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451716

July 11, 1987

Dr. Carlos Stern
Carlos Stern and Associates, Inc.
1406 North Johnson Street
Arlington, Virginia 22201

Subject: Transmittal of Site Investigation Data Summary
Paulding (OH) Friction Products Facility
JLGA Project Communication 807123.03

Dear Dr. Stern:

Enclosed is a draft of the site investigation data summary for the Paulding, Ohio Friction Products Facility. We greatly appreciate the opportunity to work with you on this project. Please feel free to contact us if you have any questions or suggestions upon your review of this program.

Very truly yours,

JAMES L. GRANT & ASSOCIATES

Richard L. Henry

Richard L. Henry
Senior Hydrogeologist

James L. Grant
President

RLH/JLG

Enclosure

807123: 7-11-87

SITE INVESTIGATION DATA SUMMARY

Friction Products Facility
Paulding, Ohio

Prepared for

CARLOS STERN AND ASSOCIATES, INC.

Arlington, Virginia

Prepared By

James L. Grant and Associates
Englewood, Colorado
July 11, 1987

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SITE INVESTIGATION DATA COLLECTION SUMMARY

1. INTRODUCTION

Soil sampling, drilling and well installation activities for the site investigation at the Paulding, Ohio Friction Products Facility, were initiated on June 5, 1987 and completed on June 14, 1987. Six soil borings and five temporary wells were completed during this investigation to assess the presence of hazardous materials at the site. The locations of the temporary wells installed during the site investigation are shown on Figure 1. Older monitoring wells also are shown on Figure 1. Table 1 lists the pertinent well completion details for all of the temporary wells. Fifty-seven shallow soil samples were collected at the site and two off-site soil samples also were collected for background characterization.

This investigation focused primarily on additional characterization of the surface distribution of waste materials and an evaluation of the subsurface occurrence of waste constituents in the abandoned waste pits and in soil materials adjacent to the underground storage tanks.

2. FIELD INVESTIGATION

2.1 Temporary Wells

Five temporary wells, designated with the prefix "PA-," were installed in the disposal areas as shown on Figure 1. One well is situated in Sludge Pond 1, the Burn Pit, and the Disposal Pit, and two wells are located in the Asbestos Pile. These wells were screened so that a ground-water sample could be obtained from each of these areas if possible. Table 1 lists the well depths, elevations, and screened interval of each well.

2.2 Under-Ground Tank Borings

Six underground tanks are present at the site. Five soil borings, designated with the prefix "PAB-," were placed adjacent to the tanks to determine if a waste constituent release has occurred. Underground tank soil boring locations are shown on Figure 1. The borings were drilled to a depth of about 15 feet and were sampled continuously.

2.3 Drilling and Soil Sampling Procedures

Eleven borings, five which were completed as temporary wells, were drilled by Professional Services, Incorporated of Lima, Ohio using hollow-stem auger drilling equipment. The wells were drilled about 8 inches in diameter, and extended to depths ranging from 8 to 15 feet. Borings which were not completed as temporary wells were abandoned with a portland cement/sodium bentonite grout mixture.

A James L. Grant and Associates (JLGA) field geologist observed all drilling and well installation activities, maintained a log of these activities, and verified compliance with technical procedures. Continuous samples of subsurface geologic materials were obtained using a 2-inch o. d. split-spoon sampler. Sampling procedures were conducted according to ASTM procedure D-1586. The soil samples were described and indications of the presence of waste constituents were noted. The borings at which foreign odors were detected are temporary well PA-5, and soil borings PAB-2, and PAB-3. Foreign odors were not detected in any of the other wells or borings. These observations are indicated on the boring logs included in Appendix A.

After the geologic characteristics of the soil samples were noted on the boring logs, a representative portion of the sample was placed in a clean glass jar, sealed, labeled, and stored in a chilled container until ready for shipment by overnight carrier to the laboratory.

Soil-boring logs and well installation records are presented in Appendix A. These records show the sample type, sample number, and intervals sampled for each borehole. The logs graphically depict subsurface materials penetrated at each boring and the details of well installation.

2.3.1 Equipment Decontamination Procedures.

To minimize the potential for introduction of waste constituents into intervals penetrated by drilling, the following procedures were followed:

- The down-hole portion of all drilling tools was cleaned before drilling and after completion of each boring with a high-pressure, hot-water cleaner.
- Well casing and screen were washed with a high-pressure, hot-water cleaner before use. All well-completion materials were examined by the field geologist and judged to be acceptably clean before use.

- All down-hole drill tools were stored on pipe racks during the drilling operation to prevent potential contamination.

- Split-spoon decontamination included a tap water wash (with non-phosphate soap), a tap water rinse, a distilled water rinse, a one percent nitric acid rinse, and a final rinse with methanol.

2.3.2 **Temporary Well Installation.**

The basic design of the temporary wells is illustrated in Figure 2. This figure shows the relative placement of well screen, gravel pack, and sealed sections of the well. The well completion details are illustrated on the temporary well records presented in Appendix A.

Upon completion of drilling to the proper termination depth, a well casing was installed in the borehole. Two-inch diameter, schedule 40, PVC screen and blank well casing were used for all wells. All well casing sections are flush-joint threaded; solvent-welded couplings were not used to avoid the possibility of introducing PVC solvents into the well water. The PVC casing at each well was fitted with a PVC bottom plug and a PVC top cap. Each well was completed in the following manner:

- The length of screen within each well is 5 feet. This length allows water from a small vertical portion of the subsurface to be obtained. The slots in the screen are factory cut to a width of 0.010 inches. A graded sand filter was placed in the annulus of the borehole against the screened interval and extends about 2 feet above the top of the screen.

- A 1-to 2-foot thick sodium bentonite pellet seal was placed above the sand filter.

- A portland cement/sodium bentonite grout mixture was placed from the top of the bentonite pellet seal, to the ground surface. The grout was placed, in a continuous process, from the top of the bentonite seal to the ground surface. All grouting below the ground-water level was performed using a 3/4-inch diameter tremie pipe.

A 1-foot diameter concrete pad was poured around the base of the protective cover and was graded to facilitate rapid runoff of precipitation.

2.3.3 Well Development.

The temporary wells were developed soon after the wells were completed. Each of the wells was developed to remove natural soil materials and drill cuttings from the well screen interval. Well development was accomplished using bailer methods. Development was terminated when the turbidity of the discharge water stabilized or after removal of three well casing volumes of water.

The total quantity removed from each well was measured. The discharge water was poured on the ground surface near the well. The volume, color, odor, and clarity of discharge water evacuated from each of the wells during development were estimated by observing flow from the well. Table 2 provides a summary of well-development data.

2.3.4 Well Surveying.

Well locations and ground-surface and datum elevation measurements were provided by R. B. Ernsberger and Associates, of Defiance, Ohio. The wells were surveyed on June 11, 1987. Horizontal and vertical control was provided for each of the borings, temporary wells, and the shallow soil sample localities. All elevations are based on U. S. Geological Survey mean sea level datum. The elevations and coordinates for each well are noted on the well records and in Table 1.

2.4 Shallow Soil Sampling

2.4.1 On-Site Soil Samples.

The site property was subdivided into nine homogenous areas as indicated on Figure 3. A shallow soil sampling program was conducted in these nine areas. Sampling consisted of collecting about five to eight random samples over each area. The soil samples were taken from shallow depths (about 6 inches) with a four-inch i.d. bucket auger. The samples from each sampled area were composited by the analytical laboratory into one sample and analyzed chemically. The samples were analyzed for copper, lead, and zinc using EP toxicity test procedures. The preliminary analytical results for the composited samples are presented in Table 5. The purpose of these shallow soil samples is to delineate the "clean" areas of the site.

Visible pieces of the manufactured materials occur on the site surface. During the shallow soil sampling an estimate of the percentage of these materials in the soils was made. Areas where these materials occur were not included in the soil samples, but

were noted on a site map.

2.4.2 Off-Site Soil Samples.

In order to determine the background characteristics of the local soils away from the site, two composite soil samples, designated Offsite 1 and Offsite 2, were collected from areas near the site. The locations of these soil samples are shown on Figure 4. The samples were collected and composited according to the methods described in Section 2.6.1. The samples were analyzed for copper, lead, and zinc using EP toxicity test procedures. The preliminary analytical results for these samples are presented in Table 5.

2.5 Ground-Water Sampling

Temporary wells installed during this program were sampled on June 12, 1987. Ground-water samples were collected from two of the temporary wells. Wells PA-5 (Sludge Pit 1) and PA-6 (Burn Pit) yielded sufficient water to sample. Wells PA-7 (Disposal Pit), PA-8 (Asbestos Pile), and PA-9 (Asbestos Pile) were dry. These samples will be used to determine the character of the disposal site leachates and establish the potential for waste constituent releases to the site soil and ground-water systems. The samples were analyzed for the parameters listed in Table 4. Preliminary analytical results for the two ground-water samples obtained from Sludge Pit 1 (PA-5) and the Burn Pit (PA-6) are presented in Tables 6, 7, and 8.

TABLE 1

Well Completion Data

WELL NO	COORDINATES EAST	COORDINATES NORTH	WELL INSTALLATION DATE	WELL INSTALLATION BY	ELEVATION GROUND (ft msl)	ELEVATION DATUM (ft msl)	SCREEN TOP DEPTH (ft)	SCREEN TOP ELEVATION (ft msl)	SCREEN BOTTOM DEPTH (ft)	SCREEN BOTTOM ELEVATION (ft msl)	TOTAL DEPTH (ft)
PA-5	1260	694	Jun-87	JLGA	102.0	103.42	8.8	93.2	13.8	88.2	13.8
PA-6	1023	757	Jun-87	JLGA	100.7	104.00	5.7	95.0	10.7	90.0	10.7
PA-7	819	763	Jun-87	JLGA	101.2	104.33	3.0	98.2	8.0	93.2	8.0
PA-8	171	476	Jun-87	JLGA	103.2	104.10	3.0	100.2	8.0	95.2	8.0
PA-9	187	240	Jun-87	JLGA	103.6	103.17	4.0	99.6	9.0	94.6	9.0

TABLE 2

Well Development Summary

TABLE 3

Water-Level Data

WELL NO	DEPTH TO WATER (feet)	DATUM (ft msl)	WATER-LEVEL ELEVATION (ft msl)
PA-5	4.15	103.42	99.27
PA-6	6.65	104.00	97.35
PA-7	DRY	104.33	DRY
PA-8	DRY	104.10	DRY
PA-9	DRY	103.17	DRY

TABLE 4

Analytical Parameters

SOIL SAMPLES	GROUND WATER SAMPLES
LEAD	MAJOR IONS
ZINC	SEMIVOLATILE ORGANICS
COPPER	VOLATILE ORGANICS
	PRIORITY POLLUTANT METALS

Note: Soil samples were analyzed using EP Toxicity Test Methods.

TABLE 5

EP Toxicity Analyses

EP TOXICITY TEST RESULTS

COMPOSITED SHALLOW SOIL SAMPLES

PAULDING, OHIO

AREA NO	COPPER (mg/l)	LEAD (mg/l)	ZINC (mg/l)
I	0.007	ND	0.02
II	0.011	ND	0.05
III	0.160	0.40	1.20
IV	0.180	4.10	1.40
V	0.320	5.10	2.10
VI	3.400	8.80	9.90
VII	0.090	7.80	0.47
VIII	0.022	ND	0.19
IX	0.200	0.18	2.00
OFFSITE 1	0.011	ND	0.02
OFFSITE 2	0.011	ND	0.08

TABLE 6

Ground-Water Analyses - Metals

Parameter	PA-5 (mg/l)	PA-6 (mg/l)
ANTIMONY	ND	ND
ARSENIC	ND	ND
BERYLLIUM	ND	ND
CADMIUM	ND	ND
CHROMIUM	ND	ND
COPPER	0.011	0.029
LEAD	0.099	0.023
MERCURY	ND	ND
NICKEL	ND	ND
SELENIUM	ND	ND
SILVER	ND	ND
THALLIUM	ND	ND
ZINC	0.04	0.14

TABLE 7

Ground-Water Analyses - Major Ions

Parameter	PA-5	PA-6	Average
Calcium	20	98	59
Iron	ND	ND	ND
Magnesium	422	431	427
Potassium	56	7	32
Sodium	287	32	160

TABLE 8

Ground-Water Analyses - Organics

Parameter	PA-5 (ug/l)	PA-6 (ug/l)
Volatile Organics		
Acetone	230	ND
Total Xylenes	7.0	ND
SS Toluene-D8	101	99
SS Bromofluorobenzene (BFB)	102	104
SS 1,2-Dichloroethane-D4	104	98
Semivolatile Organics		
2,4-Dinitrophenol	15	ND
Phenol	730	ND
SS Nitrobenzene-D5	71	70
SS 2-Fluorobiphenyl	75	72
SS Terphenyl-D14	21	34
SS Phenol-D5	30	23
SS 2-Fluorophenol	30	24
SS 2,4,6-Tribromophenol	32	24

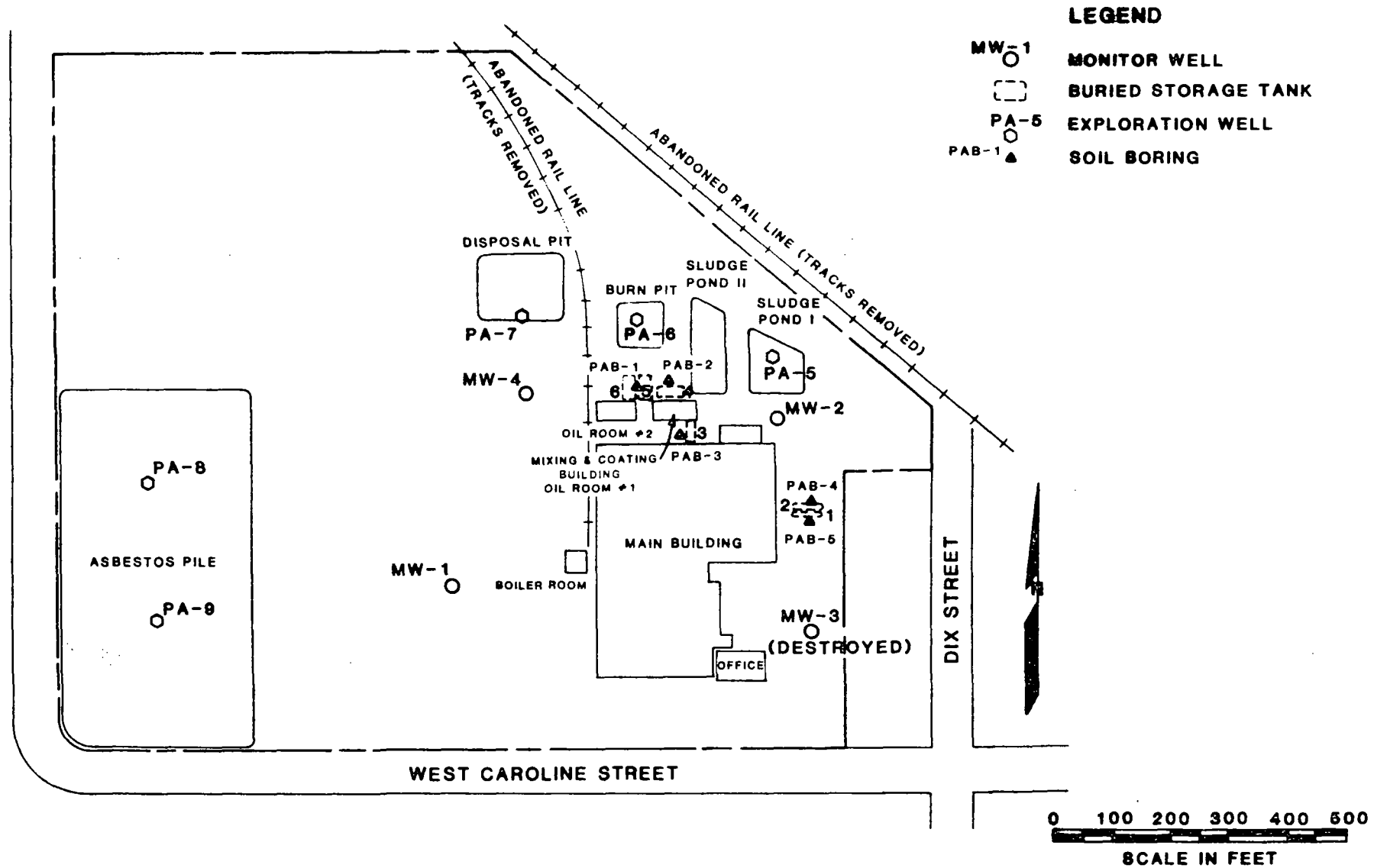

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FIGURE 1
TEMPORARY WELL AND BORING LOCATIONS

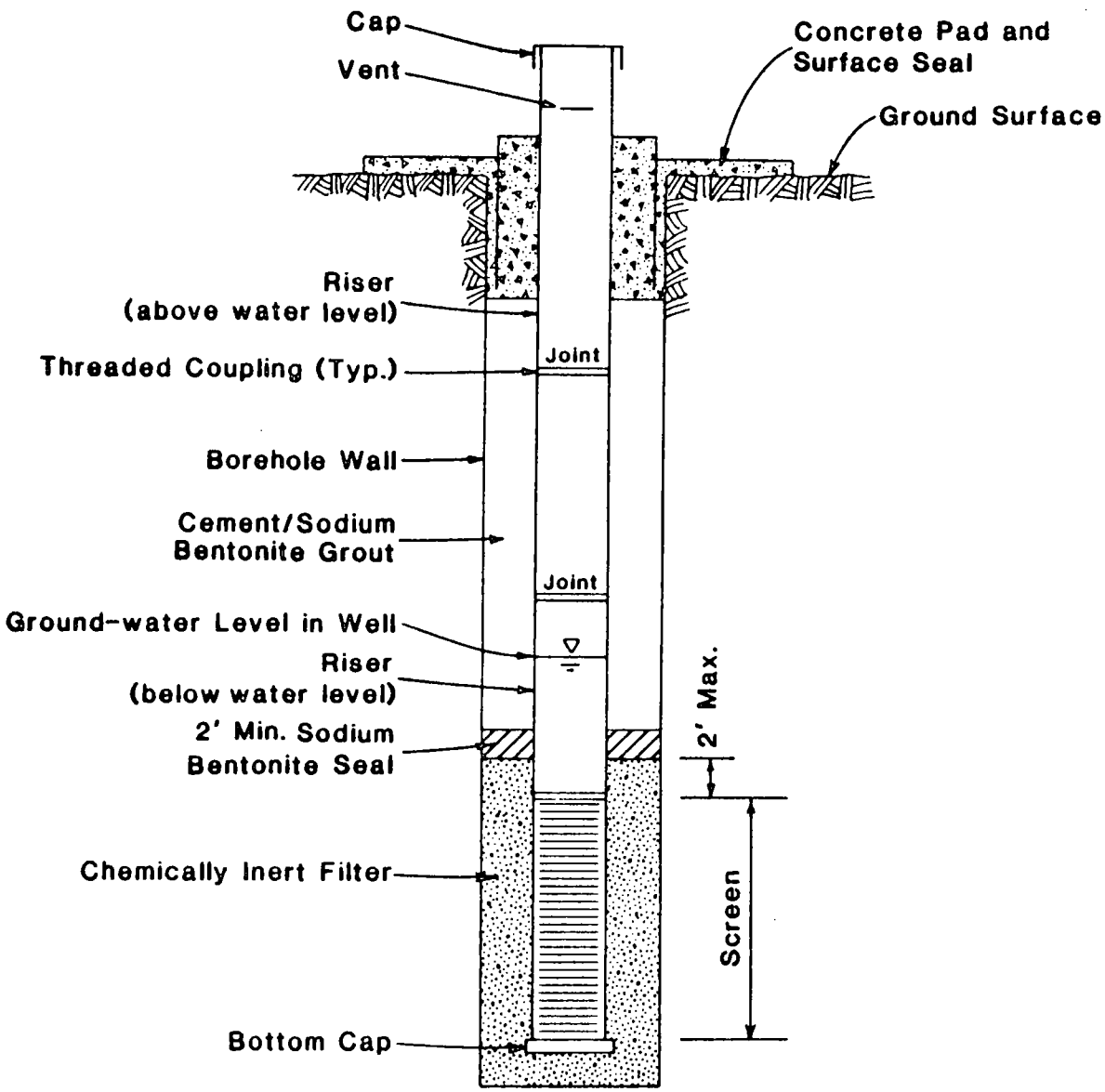

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FIGURE 2

MONITORING WELL DESIGN

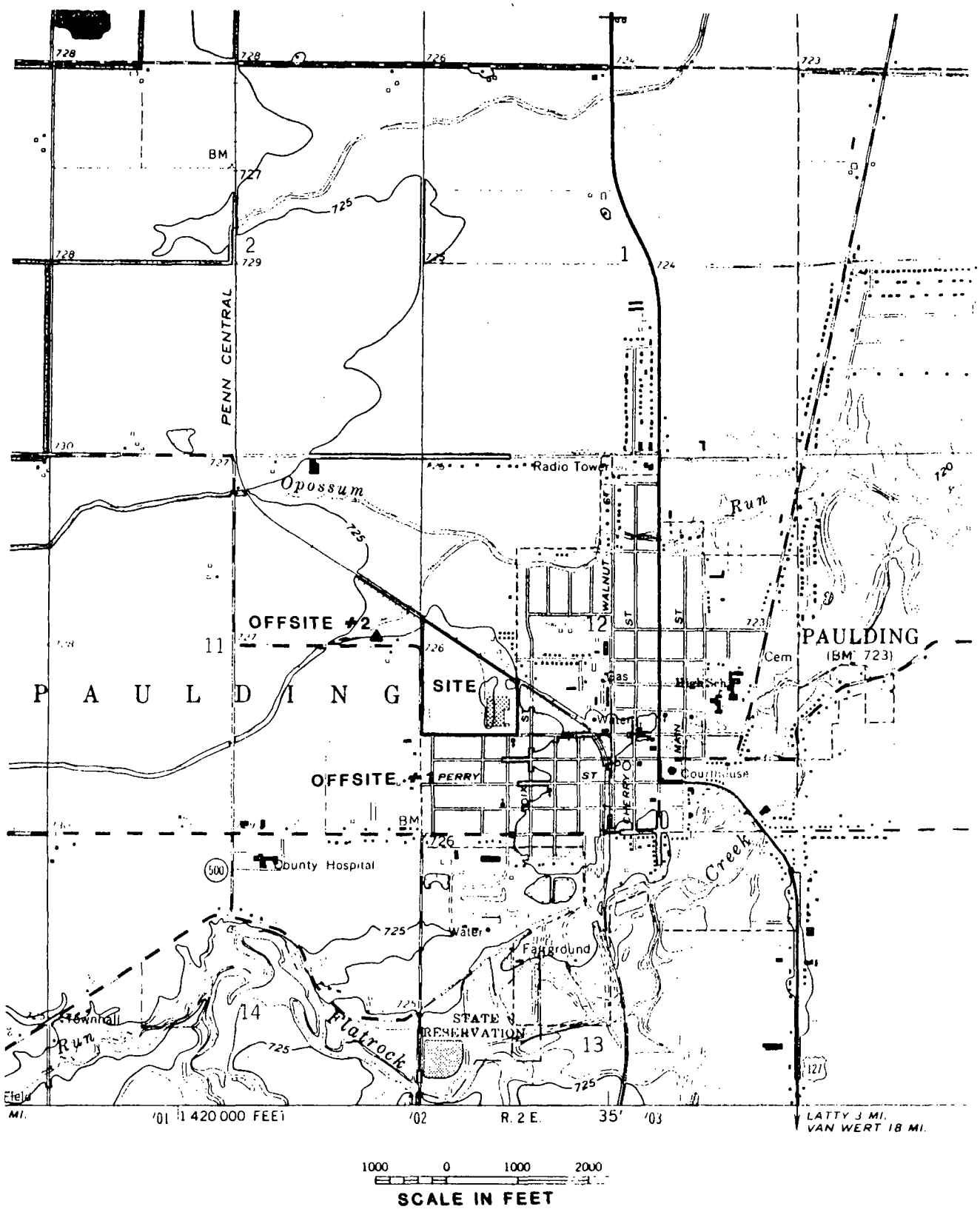

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FIGURE 4

OFF-SITE SOIL SAMPLE LOCATIONS

APPENDIX A

WELL INSTALLATION RECORDS

Elev. (Feet)	Depth (Feet)	Description	USC	Sample Interval	Odor	Graphic Log	Well Completion Detail	Depth (Feet)
		Ground Surface 102.0					Top PVC Datum	
	0	TOPSOIL: orange-brown mottled, silty clay, with abundant roots and organic matter, damp.	CL	60%			Portland Cement/ Sodium Bentonite Grout	0
	1.1				7		2" I.D. SCH 40 PVC Flush-threaded	
	2	SLUDGE: black to greenish-black, spongy, fibrous product material; common fine metallic particles; sludge is layered with bright green layers which range in thickness from 1 to 2.5 inches; green layers appear to contain less fibrous material and more metallic material. Material has an oily odor which varies from moderate to strong.		No 45%			8" Borehole	2
					3			
	4			Mo 100%				4
					2			
	6			So 75%			5.9 Sodium Bentonite Pellets	6
					2		7.0	
	8			Mo 55%			Sand	8
					2		8.8	
	10			Mo 68%			2" I.D. Sch 40 PVC 0.010" Slotted Screen	10
					2			
	12			Wo 93%				12
	13.1	CLAY TILL: brown, to gray-brown mottled, laminated clay till with quartz pebbles (1 to 3%); stiff, damp.			11		13.8	
	14		CL	No 100%			14.0 cap	14
	15.0			No	11			
	16	Boring Terminated @15'					SLUDGE POND	16

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Monitoring Well Record PA-5

Location Paulding, Ohio Job # 807123
Coordinates N694 E1260
Installation Date 6/9/87
Drilled By PSI Logged By RLH

Elev. (Feet)	Depth (Feet)	Description	USC	Sample Interval	Odor	Graphic Log	Well Completion Detail	Depth (Feet)
	0	Ground Surface 100.7					Top PVC Datum	0
	1.1	TOPSOIL: yellow-brown mottled, silty clay with roots and organic material, damp.	CL	70%	7		Portland Cement/ Sodium Bentonite Grout	
	2	CLAY AND GRAVEL WITH MANUFACTURED PRODUCTS: reddish-orange mottled gravelly clay to clayey gravel with black ash, abundant brake lining fragments, fibrous product material, wire mesh, fabric; some zones of laminated ash and soil, damp to wet. Water occurred at about 4 feet deep.	GC to CL	No 35%	6		1.5 2" I.D. SCH 40 PVC Flush-threaded; Sodium Bentonite Pellets; 2.5 8" Borehole	2
	4			No 40%	11		Sand	4
	6			No 23%	6		5.7	6
	7.5	CLAY TILL: yellow-brown mottled, stiff, damp, laminated silty clay till with rounded quartz pebbles (up to 5%).	CL	No 50%	12		2" I.D. Sch 40 PVC 0.010" Slotted Screen	8
	10			No 50%	42		10.7 cap; Loose Native Soil Caved into Hole	10
	12	Boring Terminated @ 12.0'		No			12.0	12
	14							14
	16						BURN PIT	16

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Monitoring Well Record PA-6

Location Paulding, Ohio Job # 807123
Coordinates N757 E1023
Installation Date 6/9/87
Drilled By PSI Logged By RLH

Elev. (Feet)	Depth (Feet)	Description	USC	Sample Interval	Odor	Graphic Log	Well Completion Detail	Depth (Feet)
	0	Ground Surface 101.2					Top PVC Datum	0
	0.8	TOPSOIL: yellow-brown mottled silty clay with grass root and organic material.	CL	70%	13		Portland Cement/ Sodium Bentonite Grout; 1.0 Sodium Bentonite Pellets	
	2.4	MANUFACTURED PRODUCTS: black ash with abundant brake linings, rust particles, product pieces up to 1.5 inches, common metallic particles, dry.		No 68%	9		2" I.D. SCH 40 PVC Flush-threaded; 2.0; 8" Borehole; 3.0	2
	4	CLAY TILL: yellow-brown to gray mottled silty clay till, stiff, damp, laminated with sparse limestone and quartz pebbles (1-5%).	CL	No 75%	9		Sand	4
	6			No 75%	18		2" I.D. Sch 40 PVC 0.010" Slotted Screen	6
	8	Boring Terminated @ 8.0'		No			8.0 cap	8
	10							10
	12							12
	14							14
	16						DISPOSAL PIT	16

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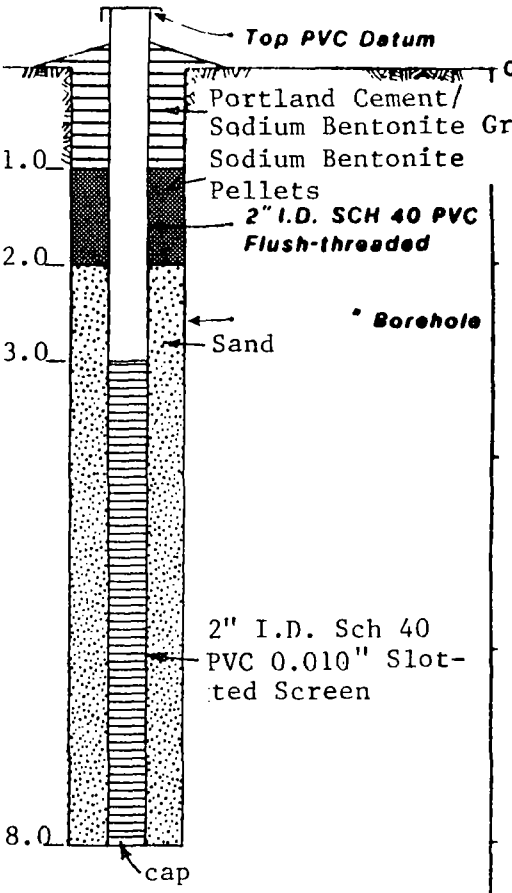
Monitoring Well Record PA-7

Location Paulding, Ohio Job # 807123
Coordinates N763 E819
Installation Date 6/9/87
Drilled By PSI Logged By RLH

Elev. (Feet)	Depth (Feet)	Description	USC	Sample Interval	Odor	Graphic Log	Well Completion Detail	Depth (Feet)
	0	*Ground Surface* 103.2						0
	0.9	TOPSOIL: brown-yellow mottled silty clay with grass roots and organic matter.	CL	75%	5			
	2	MANUFACTURED PRODUCTS: black to greenish-black, spongy, fibrous product material; very fine metallic particles; sparse green layers with less fibrous material and more metallic particles.		No 83%	6			2
	4			No 95%				4
	6.0	CLAY TILL: yellow-brown to gray mottled, stiff, damp, laminated silty clay till with rounded pebbles (trace).	CL	No 65%	8			
	6				9			6
	8			No				8
		Boring Terminated @ 8.0'						
	10							10
	12							12
	14							14
	16							16



ASBESTOS PILE

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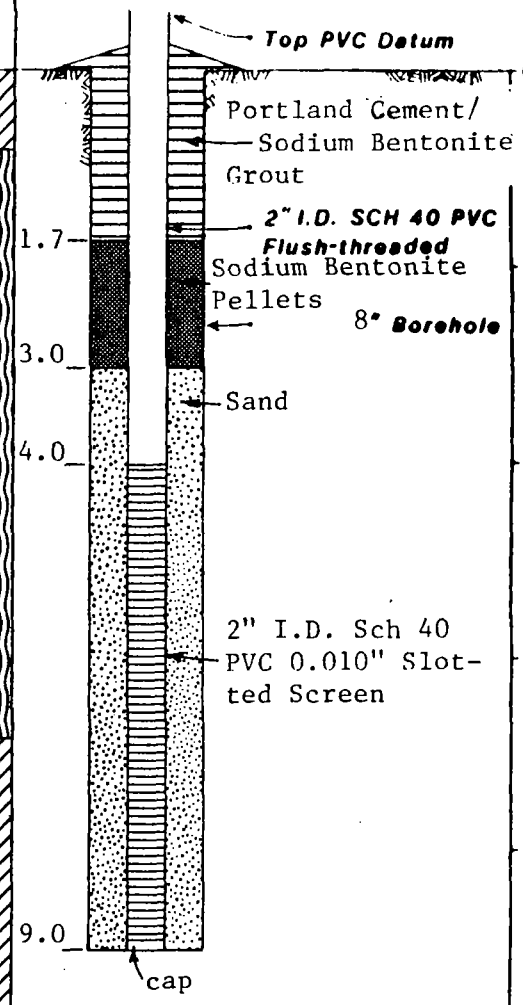
Monitoring Well Record PA-8

Location Paulding, Ohio Job # 807123
Coordinates N476 E171
Installation Date 6/9/87
Drilled By PSI Logged By RLH

Elev. (Feet)	Depth (Feet)	Description	USC	Sample Interval	Odor	Graphic Log	Well Completion Detail	Depth (Feet)
	0	*Ground Surface* 103.6						0
	0.8	TOPSOIL: yellow-brown, silty clay with grass roots and organic material, dry.	CL	55%				
	2	MANUFACTURED PRODUCTS: black to greenish-black, spongy, fibrous product material; very fine metallic particles; from 3.5' to 3.6' a thin brown clay layer overlies fibrous product.		No 85%				2
	4			No 80%				4
	6			No 65%				6
	6.8	CLAY TILL: yellow-brown, orange-brown, to gray mottled stiff damp, laminated silty clay till with rounded quartz pebbles (1%-5%).	CL					
	8			No 90%				8
	10	Boring Terminated @ 10.0'		No				10
	12							12
	14							14
	16							16



ASBESTOS PILE

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Monitoring Well Record PA-9

Location Paulding, Ohio Job # 807123
Coordinates N240 E187
Installation Date 6/10/87
Drilled By PSI Logged By RLH

BORING RECORD

Elev. (Feet)	Depth (Feet)	Description	Unified Soil Classif.	Penetration Resistance, "N" Blows per Foot (10 20 30 40 50 60 70 80 90)	Sample Data	Remarks
	0					
	0.3	TOPSOIL: brown, dry, silty clay with grass roots and organic material, damp	CL	11	68%	Sampling Number PAB-1-1
	2	CLAY WITH MANUFACTURED PRODUCTS: olive gray silty clay with common product pieces (about 10%), rust particles, black ash, firm moist, mostly no odor, although weak odor detected in thin interval.	CL	5	No / 45%	PAB-1-2
	4				No / 85%	
	5.0	CLAY TILL: orange to gray irregularly mottled silty clay with trace very coarse quartz sand, firm, damp.	CL	9	No	PAB-1-3
	6				65%	
	8		CL	7	No	PAB-1-4
				6	35%	PAB-1-5
	10.0	CLAY TILL: brown, with traces of gray to orange mottled, laminated silty clay till with rounded quartz and limestone pebbles (1 to 5%), stiff, damp.	CL	28	No / 100%	PAB-1-6
	12				No / 100%	
				29	No	PAB-1-7
	14.0	Boring Terminated @ 14.0'				
	16					

Date Drilled 6/8/87
Drilling Method Hollow Stem
Drilled By PSI
Logged By RLH
Checked By SLW

Standard Penetration Test
Undisturbed Sample
Water Table (24Hour)
Water Table (Time of Boring)
L Laboratory Test Location

SO Strong contaminant odor
WO Weak to moderate contaminant odor
NO No contaminant odor

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ENGLEWOOD, COLORADO

Boring Number PAB-1
Job Number 807123
Page 1 of 1

BORING RECORD

Elev. (Feet)	Depth (Feet)	Description	Unified Soil Classif.	Penetration Resistance, "N" Blows per Foot (10 20 30 40 50 60 70 80 90)	Sample Data	Remarks
	0	Concrete Slab - 0.0' to 0.5'				Sample Numbers
	2	CLAY: dark brown to gray-brown mottled, soft, damp moderately plastic to plastic, silty clay with rounded pebbles (1% - 2%); basal contact with clay till is gradational.	CL	8	55%	PAB-2-1
	4	▽ 3.75' depth to water Note: 20 minutes after drilling approximately two inches of an oily layer on water surface	CL	8	No 88%	PAB-2-2
	6		CL	8	No 73%	PAB-2-3
	8		CL	12	No 80%	PAB-2-4
		.... slight "sanitary sewer" and oily odor.	CL		Wo 100%	PAB-2-5
	10.0	CLAY TILL: dark brown to yellow-brown mottled, stiff, hard, damp, laminated clay till with rounded pebbles; sparse interbeds of reddish-brown sandy, clay.	CL	8	Wo 75%	PAB-2-6
	12		CL	36	Wo 100%	PAB-2-7
	14		CL	19		
	15.0				No	
	16	Boring Terminated @ 15.0'				

Date Drilled 6/10/87
Drilling Method Hollow Stem
Drilled By PSI
Logged By GSB
Checked By SLW

Standard Penetration Test
Undisturbed Sample
Water Table (24Hour)
Water Table (Time of Boring)
L Laboratory Test Location

SO Strong contaminant odor
WO Weak to moderate contaminant odor
NO No contaminant odor

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Boring Number PAB-2
Job Number 807123
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BORING RECORD

Elev. (Feet)	Depth (Feet)	Description	Unified Soil Classif.	Penetration Resistance, "N" Blows per Foot (10 20 30 40 50 60 70 80 90)	Sample Data	Remarks
	0	Concrete Slab - 0.0' to 0.5'				
	0.5	CLAY: greenish-gray to yellow-brown mottled, plastic, moist, laminated silty clay; common to abundant streak and patches of black oily material with weak to strong odor (possibly "mineral spirits"). Rounded pebbles up to 1.5" occur in clay.	CL		40%	Sample Number
	2			5		PAB-3-1
					Wo 45%	
	4			2		PAB-3-2
					So 55%	
	6			2		PAB-3-3
					So 90%	
	8			7		PAB-3-4
	9.0	..... gradational contact to clay till composed of plastic yellow-brown mottled silty clay to sandy clay.			Wo 100%	
	10			5		PAB-3-5
	10.3	CLAY TILL: yellow-brown to gray-brown mottled, stiff, hard, damp, laminated clay till with rounded pebbles; fractures coated with manganese oxide; damp.	CL		No 90%	
	12			29		PAB-3-6
					No 90%	
	13.5	..... orange-brown sandy clay (13.5' - 13.6')				PAB-3-7
	14			31		
	15.0				No	
		Boring Terminated @ 15.0'				
	16					

Date Drilled 6/10/87
Drilling Method Hollow Stem
Drilled By PSI
Logged By RLH
Checked By SLW

Standard Penetration Test
Undisturbed Sample
Water Table (24Hour)
Water Table (Time of Boring)
L Laboratory Test Location

SO Strong contaminant odor
WO Weak to moderate contaminant odor
NO No contaminant odor

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Boring Number PAB-3
Job Number 807123
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BORING RECORD

Elev. (Feet)	Depth (Feet)	Description	Unified Soil Classif.	Penetration Resistance, "N" Blows per Foot (10 20 30 40 50 60 70 80 90)	Sample Data	Remarks
	0					
	0.2	FILL: gray limestone gravel road base	GW		80%	
			CL	12	No	PAB-4-1
	1.5	CLAY WITH MANUFACTURED PRODUCTS: dark brown mottled silty clay with product material, rust particles, and fine ash firm, dry to damp.				
	2			8	65% No	PAB-4-2
	4	CLAY FILL: brown, gray, and orange mottled silty clay with sparse rounded pebbles (1%-3%) soft to stiff, damp to dry, orange and gray mottled zones are soft, moist, and plastic; possibly disturbed clay till material.	CL	8	65% No	PAB-4-3
	6			10	50% No	PAB-4-4
	8					
	8.5	CLAY TILL: brown to gray mottled to laminated, hard, silty clay till with sparse rounded pebbles (1-5%), stiff to very stiff, damp; thin vertical fractures filled with red clayey silt.		16	90% No	PAB-4-5
	10		CL	28	100% No	PAB-4-6
	12			31	100% No	PAB-4-7
	14			16	100% No	PAB-4-8
	15.0	Boring Terminated @ 15.0'				
	16					

Date Drilled 6/10/87
Drilling Method Hollow Stem
Drilled By PSI
Logged By GSB
Checked By SLW/RLH

Standard Penetration Test
Undisturbed Sample
Water Table (24Hour)
Water Table (Time of Boring)
L Laboratory Test Location

SO Strong contaminant odor
WO Weak to moderate contaminant odor
NO No contaminant odor

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Boring Number PA-4
Job Number 807123
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BORING RECORD

Elev. (Feet)	Depth (Feet)	Description	Unified Soil Classif.	Penetration Resistance, "N" Blows per Foot (10 20 30 40 50 60 70 80 90)	Sample Data	Remarks
	0					
	0.2	FILL: gray limestone gravel road base	GW		60%	
	1.0	CLAY WITH MANUFACTURED PRODUCTS: dark brown mottled silty clay with product material, rust particles, and fine ash, firm, dry to damp.	CL	8	No	PAB-5-1
	2				63%	
		CLAY FILL: brown to gray mottled silty clay with sparse rounded pebbles (1 to 2%) soft to firm, damp, gray zones are moist and plastic; possibly disturbed clay till material.		7	No	PAB-5-2
	4				65%	
				6	No	PAB-5-3
	6				73%	
				7	No	PAB-5-4
	8				80%	
				5	No	PAB-5-5
		CLAY TILL: brown to gray mottled to laminated, hard silty clay till with rounded pebbles (3 to 5%), stiff to very stiff, damp.				
	10				100%	
				17	No	PAB-5-6
	12				100%	
				30	No	PAB-5-7
	14				100%	
				16	No	PAB-5-8
	15.0	Boring Terminated @ 15.0'				
	16					

Date Drilled 6/10/87
Drilling Method Hollow Stem
Drilled By PSI
Logged By GSB
Checked By SLW/RHL

Standard Penetration Test
Undisturbed Sample
Water Table (24Hour)
Water Table (Time of Boring)
L Laboratory Test Location

SO Strong contaminant odor
WO Weak to moderate contaminant odor
NO No contaminant odor

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Boring Number PAB-5
Job Number 807123
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