APPENDIX A

Field Sampling Logs

Discrete Surface Soil Samples
Soil Boring Samples
Surface Water and Sediment Samples

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DISCRETE SURFACE SOIL SAMPLES

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HTRW DRILLING LOG (continued)

DISTRICT	BOREHOLE NUMBER
USACE - Louisville	CPCss-0316

1. COMPANY NAME	2. DRILLING SUBCONTRACTOR	SHEET 1 OF 1
SAIC	NA	

3. PROJECT RVAAP - PBA2008 RI

4. LOCATION RVAAP 8451 State Route 5 Ravenna, OH 44266

5. NAME OF DRILLER Ryan Laurich

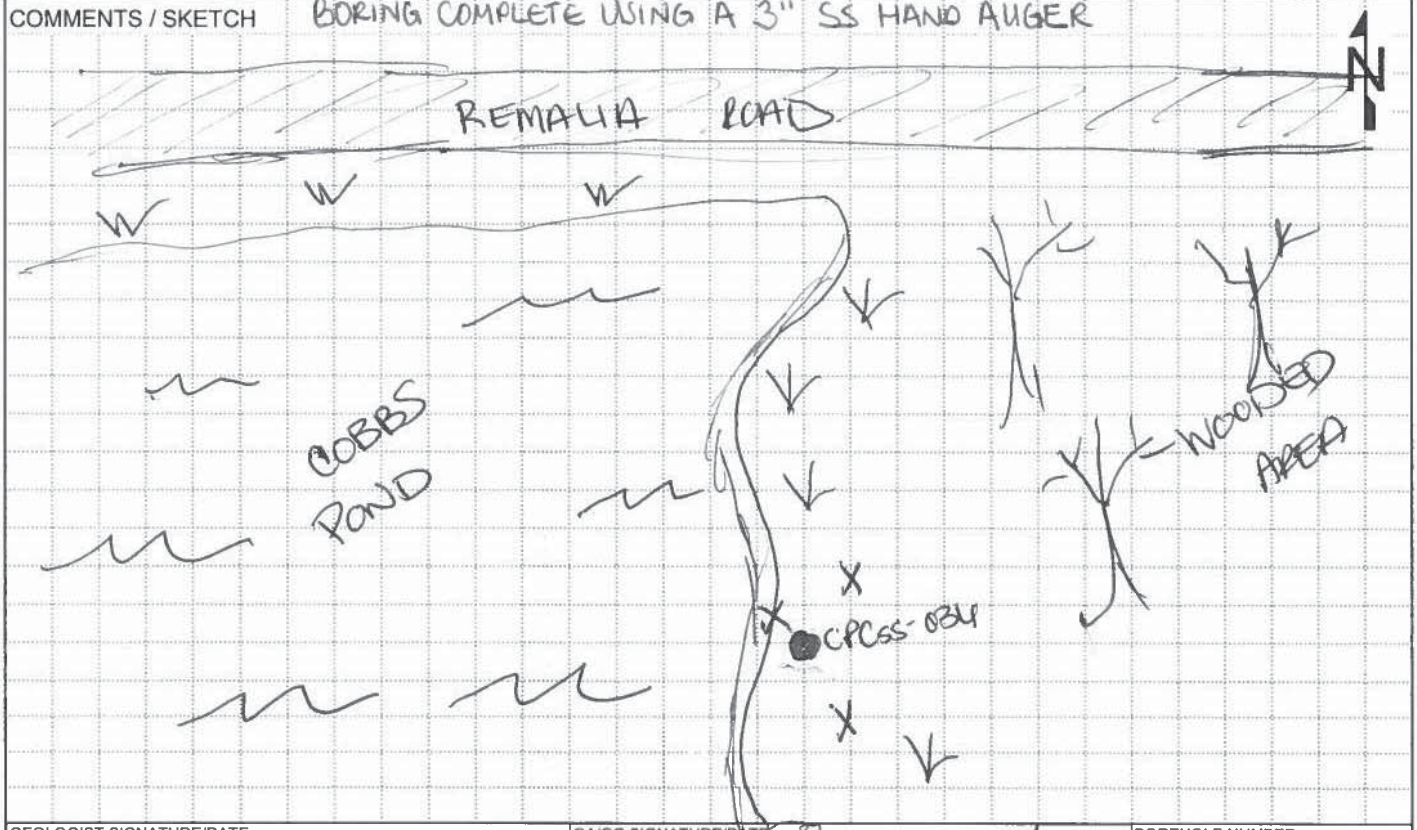
6. DIRECTION OF BOREHOLE ☑ VERTICAL ☐ INCLINED DEGREES

7. NOTES PID MAKE/MODEL: — PID SERIAL#: — Colors from Munsell Soil Color Chart, Rev 1994

WATER LEVEL MAKE/MODEL: — WATER LEVEL SERIAL#: —

ELEVATION	DEPTH (Feet)	USCS	CLASSIFICATION OF MATERIALS	SPT DATA (0.5 Feet)	MONITORING (PPM/CPM)	REMARKS (Sample IDs/Depths/Core Box/Etc.)
	1	ML	SILTY CLAY (ML). Little sand. Gray 10YR 5/1 with a strong Brown 10YR 5/8 mottling; moist, soft to medium stiff, ~~very~~ low plasticity; organic material such as roots and leaves.			1600: 02-23-2010 collected: CPCSS-0316-5014-SC
			BOREHOLE terminated at 1' BGS			

COMMENTS / SKETCH BORING COMPLETE USING A 3" SS HAND AUGER



GEOLOGIST SIGNATURE/DATE	QA/QC SIGNATURE/DATE	BOREHOLE NUMBER
Emily Cunningham 02-23-2010	2/23/16	CPCss-0316

HTRW DRILLING LOG (continued)

DISTRICT	BOREHOLE NUMBER
USACE - Louisville	CPCss-037

1. COMPANY NAME	2. DRILLING SUBCONTRACTOR	SHEET 1 OF 1
SAIC	NA	

3. PROJECT	4. LOCATION
RVAAP-PBA2008 RI	RVAAP 8451 State Route 5 Ravenna, OH 44266

5. NAME OF DRILLER	6. DIRECTION OF BOREHOLE
Regan Laurich	☑ VERTICAL ☐ INCLINED DEGREES

7. NOTES PID MAKE/MODEL: — PID SERIAL#: — Colors from Munsell Soil Color Chart, Rev 1994

WATER LEVEL MAKE/MODEL: — WATER LEVEL SERIAL#: —

ELEVATION	DEPTH (Feet)	USCS	CLASSIFICATION OF MATERIALS	SPT DATA (0.5 Feet)	MONITORING (PPM/CPM)	REMARKS (Sample IDs/Depths/Core Box/Etc.)
	1	OL	Silty CLAY (OL), Dark gray 10YR 4/1, very soft, wet to semi-saturated; low-plasticity, anaerobic odor, decomposing leaves, roots and stems. *water filled Borehole once soil was removed.			1450; 03-23-2010 collected: CPCSS-037-5015-SO CPCSS-037-6040-QA CPCSS-037-6041-FD
			BORING TERMINATED AT 1' BGS. BORING COMPLETE USING A 3" SS HAND AUGER			

COMMENTS / SKETCH

GEOLOGIST SIGNATURE/DATE	QA/QC SIGNATURE/DATE	BOREHOLE NUMBER
Emily Annington 03-23-2010	2/23/10	CPCss-037

HTRW DRILLING LOG (continued)

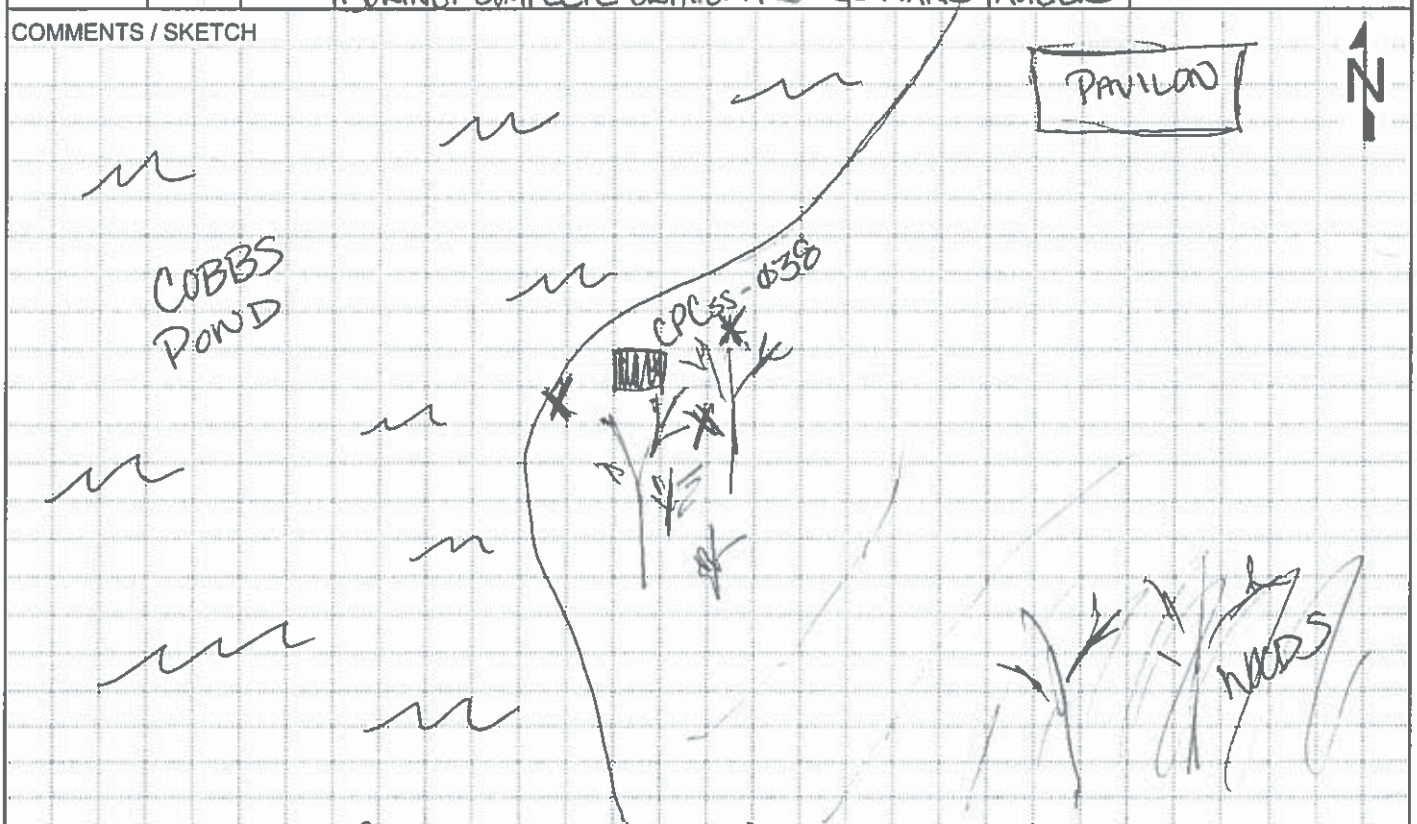
DISTRICT	BOREHOLE NUMBER
USACE - Louisville	CPCss - 038

1. COMPANY NAME	2. DRILLING SUBCONTRACTOR	SHEET 1 OF 1
SAIC	NA	

3. PROJECT RVAAP- PBA08 RI	4. LOCATION RVAAP 8451 State Route 5 Ravenna, OH 44266
5. NAME OF DRILLER Ryan Laurich	6. DIRECTION OF BOREHOLE ☑ VERTICAL ☐ INCLINED DEGREES
7. NOTES PID MAKE/MODEL: — PID SERIAL#: —	Colors from Munsell Soil Color Chart, Rev 1994
WATER LEVEL MAKE/MODEL: — WATER LEVEL SERIAL#: —	

ELEVATION	DEPTH (Feet)	USCS	CLASSIFICATION OF MATERIALS	SPT DATA (0.5 Feet)	MONITORING (PPM/CPM)	REMARKS (Sample IDs/Depths/Core Box/Etc.)
	1	CL	CLAY (CL) little silt Yellow Brown ~~10YR 5/4~~ 2/25/10 10YR 5/4 with Dark yellowish Brown 10YR 4/6 and dark gray 10YR 4/1 mottling, medium stiff, damp, medium plasticity and some organics (roots & leaves).			1050; 02-23-2010 collected sample CPCSS-038-SB1050
			BORING TERMINATED at 1' BGS BORING COMPLETE USING A 3" SS HAND AUGER			

COMMENTS / SKETCH



GEOLOGIST SIGNATURE/DATE	QA/QC SIGNATURE/DATE	BOREHOLE NUMBER
Emily Cunningham 02-23-2010	2/23/10	CPCss - 038

HTRW DRILLING LOG (continued)

DISTRICT	BOREHOLE NUMBER
USACE - Louisville	CPCss-039

1. COMPANY NAME	2. DRILLING SUBCONTRACTOR	SHEET 1 OF 1
SAIC	NA	

3. PROJECT: RVAAP PBA 2006 RI

4. LOCATION: RVAAP 8451 State Route 5 Ravenna, OH 44266

5. NAME OF DRILLER: Ryan Laurich

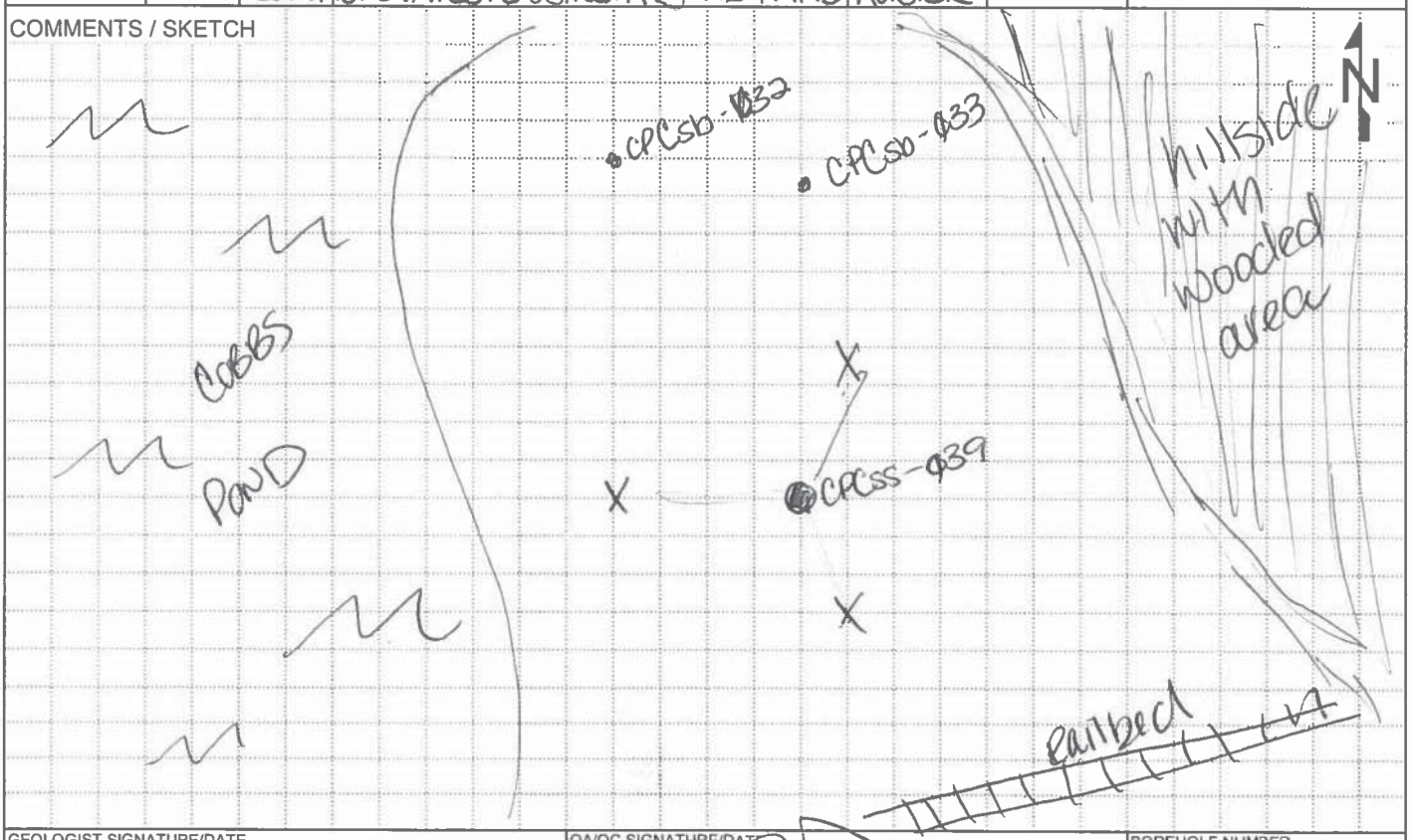
6. DIRECTION OF BOREHOLE: ☑ VERTICAL ☐ INCLINED DEGREES

7. NOTES: PID MAKE/MODEL: — PID SERIAL#: — Colors from Munsell Soil Color Chart, Rev 1994

WATER LEVEL MAKE/MODEL: — WATER LEVEL SERIAL#: —

ELEVATION	DEPTH (Feet)	USCS	CLASSIFICATION OF MATERIALS	SPT DATA (0.5 Feet)	MONITORING (PPM/CPM)	REMARKS (Sample IDs/Depths/Core Box/Etc.)
	1	OL	SILTY CLAY (OL); trace amount of fine sands; yellowish brown 10YR5/6 with gray 10YR5/1; soft; moist; medium plasticity; some roots and leaves.			1150; 02-23-2010 Collect sample CPCSS-039-5017-SC
			BOREHOLE TERMINATED AT 1' BGS. BORING COMPLETE USING A 3" SS HAND AUGER			

COMMENTS / SKETCH



GEOLOGIST SIGNATURE/DATE	QA/QC SIGNATURE/DATE	BOREHOLE NUMBER
Emily Cunningham 02-23-2010	2/25/10	CPCss-039

HTRW DRILLING LOG (continued)

DISTRICT	BOREHOLE NUMBER
USACE - Louisville	CPCss-040

1. COMPANY NAME	2. DRILLING SUBCONTRACTOR	SHEET 1 OF 1
SAIC	NA	

3. PROJECT	4. LOCATION
RVAAP-PBA2008 RI	RVAAP 8451 State Route 5 Ravenna, OH 44266

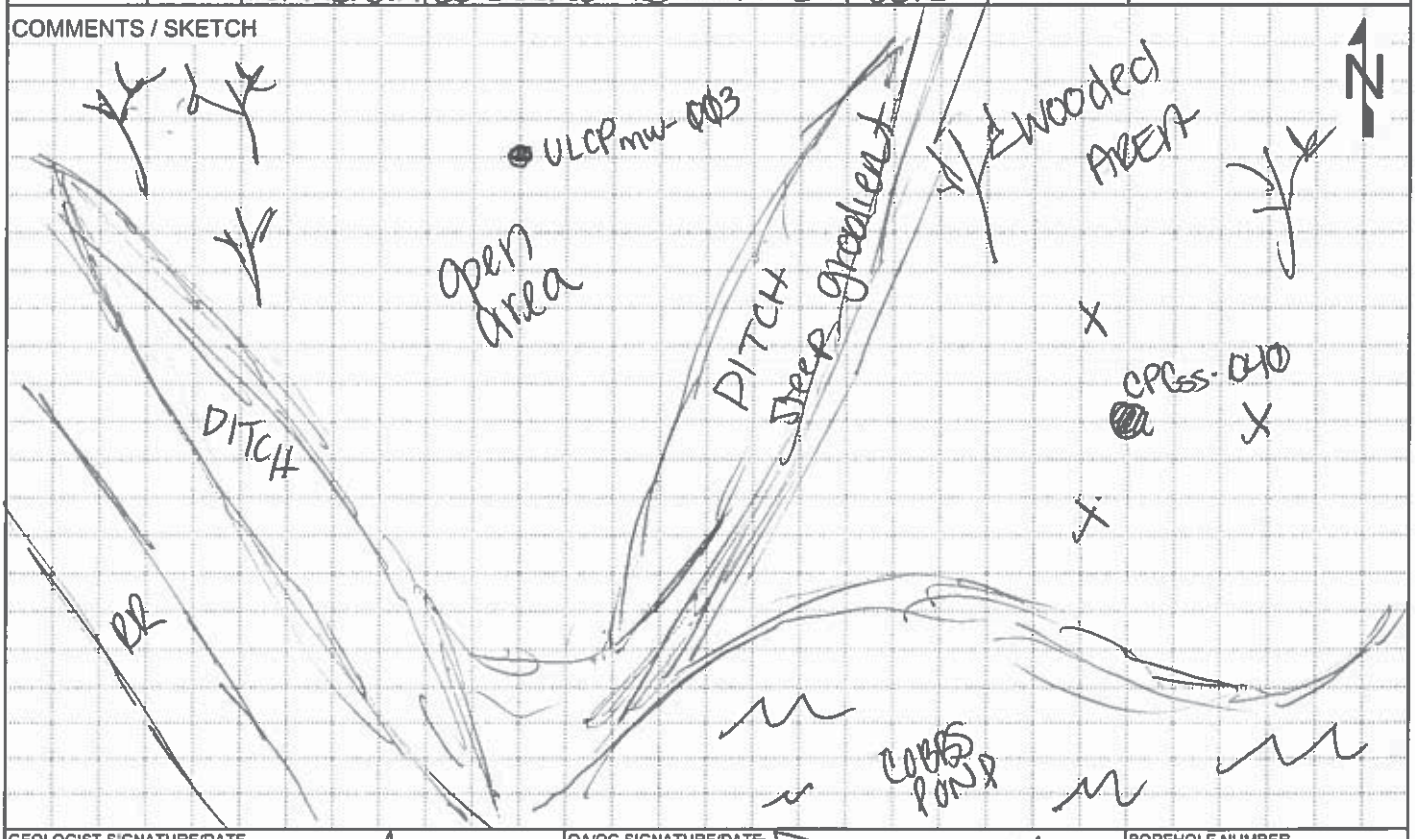
5. NAME OF DRILLER	6. DIRECTION OF BOREHOLE
Ryan Laurich	☑ VERTICAL ☐ INCLINED DEGREES

7. NOTES PID MAKE/MODEL: — PID SERIAL#: — Colors from Munsell Soil Color Chart, Rev 1994

WATER LEVEL MAKE/MODEL: — WATER LEVEL SERIAL#: —

ELEVATION	DEPTH (Feet)	USCS	CLASSIFICATION OF MATERIALS	SPT DATA (0.5 Feet)	MONITORING (PPM/CPM)	REMARKS (Sample IDs/Depths/Core Box/Etc.)
	1	CH	CLAYIE SILT (CH). some clay; light yellowish brow 10YR 6/4 with brown yellow mothling 10YR 6/8. medium stiff. ~~moist~~ damp to moist. High plasticity; and organics (roots & leaves). EC-2/23/10			1300. 02-23-2010 Collected sample: CPCSS-040-5018-SO
			BORE HOLE TERMINATED AT 1' BGS			
			BORING COMPLETE USING A 3" SS HAND AUGER			

COMMENTS / SKETCH



GEOLOGIST SIGNATURE/DATE	QA/QC SIGNATURE/DATE	BOREHOLE NUMBER
Emily Cunningham 02-23-2010	2/23/10	CPCss-040

HTRW DRILLING LOG (continued)

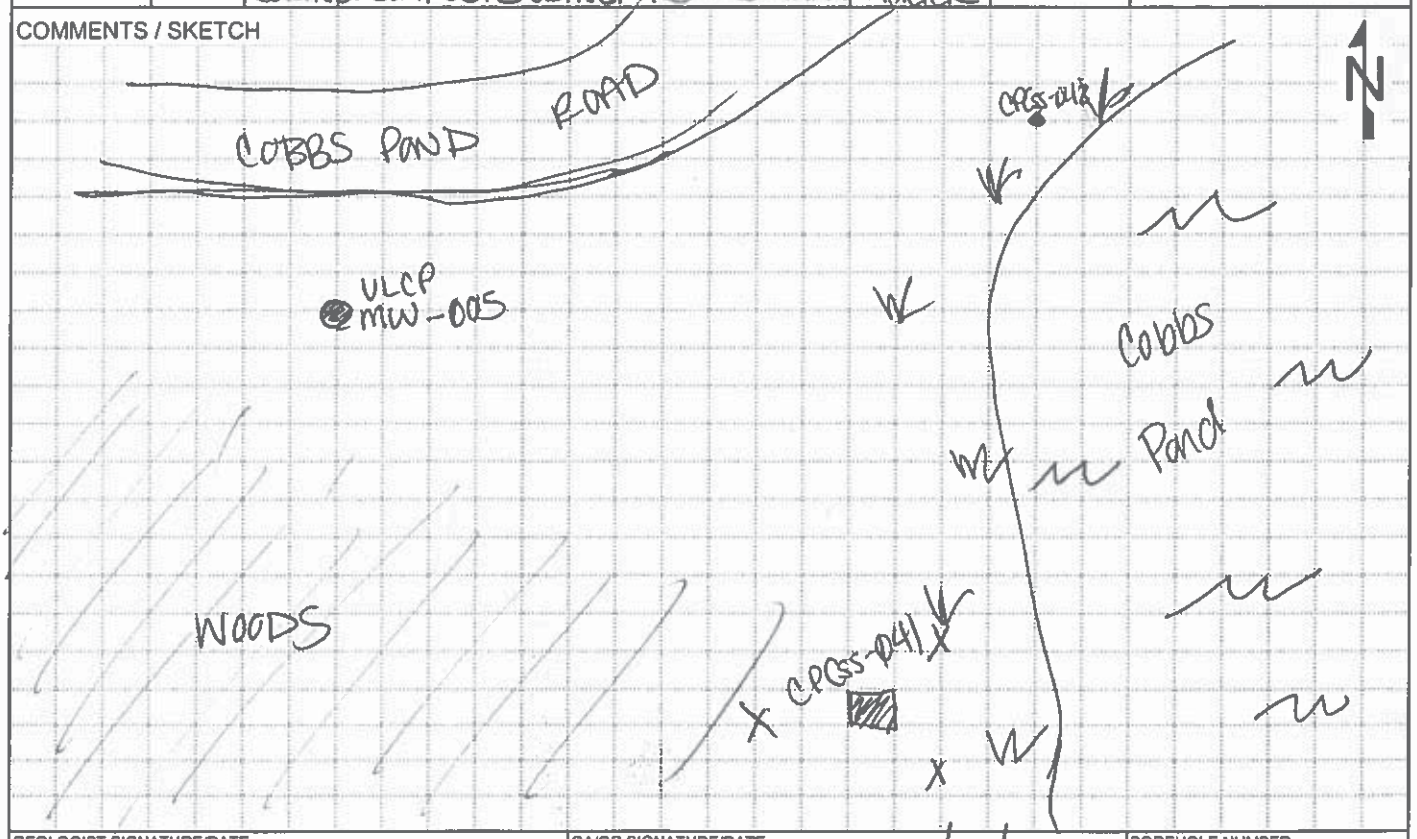
DISTRICT	BOREHOLE NUMBER
USACE - Louisville	CPCss-041

1. COMPANY NAME	2. DRILLING SUBCONTRACTOR	SHEET 1 OF 1
SAIC	NA	

3. PROJECT: RVAAP-PBA00 RI
4. LOCATION: RVAAP 8451 State Route 5 Ravenna, OH 44266
5. NAME OF DRILLER: Ryan Lawrich
6. DIRECTION OF BOREHOLE: ☑ VERTICAL ☐ INCLINED DEGREES
7. NOTES: PID MAKE/MODEL: —; PID SERIAL#: —; Colors from Munsell Soil Color Chart, Rev 1994
WATER LEVEL MAKE/MODEL: —; WATER LEVEL SERIAL#: —

ELEVATION	DEPTH (Feet)	USCS	CLASSIFICATION OF MATERIALS	SPT DATA (0.5 Feet)	MONITORING (PPM/CPM)	REMARKS (Sample IDs/Depths/Core Box/Etc.)
	1	ML	SILTY CLAY (CMH). Yellowish Brown 10YR 5/8 mottling 10YR 5/3. Very soft. damp non-plastic with some organics (roots & leaves)			0845 / 02-23-2010 collected CPCss-041-5019-SD
			BORING TERMINATED AT 1 Ft BGS			
			BORING COMPLETE USING A 3" SS HAND AUGER			

COMMENTS / SKETCH



GEOLOGIST SIGNATURE/DATE	QA/QC SIGNATURE/DATE	BOREHOLE NUMBER
Emily Cunningham 02-23-10	2/25/10	CPCss-041

HTRW DRILLING LOG (continued)

DISTRICT	BOREHOLE NUMBER
USACE - Louisville	CPCss-042

1. COMPANY NAME	2. DRILLING SUBCONTRACTOR	SHEET 1 OF 1
SAIC	NA	

3. PROJECT RVAAP-PBA2008 RI

4. LOCATION RVAAP 8451 State Route 5 Ravenna, OH 44266

5. NAME OF DRILLER Emily Cunningham | Ryan Lavrich

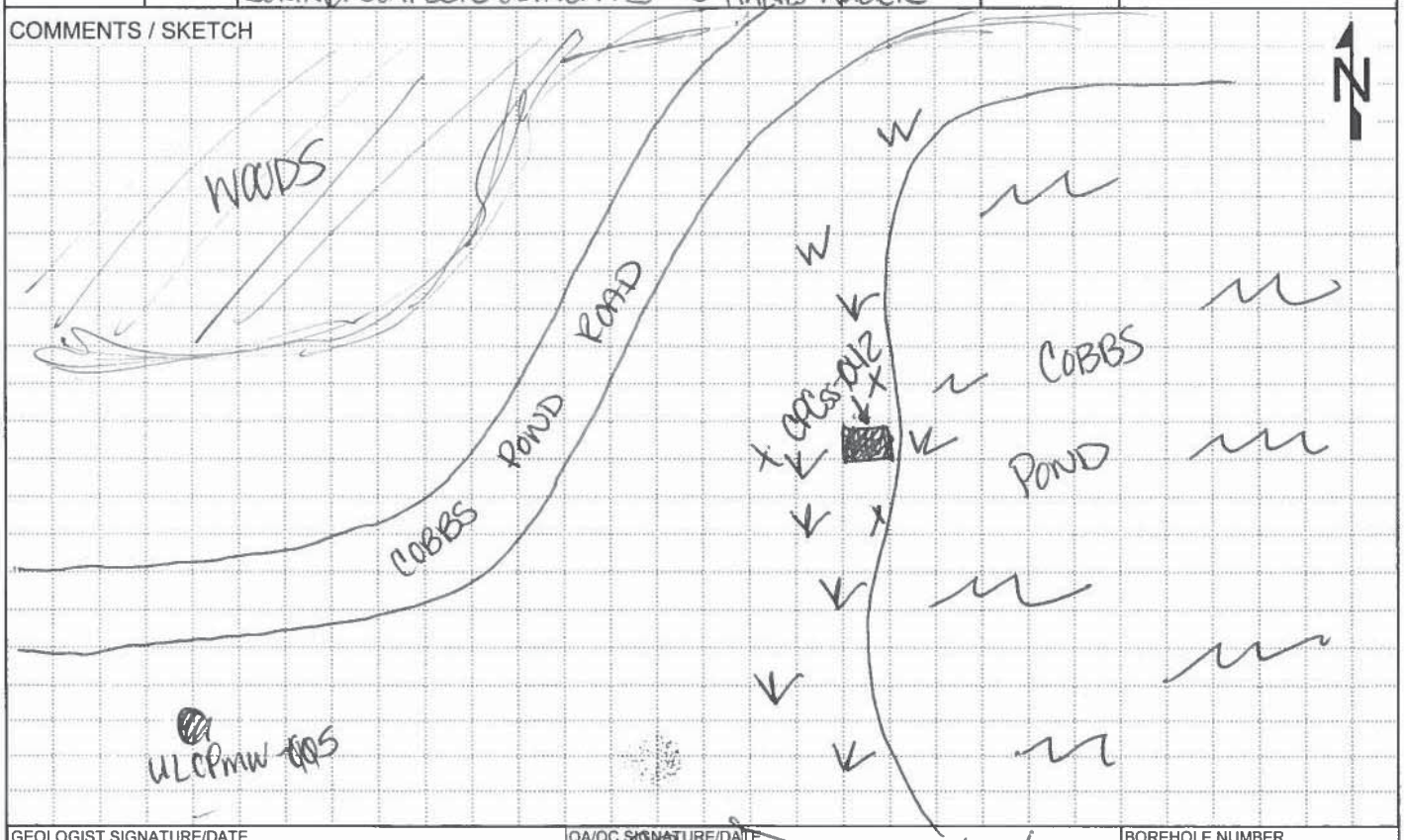
6. DIRECTION OF BOREHOLE ☑ VERTICAL ☐ INCLINED DEGREES

7. NOTES PID MAKE/MODEL: —— PID SERIAL#: —— Colors from Munsell Soil Color Chart, Rev 1994

WATER LEVEL MAKE/MODEL: —— WATER LEVEL SERIAL#: ——

ELEVATION	DEPTH (Feet)	USCS	CLASSIFICATION OF MATERIALS	SPT DATA (0.5 Feet)	MONITORING (PPM/CPM)	REMARKS (Sample IDs/Depths/Core Box/Etc.)
	1	CL	CLAY (CL); some silt. Dark yellowish Brown 10YR 4/6 with Dark gray mottling 10YR 4/1 soft; damp; low-plasticity with organics (roots & leaves).			0850. 02-23-20 Collected: CPCSS-042-5020-
			BORING TERMINATED AT 1 FT BGS			
			BORING COMPLETE USING A 3" SS HAND AUGER			

COMMENTS / SKETCH



GEOLOGIST SIGNATURE/DATE	QA/QC SIGNATURE/DATE	BOREHOLE NUMBER
Emily Cunningham 02-23-2010	2/23/10	CPCss-042

HTRW DRILLING LOG (continued)

DISTRICT	BOREHOLE NUMBER
USACE - Louisville	CPCss-043

1. COMPANY NAME	2. DRILLING SUBCONTRACTOR	SHEET 1 OF 1
SAIC	NA	

3. PROJECT	4. LOCATION
RVAAP-PBA2008-RI	RVAAP 8451 State Route 5 Ravenna, OH 44266

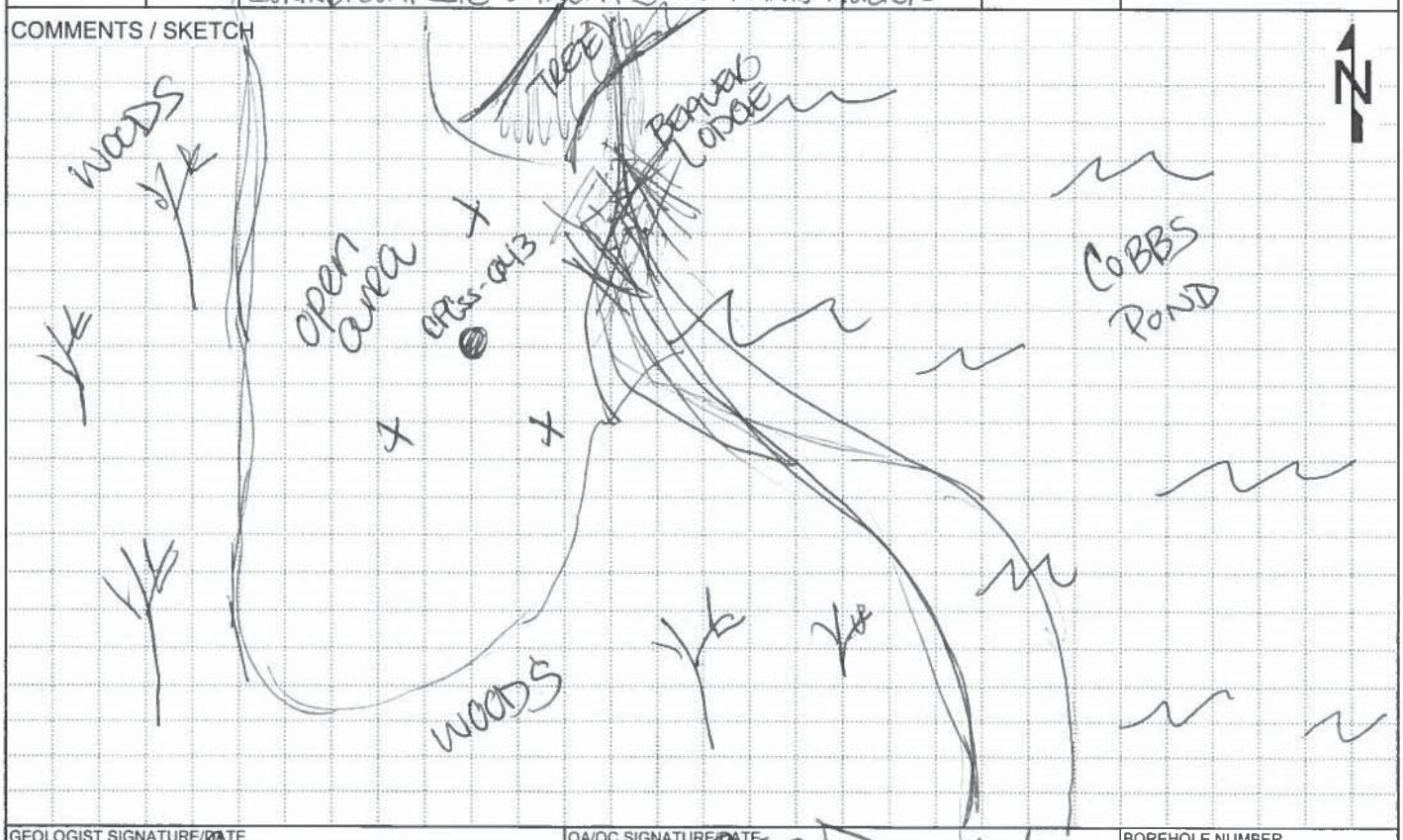
5. NAME OF DRILLER	6. DIRECTION OF BOREHOLE
Ryan Lauricn	☑ VERTICAL ☐ INCLINED DEGREES

7. NOTES PID MAKE/MODEL: —— PID SERIAL#: —— Colors from Munsell Soil Color Chart, Rev 1994

WATER LEVEL MAKE/MODEL: —— WATER LEVEL SERIAL#: ——

ELEVATION	DEPTH (Feet)	USCS	CLASSIFICATION OF MATERIALS	SPT DATA (0.5 Feet)	MONITORING (PPM/CPM)	REMARKS (Sample IDs/Depths/Core Box/Etc.)
	1	MH	SILT (MH); some CLAYS (CL); silt - Brown 10YR 5/3. clays - gray 10YR 5/1. very soft; wet, slight plasticity; some organics (roots, leaves, & bark). * Sample location located next to Beave lodge - lots of branches on surface and buried.			1400, 02-23-2010 collected sample. CPCSS-043-5021-SO CPCSS-043-5031-MS/MSD
			BORING TERMINATED AT 1' BGS			
			BORING COMPLETE USING A 3" SS HAND AUGER			

COMMENTS / SKETCH



GEOLOGIST SIGNATURE/DATE	QA/QC SIGNATURE/DATE	BOREHOLE NUMBER
Emily Cunningham 02-23-2010	2/23/10	CPCss-043

SOIL BORING SAMPLES

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HTRW DRILLING LOG

DISTRICT	BOREHOLE NUMBER
USACE - Louisville	CPCsb-030

1. COMPANY NAME	2. DRILLING SUBCONTRACTOR	SHEET 1 OF 2
SAIC	Frontz Drilling	

3. PROJECT RVAAP PBA08-22	4. LOCATION RVAAP 8451 State Route 5 Ravenna, OH 44266
5. NAME OF DRILLER Steve Vasicky	6. MAKE/MODEL OF DRILL ~~Geoprobe SV~~ 3/29/10 Hand Auger
7. SIZES AND TYPES OF SAMPLING EQUIPMENT SS Bowl 3" Hand Auger	8. BOREHOLE LOCATION E2368598.47 N562401.85
	9. SURFACE ELEVATION/DATUM NAD 83
	10. DRILL DATE/TIME 3/29/10 STARTED: 1030 COMPLETED: 1055
	15. DEPTH GROUNDWATER ENCOUNTERED 1' BGS
	16. DEPTH TO WATER/ELAPSED TIME AFTER BOREHOLE COMPLETION NA
12. OVERBURDEN THICKNESS >1'	
13. DEPTH DRILLED INTO BEDROCK NA	17. OTHER WATER LEVEL MEASUREMENTS (INLCLUDE DATE/TIME) NA
14. TOTAL DEPTH OF BOREHOLE 1'	

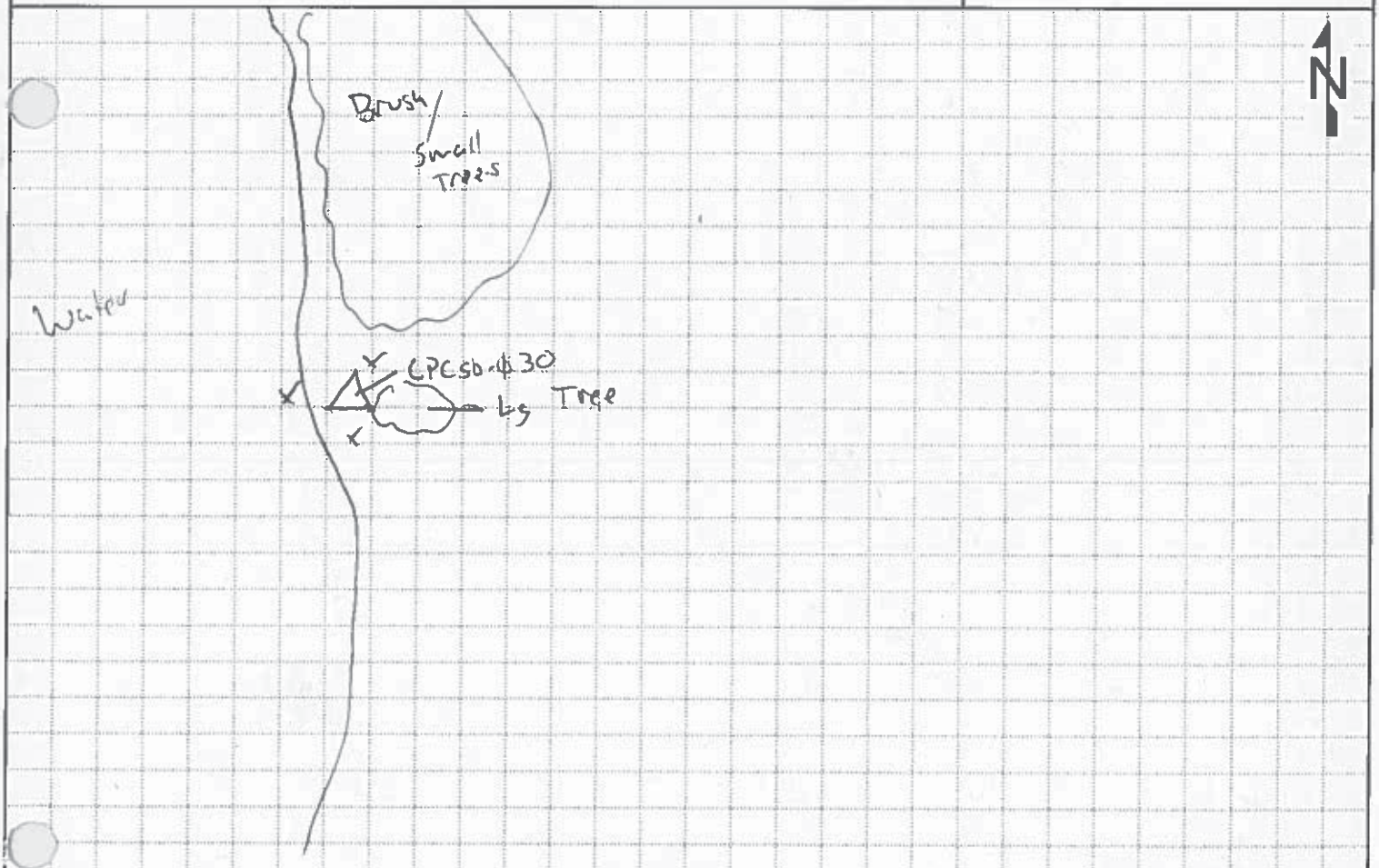
18. GEOTECHNICAL SAMPLES	UNDISTURBED: NA	DISTURBED:	19. TOTAL NUMBER OF CORE BOXES NA	
20. CHEMICAL SAMPLES	CHEM: ~~Metals~~ Explosives/VOCs RAD: NA	OTHER:	21. TOTAL CORE RECOVERY %	
22. DISPOSITION OF BOREHOLE	DATE STARTED/INSTALLED: 3/29/10	DATE COMPLETED/ABANDONED: 3/29/10		

BACKFILL TYPE: ☐ GROUT ☑ BENTONITE ☐ TEMPORARY WELL POINT ☐ MONITORING WELL

23. NOTES BKG: ≤ Background BGS: Below Ground Surface CPM: Counts per Minute PPM: Parts per Million

▽ : First Water Encountered ▼ : Static Water Level NA: Not Applicable

LOCATION SKETCH/COMMENTS SCALE: None



GEOLOGIST SIGNATURE/DATE	QA/QC SIGNATURE/DATE	BOREHOLE NUMBER
3/29/10	03/29/10	CPCsb-030

US Army Corps of Engineers
Louisville District

SAIC From Science to Solutions

RVAAP-29
Upper & Lower Cobbs Ponds
CPCsb-030

RVAAP PBA 2008 Remedial Investigation
Ravenna Army Ammunition Plant
8451 State Route 5
Ravenna, Ohio 44266
Portage County

Start Date	: 03/29/10; 1030
End Date	: 03/29/10; 1055
Northing Coord.	: 562401.05
Easting Coord.	: 2368598.47
Total Depth of Boring	: 1.0 ft

Drilling Company	: SAIC
Driller	: Steve Visocky
Designation of Drill	: NA
Type of Drill Rig	: NA
Geologist	: Steve Visocky
Oversight Company	: SAIC
Borehole Diameter	: 3"
Sampling Equipment	: 3" Hand Auger

Depth in feet	USCS Symbol	USCS Graphic	Description	Analyses	Recovery	Collection Interval	Comments
0	SC		(0.0' - 1.0') Fine grained SAND (SC); some Silt; trace Clay; trace Gravel (Sandstone fragments); 10YR3/3 very dark brown; very loose; moist; little organics (roots).	CPCsb-030-5105-SO collected from 0.0' - 1.0' on 03/29/10 at 1050 for TAL Metals + Hg, Explosives, and SVOCs.	1.0'/1.0'		Soil Color Chart Munsell 1994 Rev. Ed.
1			Boring terminated at 1.0 ft bgs. Groundwater encountered.				
2							
3							
4							
5							Coordinate System: NAD 83

Boring backfilled with sodium bentonite chips and hydrated.
0.0' - 1.0' sampled using a 3" hand auger and triangular subsample procedure for explosives as presented in Section 4.5.2.1.1 of the Facility-Wide SAP.
Samples were composited and homogenized for all analyses.

CPCsb-030

HTRW DRILLING LOG

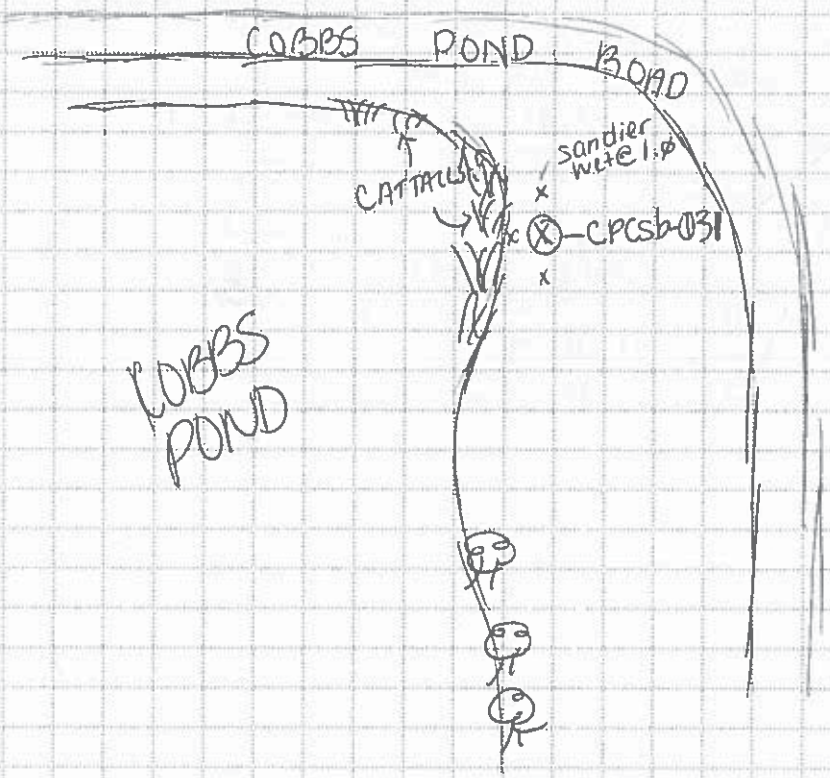
	DISTRICT: USACE - Louisville	BOREHOLE NUMBER: CPCsb-031
1. COMPANY NAME: SAIC	2. DRILLING SUBCONTRACTOR: Frontz Drilling	SHEET 1 OF 2
3. PROJECT: RVAAP PBA 08 RI	4. LOCATION: RVAAP 8451 State Route 5 Ravenna, OH 44266	
5. NAME OF DRILLER: Jeremy Leckrone	6. MAKE/MODEL OF DRILL: Geoprobe 6620 DT	
7. SIZES AND TYPES OF SAMPLING EQUIPMENT: 3" x 1' Hand Auger; 1.5" x 4' Acetate Liner; 2" x 4' Dual Tube	8. BOREHOLE LOCATION: N-561867.0187' E-2368547.4340'	
	9. SURFACE ELEVATION/DATUM: NAD 83	
	10. DRILL DATE/TIME: 03/24/10 STARTED: 1415 COMPLETED: 1445	
	15. DEPTH GROUNDWATER ENCOUNTERED: 1.3	
	16. DEPTH TO WATER/ELAPSED TIME AFTER BOREHOLE COMPLETION: NA	
12. OVERBURDEN THICKNESS: ~~>1.3~~ >7FT		
13. DEPTH DRILLED INTO BEDROCK: NA	17. OTHER WATER LEVEL MEASUREMENTS (INLCLUDE DATE/TIME): NA	
14. TOTAL DEPTH OF BOREHOLE: 7 FT		

18. GEOTECHNICAL SAMPLES: UNDISTURBED: ——— DISTURBED: ———	19. TOTAL NUMBER OF CORE BOXES: NA	
20. CHEMICAL SAMPLES: CHEM: EXPL/MET/SVOC RAD: NA OTHER: ———	21. TOTAL CORE RECOVERY %: NA	
22. DISPOSITION OF BOREHOLE: DATE STARTED/INSTALLED: 03/24/10 1415	DATE COMPLETED/ABANDONED: 03/24/10 1445	

BACKFILL TYPE: ☐ GROUT ☑ BENTONITE ☐ TEMPORARY WELL POINT ☐ MONITORING WELL

23. NOTES: BKG: ≤ Background; BGS: Below Ground Surface; CPM: Counts per Minute; PPM: Parts per Million; ▽: First Water Encountered; ▼: Static Water Level; NA: Not Applicable

LOCATION SKETCH/COMMENTS — **SCALE:** None



GEOLOGIST SIGNATURE/DATE: Amanda Trenton 03/24/10	QA/QC SIGNATURE/DATE: 4/26/10	BOREHOLE NUMBER: CPCsb-031

US Army Corps of Engineers
Louisville District

SAIC From Science to Solutions

RVAAP-29
Upper & Lower Cobbs Ponds
CPCsb-031

RVAAP PBA 2008 Remedial Investigation
Ravenna Army Ammunition Plant
8451 State Route 5
Ravenna, Ohio 44266
Portage County

Start Date	: 03/24/10; 1415
End Date	: 03/24/10; 1445
Northing Coord.	: 561867.0187
Easting Coord.	: 2368547.4340
Total Depth of Boring	: 7.0 ft

Drilling Company	: Frontz Drilling
Driller	: Jeremy Leckrone
Designation of Drill	: Geoprobe 6620DT
Type of Drill Rig	: Direct Push Technology
Geologist	: Amanda Trenton
Oversight Company	: SAIC
Borehole Diameter	: 2"
Sampling Equipment	: 1.5" x 4' Long Acetate Liner
	: 2" x 4' Dual Tube
	: 3" Hand Auger

Depth in feet	USCS Symbol	USCS Graphic	Description	Analyses	Recovery	Collection Interval	Comments
0–1	CL		(0.0' - 1.3') CLAY (CL); little Silt; 10YR4/3 brown with little 7.5YR5/6 strong brown and 2.5Y6/1 gray mottling; soft; damp; high plasticity.	CPCsb-031-5109-SO & MS/MSD collected from 0.0' - 1.0' on 03/24/10 at 1427 for TAL Metals + Hg, Explosives, and SVOCs.	1.0'/1.0'		Soil Color Chart Munsell 2000 Rev. Ed.
1–4	SW		(1.3' - 4.1') Medium to fine grained SAND (SW); trace lenses of Siltier Sand throughout; 10YR5/4 yellowish brown; medium dense; wet; nonplastic.				Groundwater encountered at 1.3 ft bgs.
4–5	SP		(4.1' - 5.6') Coarse grained SAND (SP); little Gravel, <1/4"; 10YR5/4 yellowish brown; medium dense; wet; nonplastic.				
5–6	ML		(5.6' - 5.8') SILT (ML); some Sand; 10YR5/4 yellowish brown; medium stiff; damp.				
6	SW		(5.8' - 6.35') Fine grained SAND (SW); trace lenses of Siltier Sand throughout; 10YR5/4 yellowish brown; medium dense; wet; nonplastic.				
6–7	SP		(6.35' - 6.75') Coarse grained SAND (SP); little Gravel, <1/4"; 10YR5/4 yellowish brown; medium dense; wet; nonplastic.				
7	CL		(6.75' - 7.0') Silty CLAY (CL); little Sand, Sand content decreases with depth; 10B5/1 bluish gray; medium stiff; damp.				
7–8			Boring terminated at 7.0 ft bgs.				Coordinate System: NAD 83

Boring backfilled with sodium bentonite chips and hydrated.
0.0' - 1.0' sampled using a 3" hand auger and triangular subsample procedure for explosives as presented in Section 4.5.2.1.1 of the Facility-Wide SAP.
Samples were composited and homogenized for all analyses.

CPCsb-031

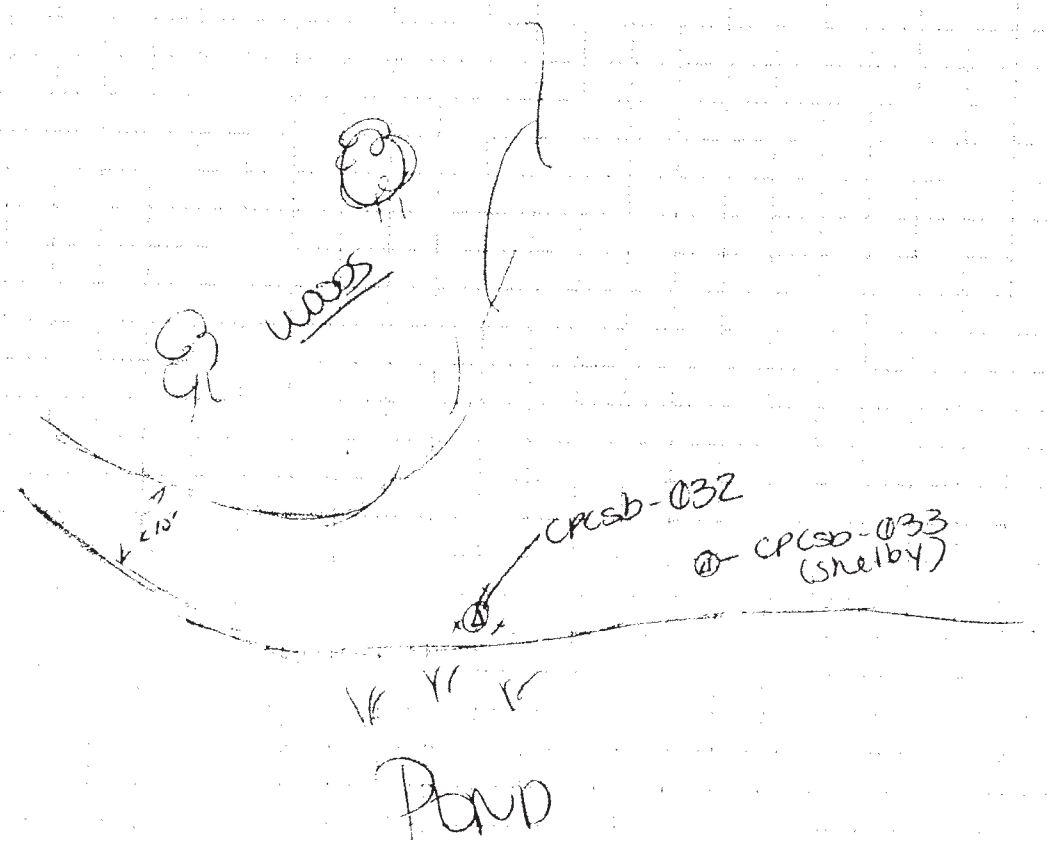
CPCSD-033 @

HTRW DRILLING LOG

	DISTRICT: USACE - Louisville	BOREHOLE NUMBER: CPCSD-032
1. COMPANY NAME: SAIC	2. DRILLING SUBCONTRACTOR: Frontz Drilling	SHEET 1 OF 2
3. PROJECT: RVAAP PBA 08 RI	4. LOCATION: RVAAP 8451 State Route 5 Ravenna, OH 44266	
5. NAME OF DRILLER: JEREMY LECKRONE	6. MAKE/MODEL OF DRILL: Geoprobe 6620 DT	
7. SIZES AND TYPES OF SAMPLING EQUIPMENT: 3" x 1' HAND AUGER; 1.5" x 4' ACETATE LINER; 2" x 4' DUAL TUBE	8. BOREHOLE LOCATION	
	9. SURFACE ELEVATION/DATUM	
	10. DRILL DATE/TIME STARTED: 1530 COMPLETED: 1640	
	15. DEPTH GROUNDWATER ENCOUNTERED: 10.0 FT	
12. OVERBURDEN THICKNESS: > 32 FT	16. DEPTH TO WATER/ELAPSED TIME AFTER BOREHOLE COMPLETION: NA	
13. DEPTH DRILLED INTO BEDROCK: NA	17. OTHER WATER LEVEL MEASUREMENTS (INLCLUDE DATE/TIME): NA	
14. TOTAL DEPTH OF BOREHOLE: 13 FT BGS		
18. GEOTECHNICAL SAMPLES: UNDISTURBED: — DISTURBED: —	19. TOTAL NUMBER OF CORE BOXES: NA	
20. CHEMICAL SAMPLES: CHEM: MET/EXPA/SVOC RAD: NA OTHER: —	21. TOTAL CORE RECOVERY %: NA	
22. DISPOSITION OF BOREHOLE: DATE STARTED/INSTALLED: 03/24/10; 1530	DATE COMPLETED/ABANDONED: 03/24/10; 1640	
BACKFILL TYPE: ☐ GROUT ☑ BENTONITE ☐ TEMPORARY WELL POINT ☐ MONITORING WELL		

23. NOTES: BKG: ≤ Background; BGS: Below Ground Surface; CPM: Counts per Minute; PPM: Parts per Million; ▽: First Water Encountered; ▼: Static Water Level; NA: Not Applicable

LOCATION SKETCH/COMMENTS — **SCALE:** None



GEOLOGIST SIGNATURE/DATE	QA/QC SIGNATURE/DATE	BOREHOLE NUMBER
Amanda Trenton 03/24/10	4/26/10	CPCSD-032 & CPCSD-033

US Army Corps of Engineers
Louisville District

SAIC From Science to Solutions

RVAAP-29
Upper & Lower Cobbs Ponds
CPCsb-032

RVAAP PBA 2008 Remedial Investigation
Ravenna Army Ammunition Plant
8451 State Route 5
Ravenna, Ohio 44266
Portage County

Start Date	: 03/24/10; 1530
End Date	: 03/24/10; 1640
Northing Coord.	:
Easting Coord.	:
Total Depth of Boring	: 13.0 ft

Drilling Company	: Frontz Drilling
Driller	: Jeremy Leckrone
Designation of Drill	: Geoprobe 6620DT
Type of Drill Rig	: Direct Push Technology
Geologist	: Amanda Trenton
Oversight Company	: SAIC
Borehole Diameter	: 2"
Sampling Equipment	: 1.5" x 4' Long Acetate Liner
	: 2" x 4' Dual Tube
	: 3" Hand Auger

Depth in feet	USCS Symbol	USCS Graphic	Description	Analyses	Recovery	Collection Interval	Comments
0	ML		(0.0' - 3.5') SILT (ML); little Clay and very fine grained Sand; 10YR5/6 yellowish brown, 5B6/1 bluish gray, and little 10YR6/3 pale brown; medium dense; dry to damp. Sand content increases with depth.	CPCsb-032-5113-SO collected from 0.0' - 1.0' on 03/24/10 at 1540 for TAL Metals + Hg, Explosives, and SVOCs.	1.0'/1.0'		Soil Color Chart Munsell 2000 Rev. Ed.
1							
2			2.0' - 2.2' Medium to fine grained Sand seam; little Silt; dry; 10YR4/4 dark yellowish brown.	CPCsb-032-5114-SO, CPCsb-032-6073-FD, & CPCsb-032-6075-QA collected from 1.0' - 4.0' on 03/24/10 at 1545 for TAL Metals + Hg, Explosives, and SVOCs.	3.0'/3.0'		(0.0' - 4.0') Hand Augered
3							
4	CL		(3.5' - 8.5') CLAY (CL); some Silt; trace Sand; trace <1/4" Gravel; 10YR5/6 yellowish brown and 2.5Y5/3 light olive brown; stiff; dry; low plasticity.				
5				CPCsb-032-5115-SO collected from 4.0' - 7.0' on 03/24/10 at 1625 for TAL Metals + Hg, Explosives, and SVOCs.	3.1'/3.0'		
6							
7			(7.0' - 7.8') Addition of N5/ gray.				
8			(7.8' - 8.5') Clay is all N5/ gray.	CPCsb-032-5116-SO collected from 7.0' - 10.0' on 03/24/10 at 1640 for TAL Metals + Hg, Explosives, and SVOCs.	3.1'/3.0'		
9	ML		(8.5' - 10.0') SILT (ML); some very fine grained Sand; N5/ gray; stiff; dry.				
10	SW		(10.0' - 11.5') Very fine grained SAND (SW); N5/ gray; medium dense; wet; nonplastic.				Groundwater encountered at 10 ft bgs
11							
12	SM		(11.5' - 13.0') SILT and very fine grained SAND (SM); trace Clay; N5/ gray; stiff; damp; nonplastic.		2.45'/3.0'		
13			Boring terminated at 13.0 ft bgs.				Coordinate System: NAD 83

Boring backfilled with sodium bentonite chips and hydrated.
0.0' - 1.0' sampled using a 3" hand auger and triangular subsample procedure for explosives as presented in Section 4.5.2.1.1 of the Facility-Wide SAP.
Samples were composited and homogenized for all analyses.

CPCsb-032

US Army Corps of Engineers
Louisville District

SAIC From Science to Solutions

RVAAP-29
Upper & Lower Cobbs Ponds
CPCsb-033

RVAAP PBA 2008 Remedial Investigation
Ravenna Army Ammunition Plant
8451 State Route 5
Ravenna, Ohio 44266
Portage County

Start Date	: 03/29/10; 1055
End Date	: 03/29/10; 1300
Northing Coord.	:
Easting Coord.	:
Total Depth of Boring	: 13.0 ft

Drilling Company	: Frontz Drilling
Driller	: Jeremy Leckrone
Designation of Drill	: Geoprobe 6620DT
Type of Drill Rig	: Direct Push Technology
Geologist	: Amanda Trenton
Oversight Company	: SAIC
Borehole Diameter	: 8"
Sampling Equipment	: 4.25" Hollow Stem Auger
	: 28" x 3" Shelby Tube

Depth in feet	USCS Symbol	USCS Graphic	Description	Analyses	Recovery	Collection Interval	Comments
0	ML		(0.0' - 3.5') SILT (ML); little Clay and very fine grained Sand; 10YR5/6 yellowish brown, 5B6/1 bluish gray, and little 10YR6/3 pale brown; medium dense; dry to damp. Sand content increases with depth.				Soil Color Chart Munsell 2000 Rev. Ed.
2			2.0' - 2.2' Medium to fine grained Sand seam; little Silt; dry; 10YR4/4 dark yellowish brown.				
4	CL		(3.5' - 8.5') CLAY (CL); some Silt; trace Sand; trace <1/4" Gravel; 10YR5/6 yellowish brown and 2.5Y5/3 light olive brown; stiff; dry; low plasticity.	Shelby Tube CPCsb-033-5117-SO collected from 4.0' - 5.4' on 03/29/10 for Porosity, Bulk Density, Moisture Content, Total Organic Carbon, Permeability, and Grain Size Fraction Analysis.	1.4'/2.0'		
7			(7.0' - 7.8') Addition of N5/ gray.				
8			(7.8' - 8.5') Clay is all N5/ gray.	Shelby Tube CPCsb-033-5118-SO collected from 8.0' - 9.7' on 03/29/10 for Porosity, Bulk Density, Moisture Content, Total Organic Carbon, Permeability, and Grain Size Fraction Analysis.	1.7'/2.0'		
9	ML		(8.5' - 10.0') SILT (ML); some very fine grained Sand; N5/ gray; stiff; dry.				
10	SW		(10.0' - 11.5') Very fine grained SAND (SW); N5/ gray; medium dense; wet; nonplastic.				
12	SM		(11.5' - 13.0') SILT and very fine grained SAND (SM); trace Clay; N5/ gray; stiff; damp; nonplastic.				
13			Boring terminated at 13.0 ft bgs.				Coordinate System: NAD 83

Boring backfilled with sodium bentonite chips and hydrated.
Shelby Tubes sealed with wax and capped.

CPCsb-033

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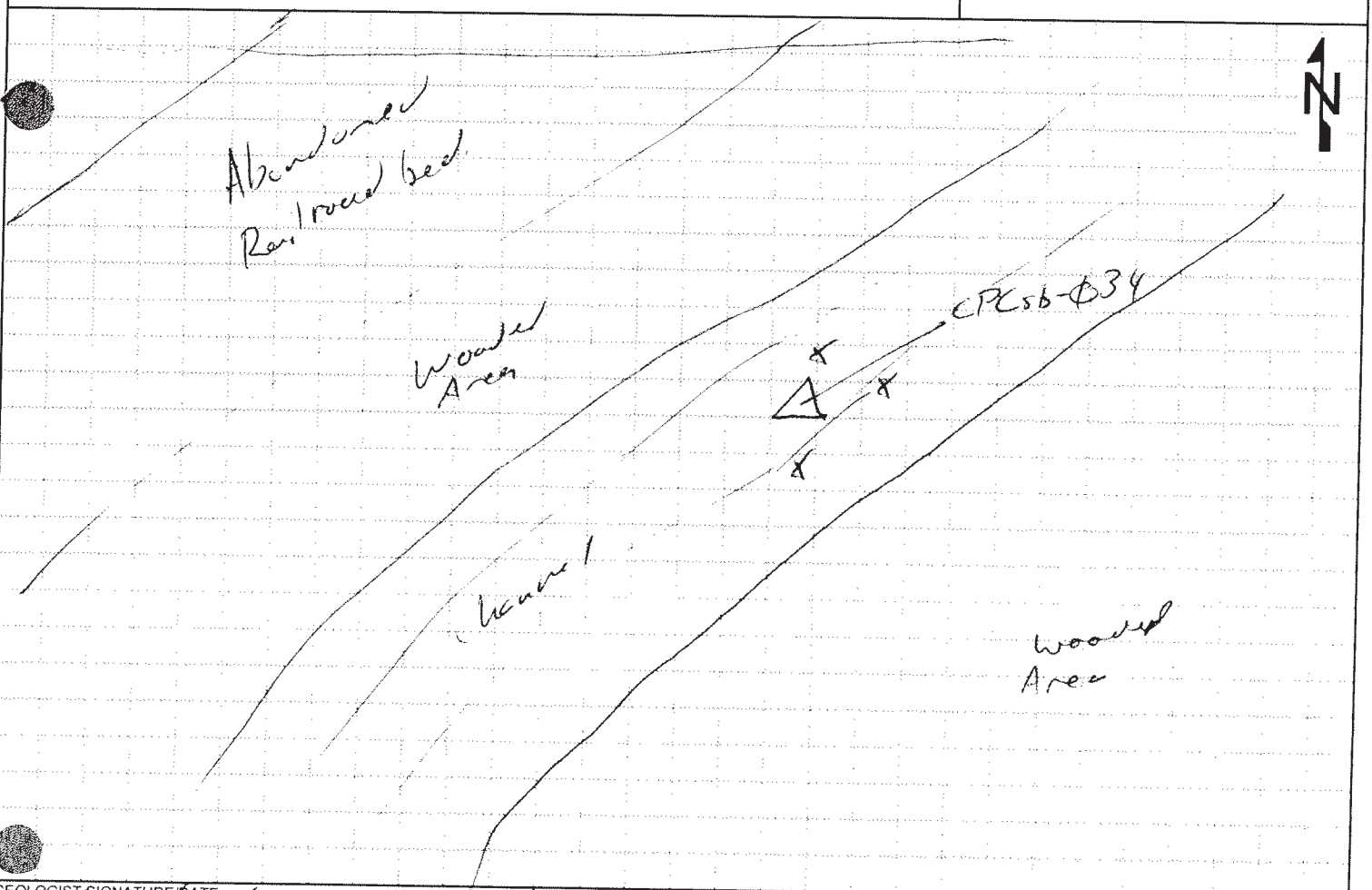
HTRW DRILLING LOG

DISTRICT: USACE - Louisville		BOREHOLE NUMBER: CPCsb-034
1. COMPANY NAME: SAIC	2. DRILLING SUBCONTRACTOR: Frontz Drilling	SHEET 1 OF 2
3. PROJECT: RVAAP PBA08 RI	4. LOCATION: RVAAP 8451 State Route 5 Ravenna, OH 44266	
5. NAME OF DRILLER: Steve Visicky	6. MAKE/MODEL OF DRILL: Geoprobe	
7. SIZES AND TYPES OF SAMPLING EQUIPMENT: 3" Hand Auger, SS Bowl	8. BOREHOLE LOCATION: E 2368709.691 N 560730.093	
	9. SURFACE ELEVATION/DATUM: NAD 83	
	10. DRILL/DATE/TIME STARTED: 3/29/10 1300 COMPLETED: 1400	
	15. DEPTH GROUNDWATER ENCOUNTERED: 2' BGS	
	16. DEPTH TO WATER/ELAPSED TIME AFTER BOREHOLE COMPLETION: NA	
12. OVERBURDEN THICKNESS: 2'+		
13. DEPTH DRILLED INTO BEDROCK: NA	17. OTHER WATER LEVEL MEASUREMENTS (INLCLUDE DATE/TIME): NA	
14. TOTAL DEPTH OF BOREHOLE: 2'		
18. GEOTECHNICAL SAMPLES: UNDISTURBED: NA DISTURBED:	19. TOTAL NUMBER OF CORE BOXES: NA	
20. CHEMICAL SAMPLES: CHEM: Full Suite RAD: NA OTHER:	21. TOTAL CORE RECOVERY %:	
22. DISPOSITION OF BOREHOLE: DATE STARTED/INSTALLED: 3/29/10	DATE COMPLETED/ABANDONED: 3/29/10	

BACKFILL TYPE: ☐ GROUT ☑ BENTONITE ☐ TEMPORARY WELL POINT ☐ MONITORING WELL

23. NOTES: BKG: ≤ Background; BGS: Below Ground Surface; CPM: Counts per Minute; PPM: Parts per Million; ▽ : First Water Encountered; ▼ : Static Water Level; NA: Not Applicable

LOCATION SKETCH/COMMENTS — **SCALE:** None



GEOLOGIST SIGNATURE/DATE	QA/QC SIGNATURE/DATE	BOREHOLE NUMBER
3/29/10	3/29/10	CPCsb-034

US Army Corps of Engineers
Louisville District

SAIC From Science to Solutions

RVAAP-29
Upper & Lower Cobbs Ponds
CPCsb-034

RVAAP PBA 2008 Remedial Investigation
Ravenna Army Ammunition Plant
8451 State Route 5
Ravenna, Ohio 44266
Portage County

Start Date	: 03/29/10; 1300
End Date	: 03/29/10; 1400
Northing Coord.	: 560730.093
Easting Coord.	: 2368709.691
Total Depth of Boring	: 2.0 ft

Drilling Company	: SAIC
Driller	: Steve Visocky
Designation of Drill	: NA
Type of Drill Rig	: NA
Geologist	: Steve Visocky
Oversight Company	: SAIC
Borehole Diameter	: 3"
Sampling Equipment	: 3" Hand Auger

Depth in feet	USCS Symbol	USCS Graphic	Description	Analyses	Recovery	Collection Interval	Comments
0	SM		(0.0' - 1.5') Fine grained SAND (SM); some Silt; trace Gravel; 1" ballast; 10YR4/3 brown with 10YR5/6 yellowish brown iron accumulations; loose; moist; nonplastic.	CPCsb-034-5119-SO collected from 0.0' - 1.0' on 03/29/10 at 1315 for VOCs, SVOCs, PCBs, Pesticides, Explosives, Propellants, and TAL Metals + Hg.	1.0'/1.0'		Soil Color Chart Munsell 1994 Rev. Ed.
1	SM		(1.0' - 2.0') SILT (SM); some fine to medium grained Sand; trace Clay; trace Gravel; gray N6/ with 10YR6/6 reddish yellow iron accumulations; moist; nonplastic.	CPCsb-034-5120-SO collected from 1.0' - 2.0' on 03/29/10 at 1345 for VOCs, SVOCs, PCBs, Pesticides, Explosives, Propellants, and TAL Metals + Hg.	1.0'/1.0'		
2			Boring terminated at 2.0 ft bgs. Groundwater encountered.				
3							
4							
5							Coordinate System: NAD 83

Boring backfilled with sodium bentonite chips and hydrated.
0.0' - 1.0' sampled using a 3" hand auger and triangular subsample procedure for explosives as presented in Section 4.5.2.1.1 of the Facility-Wide SAP.
Samples were composited and homogenized for all analyses, except VOCs.

CPCsb-034

HTRW DRILLING LOG

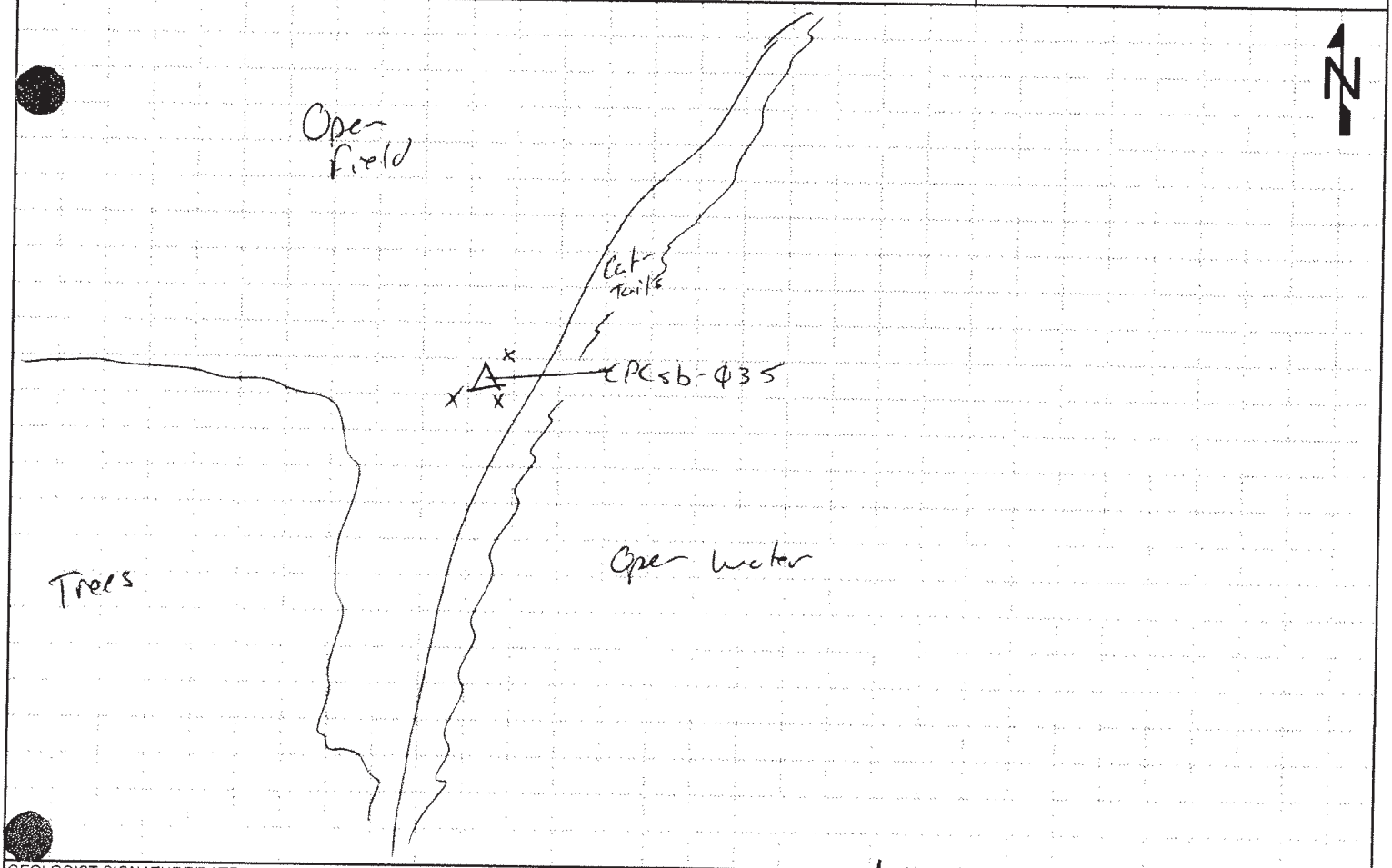
DISTRICT: USACE - Louisville		BOREHOLE NUMBER: CPCsb-035
1. COMPANY NAME: SAIC	2. DRILLING SUBCONTRACTOR: Frontz Drilling	SHEET 1 OF 2
3. PROJECT: RVAAP PBA08-RI	4. LOCATION: RVAAP 8451 State Route 5 Ravenna, OH 44266	
5. NAME OF DRILLER: Emily Cunningham / Jeremy Lederman	6. MAKE/MODEL OF DRILL: Geoprobe 6620	
7. SIZES AND TYPES OF SAMPLING EQUIPMENT: SS Bowl; 3" Hand Auger; 2" Dual Tube; 1½" Acetate Liner	8. BOREHOLE LOCATION: E 2368021.41 N 561865.41	
	9. SURFACE ELEVATION/DATUM: NAD 83	
	10. DRILL DATE/TIME: 3/29/10 STARTED: 1500 COMPLETED: 1700	
	15. DEPTH GROUNDWATER ENCOUNTERED: NA	
	16. DEPTH TO WATER/ELAPSED TIME AFTER BOREHOLE COMPLETION: NA	
12. OVERBURDEN THICKNESS: 13' +		
13. DEPTH DRILLED INTO BEDROCK: NA	17. OTHER WATER LEVEL MEASUREMENTS (INLCLUDE DATE/TIME): NA	
14. TOTAL DEPTH OF BOREHOLE: 13'		
18. GEOTECHNICAL SAMPLES: UNDISTURBED: NA DISTURBED:	19. TOTAL NUMBER OF CORE BOXES: NA	
20. CHEMICAL SAMPLES: CHEM: Fullsuite RAD: NA OTHER:	21. TOTAL CORE RECOVERY %:	
22. DISPOSITION OF BOREHOLE: DATE STARTED/INSTALLED: 3/29/10	DATE COMPLETED/ABANDONED: 3/29/10	

BACKFILL TYPE: ☐ GROUT ☑ BENTONITE ☐ TEMPORARY WELL POINT ☐ MONITORING WELL

23. NOTES: BKG: ≤ Background; BGS: Below Ground Surface; CPM: Counts per Minute; PPM: Parts per Million

▽ : First Water Encountered ▼ : Static Water Level NA: Not Applicable

LOCATION SKETCH/COMMENTS **SCALE:** None



GEOLOGIST SIGNATURE/DATE: 3/29/10	QA/QC SIGNATURE/DATE:	BOREHOLE NUMBER: CPCsb-035

US Army Corps of Engineers
Louisville District

SAIC From Science to Solutions

RVAAP-29
Upper & Lower Cobbs Ponds
CPCsb-035

RVAAP PBA 2008 Remedial Investigation
Ravenna Army Ammunition Plant
8451 State Route 5
Ravenna, Ohio 44266
Portage County

Start Date	: 03/29/10; 1500
End Date	: 03/29/10; 1700
Northing Coord.	: 561865.41
Easting Coord.	: 2368021.41
Total Depth of Boring	: 13.0 ft

Drilling Company	: Frontz Drilling
Driller	: Jeremy Leckrone
Designation of Drill	: Geoprobe 6620DT
Type of Drill Rig	: Direct Push Technology
Geologist	: Steve Visocky
Oversight Company	: SAIC
Borehole Diameter	: 2"
Sampling Equipment	: 1.5" x 4' Long Acetate Liner
	: 2" x 4' Dual Tube
	: 3" Hand Auger

Depth in feet	USCS Symbol	USCS Graphic	Description	Analyses	Recovery	Collection Interval	Comments
0	SC		(0.0' - 1.0') Fine grained SAND (SC); little Silt; trace Gravel; trace Clay; 1" - 2" Slag from 0.5' - 1.5'; 2.5Y5/2 grayish brown with 7.5YR5/8 strong brown iron accumulations; damp; low plasticity; trace organics (roots).	CPCsb-035-5123-SO collected from 0.0' - 1.0' on 03/29/10 at 1540 for VOCs, SVOCs, PCBs, Pesticides, Explosives, Propellants, and TAL Metals + Hg.	1.0'/1.0'		Soil Color Chart Munsell 1994 Rev. Ed.
1							
2	CL		(1.0' - 6.0') CLAY (CL); some Silt; trace Sand; trace Gravel; 2.5Y5/2 grayish brown with 10YR5/8 yellowish brown iron accumulations and Gray N6/ infilled root casts; damp; low plasticity; trace organics (roots).	CPCsb-035-5124-SO collected from 1.0' - 4.0' on 03/29/10 at 1615 for VOCs, SVOCs, PCBs, Pesticides, Explosives, Propellants, and TAL Metals + Hg.	3.0'/3.0'		(0.0' - 4.0') Hand Augered
3							
4							
5				CPCsb-035-5125-SO, CPCsb-035-6072-FD, & CPCsb-035-6074-QA collected from 4.0' - 7.0' on 03/29/10 at 1645 for VOCs, SVOCs, PCBs, Pesticides, Explosives, Propellants, and TAL Metals + Hg.	A 3.2'/3.0' B 3.0'/3.0'		
6	SC		(6.0' - 9.0') Fine grained SAND (SC); little Silt; trace Clay; trace Gravel; 10YR5/2 grayish brown with 10YR6/8 brownish yellow iron accumulations; moist; low plasticity.				
7							
8					3.4'/3.0'		
9	CL		(9.0' - 11.5') CLAY (CL); some Silt; trace Sand; 10YR5/2 grayish brown with 10YR6/8 yellowish brown iron accumulations; damp; low plasticity.	CPCsb-035-5126-SO collected from 7.0' - 13.0' on 03/29/10 at 1655 for VOCs, SVOCs, PCBs, Pesticides, Explosives, Propellants, and TAL Metals + Hg.			
10							
11					3.8'/3.0'		
12	ML		(11.5' - 13.0') SILT (ML); some Clay; trace Sand; trace Gravel; 10YR5/1 gray; damp; low plasticity.				
13			Boring terminated at 13.0 ft bgs.				Coordinate System: NAD 83

Boring backfilled with sodium bentonite chips and hydrated.
0.0' - 1.0' sampled using a 3" hand auger and triangular subsample procedure for explosives as presented in Section 4.5.2.1.1 of the Facility-Wide SAP.
Samples were composited and homogenized for all analyses, except VOCs.
Twin boreholes were drilled to obtain volume required for analyses.

CPCsb-035

SURFACE WATER AND SEDIMENT SAMPLES

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SAIC
From Science to Solutions

RVAAP - Surface Water & Wet Sediment Field Form

SHEET 1 OF 1

USACE - Louisville
RVAAP PBA 2008 RI

RVAAP 8451 State Rt. 5
Ravenna, OH 44266

1. Sample Team: Steve Visocky
Emily Cunningham

2. Location ID: CPC sw/sd - 044

3. Revised Coordinates Recorded: NA

4. Surface Water Sample ID: CPCSW-044

5. Date and Time: 3/29/10 0910

6. Dupe ID (if needed): NA

7. Split ID (if needed) NA

8. Surface Water Sample Type and Equipment Used: 1L Amber

9. MS/MSD: NA

10. Wet Sediment Sample ID: CPCsd-044-5022-SD

11. Date and Time: 3/29/10 0910

12. Dupe ID (if needed): NA

13. Split ID (if needed) NA

14. Wet Sediment Sample Type and Equipment Used: SS Bowl / Spoon / Push Probe

15. MS/MSD: NA

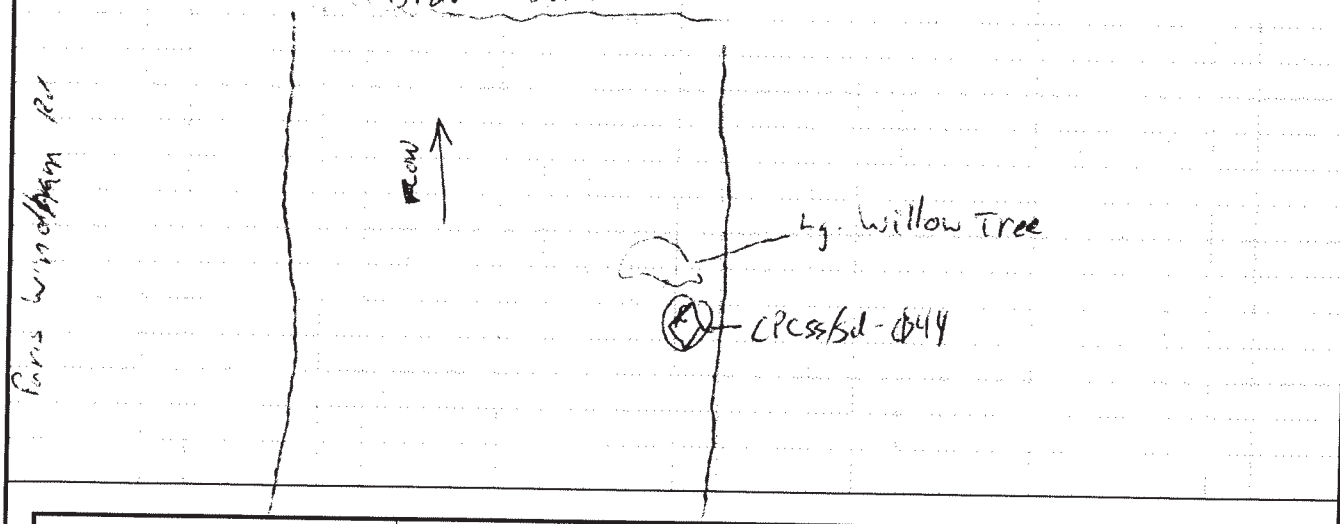
16. Weather Conditions: Overcast 43°F

17. Activities in the Area: None

LOCATION SKETCH/COMMENTS — **SCALE:** None

Field Notes:

SILT (SC), Some Fine Sand, Trace Clay, Trace organics (roots) Soft, Grayish Brown 2.5Y 5/2, clumpy, swampy odor.
WATER IS APPX. 1.5' deep



FIELD MEASUREMENTS	READING	UNITS	SERIAL NO.	LAST CALIB.
TEMPERATURE:	9.13	°C	15558	03-29-2010
pH:	7.10	S.U	↓	↓
CONDUCTIVITY:	0.128	mS/cm		
DO:	9.32	mg/L	↓	
TURBIDITY:	6.92	NTU	15559	
OTHER _____				

SURFACE WATER ANALYSES:
☐ EXPLOSIVES ☐ TAL METALS ☐ SVOCs ☐ OTHER _____
☒ FULL SUITE (VOCs, SVOCs, Metals, Explosives, Propellants, Pesticides, PCBs)

WET SEDIMENT ANALYSES:
☒ EXPLOSIVES ☒ TAL METALS ☒ SVOCs ☐ OTHER _____
☐ FULL SUITE (VOCs, SVOCs, Metals, Explosives, Propellants, Pesticides, PCBs)

Recorded By: [signature] 3/29/10 (Signature and Date)

QC Checked by: Emily Cunningham 03-29-10 (Signature and Date)

RVAAP - Surface Water & Wet Sediment Field Form

SHEET 1 OF 1

SAIC — From Science to Solutions

USACE - Louisville
RVAAP PBA 2008 RI

RVAAP 8451 State Rt. 5
Ravenna, OH 44266

1. Sample Team: Amanda Trenton, Ryan Lourich, Mike Remalia, Steve Visocky

2. Location ID: CPCsw/sd-Φ45

3. Revised Coordinates Recorded: NA

4. Surface Water Sample ID: CPCsw-Φ45-5Φ28-SW

5. Date and Time: 4/1/10 0910

6. Dupe ID (if needed): NA

7. Split ID (if needed): NA

8. Surface Water Sample Type and Equipment Used: Direct Fill, Grab.

9. MS/MSD: NA

10. Wet Sediment Sample ID: Φ-Φ5 CPCsd-Φ45-5Φ23-SD / Φ5-2 CPCsd-Φ45-5Φ25-SD 5783

11. Date and Time: 4/1/10 Φ-Φ.5: 0910 Φ.5-2: 0945

12. Dupe ID (if needed): NA

13. Split ID (if needed) NA

14. Wet Sediment Sample Type and Equipment Used: Composite, Grab via Piner, SS Core barrel + Liners, Slide Hammer + SS Bowl

15. MS/MSD:

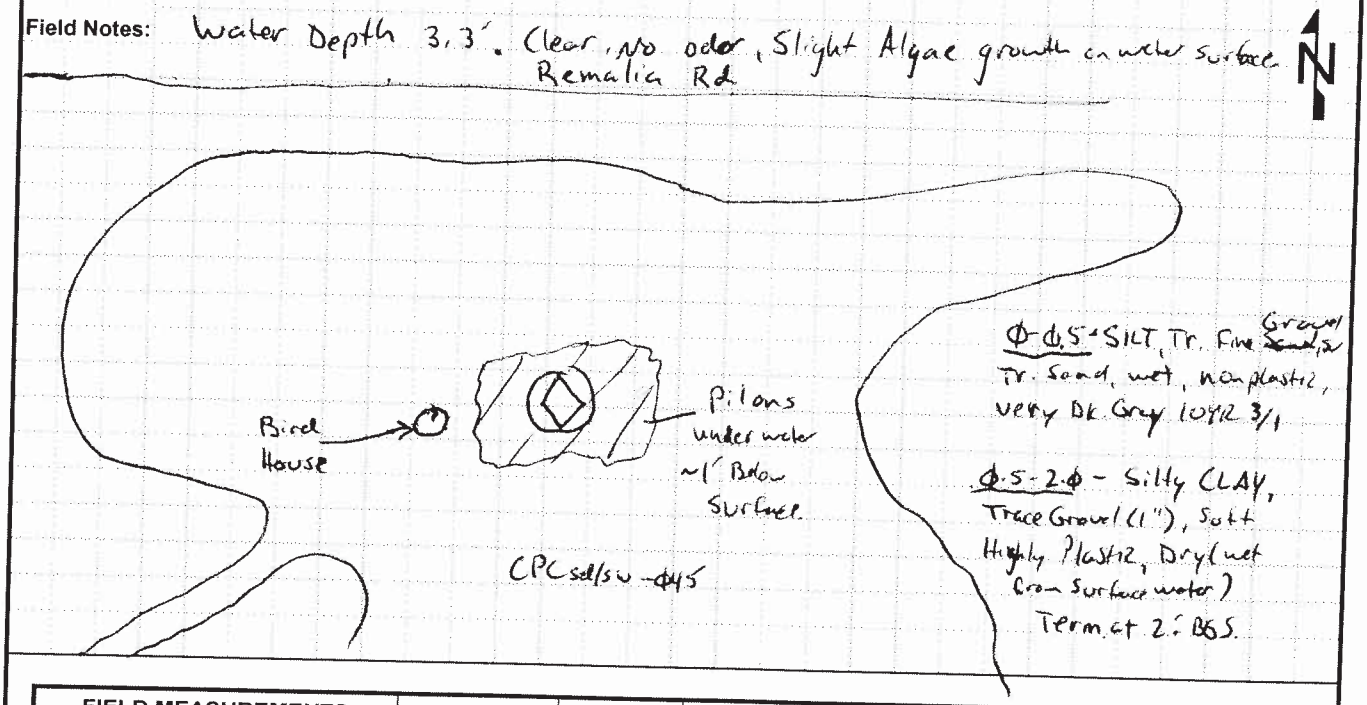
16. Weather Conditions: Sunny 55°F

17. Activities in the Area: None

LOCATION SKETCH/COMMENTS

SCALE: None

Field Notes: Water Depth 3.3'. Clear, No odor, Slight Algae growth on water surface



FIELD MEASUREMENTS	READING	UNITS	SERIAL NO.	LAST CALIB.
TEMPERATURE:	10.92	°C	15558	4/1/10
pH:	7.87	S.U		
CONDUCTIVITY:	Φ.116	mS/cm		
DO:	12.86	mg/L		
TURBIDITY:	5.48	NTU	15557	
OTHER SAL	Φ Φ5		15558	
ORP	119.1	mV	↓	↓

SURFACE WATER ANALYSES: ☐ EXPLOSIVES ☐ TAL METALS ☐ SVOCs ☐ OTHER _____
☒ FULL SUITE (VOCs, SVOCs, Metals, Explosives, Propellants, Pesticides, PCBs)

WET SEDIMENT ANALYSES: ☐ EXPLOSIVES ☐ TAL METALS ☐ SVOCs ☐ OTHER _____
☒ FULL SUITE (VOCs, SVOCs, Metals, Explosives, Propellants, Pesticides, PCBs)

Recorded By: _____ 4/1/10 (Signature and Date)

QC Checked by: _____ 4/12/10 (Signature and Date)

SAIC. From Science to Solutions

RVAAP - Surface Water & Wet Sediment Field Form

SHEET 1 OF 1

USACE - Louisville
RVAAP PBA 2008 RI

RVAAP 8451 State Rt. 5
Ravenna, OH 44266

1. Sample Team: Amanda Trenton, Ryan Lourich, Mike Denella, Steve Visocky

2. Location ID: CPCsw/sd-045

3. Revised Coordinates Recorded: NA

4. Surface Water Sample ID: CPCsw-045-5028-SW

5. Date and Time: 4/1/10 0910

6. Dupe ID (if needed): NA

7. Split ID (if needed) NA

8. Surface Water Sample Type and Equipment Used: Direct Fill, Grab.

9. MS/MSD: NA

10. Wet Sediment Sample ID: 0-0.5 / 0.5-2 CPCsd-045-5023-SD / CPCsd-045-5025-SD 4/1/10

11. Date and Time: 4/1/10 0-0.5: 0910 0.5-2: 0945

12. Dupe ID (if needed): NA

13. Split ID (if needed) NA

14. Wet Sediment Sample Type and Equipment Used: Composite, Grab-Ponar, SS Core barrel + Liners, Slide Hammer + SS Bowl

15. MS/MSD:

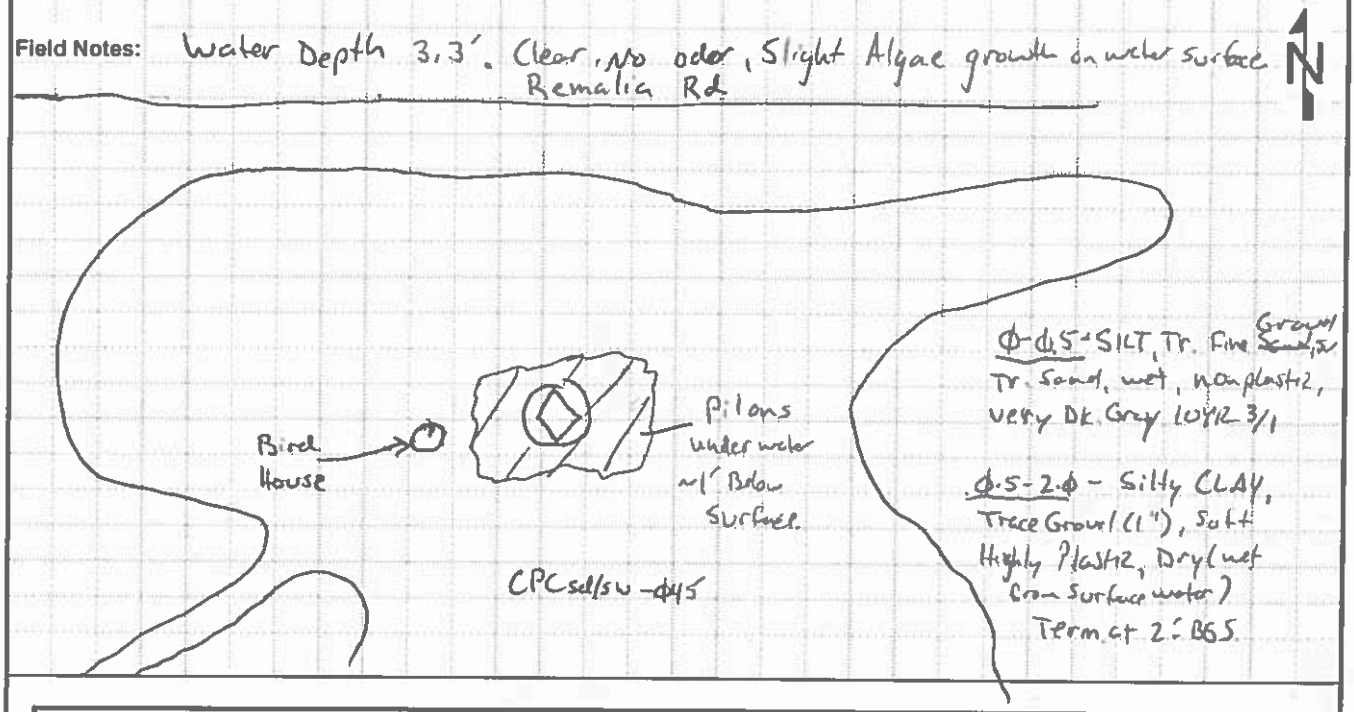
16. Weather Conditions: Sunny 55°F

17. Activities in the Area: None

LOCATION SKETCH/COMMENTS

SCALE: None

Field Notes: Water Depth 3.3'. Clear, No odor, Slight Algae growth on water surface



FIELD MEASUREMENTS	READING	UNITS	SERIAL NO.	LAST CALIB.
TEMPERATURE:	10.92	°C	15558	4/1/10
pH:	7.87	S.U		
CONDUCTIVITY:	0.116	mS/cm		
DO:	12.86	mg/L		
TURBIDITY:	5.48	NTU	15557	
OTHER SAL:	0.05		15558	
ORP	119.1	mV		

SURFACE WATER ANALYSES:
☐ EXPLOSIVES ☐ TAL METALS ☐ SVOCs ☐ OTHER _____
☒ FULL SUITE (VOCs, SVOCs, Metals, Explosives, Propellants, Pesticides, PCBs)

WET SEDIMENT ANALYSES:
☐ EXPLOSIVES ☐ TAL METALS ☐ SVOCs ☐ OTHER _____
☒ FULL SUITE (VOCs, SVOCs, Metals, Explosives, Propellants, Pesticides, PCBs)

Recorded By: _____ 4/1/10 (Signature and Date)

QC Checked by: _____ 4/12/10 (Signature and Date)

HTRW DRILLING LOG (continued)

	DISTRICT: USACE - Louisville	BOREHOLE NUMBER: CPCsd/sw-045
1. COMPANY NAME: SAIC	2. DRILLING SUBCONTRACTOR: ~~Frontz Drilling~~ MS 4/12/10	SHEET 2 OF
3. PROJECT: RVAAP PBA08 RI	4. LOCATION: RVAAP 8451 State Route 5 Ravenna, OH 44266	
5. NAME OF DRILLER	6. DIRECTION OF BOREHOLE: VERTICAL (circled) INCLINED DEGREES	
7. NOTES: PID MAKE/MODEL:	PID SERIAL#:	Colors from Munsell Soil Color Chart, Rev
WATER LEVEL MAKE/MODEL:	WATER LEVEL SERIAL#:	

ELEVATION	DEPTH (Feet)	USCS	CLASSIFICATION OF MATERIALS	SPT DATA (0.5 Feet)	MONITORING (PPM/CPM)	REMARKS (Sample IDs/Depths/Core Box/Etc.)
	1		0-0.5 SILT (ML), Tr. Fine Gravel, Tr. Sand, wet, nonplastic Very Dark Grey 10YR 3/1.	0-0.5 0.5/0.5	N/A	CPCsd-045-5023-SD collected @ 0910 (FULL SUITE)
	2		0.5-2' ~~Silty~~ Silty CLAY Tr. 1" Gravel, soft, Grey 10YR 5/1, Highly Plastic. Dry (wet when removed through water)	0.5-2 1.0/2.0	RS 4/12/10	CPCsd-045-5703-SD collected @ 0945 (FULL SUITE)
	3					
	4					
	5		Term @ 2'			
	6					
	7					
	8				RS 4/12/10	
	9					
	10					
	11					
	12					
	13					

GEOLOGIST SIGNATURE/DATE	QA/QC SIGNATURE/DATE	BOREHOLE NUMBER
4/1/10	4/12/10	CPCsd/sw-045

RVAAP - Surface Water & Wet Sediment Field Form

SHEET 1 OF 1

SAIC — From Science to Solutions

USACE - Louisville
RVAAP PBA 2008 RI

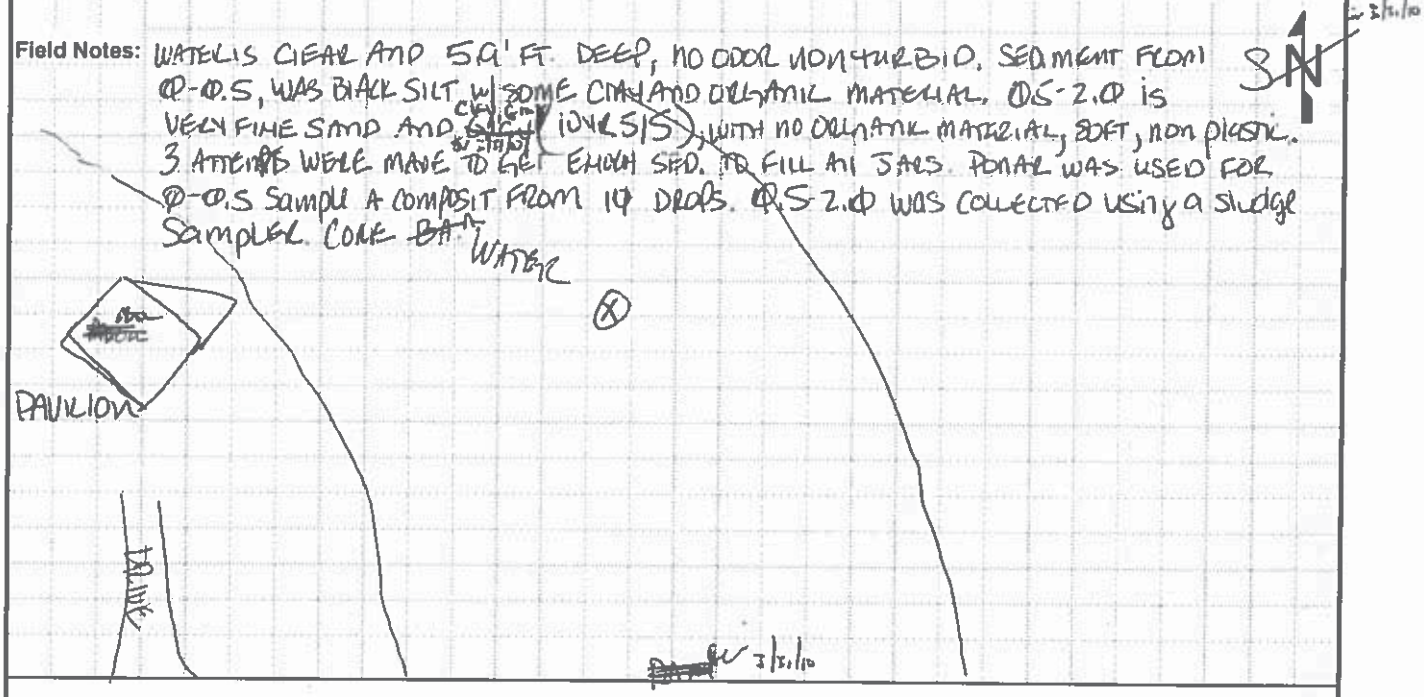
RVAAP 8451 State Rt. 5
Ravenna, OH 44266

1. Sample Team: AMANDA TRENTON & EMILY CUNNINGHAM & HEATHER MILLER

2. Location ID: CPC SW/SD - 0046	3. Revised Coordinates Recorded: NA
4. Surface Water Sample ID: CPCSW-0046-SD29-SW	5. Date and Time: 03/25/2010 ; 1045
6. Dupe ID (if needed): NA	7. Split ID (if needed) NA
8. Surface Water Sample Type and Equipment Used: DIRECT GRAB ; NONE	9. MS/MSD: NA
10. Wet Sediment Sample ID: CPCSD-0046-SD24-SD CPCSD-0046-SD04-SD	11. Date and Time: 03/25/2010 1150 1200
12. Dupe ID (if needed): NA	13. Split ID (if needed) NA
14. Wet Sediment Sample Type and Equipment Used: PONAR & SED. COLOR.	15. MS/MSD: NA
16. Weather Conditions: LT. RAIN, OVERCAST, 40°F	17. Activities in the Area: NONE

LOCATION SKETCH/COMMENTS — **SCALE:** None

Field Notes: WATER IS CLEAR AND 5Q' FT. DEEP, NO ODOR NON-TURBID. SEDIMENT FROM 0-0.5, WAS BLACK SILT W/ SOME CLAY AND ORGANIC MATERIAL. 0.5-2.0 is VERY FINE SAND AND CLAY (1045/S), WITH NO ORGANIC MATERIAL, SOFT, NON PLASTIC. 3 ATTEMPTS WERE MADE TO GET ENOUGH SED. TO FILL ALL JARS. PONAR WAS USED FOR 0-0.5 SAMPLE A COMPOSIT FROM 10 DROPS. 0.5-2.0 WAS COLLECTED USING A SLUDGE SAMPLER. CORE BAY



FIELD MEASUREMENTS	READING	UNITS	SERIAL NO.	LAST CALIB.
TEMPERATURE:	10.19	°C	15550	03/25/2010
pH:	7.000	S.U		
CONDUCTIVITY:	0.110	mS/cm		
DO:	9.96	mg/L		
TURBIDITY:	10.53	NTU	15559	03/25/2010
OTHER NA				

SURFACE WATER ANALYSES:
☐ EXPLOSIVES ☐ TAL METALS ☐ SVOCs ☐ OTHER _____
☒ FULL SUITE (VOCs, SVOCs, Metals, Explosives, Propellants, Pesticides, PCBs)

WET SEDIMENT ANALYSES:
☐ EXPLOSIVES ☐ TAL METALS ☐ SVOCs ☐ OTHER _____
☒ FULL SUITE (VOCs, SVOCs, Metals, Explosives, Propellants, Pesticides, PCBs)

Recorded By: _____ 03/25/2010
(Signature and Date)

QC Checked by: _____ 3/31/10
(Signature and Date)

SAIC. From Science to Solutions

RVAAP - Surface Water & Wet Sediment Field Form

SHEET 1 OF 1

USACE - Louisville
RVAAP PBA 2008 RI

RVAAP 8451 State Rt. 5
Ravenna, OH 44266

1. Sample Team: Mike Donnelly, Steve Visosky, Ryan Lovick, Amanda Trenton

2. Location ID: CPCsw/sd-Φ47

3. Revised Coordinates Recorded: NA

4. Surface Water Sample ID: CPCsw-Φ47-5030-SW

5. Date and Time: 4/1/10 1126

6. Dupe ID (if needed): CPCsw-Φ47-6045-FD

7. Split ID (if needed) CPCsw-Φ45-6044-QA

8. Surface Water Sample Type and Equipment Used: Direct Fill - Grab

9. MS/MSD: NA

10. Wet Sediment Sample ID: 5025 4/1/10 Φ.5-2 Φ-Φ5 CPCsd-Φ47-~~5783~~-SD / CPCsd-Φ47-5845

11. Date and Time: 4/1/10 Φ-Φ5 - 1126 Φ.5-2.0 - 1200

12. Dupe ID (if needed): NA

13. Split ID (if needed) NA

14. Wet Sediment Sample Type and Equipment Used: Ponar, SS Core Barrel + liners, Sieve Hammer, SS Bowl

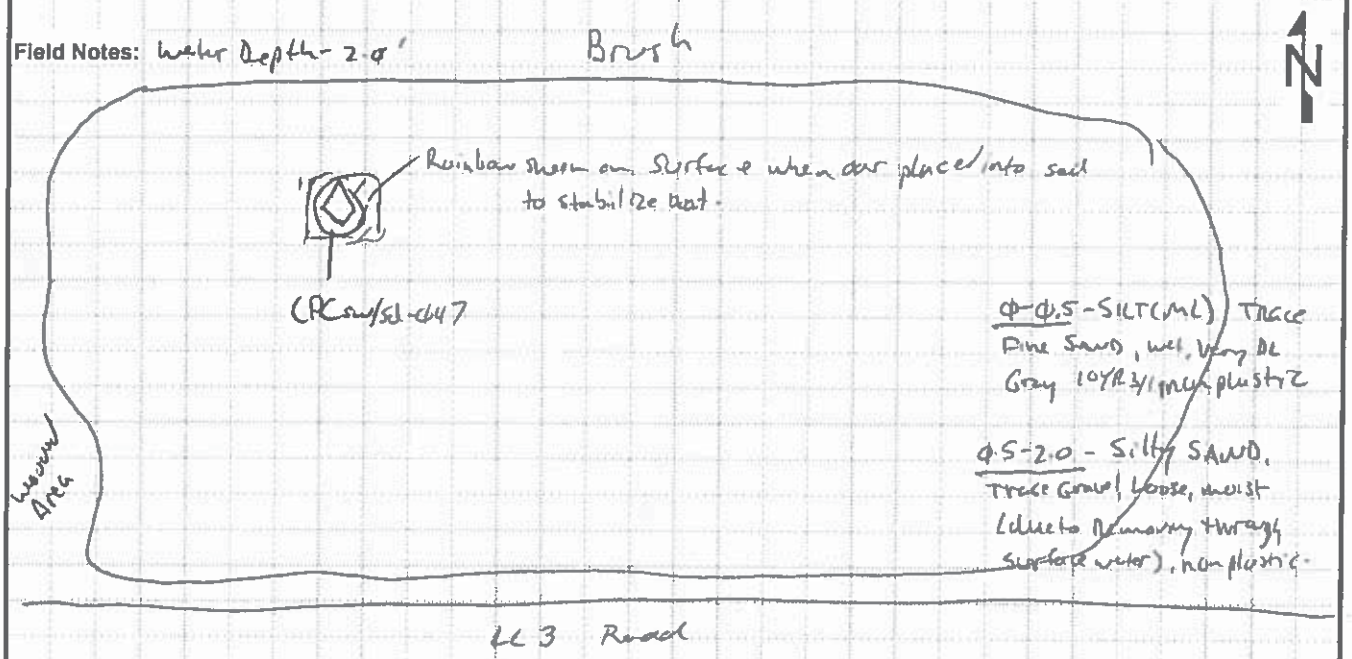
15. MS/MSD: NA

16. Weather Conditions: Sunny 70°F

17. Activities in the Area: Grab-UK, Composite

LOCATION SKETCH/COMMENTS

SCALE: None



FIELD MEASUREMENTS	READING	UNITS	SERIAL NO.	LAST CALIB.
TEMPERATURE:	12.94	°C	15558	4/1/10
pH:	9.61	S.U		
CONDUCTIVITY:	Φ.146	mS/cm		
DO:	12.25	mg/L		
TURBIDITY:	6.17	NTU	15557	
OTHER SAL:	Φ.Φ7		15558	
ORP	23.3	mV		

SURFACE WATER ANALYSES:
☐ EXPLOSIVES ☐ TAL METALS ☐ SVOCs ☐ OTHER _____
☒ FULL SUITE (VOCs, SVOCs, Metals, Explosives, Propellants, Pesticides, PCBs)

WET SEDIMENT ANALYSES:
☐ EXPLOSIVES ☐ TAL METALS ☐ SVOCs ☐ OTHER _____
☒ FULL SUITE (VOCs, SVOCs, Metals, Explosives, Propellants, Pesticides, PCBs)

Recorded By: _____ 4/1/10 (Signature and Date)

QC Checked by: RS 4/12/10 (Signature and Date)

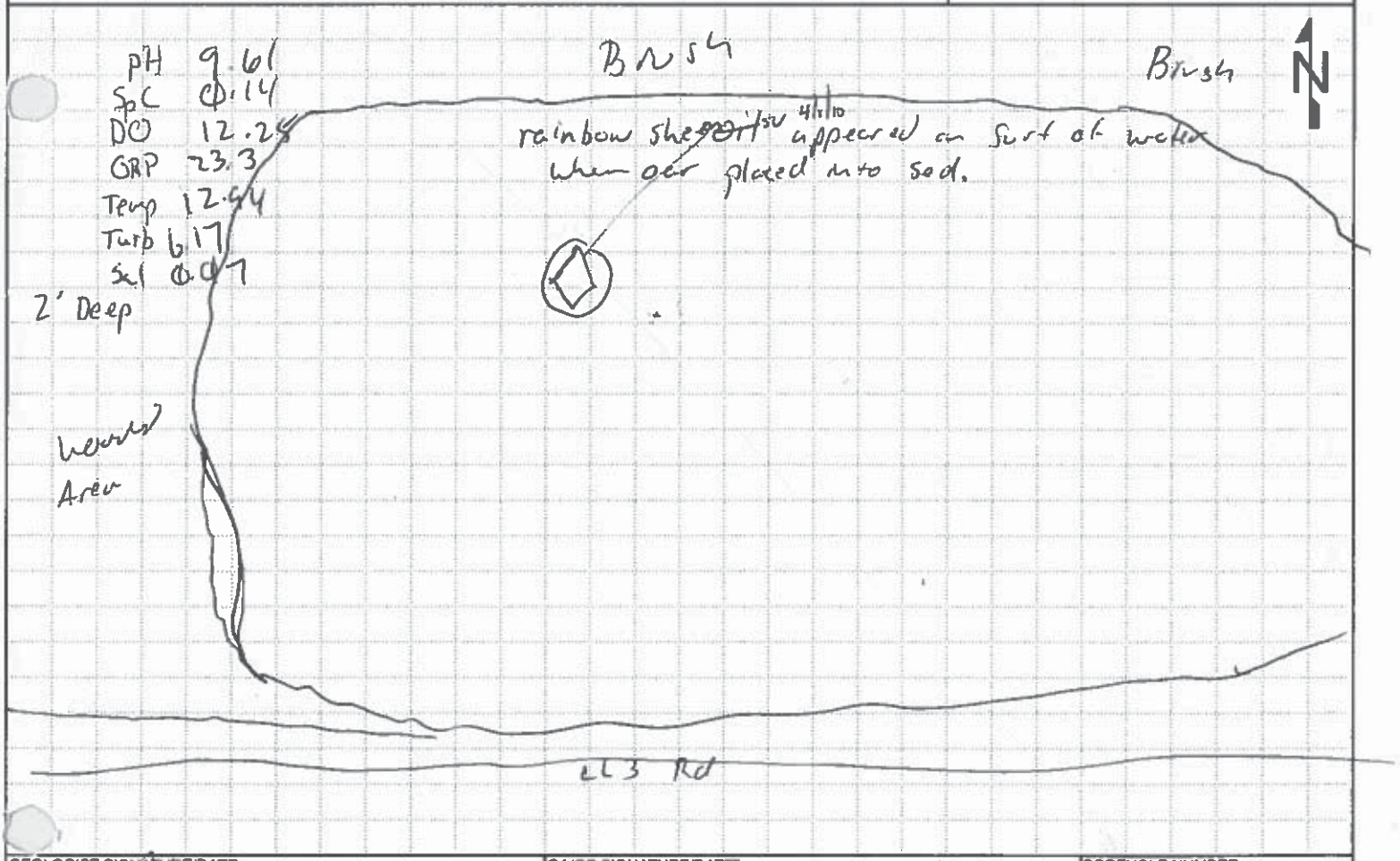
HTRW DRILLING LOG

	DISTRICT: USACE - Louisville	BOREHOLE NUMBER: CPCsw/sd-047
1. COMPANY NAME: SAIC	2. DRILLING SUBCONTRACTOR: ~~Frontz Drilling~~ RS 4/1/10	SHEET 1 OF
3. PROJECT: RVAAP	4. LOCATION: RVAAP 8451 State Route 5 Ravenna, OH 44266	
5. NAME OF DRILLER	6. MAKE/MODEL OF DRILL: ~~Geoprobe~~ RS 4/1/10	
7. SIZES AND TYPES OF SAMPLING EQUIPMENT: Ponar, 2" SS Liner + Sleeve, SS bowl + spoon, water direct fill	8. BOREHOLE LOCATION: E2368432.9980 / N561046.7020	
	9. SURFACE ELEVATION/DATUM	
	10. DRILL DATE/TIME: 4/1/10 STARTED: 1120 COMPLETED: 1200	
	15. DEPTH GROUNDWATER ENCOUNTERED	
	16. DEPTH TO WATER/ELAPSED TIME AFTER BOREHOLE COMPLETION	
12. OVERBURDEN THICKNESS		
13. DEPTH DRILLED INTO BEDROCK: NA	17. OTHER WATER LEVEL MEASUREMENTS (INCLUDE DATE/TIME)	
14. TOTAL DEPTH OF BOREHOLE: 2'		
18. GEOTECHNICAL SAMPLES — UNDISTURBED: — DISTURBED:	19. TOTAL NUMBER OF CORE BOXES: NA	
20. CHEMICAL SAMPLES — CHEM: — RAD: NA — OTHER:	21. TOTAL CORE RECOVERY %:	
22. DISPOSITION OF BOREHOLE — DATE STARTED/INSTALLED: — DATE COMPLETED/ABANDONED:		

BACKFILL TYPE: ☐ GROUT ☑ BENTONITE 4/1/10 ☐ TEMPORARY WELL POINT ☐ MONITORING WELL

23. NOTES: BKG: ≤ Background; BGS: Below Ground Surface; CPM: Counts per Minute; PPM: Parts per Million; ▽: First Water Encountered; ▼: Static Water Level; NA: Not Applicable

LOCATION SKETCH/COMMENTS — **SCALE:** None



GEOLOGIST SIGNATURE/DATE	QA/QC SIGNATURE/DATE	BOREHOLE NUMBER
4/1/10	4/12/10	CPCsw/sd-047

HTRW DRILLING LOG (continued)

	DISTRICT: USACE - Louisville	BOREHOLE NUMBER: CPCsd/sw-047
1. COMPANY NAME: SAIC	2. DRILLING SUBCONTRACTOR: ~~Frontz Drilling LS~~ 4/12/10	SHEET 2 OF
3. PROJECT: RVAAP PBA08 RI	4. LOCATION: RVAAP 8451 State Route 5 Ravenna, OH 44266	
5. NAME OF DRILLER	6. DIRECTION OF BOREHOLE: VERTICAL / INCLINED / DEGREES	
7. NOTES: PID MAKE/MODEL:	PID SERIAL#:	Colors from Munsell Soil Color Chart, Rev
WATER LEVEL MAKE/MODEL:	WATER LEVEL SERIAL#:	

ELEVATION	DEPTH (Feet)	USCS	CLASSIFICATION OF MATERIALS	SPT DATA (0.5 Feet)	MONITORING (PPM/CPM)	REMARKS (Sample IDs/Depths/Core Box/Etc.)
	1		0-0.5 SILT (ML) Tr. Fine Sand. wet, very DK Grey 10YR 3/1	0-0.5 0.5/0.5	N/A	CPCsd-047-SW25-SD Collected @ 1120 (FULL SUITE) RS 4/14/10
	2		~~0-0.5~~ 0.5 - 2.0 Silty SAND, Tr Gravel, Loose, moist (wet due to Removal through water.) non plastic. Term @ 2' BGS.	0.5-2	N/A	CPCsd-0475785-SD Collected @ 1200 (FULL SUITE) RS 4/12/10
	3					
	4					
	5					
	6					
	7					
	8					
	9					
	10					
	11					
	12					
	13					

RS 4/12/10

GEOLOGIST SIGNATURE/DATE	QA/QC SIGNATURE/DATE	BOREHOLE NUMBER
4/1/10	RS 4/12/10	CPCsd/sw-047

SAIC
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RVAAP - Surface Water & Wet Sediment Field Form

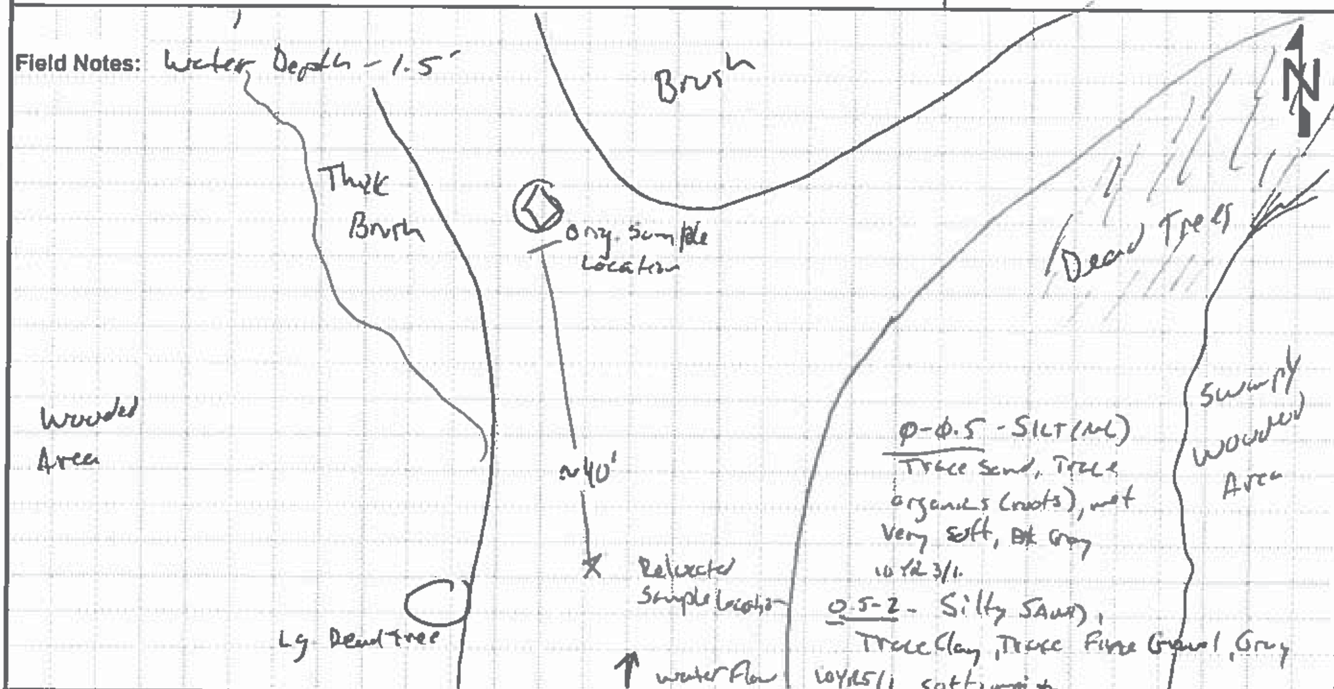
SHEET	1	OF	1

USACE - Louisville	RVAAP 8451 State Rt. 5 Ravenna, OH 44266	1. Sample Team: Niko Donallo, Steve Vitosky, Ryan McCurdy, ~~Amanda~~ SV 4/1/10
RVAAP PBA 2008 RI		

2. Location ID: CPCsw/sd-048	3. Revised Coordinates Recorded: E2368673.47' N560040.80'
4. Surface Water Sample ID: CPCsw-048-5031-SW	5. Date and Time: 4/1/10 1415
6. Dupe ID (if needed): NA	7. Split ID (if needed): NA
8. Surface Water Sample Type and Equipment Used: Direct Fill, Grab	9. MS/MSD: NA
10. Wet Sediment Sample ID: 0-0.5 CPCsd-048-5026-SD / 0.5-2 CPCsd-048-5786-SD	11. Date and Time: 4/1/10 0-0.5-1415 0.5-2-1450
12. Dupe ID (if needed): NA	13. Split ID (if needed): NA
14. Wet Sediment Sample Type and Equipment Used: Power, SS Core barrel, Slide Hammer, SS Bowl, Grab-VOC, composite	15. MS/MSD: NA
16. Weather Conditions: Sunny 78°F	17. Activities in the Area: None

LOCATION SKETCH/COMMENTS SCALE: None

Field Notes: Water Depth ~1.5'



FIELD MEASUREMENTS	READING	UNITS	SERIAL NO.	LAST CALIB.
TEMPERATURE:	~~8.23~~ 15.79 (SV 4/1/10)	°C	15558	4/1/10
pH:	8.23	S.U	↓	↓
CONDUCTIVITY:	0.147	mS/cm	↓	↓
DO:	10.95	mg/L	↓	↓
TURBIDITY:	4.98	NTU	15557	↓
OTHER SAL:	0.07		15558	↓
ORP	52.9	mV	↓	↓

SURFACE WATER ANALYSES: ☐ EXPLOSIVES ☐ TAL METALS ☐ SVOCs ☐ OTHER ______
☒ FULL SUITE (VOCs, SVOCs, Metals, Explosives, Propellants, Pesticides, PCBs)

WET SEDIMENT ANALYSES: ☐ EXPLOSIVES ☐ TAL METALS ☐ SVOCs ☐ OTHER ______
☒ FULL SUITE (VOCs, SVOCs, Metals, Explosives, Propellants, Pesticides, PCBs)

Recorded By: [signature] 4/1/10 (Signature and Date)   QC Checked by: [signature] 4/12/10 (Signature and Date)

SAIC
From Science to Solutions

RVAAP - Surface Water & Wet Sediment Field Form

SHEET 1 OF 1

USACE - Louisville
RVAAP PBA 2008 RI

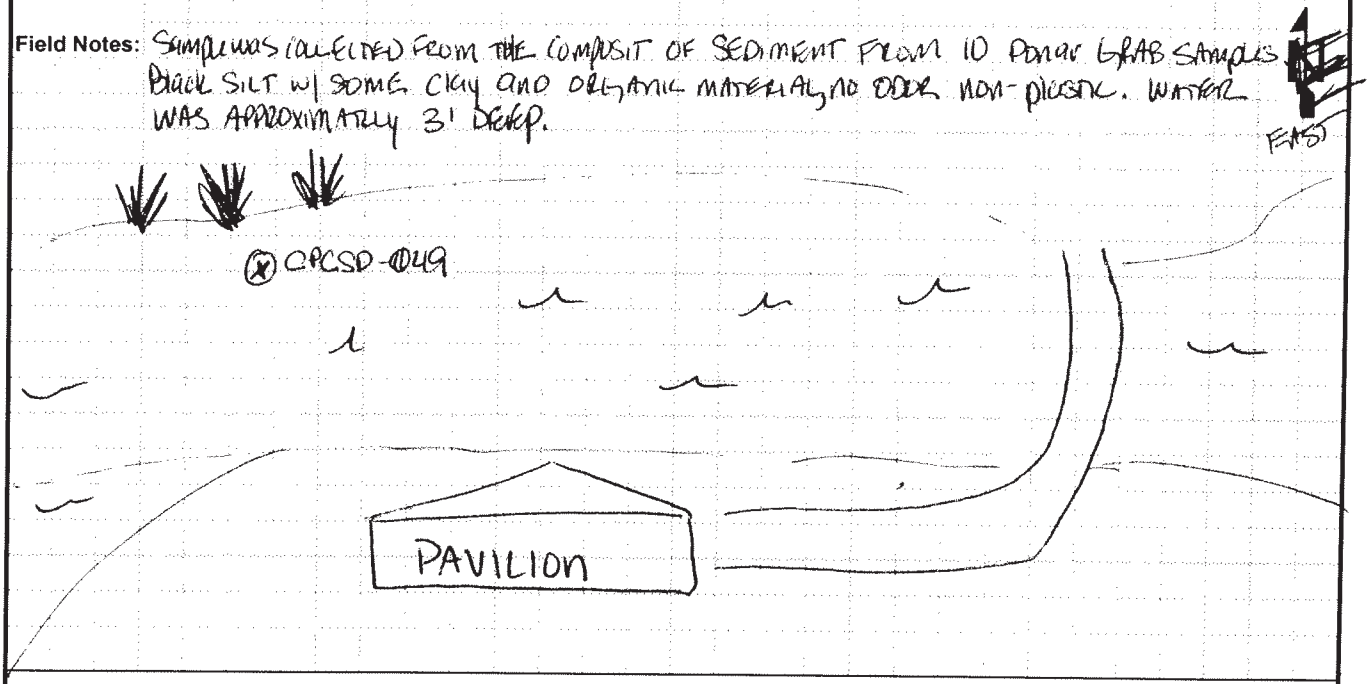
RVAAP 8451 State Rt. 5
Ravenna, OH 44266

1. Sample Team: Amanda Tenison
Emily Cunningham & Heather Miller

2. Location ID:	3. Revised Coordinates Recorded:
CPCSD-049	NA
4. Surface Water Sample ID:	5. Date and Time:
NA	NA
6. Dupe ID (if needed):	7. Split ID (if needed)
NA	NA
8. Surface Water Sample Type and Equipment Used: NA	9. MS/MSD: NA
10. Wet Sediment Sample ID:	11. Date and Time:
CPCSD-049-SED32-SD	03/25/2010 1315
12. Dupe ID (if needed):	13. Split ID (if needed)
NA	NA
14. Wet Sediment Sample Type and Equipment Used: PONAR SEDIMENT GRABBER	15. MS/MSD: NA
16. Weather Conditions: 40°F LT RAIN, MOD. WIND	17. Activities in the Area: NONE

LOCATION SKETCH/COMMENTS — **SCALE:** None

Field Notes: SAMPLE WAS COLLECTED FROM THE COMPOSIT OF SEDIMENT FROM 10 PONAR GRAB SAMPLES BLACK SILT W/ SOME CLAY AND ORGANIC MATERIAL, NO ODOR, NON-PLASTIC. WATER WAS APPROXIMATELY 3' DEEP.



FIELD MEASUREMENTS	READING	UNITS	SERIAL NO.	LAST CALIB.
TEMPERATURE:		°C		
pH:		S.U		
CONDUCTIVITY:		mS/cm		
DO:		mg/L		
TURBIDITY:		NTU		
OTHER _____:				

SURFACE WATER ANALYSES: ☐ EXPLOSIVES ☐ TAL METALS ☐ SVOCs ☐ OTHER _____
☐ FULL SUITE (VOCs, SVOCs, Metals, Explosives, Propellants, Pesticides, PCBs)

WET SEDIMENT ANALYSES: ☐ EXPLOSIVES ☐ TAL METALS ☐ SVOCs ☒ OTHER TOTAL CHROM & HEX CHROME
☐ FULL SUITE (VOCs, SVOCs, Metals, Explosives, Propellants, Pesticides, PCBs)

Recorded By: _____ 03/25/2010 (Signature and Date)

QC Checked by: _____ 3/31/10 (Signature and Date)