4.0 FIELD ACTIVITIES

In order to organize and track sampling efforts for the Phase I RI at EBG, the AOC has been separated into 14 sub-areas based on operational data, available maps, and historical aerial photographs. These sub-areas and a summary of the environmental matrices that will be sampled within each are listed in Table 4-1. Areas 1 through 8 lie within the EBG and will be sampled to evaluate potential contaminant sources within the AOC. Areas 9 through 14 lie adjacent to or outside of EBG and will be sampled to evaluate off-AOC contaminant migration. The selection of these sub-areas for biased sampling is based on the project DQOs and conceptual site model described in Section 3.2.

4.1 SUBSURFACE SOILS

4.1.1 Rationales

Subsurface soil samples will be collected during the Phase I RI at EBG to investigate (1) potential subsurface contamination occurring as a result of surface thermal destruction of explosives and other munitions wastes and (2) transport pathways to deeper soil horizons for such contaminants as described in the DQOs (Section 3.2). Table 4-2 summarizes the planned EBG subsurface soil sampling activities for the Phase I RI.

4.1.1.1 Soil Boring Locations

As denoted in Table 4-1, subsurface soil samples are planned at locations along the railroad embankment, the gravel access road, and the "T-Area." All of these areas represent locations where surface soil samples will also be collected. The proposed locations were selected on the basis of DQOs and the conceptual site model developed from operational information and analytical results from previous sampling events (see Sections 1.0 and 3.2). Proposed sampling locations are shown in Figure 4-1.

A total of 45 subsurface soil samples will be collected from the 0.3- to 0.9-m (1- to 3-foot) interval. Table 4-3 describes the rationale for the placement of individual soil borings. Five sample locations are planned along the Track 49 embankment at the crest (both east and west of the former drainage channel). Six locations are planned along the north and south water edges at the base of the embankment east of the former channel. The locations of the samples along the southern water edge roughly correspond to three areas that appear devoid of vegetation as observed in 1952 vintage aerial photographs. Along the northern water edge, the easternmost location corresponds to the approximate location of the former waste chute; the remaining two sample locations are equally spaced.

Nineteen sample locations are planned along the middle and edges of the gravel access road leading to the Track 49 terminus, including four sample locations within the former staging/parking area at the northern end of the road. Within the "T-Area," 15 equally spaced sample locations are planned (5 along the north–south leg and 10 along the east–west leg).

Four additional subsurface contingency samples are planned and will be collected from areas adjacent to burning sites that exhibit visual evidence or indications of surface soil contamination. These subsurface contingency samples will be located in the field during the sampling effort.

Table 4-1. Phase I RI Sub-Areas at Erie Burning Grounds

Area No.	Description	Sample Matrix
1	Track 49 Railroad Embankment	Surface soil/subsurface soil/ballast
2	Gravel Access Road	Surface/subsurface soil
3	Inundated burning areas adjacent to Track 49 Embankment (north and south)	Sediment
4	Inundated burning areas adjacent to the gravel access road	Sediment
5	"T-Area"	Surface/subsurface soil
6	"T-Area" ditches	Sediment/surface water
7	Surface water basins (four)	Sediment/surface water
8	Former borrow area north of Track 49	Surface soil
9	Stream (culvert) immediately upstream of EBG (ambient inflow)	Sediment/surface water
10	Stream (culvert and channel) immediately downstream of EBG (exit pathway)	Sediment/surface water
11	Stream at PF 534	Sediment/surface water
12	Wooded area south of "T-Area"	Surface soil
13	East inlet to EBG	Sediment/surface water
14	Downstream of EBG at the Ore Piles (2 stations – one upstream of the piles, one at the tributary draining the piles)	Sediment/surface water

Table 4-2. Summary of Phase I RI Sampling at Erie Burning Grounds

Sampling Media	Sample Stations	Sampling Method	Depth (feet)	Samples/Station	Total No. of Samples	Explosives (8330)	Propellants (8330/352.2)	TAL Metals (6010/7000/7841/7470/7471)	Cyanide (9012)	VOCs (8260B)	SVOCs (8270C)	PCBs (8082)	Grain Size (ASTM D422)	Moisture Content (ASTM D2216)	Atterberg Limits (ASTM D4318)	Unified Soil Classification	Total Organic Carbon (9060)
Planned Samples[a,b]																	
Surface soils	51	Composite	0 to1	1	51	51	46										
Surface soils	51	Discrete	0 to 1	1	51			51	51	6	51	6	6	6	6	6	
Surface soils	2	Discrete	RR Ballast	1	2			2	2								
Subsurface soils	45	Discrete	1 to 3	1	45	45	14	45	45	5	45	5	5	5	5	5	
Sediment	22	Discrete	Loose	1	22	22	5	22	22		22		2		2	2	
Sediment	22	Discrete	Debris	1	22	22	5	22	22		22						
Sediment	60	Discrete	0 to 0.5	1	60	60	17	60	60	16	60	17	14		4	4	10
Surface water	16	Grab	--	1	16	16	16	16	16	16	16	16					
Total Planned	269				269	216	103	218	218	43	216	44	25	11	15	15	10
Contingency Samples																	
Surface soils[c]	4	Composite	0 to 1	1	4	4	1										
Surface soils	4	Discrete	0 to 1	1	4			4	4	0	4	1					
Subsurface soils	4	Discrete	1 to 3	1	4	4	1	4	4	1	4						
Sediments	2	Discrete	0 to 0.5	1	2	2	1	2	2		2						
Surface water	2	Grab	--	1	2	2	2	2	2	2	2	2					
Total Contingency	16				16	12	5	12	12	3	12	3					
QC Samples (A&E)																	
Surface soil	6	Composite	0 to 1	1	6	6	5										
Surface soil	6	Discrete	0 to 1	1	6			6	6		6	1					
Subsurface soil	5	Discrete	1 to 3	1	5	5	1	5	5	1	5						
Sediment	2	Discrete	Loose	1	2	2	1	2	2		2						
Sediment	2	Discrete	Debris	1	2	2		2	2		2						
Sediment	7	Discrete	0 to 0.5	1	7	7	2	7	7	2	7	2					
Surface water	2	Grab	--	1	2	2	2	2	2	2	2	2					
Total QC samples	30				30	24	11	24	24	5	24	5					
QA Samples (USACE)																	
Surface soil	6	Composite	0 to 1	1	6	6	5										
Surface soil	6	Discrete	0 to 1	1	6			6	6		6	1					
Subsurface soil	5	Discrete	1 to 3	1	5	5	1	5	5	1	5						
Sediment	2	Discrete	Loose	1	2	2	1	2	2		2						
Sediment	2	Discrete	Debris	1	2	2		2	2		2						
Sediment	7	Discrete	0 to 0.5	1	7	7	2	7	7	2	7	2					
Surface water	2	Grab	--	1	2	2	2	2	2	2	2	2					
Total QA Samples	30				30	24	11	24	24	5	24	5					

[a]Unused laboratory analyses will be applied to contingency sampling, if necessary.
[b]Unused subsurface samples will be applied as necessary to contingency sampling.
[c]Contingency sample for propellants analysis is tentatively planned for the wooded area south of the "T-Area" and north of Track 49.
SVOCs = Semivolatile organic compounds.
TAL = Target analyte list.
VOCs = Volatile organic compounds.

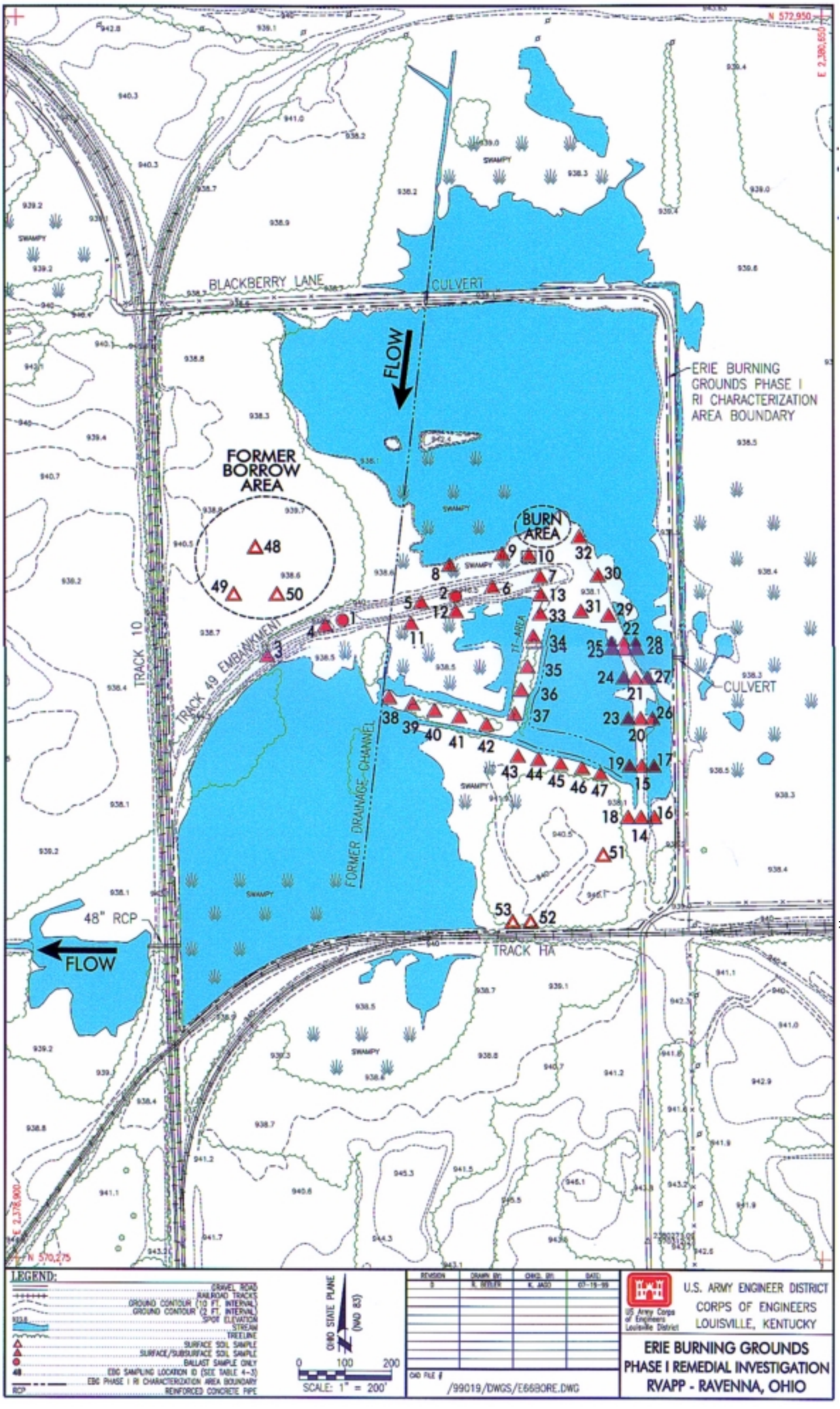

Figure 4-1. Surface Soil, Subsurface Soil, and Ballast Sampling Locations

Table 4-3. Phase II RI Sampling Locations and Rationale

Site Location	No. Sample Stations	Sample Station IDs	Location Description	Sample Station Rationale
Soils (see Figure 4-1)				
Track 49 Embankment	2	EBG-001	Track 49 spur railroad ballast, west of original creek.	Possible contaminant source due to spills or burning of munitions in railroad cars.
		EBG-002	Track 49 spur railroad ballast, east of original creek.	
Track 49 Embankment	2	EBG-003	Along crest of track west of original creek. Surface and subsurface soil samples.	Possible contaminant source due to spills or burning of munitions in railroad cars.
		EBG-004	Along crest of track west of original creek. Surface and subsurface soil samples.	
Track 49 Embankment	3	EBG-005	Along crest of track east of original creek. Surface and subsurface soil samples.	Possible contaminant source due to spills or burning of munitions in railroad cars.
		EBG-006	Along crest of track east of original creek. Surface and subsurface soil samples.	
		EBG-007	Along crest of track east of original creek. Surface and subsurface soil samples.	
Track 49 Embankment	3	EBG-008	On embankment, east of original creek, north water edge. Surface and subsurface soil samples.	Possible contaminant source due to spills and burning of munitions in rail cars or adjacent to railroad tracks.
		EBG-009	On embankment, east of original creek, north water edge. Surface and subsurface soil samples.	
		EBG-010	On embankment, east of original creek, north water edge. Surface and subsurface soil samples.	
Track 49 Embankment	3	EBG-011	On embankment, east of original creek, south water edge. Surface and subsurface soil samples.	Possible contaminant source due to spills and burning of munitions in rail cars or adjacent to railroad tracks.
		EBG-012	On embankment, east of original creek, south water edge. Surface and subsurface soil samples.	
		EBG-013	On embankment, east of original creek, south water edge. Surface and subsurface soil samples.	
Gravel Access Road	2	EBG-014	Southern 300 feet of road – center. Surface and subsurface soil samples.	Possible contaminant source area due to spillage from waste transport vehicles.

Table 4-3 (continued)

Site Location	No. Sample Stations	Sample Station IDs	Location Description	Sample Station Rationale
		EBG-015	Southern 300 feet of road – center. Surface and subsurface soil samples.	
Gravel Access Road	2	EBG-016	Southern 300 feet of road – east water edge. Surface and subsurface soil samples.	Possible contaminant source area due to spillage from waste transport vehicles.
		EBG-017	Southern 300 feet of road – east water edge. Surface and subsurface soil samples.	
Gravel Access Road	2	EBG-018	Southern 300 feet of road – west water edge. Surface and subsurface soil samples.	Possible contaminant source area due to spillage from waste transport vehicles.
		EBG-019	Southern 300 feet of road – west water edge. Surface and subsurface soil samples.	
Gravel Access Road	3	EBG-020	Northern portion of access road – center. Surface and subsurface soil samples.	Possible contaminant source area due to spillage from waste transport vehicles.
		EBG-021	Northern portion of access road – center. Surface and subsurface soil samples.	
		EBG-022	Northern portion of access road – center. Surface and subsurface soil samples.	
Gravel Access Road	3	EBG-023	Northern portion of access road – west water edge. surface and subsurface soil samples.	Possible contaminant source area due to spillage from waste transport vehicles.
		EBG-024	Northern portion of access road – west water edge. Surface and subsurface soil samples.	
		EBG-025	Northern portion of access road – west water edge. Surface and subsurface soil samples.	
Gravel Access Road	3	EBG-026	Northern portion of access road – east water edge. Surface and subsurface soil samples.	Possible contaminant source area due to spillage from waste transport vehicles.
		EBG-027	Northern portion of access road – east water edge. Surface and subsurface soil samples.	
		EBG-028	Northern portion of access road – east water edge. Surface and subsurface soil samples.	
Gravel Access Road	4	EBG-029	Northern portion of access road – staging/parking area. Surface and subsurface soil samples.	Possible contaminant source area due to spillage from waste transport vehicles, area adjacent to potential burning areas.

Table 4-3 (continued)

Site Location	No. Sample Stations	Sample Station IDs	Location Description	Sample Station Rationale
		EBG-030	Northern portion of access road – staging/parking area. Surface and subsurface soil samples.	
		EBG-031	Northern portion of access road – staging/parking area. Surface and subsurface soil samples.	
		EBG-032	Northern portion of access road – staging/parking area. Surface and subsurface soil samples.	
"T-Area"	5	EBG-033	North-South leg. Surface and subsurface soil samples.	Possible contaminant source area due to thermal destruction of munitions in this area.
		EBG-034	North-South leg. Surface and subsurface soil samples.	
		EBG-035	North-South leg. Surface and subsurface soil samples.	
		EBG-036	North-South leg. Surface and subsurface soil samples.	
		EBG-037	North-South leg. Surface and subsurface soil samples.	
"T-Area"	10	EBG-038	East-West leg. Surface and subsurface soil samples.	Possible contaminant source area due to thermal destruction of munitions in this area.
		EBG-039	East-West leg. Surface and subsurface soil samples.	
		EBG-040	East-West leg. Surface and subsurface soil samples.	
		EBG-041	East-West leg. Surface and subsurface soil samples.	
		EBG-042	East-West leg. Surface and subsurface soil samples.	
		EBG-043	East-West leg. Surface and subsurface soil samples.	
		EBG-044	East-West leg. Surface and subsurface soil samples.	
		EBG-045	East-West leg. Surface and subsurface soil samples.	
		EBG-046	East-West leg. Surface and subsurface soil samples.	
		EBG-047	East-West leg. Surface and subsurface soil samples.	
Former Borrow Area North of Track 49	3	EBG-048	Within known borrow pit boundaries. Surface soil samples only.	Possible contaminant source area, potential thermal destruction of munitions in this area.
		EBG-049	Within known borrow pit boundaries. Surface soil samples only.	
		EBG-050	Within known borrow pit boundaries. Surface soil samples only.	

Table 4-3 (continued)

Site Location	No. Sample Stations	Sample Station IDs	Location Description	Sample Station Rationale
Wooded Area South of "T-Area"	3	EBG-051	Along small east-west drainage ditch bisecting the area. Surface soil samples only.	Possible contaminant source area, visual observations of metal debris in this area.
		EBG-052	Location in vicinity of former OE sitings; TBD based on field observations. Surface soil samples only.	
		EBG-053	Location in vicinity of former OE sitings; TBD based on field observations. Surface soil samples only.	
Contingency	4	EBG-054	Location TBD. Surface and subsurface soil samples.	Additional sample coverage based on field observations. One propellant sample is tentatively planned for the wooded area south of the "T-Area" and north of Track 49.
		EBG-055	Location TBD. Surface and subsurface soil samples.	
		EBG-056	Location TBD. Surface and subsurface soil samples.	
		EBG-057	Location TBD. Surface and subsurface soil samples.	
Total Soil Stations	57			
Sediment Samples (see Figure 4-2)				
Track 49 Embankment	3	EBG-058	Along north water edge – loose, debris, and 0 to 0.5 foot samples.	Possible contaminant accumulation from spills and burning of munitions in rail cars or adjacent to railroad tracks.
		EBG-059	Along north water edge – loose, debris, and 0 to 0.5 foot samples.	
		EBG-060	Along north water edge – loose, debris, and 0 to 0.5 foot samples.	
	3	EBG-061	Along south water edge – loose, debris, and 0 to 0.5 foot samples.	Possible contaminant accumulation from spills and burning of munitions in rail cars or adjacent to railroad tracks.
		EBG-062	Along south water edge – loose, debris, and 0 to 0.5 foot samples.	
		EBG-063	Along south water edge – loose, debris, and 0 to 0.5 foot samples.	

Table 4-3 (continued)

Site Location	No. Sample Stations	Sample Station IDs	Location Description	Sample Station Rationale
Along Gravel Access Rd.	5	EBG-064	Along west water edge – loose, debris, and 0 to 0.5 foot samples.	Possible contaminant accumulation from spills along waste haul route and inundated burning areas.
		EBG-065	Along west water edge – loose, debris, and 0 to 0.5 foot samples.	
		EBG-066	Along west water edge – loose, debris, and 0 to 0.5 foot samples.	
		EBG-067	Along west water edge – loose, debris, and 0 to 0.5 foot samples.	
		EBG-068	Along west water edge – loose, debris, and 0 to 0.5 foot samples.	
Along Gravel Access Rd.	5	EBG-069	Along east water edge – loose, debris, and 0 to 0.5 foot samples.	Possible contaminant accumulation from spills along waste haul route and inundated burning areas.
		EBG-070	Along east water edge – loose, debris, and 0 to 0.5 foot samples.	
		EBG-071	Along east water edge – loose, debris, and 0 to 0.5 foot samples.	
		EBG-072	Along east water edge – loose, debris, and 0 to 0.5 foot samples.	
		EBG-073	Along east water edge – loose, debris, and 0 to 0.5 foot samples.	
Staging/Parking Area	6	EBG-074	Along water edge – loose, debris, and 0 to 0.5 foot samples.	Possible contaminant accumulation from spills along waste haul route and inundated burning areas.
		EBG-075	Along water edge – loose, debris, and 0 to 0.5 foot samples.	
		EBG-076	Along water edge – loose, debris, and 0 to 0.5 foot samples.	
		EBG-077	Along water edge – loose, debris, and 0 to 0.5 foot samples.	

Table 4-3 (continued)

Site Location	No. Sample Stations	Sample Station IDs	Location Description	Sample Station Rationale
		EBG-078	Along water edge – loose, debris, and 0 to 0.5 foot samples.	
		EBG-079	Along water edge – loose, debris, and 0 to 0.5 foot samples.	
"T-Area" ditches	20	EBG-080	0 to 0.5 foot below debris	Possible contaminant accumulation point due to surface water transport mechanisms from adjacent burning area.
		EBG-081	0 to 0.5 foot below debris	
		EBG-082	0 to 0.5 foot below debris	
		EBG-083	0 to 0.5 foot below debris	
		EBG-084	0 to 0.5 foot below debris	
		EBG-085	0 to 0.5 foot below debris	
		EBG-086	0 to 0.5 foot below debris	
		EBG-087	0 to 0.5 foot below debris	
		EBG-088	0 to 0.5 foot below debris	
		EBG-089	0 to 0.5 foot below debris	
		EBG-090	0 to 0.5 foot below debris	
		EBG-091	0 to 0.5 foot below debris	
		EBG-092	0 to 0.5 foot below debris	
		EBG-093	0 to 0.5 foot below debris	
		EBG-094	0 to 0.5 foot below debris	
		EBG-095	0 to 0.5 foot below debris	
		EBG-096	0 to 0.5 foot below debris	
		EBG-097	0 to 0.5 foot below debris	
		EBG-098	0 to 0.5 foot below debris	
		EBG-099	0 to 0.5 foot below debris	
Four Surface Water Basins	12	EBG-100	Subaqueous sediment	Possible contaminant accumulation points due from inundated burning areas and runoff from elevated source areas.
		EBG-101	Subaqueous sediment	

Table 4-3 (continued)

Site Location	No. Sample Stations	Sample Station IDs	Location Description	Sample Station Rationale
		EBG-102	Subaqueous sediment	
		EBG-103	Subaqueous sediment	
		EBG-104	Subaqueous sediment	
		EBG-105	Subaqueous sediment	
		EBG-106	Subaqueous sediment	
		EBG-107	Subaqueous sediment	
		EBG-108	Subaqueous sediment	
		EBG-109	Subaqueous sediment	
		EBG-110	Subaqueous sediment	
		EBG-111	Subaqueous sediment	
North Inlet to EBG	1	EBG-112	Blackberry Lane culvert	Characterization of ambient conditions.
Creek West of EBG	1	EBG-113	Downstream of 48-inch RCP beneath Track 10.	Surface water exit pathway.
PF 534	1	EBG-114	Parshall Flume at Route 534.	Facility discharge point.
East Inlet to EBG	1	EBG-115	Flow from offpost area through culvert beneath Blackberry Lane.	Characterization of ambient conditions.
Drainage Area Adjacent to Ore Piles	2	EBG-116	EBG drainageway, about 50 feet upstream of where the tributary from the Ore Piles flows into the drainageway.	Characterize and isolate any contaminant flux and associated potential impacts at PF 534 due to runoff from the Ore Piles rather than EBG.
		EBG-117	Tributary draining the Ore Piles, about 50 feet upstream of where it flows into the EBG drainageway.	
Contingency	2	EBG-118	Location TBD	Additional sample coverage based on field observations.
		EBG-119	Location TBD	
Total Sediment Locations	62			

Table 4-3 (continued)

Site Location	No. Sample Stations	Sample Station IDs	Location Description	Sample Station Rationale
Surface Water Samples (see Figure 4-2)				
"T-Area" ditches	6	Co-located with Sediment Sample	Ditch 1, co-located with sediment location TBD in the field based on flow conditions.	Possible contaminant accumulation point due to surface water transport mechanisms from adjacent burning area.
		Co-located with Sediment Sample	Ditch 2, co-located with sediment location TBD in the field based on flow conditions.	
		Co-located with Sediment Sample	Ditch 3, co-located with sediment location TBD in the field based on flow conditions.	
		Co-located with Sediment Sample	Ditch 4, co-located with sediment location TBD in the field based on flow conditions.	
		Co-located with Sediment Sample	Ditch 5, co-located with sediment location TBD in the field based on flow conditions.	
		Co-located with Sediment Sample	Ditch 6, co-located with sediment location TBD in the field based on flow conditions.	
Four Surface Water Basins	4	Co-located with Sediment Sample	Northeast basin, co-located with one of three sediment locations TBD in the field based on flow conditions.	Possible contaminant accumulation points due from inundated burning areas and runoff from elevated source areas.

Table 4-3 (continued)

Site Location	No. Sample Stations	Sample Station IDs	Location Description	Sample Station Rationale
		Co-located with Sediment Sample	Northwest basin, co-located with one of three sediment locations TBD in the field based on flow conditions.	
		Co-located with Sediment Sample	Southeast basin, co-located with one of three sediment locations TBD in the field based on flow conditions.	
		Co-located with Sediment Sample	Southwest basin, co-located with one of three sediment locations TBD in the field based on flow conditions.	
North Inlet to EBG	1	EBG-112	Blackberry Lane culvert, co-located with sediment sample.	Characterization of ambient conditions.
Creek West of EBG	1	EBG-113	Downstream of 48-inch RCP beneath Track 10, co-located with sediment sample.	Surface water exit pathway.
PF 534	1	EBG-114	Parshall Flume at Route 534, co-located with sediment sample.	Facility discharge point.
East Inlet to EBG	1	EBG-115	Flow from offpost area through culvert beneath Blackberry Lane, co-located with sediment sample.	Characterization of ambient conditions.
Drainage Area Adjacent to Ore Piles	2	EBG-116	EBG drainage way, about 50 feet upstream of where the tributary from the Ore Piles flows into the drainage way, co-located with sediment sample.	Characterize and isolate any contaminant flux and associated potential impacts at PF 534 due to runoff from the Ore Piles rather than EBG.
		EBG-117	Tributary draining the Ore Piles, about 50 feet upstream of where it flows into the EBG drainage way, co-located with sediment sample.	
Contingency	2	EBG-118	Location TBD, co-located with sediment sample.	Additional sample coverage based on field observations.
		EBG-119	Location TBD, co-located with sediment sample.	
Total Surface Water Locations	**18**			

4.1.1.2 Discrete/Composite Soil Sampling Requirements

All subsurface soil samples collected during the EBG Phase I RI will be collected from the 0.3- to 0.9-m (1- to 3-foot) depth interval. The sample location will be in the approximate center of the three surface soil composite samples collected for explosives and/or propellant analyses (see Section 4.2). All volatile organic compound (VOC) samples will be collected as discrete aliquots from the middle of the interval without homogenization. All remaining samples will be collected from homogenized soil collected using a bucket hand auger over the depth interval. Soil will be collected over the depth interval, placed into a stainless steel pan or bowl, homogenized, and representative aliquots placed into sample containers in accordance with Section 4.4.2.5.2 of the Facility-wide SAP.

4.1.1.3 Sample Collection for Laboratory Analysis

All subsurface samples will be submitted for off-site laboratory analysis of explosives, Target Analyte List (TAL) metals, cyanide, and semivolatile organic compounds (SVOCs). Fourteen samples will receive analyses for propellants. Six samples will be selected for VOC analysis and five samples for PCB analyses as follows:

- one sample from the Track 49 embankment;
- two samples along the northern half of the access road;
- two samples from the "T-Area"; and
- one contingency sample (VOC analysis only).

Geotechnical samples will be collected at five representative locations analyzed for moisture content, Atterberg limits, grain size distribution, and Unified Soil Classification System (USCS) classification. All four subsurface contingency samples will be submitted for laboratory analysis of explosives, TAL metals, cyanide, and SVOCs. One contingency sample will be submitted for propellants analysis. Up to one contingency sample may be submitted for VOC and PCB analyses. Geotechnical logging of all samples will be conducted including visual estimates of USCS classification and moisture content. Table 4-2 summarizes the analytical parameters and methods that will be used during the EBG Phase I RI. Analytical laboratory methods, analytes, and procedures are further discussed in the EBG Phase I RI Quality Assurance Project Plan (QAPP) Addendum.

4.1.1.3.1 Organic Vapor Screening

All soil borings will be field screened for VOCs using a hand-held photo-ionization detector (PID) or flame-ionization detector (FID) organic vapor analyzer (OVA) during sample collection. All OVA readings will be recorded in the field boring logs. No samples will be collected for additional headspace analysis of VOCs.

4.1.1.4 Field Quality Control Sampling Procedures

Subsurface soil quality assurance/quality control (QA/QC) samples will be collected during the Phase I RI. Duplicate soil samples will be collected at a frequency of 10% (1 per 10 environmental samples). Split samples will be submitted to the following USACE contract laboratory for independent analysis: GP Environmental, Inc., 202 Perry Parkway, Gaithersburg, MD 20877, (301) 926-6802.

Split samples will be collected at a frequency of 10% (1 per 10 environmental samples). Duplicate and split samples will be selected on a random statistical basis and submitted for the same analyses as the

environmental samples. No field or rinsate blanks will be collected for subsurface soils. Chapter 8.0 of the EBG Phase I RI QAPP Addendum summarizes QA/QC sampling.

4.1.2 Procedures

4.1.2.1 Drilling Methods

A hand-operated power auger will be used in conjunction with bucket hand augers to create the subsurface borings. The power auger will be used to advance the soil boring to the target depth interval of 0.3 to 0.9 m (1 to 3 feet) if necessary, as discussed in Sections 4.4.2.4.2 and 4.4.2.5.2 of the Facility-wide SAP. Once the boring has been advanced to the top of the 0.3- to 0.9-m (1- to 3-foot) interval with the power auger, a bucket hand auger will be used for the collection of the soil sample.

4.1.2.1.1 Equipment Condition and Cleaning

Requirements for the condition and cleaning of equipment used for well installation are described in Section 4.3.2.1.1 of the Facility-wide SAP. These requirements, as applicable, will be employed for equipment used to drill soil borings during the Phase I RI of EBG.

4.1.2.2 Field Measurement Procedures and Criteria

All field measurement procedures and criteria will follow Section 4.4.2.3 of the Facility-wide SAP, with the following exception. Headspace gases will not be screened in the field for organic vapors.

4.1.2.3 Sampling for Geotechnical Analysis

Subsurface soil samples collected using the hand auger method are classified as disturbed samples; therefore, geotechnical analysis of samples collected using these methods will be limited to grain size, Atterberg limits, moisture content, and USCS. Each soil sample collected will be visually classified according to the USCS in the field. Procedures for sampling for geotechnical analysis using the bucket hand auger method are presented in Section 4.4.2.4.2 of the Facility-wide SAP.

4.1.2.4 Sampling for Chemical Analysis

Procedures for sampling of subsurface soils for chemical analysis using the Bucket Hand Auger Method are presented in Section 4.4.2.5.2 of the Facility-wide SAP.

4.1.2.5 Sample Containers and Preservation

Requirements for sample containers and preservation techniques for subsurface soil samples are presented in Section 4.4.2.6 of the Facility-wide SAP and the EBG Phase I RI QAPP Addendum.

4.1.2.6 Decontamination Procedures

The decontamination procedure for subsurface soil sampling activities presented in Section 4.4.2.8 of the Facility-wide SAP will be followed, except that a 1% HCl acid rinse will be used instead of a 10% solution.

4.1.2.7 OE Screening

OE support staff will be present during all field operations. The OE Team Leader will train all field personnel to recognize and stay away from propellants and OE. Safety briefings for OE will also be provided to all site personnel and site visitors. All sample locations and access routes into the locations will be cleared for potential OE prior to entry. The OE Team Leader will clearly mark the boundaries of the cleared soil sampling locations and access routes. If surface OE is encountered, the approach path will be diverted away from the OE, the area clearly marked, and the OE Team Leader notified immediately. In any area where surface metallic OE is encountered, a magnetometer will be used to ensure that no subsurface OE exists within the approach path. Prior to collection of the surface soil sample (0 to 1 foot bgs), the OE team will verify that the location is anomaly free using a magnetometer. Where subsurface soil samples are to be collected (1 to 3 feet bgs), the auger will be withdrawn at the top of the subsurface interval (1 foot bgs) and the magnetometer lowered into the borehole to screen for subsurface magnetic anomalies. Should special circumstances dictate that the borehole be deepened beyond 3 feet bgs, then a magnetometer reading will be taken at the top of each subsequent 2-foot interval prior to augering.

4.2 SURFACE SOIL AND SEDIMENT

4.2.1 Rationales

Surface soil samples will be collected during the Phase I RI at EBG to identify impacted areas within EBG resulting from surface thermal destruction of explosives and other munitions wastes, and to identify the potential for contaminant migration via leaching or erosional processes from surface soil sources to receptor media, such as sediment and surface water (see Section 3.2). Table 4-2 summarizes the planned EBG surface soil and sediment sampling activities for the Phase I RI.

4.2.1.1 Surface Soil Sampling Locations

As denoted in Table 4-1, surface soil samples are planned at locations within five sub-areas: (1) the Track 49 embankment, (2) the gravel access road, (3) the "T-Area," (4) the borrow area north of Track 49, and (5) the wooded area south of the "T-Area" (sub-area 13). As denoted in Section 4.1, subsurface soil samples will also be collected at the same locations along the Track 49 embankment, along the access road, and in the "T-Area." The proposed locations were selected on the basis of DQOs and the conceptual site model developed from operational information and analytical results from previous sampling events (see Sections 1.0 and 3.2). Proposed sampling locations are shown in Figure 4-1.

A total of 51 surface soil samples will be collected from the 0- to 0.3-m (0- to 1-foot) interval. In addition, two samples of ballast material are planned along the Track 49 embankment; these are considered as surface samples for the purposes of this SAP Addendum. Four sample locations are planned as a contingency; locations will be determined in the field during the sampling effort. Contingency surface soil samples will be used to evaluate the horizontal extent of contaminated areas based on visual observations. The rationale for locating contingency surface soil samples is to target areas of obvious contamination, stressed vegetation, evidence of OE, or areas where additional samples may be deemed necessary based on field observations. Table 4-3 describes the rationale for the placement of individual soil sampling locations.

Seven sample locations, including the two ballast samples, are planned along the Track 49 embankment at the crest (four locations east and three locations west of the former drainage channel, respectively). With the exception of the ballast samples, all of the surface soil sample locations along Track 49 correspond to the subsurface soil locations discussed in Section 4.1.1.1. Ballast samples may be collected from one corresponding surface/subsurface soil sampling location east and west of the former drainage channel, or, if field conditions indicate, from alternate locations. Separate location identifiers have been assigned to these two samples, accordingly.

Nineteen sample locations are planned along the middle and edges of the access road leading to the Track 49 terminus, including four sample locations within the former staging/parking area at the northern end of the road. Within the "T-Area," 15 equally spaced sample locations are planned (5 along the north–south leg and 10 along the east–west leg). All of these locations correspond to those defined for subsurface soils in Section 4.1.1.1.

Three surface soil sample locations are planned for the former borrow area located north of Track 49. As indicated in Sections 1.0 and 3.2, this area may have been used for burning activities. Three surface soil samples are also planned for the wooded area south of the "T-Area." Visual observations of this area have shown metal debris and evidence of possible site-related activity.

4.2.1.2 Sediment Sampling Locations from Drainage Channels and Surface Water Basins

Sediment samples will be collected from four sub-areas (54 locations) within EBG and five sub-areas (six locations) outside of EBG during the Phase I RI (Table 4-1). Two additional contingency locations are planned and will be located based on field observations. The locations within EBG will identify whether contaminants from source areas are migrating via surface water dissolution and erosional processes and accumulating within sediment. Drainage ways entering EBG or upstream of the AOC provide data on baseline conditions and potential water quality impacts from other sources. Locations outside and downstream of EBG will provide data on potential contaminants exiting the site and accumulating within surface water drainage system sediments. Figures 4-2, 4-3, and 4-4 illustrate sediment sampling locations. Table 4-3 provides a description and rationale for each location.

Sediment sampling locations within EBG include:

- Three sediment locations are planned along Track 49 (sub-area 3) at the north water edge and three sites are planned along the south water edge. These stations are adjacent to known or suspected burning areas identified from historical aerial photos and operational data. Note that at each location, funding for collecting three samples—a loose surface material sample, a debris sample, and a sediment sample from 0 to 0.15 m (0 to 0.5 foot)—is provided for. If conditions are different from those assumed, the sampling strategy will be adapted but kept within the funding provided. For example, the sampling protocol may be adapted to collecting samples above, within, and below any identified hardpan layers, which potentially indicate a burn site.

- Ten sediment sampling sites are planned along the gravel access road (five at the western water edge and five at the eastern water edge). An additional six sites are planned along the water edges adjacent to the staging/parking area located at the northern terminus of the "T-Area." These samples are located to evaluate potential accumulated contaminants along this haul route and staging area, as well as from inundated borrow areas. Note that at each location, three samples will be collected: a loose surface material sample, a debris sample, and a sediment sample from 0 to 0.15 m (0 to 0.5 foot).

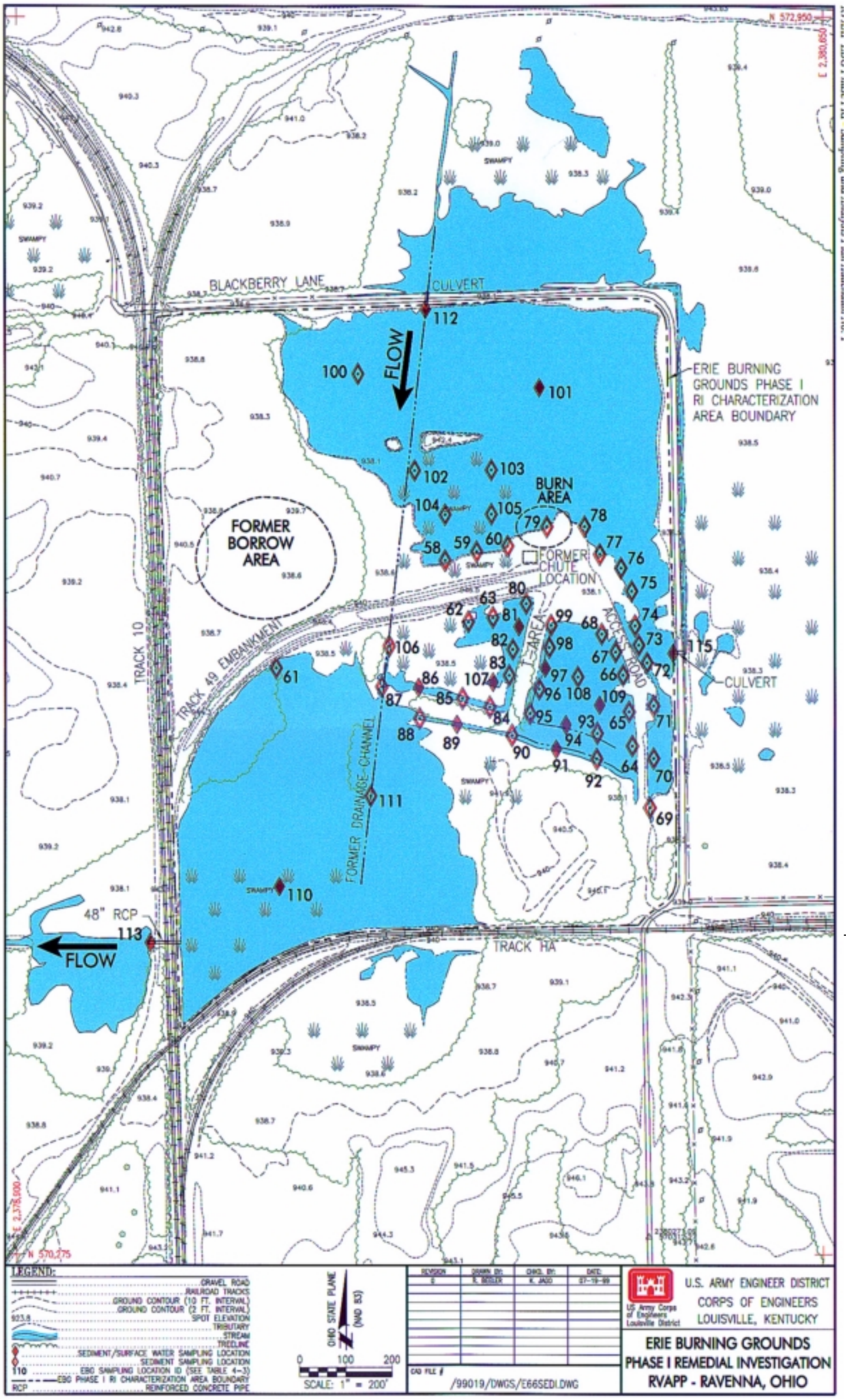

Figure 4-2. Surface Water/Sediment Sampling Locations

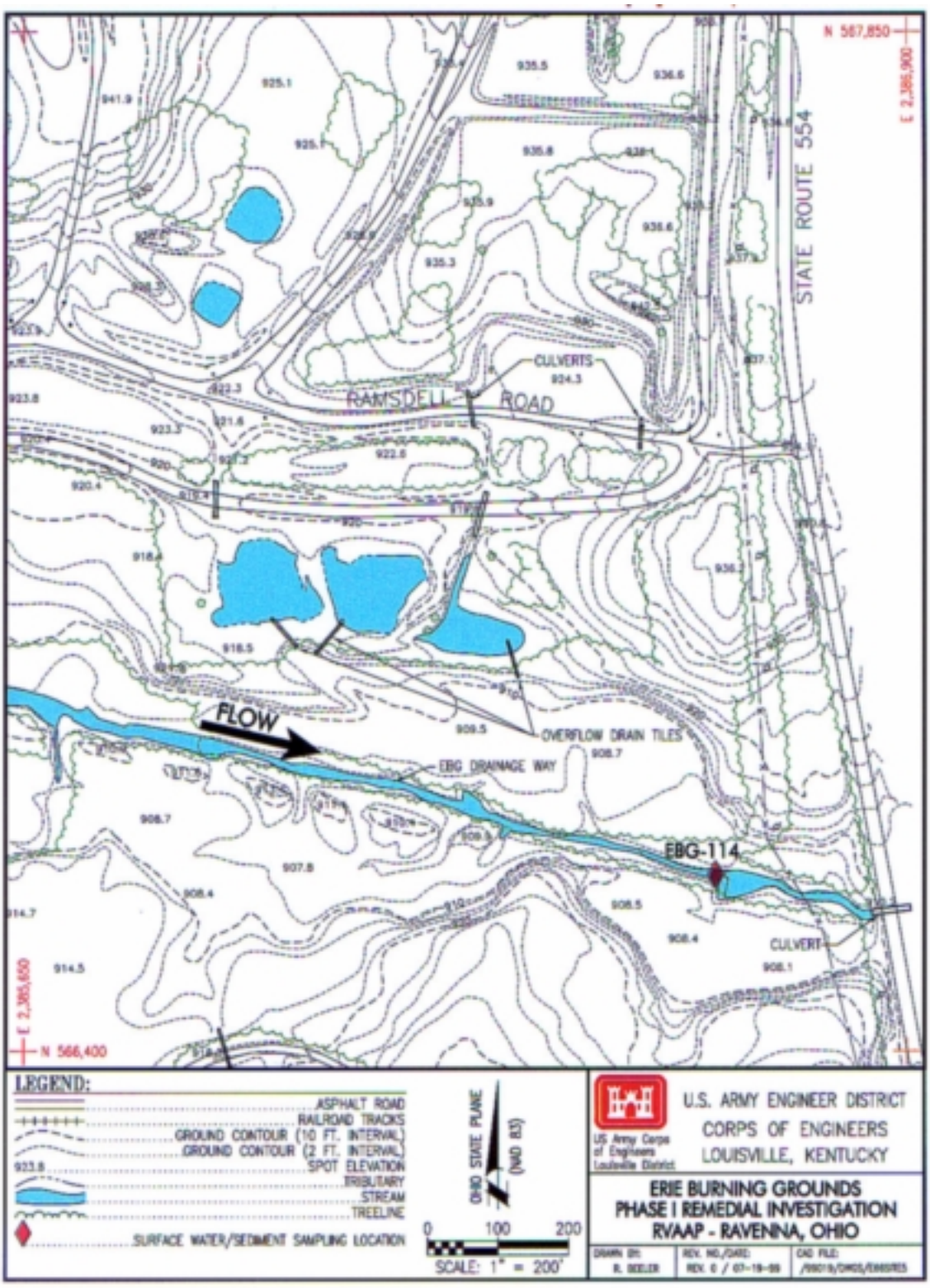

Figure 4-3. Surface Water/Sedin nt Sampling Locations at PF 534

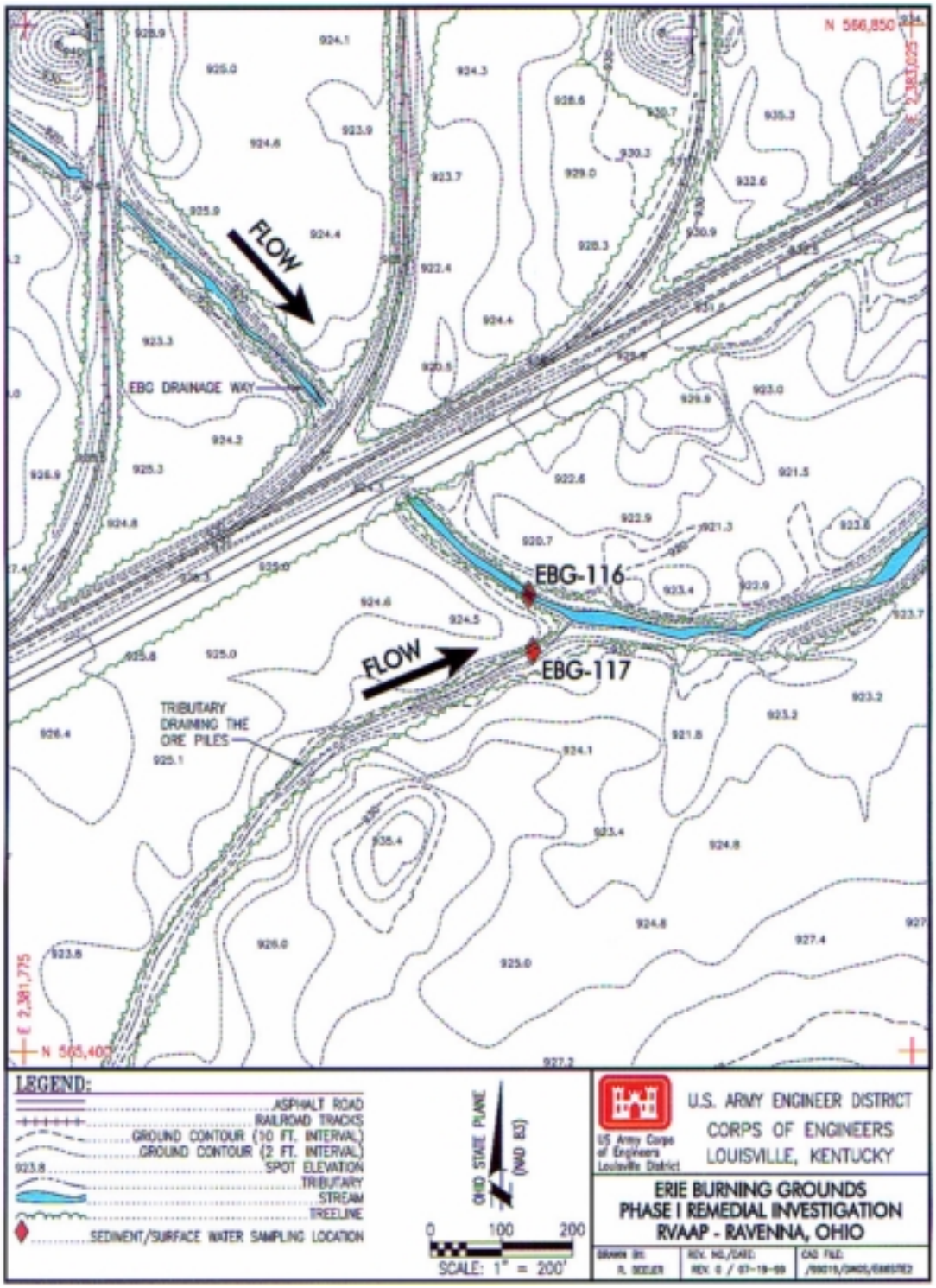

Figure 4-4. Surface Water/Sediment Sampling Locations at Sub-Area 14, Ore Piles

- Twenty sediment locations are planned within the "T-Area" ditches as these represent potential accumulation points for contaminants migrating from this former source area.

- A total of twelve sediment sampling locations are planned within the four surface water basins (three per basin) to evaluate potential inundated burning areas and contaminant accumulation within these quiescent waters.

Locations outside of EBG include:

- North inlet (culvert) to EBG beneath Blackberry Lane (to evaluate ambient conditions).

- Below the 48-inch RCP west of EBG (surface water exit pathway).

- Parshall Flume at State Route 534 (PF 534) exiting RVAAP.

- East Inlet to EBG beneath Blackberry Lane (to evaluate ambient conditions).

- Tributaries exiting EBG near the Ore Piles (to evaluate potential contaminant contributions from this possible source area at PF 534). Two locations will be sampled: (1) the tributary exiting EBG upstream of the confluence with the tributary exiting the Ore Pile, and (2) the tributary exiting the Ore Pile above the junction with the tributary exiting EBG.

4.2.1.3 Discrete/Composite Soil and Sediment Sampling Requirements

All surface soil [0 to 0.3 m (0 to 1 foot)] samples collected for explosives and propellants analyses will be composited and homogenized from three subsamples collected about 0.9 m (3 feet) from one another in a roughly equilateral triangle pattern. Equal portions of soil from each of the subsamples will be homogenized in a stainless steel bowl following protocols in Section 4.5.2.5 of the Facility-wide SAP. Once the subsamples are homogenized, a composite sample will be sent for laboratory analysis as described in Section 4.2.1.4. Remaining surface soil samples (and subsurface soil samples) will be collected from a point located in the approximate center of the triangle. Surface soil sample material will be extracted from the center location and placed into a stainless steel bowl. Discrete samples for VOC analysis will be taken from the middle of the sample interval. The remaining portion of the soil interval will be homogenized and nonvolatile fractions collected for analyses.

All sediment samples will be discrete samples. Sediments from the surface water basins will be collected using a stainless steel trowel or spoon, hand auger, or sediment coring device, where necessary. Although the surface water depth is generally less than 3 feet during the season in which the work is scheduled to be performed, a boat will be used as a sampling platform within the surface water basins. Sediment samples will be collected from downstream locations first and moving upstream relative to overall flow patterns within a sub-area. Sediment samples will not be collected from areas exhibiting turbid or rapid flow. Where sediment and surface water stations are co-located, surface water samples will be collected first.

4.2.1.4 Sample Collection for Field and Laboratory Analysis

All surface soil samples will be submitted for laboratory analysis of explosives, TAL metals, cyanide, and SVOCs. All surface soil samples will be submitted for propellant analysis except for the borrow north of Track 49 (only 1 of 3 total samples for propellants) and the wooded area south the of

"T-Area" (no propellant analysis). Six samples will be selected for VOC analysis and 7 samples for PCB analyses as follows:

- two samples from the Track 49 embankment;
- one sample along the southern 300 feet of the access road;
- one sample along the northern half of the access road;
- one sample from the "T-Area";
- one sample from the borrow area north of Track 49; and
- one contingency sample (PCB analysis only).

Geotechnical samples will be collected at six locations and analyzed for moisture content, Atterberg Limits, grain-size distribution, and USCS classification. Geotechnical logging will be performed for all samples including estimates of USCS classification and visual moisture content. In addition, two samples of railroad ballast from Track 49 will be collected and analyzed for TAL metals and cyanide.

All surface soil samples will be field screened for VOCs using a hand-held PID during collection. Field screening readings will be recorded in the field boring logs. No samples will be collected for additional headpsace analysis of VOCs.

All sediment samples collected at EBG will be analyzed for explosives, TAL metals, cyanide, and SVOCs. A total of 28 sediment samples will be analyzed for propellants. Additional VOC and PCB analyses will be conducted as follows:

- two sediment samples randomly selected along the Track 49 railroad embankment (one north and one south); five samples along the gravel access road;

- two samples from the "T-Area" ditches;

- two samples from the surface water basins; and

- one sample from each of the locations beyond the EBG boundary.

A total of ten samples for grain-size distribution and total organic carbon will be collected including (1) two samples from the "T-Area" ditches, (2) two samples from the surface water basins, and (3) one sample from each of the areas beyond the EBG boundary. Two samples from the north water edge of the Track 49 embankment and two samples from the access road staging/parking area will be obtained for geotechnical analyses including Atterberg Limits, grain-size distribution, and moisture content. Visual classification of soil types according to the USCS shall be noted in the field. Moisture content will also be estimated and noted in the field logs.

All sediment samples will be field screened for VOCs using a hand-held PID during collection. Field screening readings will be recorded in the field boring logs. No samples will be collected for additional headspace analysis of VOCs.

4.2.1.5 Field Quality Control Sampling Procedures

Surface soil/sediment QA/QC samples will be collected during the EBG Phase I RI. Duplicate soil samples will be collected at a frequency of 10% (1 per 10 environmental samples). Split samples will be submitted to the USACE MRD laboratory for independent analysis. Split samples will be collected at a frequency of 10% (1 per 10 environmental samples). Duplicate and split samples will be selected

on a random statistical basis and submitted for the same analyses as the environmental samples. No field or rinsate blanks will be collected for surface soils/sediments. Chapter 8.0 of the Phase I QAPP Addendum summarizes QA/QC sampling.

4.2.2 Procedures

4.2.2.1 Sampling Methods for Soil/Dry Sediments

4.2.2.1.1 Bucket Hand Auger Method

Surface soil and dry sediment samples will be collected with a bucket hand auger in accordance with Section 4.5.2.5 of the Facility-wide SAP. In this investigation, auger buckets 15.24 cm (6.0 in.) in length and 7.62 cm (3.0 in.) in diameter will be used. At each location, an auger will be advanced in 15.24-cm (6.0-in.) increments.

For surface soil samples, as noted in Section 4.2.1.3, composite soil samples for explosives and propellant analyses will be created from three subsamples collected in a roughly equilateral triangle pattern with the subsamples positioned about 0.9 m (3 feet) apart from each other. Each subsample point will be augered to a depth of 30.48 cm (1.0 foot). The content of each subsample will be added to a stainless-steel bowl and homogenized thoroughly. Aliquots for analyses will be extracted for the homogenized mixture. A point located at the approximate center of the triangle will be selected for collecting the remaining samples. The hand auger will be advanced to a depth of 30.48 cm (1.0 foot) and the contents placed into a stainless steel bowl. Aliquots for VOC analyses will be collected at the center of the interval (15.24 cm [0.5 foot]) immediately upon extraction from the boring. No VOC sample will be collected from homogenized or composited sample volumes. If field observations indicate evidence of contamination, then the collection depth for the VOC sample will be adjusted in order to contain the observed contamination. The remainder of the soil interval will be homogenized and samples for nonvolatile analyses collected.

Sediment samples collected using a hand auger will be discrete samples. Loose material or debris sample collection will not be performed using a hand auger. Sample contents from the 0 to 15.24 cm (0 to 0.5 foot) interval will be placed into a stainless steel bowl. Samples for VOC analyses will be collected first followed by samples for nonvolatile analyses.

4.2.2.1.2 Trowel/Scoop Method

A stainless steel trowel or scoop may be used to collect surface soil samples in soft, loose soil, if feasible. The protocol for compositing, homogenization, and discrete VOC sample collection will follow that described in Section 4.2.2.1.1 for bucket hand augers.

Loose material, debris, and dry sediment may also be collected using the trowel method as presented in Section 4.5.2.1.2 of the Facility-wide SAP. The trowel will be used to manually obtain sediment to a depth of 15.24 cm (0.5 foot) bgs. Extracted material will be placed into a stainless steel bowl. At sample locations where VOC fractions are to be collected, the VOC containers will be immediately filled with the first materials obtained.

4.2.2.2 Sampling Methods for Subaqueous Sediments from Streams and Surface Water Basins

4.2.2.2.1 Trowel/Scoop Method

Sediment samples in locations where water depth does not exceed 15.24 cm (0.5 foot) will be collected with a stainless steel trowel or scoop. The trowel will be used to manually obtain sediment to a depth of 15.2 cm (0.5 foot) below the sediment surface. Sediment will be placed into a stainless steel bowl as it is collected. At sample locations where VOC fractions are to be collected, the VOC containers will be immediately filled with the first sediment obtained. Sample containers for the remaining nonvolatile analytes will be filled as described in Section 4.5.2.5 of the Facility-wide SAP.

4.2.2.2.2 Hand Core Sampler Method

A sludge sampler will be used to collect sediment at locations where the depth of the surface water exceeds 15.24 cm (0.5 foot). Samples will be collected following the guidelines presented in Section 4.5.2.5 of the Facility-wide SAP.

The sludge sampler consists of a stainless steel, 8.26-cm (3.25-in.) OD, 30.48-cm (12-in.) long capped tube, which can be fitted with either an auger- or core-type sampler end. Each sampler end is equipped with a butterfly valve to prevent loss of sample upon retrieval. In this investigation, the core-type end will be preferentially used. The auger-type sampler end will be used only in the event that the sediment becomes too gravelly or consolidated for the efficient use of the core type-end. The sludge sampler will be extended to the sampling depth by connecting 60.96-, 91.44-, 121.92-, or 152.40-cm (2-, 3-, 4-, or 5-foot) stainless steel extension rods to the sampler. The extension rods will be attached to a cross handle and will be pushed or augered by hand.

Sediment will be placed into a stainless steel bowl as it is collected. At sample locations where VOC fractions are to be collected, the VOC containers will be immediately filled with the first sediment obtained. Sample containers for the remaining nonvolatile analytes will be filled as described in Section 4.5.2.5 of the Facility-wide SAP.

4.2.2.3 Field Measurement Procedures and Criteria

4.2.2.3.1 Organic Vapor Screening

All field measurement procedures and criteria will follow Section 4.4.2.3 of the Facility-wide SAP, with the following exception. Headspace gases will not be screened in the field for organic vapors. All OVA readings will be noted in the field boring logs.

4.2.2.4 Sampling for Geotechnical Analysis

Surface soil samples collected using the hand auger, scoop, or sediment corer methods are classified as disturbed samples. Therefore, geotechnical analysis of samples collected using these methods will be limited to grain size, Atterberg limits, moisture content, and USCS classification. Sediment samples shall be submitted for geotechnical analysis for Atterberg limits, grain size, and USCS classification only. Procedures for sampling for geotechnical analysis using the above sampling methods are presented in Section 4.5.2.4 of the Facility-wide SAP.

4.2.2.5 Sampling for Chemical Analysis

Procedures for sampling of surface soils and sediment for chemical analysis using the Bucket Hand Auger/Trowel and Hand Core Sampler Methods are presented in Sections 4.5.2.1.1, 4.5.2.1.2, and 4.5.2.2.2 of the Facility-wide SAP.

4.2.2.6 Sample Containers and Preservation

Requirements for sample containers and preservation techniques for surface soil and sediment samples are presented in Section 4.4.2.6 of the Facility-wide SAP and the EBG Phase I QAPP Addendum.

4.2.2.7 Decontamination Procedures

The decontamination procedure for surface soil and sediment sampling activities is presented in Section 4.4.2.8 of the Facility-wide SAP, except that a 1% HCl rinse will be used instead of at 10% solution.

4.2.2.8 OE Screening

OE support staff will be present during all field operations. The OE Team Leader will train all field personnel to recognize and stay away from propellants and OE. Safety briefings for OE will also be provided to all site personnel and site visitors. All sample locations and access routes into the locations will be cleared for potential OE prior to entry. The OE Team Leader will clearly mark the boundaries of the cleared soil sampling locations and access routes. If surface OE is encountered, the approach path will be diverted away from the OE, the area clearly marked, and the OE Team Leader notified immediately. In any area where surface metallic OE is encountered, a magnetometer will be used to ensure that no subsurface OE exists within the approach path. Prior to collection of the surface soil sample (0 to 1 foot bgs), the OE team will verify that the locations is anomaly free using a magnetometer. Where subsurface soil samples are to be collected (1 to 3 feet bgs), the auger will be withdrawn at the top of the subsurface interval (1 foot bgs) and the magnetometer lowered into the borehole to screen for subsurface magnetic anomalies. Should special circumstances dictate that that the borehole be deepened beyond 3 feet bgs, then a magnetometer reading will be taken at the top of each subsequent 2-foot interval prior to augering.

4.3 SURFACE WATER

Surface water samples will be co-located with 18 of the sediment samples. Evaluation of surface water is a critical element of the Phase I RI because this medium represents the primary contaminant transport pathway off of the AOC (either as dissolved phase or adsorbed to particulates/sediment mobilized by flow).

4.3.1 Rationales

The rationale for surface water sampling at EBG is to characterize surface water quality in accumulation areas, such as the surface water basins and “T-Area” ditches, and to evaluate the potential for transport of contaminants off of the AOC via the surface water exit pathway west of the site beneath Track 10. In addition, the RI will obtain data on ambient water quality entering the AOC.

4.3.1.1 Locations

Surface water sampling locations are shown on Figures 4-2, 4-3, and 4-4. A total of 16 surface water sampling locations are planned. Two additional samples, designated as contingency samples, will be located after the field sampling effort begins. The samples are to be distributed in the following manner:

- one in each of the six ditches in the "T-Area";
- one in each of the four surface water basins;
- one at the north inlet to EBG (ambient);
- one in the creek west of EBG (exit pathway);
- one in the stream that exits RVAAP (PF 534);
- one at the east inlet to EBG (ambient); and
- Two in the tributary downstream of EBG near the ore piles (to account for potential flux from this source unit).

4.3.2 Procedures–General

All surface water sampling will be conducted as described in Section 4.6.2.1.1 of the Facility-wide SAP. The hand-held bottle method will be used to sample water in ditches where water is flowing. The sample container will be submerged, with the cap in place, into the surface water flow. Then container will then be slowly and continuously filled using the cap to regulate the rate of sample entry into the container. The sample container will be removed from the flow with minimal disturbance to the sample. Immediately after collection of the sample and proper labeling, the container will be placed into a sealable plastic bag and placed into an ice-filled cooler to ensure preservation.

All surface water sample collection will begin at the sampling point furthest downstream in the channel and proceed upstream, to minimize the effects of sediment turbidity on surface water quality. Surface water sample will be collected prior to sediment samples at co-located sites.

4.3.2.1 Sampling Methods for Surface Water–Filtration

Surface water collected during the EBG Phase I RI will not be filtered prior to analysis.

4.3.2.2 Field Measurement Procedures and Criteria

Surface water field measurements to be performed during the EBG Phase I RI will include determination of pH, conductivity, dissolved oxygen content, and temperature. These measurements will be performed in the same manner as described in Section 4.3.3 of the Facility-wide SAP. All field measurements will be recorded in the sampling logbooks.

4.3.2.3 Sampling for Chemical Analysis

All unfiltered surface water samples will be submitted to the analytical laboratory for analysis of explosives, propellants, TAL metals, cyanide, VOCs, SVOCs, and PCBs, as shown in Table 4-1.

4.3.2.4 Sample Containers and Preservation Techniques

Information regarding sample containers and preservation techniques for surface water samples collected for chemical analysis during the EBG Phase I RI is presented in Chapter 4.0 of the EBG

Phase I RI QAPP Addendum. All sample containers will be provided by the contracted laboratory, including pre-preserved containers for VOC samples.

4.3.2.5 Field Quality Control Sampling Procedures

Surface water QA/QC samples will be collected during the EBG Phase I RI. Duplicate samples will be collected at a frequency of 10% (1 per 10 environmental samples). Split samples will be submitted to the USACE MRD laboratory for independent analysis. Split samples will be collected at a frequency of 10% (1 per 10 environmental samples). Duplicate and split samples will be selected based on a random statistical basis and submitted for the same analyses as the environmental samples. One field blank or rinsate for surface water will be collected (frequency of 5%). The EBG Phase I RI QAPP Addendum summarizes required QA/QC sampling.

4.3.2.6 Decontamination Procedures

Decontamination of any equipment used for collection of surface water samples during the EBG Phase I RI will be conducted in the same manner as described for nondedicated sampling equipment in Section 4.3.8 of the Facility-wide SAP, except that a 1% HCl rinse will be used instead of a 10% solution.

In addition to the surface water sampling equipment, field measurement instruments will also be decontaminated between sampling locations. Only those portions of each instrument that come into contact with potentially contaminated surface water will be decontaminated. This will be accomplished with a deionized-water rinse of the measurement probe and the collection cup.

4.4 SITE SURVEY

The horizontal coordinates of all sampling stations will be determined to within 1 foot. The surface elevations will be determined to within 0.2 foot. For soil sampling stations, the ground elevations will be determined at the point of collection. For tributary surface water locations and sediment sampling stations that are not underwater (i.e., adjacent to the water edge), the ground elevation at the water's edge at the collection point will be determined. For surface water locations within the surface water basins and for sediment sampling stations underwater, the elevation of the water surface, depth to bottom, and elevation of the bottom will be determined.

All locations will be conveyed in Ohio State Plane Coordinates (NAD83). The vertical datum for all elevations will be 1929 National Geodetic Vertical Datum (NGVD). All coordinates and elevations will be recorded on the boring logs upon receipt of quality assured survey results. In addition, electronic results will be provided to the USACE and RVAAP in ASCII format.

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