564668.245	2376164.443
CA-14-13h	Hole in slab	41.122538	-81.010581	564662.591	2376178.663
CA-14-14h	Hole in slab	41.122514	-81.010574	564638.219	2376184.167
CB-4-1	VCT Drain	41.121195	-81.01007	563310.067	2376592.165
CB4-2d	Scupper hole to ground drain	41.121259	-81.010103	563373.926	2376565.986
CA6-1d	West Drain	41.121475	-81.005524	563600.346	2377004.305
CA6-2d	East Drain	41.121443	-81.0055	563568.723	2377023.135
CB-10	Drain	41.205079	-81.018813	563941.879	2376044.168
CB-10	Hole in slab	41.204831	-81.018742	563851.938	2376065.322

Table 3-5
Sampling for Load Line 1 and Additional Building Locations
Ravenna Army Ammunition Plant
Ravenna, Ohio

Description			Sq. Ft.			Analyses Required						
Sample Type	Building	Building Utilization	Slab Area	MI Area	Sample ID	EXPL	PROP	MET[1]	SVOCs	PCBs	PEST	VOC
Load Line 1	1-51	Clock Alley	1092	3132	LL1SS-nnnM-####-SO	X		X				
	1-51A	Line Office	2040									
	CC-1	Power House No.1	3158	3158	LL1SS-nnnM-####-SO	X		X				
	CB-2	Truck Maintenance	665	665	LL1SS-nnnM-####-SO	X		X	X			
	CB-3	Shell Receiving Building	17050	17050	LL1SS-nnnM-####-SO	X	X	X	X	X	X	
	CB-3	Shell Receiving Building	17050	17050	LL1SS-nnnD-####-SO							X
	CB-4 (#1)	Melt Load	21288	7096	LL1SS-nnnM-####-SO	X	X	X		X		
	CB-4 (#2)	Melt Load	21288	7096	LL1SS-nnnM-####-SO	X	X	X		X		
	CB-4 (#3)	Melt Load	21288	7096	LL1SS-nnnM-####-SO	X	X	X		X		
	CB-4A (#1)	Melt Load	21288	7096	LL1SS-nnnM-####-SO	X	X	X	X	X	X	
QA Sample	CB-4A (#1)	Melt Load	21288	7096	LL1SS-nnnM-####-QA	X	X	X	X	X	X	
Field MI Duplicate	CB-4A (#1)	Melt Load	21288	7096	LL1SS-nnnM-####-SO	X	X	X	X	X	X	
Blind Duplicate	CB-4A (#1)	Melt Load	21288	7096	LL1SS-nnnM-####-SO	X	X	X	X	X	X	
	CB-4A (#1)	Melt Load	21288	7096	LL1SS-nnnD-####-SO							X
VOC QA Sample	CB-4A (#1)	Melt Load	21288	7096	LL1SS-nnnD-####-QA							X
VOC Blind Dupl	CB-4A (#1)	Melt Load	21288	7096	LL1SS-nnnD-####-SO							X
	CB-4A (#2)	Melt Load	21288	7096	LL1SS-nnnM-####-SO	X	X	X	X	X	X	
	CB-4A (#2)	Melt Load	21288	7096	LL1SS-nnnD-####-SO							X
	CB-4A (#3)	Melt Load	21288	7096	LL1SS-nnnM-####-SO	X	X	X	X	X	X	
MS	CB-4A (#3)	Melt Load	21288	7096	LL1SS-nnnM-####-MS	X	X	X	X	X	X	
MSD	CB-4A (#3)	Melt Load	21288	7096	LL1SS-nnnM-####-MSD	X	X	X	X	X	X	
	CB-4A (#3)	Melt Load	21288	7096	LL1SS-nnnD-####-SO							X
VOC MS	CB-4A (#3)	Melt Load	21288	7096	LL1SS-nnnD-####-MS							X
VOC MSD	CB-4A (#3)	Melt Load	21288	7096	LL1SS-nnnD-####-MSD							X
	CB-4VP1	Vacuum Pump House	100	100	LL1SS-nnnM-####-SO	X		X				
	CB-4AVP1	Vacuum Pump House	100	100	LL1SS-nnnM-####-SO	X		X				
	CB-4WN	Washout Annex for CB-4	865	865	LL1SS-nnnM-####-SO	X	X	X				
	CB-4WS	Washout Annex for CB-4	272	272	LL1SS-nnnM-####-SO	X	X	X				
	CB-4AWN	Washout Annex for CB-4A	865	865	LL1SS-nnnM-####-SO	X	X	X				
	CB-4AWS	Washout Annex for CB-4A	272	272	LL1SS-nnnM-####-SO	X	X	X				
	CB-4B	Conveyor Drive House	496	496	LL1SS-nnnM-####-SO	X		X				
	CA-5	Service Building	665	665	LL1SS-nnnM-####-SO	X		X				
QA Sample	CA-5	Service Building	665	665	LL1SS-nnnM-####-QA	X		X				
Field MI Duplicate	CA-5	Service Building	665	665	LL1SS-nnnM-####-SO	X		X				
Blind Duplicate	CA-5	Service Building	665	665	LL1SS-nnnM-####-SO	X		X				
	CA-6	Explosive Preparation	1485	1553	LL1SS-nnnM-####-SO	X	X	X				
	CA-28	Elevator Machine House	68									
	CA-6A	Explosive Preparation	1485	1553	LL1SS-nnnM-####-SO	X	X	X				
	CA-28A	Elevator Machine House	68									
	T-4801	Boiler House	500	500	LL1SS-nnnM-####-SO	X		X				
	CA-7	Service Building	665	665	LL1SS-nnnM-####-SO	X		X				
MS	CA-7	Service Building	665	665	LL1SS-nnnM-####-MS	X		X				
MSD	CA-7	Service Building	665	665	LL1SS-nnnM-####-MSD	X		X				
	CB-8	Change House	6770	6770	LL1SS-nnnM-####-SO	X		X				
	CB-9	Service Building	665	665	LL1SS-nnnM-####-SO	X		X				
	CB-10 (#1)	Drill & Assembly/ Munitions Rehabilitation	22757	11379	LL1SS-nnnM-####-SO	X	X	X	X	X	X	
	CB-10 (#1)	Drill & Assembly/ Munitions Rehabilitation	22757	11379	LL1SS-nnnD-####-SO							X
	CB-10 (#2)	Drill & Assembly/ Munitions Rehabilitation	22757	11379	LL1SS-nnnM-####-SO	X	X	X		X		
	CB-10VP1	Vacuum Pump House	138	414	LL1SS-nnnM-####-SO	X		X				
	CB-10VP2	Vacuum Pump House	138									
	CB-10VP3	Vacuum Pump House	138									
	CB-11	Service Building	665	665	LL1SS-nnnM-####-SO	X		X				
	CB-13/13A	Packing and Shipping	47294	47294	LL1SS-nnnM-####-SO	X	X	X				
QA Sample	CB-13/13A	Packing and Shipping	47294	47294	LL1SS-nnnM-####-QA	X	X	X				
Field MI Duplicate	CB-13/13A	Packing and Shipping	47294	47294	LL1SS-nnnM-####-SO	X	X	X				
Blind Duplicate	CB-13/13A	Packing and Shipping	47294	47294	LL1SS-nnnM-####-SO	X	X	X				
	CB-13B	Shipping Warehouse Annex	32354	32354	LL1SS-nnnM-####-SO	X	X	X				
	CA-14 (#1)	Propellant Charge	22300	2230	LL1SS-nnnM-####-SO	X	X	X				
	CA-14 (#2)	Propellant Charge	22300	20070	LL1SS-nnnM-####-SO	X	X	X				
	CA-15	Change House	6770	6770	LL1SS-nnnM-####-SO	X		X				
	CA-16	Service Building	665	665	LL1SS-nnnM-####-SO	X		X				
	CA-17 (#1)	Propellant Charge	7575	3788	LL1SS-nnnM-####-SO	X	X	X				
	CA-17 (#2)	Propellant Charge	7575	3788	LL1SS-nnnM-####-SO	X	X	X				
MS	CA-17 (#2)	Propellant Charge	7575	3788	LL1SS-nnnM-####-MS	X	X	X				
MSD	CA-17 (#2)	Propellant Charge	7575	3788	LL1SS-nnnM-####-MSD	X	X	X				
	CB-19	Electric Locomotive Service	665	665	LL1SS-nnnM-####-SO	X		X	X			
	CB-20	Tool Storage	2801	2801	LL1SS-nnnM-####-SO	X		X				
	CA-21	Service Building	665	665	LL1SS-nnnM-####-SO	X		X				
	CB-25	Washout	168	168	LL1SS-nnnM-####-SO	X		X				
	CB-801 (#1)	Inert Storage	41213	20607	LL1SS-nnnM-####-SO	X		X				
	CB-801 (#2)	Inert Storage	41213	20607	LL1SS-nnnM-####-SO	X		X				
Load Line 3	EB-803 (#1)	Inert Storage	41213	20607	LL3SS-nnnM-####-SO	X		X				
	EB-803 (#2)	Inert Storage	41213	20607	LL3SS-nnnM-####-SO	X		X				
Bldgs.F15/16	F-15	Explosive & Propellant Testing	7200	7200	F15SS-nnnM-####-SO	X	X	X				
QA Sample	F-15	Explosive & Propellant Testing	7200	7200	F15SS-nnnM-####-QA	X	X	X				
Field MI Duplicate	F-15	Explosive & Propellant Testing	7200	7200	F15SS-nnnM-####-SO	X	X	X				
Blind Duplicate	F-15	Explosive & Propellant Testing	7200	7200	F15SS-nnnM-####-SO	X	X	X				
	F-16	Explosive & Propellant Testing	7200	7200	F16SS-nnnM-####-SO	X	X	X				
Load Line 4	G-1	Inert Storage	25001	25001	LL4SS-nnnM-####-SO	X		X				
QA Sample	G-1	Inert Storage	25001	25001	LL4SS-nnnM-####-QA	X		X				
Field MI Duplicate	G-1	Inert Storage	25001	25001	LL4SS-nnnM-####-SO	X		X				
Blind Duplicate	G-1	Inert Storage	25001	25001	LL4SS-nnnM-####-SO	X		X				
	G-1A	Inert Storage	25001	25001	LL4SS-nnnM-####-SO	X		X				
	G-3	Receive and Paint	17884	17884	LL4SS-nnnM-####-SO	X		X				

[1] MET = TAL Metals and Hexavalent Chromium

Primary MI Sample
Primary VOC Discrete Sample
Quality Assurance
Field MI Duplicate
Blind Duplicate
MS/MSDs

The MI soil samples from Load Lines 2, 3, and 4 were collected through the standing water after approval by the Ohio EPA with a technical change memo. A surface water sample was collected prior to collecting the soil increments. The surface water samples were analyzed for the same analytical parameters as the soil, as detailed in Table 3-5. A similar sampling scenario may be followed if approved for this work. There are no other changes to the MI sampling protocol from the approved Final Work Plan.

3.7 EXCAVATION AND DISPOSAL

Excavation activities will occur as described in the approved Final Work Plan except that the Load Line 4 buildings originally designated for the material will not be available. Under these circumstances, the material will be disposed at a licensed disposal facility in accordance with all applicable state, federal, and local rules, laws, and regulations.

Excavation will be conducted with tracked excavators, wheeled loaders, and dump trucks. All excavation areas will be surrounded with silt fence and straw bales as detailed in the site-specific Storm Water Pollution Prevention Plan. Excavation will be conducted in identified areas to a visual clean plus one additional foot laterally and vertically. Field screening samples will then be collected for analysis of TNT and RDX. The samples will be collected from both the side walls and the excavation bottom. If the concentrations are below the adjusted Cleanup Goals (CUGs), an additional 6" of soil will be removed over the entire excavation. In each excavation, two MI samples will then be collected. One MI sample will be representative of the floor of the excavation; the second MI sample will be collected from the side walls. Each MI sample will be analyzed for all the chemicals listed in the IROD. Once the MI samples are obtained, the GPS coordinates of each of the corners of the excavation will be determined and the excavation backfilled with clean fill.

Should the zone of impacted soils be encountered to a depth greater than 5 feet bgs or if saturated conditions are encountered, the USACE and the Ohio EPA will be notified regarding the situation and the path forward.

Contaminated material may be pre-characterized for disposal and loaded out directly to the extent possible. Depending on the actual areas of excavation and their size, excavated soils may have to be stockpiled temporarily prior to transporting to an approved disposal facility. The locations of stockpiles will be subject to USACE and Ohio EPA approval.

If soils are excavated based on different chemicals exceeding the clean-up levels, these soils will be kept separate since alternate disposal facilities (e.g., for PCBs) may be necessary. It is anticipated that soil stockpiles will be no more than 1,000 cubic yards each so that adequate waste characterization can be accomplished. Waste characterization will be dictated by the requirements of the disposal facility.

The preferred stockpile locations will be either on existing asphalt or concrete, thus minimizing any potential impacts to the soil. The bottom of each stockpile will be lined on two layers of 10 mil plastic and covered with a single layer of 10 mil plastic. The cover will then be secured to prevent any damage to the plastic or wind erosion of the material. Hay bales or soil berms will be placed around the perimeter of the stockpile to prevent storm-water runoff or run-on. Any storm water collected in the stockpile areas will be containerized and disposed appropriately.

Stockpile locations will be regularly inspected to ensure their integrity is maintained. Repairs to the plastic or securing system will be made immediately.

Load-out of contaminated soils from excavations or stockpiles to the disposal facility will follow the procedures established for the waste pile removals at Load Line 4 in Section 3.4 of the Final Work Plan.

3.8 TRANSPORTATION TO LOAD LINE 4

The transportation of waste piles from Load Line 4 buildings was completed as part of the Final Work Plan, and is not part of this addendum.

3.9 DECONTAMINATION

No changes are necessary to the decontamination activities in the approved Final Work Plan.

3.10 SCHEDULE

A facility-wide schedule of RVAAP activities will be obtained from USACE in order to coordinate with the appropriate parties once field activities are planned. Updates to this facility-wide schedule will be discussed biweekly and revised as necessary.

3.11 MEETINGS

There are no changes in the meeting schedule and frequency necessitated by this addendum.

This addendum does not change any portions of Section 4.0 of the approved Final Work Plan. The environmental resources within the project boundaries and those affected outside the limits of permanent work under this contract will be protected during the entire period of this contract. URS will confine its activities to areas defined by this addendum.

This addendum does not change any portions of Section 5.0 of the approved Final Work Plan. All project documentation and QA/QC will be in accordance with the Final Work Plan and its supporting appendices.

This addendum does not change any portions of Section 6.0 of the approved Final Work Plan. The handling and disposition of investigation-derived waste will be in accordance with the provisions of the approved Final Work Plan and its supporting appendices.

This section describes the CUGs that will be used in this project to make excavation decisions.

The CUG for field screening comparisons will remain unchanged for RDX (i.e., 838 mg/kg). This is the cleanup level from the Interim Record of Decision (IROD). The statistical analysis of the correlation samples collected during the previous screening effort at Load Lines 2, 3, and 4 indicated that neither a significant high or low bias was present for RDX (URS, 2008b). On the other hand, the regression equation developed for TNT indicated there was significant low bias in the screening samples relative to the fixed lab concentrations. Therefore, there is some potential for a false negative (i.e., determining the cleanup level was met when in fact it was exceeded) if the screening level result is measured between approximately 878 mg/kg and the TNT IROD cleanup level of 1,646 mg/kg. Therefore, at any building footprint where a TNT screening result is above 878 mg/kg will be covered with plastic. At these areas the decision to remediate will not be made, however, until the MI sample result confirms the exceedance of the IROD cleanup level.

The results of the MI sampling will be used to determine if additional excavation will be required at any of the building locations. The CUGs provided in the IROD (Shaw, 2007) and summarized in the Final Work Plan will be used. The results of the final MI samples may indicate detected chemicals other than those listed in the IROD. When the MI data have been verified, and chemicals other than those listed in the IROD have been detected, Ohio EPA and USACE will be consulted in order to determine the path forward.

The following deliverables will be prepared relative to the project activities addressed by this addendum.

8.1 FIELD SCREENING AND FINAL SAMPLING REPORT

Documentation of the field screening investigation and the confirmatory MI sampling will be included in one report. The report will be organized so that the results and conclusions for the high potential buildings, the medium potential buildings, and the low potential buildings can be viewed separately. Conclusions regarding the necessity for remediation will be presented. The preliminary draft report will be submitted 30 days after the receipt of all the analytical data from the fixed laboratory. Draft and final reports will be submitted to the stakeholders after USACE review of the preliminary draft.

8.2 REMEDIATION REPORT

Upon completion of all work at Load Line 1 and the additional buildings, a Remediation Report will be prepared. The report will include a description of all sampling and remediation activities completed in accordance with this addendum. Maps depicting the extent of contamination and the subsequent excavation will be included as well as copies of all disposal records. The preliminary draft report will be submitted 60 days after the last excavation and disposal occurs. Draft and final reports will be submitted to the stakeholders after USACE review of the preliminary draft.

A similar Remediation Report for Load Lines 2, 3, and 4 will be prepared at the completion of that work.

MKM. 2007. MKM Engineers, Inc. Characterization of Buildings F-15/16. Final Characterization of 14 AOCs at Ravenna Army Ammunition Plant. March 2007/

SAIC. 2003. Phase II Remedial Investigation Report for the Load Line 1 at the Ravenna army Ammunition Plant, Ravenna, Ohio. Prepared for the US Army Corps of Engineers, Louisville District. June 2003.

Shaw. 2007. Shaw E & I. Interim Record of Decision for the Remediation of Soils at Load Lines 1 Through 4 at the Ravenna army Ammunition Plant, Ravenna, Ohio. January, 2007.

Shaw. 2004a. Shaw E & I. Phase II Remedial Investigation Report for Load Line 3 at the Ravenna Army Ammunition Plant, Ravenna, Ohio. Volume 1 - Main Text. Prepared for the US Army Corps of Engineers, Louisville District. Contract No. DACA45-03-D-0026. July 2004.

Shaw. 2004b. Shaw E & I. Phase II Remedial Investigation Report for Load Line 4 at the Ravenna Army Ammunition Plant, Ravenna, Ohio. Volume 1 - Main Text. Prepared for the US Army Corps of Engineers, Louisville District. Contract No. DACA45-03-D-0026. July 2004.

URS. 2008a. URS Group, Inc. Final of the Work Plan for the Sampling of Soils Below Floor Slabs at LLs-2,3,4 and Excavation and Transportation of Contaminated Soils to Load Line 4 (Buildings G-1, G-1A, and G-3). Ravenna Army Ammunition Plant, Ravenna, Ohio. Contract No. W912QR-04-D-0025, Delivery Order No. 0006. Prepared for the US Army Corps of Engineers. Final. May 29, 2008.

URS. 2008b. URS Group, Inc. Draft of the Sampling and Screening Analysis of Soils Below Floor Slabs at Load Lines 2,3,4. Ravenna Army Ammunition Plant, Ravenna, Ohio. Contract No. W912QR-04-D-0025, Delivery Order No. 0006. Prepared for the US Army Corps of Engineers. Preliminary Draft. November 3, 2008.

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APPENDICES A-D
Located in Work Plan

APPENDIX E
Comment Response Table
(with Final Transmittal Letter)

DRAFT OF WORK PLAN ADDENDUM #1 FOR THE SAMPLING OF SOILS BELOW FLOOR SLABS AND REMEDIATION AT RVAAP-08 LOAD LINE 1 AND OTHER BUILDINGS
COMMENT RESPONSE TABLE
JULY 23, 2009

Comment Number	Page No./ Line No.	New Page or Sheet	Comment	Recommendation	Response
Ohio EPA (Eileen Mohr)					
1	General		We need to look at the overall sampling scheme. During sampling at LLs 2, 3, 4, areas of red soil appeared after sampling had occurred… which resulted in additional areas being covered later on. Although later on in the text there is a note that this had occurred, there was not clear enough information/details as to how we would capture any potential contamination that appears subsequent to sampling.	This issue needs further discussion between the stakeholders.	Noted. URS has noted this phenomenon on several occasions during the course of the field operations for this project. When stained areas were observed at a later date after sampling, a notification was sent and plastic cover was applied to the area. URS continues to monitor the plastic cover integrity on a weekly basis. The following revision has been made to the text on Page 3-3, lines 32-35: *As slabs were removed from the buildings, inspections occurred during the 2-day required timeframe. Plastic cover was applied whenever staining was observed. An additional inspection will occur at the beginning of the field screening / MI sampling in order to bias samples toward areas that are visually contaminated. Advance notice of this inspection will be given to the stakeholders. Until sampling commences, the plastic covered areas will be inspected on a weekly basis and any new areas of staining covered as needed.*

Comment Number	Page No./ Line No.	New Page or Sheet	Comment	Recommendation	Response
2	General		The issue regarding sampling outside of the perimeter of the building to determine if any contamination has resulted from D/D is still not resolved. Recall that this issue was a subject of the additional work clause of the Director's Final Findings and Orders.	This issue needs further discussion between the stakeholders.	Noted. No response required.
3	General		Change requested.	As previously requested, integrate figures and tables with the text of the workplan.	In the final version of this Work Plan, and all other reports, both the tables and figures will be integrated within the text.
4	General		Missing figures.	Add figures for: F-15, F-16, EB-803, G1, G1-A, G3 and T4301.	Noted. Figures for F-15, F-16, EB-803, G-1, G-1A, and G-3 have been created for the final version of this document. Regarding T-4301, BRAC-D has removed this building from the current demolition list. All references to this building in the Work Plan have been removed.
5	iii/4		The text references discrete samples.	Please clarify why discrete samples are being proposed.	The text references the field screening samples. The field screening samples from the building slabs are discrete samples from predetermined locations, areas that are visually suspect, or the center of the building footprint.
6	1-2/4		The title indicates "nature and extent" of sub-slab contamination.	Nature and extent has not been determined at any of the AOC sub-slabs. Revise to indicate that this was minimal sampling conducted	Noted. Text was revised as follows: *Minimal sub-slab sampling was performed at Load Line 1 during the*

Comment Number	Page No./ Line No.	New Page or Sheet	Comment	Recommendation	Response
				through the slabs as part of a RI.	*Phase II RI (SAIC, 2003). Soil samples were collected from beneath the floor slabs at six buildings (CB-4, CB-4A, CA-6, CA-6A, CB-10, and CB-13). The RI report concluded that the areas under the floor slabs showed little contamination. However, based upon data review and the Ohio EPA comments regarding the RI, no firm conclusions could be drawn from the limited amount of data obtained and the results. The nature and extent of sub-slab contamination was not fully delineated during the course of the RI.*
7	1-2/7-8		The RI erroneously concluded that the areas under the slab showed little contamination. This was repeatedly pointed out by Ohio EPA over the course of the investigations, review process, and in meetings that the sampling was minimal (at best) and no firm conclusions could be drawn.	Revise the text.	Noted. Text revised as follows: *Minimal sub-slab sampling was performed at Load Line 1 during the Phase II RI (SAIC, 2003). Soil samples were collected from beneath the floor slabs at six buildings (CB-4, CB-4A, CA-6, CA-6A, CB-10, and CB-13). The RI report concluded that the areas under the floor slabs showed little contamination. However, based upon data review and the Ohio EPA comments regarding the RI, no firm conclusions could be drawn from the limited amount of data obtained and the results. The nature and*

Comment Number	Page No./ Line No.	New Page or Sheet	Comment	Recommendation	Response
					extent of sub-slab contamination was not fully delineated during the course of the RI.
8	Fig 1-2		Revise figure.	a. Add vacuum pump houses to the key (i.e., the circles with the numbers within). b. Add to the key what is meant by the very small circles with the dot inside.	Noted. a. - The circles with numbers designate the vacuum pump houses for bldg CB-10 and have been added to Figure 1-2. b. – The very small circles with the dot inside are a part of the original CAD file. These features have been identified as steam stanchions and have been so noted on the revised figure.
9	2-1/4-7		Explanation required.	The text indicates that the soil may still be transported to LL4 for temporary storage prior to disposal. Based on the fact that the designated buildings are to be removed, please clarify what conditions would need to be met in order to store materials here. Specifically, storage of material in these buildings should not impact the D/D schedule. There needs to be close coordination on this issue.	The intent of the text was to note that the original SOW specification to transport all excavated soils to the LL4 buildings had been changed. Since this is somewhat confusing the text has been changed as follows: *The only substantive change is that soil determined to require removal will not be transported to Load Line 4 Buildings, but will, instead, be loaded, transported, and disposed at a licensed disposal facility in accordance with applicable state, federal, and local rules, laws, and regulations.*
10	3-2/21-25		Text clarification requested.	Where do vacuum pump houses fit into the picture? Are there any	The seven vacuum pump houses will be evaluated as high potential

Comment Number	Page No./ Line No.	New Page or Sheet	Comment	Recommendation	Response
				elevator shafts that need to be dealt with?	buildings based upon the results from the field work at Load Line 2. One 4-foot core will be obtained from each footprint. Five screening samples will be analyzed from each core in the same manner as all other cores collected from building footprints. URS assumes that the elevator sump question results from the LL2 DB-4 north sump (DB-4-WN) and the hydraulic oil issue. To the best of our knowledge no other elevator sumps have exhibited a release of hydraulic oils to the surface. Similar conditions to LL2 DB-4 (surface water impoundment surrounding the steel casing) do not appear to exist at the other sumps.
11	3-2/33-38		Clarification requested.	Please describe what was found internal to EB-803 (floor cracks, etc.), and also what was found at other LLs at the prep/receiving areas. Is there a potential that this building should be moved into the high category?	Historically the inspections of the floors of Bldg. 803 and equivalents at LL 1 and 2 did not show any floor cracks, floor defects or other possible migration routes. The only drains observed were those in the restrooms and wash facilities. These buildings were originally intended to be maintained for future use based upon the structural condition and the fact that the historical use was preparation and

Comment Number	Page No./ Line No.	New Page or Sheet	Comment	Recommendation	Response
					receiving of nonexplosive materials. It is not recommended that these buildings be moved into the high potential category.
12	3-3/5-7		Disagree with assigning T-4301 into the low potential category.	According to historical information, explosives testing (type unknown) was conducted in this building. At a minimum, this building should be moved into the medium category and, preferably, the high category.	The slab at Building T-4301 will not be removed and all references to the building have been removed from the Work Plan. See comment # 4.
13	3-3/14-15		This portion of the text indicates that field screening will occur after the BRAC-D rep has cleared the slab.	Again, this is a step that was not in the original SOW or WP and was added in by the former BRAC-D rep. While we can live with this additional step, be advised that the "inspection" shall not negatively impact the necessary screening and potential soil covering described in the SOW/WP.	Noted.
14	3-3/29-35		We need to look at the overall sampling scheme. During sampling at LLs 2, 3, 4, areas of red soil appeared after sampling had occurred, which later resulted in additional areas being covered. It is not clear as to how we would capture any potential contamination that appears subsequent to the screening sampling. Are there going to be additional inspections?	This issue needs further discussion between the stakeholders.	Please see the response to Comment 1. An additional inspection will occur prior to the field screening/MI sampling.
15	3-3/36-37		Text addition requested.	Add in explosives to the suite of	Noted. Text changed as follows:

Comment Number	Page No./ Line No.	New Page or Sheet	Comment	Recommendation	Response
				constituents.	*For the buildings considered high potential for residual explosive contamination, multiple 4-foot cores (five discrete samples per core) will be used to collect samples for TNT and RDX explosive field screening analysis.*
16	3-4/37		Text change requested.	Change to read TAL metals.	Noted. The term metals is used in the text to capture both TAL metals and the analysis for hexavalent chromium. For clarification, the text was changed as follows: *….compounds (SVOCs), explosives, TAL metals, hexavalent chromium, propellants, polychlorinated biphenyls (PCBs) and pesticides.*
17	3-5/1-5		This text discusses how to sample a building footprint that may have standing water.	The decision on how to sample will be made on a case by case basis and subject to such considerations as to evaporation/infiltration potential, timeframe in which sampling was initially to occur, depth of water, whether or not the water is on plastic, etc. The text needs to be revised to reflect this strategy.	Text changed as follows: *Based upon conditions experienced during the sampling conducted at Load Lines 2, 3, and 4, water may accumulate on the building foot print prior to the final soil sampling. The decision on how to collect the required soil samples will be made on a case by case basis by conferring with the USACE and Ohio EPA. The decision will be subject to such considerations as evaporation/infiltration potential, timeframe in which sampling was initially to occur, depth of water, and*

Comment Number	Page No./ Line No.	New Page or Sheet	Comment	Recommendation	Response
					whether or not the water is on plastic. *The MI soil samples from Load Lines 2, 3, and 4 were collected through the standing water after approval by the Ohio EPA with a technical change memo. A surface water sample was collected prior to collecting the soil increments. The surface water samples were analyzed for the same analytical parameters as the soil, as detailed in Table 3-5. A similar sampling scenario may be followed if approved for this work. There are no other changes to the MI sampling protocol from the approved Final Work Plan.*
18	3-5/8		Explanation required.	The text indicates that the soil may still be transported to LL4 for temporary storage prior to disposal. Based on the fact that the designated buildings are to be removed, please clarify what conditions would need to be met in order to store materials here. Specifically, storage of material in these buildings should not impact the D/D schedule. There needs to be close coordination on this issue.	The intent of the text was to note that the original SOW specification to transport all excavated soils to the LL4 buildings had been changed. Since this is somewhat confusing the text has been changed as follows: *…except that the Load Line 4 buildings originally designated for the material will not be available.*
19	3-5/28-30		Assurance requested.	Please provide assurance that the load out of soils to the disposal	Removal of Load Line 1 soil to the disposal facility will not be as

Comment Number	Page No./ Line No.	New Page or Sheet	Comment	Recommendation	Response
				facility will not be as arduous as the previous removal of soils from the LL4 buildings.	arduous as the previous removal of soils from Load Line 4 buildings.
20	Fig 3-1		Revise figure.	a. There is a notation below CB-3 that indicates "drain pipes." Where do they drain to? b. Add a few contour elevations to the figure. c. The RR tracks in the figure do not match the key. Revise to be consistent. d. Explain why discrete samples are being taken. e. Add square with cross-hatching to key. f. Add walkways to the key.	a. Based upon the current state of the building slabs it is not clear where the pipes drained to. Based on additional field inspection, the nature or discharge point of the noted drains could not be ascertained. b. All available contour elevation values from the original USACE base map have been added to the figures. c. Noted. The key has been revised to match the figure. d. The listed discrete samples are being taken as per the SOW for screening purposes. e. Noted. The square structure is a sump/filter bed that had been added to the figure. f. Noted. Walkways have been added to the figure key.
21	Figure 3-2		Revise figure.	a. Clarify if there are sumps at the wash-out annex. b. The RR tracks in the figure do not match the key. Revise to be consistent. c. Any apparent exit points to the vitreous clay tile? d. Add polygon shape to the key.	a. Noted. The figures have been modified to indicate that sumps are present. b. Noted. The key has been revised to match the figure. c. None could be seen during the inspection. The drain appears to traverse behind the sump.

Comment Number	Page No./ Line No.	New Page or Sheet	Comment	Recommendation	Response
				e. Add square shape to the key. f. Add circle with "p" inside to the key. g. Add additional contour elevations to the figure. h. Add walkways to the key. i. What are the exit points for the external scupper drain holes?	d. Noted. The polygon shape representing the vacuum unit enclosures has been added to the figure. e. Noted. The square shape representing small structures has been added to the key. f. Noted. The requested addition to the figure has been made. g. Available contour elevation values have been added to the figure. h. Noted. Walkways have been added to the figure key. i. This is a drain hole in the bldg slab to the sub slab soil. It is not clear if a drain was originally installed in the opening or the scupper materials were drained directly onto the ground surface.
22	Figure 3-3		Revise figure.	a. Clarify the discharge points for the drains depicted on the figures. b. Add a few contour elevations to the figure. c. Add to the key what is meant by the circle with the dot inside and NE/SW trending line. d. The RR tracks in the figure do not match the key. Revise to be consistent. e. Add walkways to the key.	a. Based upon the inspection it is not clear where the discharge points for these drains were located since the drain pipes have been removed from the drain. b. Available contour elevation values have been added to the figure. c. The circle with a dot and line are identified as steam stanchions. The figure legend has been modified to clarify.

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					d. Noted. The key has been revised to match the figure. e. Noted. Walkways have been added to the figure key.
23	Figure 3-4		Revise figure.	a. Clarify the discharge points for the drains depicted on the figures. b. Add polygon shape to the key. c. Add square shape to the key. d. Add large circle to the key. e. The RR tracks in the figure do not match the key. Revise to be consistent. f. Add to the key what is meant by the circle with the dot inside and NE trending line segment. g. Add a few contour elevations to the figure. h. Add walkways to the key.	a. The discharge points for the listed drain could not be ascertained during the inspection due to the demolition and removal of the drain pipes. b. Noted. The polygon shape representing the vacuum unit enclosures has been added to the figure. c. Noted. The square shape representing small structures has been added to the key. d. The large circles are the labels indicating the number assigned to the vacuum pump house (See Figure 1-2). These labels have been removed from Figure 3-4 and the VP buildings labeled appropriately. e. Noted. The key has been revised to match the figure. f. The circle with a dot and line are identified as steam stanchions in Figure 1-2. The figure legend will be modified to clarify. g. Available contour elevation values have been added to the figure. h. Walkways have been added to

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					the figure legend.
24	Figure 3-5		Revise figure.	a. The RR tracks in the figure do not match the key. Revise to be consistent. b. Add rectangle to the key. c. Add square to the key. d. Describe what is meant by "test area." e. Add a few contour elevations to the figure. f. Add walkways to the key.	a. Noted. The key has been revised to match the figure. b. Noted. The rectangle shape representing small structures has been added to the key. c. Noted. The square shape representing small structures has been added to the key. d. Based upon the field inspection, the test area is an area where unknown testing was conducted. Remnants of containment and an exhaust hood remain. The figure has been modified to note former test area with unknown purpose. This information was also added to Section 3.6.3. e. Available contour elevation values have been added to the figure. f. Noted. Walkways have been added to the figure key.
25	Figure 3-6		Revise figure.	a. The RR tracks in the figure do not match the key. Revise to be consistent. b. Any apparent exit points to the vitreous clay tile lines? c. Add to the key what is meant by the circle with the dot inside and NE/SW trending line. d. Clarify the bank of drains, i.e.,	a. Noted. The key has been revised to match the figure. b. No. The tile line traverses near the eastern footer of the bldg and the beginning/end are not apparent. As with the other bldg slabs, there are significant health and safety concerns with any close inspection due to the unstable, partially

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				what they are, discharge points, etc. e. Add walkways to the key. f. Add a few contour elevations to the figure.	demolished slabs. c. Noted. The circle with a dot and line are identified as steam stanchions in Figure 1-2. The figure legend has been modified to clarify. d. The drains appear to mostly be from the former third floor and the discharge points are not known since the pipes are buried beginning at the ground surface. At least two of the drains are painted yellow indicating a possible explosive material function. This information was also added to Section 3.6.3. e. Noted. Walkways have been added to the figure key. f. Available contour elevation values have been added.
26	Table 3-1		Revise table.	a. Explain how CB-3 was selected for multiple field screening samples. b. T-4301 – move to medium or high category due to historical testing. c. Move F-15 and F-16 to high category. d. Distinguish the "additional buildings" from the LL1 buildings by using a different color or font type, etc. e. Weren't contaminants found at	a. The multiple screening samples are based upon slab drains noted during the field inspection as noted in Section 3.6.3. b. Noted. See response to comments # 4 and # 12 (not on demolition list). c. Buildings F-15 and F-16 have been moved to the high potential category. An additional figure showing core locations (four, 4-ft. cores per building) has been added. d. Noted. The non- Load Line 1

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				vacuum pump houses at other LLs? If so, move to the high potential category.	buildings have been distinguished by italicizing. e. Noted. See response to comment # 10 which addresses the USACE evaluation of this issue.
27	Table 3-2		Revise table.	Add in a summary of the additional buildings covered by this workplan.	Noted. The requested additional summary has been added to Table 3-2. The table title has been revised to reflect the inclusion of the non-Load Line 1 buildings.
28	Table 3-3		Revise table.	a. Clarification: are the core samples being sent to the lab? b. Clarify what is meant by two dashed lines in the rationale/remarks section.	a. No. These samples are part of the explosive field screening. The table is being modified with the following footnote: *These samples are being analyzed for TNT and RDX in the field laboratory*. b. The dashes will be replaced with the word *"None"*.
29	Table 3-5		Revise table.	a. Revise table based upon previous comments in this RTC table. b. Specify TAL metals.	a. Building T-4301 has been removed from this table based on the response to comment 4. b. MET will be defined in a footnote as TAL metals and hexavalent chromium.
30	7-1/Title		Clarification.	What is meant by "action level?	Action level (same as cleanup goal) is being used in reference to the predetermined levels for TNT and RDX that trigger a removal response if exceeded. The title of this section has been changed to "Cleanup Goals"

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31	7-1/19		Text revision requested. same	Change sentence to read: "Should this occur, consultation with the Ohio EPA and USACE will occur in order to determine the path forward." Delete the rest of lines 19 through 30.	The sentence has been revised as follows: *When the MI data have been verified, and chemicals other than those listed in the IROD have been detected, Ohio EPA and USACE will be consulted in order to determine the path forward.* The remaining lines on this page have been deleted.
32	Section 8.1		Clarification requested.	The text indicates that the screening and MI samples will be included in one report. Provide a discussion as to the change between the work conducted at LLs2-4 and this effort.	The field screening and MI sampling will be performed in the same mobilization in contrast to the previous work completed at Load Lines 2, 3, and 4, which were completed at separate times. The screening/MI work performed at Load Lines 2, 3, and 4 was separated due to the Work Plan approval process. The work at Load Line 1 will not require this separation of field work. Thus, the screening and MI data results can be presented in a single report.

Addendum to the Comment Response Table and Transmittal Letter for the Final Work Plan Amendment #1 for the Sampling of Soils Below Floor Slabs and Remediation at RVAAP-08 Load Line 1 and Other Building Locations

Report Section and Location	Summary of Change	Reason
Section 2.0, Project Description, Page 2-1	Insert was added to explain that Delivery Order 0006 was modified in May, 2009 to provide for plastic cover on certain building footprints 2 days after slab removal.	Modification was issued to provide for cover since slab removals began before the Work Plan Amendment was approved.
Section 3.5 Project Activities, Page 3-1	Insert was added to explain the change in covering building footprints.	Modification was issued since slab removals began before the Work Plan Amendment was approved
Tables 3-1 and 3-5, Pages 3-2 and 3-10	Buildings CA-6VP1, CA-6AVP1, CB-12, CB-22 and CB-23 deleted from sampling tables.	During the slab removal process it was determined that CA-6VP1 and CA-6AVP1 are not separate slabs, but were constructed as part of buildings CA-6 and CA-6A. Slabs were not removed from Buildings C-12, CB-22 and CB-23. These slabs remain and are covered with hard fill.
Tables 3-1 and 3-5, Pages 3-2 and 3-10	Building T-4801 (Boiler House) added to sampling tables.	This slab was removed and inspected and therefore needs to be sampled.
Section 3.7, Excavation and Removal, Page 3-20	The following details were added to this section: *Excavation will be conducted with tracked excavators, wheeled loaders, and dump trucks. All excavation areas will be surrounded with silt fence and straw bales as detailed in the site-specific Storm Water Pollution*	Revision documents decisions made between USACE and Ohio EPA regarding remediation at the Load Lines.

	Prevention Plan. Excavation will be conducted in identified areas to a visual clean plus one additional foot laterally and vertically. Field screening samples will then be collected for analysis of TNT and RDX. The samples will be collected from both the side walls and the excavation bottom. If the concentrations are below the adjusted Cleanup Goals (CUGs), an additional 6" of soil will be removed over the entire excavation. In each excavation, two MI samples will then be collected. One MI sample will be representative of the floor of the excavation; the second MI sample will be collected from the side walls. Each MI sample will be analyzed for all the chemicals listed in the IROD. Once the MI samples are obtained, the GPS coordinates of each of the corners of the excavation will be determined and the excavation backfilled with clean fill. *Should the zone of impacted soils be encountered to a depth greater than 5 feet bgs or if saturated conditions are encountered, the USACE and the Ohio EPA will be notified regarding the situation and the path forward.*	