VOLUME II OF IV
APPENDIX B

TECHNICAL REPORT

NON-AQUEOUS PHASE LIQUID (NAPL) SOURCE STUDY AT DEFENSE SUPPLY CENTER PHILADELPHIA PHILADELPHIA, PENNSYLVANIA

Prepared For

SUNOCO

Prepared By

INTEGRATED SCIENCE & TECHNOLOGY, INC.

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IT HAS BEEN PREPARED FOR COUNSEL IN
ANTICIPATION OF LITIGATION

MARCH 1998

APPENDIX B

SOIL BORING LOGS

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SOIL BORING LOGS (CONTINUED)

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INTEGRATED SCIENCE & TECHNOLOGY, INC.

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USACE
US ARMY CORPS OF ENGINEERS

BORING MW-1A

SOIL BORING LOGS (CONTINUED)

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SOIL BORING LOGS (CONTINUED)

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USACE
ARMY CORPS OF ENGINEERS

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SOIL BORING LOGS (CONTINUED)

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MALCOLM PIRNIE

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DAMES & MOORE

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DAMES & MOORE

BORING PH-1
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BORING PH-3
BORING PH-4
BORING PH-5
BORING PH-6
BORING PH-7

S-1

C.V.M. industries

geotechnical division inc.
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215-947-2555

Client ARCO REFINERY
Project WELLS AND TEST BORINGS
Location PHILADELPHIA, PA
Project No. -
Boring No. SM-5.1 Depth 30.0'
Elevation
Spoon Size 2" Casing Size
Core Size Bit No.
Hammers:
Spoon, weight 140 # Drop 30"
Drive, weight Drop
Date Started 8-1-85

Driller SB
Helper WGH
Inspector
Job No. 3115

Ground Water Data:
0 HRS: WATER AT 10"
TOTAL PIPE: 13.0'

Date Completed 8-1-85

Depth	Casing Blows	STRATA CLASSIFICATION	Sampling Depth	Sampling No.	Blows per 6"	REMARKS
		BLACK AND GREY FINE SAND. TRACE SOME SILT 5.0'	0.0 - 2.0	S-1	2 - 1 / 1 - 6	INSTALLED PIPE TO 10.0'
			3.0 - 5.0	S-2	4 - 2 / 1 - 1	
		DARK GREY TO BLACK SILT TRACE SOME CLAY. (VERY MOIST) 30.0'				DRILLED FIRST HOLE TO 30.0' SOIL IS VERY MOIST. HOWEVER, WE COULD NOT GET A WATER LEVEL. SAMPLE HOLE OFFSET APPROXIMATELY 2.0-4.0' FROM WELL ON 8-5-85
		COMPLETE AT 30.0'				

SHEET NO. .... OF ....

S-2

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Client: ARCO REFINERY
Project: WELLS AND TEST BORINGS
Location: PHILADELPHIA, PA.
Project No.: -
Boring No.: SM-49 Depth: 10.0'
Elevation:
Spoon Size: 2" Casing Size:
Core Size: Bit No.:
Hammers:
Spoon, weight: 140 # Drop: 30"
Drive, weight: Drop:
Date Started: 7-31-85

Driller: S.B.
Helper: WGH
Inspector: MC
Job No.: 3115

Ground Water Data:
0 Hrs: WATER AT 6' 2 1/2"
TOTAL PIPE - 13.0'

Date Completed: 7-31-85

Depth	Casing Blows	STRATA CLASSIFICATION	Sampling Depth	Sampling No.	Blows per 6"	REMARKS
		MISCELLANEOUS SOIL FILL. MOSTLY FINE SAND 5.5'	0.5-		7-5	SAMPLE HOLE OFFSET APPROXIMATELY 2.0-4.0' OF WELL ON 8-5-85 ±
			2.5-	S-1	3-2	
		DARK GREY SANDY SILT 10.0'				THIS WELL TEST BORING OFFSET BECAUSE OF SM-47 BEING MOVED. (FROM PRELIMINARY LOCATION MAP)
		COMPLETE AT 10.0'				

SHEET NO. .... OF ....

S-3

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Client ARCO REFINERY
Project WELLS AND TEST BORINGS
Location PHILADELPHIA, PA.
Project No. -
Boring No. SM-47 Depth 15.0'
Elevation
Spoon Size 2" Casing Size
Core Size Bit No.
Hammers:
Spoon, weight 140# Drop 30"
Drive, weight Drop
Date Started 7-31-85

Driller SB
Helper WGH
Inspector MC
Job No. 3115

Ground Water Data:
TOTAL PIPE - 18.0'

Date Completed 7-31-85

Depth	Casing Blows	STRATA CLASSIFICATION	Sampling Data Depth	Sampling Data No.	Blows per 6"	REMARKS
		TAN SAND FILL 5.5'	0.0 - 2.0	S-1	4-3 / 3-2	
			3.0 - 5.0	S-2	1-1 / 2-3	
		TAN SILTY SOIL. MAY BE FILL 15.0'				THIS WELL TEST BORING OFFSET TO AVOID REMOVING FENCE AND OVERHEAD WIRES
		COMPLETE AT 15.0'				SAMPLE HOLE OFFSET APPROXIMATELY 2.0-4.0'

SHEET NO. .... OF ....

S-4

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215-947-2555

Client: ARCO REFINERY
Project: WELLS AND TEST BORINGS
Location: PHILADELPHIA, PA.
Project No.: -
Boring No.: SM-46 — Depth: 10.0'
Elevation:
Spoon Size: 2" — Casing Size:
Core Size: — Bit No.:
Hammers:
Spoon, weight: 140 # — Drop: 30"
Drive, weight: — Drop:
Date Started: 7-31-85

Driller: SB
Helper: WGH
Inspector: MC
Job No.: 3115

Ground Water Data:
0 HRS: WATER AT 5'7"

TOTAL PIPE - 11.5'

Date Completed: 7-31-85

Depth	Casing Blows	STRATA CLASSIFICATION	Sampling Depth	Sampling No.	Blows per 6"	REMARKS
		TAN SAND AND GRAVEL FILL. ±6.0'	3.5 - 5.5	S-1	4 - 2 / 2 - 2	SAMPLE HOLE OFFSET APPROXIMATELY 2.0-4.0' OF WELL ON 8-2-85
		GREY SILTY SAND. 10.0'				
		COMPLETE AT 10.0'				

SHEET NO. .... OF ....

ENSR

BORING LOG 5-5

Sheet 1 of 1

Project No. 6445-017 Date - Start 2-12-92 Finish 2-12-92 Boring B-4

Project Name Sun Oil Drilling Co. EMPIRE

Location Gaurd Basin (SWMU-3) Drilling Method 6 1/4 HSA

Total Depth 9' Inspector J. Rice Reviewer Charles E. Martin

Remarks

Depth Feet	Sample Type & No.	Sample Blows per 6 In.	Sample Depth Range	Sample Rec.	Graphic Log	Lithologic Description	Equipment Installed
5						No samples Taken	
10					9'	Total depth 9'	

M890278

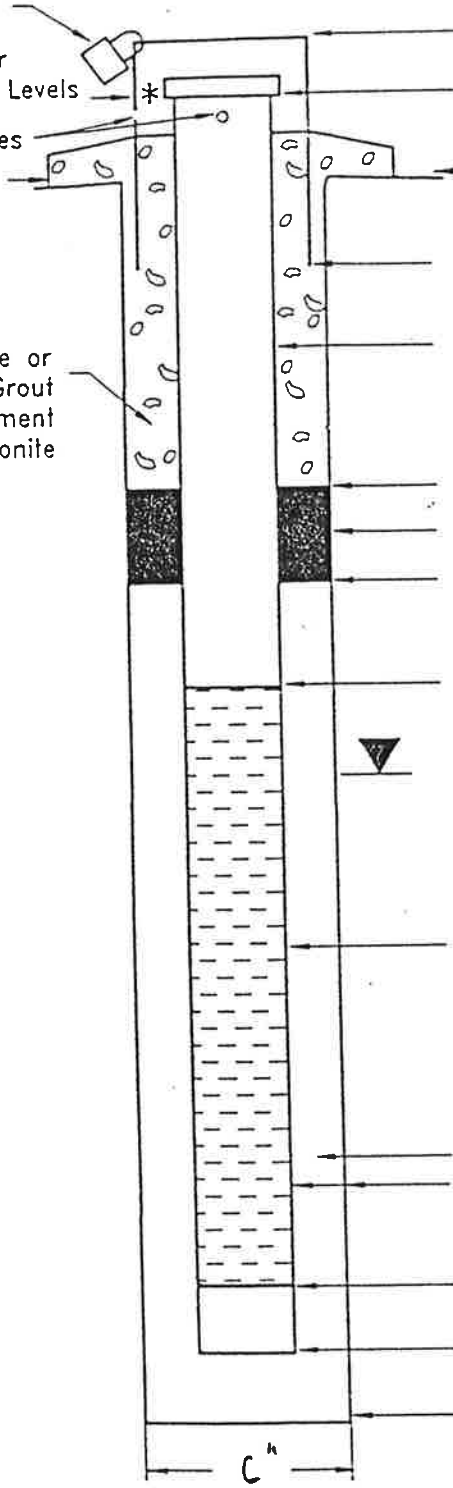
Project No: 6445-017 Client: SUN OIL Site: Philadelphia WELL NO. MW-4

Well Location: Guard Basin Date Installed: 2/15/92

[Con]tractor: EMPIRE Method: 6 1/4 HSA Inspector: J. Rice

5-5

MONITORING WELL CONSTRUCTION DETAIL



		Depth from G.S. (feet)	Elevation (NGVD)
Top of Steel Guard Pipe		0	
Top of Riser Pipe		0	
Ground Surface (G.S.)		0.00	
Bottom of Steel Guard Pipe		6"	
Riser Pipe: Length	4		
Inside Diameter (ID)	4"		
Type of Material	PVC		
Top of Bentonite Seal		2'	
Bentonite Seal Thickness	1		
Top of Sand		3'	
Top of Screen		4'	
Stabilized Water Level			
Screen: Length	5'		
Inside Diameter (ID)	4"		
Slot Size	0.020		
Type of Material	PVC		
Type/Size of Sand	Silica/#1		
Sand Pack Thickness	1"		
Bottom of Screen		9'	
Bottom of Tail Pipe:			
Length	.5'		
Bottom of Borehole	JH 5/27/93	9'	

Approved:

* Describe Measuring Point:

Signature Date

ENSR.

-S-6

ENSR

Project No. 6445-017 Date - Start 2/27/92 Finish 3/2/92 Boring B-10

Project Name Sun Oil Drilling Co. Empire

Location Guard Basin (SWMU-3) Drilling Method Mud Rotary

Total Depth 90.3' Inspector BEM Reviewer Charles E Martin

Remarks

Depth Feet	Sample Type & No.	Blows per 6 In.	Depth Range	Rec.	Graphic Log Sample	Lithologic Description	Equipment Installed.
0						Asfalt Road	
	~~A~~		~~2-4~~			Drilled Thraugh fill material	
5	~~B~~		~~4-6~~			(Ash, SilT, Gravel, sand)	
					FI	FILL	
10	A	1-8 0-8	10-12	24"	310AA	SilT, Trace ClaY, Brown Grey, SoFT Oil odor, weT	SamPle chemical + GeoTech
	B	2-8 12-17	12-14	6"	ML	As Above Trace med Gravel	
15							
20	C	8-9 12-29	20-22	10"	C/EA 310BA	Gravel, Fine, and SilT and F. sand Loose, Brown, moisT, PoorlY Sorted Trace Cobbles	Chemical + GeoTech
25	D	12-28 32-38	25-27	0"	GP	Large Gravel, PossiblY cobbles rough Drilling	
30	E	7-4 4-10	30-32	9"	310CA CL	ClaY, SoFT, med Plastic, Yellow weT. NOT ~~enough for sample 310C~~	Chemical ~~[illegible]~~
	—	—	33-35	18"	Tube		ShelbY Tube
35	F	5-5 10-20	35-37	8"	310CA CL	As Above, Damp, Thin coloured stratagraphic layers	Chemical ~~[illegible]~~

M890278

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ENSR BORING LOG (continued)

Project 6445-017 Boring B-10 Sheet 2 of 3

Depth Feet	Sample Type & No.	Blows per 6 in.	Depth Range	Rec.	Graphic Log	Lithologic Description	Equipment Installed
						B-10 Contioned	
40							
	G	18-24 48/6"	41-43	14"	CL	Clay, STiFF, Low Plastic, Grey Brown moist	
45	H	24-27 24/6"	45-47	10"		As Above	
50	I	24-28 27/3"	50-52	10"	CL	Clay, STiFF, med Plastic, Grey, moist	
55	J	56/6"	55-57	8"	CL	Clay, hard, Trace Coal Fragments, Dark Grey, damp,	
60	K	50/6	60-62	1"	SW	Sand, Fine To Corse, Some F. Gravel and Clay, Loose, WeT, Brown	
65	L	50/6"	65-67	6"	310DA	Sand, Fine To Corse, Some F.-M. Gravel Trace Clay, Dense, Brown To Yellow, WeT	Chemical + GeoTech
70	M	50/8"	70-72	6"	SW	As Above	
75	N	50/8"	75-76	5"	SW	As Above	
80	O	50/6"	80-82	1"	GP	Gravel, med To Crse, Some F. Sand Dense, Brown, WeT	

M890248

ENSR BORING LOG (continued)

Project Sun Oil Boring B-10 Sheet 3 of 3

Depth Feet	Sample Type & No.	Blows per 6 In.	Depth Range	Rec.	Graphic Log	Lithologic Description	Equipment Installed
85	P	50/8"	85-87	8"	SW	Sand, Fine, Well Sorted, Brown Loose; wet	
90	Q	50/4"	90-92	4"	90'	Sand, Fine and Rock Fragments Trace Clay, Damp-Dry (Bedrock)	
						BOH = ~~92.0'~~ 90.3'	

M890248

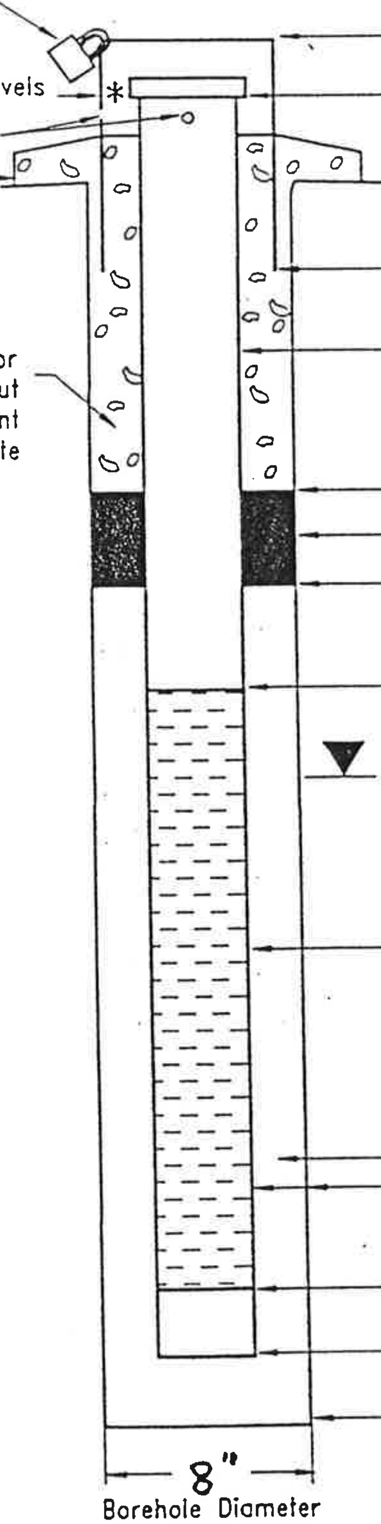
Project No: ______ Client: [illegible] Site: [illegible] | WELL NO: MW-10

Well Location: Guard Basin | Date Installed: 3/2/92

Contractor: Empire Soil | Method: Mud Rotary | Inspector: BEM

S-6

MONITORING WELL CONSTRUCTION DETAIL



1⁄2 Sand
2 Bentonite
6 Grout

		Depth from G.S. (feet)	Elevation (NGVD)
Top of Steel Guard Pipe		0'	
Top of Riser Pipe		0'	
Ground Surface (G.S.)		0.00	
Bottom of Steel Guard Pipe		0.5'	
Riser Pipe:			
Length	62.0'		
Inside Diameter (ID)	2"		
Type of Material	PVC		
Top of Bentonite Seal		54.0'	
Bentonite Seal Thickness	6.0'		
Top of Sand		60.0'	
Top of Screen		62.0'	
Stabilized Water Level			
Screen:			
Length	10'		
Inside Diameter (ID)	2"		
Slot Size	.020		
Type of Material	PVC		
Type/Size of Sand	O Marie		
Sand Pack Thickness	3"		
Bottom of Screen		72.0'	
Bottom of Tail Pipe:		72.0'	
Length	.5'		
Bottom of Borehole	JH 5/27/93	92.0'	

Approved:

* Describe Measuring Point: Black Mark on Riser

Signature ______ Date ______

ENSR

C.V.M. industries

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Client ARCO
Project WELL INSTALLATION
Location PASSYUNK AVENUE, PHILADELPHIA PA.
Project No. 9200
Boring No. B-4 Depth 25.0'
Elevation
Spoon Size — Casing Size CONTINUOUS FLIGHT AUGERS
Core Size Bit No.
Hammers:
Spoon, weight — Drop —
Drive, weight Drop
Date Started 11-15-84

Driller S.B.
Helper W.H.
Inspector M.C.
Job No. 2890

Ground Water Data:
0 HOURS AFTER COMPLETION:
WATER AT 20'1"
1ST ENCOUNTERED: 21.5'
TOTAL PIPE INSTALLED: 28.0'

Date Completed 11-15-84

Depth	Casing Blows	STRATA CLASSIFICATION	Depth	SAMPLING DATA No.	Blows per 6"	REMARKS
		BLACK ASH, CINDER. FINE GRAVEL. MISCELLANEOUS FILL. 17.0'				PETROLEUM SMELL VERY STRONG.
		GREY CLAY FINE SAND. 25.0'				
		COMPLETE AT 25.0'				

SHEET NO. .... OF ....

ENSR

S-7

Sheet 1 of 1

Project No. 6445-017 Date - Start 3/12/92 Finish 3/16/92 Boring B-~~10I~~ 22

Project Name Sun Oil Drilling Co. Empire

Location Guard Basin Drilling Method Mud Rotary

Total Depth 26' Inspector B. Miller/C. Martin Reviewer C Martin

Remarks Next to B-10 and close to B-4. 6' N of B-10

Depth Feet	Sample				Graphic Log	Lithologic Description	Equipment Installed
	Type & No.	Blows per 6 In.	Depth Range	Rec.			
0							
5						Drilled To 11 Feet. Pushed casing To 12 feet.	
						(Fill) contaminated Strong Petro. Odor	
10							6" casing To 12.5'
					12.5'	--(6" casing at this depth)	
15							
20							
25							
					26'	Total Depth 26'	
30							
35						No samples collected. Refer to B-10 log for soil info.	

M890278

Project No: 6445-017 Client: SUN OIL Site: PHIL., PA.

WELL No: MW-22

Well Location: Guard Basin (SWMU-3), N of B-10

Date Installed: 3/16/92

tractor: EMPIRE Method: MUD ROTARY Inspector: C. MARTIN

5-7

MONITORING WELL CONSTRUCTION DETAIL

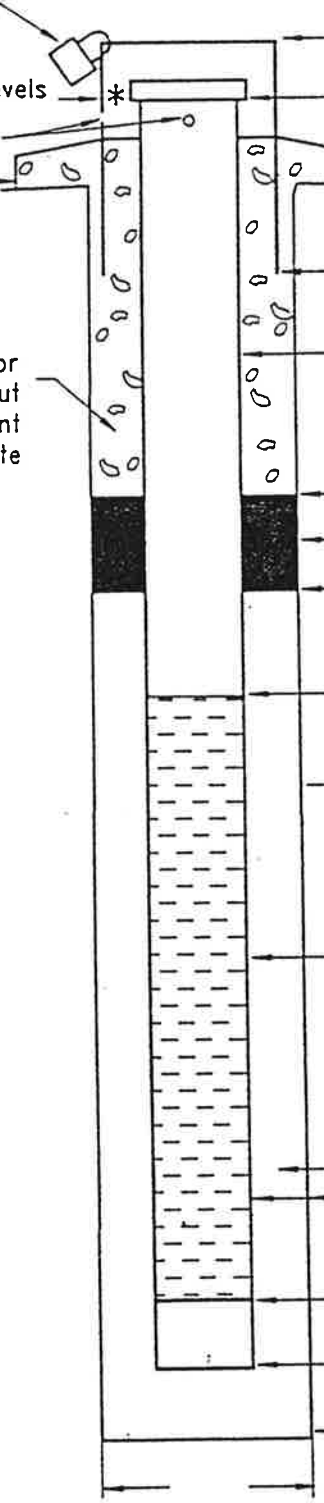
Lock

Measuring Point for Surveying & Water Levels *

Vent Holes

Concrete Pad

Cement-Bentonite or Bentonite Slurry Grout
95 % Cement
5 % Bentonite



		Depth from G.S. (feet)	Elevation (NGVD)
Top of Steel Guard Pipe		FLUSH	
Top of Riser Pipe		~0.3	
Ground Surface (G.S.)		0.00	
Bottom of Steel Guard Pipe		1.5'	
Riser Pipe:			
Length	12		
Inside Diameter (ID)	2"		
Type of Material	PVC		
Top of Bentonite Seal		12	
Bentonite Seal Thickness	3"		
Top of Sand		14	
Top of Screen		16	
Stabilized Water Level			
Screen:			
Length	10'		
Inside Diameter (ID)	2"		
Slot Size	~~.010~~ .020		
Type of Material	PVC		
Type/Size of Sand	#2		
Sand Pack Thickness	3"		
Bottom of Screen		25.75'	
Bottom of Tail Pipe:		26	
Length	.25'		
Bottom of Borehole		26'	

5 bags sand

Borehole Diameter

* Describe Measuring Point: top of PVC

Approved: C. Martin 4/1/92
Signature Date

ENSR.

ENSR BORING LOG S-8

Sheet 1 of 3

Project No. 6445-017 Date - Start 2/12/92 Finish 2/19/92 Boring B-2

Project Name SUN-OIL Drilling Co. EMPIRE Co.

Location Guard Basin - SWMO No. 3 Drilling Method MUD ROTARY

Total Depth 91' Inspector C. Martin Reviewer

Remarks S 13:30

Depth Feet	Sample Type & No.	Blows per 6 In.	Depth Range	Rec.	Graphic Log	Lithologic Description	Equipment Installed HNU
	NS		0-2			2" asphalt — FILL —	
	S-1	11-14-9-12	2-4'	12"	FILL/SW	Brown F-M SAND, some C Sand and C Gravel (to 1" ø)	
5	S-2	5-10-8-10	4-6'	8"	ML	Gray SILT w/ some Clay and C Sand	
	S-3	5-7-4-4	6-8	0		(No rec.; C Gravel, wash only)	0 in mud tub
	S-4	1-1-1-1	8-10	0		(No rec; mud too thin, will be thickened)	
10	S-5	WOR/1/0	10-12	3"	CL	Gray CLAY, some Silt (very soft)	3
	S-6	WOH/5/6	12-14	8"	13' ~~ML~~ OL 14'	Gray/brown SILT w/ Clay, C gravel, little organics	3
15	S-7	N.Rec.	14-16	10"	SW	Brown F-C SAND w/ Gravel (to 1" ø), some Silt (mod. HC. odor)	25
	S-8	14-42-45-42	16-18	12"	SW	brown F-M SAND w/ some Silt and C Gravel (½"-1"), HC odor (Sheen in tub)	18
	S-9	16-26-27-40	18-20	12"		- same -	4
20	S-10	22-28-50-53	20-22	14"		- same -	4.5
	S-11	22-52-42-52	22-24	12"	23 SW/SP 23	gray M SAND w/ some C Sand, little F Sand; Red/brn M-C SAND	
25	S-12	17-20-30-48	24-26	12"		- same - (dense, tr. clay in spoon tip)	
	S-13	17-34-40-43	26-28	0		No rec. (only wash gravel)	
	S-14	15-27-21-27	28-30	3"	SW	Red/br F-M SAND, & some C Sand, gravel, silt, tr. Clay	
30	S-15	4-6-9-9	30-32	4"	30 CH	Yellow CLAY, tr. C sand (very plastic)	
	S-16	WOR/WOR/1-1	32-34	0		No recovery (clay smear in spoon)	
35	S-17	NR	34-36	0'		"	
	S-18	11/14/15/25	36-38	14"	CH	RED CLAY ~~and some~~ Silt, (some yel clay)	
	ST-1	—	38-40			(Shelby tube - no rec)	

M890278

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ENSR Project 6445-017 BORING LOG (continued) Boring B-2 Sheet 2 of

Depth Feet	Sample Type & No.	Blows per 6 In.	Depth Range	Rec.	Graphic Log	Lithologic Description	Equipment Installed
40							
	ST-2	—	41-43'	~12"		CLAY	
	S-19	WOH-7-7	43-45	4"	CL	RED CLAY (V. Soft)	
45	S-20	20-28-28-34	45-47	16"	CH	brown/gray CLAY (M. Dense)	
	S-21	19-23-30-39	47-49	12"		- same -	
50	S-22	WOR	50-52	10"	CH	dk Gray CLAY (~~Soft~~)	
	S-23	NR	52-54	12"	CH	dk Gray CLAY w/ some Silt, black wood frags (V. dense)	
55	S-24	WOR/50/6"	54-56	12"		- same -	
	S-25	NR	56-58	12	ML / SP	yel/light gray SILT w/ CLAY br Med SAND	
	S-26	50/6"	58-60	6"	GP	C GRAVEL w/ M-C Sand	
60	S-27	50/6"	60-62	2"		(Qtz cobble only)	
	S-28	50/6"	62-64	6"	GP	C GRAVEL (to 1.5" ø) (Qtz), some M-C Sand	
65	S-29	35/50/6"	64-66'	8"		M-C SAND w/ C Gravel (Qtz)	
	S-30	50/6"	66-68	6"	SP	C SAND w/ C Gravel	
	S-31	50/6"	68-70	6"		brown M-C SAND w/ some C Gravel (to 1" ø)	
70	S-32	50/6"	70-72	6"	GP	C GRAVEL (Qtz to 1.5" ø)	
	S-33	50/6"	72-74	6"		C GRAVEL (wash ?)	
75	S-34	50/6"	74-76	6"	GP	C GRAVEL w/ C SAND	
	S-35	50/6"	76-78	2"		- same - (cobble in spoon)	
	S-36	35/50/6"	78-80	8"	SW	brown C SAND, some F-M Sand, tr Gravel, Silt	
80	S-37	18-35-50/2	80-82	8"		lt br/tan M-SAND, some F/C Sand, C Gravel, some Silt	
	S-38	50/6"	82-84	6"	SW	- same -	
85	S-39	—	84-86	2"		Gravel only (poor rec.)	
	S-40	50/6"	86-88	3"	SW	M br M-C SAND w/ C Gravel, tr Silt	
	S-41	50/6"	88-90	2"	CL/BR	tan CLAY w/ Silt and some C Sand, micaceous (possibly wthrd rock)	

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B-2
62-64

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ENSR Project 6445-017 Boring B-2 Sheet 3 of

Depth Feet	Sample Type & No.	Blows per 6 In.	Depth Range	Rec.	Graphic Log	Lithologic Description	Equipment Installed
	S-42	—	90-91	12"	BR	Wthrd mica schist (?)	
						Bottom of Boring @ 91'	
95							

M890248

Project No: 6445-01-1 Client: SUN Site: SUN OIL

WELL NO: MW-2

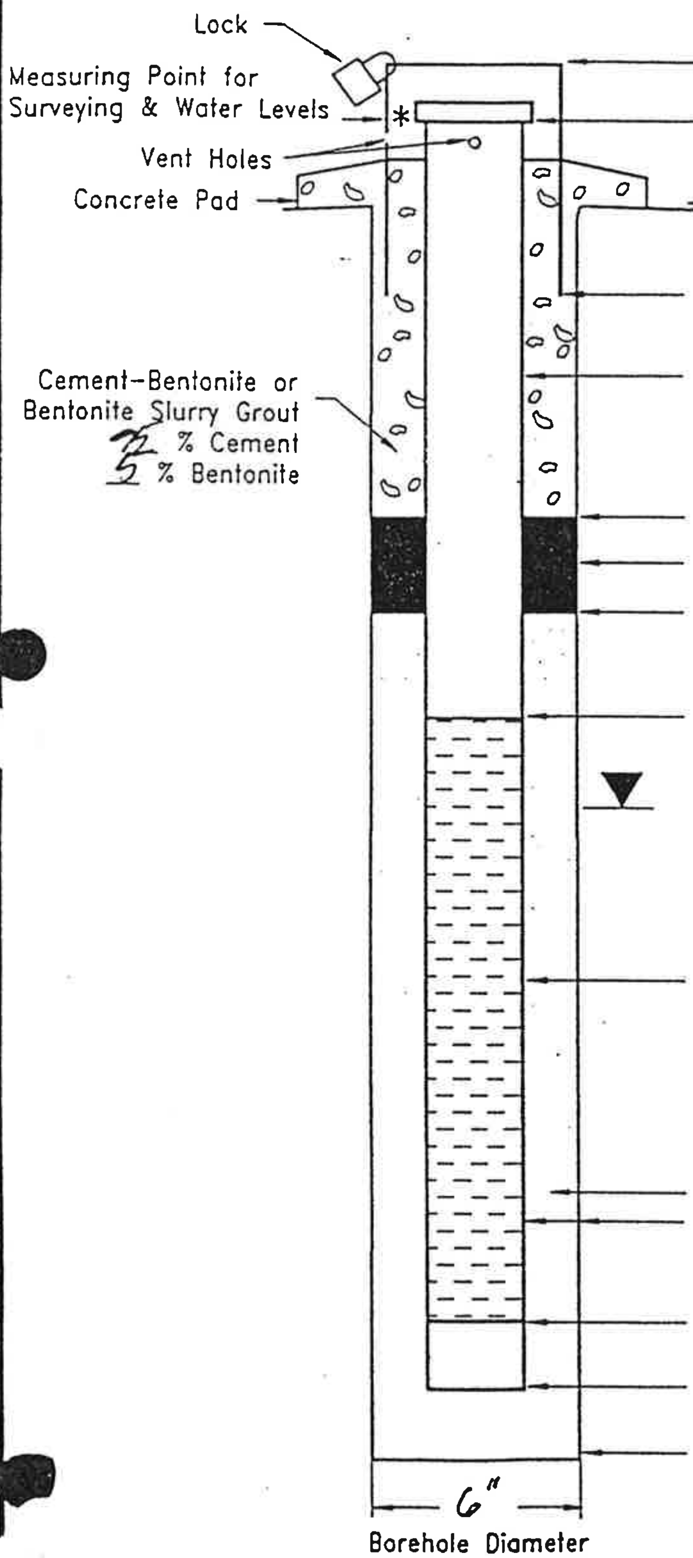
Well Location: GUARD BASIN (B-2) SWMU-3

Date Installed: 2/19/92

Contractor: EMPIRE Method: MUD ROTARY Inspector: C MARTIN

5-8

MONITORING WELL CONSTRUCTION DETAIL



		Depth from G.S. (feet)	Elevation (NGVD)
Top of Steel Guard Pipe		FLUSH	
Top of Riser Pipe		-.5	
Ground Surface (G.S.)		0.00	
Bottom of Steel Guard Pipe		1'	
Riser Pipe:			
Length	60'		
Inside Diameter (ID)	2"		
Type of Material	PVC		
Top of Bentonite Seal		54'	
Bentonite Seal Thickness	3'		
Top of Sand		57'	
Top of Screen		60'	
Stabilized Water Level			
Screen:			
Length	10'		
Inside Diameter (ID)	2"		
Slot Size	.020		
Type of Material	PVC		
Type/Size of Sand	No.2 Morie		
Sand Pack Thickness	2"		
Bottom of Screen		69.5'	
Bottom of Tail Pipe:		70'	
Length	.5		
Bottom of Borehole		91'	

Approved:

* Describe Measuring Point:

Signature Date

ENSR®

ENSR

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Sheet 1 of 1

Project No. 6445-017 Date - Start 2-11-92 Finish 2-11-92 Boring B-1

Project Name Son O' Cimsan, Drilling Co. EMPIRE

Location SAMU-3 Drilling Method 6 1/4 HSA

Total Depth 12' Inspector J. Rice/C. Martin Reviewer Charles E. Martin

Remarks

Depth Feet	Sample: Type & No.	Sample: Blows per 6 In.	Sample: Depth Range	Sample: Rec.	Graphic Log	Lithologic Description	HNU ~~Equipment Installed~~
5	S-1	5 6-5-3	5-7'	14"	FI	Black-Brown-Red SAND and CINDER FILL (slight odor)	0 / 2
10	S-2	wo2-wo2-1-1	10'-12'	24"	9' OL 12'	Brownish-gray CLAY w/ silt, trace organics	17
						Bot. of Boring @ 12'	
15							
20							
25							
30							
35							

M890278

Project No: 6445-017 Client: Sun Oil Site: Philadelphia PA

WELL No: MW-1

Well Location: Guard Basin

Date Installed: 2/12/92

Contractor: Empire Method: 6¼ HSA

Inspector: J. Ra/C.M

MONITORING WELL CONSTRUCTION DETAIL

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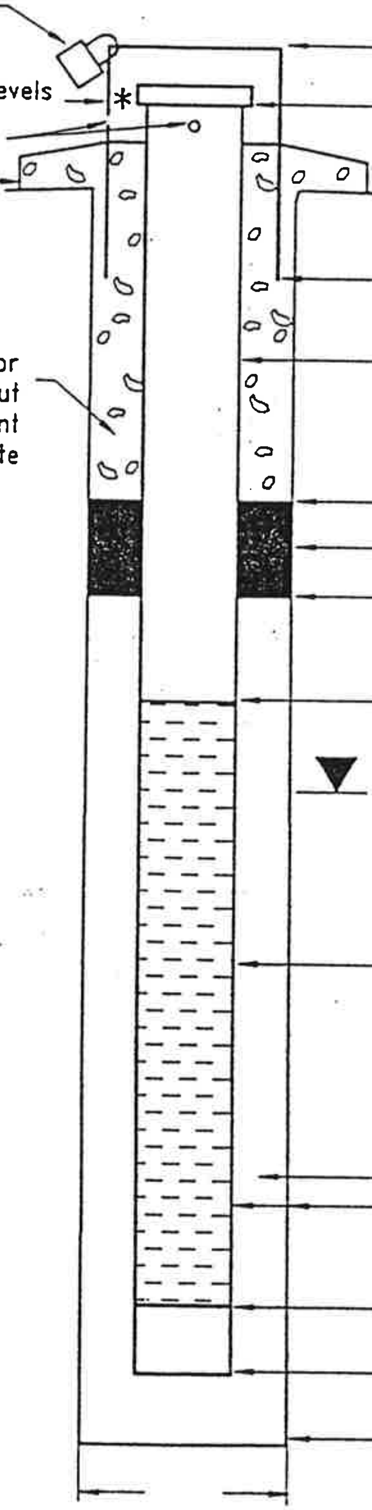

		Depth from G.S. (feet)	Elevation (NGVD)
Lock			
Measuring Point for Surveying & Water Levels			
Vent Holes			
Concrete Pad			
Top of Steel Guard Pipe		0	
Top of Riser Pipe		0	
Ground Surface (G.S.)		0.00	
Bottom of Steel Guard Pipe		6"	
Riser Pipe:			
Length	5'		
Inside Diameter (ID)	4"		
Type of Material	PVC		
Cement-Bentonite or Bentonite Slurry Grout			
__ % Cement			
__ % Bentonite			
Top of Bentonite Seal		3'	
Bentonite Seal Thickness	1'		
Top of Sand		4'	
Top of Screen		5'	
Stabilized Water Level			
Screen:			
Length	5'		
Inside Diameter (ID)	4"		
Slot Size	0.02		
Type of Material	PVC		
Type/Size of Sand	Silica /		
Sand Pack Thickness	1"		
Bottom of Screen		10'	
Bottom of Tail Pipe:			
Length	.5'		
Bottom of Borehole		12'	

JH 5/27/93

Borehole Diameter

Approved:

Describe Measuring Point:

Signature Date

ENSR

ENSR

BORING LOG S-10

Sheet 1 of 1

Project No. 6445-017 Date - Start 3/16/92 Finish 3/17/92 Boring B-23

Project Name SUN OIL Drilling Co. EMPIRE

Location GUARD BASIN (SWMU-3) Drilling Method MUD ROTARY

Total Depth 25.5' Inspector C. MARTIN/T. RICE Reviewer C. Martin

Remarks

Depth Feet	Sample: Type & No.	Sample: Blows per 6 In.	Sample: Depth Range	Sample: Rec.	Graphic Log	Lithologic Description	Equipment Installed
						8" sand bit to 12'	
						6" Casing installed to 12'	
					25.5'		
						Total depth 25.5'	
						No Samples Collected Refer to B-29 log for Soil information	

M890278

Project No: 6445-617 Client: SUN OIL Site: Phil, PA.

WELL No: MW-23

Well Location: Guard Basin (SWMU-3)

Date Installed: 3/17/92

tractor: Empire Method: Mud Rotary Inspector: T. Rice

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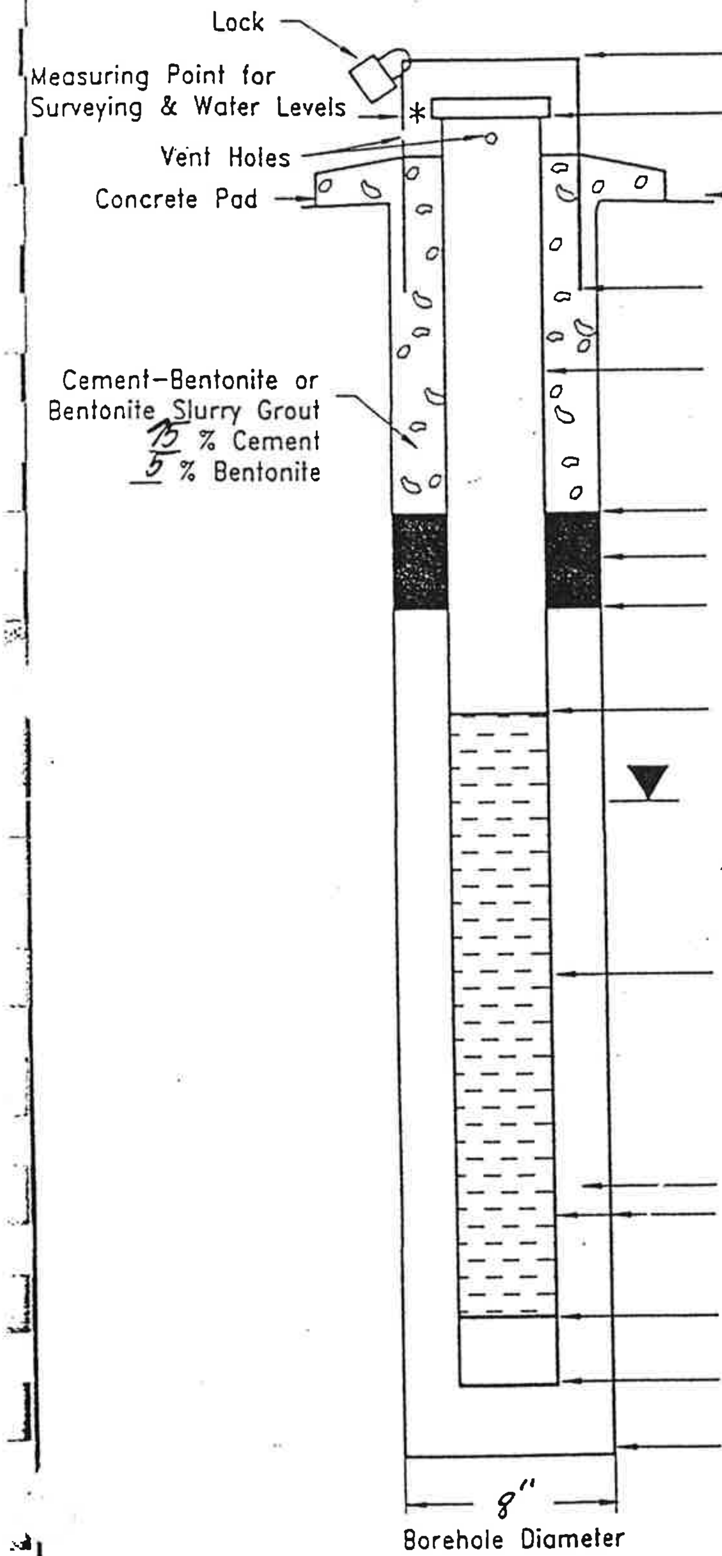
MONITORING WELL CONSTRUCTION DETAIL



	Depth from G.S. (feet)	Elevation (NGVD)
Top of Steel Guard Pipe	Flush	
Top of Riser Pipe	3' ~~-0.3~~	
Ground Surface (G.S.)	0.00	
Bottom of Steel Guard Pipe	1.5'	
Riser Pipe: Length 11.5' / Inside Diameter (ID) 2" / Type of Material PVC		
Top of Bentonite Seal pellets + grout	11.5	
Bentonite Seal Thickness 3"		
Top of Sand	13.5'	
Top of Screen	15.5'	
Stabilized Water Level		
Screen: Length 10' / Inside Diameter (ID) 2" / Slot Size ~~.010~~ .020 / Type of Material PVC		
Type/Size of Sand #2		
Sand Pack Thickness 3"		
Bottom of Screen	25.25'	
Bottom of Tail Pipe: Length .25'	25.50'	
Bottom of Borehole	25.5'	

Approved:

C. Martin 4/1/92

Signature Date

* Describe Measuring Point: Top of PVC

ENSR

S-11

ENSR

Sheet 1 of 1

Project No. 5475-017 Date - Start 2-13-92 Finish [illegible] Boring B-3

Project Name [illegible] Drilling Co. EMPIRE

Location SWMU-3 Drilling Method 6 1/4 HSA

Total Depth 12' Inspector J. Rice Reviewer Charles S Martin

Remarks

Depth Feet	Sample Type & No.	Blows per 6 In.	Depth Range	Rec.	Graphic Log	Lithologic Description	Equipment Installed
	S-1	13-14-14	0.5-2	8	FI	Black-Brown FILL (sand + gravel, some silt)	1
	S-2	12-13-9-5	2-4	12		brown FILL (med to cs SAND, some gravel	1
5	S-3	2-2-3-7	4-6	3		black med SAND + GRAVEL (FILL) (hydrocarbon ODOR)	50
	S-4	9-4-3-2	6-8	20	WT FI/OL	12" brown CLAY + SILT 8" FILL (layers) (hydrocarbon odor)	58
	S-5	1-1-2-2	8-10	24	OL	gray-brown CLAY, some silt, trace organics and fine sand	11
10	S-6		10-12	24		gray-brown CLAY and SILT, some fine sand	5
						EOB 12'	
15							

303A

303B

M890278

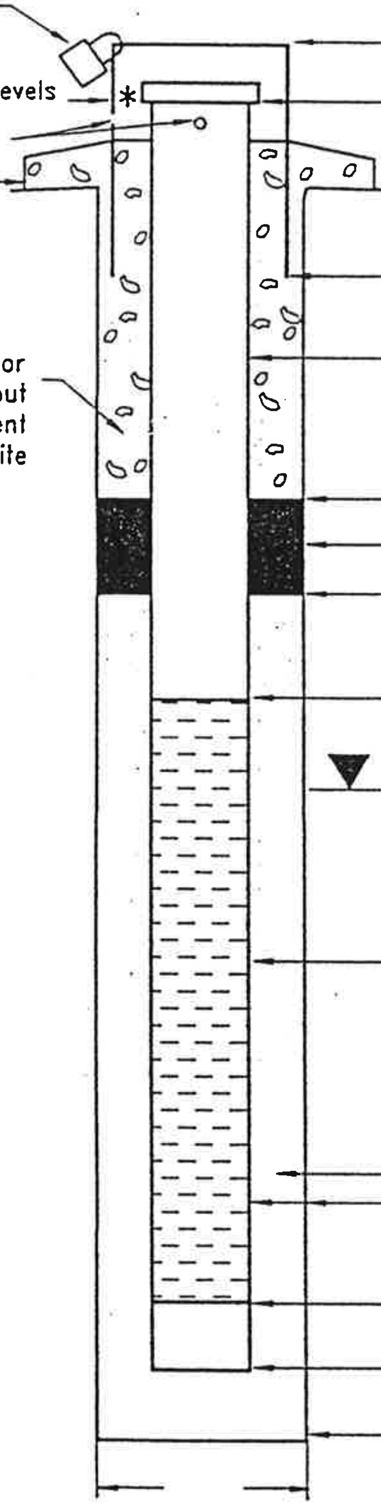
Project No: 6445-017 Client: Sun Oil Site: ~~Sun Oil~~ Philadelphia **WELL NO: MW-3**

Well Location: Guard Basin Date Installed: 2/11/92

Contractor: EMPIRE Method: 6 1/4 HSA Inspector: J. Ru

S-11

MONITORING WELL CONSTRUCTION DETAIL



Lock

Measuring Point for Surveying & Water Levels *

Vent Holes

Concrete Pad

Cement-Bentonite or Bentonite Slurry Grout
__ % Cement
__ % Bentonite

	Depth from G.S. (feet)	Elevation (NGVD)
Top of Steel Guard Pipe	0	
Top of Riser Pipe	0	
Ground Surface (G.S.)	0.00	
Bottom of Steel Guard Pipe	6"	
Riser Pipe: Length 4'; Inside Diameter (ID) 4"; Type of Material PVC		
Top of Bentonite Seal	2'	
Bentonite Seal Thickness 1'		
Top of Sand	3'	
Top of Screen	4'	
Stabilized Water Level		
Screen: Length 5'; Inside Diameter (ID) 4"; Slot Size 0.020; Type of Material PVC		
Type/Size of Sand silica/#1		
Sand Pack Thickness 1"		
Bottom of Screen	9'	
Bottom of Tail Pipe: Length .5'		
Bottom of Borehole	12'	

JR 5/27/93

Borehole Diameter

Approved:

* Describe Measuring Point: ______________________

Signature ______ Date ______

ENSR

ENSR

BORING LOG

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Sheet 1 of 1

Project No. 6445-017 Date - Start 2-17-92 Finish 2-17-92 Boring B-6A

Project Name Sun Oil Philadelphia Drilling Co. Empire

Location Lizard Farm (SWMU-3) Drilling Method 6 1/4" HSA

Total Depth 16 feet Inspector E. Anderson, S. Miller Reviewer Charles S. Martin

Remarks Water @ 5" upon completion.

Boring attempt #2 (TM)

Depth Feet	Sample Type & No.	Blows per 6 In.	Depth Range	Rec.	Graphic Log	Lithologic Description	Equipment Installed
0–10					FI	Blank drill - no samples taken 0 to 10' HNu: 5ppm in augers 0ppm in BZ 4ppm @ GS FILL	
10	S-1	NR	10-12	15"	FI/OL	Black silt/clay-like material, m. stiff trace plant matter, strong petro odor; v. damp - saturated FILL	
15	S-2	NR	14-16	17"	FI/OL 16'	Black silt/clay-like material, m. stiff trace plant matter, cinders v. damp-sat ~~(strong petro odor)~~	
						EOB @ 16 feet	
20							

M890278

Project No: 4775-017 Client: Sun Oil Site: [illegible]

WELL NO: MW-6

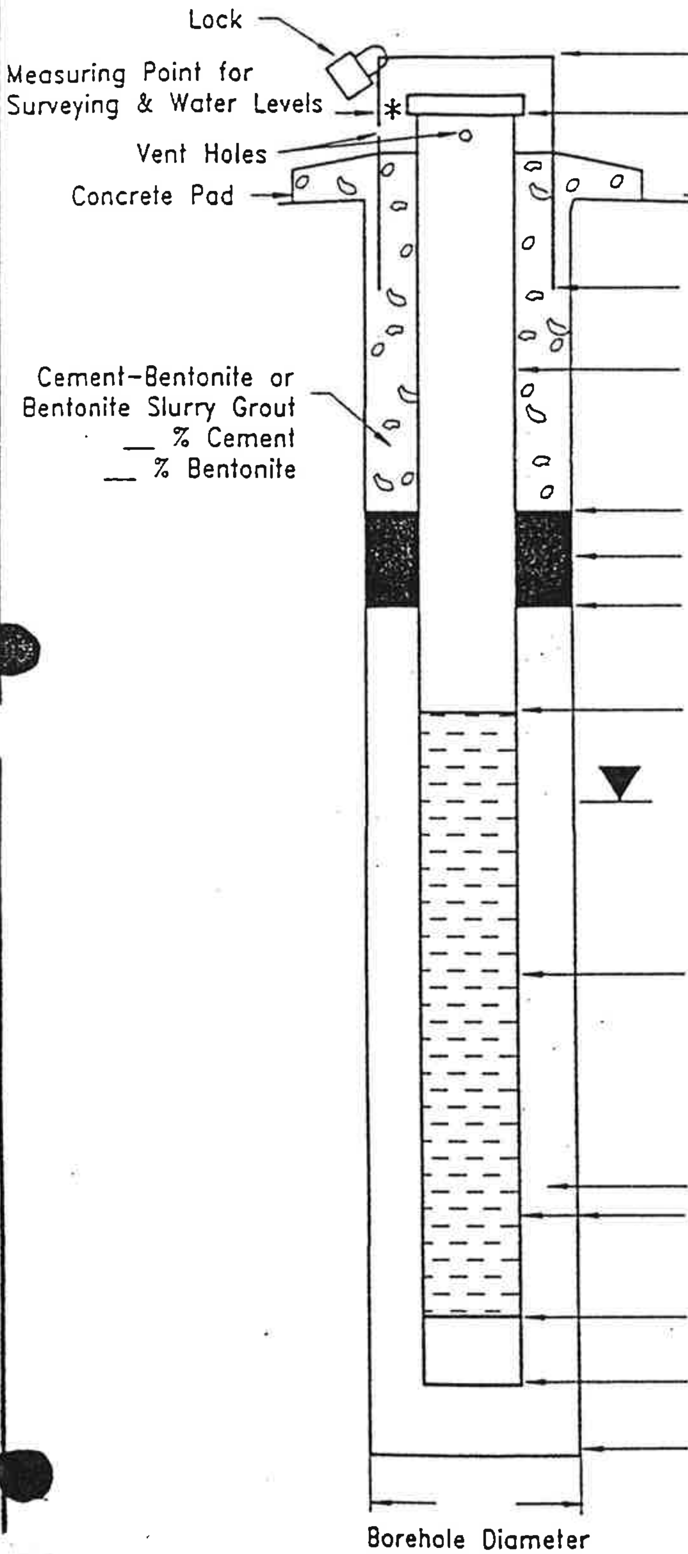
Well Location: Guard Basin

Date Installed: 2/17/92

Contractor: Empire Method: Auger Inspector: BEM

S-19

MONITORING WELL CONSTRUCTION DETAIL



		Depth from G.S. (feet)	Elevation (NGVD)
Top of Steel Guard Pipe		1.73	
Top of Riser Pipe	JH 5/27/93	1.26	
Ground Surface (G.S.)		0.00	
Bottom of Steel Guard Pipe			
Riser Pipe:			
Length	2		
Inside Diameter (ID)	4"		
Type of Material	PVC		
Top of Bentonite Seal		1	
Bentonite Seal Thickness	2		
Top of Sand		3	
Top of Screen		4'	
Stabilized Water Level			
Screen:			
Length	10 ft		
Inside Diameter (ID)	4"		
Slot Size	.020		
Type of Material	PVC		
Type/Size of Sand			
Sand Pack Thickness			
Bottom of Screen			
Bottom of Tail Pipe:		14'	
Length	.5'		
Bottom of Borehole	JH 5/27/93	16'	

Approved:

* Describe Measuring Point:

Signature Date

ENSR.

ENSR

5-14

Project No. 6445-017 Date - Start 2-13-92 Finish 2-14-92 Boring B-6

Project Name SUN OIL Drilling Co. EMPIRE

Location Pi[illegible] [illegible] Pi[illegible] Drilling Method 6¼ HSA

Total Depth 5' Inspector J. Rice Reviewer Charisse E. Martin

Remarks abandoned due to obstruction @ 5' CM

Boring moved to alternate location.

Depth Feet	Sample				Graphic Log	Lithologic Description	Equipment Installed
	Type & No.	Blows per 6 In.	Depth Range	Rec.			
					FI	Cuttings Dk Brown med SAND + GRAVEL FILL (Petro odor)	
5	S-1	100/6"	5-7		3" 5 300 [illegible]	Black Cinder FILL (Petro odor sheen) Refusal @ 5'	
10						(Boring abandoned)	
15							
20							
25							

M890278

ENSR

S-20

Project No. 6445-017 Date - Start 3/20/92 Finish 3/23/92 Boring B-26

Project Name Sun Oil Drilling Co. Empire

Location SWMU-3 (Guard Basin) Drilling Method Mud Rotary

Total Depth Inspector T. Rice / C. Martin Reviewer C. Martin

Remarks 11.5' N of B-11 (MW-11)

Depth Feet	Sample				Graphic Log	Lithologic Description	Equipment Installed
	Type & No.	Blows per 6 In.	Depth Range	Rec.			
0							
5						Mud rotary drill w/ 6" bit	
10						No samples taken. Refer to B-11 for log info -	
15						6" Casing installed to 19.5'	
20							
25						(Well set 25-35')	
30							
35					36	EOB.	

Project No: 6445-017 Client: Sun Oil Site: Phil, PA

WELL No: MW-26

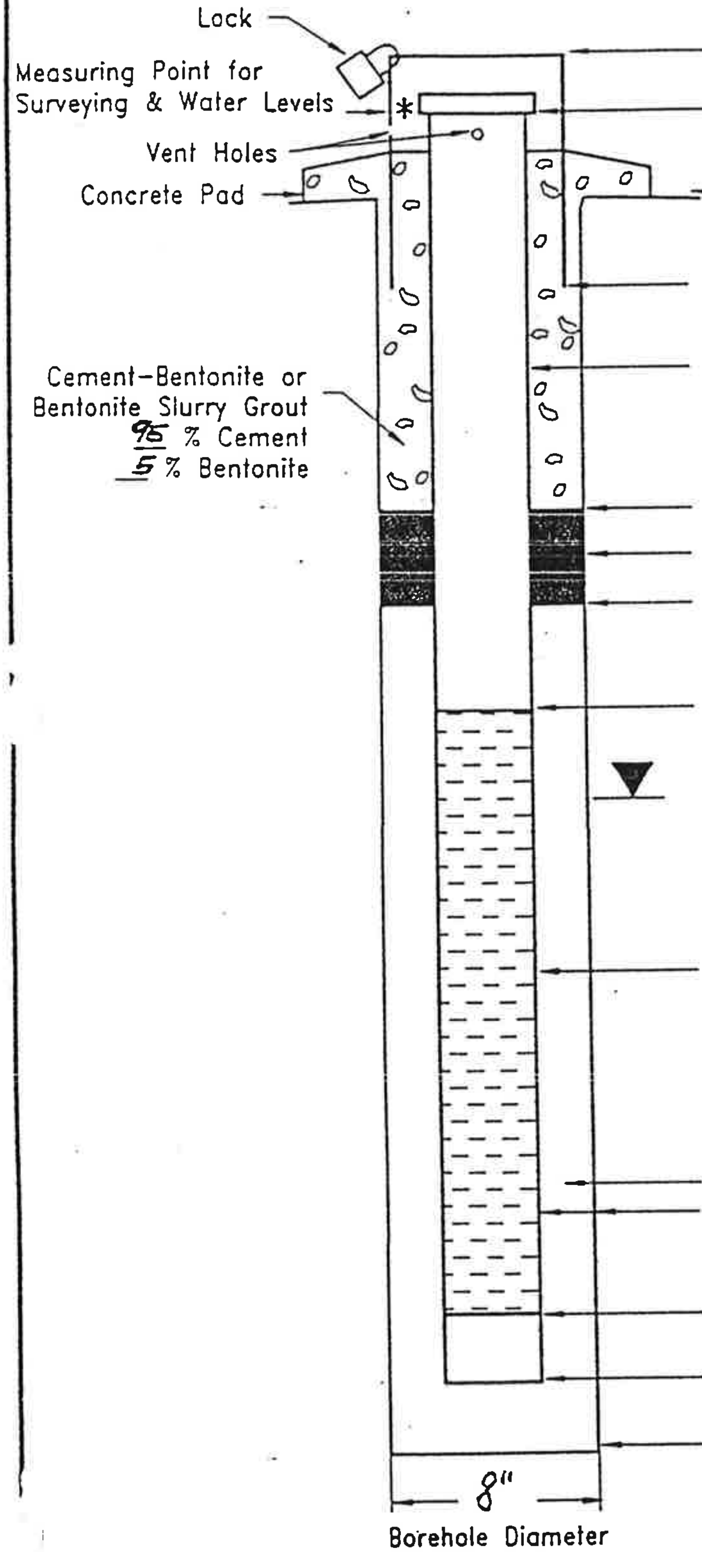
Well Location: SWMU-3 (Guard Basin)

Date Installed: 3/23/92

Contractor: Empire Method: Mud Rotary Inspector: J. Rice

S-20

MONITORING WELL CONSTRUCTION DETAIL



		Depth from G.S. (feet)	Elevation (NGVD)
Top of Steel Guard Pipe	2.65 ~~3'~~ 2'8" ~~2.5' above grade~~		
Top of Riser Pipe	2.50 ~~2'2"~~ ~~2.5' above~~		
Ground Surface (G.S.)		0.00	
Bottom of Steel Guard Pipe		17.5'	
Riser Pipe: Length	27'		
Inside Diameter (ID)	2"		
Type of Material	PVC		
Top of Bentonite Seal		21	
Bentonite Seal Thickness	3"		
Top of Sand		23	
Top of Screen		25	
Stabilized Water Level			
Screen: Length	10'		
Inside Diameter (ID)	2"		
Slot Size	~~.024~~ .020		
Type of Material	PVC		
Type/Size of Sand	#2		
Sand Pack Thickness	3"		
Bottom of Screen		34.75	
Bottom of Tail Pipe:		35	
Length	.25'		
Bottom of Borehole		36	

Approved:

* Describe Measuring Point: Top of PVC

C. Martin
Signature

4/1/92
Date

ENSR.

S-21

C.V.M. industries — **geotechnical division inc.**

post office box 2 • huntingdon valley, pennsylvania
215-947-2555

Client: ARCO
Project: WELL INSTALLATION
Location: SOUTH YARD, PHILADELPHIA, PA.
Project No.
Boring No.: SM-43 Depth: 13.0'
Elevation
Spoon Size Casing Size
Core Size Bit No.
Hammers:
Spoon, weight Drop
Drive, weight Drop
Date Started: 3-18-85

Driller: SB
Helper: WGH
Inspector: MC
Job No.: 2890

Ground Water Data:
1ST. ENCOUNTERED: 5.0'
TOTAL PIPE - 16.0'

Date Completed: 3-18-85

Depth	Casing Blows	STRATA CLASSIFICATION	SAMPLING DATA Depth	SAMPLING DATA No.	Blows per 6"	REMARKS
		MISCELLANEOUS FILL. 5.0'				FREE FLOWING FLUID AT 5.0' FILLING HOLE.
		GRANULAR TYPE SOIL 13.0'	HIGHLY SATURATED WITH PRODUCT.			MAY BE AN ABANDONED PIPE OR DRAIN THAT WAS DRILLED INTO
		COMPLETE AT 13.0'				

SHEET NO. .... OF ....

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ENSR

Sheet 1 of 2

Project No. 6445-017 Date - Start 3-4-92 Finish 3-9-92 Boring B-11

Project Name SUN OIL Drilling Co. EMPIRE

Location GUARD BASIN (SWMU-3) Drilling Method Mud Rotary

Total Depth 88' Inspector BEM Reviewer Charles E. Martin

Remarks

Depth Feet	Sample: Type & No.	Sample: Blows per 6 In.	Sample: Depth Range	Sample: Rec.	Graphic Log	Lithologic Description	Equipment Installed
0					FI	Drilling Through Fill Material	
5	1	2-3 6-7	5-7	20"	—	SILT, SOFT, Brown, moist PeTro. odor	
10	2	25-18 18-23	10-12	15"	311AA SW	Sand, Fine, well sorTed, Brown Loose, moisT, PeTro Odor	Chemical
15	3	21-27 31-28	15-17	9"	GP	Gravel, med. To Crse. Some Sand F. Dense, Brown, moist	
					SW	Sand As Above, odor. Natural?	
20	4	8-19 19-20	20-22	10"	Geo.	Sand, As Above, Odor med. Dense	GeoTech.
25	5	24-34 31-18	25-27	12"	311BA	Sand. Fine. Well sorTed. Loose. Grey, weT. No odor	Chemical
30	6	19-42 50/3"	30-32	0"	—	No Recovery Cobble in Tip	
35	7	34-24 80-26	35-37	10"	SP	Sand. Fine To Med. Loose. White/Grey Trace F. Gravel, WET	
40							

M890278

ENSR Project 6445-017 Boring B-11 Sheet 2 of 2

Depth Feet	Sample: Type & No.	Sample: Blows per 6 In.	Sample: Depth Range	Sample: Rec.	Graphic Log	Lithologic Description	Equipment Installed
	8	50-30 ~~50~~-40	40-42	10"	—	Sand, Fine, Loose, White/Grey Well Sorted, wet	
45					SP		
	9	44-24 27-39	45-47	12"	—	Sand, med To Crse, Loose, Grey, well Sorted wet, Petro. Odor,	
50	10	19-30 31/5"	50-52	1"	CL	Clay, V. Stiff, Yellow To Red, mottled med-Plastic, moist,	
55						Drilled Through To 56.0'	55.0' Bottom of Casing
	—	—	57-59	18"	CL Shelby Tube	Clay, hard, ~~Red+White~~, med-Plastic, Damp-Dry at Tip	Shelby Tube
60	11	50-50/4"	60-62	20"	311CA	Clay, V. Hard, Red+White mottled Brittle, Dry.	Chemical MS+MSD
					CL		
65	12	50 50/2"	65-67	4"	—	Sand, V. Fine to Powder, White Dense, Damp,	
					SP	very hard	
70	13	50/4"	70-72	4"	—	Sand, Fine, med dense, moist, brown layers, weathered rock?	
75	14	50/8"	75-77	6"	311DA	Sand, med-corse, med dense, wet Brown, Petro, odor	Chemical VOC's
					SP		
80	15	50/8"	80-82	8"	311DA	Sand, Med-Corse, Clay Binder, hard, White, damp. Mica+Quartz	Chemical SVOC's
85	16	50/6"	85-87	6"	—	Sand, Med-Corse, Trace Clay. Red, hard, [illegible] slight odor	
					88'	B.O.H. (Stopped - Very hard drilling)	

Project No: ______ Client: [illegible] Site: [illegible]

WELL NO: MW-11

Well Location: Gaurd Basin

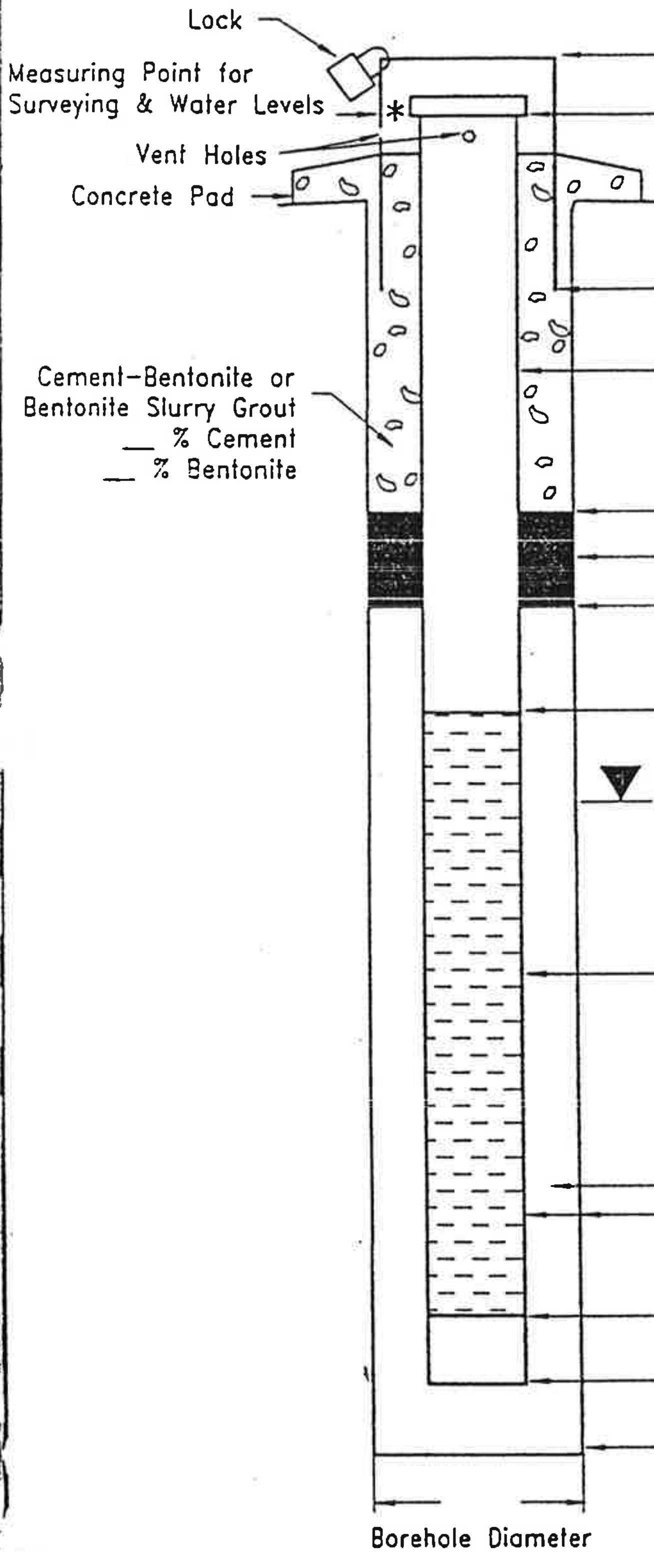
Date Installed: 3/9/92

Contractor: ______ Method: ______

Inspector: BEM

S-22

MONITORING WELL CONSTRUCTION DETAIL



		Depth from G.S. (feet)	Elevation (NGVD)
Top of Steel Guard Pipe		1.55	
Top of Riser Pipe	JH 5/27/93	1.35	
Ground Surface (G.S.)		0.00	
Bottom of Steel Guard Pipe			
Riser Pipe: Length	72'		
Inside Diameter (ID)	2"		
Type of Material	PVC		
Top of Bentonite Seal		59.0'	
Bentonite Seal Thickness	5'		
Top of Sand		64.0'	
Top of Screen		70.0	
Stabilized Water Level		[illegible]	
Screen: Length	10.0'		
Inside Diameter (ID)	2"		
Slot Size	.020		
Type of Material	~~[illegible]~~ PVC		
Type/Size of Sand	O Marie		
Sand Pack Thickness	3"		
Bottom of Screen		80.0	
Bottom of Tail Pipe:		~~70.0~~	
Length	.5'		
Bottom of Borehole	JH 5/27/93	98.0'	

Approved:

* Describe Measuring Point:

Signature ______ Date ______

ENSR.

ENSR — BORING LOG — S-23

Project No. 6445-017 Date - Start 2-13-92 Finish 2-13-92 Boring B-5

Project Name SUN OIL Drilling Co. EMPIRE

Location SWMU-3 Drilling Method 6 1/4 HSA

Total Depth 26' Inspector J. Rice Reviewer Charles S Martin

Remarks

Depth Feet	Sample: Type & No.	Sample: Blows per 6 In.	Sample: Depth Range	Sample: Rec.	Graphic Log	Lithologic Description	HNu ~~Equipment Installed~~	
	S-1	14-10-8-8	0-2'	12	FI	dk. brown FILL (fine sand - silt, some gravel)	5.2	
	S-2	9-11-9-7	2-4	18	2 FI	black FILL (silt + Clay like material, (fine fines?) (Petro odor)	72	
5	S-3	8-7-6-5	4-6	12			100	
	S-4	5-6-5-5	6-8	18		2" brown med sand + gravel seam	92	
	S-5	8-4-5-5	8-10	12			80	
10	S-6	4-7-11-10	10-12	12	10.5 FI/SM	lt. brown fine SAND + SILT (FILL)	8.2	
	S-7	3-3-7-10	12-14	12			9.4	
15	S-8	17-12-8-8	14-16	12	14		4.8	
	S-9	13-16-14-20	16-18	12	FI	lt. brown medium to c. SAND + GRAVEL, some silt (Fill) (Petro ODOR)	5.0	
	S-10	17-17-20-15	18-20	8	▽		9.5	305AA
20	S-11	13-10-13-10	20-22	24			—	305AB (dup
	S-12	7-6-5-7	22-24	12	22 SW	gray fine to cs. SAND (Petro ODOR)	3.0	
25	S-13	13-17-18-26	24-26	18	26'		1.8	
						EOB 26'		
30								

M890278

Project No.: [illegible] Client: [illegible] Site: [illegible] WELL NO. MW-5

Well Location: GUARD BASIN

Date Installed: 2/13/92

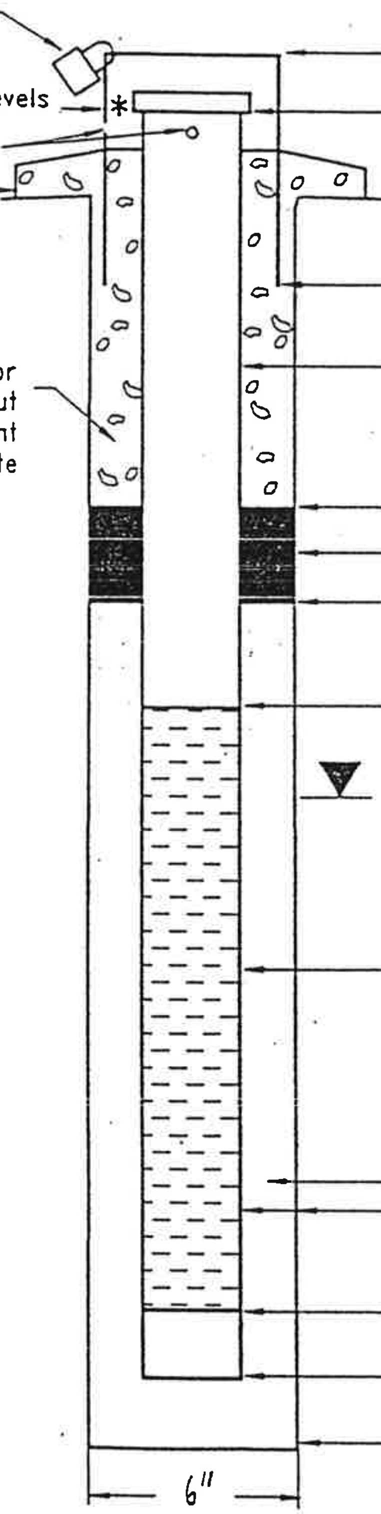
Contractor: EMPIRE

Method: 6 1/4 HSA

Inspector: J. Ria

S-23

MONITORING WELL CONSTRUCTION DETAIL



	Depth from G.S. (feet)	Elevation (NGVD)
Top of Steel Guard Pipe	≈ 2.5	
Top of Riser Pipe	≈ 2.0	
Ground Surface (G.S.)	0.00	
Bottom of Steel Guard Pipe	≈ 3.8	
Top of Bentonite Seal	12'	
Top of Sand	14'	
Top of Screen	16'	
Stabilized Water Level		
Bottom of Screen	26'	
Bottom of Tail Pipe:		
Bottom of Borehole	26'	

Riser Pipe:
- Length: 18.0
- Inside Diameter (ID): 4"
- Type of Material: PVC

Bentonite Seal Thickness: 2

Screen:
- Length: 10'
- Inside Diameter (ID): 4"
- Slot Size: 0.020
- Type of Material: PVC

Type/Size of Sand: Silica / #1

Sand Pack Thickness: 1"

Bottom of Tail Pipe: Length: .5'

JH 5/27/93

Describe Measuring Point:

Approved:

Signature ______ Date ______

ENSR

5-24

C.V.M. industries — geotechnical division inc.

post office box 2 • huntingdon valley, pennsylvania

215-947-2555

Client: ARCO
Project: WELL INSTALLATION
Location: SOUTH YARD, PHILADELPHIA, PA.
Project No.
Boring No.: SM-32
Depth: 16.0'
Elevation
Spoon Size
Casing Size
Core Size
Bit No.
Hammers:
Spoon, weight
Drop
Drive, weight
Drop
Date Started: 3-18-85

Driller: SB
Helper: WGH
Inspector: MC
Job No.: 2890

Ground Water Data:

TOTAL PIPE - 19.0'

Date Completed: 3-18-85

Depth	Casing Blows	STRATA CLASSIFICATION	Depth	SAMPLING DATA No.	Blows per 6"	REMARKS
		GRANULAR PRODUCT SATURATED MATERIAL (POSSIBLE SOIL FILL) 8.0'				DUE TO OIL LEVEL BEING LESS THAN 1.0' BELOW SURFACE. NO BENTONITE WAS USED. INSTEAD IT WAS FILLED WITH GRAVEL.
		PRODUCT SATURATED SILTY SOIL 16.0'				15.0' OF WELL SCREEN WAS USED TO ASSURE THE TOP OF FLUID LEVEL PENETRATED THE WELL AND WAS NOT CUT OFF.
		COMPLETE AT 16.0'				

SHEET NO. .... OF ....

S-24

C.V.M. industries

geotechnical division inc.

post office box 2 • huntingdon valley, pennsylvania
215-947-2555

Client: ARCO
Project: WELL INSTALLATION
Location: PHILADELPHIA, PA.
Project No.: 9200
Boring No.: SM-32 Depth: 10.0'
Elevation:
Spoon Size: Casing Size:
Core Size: Bit No.:
Hammers:
Spoon, weight: Drop:
Drive, weight: Drop:
Date Started: 12-18-84

Driller: SB
Helper: WGH
Inspector: MC
Job No.: 2890

Ground Water Data:

Date Completed: 12-18-84

Depth	Casing Blows	STRATA CLASSIFICATION	Depth	SAMPLING DATA No.	Blows per 6"	REMARKS
		MISCELLANEOUS FILL 1.0'				
		HIT CRUDE OIL AT 1.0' BUBBLED AND STOPPED DRILLING AT 10.0'				NO PIPE LENGTH INSTALLED
		10.0'				
		CONTACTED MCKEE AND RJ FOR VISUAL CONFIRMATION.	ABANDONED HOLE.			
		INSTRUCTED US TO GO TO NEXT HOLE.				

SHEET NO. .... OF ....

S-25

C.V.M. industries — **geotechnical division inc.**
post office box 2 • huntingdon valley, pennsylvania
215-947-2555

Client: ARCO
Project: WELL INSTALLATION
Location: SOUTH YARD, PHILADELPHIA, PA.
Project No.
Boring No.: SM-44 — Depth: 18.0'
Elevation
Spoon Size — Casing Size
Core Size — Bit No.
Hammers:
Spoon, weight — Drop
Drive, weight — Drop
Date Started: 3-18-85

Driller: SB
Helper: WGH
Inspector: MC
Job No.: 2890

Ground Water Data:
1ST. DRILLED - APPROX. 14.0'
(MOIST)
AFTER DRILLING - WATER 16'10"
TOTAL PIPE - 20.0'

Date Completed: 3-18-85

Depth	Casing Blows	STRATA CLASSIFICATION	Sampling Data Depth	No.	Blows per 6"	REMARKS
		STONE FILL 1'				
		BROWN SILTY SAND TO SILTY CLAY. 5.0'				
		BROWN FINE SAND AND GRAVEL. 18.0'				DAMP AT 14.0'
		COMPLETE AT 18.0'				

SHEET NO. .... OF ....

S-26

C.V.M. industries

geotechnical division inc.
post office box 2 • huntingdon valley, pennsylvania
215-947-2555

Client: ARCO
Project: WELL INSTALLATION
Location: PHILADELPHIA, PA
Project No.: 9200
Boring No.: SM-33 Depth: 24.0'
Elevation:
Spoon Size: Casing Size:
Core Size: Bit No.:
Hammers:
Spoon, weight: Drop:
Drive, weight: Drop:
Date Started: 12-17-84

Driller: SB
Helper: WGH
Inspector: MC
Job No.: 2890

Ground Water Data:
0 HRS: WATER AT 18'8"
TOTAL PIPE - 27.0'

Date Completed: 12-17-84

Depth	Casing Blows	STRATA CLASSIFICATION	Depth	SAMPLING DATA No.	Blows per 6"	REMARKS
		MISCELLANEOUS FILL 0.				
		SILT AND VERY FINE SAND. TAN - BROWN 10.0'				3.0' STICK-UP
		FINE TO COARSE SAND AND GRAVEL MULTI-COLORED 19.0'				
		FINE BROWN SAND WITH TRACE OF CLAY. 24.0'				
		COMPLETE AT 24.0'				

SHEET NO. .... OF ....

S-27

C.V.M. industries — **geotechnical division inc.**
post office box 2 • huntingdon valley, pennsylvania
215-947-2555

Client: ARCO
Project: WELL INSTALLATION
Location: SOUTH YARD, PHILADELPHIA, PA.
Project No.
Boring No.: SM-42 Depth: 34' 9"
Elevation
Spoon Size Casing Size
Core Size Bit No.
Hammers:
Spoon, weight Drop
Drive, weight Drop
Date Started: 3-19-85

Driller: SB
Helper: W.G.H.
Inspector: MC
Job No.: 2890

Ground Water Data:
0 HRS: WATER AT 36' 9"
TOTAL PIPE - 36' 9"

Date Completed: 3-19-85

Depth	Casing Blows	STRATA CLASSIFICATION	Sampling Data: Depth	No.	Blows per 6"	REMARKS
		ASH AND CINDER FILL. 7.0'				PRODUCT ODOR OBVIOUS
		TAN VERY FINE TO FINE SAND AND SILT 14.0'				DUE TO DIFFICULTIES IN DETERMINING WATER LEVEL, APPROXIMATLY 30.0' OF SLOTTED SCREEN WAS INSTALLED.
		BROWN FINE TO COARSE SAND AND GRAVEL				IN THIS WAY, THERE IS MORE THAN ADEQUATE SCREEN FOR THE ADJUSTING WATER LEVEL.
		WITH GRAVEL GRADING INTO A TAN FINE TO MEDIUM SAND. 34' 9"				TOP 9.0' WAS SEALED WITH BENTONITE. RISER + ≈ 1' BS WAS SOLID PIPE.
		COMPLETE AT 34' 9"				

SHEET NO. .... OF ....

S-28

C.V.M. industries

geotechnical division inc.
post office box 2 • huntingdon valley, pennsylvania
215-947-2555

Client: ARCO
Project: WELL INSTALLATION
Location: PHILADELPHIA, PA.
Project No. 9200
Boring No. SM-29 Depth 25.0'
Elevation
Spoon Size Casing Size
Core Size Bit No.
Hammers:
Spoon, weight Drop
Drive, weight Drop
Date Started 12-17-84

Driller SB
Helper WGH
Inspector MC
Job No. 2890

Ground Water Data:
0 HRS: WATER AT 20'8"
TOTAL PIPE - 28.0'

Date Completed 12-17-84

Depth	Casing Blows	STRATA CLASSIFICATION	Depth	SAMPLING DATA No.	Blows per 6"	REMARKS
		MISCELLANEOUS FILL: CINDER AND ASH 2.5'				
		TAN SANDY SILT 5.0'				PRODUCT ODOR VERY APPARENT
		GREY CLAY. TRACE OF VERY FINE SAND. 12.0'				
		FINE TO COARSE SAND AND GRAVEL. 19.0'				
		GREY FINE SAND. 25.0'				

SHEET NO. .... OF ....

S-29

WELL 59

WELL ELEVATION:
WELL INSTALLED: 12/08/86
WELL DEVELOPED: 12/13/86
WELL DEPTH:

BORING 59

SURFACE ELEVATION:
DRILLING METHOD: H.S.A.
BORING DEPTH:

DEPTH IN FEET	WELL	SOIL TYPE USCS	DESCRIPTION	BLOWS	% RETAINED	SAMPLE NO.	SAMPLE DEPTH	SAMPLE TYPE
0	2" Sch. 40 PVC	ML	SILT: with a trace of very fine sand, brown					
5–10	Cement Grout		Very moist with H.C. odors					
14–15		MH	CLAYEY SILT: 14-17 ft. - less odors, gray					
15–16	Bentonite Seal							
17	3 bags of sand	SP	SAND: poorly graded sand, medium to coarse, with trace of gravel @ 17 feet, brown	9 11 13 13	62	1		
19–20		SW	SAND: fine to coarse with some gravel, varied	8 22 55	40	2		

Drilled by CVM Inc.
Logged by J. Lundberg
Client ARCO
Job No. 502-158-02
Page 1 of 2

EEI ENGINEERING ENTERPRISES, INC.

DEPTH IN FEET	WELL 59 Cont.	SOIL TYPE USCS	BORING 59 Cont.	BLOWS	% RETAINED	SAMPLE NO.	SAMPLE DEPTH	SAMPLE TYPE
20		SW	SAND: fine to coarse with some gravel, varied	– 19 16 13	50	3		
		SM	SILTY SAND: fine to medium with some silt & quartz cobbles-saturated with gas 21.5-23 feet, brown	7 10 10 12	75	4		
		CL	CLAY: dense clay-mottled with 2" of sand in middle of core; 4" of sand @ 25', gray orange					
25	.020" slotted screen	MH	CLAYEY SILT: silt - mottled with some carbon deposits & wood fragments, grades to silty sand, brown	6 9 11 13	100	5		
		SM	SILTY SAND: fine to coarse with some gravel - H.C. odors brown	– 13 22 34	100	6 7		
30		GM	SILTY GRAVEL: well graded sand to 3/4" gravel with some silt; dark brown	– 12 19 29	80	8		
			No sample from 30½ to 40 - dark brown silt on tip of auger					
35	Caved							
40			T.D. = 40'					

ENGINEERING ENTERPRISES, INC.

S-31

C.V.M. industries — **geotechnical division inc.**
post office box 2 • huntingdon valley, pennsylvania
215-947-2555

Client: ARCO REFINERY
Project: WELLS AND TEST BORINGS.
Location: PHILADELPHIA, PA.
Project No.:
Boring No.: SM-53 Depth: 25.0'
Elevation:
Spoon Size: 2" Casing Size:
Core Size: Bit No.:
Hammers:
Spoon, weight: 140# Drop: 30"
Drive, weight: Drop:
Date Started: 7-31-85

Driller: S.B
Helper: W.G.H.
Inspector: MC
Job No.: 3115

Ground Water Data:
O. Hrs: WATER AT 21.0'
TOTAL PIPE - 28.0'

Date Completed: 7-31-85

Depth	Casing Blows	STRATA CLASSIFICATION	Sampling Depth	Sampling No.	Blows per 6"	REMARKS
	Fill	MISCELLANEOUS FILL. ASH - CINDER 8.0'	4.0 - 6.0	S-1	6 - 6 8 - 10	SAMPLE HOLE OFFSET APPROXIMATELY 2.0 - 4.0' FROM WELL ON 8-5-85
	Qal	YELLOW SANDY SILT. GRADING TO				
	QP	MULTI-COLORED FINE TO COARSE SAND AND GRAVEL. 25.0'	18.0 - 20.0	S-2	16 - 38 40 - 54	
		COMPLETE AT 25.0'				

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SHEET NO. .... OF ....

S-32

C.V.M. industries **geotechnical division inc.**
post office box 2 • huntingdon valley, pennsylvania
215-947-2555

Client ARCO
Project WELL INSTALLATION
Location PHILADELPHIA, PA.
Project No. 9200
Boring No. SM-27 Depth 25.0'
Elevation
Spoon Size Casing Size
Core Size Bit No.
Hammers:
Spoon, weight Drop
Drive, weight Drop
Date Started 12-17-84

Driller SB
Helper WGH
Inspector MC
Job No. 2890

Ground Water Data:
0 HRS: WATER AT 21'6"
TOTAL PIPE - 28.0'

Date Completed 12-17-84

Depth	Casing Blows	STRATA CLASSIFICATION	Depth	SAMPLING DATA No.	Blows per 6"	REMARKS
		MISCELLANEOUS FILL 2.0'				3' STICK-UP
		GREY-GREEN CLAY TRACE OF SILT VERY FINE SAND. 10.5'				
		MULTI-COLORED FINE TO COARSE SAND AND GRAVEL. 17.0'				GASOLINE ODOR OBVIOUS
		TAN FINE SAND 25.0'				
		COMPLETE AT 25.0'				

SHEET NO. .... OF ....

S-33

C.V.M. industries

geotechnical division inc.

post office box 2 • huntingdon valley, pennsylvania

215-947-2555

Client ARCO REFINERY
Project WELLS AND TEST BORINGS
Location PHILADELPHIA, PA.
Project No.
Boring No. SM-54 Depth 28.0'
Elevation
Spoon Size 2" Casing Size
Core Size Bit No.
Hammers:
Spoon, weight 140# Drop 30"
Drive, weight Drop
Date Started 7-30-85

Driller SB
Helper WGH
Inspector MC
Job No. 3115

Ground Water Data:
0 HRS: WATER AT 22.0'
TOTAL PIPE = 31.0'

Date Completed 7-30-85

Depth	Casing Blows	STRATA CLASSIFICATION	Sampling Data Depth	Sampling Data No.	Blows per 6"	REMARKS
		MISCELLANEOUS FILL ± 8.5'	4.0 - 6.0	S-1	3 - 2 2 - 3	APPROXIMATELY 3.0' OF PRODUCT ON TOP OF WATER SURFACE. SAMPLE HOLE OFFSET APPROXIMATELY 2.0-4.0' OF WELL ON 8-2-85
		BROWN SANDY SILT WITH FINE GRAVEL GRADING TO SILTY SAND AND FINE TO COARSE SAND WITH FINE TO MEDIUM GRAVEL. 28.0'	18.0 - 20.0	S-2	13 - 13 12 - 16	
		COMPLETE AT 28.0'				

SHEET NO. .... OF ......

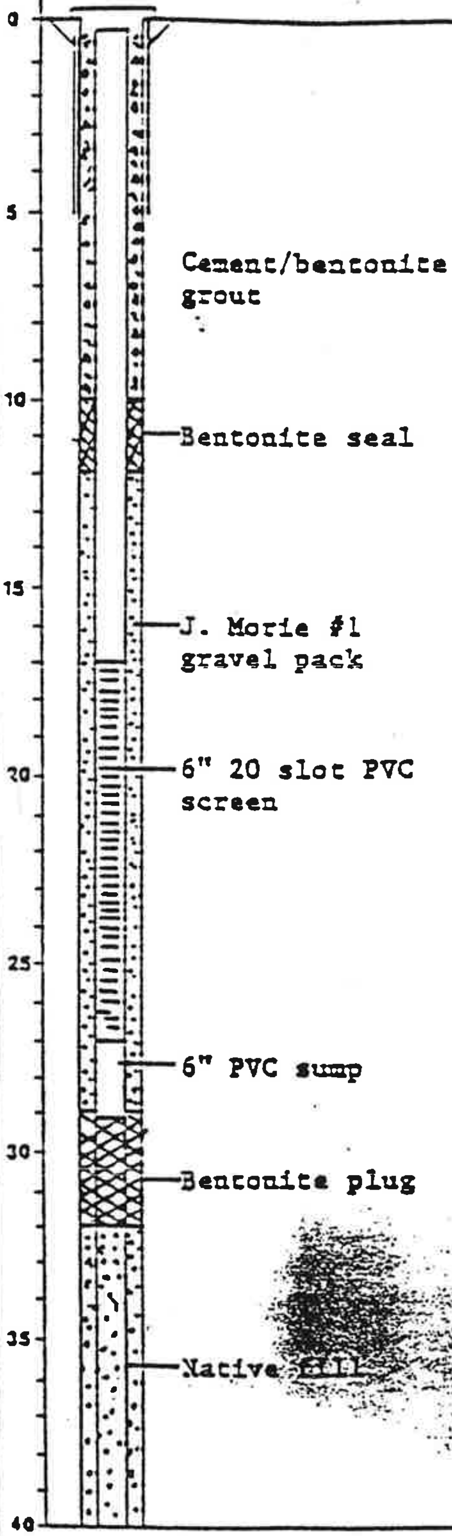
5-37

WELL PN-1

WELL ELEVATION:
WELL INSTALLED: 5/26/87
WELL DEVELOPED: 5/27/87
WELL DEPTH: 29.0

BORING PN-1

SURFACE ELEVATION:
DRILLING METHOD: Mud Rotary
BORING DEPTH: 40.0



SOIL TYPE: USCS	SOIL TYPE: SYMBOLS	DESCRIPTION	SAMPLE DATA:		BLOWS	% RETAINED	SAMPLE NO.	SAMPLE DEPTH	SAMPLE TYPE
		0.0 - 4.0 FILL							
		4.0 - 5.0 SILT: sandy; brown							
		5.0 - 9.0 SILT: sandy w/trace gravel; brown							
		9.0 - 11.0 GRAVEL LAYER							
		11.0 - 27.0 SAND AND GRAVEL: (fine-very coarse) trace silt; variegated							
		27.0 - 29.5 CLAY: sandy; variegated							
		29.5 - 33.0 SAND: (fine-medium) w/silt; brown & gray							
		33.0 - 36.0 SAND: (fine-coarse) w/gravel and silt							
		36.0 - 40.0 SAND: clayey w/gravel							

Drilled By W. C. Services
Logged By P. Dougherty
Client ARCO
Job No. 522-189-00
Page 1 Of

EEI ENGINEERING ENTERPRISES, INC.

WELL [illegible]

WELL ELEVATION:
WELL INSTALLED: 5/28/87
WELL DEVELOPED: 5/28/87
WELL DEPTH: 29.0

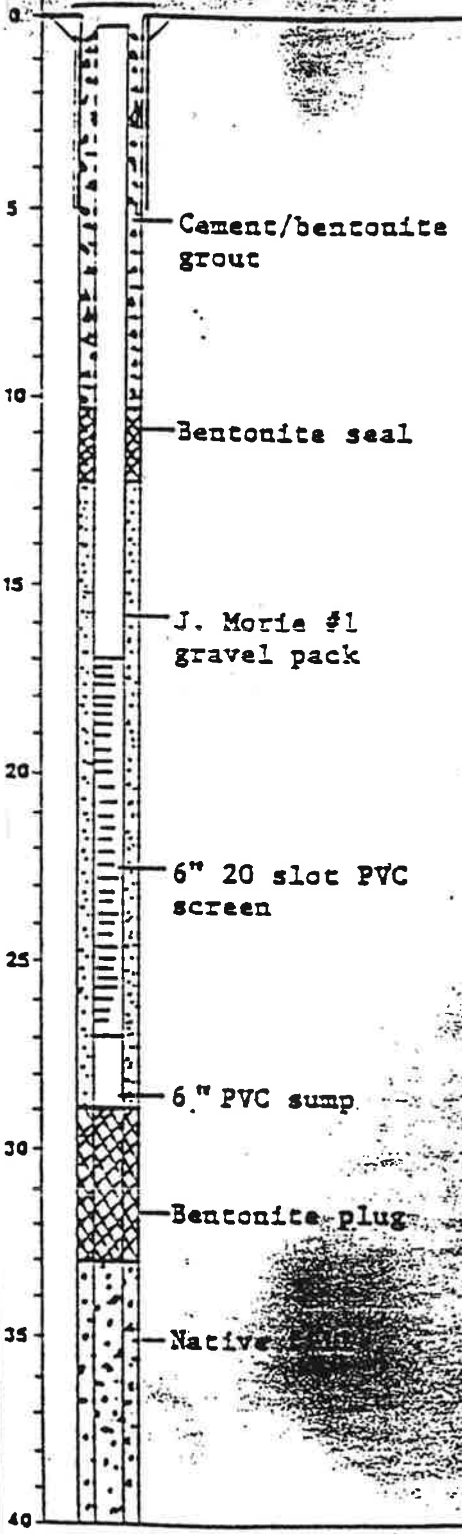
SOIL TYPE: USCS | SYMBOLS

BORING EN-2

SURFACE ELEVATION:
DRILLING METHOD: Mud Rotary
BORING DEPTH: 40.0

BLOWS | % RETAINED | SAMPLE NO. | SAMPLE DEPTH | SAMPLE TYPE

DEPTH IN FEET: 0, 5, 10, 15, 20, 25, 30, 35, 40



0.0 - 2.0 FILL

2.0 - 7.0 SILT: sandy w/some clay; brown

7.0 - 10.0 SILT: clayey w/ gravel lenses; brown and gray

10.0 - 18.0 SAND AND GRAVEL: (medium-very coarse); variegated

18.0 - 27.5 SAND & GRAVEL: (medium-coarse) trace silt; variegated

27.5 - 32.0 CLAY: sandy w/ silt; green and gray

32.0 - 35.0 SAND & GRAVEL: coarse w/some silt

35.0 - 40.0 SAND: silt w/some gravel; red and brown

Drilled By W.C. Services
Logged By P. Dougherty
Client ARCO
Job No. 522-189-00
Page 1 Of

ENGINEERING ENTERPRISES, INC.

5-37

C.V.M. industries — **geotechnical division inc.**
post office box 2 • huntingdon valley, pennsylvania
215-947-2555

Client ARCO
Project WELL INSTALLATION
Location PHILADELPHIA, PA.
Project No. 9200
Boring No. SM-25 Depth 30'
Elevation
Spoon Size Casing Size
Core Size Bit No.
Hammers:
Spoon, weight Drop
Drive, weight Drop
Date Started 12-17-85

Driller JB
Helper WGH
Inspector MC
Job No. 2890

Ground Water Data:
0 HRS WATER AT 24'3"
TOTAL PIPE 32.9'

Date Completed 12-17-84

Depth	Casing Blows	STRATA CLASSIFICATION	Depth	SAMPLING DATA No.	Blows per 6"	REMARKS
		MISCELLANEOUS FILL ASH AND CINDER 1.0'				2'10" STICK-UP
		TAN SILTY CLAY WITH TRACE TO SOME VERY FINE SAND. 9.0'				STRONG GAS ODOR APPARENT.
		BLUE - GREY CLAY 14.0'				
		SAND AND GRAVEL. MULTI-COLORED. 20.0'				
		TAN-LIGHT ORANGE FINE SAND WITH TRACE TO SOME SILT AND CLAY. 30.0'				
		COMPLETE AT 30.0'				

SHEET NO. .... OF ....

S-38

C.V.M. industries **geotechnical division inc.**
post office box 2 • huntingdon valley, pennsylvania
215-947-2555

Client ARCO
Project WELL INSTALLATION
Location PHILADELPHIA, PA.
Project No. 9200
Boring No. SM-31 Depth 23.2'
Elevation
Spoon Size Casing Size
Core Size Bit No.
Hammers:
Spoon, weight Drop
Drive, weight Drop
Date Started 12-19-84

Driller SB
Helper WGH
Inspector MC
Job No. 2890

Ground Water Data:
0 HRS: WATER AT 21.4'
TOTAL PIPE: 26.2'

Date Completed 12-19-84

Depth	Casing Blows	STRATA CLASSIFICATION	Depth	SAMPLING DATA No.	Blows per 6"	REMARKS
		MISCELLANEOUS ASH AND CINDER FILL 6"				
		TAN VERY FINE SAND AND SILT WITH TRACE OF CLAY. 7.0'				3' STICK-UP
		INTERBEDDED WITH LAYERS OF SAND AND GRAVEL. 12.0'				
		MULTI-COLORED SAND AND GRAVEL. 22.0'				
		TAN BROWN CLAY WITH TRACE GRAVEL 23.2'				
		COMPLETE AT 23.2'				

SHEET NO. .... OF ....

S-39

LOG of BORING No. AS-7

DATE 2/4/82 SURFACE ELEV. ______ LOCATION See Plate

DEPTH, FEET	SAMPLES	SAMPLING RESISTANCE	DESCRIPTION	ELEVATION	WATER CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	OTHER TESTS
0								
5		23	Stiff to hard brown and gray mottled clayey SILT					
10		26						
15		24	Dense brown and gray coarse to fine SAND and GRAVEL					
20		37						
25		17	Dense gray silty fine SAND					
30		18						
35		17						
40								

COMPLETION DEPTH 37.0 feet FLUID Depth enc. @ 25 ft. Date 2/4/82

SAMPLER: 2" O.D. SPLIT-BARREL SAMPLER

LOG JOB NO 81 C 2256A

WCC RP 1

S-39

PIEZOMETER INSTALLATION REPORT

Project: ARCO REFINERY

Project No.: 81C2256 Installed By: PFM

Piezometer No.: AS-7

Location: See Fig.

Date: 2/4/82 Time:

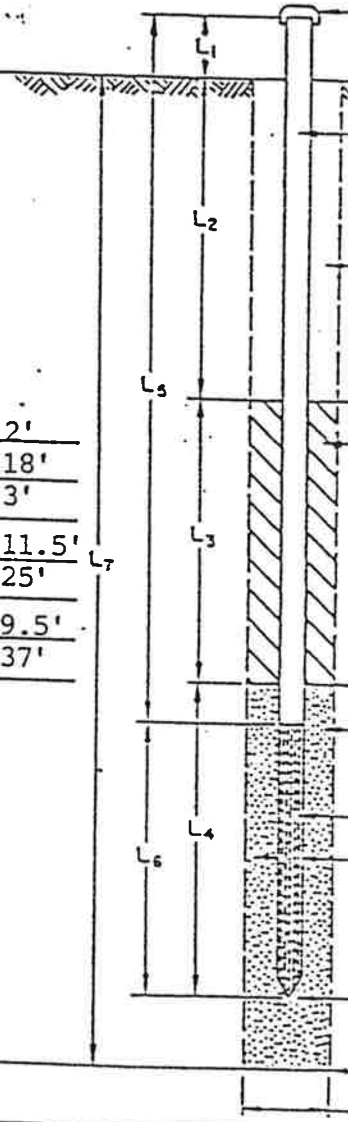
Method of Installation: Hollow stem auger

LOG OF BORING AND PIEZOMETER

BORING			PIEZOMETER
Depth in ft.	Description	Symbol	Type of Piezometer: PVC

Ground Elev. 20.06'

Top of Riser Elev. 22.08'



- Vented Cap
- I.D. of Riser Pipe: 3"
- Type of Pipe: PVC
- Type of Backfill Around Riser: cement grout
- Top of Seal Elev. 2.06'
- Type of Seal Material: bentonite balls
- Top of Filter Elev. -.94'
- Type of Filter Material: sand
- Size of Openings: .010"
- Diameter of Piezometer Tip: 3"
- Bottom of Piez. Elev. -12.44'
- Bottom of Boring Elev. -16.94'
- Diameter of Boring: 12"

L1 = 2'
L2 = 18'
L3 = 3'
L4 = 11.5'
L5 = 25'
L6 = 9.5'
L7 = 37'

Remarks:

Inspected By: PFM

S-50

C.V.M. industries

geotechnical division inc.

post office box 2 • huntingdon valley, pennsylvania
215-947-2555

Client ARCO REFINERY
Project WELLS AND TEST BORINGS
Location PHILADELPHIA, PA.
Project No. -
Boring No. SM-57 Depth 27.0'
Elevation
Spoon Size 2" Casing Size
Core Size Bit No.
Hammers:
Spoon, weight 140 # Drop 30"
Drive, weight Drop
Date Started 8-1-85

Driller SB
Helper WGH
Inspector
Job No. 3115

Ground Water Data:
WATER AT 23.5'
TOTAL PIPE - 30.0'

Date Completed 8-1-85

Depth	Casing Blows	STRATA CLASSIFICATION	Depth	SAMPLING DATA No.	Blows per 6"	REMARKS
		BLACK ASH CINDERS 8.5'	4.0 - 6.0	S-1	2 - 2 3 - 2	SAMPLE HOLE OFFSET APPROXIMATELY 2.0-4.0' ON 8-2-85
		TAN SILT AND CLAY. SOME VERY FINE SAND. 15.0'				
		GREY CLAY. TRACE VERY FINE TO FINE SAND. 18.0'				
		MULTI-COLORED FINE TO COARSE SAND AND GRAVEL. 27.0'	21.0 - 23.0	S-2	27 - 60 83 - 114	
		COMPLETE AT 27.0'				

SHEET NO. .... OF ....

S-51

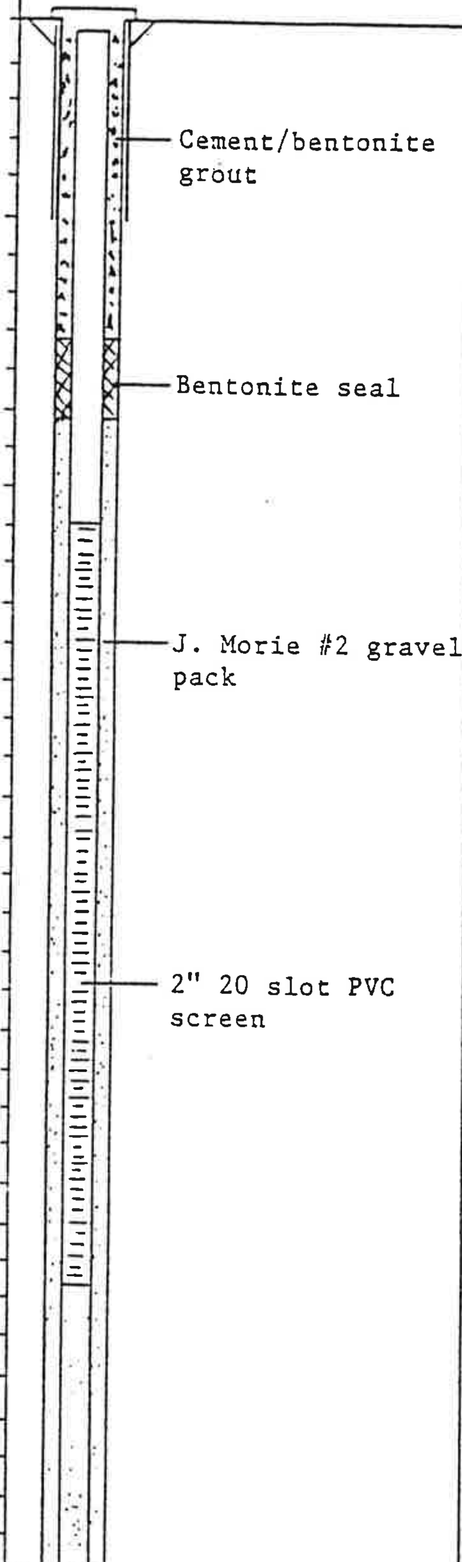
WELL #68

WELL ELEVATION: 26.14
WELL INSTALLED: 7-22-87
WELL DEVELOPED:
WELL DEPTH:

BORING

SURFACE ELEVATION:
DRILLING METHOD: Hollow Stem Auger
BORING DEPTH: 40.0

DEPTH IN FEET: 0, 5, 10, 15, 20, 25, 30, 35, 40



SOIL TYPE: USCS | SYMBOLS

Description	BLOWS	% RETAINED	SAMPLE NO.	SAMPLE DEPTH	SAMPLE TYPE
0.0 - 1.5 FILL					
1.5 - 4.5 SILT: brown, sandy					
4.5 - 6.5 SILT: dark gray, some fine sand, moist, slight odor					
6.5 - 12.0 SILT AND CLAY: dark gray					
12.0 - 17.0 SAND AND GRAVEL: dark brown					
17.0 - 20.0 SAND: dark brown, silty, gravel, moist, odor present					
20.0 - 27.0 SAND: dark brown, silty, slightly finer gravel, wet, slight odors			1		
			2		
			3		
27.0 - 32.0 SAND: variegated, some gravel, little silt, wet, strong odors			4		
32.0 - 36.5 SAND: variegated, medium to coarse, some gravel			5		
36.5 - 40.0 SAND: gray, medium to coarse, some silt and clay					
TOTAL DEPTH 40.0					

Drilled By Hardin-Huber
Logged By Peter J. Dougherty
Client Atlantic
Job No. 522-239-00

EEI ENGINEERING ENTERPRISES, INC.

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LOG of BORING No. AS-3

DATE 1/29/82 SURFACE ELEV. ______ LOCATION See Plate

DEPTH, FEET	SAMPLING RESISTANCE	DESCRIPTION	ELEVATION	WATER CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	OTHER TESTS
0							
5	13	Stiff gray clayey SILT					
10	29	Medium dense to very dense coarse to fine SAND and GRAVEL					
15	31						
20	22						
25	100/3"						
30	35						
35	66						
40	26						
45							

COMPLETION DEPTH 41.0 feet FLUID Depth enc. @ 28 ft. Date 1/29/82

SAMPLER: 2" O.D. SPLIT-BARREL SAMPLER

JOB NO 81 C 2256A

5-52

PIEZOMETER INSTALLATION REPORT

Project ARCO REFINERY

Project No. 81C2256 Installed By PFM

Method of Installation Hollow stem auger

Piezometer No. AS-3

Location See Fig.

Date 2/2/82 Time

LOG OF BORING AND PIEZOMETER

BORING.

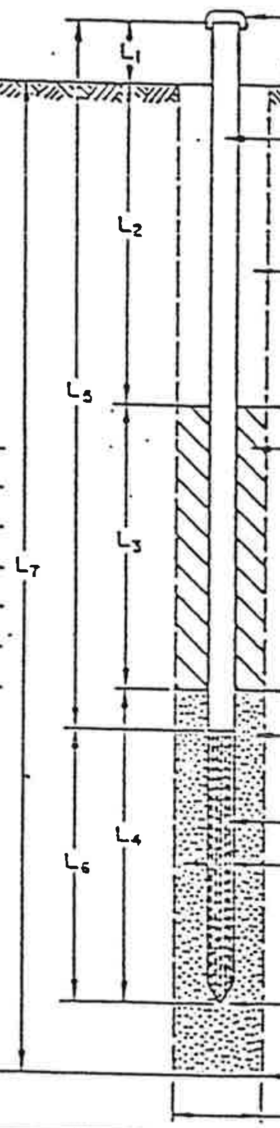
Depth in ft.	Description	Symbol

PIEZOMETER

Type of Piezometer PVC

Ground Elev. 22.55'

Top of Riser Elev. 24.05'



Vented Cap

I.D. of Riser Pipe 3"

Type of Pipe PVC

Type of Backfill Around Riser cement grout

Top of Seal Elev. 9.55'

Type of Seal Material bentonite slurry

Top of Filter Elev. -3.78'

Type of Filter Material sand

Size of Openings .010"

Diameter of Piezometer Tip 3"

Bottom of Piez. Elev. 20.45'

Bottom of Boring Elev. -22.45'

Diameter of Boring 12"

L_1 = 1.5'

L_2 = 13'

L_3 = 13.3'

L_4 = 16.7'

L_5 = 29.5'

L_6 = 15'

L_7 = 45'

Remarks

Inspected By PFM

LOG of BORING No. AS-10A

DATE 2/10-12/82 SURFACE ELEV. ______ LOCATION See Plate

DEPTH, FEET	SAMPLES	SAMPLING RESISTANCE	DESCRIPTION	ELEVATION	WATER CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	OTHER TESTS
0–12			FILL - oily black sandy clayey silt with rubble					
10	■	21						
12–27			Medium dense to very dense brown and gray coarse to fine SAND, trace gravel					
15	■	25/0"						
20	■	25						
25	■	59	containing more gravel @ 25 feet					

COMPLETION DEPTH 27.0 feet FLUID Depth enc. @ 19 ft. Date 2/12/82

SAMPLER: 2" O.D. SPLIT-BARREL SAMPLER

PIEZOMETER INSTALLATION REPORT

Project: ARCO REFINERY

Project No.: 81C2256 Installed By: PFM

Method of Installation: Hollow stem auger

Piezometer No.: AS-10A

Location: See Fig.

Date: 2/12/82 Time:

LOG OF BORING AND PIEZOMETER

BORING

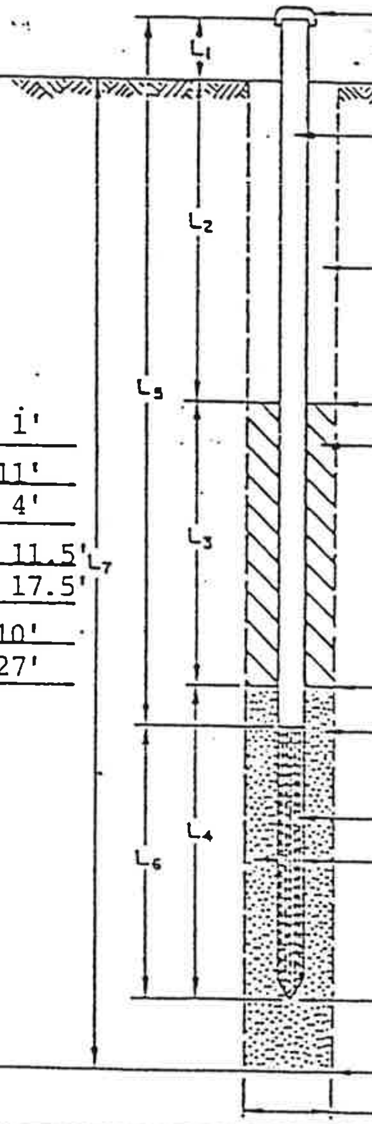
Depth in ft.	Description	Symbol

PIEZOMETER

Type of Piezometer: PVC

Ground Elev. 19.66'

Top of Riser Elev. 20.66'



Vented Cap

I.D. of Riser Pipe: 3"

Type of Pipe: PVC

Type of Backfill Around Riser: cement grout

Top of Seal Elev. 8.66'

Type of Seal Material: bentonite balls

Top of Filter Elev. 4.66'

Type of Filter Material: sand

Size of Openings: .010"

Diameter of Piezometer Tip: 3"

Bottom of Piez. Elev. -6.84'

Bottom of Boring Elev. -7.34'

Diameter of Boring: 12"

L_1 = 1'
L_2 = 11'
L_3 = 4'
L_4 = 11.5'
L_5 = 17.5'
L_6 = 10'
L_7 = 27'

Remarks:

Inspected By: PFM

S-54

C.V.M. industries

geotechnical division inc.
post office box 2 • huntingdon valley, pennsylvania
215-947-2555

Client: ARCO
Project: WELL INSTALLATION
Location: PHILADELPHIA, PA.
Project No.: 9200
Boring No.: SM-14
Depth: 30.5'
Elevation:
Spoon Size:
Casing Size:
Core Size:
Bit No.:
Hammers:
Spoon, weight:
Drop:
Drive, weight:
Drop:
Date Started: 12-20-84

Driller: SB
Helper: WGH
Inspector: MC
Job No.: 2890

Ground Water Data:
0 Hrs - WATER AT 28.3'

TOTAL PIPE - 33.5'

Date Completed: 12-20-84

Depth	Casing Blows	STRATA CLASSIFICATION	Sampling Data: Depth	No.	Blows per 6"	REMARKS
		MISCELLANEOUS FILL 8.5'				3' STICK-UP
		TAN SILT AND CLAY 14.0'				
		FINE TO COARSE MULTI-COLORED GRAVEL AND SAND. 30.5'				
		COMPLETE AT 30.5'				

SHEET NO. .... OF ....

S-55

C.V.M. industries

geotechnical division inc.

post office box 2 • huntingdon valley, pennsylvania

215-947-2555

Client: ARCO
Project: WELL INSTALLATION
Location: PHILADELPHIA, PA.
Project No.:
Boring No.: SM-20 Depth: 19.6'
Elevation:
Spoon Size: Casing Size:
Core Size: Bit No.:
Hammers:
Spoon, weight: Drop:
Drive, weight: Drop:
Date Started: 12-17-84

Driller: SB
Helper: WGH
Inspector: MC
Job No.: 2890

Ground Water Data:
0 HRS: WATER AT 16.1
TOTAL PIPE - 22.6'

Date Completed: 12-17-84

Depth	Casing Blows	STRATA CLASSIFICATION	Sampling Data Depth	Sampling Data No.	Blows per 6"	REMARKS
		TAN FINE TO COARSE SAND. TRACE GRAVEL. 3.5'				
		GREY-TAN SILTY CLAY TRACE VERY FINE TO FINE SAND 7.0'				
		MULTI-COLORED FINE TO COARSE SAND AND GRAVEL. 19.6'				
		COMPLETE AT 19.6'				

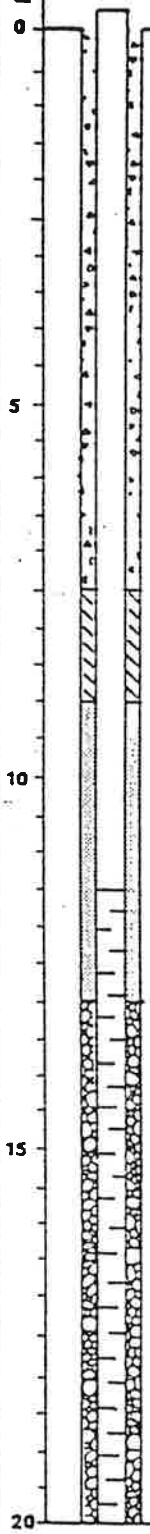
SHEET NO. .... OF ....

WELL 62

WELL ELEVATION:
WELL INSTALLED: 12/11/86
WELL DEVELOPED: 12/13/86
WELL DEPTH:

BORING 62

SURFACE ELEVATION:
DRILLING METHOD: H.S.A.
BORING DEPTH:



DEPTH IN FEET	USCS	DESCRIPTION
0	GM	FILL: gravelly fill
5	GP	GRAVEL: 1" gravel with medium sand; gray
	SM	SILTY SAND: fine to medium sand with some silt; gray
10	GM	GRAVEL: silty gravel - poor recovery due to plugged sampler; brown
		SILTY GRAVEL: 1" gravel and larger with some silt and possibly cobbles; red-brown and varied
15		GRAVEL: 1/4" to 1" gravel; red brown with a little silt & varied sands - H.C. odors
	SM	SAND: sand lens @ 16.5'; medium
20	GM	GRAVEL: 1/4" to 1" gravel with some silt and sand - several colors - compacted; dense; varied

SAMPLE DATA

BLOWS	% RETAINED	SAMPLE NO.	SAMPLE DEPTH	SAMPLE TYPE
16 11 29 35	5	1		
24 47 48 100	10	2		
40 43 31 41	70	3		
22 32 39 33	80	4		
40 38 41 58	80	5		

Drilled by CVM Inc.
Logged by J. Lundberg
Client ARCO
Job No. 502-158-02

ENGINEERING ENTERPRISES, INC.

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DEPTH IN FEET	WELL 62 Cont.	SOIL TYPE USCS	BORING 62 Cont.	BLOWS	% RETAINED	SAMPLE NO.	SAMPLE DEPTH	SAMPLE TYPE
20	Caved	GM	Same with interbedded sands	36 22 55 25		6		
		GM SM	Same with interbedded sands Softer @ 24' - Clay					
25						N/S		
		CL	SANDY CLAY: low plasticity clay with fine to medium sand; brown; olive	3 2 3 5	100	7		
			T.D. = 29'					
30								
35								
40								

EEI ENGINEERING ENTERPRISES, INC.

3-57

C.V.M. industries

geotechnical division inc.

post office box 2 • huntingdon valley, pennsylvania
215-947-2555

Client ARCO
Project WELL INSTALLATION
Location PHILADELPHIA, PA
Project No. 9200
Boring No. SM-24 Depth 14.0'
Elevation
Spoon Size Casing Size
Core Size Bit No.
Hammers:
Spoon, weight Drop
Drive, weight Drop
Date Started 12-18-84

Driller SB
Helper WGH
Inspector MC
Job No. 2890

Ground Water Data:
0 HRS: WATER AT 11'2"
TOTAL PIPE - 17.0'

Date Completed 12-18-84

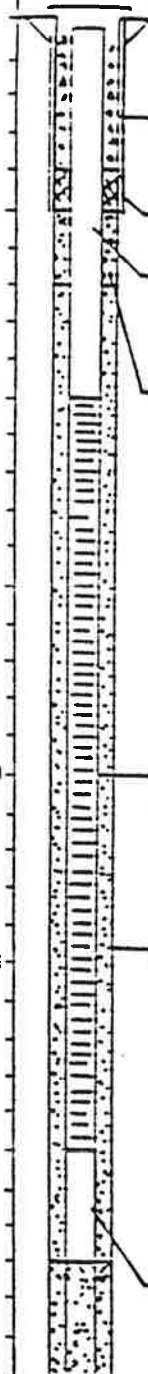
Depth	Casing Blows	STRATA CLASSIFICATION	Depth	SAMPLING DATA No.	Blows per 6"	REMARKS
		CRUSHED STONE MISCELLANEOUS FILL 2.0'				
		GREENISH GREY SILT VERY FINE SAND. 12.0'				
		MULTI-COLORE SAND AND GRAVEL 14.0'				
		COMPLETE AT 14.0'				

SHEET NO. .... OF ....

S-58

WELL RW-1	SOIL TYPE	BORING RW-1	SAMPLE DATA
WELL ELEVATION: WELL INSTALLED: 6/23/87 WELL DEVELOPED: 6/24/87 WELL DEPTH: 33.0	USCS / SYMBOLS	SURFACE ELEVATION: DRILLING METHOD: Reverse/Bucket BORING DEPTH: 36.0	BLOWS / % RETAINED / SAMPLE NO. / SAMPLE DEPTH / SAMPLE TYPE

DEPTH IN FEET: 0, 5, 10, 15, 20, 25, 30, 35, 40



0.0 - 1.0 FILL

1.0 - 3.0 SILT: sandy; brown

3.0 - 5.0 SILT: sand w/clay and gravel; gray

5.0 - 7.5 SAND: (fine-coarse) w/gravel; gray

7.5 - 13.0 SAND & GRAVEL: (medium-coarse) w/cobbles

13.0 - 16.0 SAND: (fine-coarse) w/gravel and cobbles; brown

16.0 - 20.0 SAND: (fine-coarse) w/gravel and some cobbles; gray

20.0 - 34.0 SAND: (fine-coarse) w/gravel (very clean)

34.0 - 36.0 SAND: clayey; brown

Drilled By W.C. Services
Logged By P. Dougherty
Client ARCO
Job No. 522-189-00
Page 1 Of 1

ENGINEERING ENTERPRISES, INC.

S-59

WELL 60

WELL ELEVATION:
WELL INSTALLED: 12/8/86
WELL DEVELOPED: 12/13/86
WELL DEPTH:

BORING 60

SURFACE ELEVATION:
DRILLING METHOD: H.S.A.
BORING DEPTH:

Well construction (DEPTH IN FEET 0–20): 2 ft riser; Cement Grout; Bentonite Seal; 2" Sch. 40 PVC; .020" Slotted Screen; Caved

DEPTH IN FEET	SOIL TYPE (USCS)	DESCRIPTION	BLOWS	% RETAINED	SAMPLE NO.	SAMPLE DEPTH	SAMPLE TYPE
0	ML	SILT: with trace of sand - some H.C. odors; dark brown					
10	GM	GRAVELLY FILL: 1/4 to 1" gravel and fine to coarse sand with some silt; dark brown	14 11 12 -	70	1		
		Same, saturated with H.C.	79 19 14	30	2		
	SM	SAND: medium to coarse sand with some silt, gravel - high H.C. content; gray	5 11 11	30	3		
15	GM	GRAVELLY FILL: 1/4" to 1" gravel with medium to coarse sand - H.C. & water; varied	7 13 21 44	75	4		
			15 49 35 34	30	5		
	SP	SAND: fine to medium sand - wet, gray					
20			7				

Drilled by CVM Inc.
Logged by J. Lundberg
Client ARCO
Job No. 502-158-02

EEI ENGINEERING ENTERPRISES, INC.

5-59

WELL 60 Cont. — BORING 60 Cont.

Depth in Feet	Well	USCS	Description	Blows	% Retained	Sample No.	Sample Depth	Sample Type
20		SP	Fine gravel with medium to coarse sand	9 7 6	90	6		
		SW	SAND: very coarse sand with little finer grains and a trace of gravel; gray			N/S		
				11 15 14 15	20	7		
25		SW	SAND: same as above with more fine to medium grain size; brown	10 11 10 12	50	8		
						N/S		
	Caved							
30		SW	SAND: fine to very coarse sand with little silt, trace gravel; brown	13 10 10 13	60	9		
			T.D. = 31 ft.					
35								
40								

EEI ENGINEERING ENTERPRISES, INC.

S-40

C.V.M. industries **geotechnical division inc.**
post office box 2 • huntingdon valley, pennsylvania
215-947-2555

Client ARCO REFINERY
Project WELLS AND TEST BORINGS
Location PHILADELPHIA, PA.
Project No. -
Boring No. SM-55 Depth 28.0'
Elevation
Spoon Size 2" Casing Size
Core Size Bit No.
Hammers:
Spoon, weight 140 # Drop 30"
Drive, weight Drop
Date Started 7-31-85

Driller S.B
Helper WGH
Inspector MC
Job No. 3115

Ground Water Data:
0 HRS:
WATER AT 25.5'
TOTAL PIPE - 30.0'

Date Completed 7-31-85

Depth	Casing Blows	STRATA CLASSIFICATION	Sampling Data Depth	Sampling Data No.	Blows per 6"	REMARKS
		MISCELLANEOUS FILL 1.5'				
		FILL SOIL	4.0 - 6.0	S-1	4 - 4 4 - 4	
		MEDIUM BROWN FINE TO COARSE SAND. TRACE SILT TRACE FINE GRAVEL.				SAMPLE HOLE OFFSET APPROXIMATELY 2.0-4.0' OF WELL ON 8-2-85
			21.0 - 23.0	S-2	6 - 10 13 - 14	
		28.0'				
		COMPLETE AT 28.0'				

SHEET NO. .... OF ....

S-41

LOG of BORING No. AB-6 ?

DATE 1/25/82 SURFACE ELEV. ______ LOCATION See Plate

DEPTH, FEET	SAMPLES	SAMPLING RESISTANCE	DESCRIPTION	ELEVATION	WATER CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	OTHER TESTS
0			Asphalt and stone					
			Stiff brown fine sandy clayey SILT					
5		16			24.6	NP	NP	
10			becoming more sandy @ 10 feet					
		10			19.6			
		83	Dense to very dense brown and gray coarse to fine gravelly silty coarse to fine SAND		14.9			
15		65			9.2			
		146			5.2			
		120			5.6			
20		110			6.0			M
		80			6.0			
25		105			5.3			
		90			9.0			
		43			12.4			
30		37			9.1			
35								

COMPLETION DEPTH 32.0 feet FLUID Depth enc. @ 26 ft. Date 1/25/82

SAMPLER: 2" O.D. SPLIT-BARREL SAMPLER Hole caved @ 17 ft. upon completion

JOB NO 81 C 2256A

WCC RP 1

PIEZOMETER INSTALLATION REPORT

S-41

Project ARCO REFINERY

Project No. 81C2256 Installed By MHK

Method of Installation ~~Hollow stem auger~~

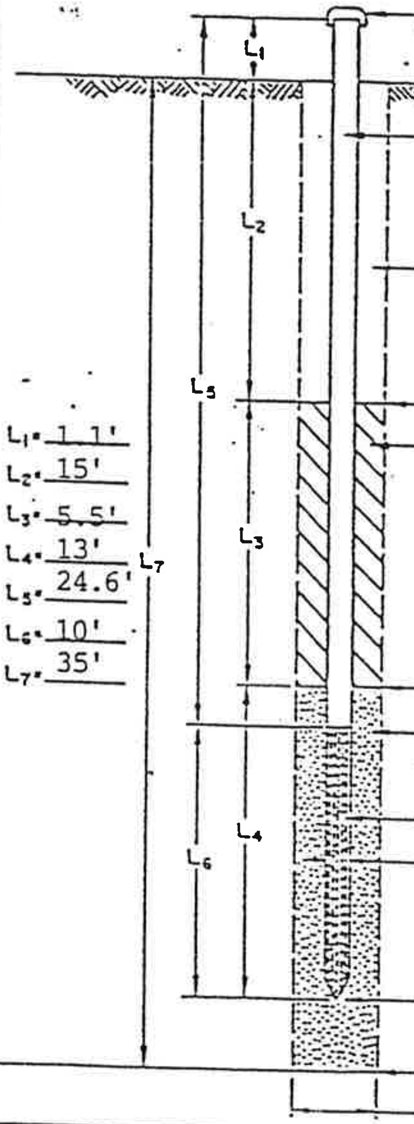
Piezometer No. AS-1

Location See Fig.

Date 2/6/82 Time

LOG OF BORING AND PIEZOMETER

BORING			PIEZOMETER
Depth in ft.	Description	Symbol	Type of Piezometer PVC



Ground Elev. 23.93'

Top of Riser Elev. 25.01'

I.D. of Riser Pipe 3"

Type of Pipe PVC

Type of Backfill Around Riser concrete & bentonite slurry mixture

Top of Seal Elev. 8.93'

Type of Seal Material Bentonite slurry

Top of Filter Elev. 3.43'

Type of Filter Material sand

Size of Openings .010"

Diameter of Piezometer Tip 3"

Bottom of Piez. Elev. 9.57'

Bottom of Boring Elev. -11.07'

Diameter of Boring 12"

L_1 = 1.1'

L_2 = 15'

L_3 = 5.5'

L_4 = 13'

L_5 = 24.6'

L_6 = 10'

L_7 = 35'

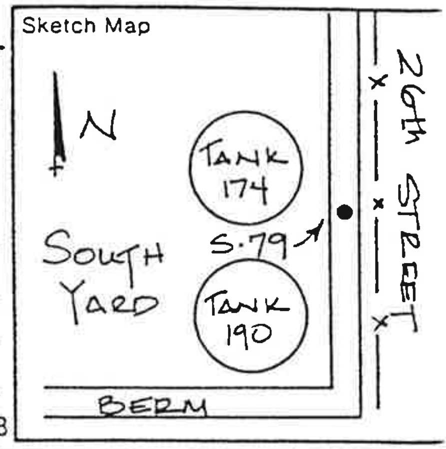
Remarks

Inspected By MHK

S-43

Groundwater & Environmental Services, Inc.

Drilling Log



Project: SUN: Atlantic Refinery | Owner: Sun Refining & Mktg.

Location: Philadelphia, PA | Permit No.: Not required

Well Number: S-79 | Total Depth: 34 feet | Diameter: 10 inch

Casing Elevation: | Water Level: Initial: 26.0 | Static: 26.82

Screen: Dia. 4 inch | Length: 20 feet | Slot Size: 0.02 inch

Casing: Dia. 4 inch | Length: 14 feet | Type: PVC Sch 40

Drilling Method: Hollow stem auger | Sample Method: N/A

Completion Details: Steel riser with locking cap

Driller: B. L. Myers Bros | Log By: J. J. Smith | Date Drilled: 5 Aug. '88

Depth (Feet)	Sample Number	Well Construction	Ova Reading	LITHOLOGY
1				FILL - Asphalt with coarse ballast stone.
2				SILT - Light brown with sand - dark brown from 2.5
4				- light green with sand from 4.0
10				- brown, damp
12				COBBLES - Red, green, white (primarily sandstone) with silt
13				SILT - brown with small sandstone pebbles at 13.0
18				- red with pebbles and cobbles
22				- moist cuttings
26				COBBLES - Red, green, white, (primarily sandstone), wet with medium sand.

S-43

Groundwater
& Environmental Services, Inc.

Project SUN: Atlantic Refinery

Well Number S-79

Date 5 August 1988

Depth (Feet)	Sample Number	Well Construction	Ova Reading	LITHOLOGY
32				
				SILT - Brown, damp with sandstone cobbles and pebbles
34				
				END HOLE

S-44

LOG of BORING No. AS-2

DATE 1/28-29/82 SURFACE ELEV. ______ LOCATION See Plate

DEPTH, FEET	SAMPLING RESISTANCE	DESCRIPTION	ELEVATION	WATER CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	OTHER TESTS
0							
5	11	Stiff brown clayey SILT					
10	27						
15	23						
20	55	Medium dense to very dense gray coarse to fine SAND and GRAVEL					
25	60						
30	35	containing less gravel @ 29 feet					
35	8	gray silty clay seam					
40	30						
45							

COMPLETION DEPTH 41.0 feet FLUID Depth enc. @ 27 ft. Date 1/28/82

SAMPLER: 2" O.D. SPLIT-BARREL SAMPLER

PIEZOMETER INSTALLATION REPORT

S-44

Project ARCO REFINERY

Project No. 81C2256 Installed By SLG

Method of Installation Hollow stem auger

Piezometer No. AS-2

Location See Fig.

Date 1/28-1/29/82 Time

LOG OF BORING AND PIEZOMETER

BORING

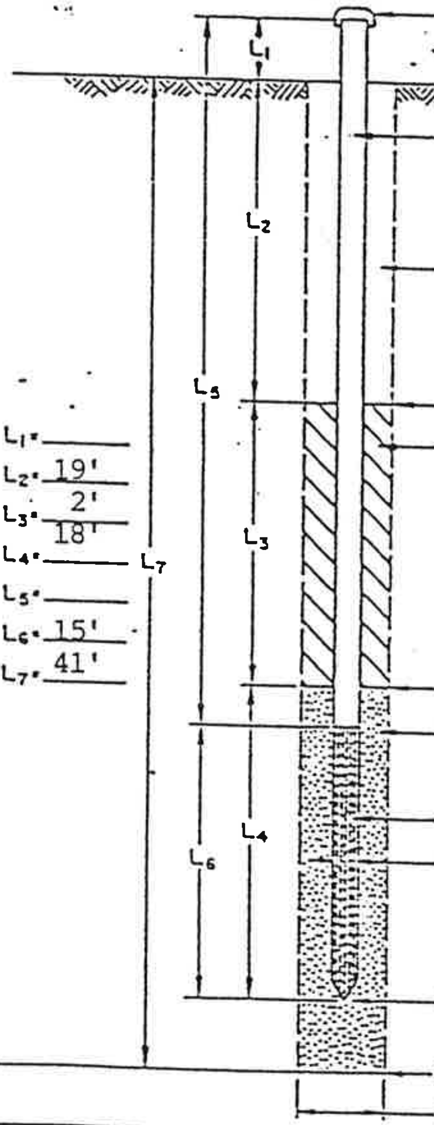
Depth in ft.	Description	Symbol

PIEZOMETER

Type of Piezometer PVC

Ground Elev. 20.97'

Top of ~~Riser~~ casing Elev. 22.97'



L1 =
L2 = 19'
L3 = 2' 18'
L4 =
L5 =
L6 = 15'
L7 = 41'

Vented Cap

I.D. of Riser Pipe 3"

Type of Pipe PVC

Type of Backfill Around Riser concrete

Top of Seal Elev. 1.97"

Type of Seal Material bentonite balls

Top of Filter Elev. -.03'

Type of Filter Material sand

Size of Openings .010"

Diameter of Piezometer Tip 3"

Bottom of Piez. Elev. -18.03

Bottom of Boring Elev. -20.03

Diameter of Boring 12"

Remarks

Inspected By SLG

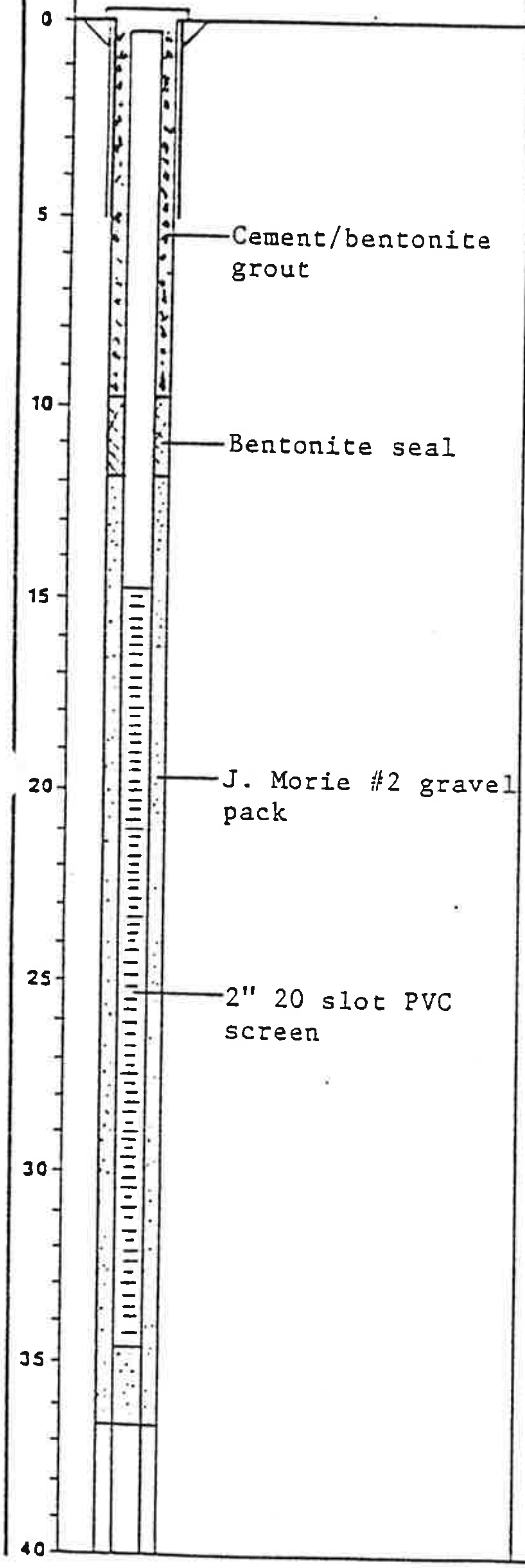
S-45

WELL #69

WELL ELEVATION: 24.73
WELL INSTALLED: 7-29-87
WELL DEVELOPED:
WELL DEPTH:

BORING

SURFACE ELEVATION:
DRILLING METHOD: Hollow Stem Auger
BORING DEPTH: 37.0



Soil type / description	SAMPLE NO.
0.0 - 0.5 BLACK TOP	
0.5 - 1.0 FILL	
1.0 - 4.0 SILT: brown and gray, some clay	
4.0 - 7.0 FILL: cinders, sand, silt	
7.0 - 20.0 SILT: brown, sandy, trace clay	
20.0 - 24.0 SAND: poorly sorted, cobbles, silt	1, 2
24.0 - 34.0 SAND: variegated, fine to coarse, wet, strong odor	3, 4
34.0 - 37.0 SILT: gray, sandy, clay, lens of gravel at 36.0 - 36.25, odors	5
TOTAL DEPTH 37.0	

SAMPLE DATA: BLOWS | % RETAINED | SAMPLE NO. | SAMPLE DEPTH | SAMPLE TYPE

Drilled By Hardin-Huber
Logged By Peter J. Dougherty
Client Atlantic
Job No. 522-239-00
Page 1 Of 1

ENGINEERING ENTERPRISES, INC.

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LOG of BORING No. AB-15

DATE 1/26/82 SURFACE ELEV. LOCATION See Plate

DEPTH, FEET	SAMPLES	SAMPLING RESISTANCE	DESCRIPTION	ELEVATION	WATER CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	OTHER TESTS
0			Crushed stone					
5		17	Stiff gray fine sandy clayey SILT					
10		41	Medium dense to very dense gray coarse to fine SAND and GRAVEL					
15		20						
20		100/6"						
		87						
25		99						
		117						
30								

COMPLETION DEPTH 28.0 feet FLUID Depth enc. @ 20 ft. Date 1/26/82

SAMPLER: 2" O.D. SPLIT-BARREL SAMPLER Hole caved @ 16 ft. upon completion

JOB NO 81 C 2256A

S-46

PIEZOMETER INSTALLATION REPORT

Project: ARCO REFINERY

Project No. 81C2256   Installed By: SLG

Method of Installation: Hollow stem auger

Piezometer No. AS-6

Location: See Fig.

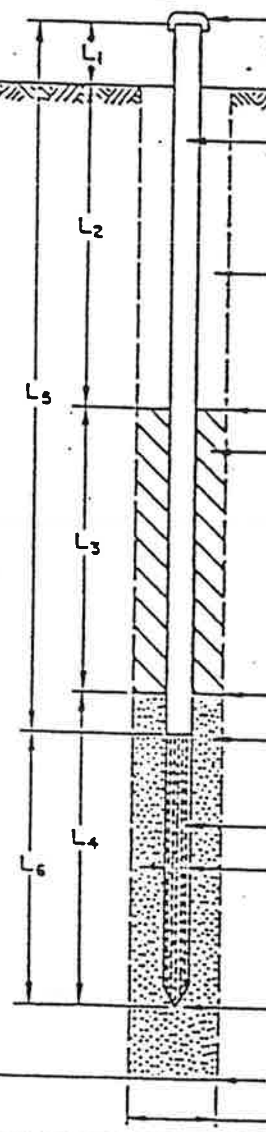
Date: 2/11/82   Time:

LOG OF BORING AND PIEZOMETER

BORING			PIEZOMETER
Depth in ft.	Description	Symbol	Type of Piezometer: PVC

Ground Elev.

Top of Riser Elev.



- L1 =
- L2 = 4'
- L3 = 14.1'
- L4 = 12.4'
- L5 =
- L6 = 10'
- L7 = 31'

I.D. of Riser Pipe: 3"

Type of Pipe: PVC

Type of Backfill Around Riser: cement grout

Top of Seal Elev.

Type of Seal Material: bentonite balls

Top of Filter Elev.

Type of Filter Material: sand

Size of Openings: .010"

Diameter of Piezometer Tip: 3"

Bottom of Piez. Elev.

Bottom of Boring Elev.

Diameter of Boring: 12"

Remarks:

Inspected By: SLG

S-47

LOG of BORING No. AD-3

DATE 2/10-11/82 SURFACE ELEV. ______ LOCATION See Plate

DEPTH, FEET	SAMPLES	SAMPLING RESISTANCE	DESCRIPTION	ELEVATION	WATER CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	OTHER TESTS
0			Gravel					
5	■	13	Stiff gray clayey SILT					
10	■	66	Medium dense to very dense gray coarse to fine SAND and GRAVEL					
15	■	33						
20	■	82						
25	■	72						
30	■	29						
35	■	12	gray silty clay seam					
40	■	13	Stiff gray silty CLAY					
	■	10						
45								

COMPLETION DEPTH 44.0 feet FLUID Depth enc. @ 24 ft. Date 2/10/82

SAMPLER: 2" O.D. SPLIT-BARREL SAMPLER

JOB NO 81 C 2256A

WCC RP 1

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PIEZOMETER INSTALLATION REPORT

Project: ARCO Refinery

Piezometer No.: AD-3

Location: See Figure

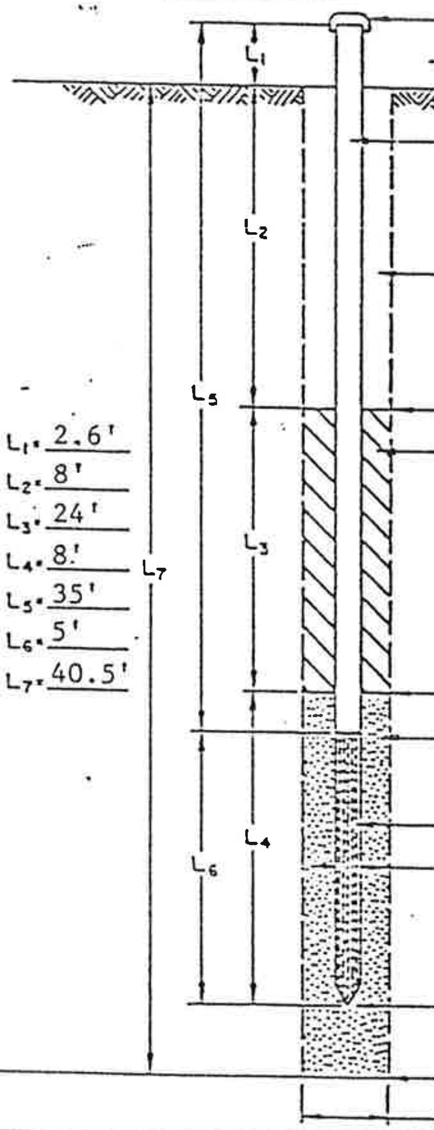
Project No.: 81C2256 Installed By: SLG

Date: 2/11/82 Time: ______

Method of Installation: Hollow stem auger

LOG OF BORING AND PIEZOMETER

BORING			PIEZOMETER
Depth in ft.	Description	Symbol	Type of Piezometer: PVC
			Ground Elev. 19.0 Top of Riser Elev. 21.63



L_1 = 2.6'
L_2 = 8'
L_3 = 24'
L_4 = 8'
L_5 = 35'
L_6 = 5'
L_7 = 40.5'

I.D. of Riser Pipe: 3"

Type of Pipe: PVC

Type of Backfill Around Riser: "clean spoils"

Top of Seal Elev.: 13.6

Type of Seal Material: Bentonite slurrey

Top of Filter Elev.: ______

Type of Filter Material: Sand

Size of Openings: 0.010"

Diameter of Piezometer Tip: 3"

Bottom of Piez. Elev.: ______

Bottom of Boring Elev.: ______

Diameter of Boring: ______

Remarks: ______

Inspected By: SLG

5-48

C.V.M. industries

geotechnical division inc.
post office box 2 • huntingdon valley, pennsylvania
215-947-2555

Client ARCO
Project WELL INSTALLATION
Location PHILADELPHIA, PA.
Project No. 9200
Boring No. SM-11 Depth 24.9'
Elevation
Spoon Size Casing Size
Core Size Bit No.
Hammers:
Spoon, weight Drop
Drive, weight Drop
Date Started 12-18-84

Driller SB
Helper WGH
Inspector MC
Job No. 2890

Ground Water Data:
0 Hrs: WATER AT 18'4"
TOTAL PIPE: 27.9'

Date Completed

Depth	Casing Blows	STRATA CLASSIFICATION	SAMPLING DATA Depth	No.	Blows per 6"	REMARKS
		MISCELLANEOUS CRUSHED ROCK FILL 4.0'				
		DARK GREY SANDY SILT. GRADING TO TAN. 12.0'				HYDROCARBON ACCUMULATION EVIDENT NEAR WATER-TABLE. STRONG FUMES EMITTING FROM HOLE.
		MULTI-COLORED FINE TO COARSE SAND AND GRAVEL. 19.0'				
		PINKISH FINE SAND TRACE OF CLAY. 24.9'				
		COMPLETE AT 24.9'				

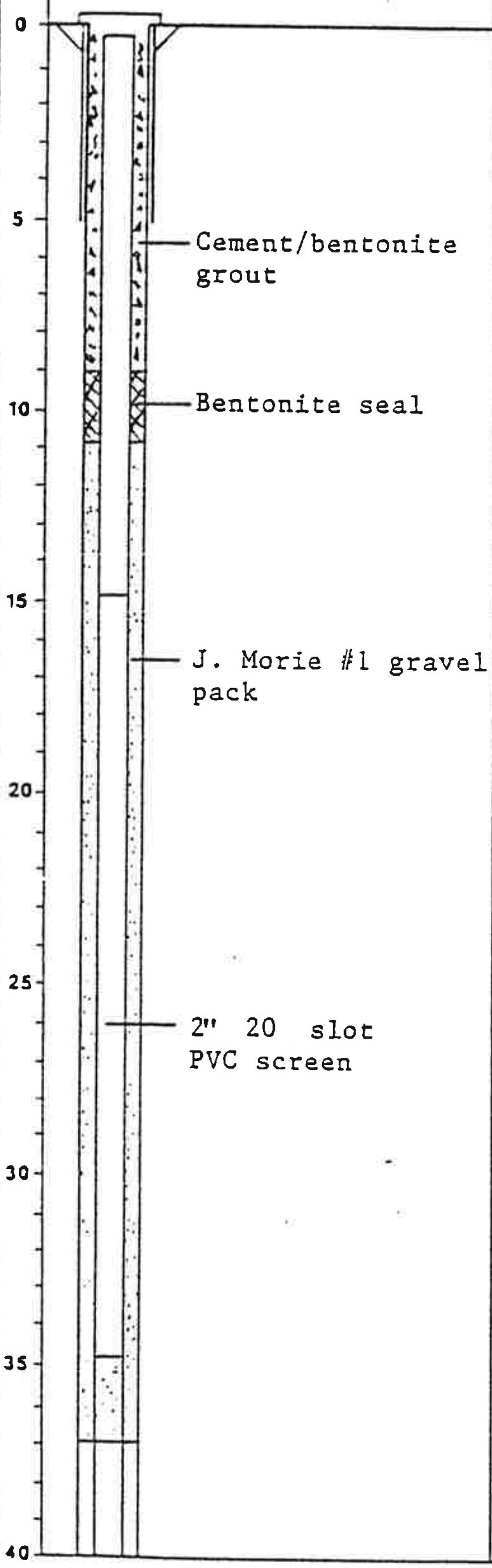
SHEET NO. .... OF ....

WELL #67

WELL ELEVATION:
WELL INSTALLED: 7-21-87
WELL DEVELOPED:
WELL DEPTH:

BORING

SURFACE ELEVATION:
DRILLING METHOD: Hollow Stem Auger
BORING DEPTH: 37.0



Boring description	Sample No.
0.0 - 2.0 FILL: gravel, stone	
2.0 - 7.0 FILL: dark brown silt, clay, gravel	
7.0 - 8.5 SAND AND GRAVEL	
8.5 - 13.0 CLAY: gray, silty, sandy, moist	
13.0 - 15.0 SILT: clayey, trace sand, moist	
15.0 - 18.0 SAND: variegated, clayey, some gravel	1
18.0 - 23.0 SAND AND GRAVEL: variegated, trace silt, strong odors	2
23.0 - 24.0 SAND AND GRAVEL: variegated, trace silt, strong odors	
24. 0 - 30.0 SAND AND GRAVEL: variegated, with some silt, hydrocarbon present	3
30.0 - 32.0 SAND AND GRAVEL: variegated, with trace silt, wet, strong odors	4
32.0 - 36.5 SAND: clean, wet	5
TOTAL DEPTH 37.0	

SOIL TYPE: USCS | SYMBOLS

SAMPLE DATA: BLOWS | % RETAINED | SAMPLE NO. | SAMPLE DEPTH | SAMPLE TYPE

Drilled By Hardin-Huber
Logged By Peter J. Dougherty
Client Atlantic
Job No. 522-239-00

ENGINEERING ENTERPRISES, INC.

3-60

C.V.M. industries — **geotechnical division inc.**

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215-947-2555

Client . ARCO

Project . WELL INSTALLATION

Location . PHILADELPHIA, PA

Project No.

Boring No. SM-18 Depth 17.0'

Elevation

Spoon Size Casing Size

Core Size Bit No.

Hammers:

Spoon, weight Drop

Drive, weight Drop

Date Started 12-17-84

Driller SB

Helper WGH

Inspector MC

Job No. 2890

Ground Water Data:
0 HRS: WATER AT 12.8'

TOTAL PIPE - 20.0'

Date Completed 12-17-84

Depth	Casing Blows	STRATA CLASSIFICATION	Depth	SAMPLING DATA No.	Blows per 6"	REMARKS
		ASH - CINDER FILL. 3.0'				3' STICK-UP
		LIGHT ORANGE FINE SAND TRACE CLAY. 5.5'				
		MULTI-COLORED FINE TO COARSE SAND, AND GRAVEL 17.0'				NOTE: DRILLED TO 25.0' FOUND WATER AT 22.0' WATER ADJUSTED TO 12.8'.
		COMPLETE AT 17.0'				PUT WELL IN ACCORDING TO WATER LEVEL

SHEET NO. .... OF ....

S-61

C.V.M. industries

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215-947-2555

Client ARCO

Project WELL INSTALLATION

Location PHILADELPHIA, PA.

Project No. 9200

Boring No. SM-13 Depth 25.0'

Elevation

Spoon Size Casing Size

Core Size Bit No.

Hammers:

Spoon, weight Drop

Drive, weight Drop

Date Started 12-17-84

Driller SB

Helper WGH

Inspector MC

Job No. 2890

Ground Water Data:

0 HRS: WATER AT 21.1'

TOTAL PIPE - 28.0'

Date Completed 12-17-84

Depth	Casing Blows	STRATA CLASSIFICATION	Depth	SAMPLING DATA No.	Blows per 6"	REMARKS
		ASH - CINDER FILL 3.5'				3' STICK-UP
		GREY SILTY SANDY CLAY. ± 9.5'				SLIGHT PETRO SMELL
		GREY VERY FINE SAND. TRACE SILT SILT GRADES OUT 25.0'				
		COMPLETE AT 25.0'				

SHEET NO. .... OF ....

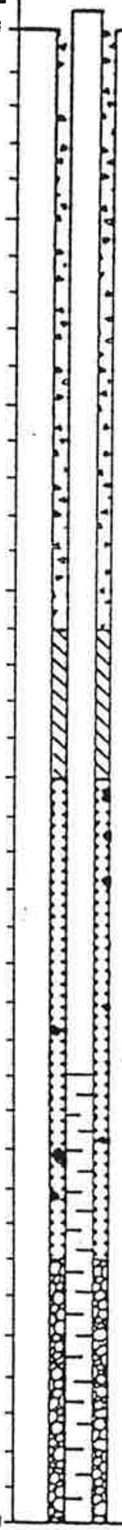
5-62

WELL 65

WELL ELEVATION:
WELL INSTALLED: 12/12/86
WELL DEVELOPED: 12/12/86
WELL DEPTH:

BORING 65

SURFACE ELEVATION:
DRILLING METHOD: H.S.A.
BORING DEPTH:



DEPTH IN FEET	WELL	SOIL TYPE (USCS)	DESCRIPTION	BLOWS	% RETAINED	SAMPLE NO.	SAMPLE DEPTH	SAMPLE TYPE
0	2 ft riser							
	2" Sch. 40 PVC	GM	GRAVEL: silt & gravel fill dark gray					
5	Cement Grout	ML	SILT: with trace of sand; gray					
	Bentonite Seal							
10	#2 Gravel Pack							
15	.020" slotted screen	GW	GRAVEL: ¼-1"; with trace amount of coarse sand; gray off-white					
			Same with more silt; HC odors	28 34 51 32	15	1		
		GM	GRAVEL: ¼-1"; medium to very coarse sand with some silt HC stains; black	30 29 52 45	70	2		
20				18 18		3		

Drilled by CVM Inc.
Logged by J. Lundberg
Client ARCO
Job No. 502-158-02
Page 1 of 2

ENGINEERING ENTERPRISES, INC.

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WELL 65 Cont. | BORING 65 Cont.

DEPTH IN FEET	WELL	SOIL TYPE USCS	SOIL TYPE SYMBOLS	BORING			BLOWS	% RETAINED	SAMPLE NO.	SAMPLE DEPTH	SAMPLE TYPE
20		SM		SILTY SAND: fine to medium; with some silt; wet; some HC content; brown gray			19 24	50	3		
							18 21 28 34	90	4		
		GM		GRAVEL: ¼-1"; fine to medium sand; some silt; HC stains; brown, varied			33 30 35 40	90	5		
		SP		SAND: fine to medium; slightly cemented; slightly dry; red							
25		GM		GRAVEL: ¼-1"; fine to medium sand; some silt; varied			26 22 5 5		6		
		ML		Sampler pushed through 26-27 softer formation @26'							
		ML		Easy drilling					N/S		
30	Caved	ML		CLAYEY SILT: trace of fine sand; gray			8 8 8	100	7		
				T.D. = 31'							
35											
40											

ENGINEERING ENTERPRISES, INC.

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C.V.M. industries **geotechnical division inc.**
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215-947-2555

Client: ARCO
Project: WELL INSTALLATION
Location: PHILADELPHIA, PA.
Project No.: 9200
Boring No.: SM-12 Depth: 22.2'
Elevation:
Spoon Size: Casing Size:
Core Size: Bit No.:
Hammers:
Spoon, weight: Drop:
Drive, weight: Drop:
Date Started: 12-19-84

Driller: SB
Helper: WGH
Inspector: MC
Job No.: 2890

Ground Water Data:
0 HRS: WATER AT 16.0'
TOTAL PIPE: 25.2'

Date Completed: 12-19-84

Depth	Casing Blows	STRATA CLASSIFICATION	Depth	SAMPLING DATA No.	Blows per 6"	REMARKS
		MISCELLANEOUS FILL 2.0'				
		DARK GREEN SANDY SILT GRADES INTO TAN COLORED SANDY SILT. 14.0'				TERRIBLE GASOLINE ODOR AND FUMES
		MULTI-COLORED FINE TO COARSE SAND AND GRAVEL. GRADES INTO FINE SAND. 22.2'				
		COMPLETE AT 22.2'				

SHEET NO. .... OF ....

S-64

Groundwater & Environmental Services, Inc.

Drilling Log

Project SUN: Atlantic Refinery Owner Sun Refining & Mktg.

Location Philadelphia, PA Permit No. Not required

Well Number S-77 Total Depth 24 feet Diameter 10 inch

Casing Elevation ______ Water Level: Initial 7.90 Static 10.20

Screen: Dia. 4 inch Length 20 feet Slot Size 0.02 in.

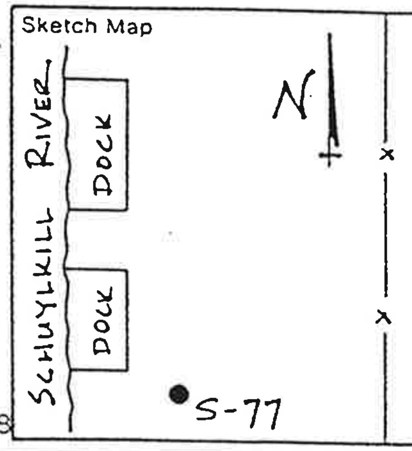
Casing: Dia. 4 inch Length 4 feet Type PVC Sch 40

Drilling Method Hollow stem auger Sample Method N/A

Completion Details Steel riser with locking cap

Driller B. L. Myers Bros Log By J. J. Smith Date Drilled 3 Aug. '88

Sketch Map



Depth (Feet)	Sample Number	Well Construction	Ova Reading	LITHOLOGY
1				FILL - Grey limestone, gravel, sand and bricks
				SILT - Black with sand, and strong petroleum odor - brown with sand from 2.0
4				
7				SAND - Reddish-brown, medium, damp with gravel and silt Petroleum odor. - water encountered at 8.0 feet
8				
14				SILT - Grey damp with slight petroleum odor.
24				END HOLE

S-65

Groundwater
& Environmental Services, Inc.

Drilling Log

Project SUN: Atlantic Refinery Owner Sun Refining & Mktg.

Location Philadelphia, PA Permit No. Not required

Well Number S-78 Total Depth 24 feet Diameter 10 inch

Casing Elevation ______ Water Level: Initial 11.15 Static 13.83

Screen: Dia. 4 inch Length 20 feet Slot Size 0.02 inch

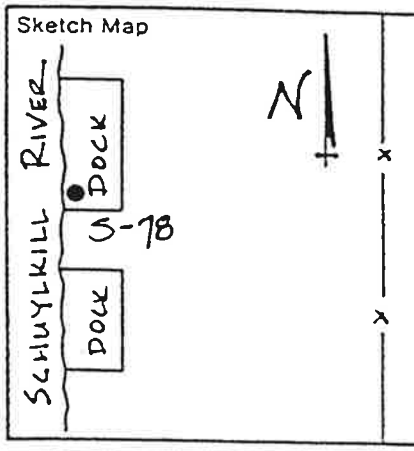
Casing: Dia. 4 inch Length 4 feet Type PVC Sch 40

Drilling Method Hollow stem auger Sample Method N/A

Completion Details Steel riser with locking cap

Driller B. L. Myers Bros Log By J. J. Smith Date Drilled 4 Aug. '88

Sketch Map



Depth (Feet)	Sample Number	Well Construction	Ova Reading	LITHOLOGY
1				FILL - Grey limestone gravel
				SAND - Orange, fine to medium
4				
				- brown, fine to medium, damp from 6.0
				- water encountered at 8.0 feet
11				SILT - Reddish brown, damp with sand and slight petroleum odor - wood from 12.0 to 13.0 feet
24				END HOLE

S-66

C.V.M. industries

geotechnical division inc.
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215-947-2555

Client: ARCO
Project: WELL INSTALLATION
Location: PHILADELPHIA, PA
Project No.: 9200
Boring No.: SM-17 Depth: 30.0'
Elevation:
Spoon Size: Casing Size:
Core Size: Bit No.:
Hammers:
Spoon, weight: Drop:
Drive, weight: Drop:
Date Started: 12-14-84

Driller: SB
Helper: WGH
Inspector: MC
Job No.: 2890

Ground Water Data:
1ST ENCOUNTERED - 26.0'
0 HRS: WATER AT 26'4"

TOTAL PIPE: 33.0'

Date Completed: 12-14-84

Depth	Casing Blows	STRATA CLASSIFICATION	Sampling Data Depth	No.	Blows per 6"	REMARKS
		MISCELLANEOUS FILL. 8.0'				3' STICK-UP
		TAN SILT AND FINE SAND SOME CLAY. 13.0'				
		TAN TO MULTI-COLORED FINE TO COARSE SAND AND GRAVEL. 26.0'				
		TAN FINE TO COARSE SAND, GRAVEL AND SOME SILT 30.0'				
		COMPLETE AT 30.0'				

SHEET NO. .... OF ....

S-67

C.V.M. industries

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215-947-2555

Client: ARCO
Project: WELL INSTALLATION
Location: PHILADELPHIA, PA.
Project No.
Boring No.: SM-22 Depth: 20.0'
Elevation
Spoon Size Casing Size
Core Size Bit No.
Hammers:
Spoon, weight: 140# Drop: 30"
Drive, weight Drop
Date Started: 12-18-84

Driller: SB
Helper: WGH
Inspector: MC
Job No.: 2890

Ground Water Data:
0 HRS: WATER AT 16.9'
TOTAL PIPE - 23.0'

Date Completed: 12-18-84

Depth	Casing Blows	STRATA CLASSIFICATION	SAMPLING DATA Depth	SAMPLING DATA No.	Blows per 6"	REMARKS
		GREY CRUSHED ROCK FILL 7.5'				3' STICK-UP
		GREY AND TAN SILTY CLAY TRACE FINE GRAVEL 16.0'				
		MULTI-COLORED FINE TO COARSE SAND AND GRAVEL. 20.0'				
		COMPLETE AT 20.0'				

SHEET NO. .... OF ....

3-68

C.V.M. industries

geotechnical division inc.

post office box 2 • huntingdon valley, pennsylvania
215-947-2555

Client .. ARCO
Project . WELL INSTALLATION
Location . PHILADELPHIA, PA.
Project No. 9200
Boring No. SM-23 Depth 15.0'
Elevation
Spoon Size Casing Size
Core Size Bit No.
Hammers:
Spoon, weight Drop
Drive, weight Drop
Date Started 12-20-84

Driller SB
Helper WGH
Inspector MC
Job No. 2890

Ground Water Data:
0 HRS - WATER AT 11.5'
TOTAL PIPE - 18.0'

Date Completed 12-20-84

Depth	Casing Blows	STRATA CLASSIFICATION	Depth	SAMPLING DATA No.	Blows per 6"	REMARKS
		[illegible]				
		MISCELLANEOUS FILL 1.0'				3' STICK-UP
		TAN SANDY SILT 10.0'				
		TAN SANDY SILT AND TRACE GRAVEL. 15.0'				
		COMPLETE AT 15.0'				

SHEET NO. .... OF ....

S-69

C.V.M. industries

geotechnical division inc.

post office box 2 • huntingdon valley, pennsylvania
215-947-2555

Client ARCO
Project WELL INSTALLATION
Location PHILADELPHIA, PA.
Project No. 9200
Boring No. SM-26 Depth 15.9'
Elevation
Spoon Size Casing Size
Core Size Bit No.
Hammers:
Spoon, weight Drop
Drive, weight Drop
Date Started 12-20-84

Driller SB
Helper WGH
Inspector MC
Job No. 2890

Ground Water Data:
0 HRS: WATER AT 13.3'
TOTAL PIPE - 19.4'

Date Completed 12-20-84

Depth	Casing Blows	STRATA CLASSIFICATION	Sampling Data Depth	Sampling Data No.	Blows per 6"	REMARKS
		BLACKTOP				
		MISCELLANEOUS FILL. 4.0'				4.0' STICK-UP
		TAN ORANGE SILTY CLAY. TRACE TO SOME VERY FINE SAND. 14.0'				
		MULTI-COLORED FINE TO COARSE SAND AND GRAVEL. 15.9'				
		COMPLETE AT 15.9'				

SHEET NO. .... OF ....

S-70

C.V.M. industries

geotechnical division inc.
post office box 2 • huntingdon valley, pennsylvania
215-947-2555

Client ... ARCO
Project ... WELL INSTALLATION
Location ... PHILADELPHIA, PA.
Project No. 9200
Boring No. SM-6 Depth 25.0'
Elevation ...
Spoon Size ... Casing Size ...
Core Size ... Bit No. ...
Hammers:
Spoon, weight ... Drop ...
Drive, weight ... Drop ...
Date Started 12-21-84

Driller ... SB
Helper ... WGH
Inspector ... MC
Job No. ... 2890

Ground Water Data:
0 HRS. - WATER AT 23.0'
TOTAL PIPE - 28.0'

Date Completed ...

Depth	Casing Blows	STRATA CLASSIFICATION	SAMPLING DATA Depth	No.	Blows per 6"	REMARKS
		MISCELLANEOUS FILL. ASH, CINDERS, ETC. 8.0'				OIL FOUND IN WELL
		BROWN FINE SAND 12.0'				
		GREY SILTY CLAY 15.0'				
		MULTI-COLORED VERY FINE SAND AND GRAVEL. 25.0'				
		COMPLETE AT 25.0'				

SHEET NO. ... OF ...

S-71

C.V.M. industries

geotechnical division inc.
post office box 2 • huntingdon valley, pennsylvania
215-947-2555

Client ... ARCO
Project ... WELL INSTALLATION
Location ... PHILADELPHIA, PA
Project No. 9210
Boring No. SM-5 Depth 12.5'
Elevation
Spoon Size Casing Size
Core Size Bit No.
Hammers:
Spoon, weight Drop
Drive, weight Drop
Date Started 12-20-84

Driller ... SB
Helper ... WGH
Inspector ... MC
Job No. ... 2890

Ground Water Data:
AFTER DRILLING: 7.5', 11.0', 9.0'
TOTAL PIPE: 15.5'

Date Completed 12-20-84

Depth	Casing Blows	STRATA CLASSIFICATION	Depth	SAMPLING DATA No.	Blows per 6"	REMARKS
		MISCELLANEOUS FILL 2.5'				3' STICK-UP
		DARK GREY. SAND - SOME SILT 12.5'				
		COMPLETE AT 12.5'				

SHEET NO. .... OF ....

S-72

C.V.M. industries

geotechnical division inc.
post office box 2 • huntingdon valley, pennsylvania
215-947-2555

Client ARCO
Project WELL INSTALLATION
Location SOUTH YARD, PHILADELPHIA
Project No.
Boring No. SM-37 Depth 31.0'
Elevation
Spoon Size Casing Size
Core Size Bit No.
Hammers:
Spoon, weight Drop
Drive, weight Drop
Date Started 3-19-85

Driller SC
Helper WGH
Inspector MC
Job No. 2890

Ground Water Data:
0 HRS: WATER AT 27'7"

TOTAL PIPE: 34.0'

Date Completed 3-19-85

Depth	Casing Blows	STRATA CLASSIFICATION	Depth	SAMPLING DATA No.	Blows per 6"	REMARKS
		BLACKTOP 0.2'				
		BLACK ASH AND CINDER FILL 5.0'				STRONG GASOLINE ODOR BELOW 15.0'
		DARK GREY SANDY CLAY 12.0'				MILD GASOLINE ODOR ABOVE 15.0'
		DARK GREY FINE SAND WITH TRACE OF SILT AND LENSES OF FINE TO COARSE SAND. 31.0'				
		COMPLETE AT 31.0'				

SHEET NO. .... OF ....

S-73

C.V.M. industries — **geotechnical division inc.**
post office box 2 • huntingdon valley, pennsylvania
215-947-2555

Client: ARCO
Project: WELL INSTALLATION
Location: SOUTH YARD, PHILADELPHIA
Project No.:
Boring No.: SM-35 Depth: 35.0'
Elevation:
Spoon Size: Casing Size:
Core Size: Bit No.:
Hammers:
Spoon, weight: Drop:
Drive, weight: Drop:
Date Started: 3-19-85

Driller: SB
Helper: WGH
Inspector: MC
Job No.: 2890

Ground Water Data:
0 HRS: WATER AT 32.0'
TOTAL PIPE: 38.0'

Date Completed: 3-19-85

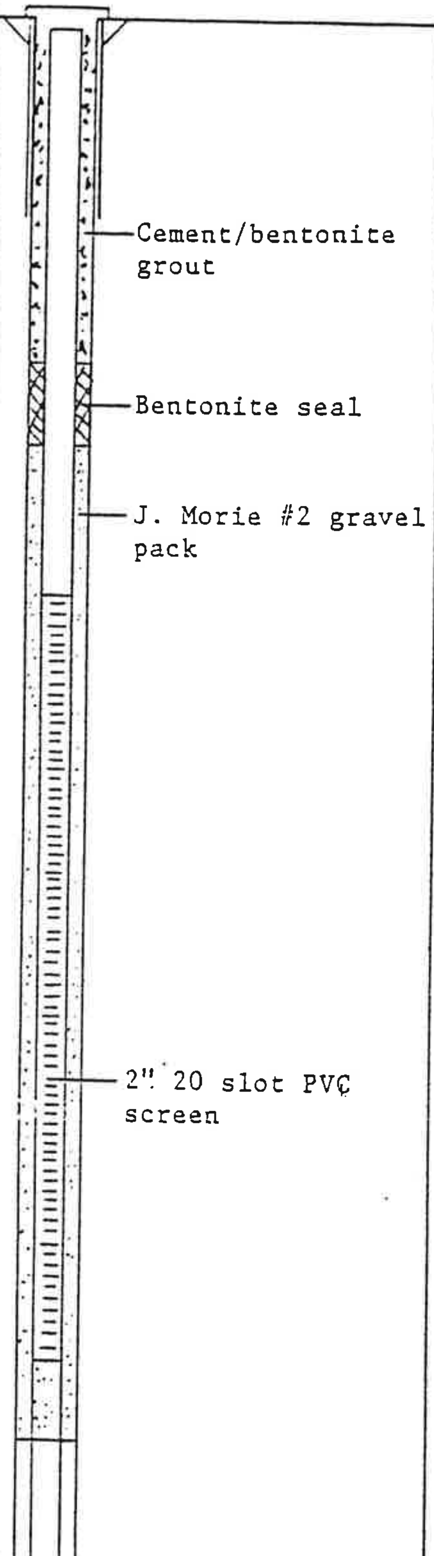
Depth	Casing Blows	STRATA CLASSIFICATION	Depth (Sampling Data)	No.	Blows per 6"	REMARKS
		BLACKTOP PAVING 0.3'				
		BLACK ASH-CINDER FILL 4.5'				SLIGHT PRODUCT SMELL
		TAN AND GREY SANDY CLAY. 20.0'				
		MULTI-COLORED FINE TO COARSE SAND AND GRAVEL. GRADING TO GREY FINE SAND. 35.0'				
		COMPLETE AT 35.0'				

SHEET NO. .... OF ....

S-74

WELL #73

WELL ELEVATION: 33.14
WELL INSTALLED: 7-27-87
WELL DEVELOPED:
WELL DEPTH:



BORING

SURFACE ELEVATION:
DRILLING METHOD: Hollow Stem Auger
BORING DEPTH: 37.0

DEPTH IN FEET	SOIL TYPE (USCS)	DESCRIPTION	BLOWS	% RETAINED	SAMPLE NO.	SAMPLE DEPTH	SAMPLE TYPE
0.0 - 1.0		BLACK TOP					
1.0 - 3.0		FILL					
3.0 - 3.5		SILT: brown, sandy,					
3.5 - 5.0		SILT: brown, sandy, clayey, wet, no ordor					
5.0 - 6.0		SILT: brown, sandy, moist, no odor					
6.0 - 10.0		SAND: light gray, silty, micaceous, wet, no odor					
10.0 - 12.0		CLAY: gray, moist, no odor					
12.0 - 17.0		SAND AND GRAVEL: brown, moist, no odor					
17.0 - 23.0		SAND: variegated, fine to coarse, trace silt, moist, no odor			1		
23.0 - 25.0		SILT: brown, sandy, micaceous, moist			2		
25.0 - 26.5		SILT: brown, sandy, trace gravel, wet, no odor			3		
26.5 - 37.0		SAND: variegated, fine to coarse, gravel and trace silt, wet, no odor			4		
		TOTAL DEPTH 37.0			5		

Drilled By Hardin-Huber
Logged By Peter J. Dougherty
Client Atlantic
Job No. 522-239-00
Page 1 Of 1

EEI ENGINEERING ENTERPRISES, INC.

S-75

C.V.M. industries

geotechnical division inc.

post office box 2 • huntingdon valley, pennsylvania

215-947-2555

Client ARCO
Project WELL INSTALLATION
Location SOUTH YARD, PHILADELPHIA, PA.
Project No.
Boring No. SM-36 Depth 31.0'
Elevation
Spoon Size Casing Size
Core Size Bit No.
Hammers:
Spoon, weight Drop
Drive, weight Drop
Date Started 3-19-85

Driller SB
Helper WGH
Inspector MC
Job No. 2890

Ground Water Data:
0 HRS: WATER AT 27'6"
TOTAL PIPE : 33.0'

Date Completed 3-19-85

Depth	Casing Blows	STRATA CLASSIFICATION	Depth	SAMPLING DATA No.	Blows per 6"	REMARKS
		ASPHALT TOP .2'				
		MISCELLANEOUS FILL 5.0'				
		LIGHT TO MEDIUM GREY SILTY SAND 11.0'				PRODUCT ODOR VERY OBVIOUS.
		REDDISH BROWN TO GREY SAND AND GRAVEL GRADING INTO MEDIUM SAND 31.0'				SATURATED WITH LIGHT PRODUCT.

SHEET NO. .... OF ....

S-76

WELL 66

WELL ELEVATION:
WELL INSTALLED: 12/13/86
WELL DEVELOPED: 12/13/86
WELL DEPTH:

BORING 66

SURFACE ELEVATION:
DRILLING METHOD: H.S.A.
BORING DEPTH:

DEPTH IN FEET	WELL	SOIL TYPE USCS	SOIL TYPE SYMBOLS	BORING 66			BLOWS	% RETAINED	SAMPLE NO.	SAMPLE DEPTH	SAMPLE TYPE
0				4" asphalt							
	2" Sch. 40 PVC	ML		SILT: HC odor (fill material) moist; black							
		GM		FILL							
		ML		No odor; slightly moist; gray, green							
5	Cement Grout										
10											
	Bentonite Seal	SM		SANDY SILT: HC odor; moist; trace fine sand & gravel fill; gray, brown							
		GM		GRAVELLY SILT: HC odor							
15							4 15 25	75			S
	5 bags of sand	SM		Silt to ½ gravel grading to bigger dry HC odor; multi			24 24 29	75			S
		SM		SILTY SAND: fine to medium HC odor, slightly moist; tan			57				
20											

Drilled by CVM Inc.
Logged by J. Garth
Client ARCO
Job No. 502-158-02
Page 1 of 2

ENGINEERING ENTERPRISES, INC.

DEPTH IN FEET	WELL 66 Cont.	SOIL TYPE USCS	BORING 66 Cont.	BLOWS	% RETAINED	SAMPLE NO.	SAMPLE DEPTH	SAMPLE TYPE
20		GP	GRAVELLY SAND: little silt; dry; multi; tan; HC odor	46 55 29 29	80			S
		ML	SILTY CLAY: trace fine sand; moist; HC odor; brown, gray					
	.020" slotted screen	CL	Fine to medium sand; moist HC odor	11 10 10 10 13	100			S
25		CL	SILTY CLAY: wet, HC odor; little fine sand	6 10 31 35	80			S
		SP	GRAVELLY SAND: fine to coarse ½" gravel; HC; wet; some silt + 3/4" gravel; tan	45 47 40 27	80			S
			Water oil cut @ 28'					
30	Caved		Fine to coarse sand 3/4" (little) gravel and some silt	33 61 53 37	50			S
			some gravel; water saturated	N/S				
		SM	SILTY SAND: medium to coarse; saturated HC odor with silt; gray	28 45 49 75	100			S
		GM	SILTY GRAVEL: grading to ½" gravel with silt					
35			TD = 35'					
40								

ENGINEERING ENTERPRISES, INC.

S-77

C.V.M. industries

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215-947-2555

Client: ARCO
Project: WELL INSTALLATION
Location: PHILADELPHIA, PA.
Project No.: 9200
Boring No.: SM-3 Depth: 20.0'
Elevation:
Spoon Size: Casing Size:
Core Size: Bit No.:
Hammers:
Spoon, weight: Drop:
Drive, weight: Drop:
Date Started: 12-20-84

Driller: SB
Helper: W&H
Inspector: MC
Job No.: 2890

Ground Water Data:
0 HRS: WATER AT 16.1'

TOTAL PIPE - 23.0'

Date Completed: 12-20-84

Depth	Casing Blows	STRATA CLASSIFICATION	Depth	SAMPLING DATA No.	Blows per 6"	REMARKS
		MISCELLANEOUS FILL 3.5'				
		GREY SILTY CLAY. 8.0'				
		TAN AND GREY FINE SAND TRACE GRAVEL. 20.0'				
		COMPLETE AT 20.0'				

SHEET NO. .... OF ....

S-78

LOG of BORING No. AS-11

DATE 2/8/82 SURFACE ELEV. ______ LOCATION See Plate

DEPTH, FEET	SAMPLES	SAMPLING RESISTANCE	DESCRIPTION	ELEVATION	WATER CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	OTHER TESTS
0			FILL - sand and gravel with rubble					
5	■	4	Firm black and gray oily silty CLAY					
10	■	21	Stiff gray fine sandy clayey SILT					
15	■	8	Stiff gray and brown mottled clayey SILT					
20	■	44	Dense to very dense gray coarse to fine SAND and GRAVEL					
25	■	29						
30	■	53						
35								

COMPLETION DEPTH 32.0 feet FLUID Depth enc. @ 24 ft. Date 2/8/82

SAMPLER: 2" O.D. SPLIT-BARREL SAMPLER

PIEZOMETER INSTALLATION REPORT 5-78

Project: ARCO REFINERY

Project No.: 81C2256 Installed By: PFM

Method of Installation: Hollow stem auger

Piezometer No.: AS-11

Location: See Fig.

Date: 2/8/82 Time:

LOG OF BORING AND PIEZOMETER

BORING

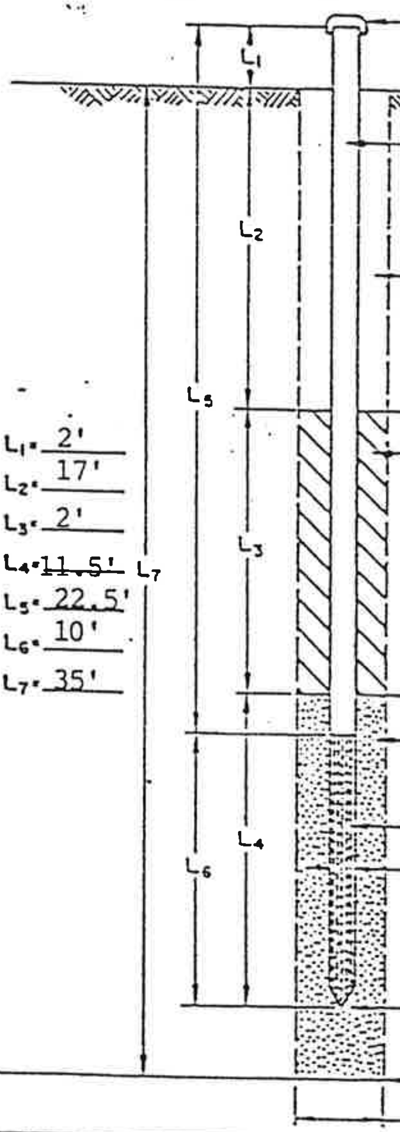
Depth in ft.	Description	Symbol

PIEZOMETER

Type of Piezometer: PVC

Ground Elev. 28.52

Top of Riser Elev. 30.52'



Vented Cap

I.D. of Riser Pipe: 3"

Type of Pipe: PVC

Type of Backfill Around Riser: sand-cement grout

Top of Seal Elev. 11.52"

Type of Seal Material: bentonite balls

Top of Filter Elev. 9.52'

Type of Filter Material: sand

Size of Openings: .010"

Diameter of Piezometer Tip: 3"

Bottom of Piez. Elev. -1.98'

Bottom of Boring Elev. -6.48'

Diameter of Boring: 12"

L_1 = 2'
L_2 = 17'
L_3 = 2'
L_4 = 11.5'
L_5 = 22.5'
L_6 = 10'
L_7 = 35'

Remarks:

Inspected By: PFM

5-79

C.V.M. industries

geotechnical division inc.

post office box 2 • huntingdon valley, pennsylvania

215-947-2555

Client ARCO REFINERY
Project WELLS AND TEST BORINGS
Location PHILADELPHIA, PA.
Project No.
Boring No. SM-58 Depth 24.0'
Elevation
Spoon Size 2" Casing Size
Core Size Bit No.
Hammers:
Spoon, weight 140# Drop 30"
Drive, weight Drop
Date Started 8-1-85

Driller SB
Helper WGN
Inspector
Job No. 3115

Ground Water Data:
0 Hrs.
WATER AT 10.0'

TOTAL PIPE - 27.0'

Date Completed 8-1-85

Depth	Casing Blows	STRATA CLASSIFICATION	Sampling Depth	Sampling No.	Blows per 6"	REMARKS
		ASH - CINDER FILL 5.0'	4.0 - 6.0	S-1	1 - 3 7 - 14	SAMPLE HOLE OFFSET APPROXIMATELY 2.0' to 4.0' OF WELL
		GREY CLAY OVER PEAT 19.0'	13.5 - 15.5	S-2	3 - 3 4 - 5	
		MULTI-COLORED FINE TO COARSE SAND. 24.0'				THIS HOLE SHOWS SIGNS OF A TRAPPED WATER LEVEL ABOVE THE ORGANIC STRATA. 9.0'-10.0' AREA
		COMPLETE AT 24.0'				

SHEET NO. .... OF ....

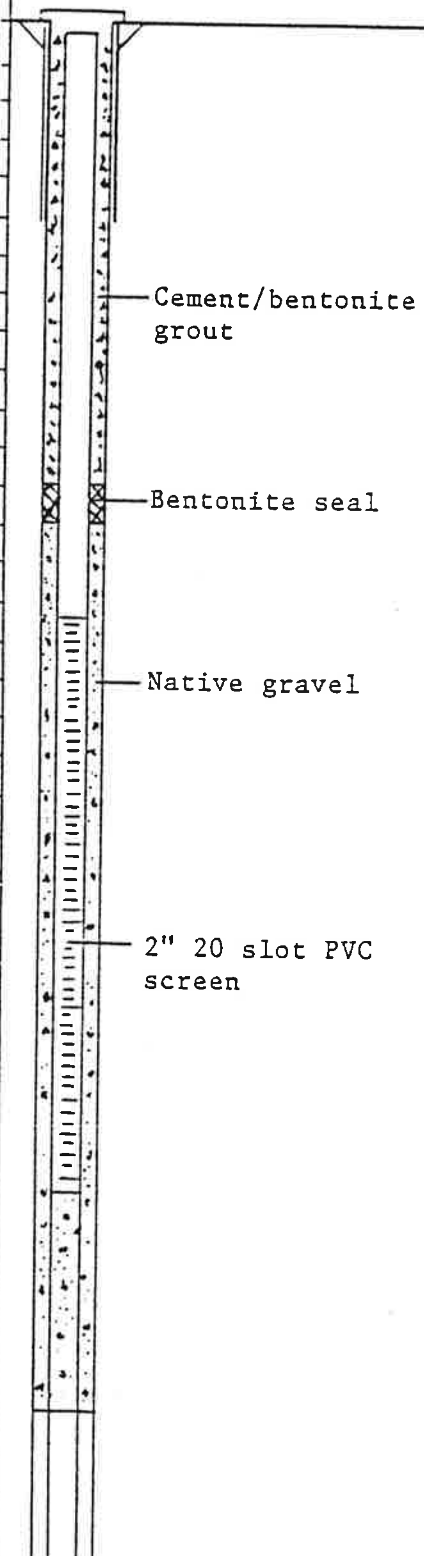
S-80

WELL #72

WELL ELEVATION: 34.47
WELL INSTALLED: 7-27-87
WELL DEVELOPED:
WELL DEPTH:

BORING

SURFACE ELEVATION:
DRILLING METHOD: Hollow Stem Auger
BORING DEPTH: 36.0



DEPTH IN FEET	SOIL TYPE: USCS	SOIL TYPE: SYMBOLS	BORING	SAMPLE DATA		BLOWS	% RETAINED	SAMPLE NO.	SAMPLE DEPTH	SAMPLE TYPE
0			0.0 - 2.0 FILL: sand, silt, gravel							
			2.0 - 4.0 CLAY: dark gray, silty, sandy, odors present							
5			4.0 - 6.0 CLAY: light gray, silty, sandy							
			6.0 - 13.0 SILT: dark gray, clayey, sand and gravel, strong odors							
10										
			13.0 - 17.5 SAND: black, silty, wet, strong odors							
15										
			17.5 - 24.0 SAND: variegated, gravel, silt, dense, strong odor							
20								1		
								2		
			24.0 - 27.0 SILT: dark brown, sandy, micaceous, highly saturated					3		
25								4		
			27.0 - 30.0 SAND: brown, fine to coarse, gravel with silt							
30			30.0 - 33.0 SAND: variegated, fine to coarse, gravel, some silt, wet, strong, odors					5		
			33.0 - 35.0 SAND: brown, fine to coarse, gravel, trace silt, wet, odors							
35			TOTAL DEPTH 36.0					6		
40										

Drilled By Hardin-Huber
Logged By Peter J. Dougherty
Client Atlantic
Job No. 522-239-00
Page 1 Of 1

ENGINEERING ENTERPRISES, INC.

S-81

WELL #70

WELL ELEVATION: 38.35
WELL INSTALLED: 7-23-87
WELL DEVELOPED:
WELL DEPTH:

BORING

SURFACE ELEVATION: 28.97
DRILLING METHOD: Hollow Stem Auger
BORING DEPTH: 37.0

Well construction (DEPTH IN FEET 0–40):

- Cement/bentonite grout
- Bentonite seal
- Native fill
- J. Morie #2 gravel pack
- 2" 20 slot PVC screen

SOIL TYPE: USCS | SYMBOLS

Boring	Sample No.
0.0 - 0.5 BLACK TOP	
0.5 - 1.0 SILT: brown, sandy	
1.0 - 4.5 CLAY: dark gray, silty, sandy, strong odor	
4.5 - 7.0 FILL: brick and gravel	
7.0 - 9.0 CLAY: black, silty, sandy, strong odor	
9.0 - 12.0 CLAY: black, sandy	
12.0 - 15.5 CLAY: gray, sandy, silt and gravel, wet, slight odor	
15.5 - 20.0 SAND: variegated, gravel, dry, slight odor	1
20.0 - 33.0 SAND: variegated, fine to coarse, gravel with clay and trace silt	2, 3, 4, 5
33.0 - 36.5 SAND: brown, fine to coarse, trace silt	6
36.5 - 37.0 SILT: light brown, sandy, clayey, micaceous	
TOTAL DEPTH 37.0	

SAMPLE DATA: BLOWS | % RETAINED | SAMPLE NO. | SAMPLE DEPTH | SAMPLE TYPE

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Logged By Peter J. Dougherty
Client Atlantic
Job No. 522-239-00

ENGINEERING ENTERPRISES, INC.

S-82

LOG of BORING No. AS-5

DATE 2/5/82 SURFACE ELEV. ______ LOCATION See Plate

DEPTH, FEET	SAMPLES	SAMPLING RESISTANCE	DESCRIPTION	ELEVATION	WATER CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	OTHER TESTS
0			FILL - oily black sand and cinders with rubble					
5	■	3	Stiff gray silty CLAY					
10	■	42	Stiff to hard brown and gray mottled gravelly clayey SILT					
15	■	12						
20	■	37	Médium dense to very dense brown and gray coarse to fine SAND and GRAVEL					
25	■	93						
30	■	127						
35								

COMPLETION DEPTH 32.0 feet FLUID Depth enc. @ 15 ft. Date 2/5/82

SAMPLER: 2" O.D. SPLIT-BARREL SAMPLER

NO 81 C 2256A

PIEZOMETER INSTALLATION REPORT

Project ARCO REFINERY

Project No. 81C2256 Installed By PFM

Method of Installation Hollow stem auger

Piezometer No. AS-5

Location See Fig.

Date 2/5/82 Time

LOG OF BORING AND PIEZOMETER

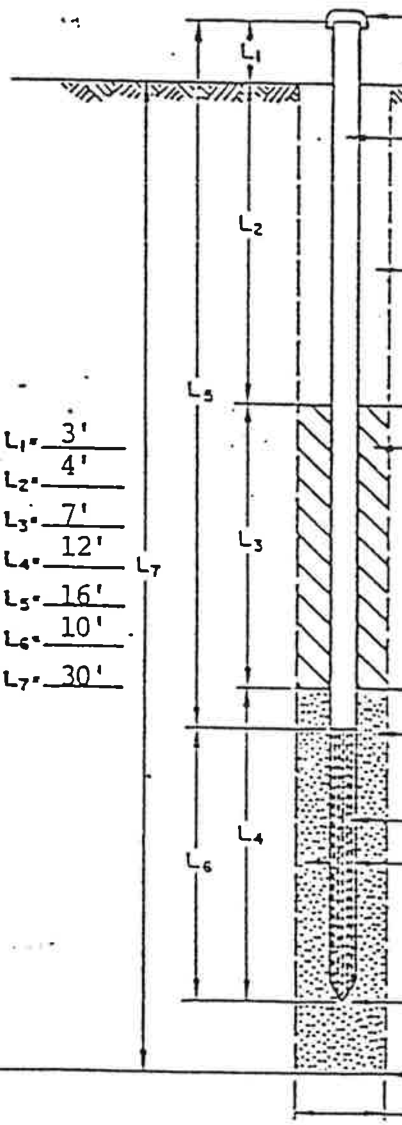
BORING			PIEZOMETER
Depth in ft.	Description	Symbol	

PIEZOMETER

Type of Piezometer

Ground Elev. 23.89

Top of Riser Elev. 26.89



Vented Cap

I.D. of Riser Pipe 3"

Type of Pipe PVC

Type of Backfill Around Riser cement, sand, bentonite grout

Top of Seal Elev. 19.89'

Type of Seal Material bentonite balls

Top of Filter Elev 12.89'

Type of Filter Material sand

Size of Openings .010"

Diameter of Piezometer Tip 3"

Bottom of Piez. Elev. .89'

Bottom of Boring Elev. -6.11'

Diameter of Boring 12"

L_1 = 3'
L_2 = 4'
L_3 = 7'
L_4 = 12'
L_5 = 16'
L_6 = 10'
L_7 = 30'

Remarks

Inspected By PFM

S-83

WELL #74

WELL ELEVATION: 26.40
WELL INSTALLED: 7-28-87
WELL DEVELOPED:
WELL DEPTH:

Cement/bentonite grout

Bentonite seal

J. Morie #2 gravel pack

2" 20 slot PVC screen

BORING

SURFACE ELEVATION:
DRILLING METHOD: Hollow Stem Auger
BORING DEPTH: 37.0

SOIL TYPE: USCS | SYMBOLS

SAMPLE DATA: BLOWS | % RETAINED | SAMPLE NO. | SAMPLE DEPTH | SAMPLE TYPE

Boring description	Sample No.
0.0 - 0.5 BLACK TOP	
0.5 - 2.0 FILL: silt, sand gravel	
2.0 - 4.0 SILT: dark brown, sandy, clayey, no odor	
4.0 - 5.5 SAND: black, silty no odor	
5.5 - 8.0 SAND: gray, fine, silty, fuel oil odor present	
8.0 - 12.0 SILT: brown and gray, clayey, some sand, no odor	
12.0 - 13.5 SAND: green, fine micaceous, no odor	
13.5 - 20.5 CLAY: brown, silty, no odor	
20.5 - 22.0 SAND: gray, fine to coarse, gravel with trace silt, saturated by hydro-carbons	1
	2
22.0 - 24.0 SAND: variegated, gravel, fine to coarse, silt, free product	3
24.0 - 25.5 SILT, SAND, AND GRAVEL: stratified, variegated, free product	
25.5 - 30.0 SAND: variegated, fine to coarse, silty, free product	
30.0 - 33.5 SAND: gray, fine to coarse, gravel	4
33.5 - 36.5 SILT: brown, clayey, some sand	
36.5 - 37.0 SAND: gray, silty, strong odors	5
TOTAL DEPTH 37.0	

DEPTH IN FEET: 0, 5, 10, 15, 20, 25, 30, 35, 40

Drilled By Hardin-Huber
Logged By Peter J. Dougherty
Client Atlantic
Job No. 522-239-00

EEI ENGINEERING ENTERPRISES, INC.

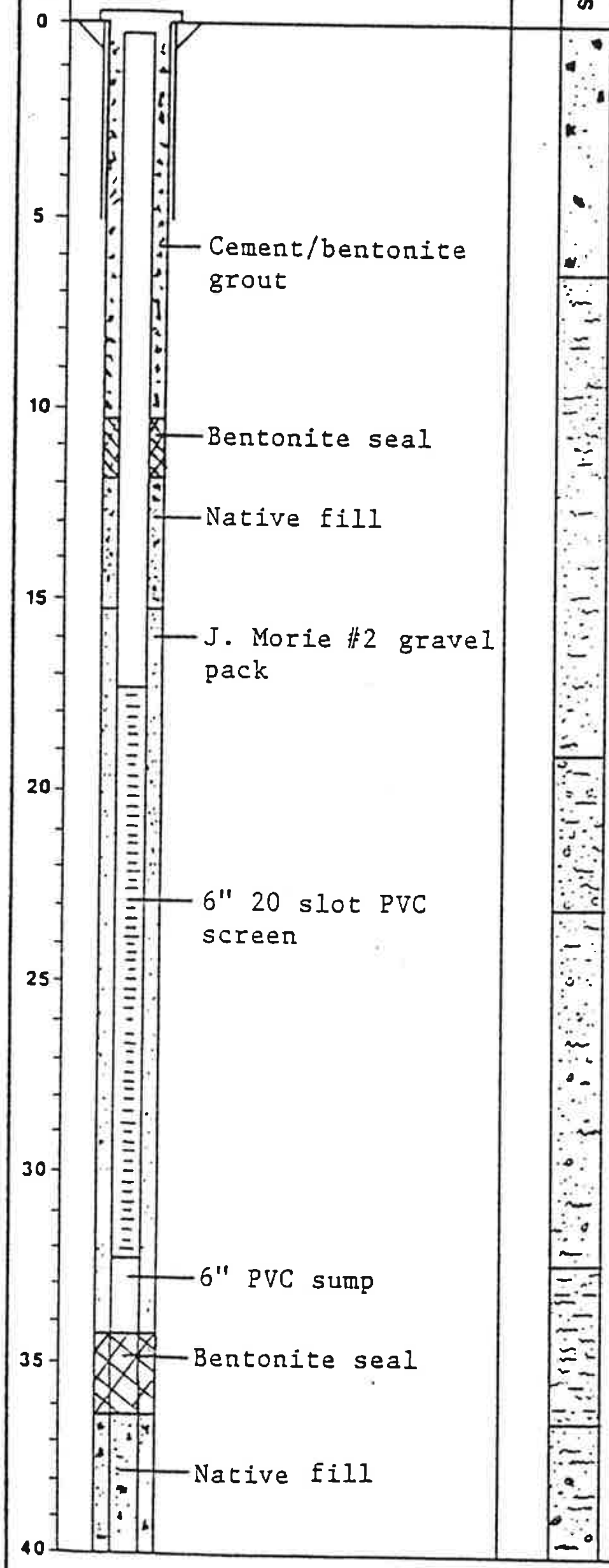
Page 1 Of 1

WELL PR-1

WELL ELEVATION:
WELL INSTALLED: 8/18/87
WELL DEVELOPED: 8/19/87
WELL DEPTH: 34.5

BORING

SURFACE ELEVATION:
DRILLING METHOD: Mud Rotary
BORING DEPTH: 43.5



0.0 - 6.5 FILL: silt, sand, gravel, brick

6.5 - 19.0 SAND: fine, silty

19.0 - 23.0 SAND: silty, some gravel

23.0 - 32.5 SAND: slightly silty, some gravel

32.5 - 36.5 SILT: sandy, clayey

36.5 - 43.5 SAND: silty, some gravel

SAMPLE DATA							
		BLOWS	% RETAINED	SAMPLE NO.	SAMPLE DEPTH	SAMPLE TYPE	

Drilled By Hardin-Huber
Logged By Peter J. Dougherty
Client Atlantic
Job No. 522-239-00

ENGINEERING ENTERPRISES, INC.

DEPTH IN FEET	WELL PR-1 Cont.	SOIL TYPE USCS	SOIL TYPE SYMBOLS	BORING Cont.	SAMPLE DATA		BLOWS	% RETAINED	SAMPLE NO.	SAMPLE DEPTH	SAMPLE TYPE
40											
				TOTAL DEPTH 43.5							
45											
50											
55											
60											
65											
70											
75											
80											

ENGINEERING ENTERPRISES, INC.

S-85

WELL #71

WELL ELEVATION: 27.64
WELL INSTALLED: 7-23-87
WELL DEVELOPED:
WELL DEPTH:

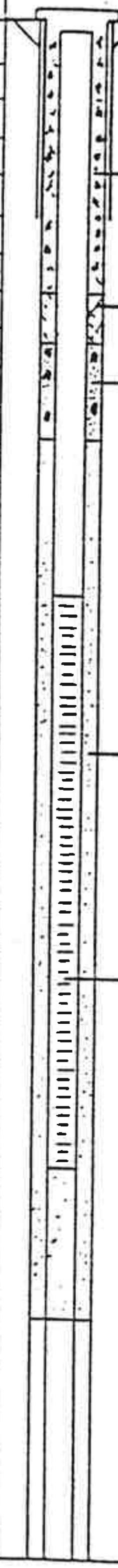
BORING

SURFACE ELEVATION:
DRILLING METHOD: Hollow Stem Auger
BORING DEPTH: 34.0

SOIL TYPE: USCS | SYMBOLS

SAMPLE DATA: BLOWS | % RETAINED | SAMPLE NO. | SAMPLE DEPTH | SAMPLE TYPE

DEPTH IN FEET: 0, 5, 10, 15, 20, 25, 30, 35, 40



Cement/bentonite grout

Bentonite seal

Native fill

J. Morie #2 gravel pack

2" 20 slot PVC screen

Description	Sample No.
0.0 - 2.0 FILL	
2.0 - 9.0 SAND: black, silty some clay and fill material, oily	
9.0 - 15.0 GRAVEL: black, clayey, silty	
15.0 - 20.0 SAND: brown and gray, fine to medium, trace silt, saturated, strong odors	
20.0 - 30.0 SAND: variegated, gravel, silt, saturated	1
	2
24.0 FREE PRODUCT	3
30.0 34.0 SILT: brown, gray, sandy, clayey	4
	5
TOTAL DEPTH 34.0	

Drilled By Hardin-Huber
Logged By Peter J. Dougherty
Client Atlantic
Job No. 522-239-00

ENGINEERING ENTERPRISES, INC.

S-86

PIEZOMETER INSTALLATION REPORT

Project ARCO REFINERY

Project No. 81C2256 Installed By PFM

Method of Installation Hollow stem auger

Piezometer No. AS-4

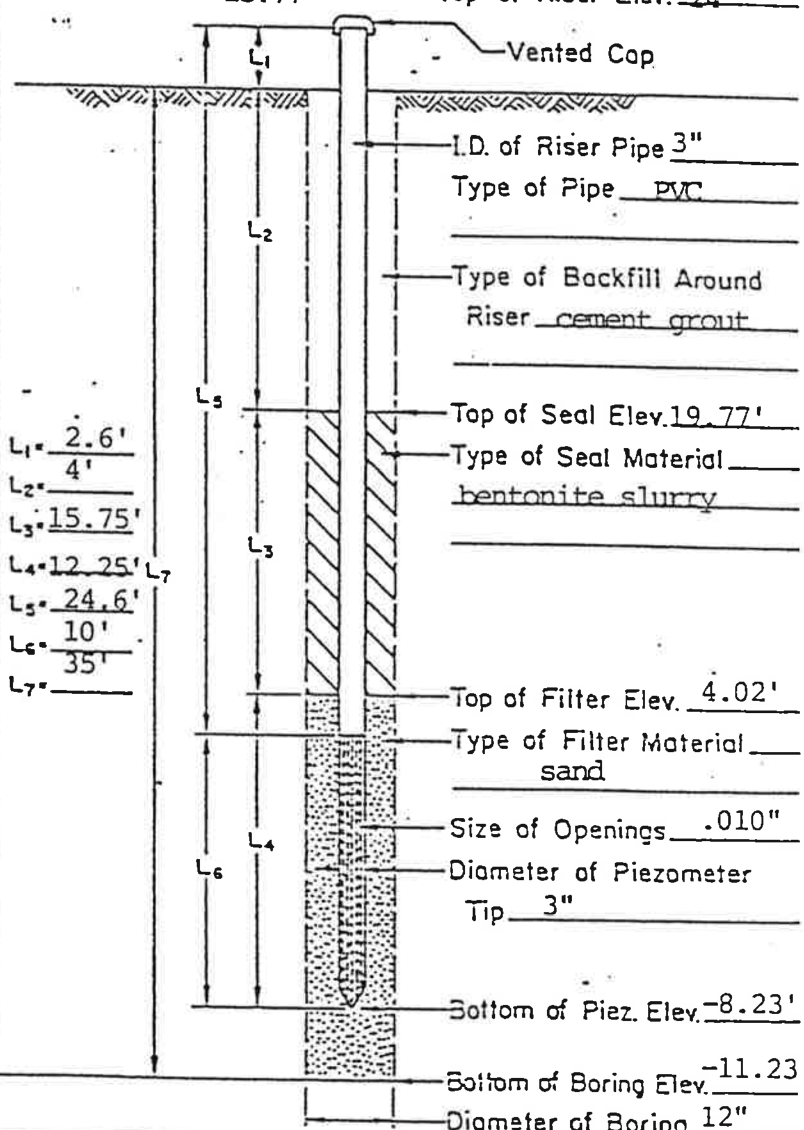
Location See Fig.

Date 2/9/82 Time

LOG OF BORING AND PIEZOMETER

BORING			PIEZOMETER
Depth in ft.	Description	Symbol	Type of Piezometer PVC

Ground Elev. 23.77' Top of Riser Elev. 24'



L_1 = 2.6'

L_2 = 4'

L_3 = 15.75'

L_4 = 12.25'

L_5 = 24.6'

L_6 = 10'

L_7 = 35'

Remarks

Inspected By PFM

S-870

LOG of BORING No. AD-2

DATE 1/28/82 SURFACE ELEV. ______ LOCATION See Plate

DEPTH, FEET	SAMPLES	SAMPLING RESISTANCE	DESCRIPTION	ELEVATION	WATER CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	OTHER TESTS
0								
5		8	FILL - oily black sandy clayey silt with rubble					
10		2						
15		13	Firm gray clayey SILT becoming more sandy with depth					
20		127						
25		28	Medium dense to dense gray coarse to fine SAND trace gravel					
30		44	becoming more gravelly @ 30 feet					
35		18						
40		18	Firm gray and red brown sandy CLAY					
45			See next page for description					

COMPLETION DEPTH 56.5 feet FLUID Depth enc. @ 26 ft. Date 1/28/82

SAMPLER: 2" O.D. SPLIT-BARREL SAMPLER

JOB NO 81 C 2256A

LOG

WCC RP 1

S-87

LOG of BORING No. AD-2 (cont'd.)

DATE 1/28/82 SURFACE ELEV. ________ LOCATION See Plate

DEPTH, FEET	SAMPLES	SAMPLING RESISTANCE	DESCRIPTION	ELEVATION	WATER CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	OTHER TESTS
45	■	25						
50	■	11	Medium dense red brown silty coarse to fine SAND					
55	■	22						
60								

COMPLETION DEPTH 56.5 feet FLUID Depth enc. @ 26 ft. Date 1/28/82

SAMPLER: 2" O.D. SPLIT-BARREL SAMPLER

PIEZOMETER INSTALLATION REPORT

Project: ARCO Refinery
Project No.: 81C2256 Installed By: SIG
Method of Installation: Hollow stem auger

Piezometer No.: AD-2
Location: See Figure
Date: 2/28/82 Time:

LOG OF BORING AND PIEZOMETER

BORING

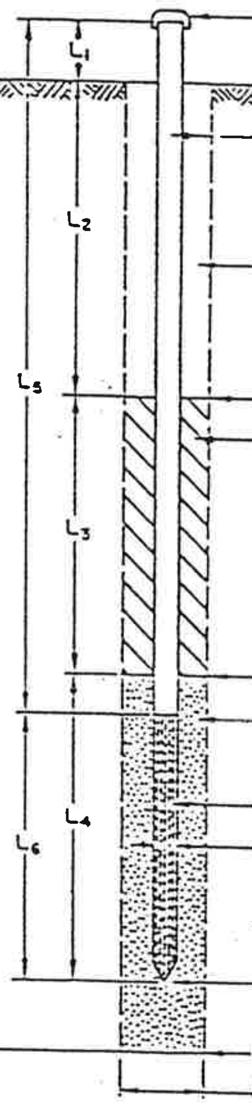
Depth in ft.	Description	Symbol

PIEZOMETER

Type of Piezometer: PVC

Ground Elev.:

Top of Riser Elev.:



Vented Cap

I.D. of Riser Pipe: 3"
Type of Pipe: PVC

Type of Backfill Around Riser: cement grout

Top of Seal Elev.:
Type of Seal Material: bentonite slurry

Top of Filter Elev.:
Type of Filter Material: sand

Size of Openings: .010"

Diameter of Piezometer Tip: 3"

Bottom of Piez. Elev.:

Bottom of Boring Elev.:

Diameter of Boring: 12"

L1 =
L2 = 4'
L3 = 37.2'
L4 = ~~13'3'~~
L5 =
L6 = 10'
L7 = 55'

Remarks:

Inspected By: SIG

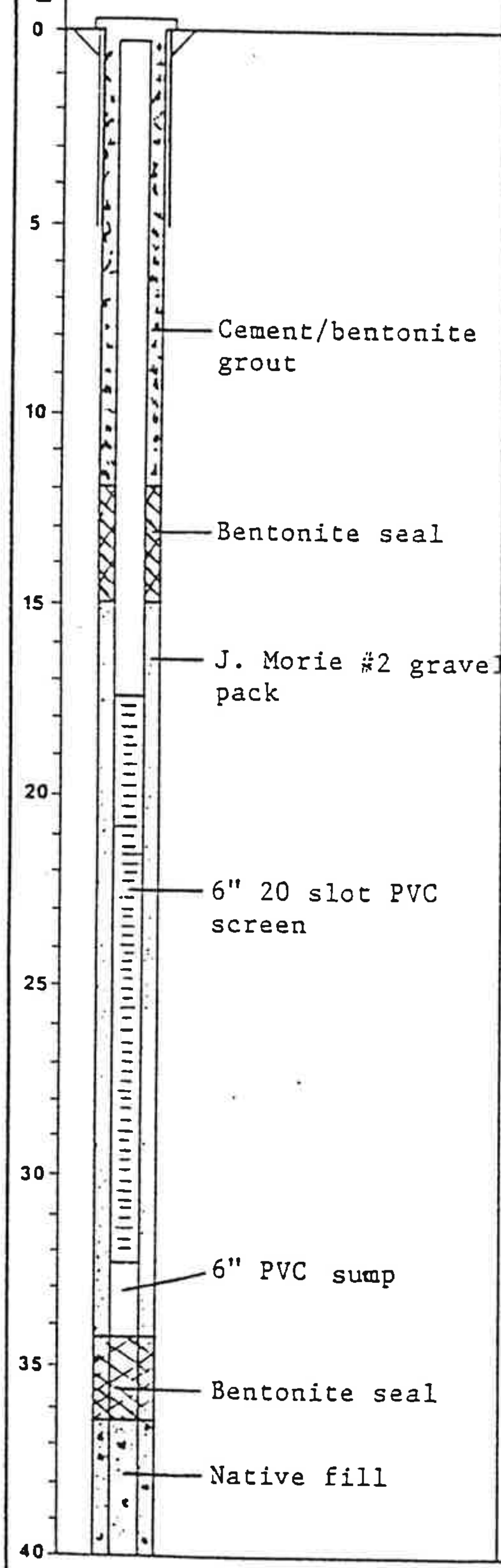
S-88

WELL PR-2

WELL ELEVATION:
WELL INSTALLED: 8/19/87
WELL DEVELOPED: 8/20/87
WELL DEPTH: 34.5

BORING

SURFACE ELEVATION:
DRILLING METHOD: Mud Rotary
BORING DEPTH: 44.0



SOIL TYPE: USCS | SYMBOLS

Depth / Description			BLOWS	% RETAINED	SAMPLE NO.	SAMPLE DEPTH	SAMPLE TYPE
0.0 - 15.0 FILL: black, sand, silty, clay, wood, oily							
(5.0 - 7.0 thick oily waste)							
15.0 - 18.0 SAND: gray, fine, silty							
18.0 - 27.0 SAND: clayey, gravel, some silt							
27.0 - 31.5 COBBLES							
31.5 - 38.5 SAND: fine, silty, some clay							
38.5 - 40.5 SAND: some cobbles							

Drilled By Hardin-Huber
Logged By Peter J. Dougherty
Client Atlantic
Job No. 522-239-00

EEI ENGINEERING ENTERPRISES, INC.

DEPTH IN FEET	WELL PR-2 Cont.	SOIL TYPE USCS	SOIL TYPE SYMBOLS	BORING Cont.			BLOWS	% RETAINED	SAMPLE NO.	SAMPLE DEPTH	SAMPLE TYPE
40	Native fill			40.5 - 44.0 SAND: silty, some clay							
				TOTAL DEPTH 44.0							
45											
50											
55											
60											
65											
70											
75											
80											

ENGINEERING ENTERPRISES, INC.

WELL #75

WELL ELEVATION: 28.99
WELL INSTALLED: 7-29-87
WELL DEVELOPED:
WELL DEPTH:

BORING

SURFACE ELEVATION:
DRILLING METHOD: Hollow Stem Auger
BORING DEPTH: 37.0

Well construction (depth in feet):
- Cement/bentonite grout
- Bentonite seal
- J. Morie gravel pack
- 2" 20 slot PVC screen

DEPTH IN FEET	SOIL TYPE: USCS	SOIL TYPE: SYMBOLS	BORING	SAMPLE DATA		BLOWS	% RETAINED	SAMPLE NO.	SAMPLE DEPTH	SAMPLE TYPE
0			0.0 - 1.0 FILL: gravel							
			1.0 - 4.0 FILL: silt, sand, glass							
5			4.0 - 9.0 SILT: black, sandy, oily							
10			9.0 - 16.0 SILT: black, sandy, trace clay, oily							
15			16.0 - 22.0 SAND AND GRAVEL: variegated, trace silt, dry, no odor							
20								1		
			22.0 - 25.5 SAND: variegated, silty, fine to coarse, sand, gravel, cobbles					2		
								3		
25			25.5 - 26.0 SAND: gray, fine to coarse, silty, strong odors					4		
			26.0 - 30.0 SAND AND SILT: fine to coarse, sand, cobbles, fairly dry, odors present							
30			30.0 - 34.0 SAND: variegated, fine to coarse, trace silt, slight odor					5		
35			34.0 - 37.0 SAND: brown and gray, fine, silty, slightly clayey, wet, odor present					6		
			TOTAL DEPTH 37.0							
40										

Drilled By Hardin-Huber
Logged By Peter J. Dougherty
Client Atlantic
Job No. 522-239-00

EEI ENGINEERING ENTERPRISES, INC.

Groundwater & Environmental Services, Inc.

Drilling Log

Project: Sun Philadelphia Refinery — Owner: Sun Company., Inc.

Location: 3144 Passyunk Ave., Phila. — Permit No.: N/A

Boring number: S-90 — Total Depth: 50 ft. — Diameter: 14 in.

Casing Elevation: 27.81 ft. — Water Level: Initial 18.12 — Static: N/A

Screen Dia.: 6 in. — Length: 35 ft. — Slot Size: 0.02

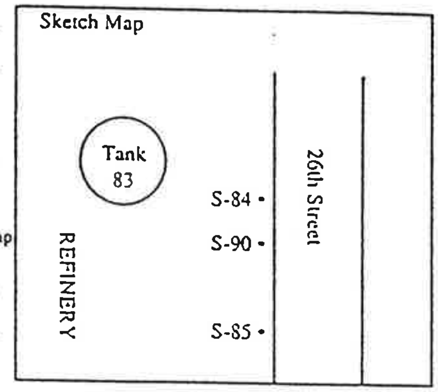
Casing Dia.: 6 in. — Length: 17 ft. — Type: Galvanized wire wrap

Drilling Method: Hollow-stem Auger — Sample Method: Split-spoon

Completion Details: Three foot high steel riser stick-up.

Driller: B.L. Myers Bros. — Log By: E. Dziedzic — Date: 1 July 1993

Sketch Map



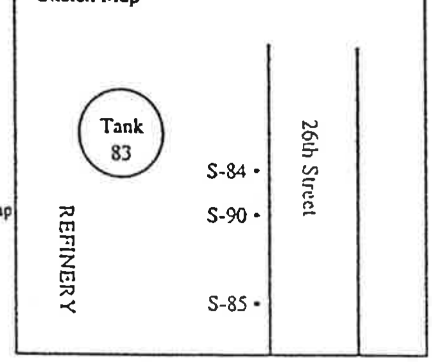
Depth (feet)	Sample No.	Well Const.	OVA (ppm)	Initial Water Depth	Lithology
0	N/A		154		FILL - Dark brown sandy fill with some brick, odor.
7			52		GRAVEL - Black gravel, odor, sticky product, moist.
15			230		- Gravel, saturated with product, black.
18.12				▽	
20			576		
26			1183		
29					PEBBLES/COBBLES
30					

Groundwater & Environmental Services, Inc.

Drilling Log

Project: Sun Philadelphia Refinery
Owner: Sun Company., Inc.
Location: 3144 Passyunk Ave., Phila.
Permit No.: N/A
Boring number: S-90
Total Depth: 50 ft.
Diameter: 14 in.
Casing Elevation: 27.81 ft.
Water Level: Initial: 18.12
Static: N/A
Screen Dia.: 6 in.
Length: 35 ft.
Slot Size: 0.02
Casing Dia.: 6 in.
Length: 17 ft.
Type: Galvanized wire wrap
Drilling Method: Hollow-stem Auger
Sample Method: Split-spoon
Completion Details: Three foot steel riser stick-up.
Driller: B.L. Myers Bros.
Log By: E. Dziedzic
Date: 1 July 1993

Sketch Map



Depth (feet)	Sample No.	Well Const.	OVA (ppm)	Initial Water Depth	Lithology
30	N/A				PEBBLES/COBBLES
			1060		SAND - Black coarse sand and gravel, saturated, slight odor.
			27		SILT - Brown sandy silt, wet, slight odor.
35					
40			0		CLAY - Tan silty clay, moist, no odor.
45					
50					COMPLETED BORING AT 50 FEET.

GES

Groundwater & Environmental Services, Inc.

Drilling Log

Project: Sun Philadelphia Refinery
Owner: Sun Company, Inc.
Location: 3144 Passyunk Ave., Phila.
Permit No.: N/A
Well number: S-91
Total Depth: 30 ft.
Diameter: 10 inch
Casing Elevation: N/A
Water Level: Initial: 21 ft.
Static: N/A
Screen Dia.: 4 inch
Length:
Slot Size: 0.02 inch
Casing Dia.: 4 inch
Length:
Type: PVC Sch 40
Drilling Method: Hollow-Stem Auger
Sample Method: Split- Spoon
Completion Details: Three foot protective steel stickup with locking cap.
Driller: B.L. Myers Bros.
Log By: E. Dziedzic
Date: 11 August 1993

Sketch Map

Pollock Street Sewer Vicinity
South Yard Figure attached

Depth (feet)	Grab Water Sample	Well Const.	OVM (ppm)	Initial Water Depth	Lithology	
					FILL	- Crushed stone fill
10			186 144 68		SILT	- Dark grey silt, moist, odor
20			700 89		SAND	- Dark brown silt, moist, odor
				▽	GRAVEL	- Gravel with pebbles, some poorly sorted sand and silts, wet, strong odor, NAPL
					COBBLES	
30			1803		SAND	- Brown medium coarse sand with some gravel and pebbles, wet, strong odor
					BORING COMPLETED AT 30 FEET	

GES

Groundwater & Environmental Services, Inc.

Drilling Log

Project Sun Philadelphia Refinery Owner Sun Company, Inc.

Location 3144 Passyunk Ave., Phila. Permit No. N/A

Well number S-92 Total Depth 30 ft. Diameter 10 inch

Casing Elevation N/A Water Level: Initial 14 ft. Static N/A

Screen Dia. 4 inch Length 20 ft Slot Size 0.02 inch

Casing Dia. 4 inch Length 10 ft Type PVC Sch 40

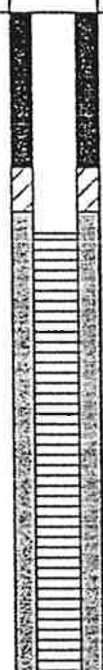
Drilling Method Hollow-Stem Auger Sample Method N/A

Completion Details Flush mount man hole with locking churney plug

Driller B.L. Myers Bros. Log By M.D. Haslett Date 9 August 1993

Sketch Map

Pollock Street Sewer Vicinity
South Yard Figure attached



Depth (feet)	Sample No.	Well Const.	OVM (ppm)	Initial Water Depth	Lithology	
	N/A					- Asphalt and ballast stone.
					FILL	- Tan sandy fill with crushed stone, dry, no odor.
5						- Dark brown fill with crushed stone, dry, no odor.
			70		SAND	- Tan sand, some crushed stone, slight odor, dry.
10						
					GRAVEL	- Black gravel with quartz pebbles, wet, sheen, slight odor.
20					SAND	- Reddish tan silty sand (top), brown fine sand (bottom)
30					BORING COMPLETED AT 30 FEET	

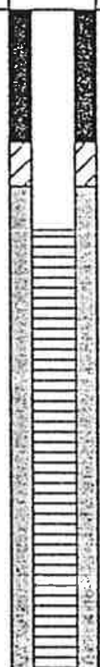
Groundwater & Environmental Services, Inc.

Drilling Log

Project	Sun Philadelphia Refinery	Owner	Sun Company, Inc.
Location	3144 Passyunk Ave., Phila.	Permit No.	N/A
Well number	S-93	Total Depth	30 ft. Diameter 10 inch
Casing Elevation	N/A	Water Level: Initial	13 ft. Static N/A
Screen Dia.	4 inch	Length	20 ft. Slot Size 0.02 inch
Casing Dia.	4 inch	Length	13 ft. Type PVC Sch. 40
Drilling Method	Hollow-Stem Auger	Sample Method	N/A
Completion Details	3 ft. protective steel stick -up with locking cap		
Driller	B.L. Myers Bros.	Log By M.D. Haslett	Date 9 August 1993

Sketch Map

Pollock Street Sewer Vicinity
South Yard Figure attached



Depth (feet)	Sample No.	Well Const.	OVM (ppm)	Initial Water Depth	Lithology	
	N/A				FILL	- Brown silty sand with pebbles, damp.
					SAND	- Black coarse sand.
10			60	▽		- Silty sand with pebbles, damp.
						- Dark grey/brown coarse sand and pebbles, moderate odor, wet, sheen.
			655			- Coarse sand with pebbles, wet sheen.
20					GRAVEL	- Grey/Brown gravel with coarse sand, moderate odor.
			926		SAND	- Dark brown silty, coarse sand with gravel.
30					BORING COMPLETED AT 30 FEET	
40						

GES

Groundwater & Environmental Services, Inc.

Drilling Log

Project: Sun Philadelphia Refinery
Owner: Sun Company, Inc. (R&M)

Location: 3144 Passyunk Ave., Phila.
Permit No.: N/A

Boring number: S-94
Total Depth: 50 ft.
Diameter: 10 in.

Casing Elevation: N/A
Water Level: Initial 22.5 ft. Static N/A

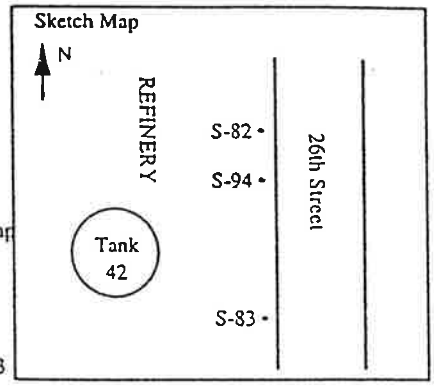
Screen Dia.: 6 in.
Length: 35 ft.
Slot Size: N/A

Casing Dia.: 6 in.
Length: 16 ft.
Type: Galvanized wire wrap

Drilling Method: Mud Rotary
Sample Method: Split-spoon

Completion Details: One foot steel stick-up riser.

Driller: Summit Drilling Co.
Log By: M. Haslett
Date: 9 September 1993



Depth (feet)	Blow Count	Well Const.	OVM (ppm)	Initial Water Depth	Lithology
					LIMESTONE BALLAST - Silty clay.
	4,2,3,4				
5			1403		CLAY - Silty clay, moist, stained.
					- Silty clay with angular stone fragments, stained, wet.
	6,11, 12,16		3		
					- Brown, thick clay, some silt, no odor.
			7		
10					- Dark gray, thick clay, odor.
	13,16, 18,24				- Light gray clay, some sand, wet, no odor.
15					
	7,10, 30,54				SAND - Light gray, silty fine sand, some medium gravel, moist odor.
20			119		
				▽	
	52,50,-,-		711		GRAVEL - Gravel, coarse sand, some silt.
25			200		COBBLES - Heavy cobbles, odor.
30	50,-,-,-				

Groundwater & Environmental Services, Inc.

Drilling Log

Project: Sun Philadelphia Refinery — Owner: Sun Company., Inc. (R&M)

Location: 3144 Passyunk Ave., Phila. — Permit No.: N/A

Boring number: S-94 — Total Depth: 50 ft. — Diameter: 10 in.

Casing Elevation: N/A — Water Level: Initial: 22.5 ft. — Static: N/A

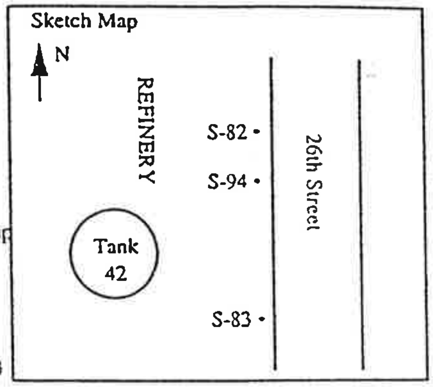
Screen Dia.: 6 in. — Length: 35 ft. — Slot Size: N/A

Casing Dia.: 6 in. — Length: 16 ft. — Type: Galvanized wire wrap

Drilling Method: Mud Rotary — Sample Method: Split-spoon

Completion Details: One foot steel stick-up riser.

Driller: Summit Drilling Co. — Log By: M. Haslett — Date: 9 September 1993

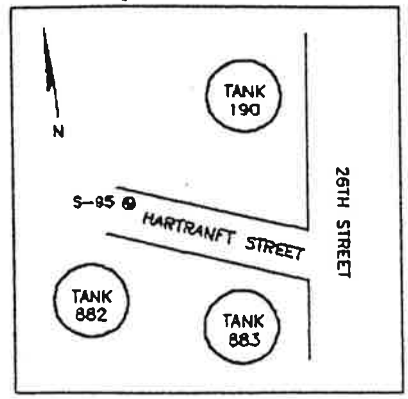


Depth (feet)	Blow Count	Well Const.	OVM (ppm)	Initial Water Depth	Lithology
30	N/A				COBBLES
			320		SAND - Medium sand, brown, moist.
35	15,26, 13,10		27		CLAY - Brown silty clay, moist, some fine sand, odor.
					- Red/Orange silty clay, odor, moist.
	7,14, 16,33				SAND - Dark mauve sand, some silty clay, wet, strong odor.
40					
	10,16, 16,25				CLAY - Dark mauve silty clay, moist, slight odor, some mica, black and fine sand.
45					
	7,12, 26,55				- Dark mauve clay, some silt, slight odor, moist.
50					COMPLETED BORING AT 50 FEET.

GROUNDWATER & ENVIRONMENTAL SERVICES, INC.
DRILLING LOG

GES

Sketch Map



Project: Sun Philadelphia Refinery
Owner: Sun Company, Inc. (R & M)
Location: South Yard
Permit No.: NA
Well Number: S-95
Total Depth: 30 ft. Diameter: 10 in.
Casing Elevation: 25.34 ft.
Water Level: Initial 21 ft. Static 22.01 ft.
Screen Dia.: 4 in.
Length: 15 ft. Slot Size: 0.02 in.
Casing Dia.: 4 in.
Length: 15 ft. Type: Sch. 40 PVC
Drilling Method: Hollow-Stem Auger
Sample Method: Split-spoon
Completion Details: 2 ft. stick-up locking cap w/6 in. steel protective casing
Driller: B. L. Myers Brothers, Inc.
Log By: MDH Date: 4/4/94

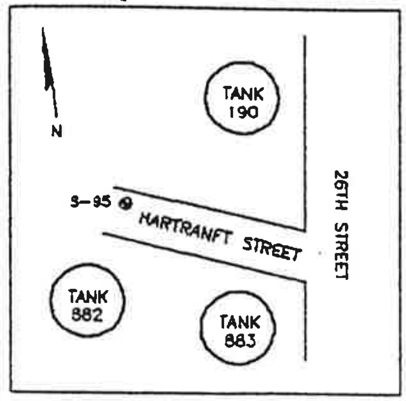
Depth (feet)	Sample No.	Well Const.	OVM (ppm)	Blow Count	Lithology
					FILL – Limestone gravel
					CLAY – Orange/brown silty clay, no odor, dry
5			0	3,4,6,9	– Same lithology, no odor, slight increase in moisture
10			0	3,4,15 Refusal	– Brown silty clay, no odor, slightly moist
					SAND – Purple coarse sand and gravel, some weathered small pebbles
15			0	6,15,18,12	– Gray poorly-sorted coarse sand, some rounded cobbles and pebbles, no odor, dry
20			106	6,15,26,25	– Same lithology, some silty clay, slight odor, increase in moisture
					Initial groundwater encountered at 21 feet.
					Static groundwater level at 22.01 feet.
25			623	5,6,6,7	– Same lithology, some fine sands, strong odor, very wet

GROUNDWATER & ENVIRONMENTAL SERVICES, INC.
DRILLING LOG

GES

Project	Sun Philadelphia Refinery	Owner	Sun Company, Inc. (R & M)
Location	South Yard	Permit No.	NA
Well Number	S-95	Total Depth	30 ft. Diameter 10 in.
Casing Elevation	25.34 ft.	Water Level: Initial	21 ft. Static 22.01 ft.
Screen Dia.	4 in.	Length	15 ft. Slot Size 0.02 in.
Casing Dia.	4 in.	Length	15 ft. Type Sch. 40 PVC
Drilling Method	Hollow-Stem Auger	Sample Method	Split-spoon
Completion Details	2 ft. stick-up locking cap w/6 in. steel protective casing		
Driller	B. L. Myers Brothers, Inc.	Log By	MDH Date 4/4/94

Sketch Map



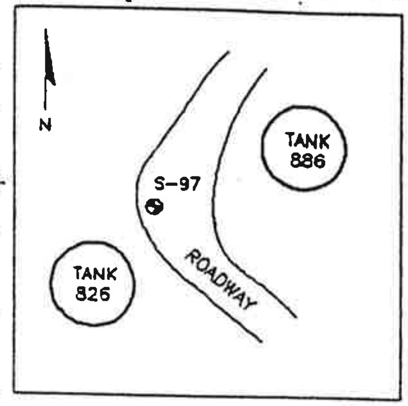
Depth (feet)	Sample No.	Well Const.	OVM (ppm)	Blow Count	Lithology
					SAND – Running sands, very wet, strong odor
30			960	3,3,5,9	
					WELL COMPLETED AT 30 FEET.
35					

GROUNDWATER & ENVIRONMENTAL SERVICES, INC.
DRILLING LOG

GES

Project Sun Philadelphia Refinery
Owner Sun Company, Inc. (R & M)
Location South Yard
Permit No. NA
Well Number S-97
Total Depth 35 ft. **Diameter** 10 in.
Casing Elevation 33.33 ft.
Water Level: Initial 27 ft. **Static** 28.60 ft.
Screen Dia. 4 in.
Length 15 ft. **Slot Size** 0.02 in.
Casing Dia. 4 in.
Length 20 ft. **Type** Sch. 40 PVC
Drilling Method Hollow-Stem Auger
Sample Method Split-Spoon
Completion Details 2 ft. stick-up locking cap w/6 in. steel protective casing
Driller B. L. Myers Brothers, Inc.
Log By MDH **Date** 4/4/94

Sketch Map



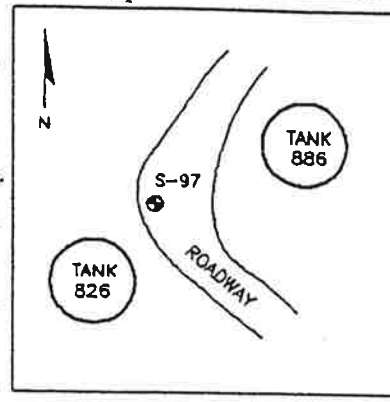
Depth (feet)	Sample No.	Well Const.	OVM (ppm)	Blow Count	Lithology	
					FILL	– Limestone gravel
			1.5		CLAY	– Orange/brown silty clay, no odor, dry
5			10	3,4,4,6		– Brown silty clay, slight odor, slight increase in moisture
						– Orange/brown silty clay, few small mica flakes, no odor, dry
						– Same lithology, no odor, dry
10			21	3,4,9,11		
					SAND	– Brown medium grained sand, no odor, dry
						– Same lithology, increase in fine-grained sand, no odor, dry
			0			
15			5	4,4,56		
					CLAY	– Dark brown silty clay, no odor, dry
					GRAVEL	– Poorly sorted cobble size gravel, coarse sands, no odor, dry
20				Refusal		
			45	4,5,9,21		– Same lithology, slight odor, dry
25				Refusal		
						Initial groundwater encountered at 27 feet.

GROUNDWATER & ENVIRONMENTAL SERVICES, INC.
DRILLING LOG

GES

Project: Sun Philadelphia Refinery
Owner: Sun Company, Inc. (R & M)
Location: South Yard
Permit No.: NA
Well Number: S-97
Total Depth: 35 ft. Diameter: 10 in.
Casing Elevation: 33.33 ft.
Water Level: Initial 27 ft. Static 28.60 ft.
Screen Dia.: 4 in.
Length: 15 ft. Slot Size: 0.02 in.
Casing Dia.: 4 in.
Length: 20 ft. Type: Sch. 40 PVC
Drilling Method: Hollow-Stem Auger
Sample Method: Split-Spoon
Completion Details: 2 ft. stick-up locking cap w/6 in. steel protective casing
Driller: B. L. Myers Brothers, Inc.
Log By: MDH Date: 4/4/94

Sketch Map



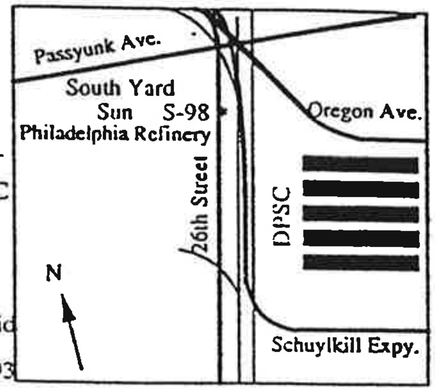
Depth (feet)	Sample No.	Well Const.	OVM (ppm)	Blow Count	Lithology
			65		SAND – Medium grained quartz sand, black staining, strong odor, wet
					Static groundwater level at 28.60 feet.
30			811	5,5,5,6	GRAVEL – Poorly-sorted gravel, some medium grained sand, strong odor, wet
					SAND – Running sands with some pebbles, poorly sorted, strong odor, wet
35			1200	3,2,33	WELL COMPLETED AT 35 FEET.

GES

Groundwater & Environmental Services, Inc.

Drilling Log

Project: Sun : Philadelphia Refinery
Owner: Sun Company, Inc. (R&M)
Location: 3144 Passyunk Ave.
Permit No.: N/A
Well number: S-98
Total Depth: 35 ft. Diameter: 10 in.
Casing Elevation: 30.94 ft.
Water Level: Initial 26 ft. Static 24.66 ft.
Screen Dia.: 4 in.
Length: 20 ft. Slot Size: 0.020 in. PVC
Casing Dia.: 4 in.
Length: 15 ft. Type: PVC riser
Drilling Method: Hollow stem auger
Sample Method: split-spoon
Completion Details: Completed with sanitary plug & iron stick-up with locking lid
Driller: B. L. Myers Bros., Inc.
Log By: E. Dziedzic Date: 6 December 1993



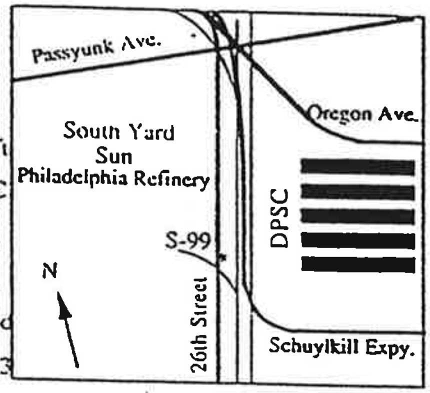
Depth (feet)	Sample No.	Well Const.	OVM (ppm)	Blow Count	Lithology	
			0.0		FILL	- Clean Fill - Brown silt with fill, dry, no odor
			0.0	2, 5, 8, 10		
			33	5, 4, 7, 9	SAND	- Gray silty sand, dry, no odor - Grayish tan silty sand, poorly sorted, dry, odor
10			1360	4, 7, 7, 8		- Gray sand, moist, odor
			396	4, 5, 8, 10		- Dark gray med. grained sand, stained, wet, odor
			16	5, 9, 10, 11	CLAY	- Light tan clay, no odor, moist
			4	6, 9, 6, 12		- Tan and brown interlayered clay, moist, no odor
			10	9, 9, 11, 14	SILT	- Light gray and light tan interlayered silt, moist, no odor
20			0.0	4, 5, 6, 5		- Brown sandy silt with pebbles and organic remains, moist, slight odor
			966	50/4"		
			786	11, 13, 14, 17	GRAVEL	- Pebble size gravel (quartz and sandstone), dry, odor
	SS-1		1020	19, 20, 23, 50/3"		- Pebble size gravel in sandy matrix, moist, odor - Cobble size gravel in sandy matrix, wet, odor
			1140	11, 19, 22, 27	Initial Water at 26 ft.	- Interlayered pebbles, cobbles, and brown med. grained sand, saturated, odor
30			1135	19, 22, 24, 22		
			57	1, 1, 1, 1		- Poorly sorted gravel and brown coarse sand, wet, odor
				No Recovery		- Poorly sorted grayish brown coarse grained sand and gravel, wet, odor
40						BORING COMPLETED AT 35 FEET
50						
60						

GES

Groundwater & Environmental Services, Inc.

Drilling Log

Project: Sun : Philadelphia Refinery		Owner: Sun Company, Inc. (R&M)	
Location: 3144 Passyunk Ave.		Permit No.: N/A	
Well number: S-99		Total Depth: 35 ft.	Diameter: 10 in.
Casing Elevation: 26.05 ft.		Water Level: Initial 26 ft.	Static 24.21 ft
Screen Dia.: 4 in.		Length: 20 ft.	Slot Size: 0.020 in. PVC
Casing Dia.: 4 in.		Length: 15 ft.	Type: PVC riser
Drilling Method: Hollow stem auger		Sample Method: split-spoon	
Completion Details: Completed with sanitary plug & iron stick-up with locking lid			
Driller: B. L. Myers Bros., Inc.		Log By: E. Dziedzic	Date: 7 December 1993



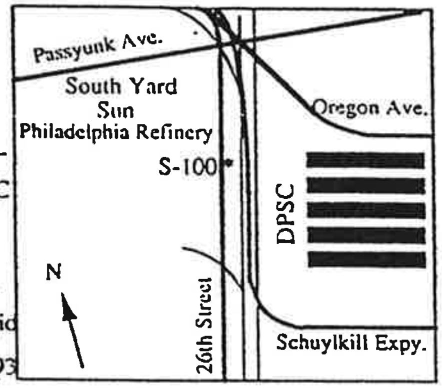
Depth (feet)	Sample No.	Well Const.	OVM (ppm)	Blow Count	Lithology	
			0.0		FILL	- Clean Fill
					SILT	- Brown silt, dry, no odor
			30	4, 12, 12, 10	SAND	- Tannish brown fine grained sand, well sorted, dry staining, odor
10			119	4, 10, 21, 24		- Grayish brown fine grained sand, well sorted, dry, odor
					GRAVEL	- Pebble and cobble size gravel
			3	10, 17, 21, 22	SAND	- Brownish tan fine grained sand with silt, dry, no odor
					GRAVEL	- Pebble and cobble size gravel
			9		SAND	- Brown fine grained sand, moist, no odor
20			40	7, 14, 17, 19	GRAVEL	- Poorly sorted gravel with coarse grained sand, moist, slight odor
			3	14, 21, 50/4"		
			156	50/4"	SILT	- Brown silt with pebbles and cobbles, no odor
	SS-1			50/5"	GRAVEL	- Pebbles and cobbles with brown coarse grained sand, moist, odor
					Initial Water at 26 ft.	- Same lithology, wet, odor
30				9, 12, 11, 17		- Gray poorly sorted gravel and coarse grained sand, wet, odor
	SS-2			7, 9, 10, 14	SAND	- Light tannish gray coarse grained sand with pebbles, wet, odor, sheen on water
						BORING COMPLETED AT 37 FEET
40						
50						
60						

GES

Groundwater & Environmental Services, Inc.

Drilling Log

Project: Sun : Philadelphia Refinery
Owner: Sun Company, Inc. (R&M)
Location: 3144 Passyunk Ave.
Permit No.: N/A
Well number: S-100
Total Depth: 35 ft.
Diameter: 10 in.
Casing Elevation: 29.08 ft.
Water Level: Initial: 24 ft.
Static: 23.39 ft.
Screen Dia.: 4 in.
Length: 20 ft.
Slot Size: 0.020 in. PVC
Casing Dia.: 4 in.
Length: 15 ft.
Type: PVC riser
Drilling Method: Hollow stem auger
Sample Method: split-spoon
Completion Details: Completed with sanitary plug & iron stick-up with locking lid
Driller: B. L. Myers Bros., Inc.
Log By: E. Dziedzic
Date: 13 December 1993

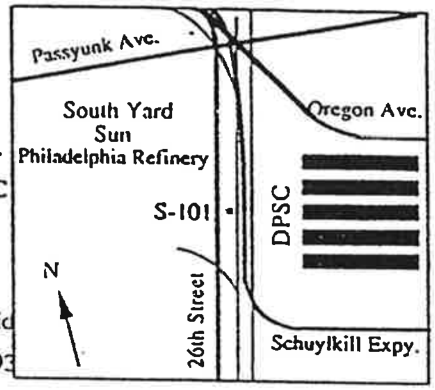


Depth (feet)	Sample No.	Well Const.	OVM (ppm)	Blow Count	Lithology
					FILL - Black sandy fill with brick and stone, dry, no odor
					- Brown silty fill, wet, no odor
			1.7	4, 3, 3, 5	- Same lithology, wet, no odor
10			49	2, 3, 4, 6	SILT - Greenish gray sandy silt, wet, odor
			4	5, 10, 12, 17	- Brown, tan, and greenish gray clayey silt, dry, no odor
20			1	7, 6, 8, 13	CLAY - Gray and tan layered clay, rare pebbles, dry, no odor
					Initial Water at 24 ft.
	SS-1		2	5, 5, 9, 15	- Same lithology, wet, no odor
					GRAVEL - Cobble size gravel
30			2	4, 5, 7, 10	SILT - Gray and tan interlayered silt with pebbles and cobbles, wet, no odor
	SS-2		2	3, 6, 6, 9	- Gray and tan silt with some sand, wet, no odor
					BORING COMPLETED AT 37 FEET
40					
50					
60					

Groundwater & Environmental Services, Inc.

Drilling Log

Project: Sun : Philadelphia Refinery
Owner: Sun Company, Inc. (R&M)
Location: 3144 Passyunk Ave.
Permit No.: N/A
Well number: S-101
Total Depth: 35 ft. Diameter: 10 in.
Casing Elevation: 51.28 ft.
Water Level: Initial 49 ft. Static 47.48 ft.
Screen Dia.: 4 in.
Length: 20 ft. Slot Size: 0.020 in. PVC
Casing Dia.: 4 in.
Length: 40 ft. Type: PVC riser
Drilling Method: Hollow stem auger
Sample Method: split-spoon
Completion Details: Completed with sanitary plug & iron stick-up with locking lid
Driller: B. L. Myers Bros., Inc.
Log By: E. Dziedzic Date: 20 December 1993



Depth (feet)	Sample No.	Well Const.	OVM (ppm)	Blow Count	Lithology
			9		FILL - Ash and cinder fill, dry, no odor, some wood
			8		
10					
			4		- Gray silty fill, dry, no odor
			5	7, 8, 9, 10	- Brown silty fill with wood fragments and crushed stone, dry, no odor
20			0.0	3, 5, 7, 8	- Brown silty fill with gray clay, crushed stone, brick, and glass, moist, no odor
				3, 7, 8, 12	- Same fill
30				6, 9, 14, 14	- No split-spoon yield
					- Auger resistance, creosote like odor
				50/0"	- Split-spoon refusal
					- Auger resistance (pebbles/cobbles?)
40			37	12, 50/5"	SAND - Brown coarse sand and small pebbles, dry, slight odor
			102	17, 50/4"	- Same lithology with some fill, moist and soft, odor
					Initial Water at 49 ft.
50	SS-1			7, 15, 14, 13	- Coarse sand with pebbles, wet, strong odor, sheen on water
				3, 5, 12, 16	CLAY - Tan and greenish gray clay, some silt, moist, slight odor
60	SS-2			1, 1, 1, 1	SAND - Tan fine grained sand with silt, wet, slight odor

BORING COMPLETED AT 60 FEET

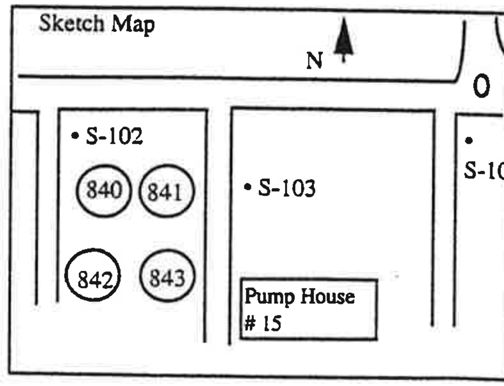
Groundwater & Environmental Services, Inc.

Drilling Log

GES

Project	Sun Point Breeze Refinery	Owner	Sun Company, Inc.
Location	South Yard	Permit No.	—
Well number	S-102	Total Depth	20 feet; Diameter 10.25 inch
Casing Elevation	20.39 feet	Water Level: Initial	15 feet; Static 18.70 feet
Screen Dia.	2 inch	Length	15 feet; Slot Size 0.020 inch
Casing Dia.	2 inch	Length	5 feet; Type Sch. 40 PVC
Drilling Method	Hollow stem auger	Sample Method	NA
Completion Details	Three foot protective steel stick-up with locking sanitary seal		
Driller	Lutz Environmental	Log By	MD Haslett; Date 17 Oct 95

Sketch Map



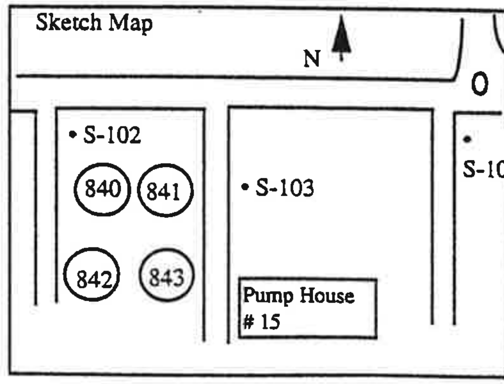
Depth (feet)	Sample No.	Well Const.	OVA (ppm)	Blow Count	Lithology
			0		SAND - Silty sand, some pebbles, dry, no odor
5			1970		CLAY - Silty clay, some fine sand, few rounded pebbles, moist, slight odor
10			325		GRAVEL - Large rounded pebbles to cobbles, silty sand matrix, odor, wet
15			250		Initial water encountered at 15 feet below grade. - Same lithology, odor, moist
					Static groundwater level at 18.70 feet
20					WELL COMPLETED AT 20 FEET.

Groundwater & Environmental Services, Inc.

Drilling Log

Project: Sun Point Breeze Refinery
Owner: Sun Company, Inc.
Location: South Yard
Permit No.: --
Well number: S-103
Total Depth: 25 feet
Diameter: 10.25 inch
Casing Elevation: 28.31 feet
Water Level: Initial 20 feet Static 27.45 feet
Screen Dia.: 2 inch
Length: 15 feet
Slot Size: 0.020 inch
Casing Dia.: 2 inch
Length: 10 feet
Type: Sch. 40 PVC
Drilling Method: Hollow stem auger
Sample Method: NA
Completion Details: Three foot protective steel stick-up with locking sanitary seal
Driller: Lutz Environmental
Log By: MD Haslett
Date: 17 Oct 95

Sketch Map

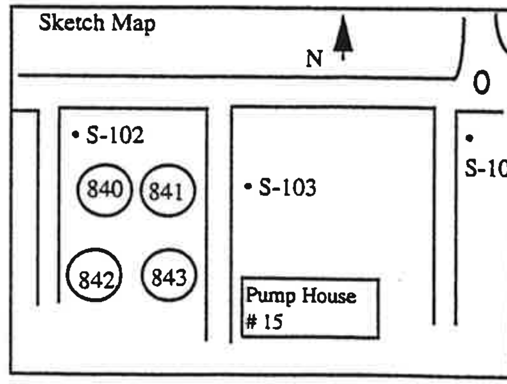


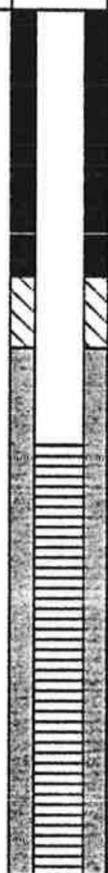
Depth (feet)	Sample No.	Well Const.	OVA (ppm)	Blow Count	Lithology
0			0		FILL - Silty sand, few pebbles, construction debris, dry, no odor
5			0		- same lithology, dry, no odor
10			0		GRAVEL - Large rounded pebbles to cobbles, silty sand matrix, odor, dry
15			20		- Same lithology, fewer pebbles, no cobbles, slight odor, dry
20					Initial water encountered at 20 feet below grade.
			3116		SAND - Silty sand, some rounded pebbles, odor, wet
					Static groundwater level at 27.45 feet
25					WELL COMPLETED AT 25 FEET.

Groundwater & Environmental Services, Inc.

Drilling Log

Project: Sun Point Breeze Refinery
Owner: Sun Company, Inc.
Location: South Yard
Permit No.: —
Well number: S-104
Total Depth: 20 feet
Diameter: 10.25 inch
Casing Elevation: 20.38 feet
Water Level: Initial 10 feet Static 18.70 feet
Screen Dia.: 2 inch
Length: 10 feet
Slot Size: 0.020 inch
Casing Dia.: 2 inch
Length: 10 feet
Type: Sch. 40 PVC
Drilling Method: Hollow stem auger
Sample Method: NA
Completion Details: Three foot protective steel stick-up with locking sanitary seal
Driller: Lutz Environmental
Log By: MD Haslett
Date: 17 Oct 95





Depth (feet)	Sample No.	Well Const.	OVA (ppm)	Blow Count	Lithology
0			0		SAND - Brown silty sand, few angular pebbles, dry, no odor
5			20		- Increased silt, slightly moist, slight odor
10					Initial water encountered at 10 feet below grade.
					- Fine silty sand, moist, odor
15			110		- Increased sand, few pebbles, moist, odor
					Static groundwater at 18.77 feet
20			90		BORING COMPLETED AT 20 FEET
25					

Groundwater & Environmental Services, Inc.

Drilling Log

Project Sun Philadelphia Refinery | Owner Sun Company, Inc.

Location 3144 Passyunk Ave., Phila. | Permit No. N/A

Boring number SB-1 | Total Depth 27 ft. | Diameter 6.125 in.

Casing Elevation N/A | Water Level: Initial 13 ft. | Static N/A

Screen Dia. N/A | Length N/A | Slot Size N/A

Casing Dia. N/A | Length N/A | Type N/A

Drilling Method Hollow-Stem Auger | Sample Method Split-Spoon

Completion Details N/A

Driller B.L. Myers Bros. | Log By E. Dziedzic | Date 17 June 1993

Sketch Map

Pollock Street Sewer Vicinity;
South Yard Figure attached

Depth (feet)	Grab Water Sample	Well Const.	OVM (ppm)	Initial Water Depth	Lithology
0		N/A			ASPHALT AND BALLAST STONE
1			3		SAND - Dark brown silty sand, dry, slight odor.
5			63		
9			23		
10			3		- Dark grey sand with pebbles, moist, slight odor.
12–14	Floating NAPL Layer			▽ (13 ft.)	
15			1349		- Coarse sand with pebbles, grey, odor, wet.
18			619		- Dark brown silty sand, wet, slight odor.
22			445		
25					GRAVEL - Grey gravel with pebbles, wet, sheen, odor.
26			372		
27					BORING COMPLETED AT 27 FEET.
30					

Groundwater & Environmental Services, Inc.

Drilling Log

Project: Sun Philadelphia Refinery
Owner: Sun Company, Inc.
Location: 3144 Passyunk Ave., Phila.
Permit No.: N/A
Boring number: SB-2
Total Depth: 22 ft.
Diameter: 6.125 in.
Casing Elevation: N/A
Water Level: Initial: 14 ft. Static: N/A
Screen Dia.: N/A
Length: N/A
Slot Size: N/A
Casing Dia.: N/A
Length: N/A
Type: N/A
Drilling Method: Hollow-Stem Auger
Sample Method: Split-Spoon
Completion Details: N/A
Driller: B.L. Myers Bros.
Log By: E. Dziedzic
Date: 28 June 1993

Sketch Map

Pollock Street Sewer Vicinity; South Yard Figure attached

Depth (feet)	Grab Water Sample	Well Const.	OVM (ppm)	Initial Water Depth	Lithology	
0		N/A	225		ASPHALT AND BALLAST STONE	
					FILL	- Brown sandy fill with crushed stone.
4			99		SILT	- Dark grey clayey silt, moist, odor.
6			174			- Tan silt, dry, odor.
8			344			
10			48			
12			196			
14	Floating NAPL Layer			▽		- Brown silt with pebbles, moist, odor.
15			401			
18					GRAVEL	- Cobble and pebble sized gravel, auger resistance.
20			270			- Gravel with coarse sand and pebbles, wet, sheen, slight odor.
22						BORING COMPLETED AT 22 FEET.

Depth scale: 5, 10, 15, 20, 25, 30

Groundwater & Environmental Services, Inc.

Drilling Log

Project: Sun Philadelphia Refinery

Owner: Sun Company, Inc.

Location: 3144 Passyunk Ave., Phila.

Permit No.: N/A

Boring number: SB-3

Total Depth: 20 ft. Diameter: 6.125 in.

Casing Elevation: N/A

Water Level: Initial: 15 ft. Static: N/A

Screen Dia.: N/A

Length: N/A Slot Size: N/A

Casing Dia.: N/A

Length: N/A Type: N/A

Drilling Method: Hollow-Stem Auger

Sample Method: Split-Spoon

Completion Details: N/A

Driller: B.L. Myers Bros.

Log By: E. Dziedzic Date: 21 June 1993

Sketch Map

Pollock Street Sewer Vicinity;
South Yard Figure attached

Depth (feet)	Grab Water Sample	Well Const.	OVM (ppm)	Initial Water Depth	Lithology	
0		N/A	0.0		ASPHALT	- Asphalt and ballast stone
1					FILL	- Tan sandy fill, dry, no odor.
5						
6			16		SILT	- Black sandy silt, moist, odor.
8			23			
10						
10.5			733		SAND	- Medium grained sand with pebbles, moist, strong odor.
15			109	▽	GRAVEL	- Brown silty gravel, wet, sheen, odor.
20						- Cobble-size gravel
20					AUGER REFUSAL AT 20 FEET	
25						

GES

Groundwater & Environmental Services, Inc.

Drilling Log

Project: Sun Philadelphia Refinery
Owner: Sun Company, Inc.
Location: 3144 Passyunk Ave., Phila.
Permit No.: N/A
Boring number: SB-4
Total Depth: 27 ft.
Diameter: 6.125 in.
Casing Elevation: N/A
Water Level: Initial: 13 ft. Static: N/A
Screen Dia.: N/A
Length: N/A
Slot Size: N/A
Casing Dia.: N/A
Length: N/A
Type: N/A
Drilling Method: Hollow-Stem Auger
Sample Method: Split-Spoon
Completion Details: N/A
Driller: B.L. Myers Bros.
Log By: E. Dziedzic
Date: 28 June 1993

Sketch Map

Pollock Street Sewer Vicinity;
South Yard Figure attached

Depth (feet)	Grab Water Sample	Well Const.	OVM (ppm)	Initial Water Depth	Lithology	
		N/A			FILL	- Brown sandy fill, dry, slight odor.
1			166			- Black sandy fill, dry, slight odor.
3			55			
5						
6			4			
7					SILT	- Dark brown sandy silt, moist, no odor.
10						
13	Floating NAPL Layer		255	▽	SAND	- Dark brown silty sand, moist, odor. - Dark brown silty sand, wet, odor
15			401			
16			3		CLAY	- Tan clay, moist, no odor
20						
25			901		SAND	- Greyish/Brown coarse sand, pebbles, and gravel, wet, slight odor.
27					BORING COMPLETED AT 27 FEET.	
30						

Groundwater & Environmental Services, Inc.

Drilling Log

Project: Sun Philadelphia Refinery
Owner: Sun Company, Inc.
Location: 3144 Passyunk Ave., Phila.
Permit No.: N/A
Boring number: SB-5
Total Depth: 24 ft.
Diameter: 6.125 in.
Casing Elevation: N/A
Water Level: Initial 20 ft. Static N/A
Screen Dia.: N/A
Length: N/A
Slot Size: N/A
Casing Dia.: N/A
Length: N/A
Type: N/A
Drilling Method: Hollow-Stem Auger
Sample Method: Split-Spoon
Completion Details: N/A
Driller: B.L. Myers Bros.
Log By: E. Dziedzic
Date: 21 June 1993

Sketch Map

Pollock Street Sewer Vicinity;
South Yard Figure attached

Depth (feet)	Grab Water Sample	Well Const.	OVM (ppm)	Initial Water Depth	Lithology	
		N/A	29		ASPHALT	- Asphalt and ballast stone.
					FILL	- Fill with brown/black sand, dry, odor.
			209			
5			309			
			436		SAND	- Dark grey sand, moist, odor.
10			216			
			46		SILT	- Orange silt, moist, slight odor.
15						
20	Floating NAPL Layer		189	▽		- Grey/Brown silt, moist, odor.
			76		GRAVEL	- Brown gravel with small pebbles, wet, odor.
			56			- Brown gravel with large pebbles, wet, odor, sheen.
					AUGER REFUSAL AT 24 FEET.	
25						
30						

Groundwater & Environmental Services, Inc.

Drilling Log

Project: Sun Philadelphia Refinery
Owner: Sun Company., Inc.
Location: 3144 Passyunk Ave., Phila.
Permit No.: N/A
Boring number: SB-7
Total Depth: 27 ft. Diameter: 6.125 in.
Casing Elevation: N/A
Water Level: Initial 14 ft. Static N/A
Screen Dia.: N/A
Length: N/A Slot Size: N/A
Casing Dia.: N/A
Length: N/A Type: N/A
Drilling Method: Hollow-Stem Auger
Sample Method: Split-Spoon
Completion Details: N/A
Driller: B.L. Myers Bros.
Log By: E. Dziedzic Date: 28 June 1993

Sketch Map

Pollock Street Sewer Vicinity; South Yard Figure attached

Depth (feet)	Grab Water Sample	Well Const.	OVM (ppm)	Initial Water Depth	Lithology	
		N/A			FILL	- Ballast stone (cobble size), large.
			3 33 11			
5						- Dark grey gravel fill, dry, odor.
			129		SILT	- Greyish brown silt, dry, odor.
10			12			
15	Floating NAPL Layer		218	▽ (14 ft)		- Pebbles in sandy matrix, moist, odor.
20						
25			277		GRAVEL	- Grey gravel, wet, sheen, odor.
30					BORING COMPLETED AT 27 FEET.	

Groundwater & Environmental Services, Inc.

Drilling Log

Project: Sun Philadelphia Refinery
Owner: Sun Company, Inc.
Location: 3144 Passyunk Ave., Phila.
Permit No.: N/A
Boring number: SB-10
Total Depth: 27 ft.
Diameter: 6.125 in.
Casing Elevation: N/A
Water Level: Initial 14 ft. Static N/A
Screen Dia.: N/A
Length: N/A
Slot Size: N/A
Casing Dia.: N/A
Length: N/A
Type: N/A
Drilling Method: Hollow-Stem Auger
Sample Method: Split-Spoon
Completion Details: N/A
Driller: B.L. Myers Bros.
Log By: E. Dziedzic
Date: 29 June 1993

Sketch Map

Pollock Street Sewer Vicinity;
South Yard Figure attached

Depth (feet)	Grab Water Sample	Well Const.	OVM (ppm)	Initial Water Depth	Lithology	
		N/A	0.0		ASPHALT	- Asphalt and ballast stone.
			15		FILL	- Black sandy fill, dry, no odor.
			24			
5					SILT	- Tan silt, dry, no odor.
			265			
10			154			
					GRAVEL	- Pebble-size gravel
			3421		SAND	- Grey coarse sand with pebbles, slight odor, wet.
15	Floating NAPL Layer			▽ (14 ft.)		
20						
					GRAVEL	- Cobble-size gravel
25			295		SAND	- Greyish/Brown coarse sand, wet, sheen, odor.
					BORING COMPLETED AT 27 FEET.	
30						

GES

Groundwater & Environmental Services, Inc.

Drilling Log

Project: Sun Philadelphia Refinery
Owner: Sun Company, Inc.
Location: 3144 Passyunk Ave., Phila.
Permit No.: N/A
Boring number: SB-12
Total Depth: 27 ft.
Diameter: 6.125 in.
Casing Elevation: N/A
Water Level: Initial 13 ft. Static N/A
Screen Dia.: N/A
Length: N/A
Slot Size: N/A
Casing Dia.: N/A
Length: N/A
Type: N/A
Drilling Method: Hollow-Stem Auger
Sample Method: Split-Spoon
Completion Details: N/A
Driller: B.L. Myers Bros.
Log By: E. Dziedzic
Date: 24 June 1993

Sketch Map

Pollock Street Sewer Vicinity;
South Yard Figure attached

Depth (feet)	Grab Water Sample	Well Const.	OVM (ppm)	Initial Water Depth	Lithology	
		N/A			ASPHALT	- Asphalt and ballast stone.
			27		FILL	- Grey sandy fill, dry, slight odor.
5			265			
			88		SAND	- Brown sand, moist.
10						
			11			- Brown silty sand, moist.
	Floating NAPL Layer			▽ (13 ft)		
15			280			- Black coarse sand and gravel with pebbles, wet, odor.
20						
25			311			
						- Dark brown coarse sand, gravel and pebbles, slight odor, globs of NAPL, wet.
					BORING COMPLETED AT 27 FEET.	
30						

GES

Groundwater & Environmental Services, Inc.

Drilling Log

Project: Sun Philadelphia Refinery
Owner: Sun Company, Inc.
Location: 3144 Passyunk Ave., Phila.
Permit No.: N/A
Boring number: SB-14
Total Depth: 27 ft. Diameter: 6.125 in.
Casing Elevation: N/A
Water Level: Initial 14 ft. Static N/A
Screen Dia.: N/A
Length: N/A Slot Size: N/A
Casing Dia.: N/A
Length: N/A Type: N/A
Drilling Method: Hollow-Stem Auger
Sample Method: Split-Spoon
Completion Details: N/A
Driller: B.L. Myers Bros.
Log By: E. Dziedzic Date: 29 June 1993

Sketch Map

Pollock Street Sewer Vicinity; South Yard Figure attached

Depth (feet)	Grab Water Sample	Well Const.	OVM (ppm)	Initial Water Depth	Lithology
		N/A			FILL - Stone fill, dry, no odor.
1			263		- Black sandy fill, odor.
5			180		
8			19		SAND - Greyish/Brown silty sand, moist, odor.
10					
11			260		
13					- Brownish/Grey fine sand, wet, slight odor.
14	Floating NAPL Layer			▽	
15			1310		
20			679		
21					GRAVEL - Pebbles and cobbles, some sand, slight odor.
25			447		
27					BORING COMPLETED AT 27 FEET.
30					

GES

Groundwater & Environmental Services, Inc.

Drilling Log

Project: Sun Philadelphia Refinery
Owner: Sun Company, Inc
Location: 3144 Passyunk Ave., Phila.
Permit No.: N/A
Boring number: SB-17
Total Depth: 27 ft. Diameter: 6.125 in.
Casing Elevation: N/A
Water Level: Initial 13 ft. Static N/A
Screen Dia.: N/A
Length: N/A Slot Size: N/A
Casing Dia.: N/A
Length: N/A Type: N/A
Drilling Method: Hollow-Stem Auger
Sample Method: Split-Spoon
Completion Details: N/A
Driller: B.L. Myers Bros.
Log By: E. Dziedzic Date: 24 June 1993

Sketch Map

Pollock Street Sewer Vicinity; South Yard Figure attached

Depth (feet)	Grab Water Sample	Well Const.	OVM (ppm)	Initial Water Depth	Lithology	
0		N/A			FILL	- Grey sandy fill with stone, dry, odor.
2			326			
5			2568		SAND	- Black sticky sand, slight odor.
10			265			
13	Floating NAPL Layer			▽		
15			459		GRAVEL	- Black gravel with pebbles interbedded with silt, wet, sheen, stained, odor.
18						- Cobble-size gravel.
20					SAND	- Black sand, water/NAPL spooge, sheen, odor.
22					GRAVEL	- Cobble-size gravel.
23					SAND	- Dark grey coarse sand.
25			111			
26					GRAVEL	- Gravel with some pebbles, odor, wet
27					BORING COMPLETED AT 27 FEET	
30						

Groundwater & Environmental Services, Inc.

Drilling Log

Project: Sun Philadelphia Refinery
Owner: Sun Company, Inc.
Location: 3144 Passyunk Ave., Phila.
Permit No.: N/A
Boring number: SB-18
Total Depth: 22 ft.
Diameter: 6.125 in.
Casing Elevation: N/A
Water Level: Initial 12 ft. Static N/A
Screen Dia.: N/A
Length: N/A
Slot Size: N/A
Casing Dia.: N/A
Length: N/A
Type: N/A
Drilling Method: Hollow-Stem Auger
Sample Method: Split-Spoon
Completion Details: N/A
Driller: B.L. Myers Bros.
Log By: E. Dziedzic
Date: 28 June 1993

Sketch Map

Pollock Street Sewer Vicinity;
South Yard Figure attached

Depth (feet)	Grab Water Sample	Well Const.	OVM (ppm)	Initial Water Depth	Lithology
		N/A			FILL - Large cobble size stone fill.
					- Brown sandy fill, dry, no odor.
5			70		
			3		
10					
	Floating NAPL Layer		78	▽	
					SAND - Brown sand with pebbles, moist.
			344		- Coarse sand and pebbles, wet, sheen, stained, slight odor.
15					
					- Pebbles and cobbles, no odor.
20			337		- Coarse sand, gravel and pebbles, wet, sheen, slight odor.
					BORING COMPLETED AT 22 FEET.
25					
30					

GES

Groundwater & Environmental Services, Inc.

Drilling Log

Project: Sun Philadelphia Refinery
Owner: Sun Company, Inc.
Location: 3144 Passyunk Ave., Phila.
Permit No.: N/A
Boring number: SB-19
Total Depth: 27 ft.
Diameter: 6.125 in.
Casing Elevation: N/A
Water Level: Initial 13 ft. Static N/A
Screen Dia.: N/A
Length: N/A
Slot Size: N/A
Casing Dia.: N/A
Length: N/A
Type: N/A
Drilling Method: Hollow-Stem Auger
Sample Method: Split-Spoon
Completion Details: N/A
Driller: B.L. Myers Bros.
Log By: E. Dziedzic
Date: 23 June 1993

Sketch Map

Pollock Street Sewer Vicinity;
South Yard Figure attached

Depth (feet)	Grab Water Sample	Well Const.	OVM (ppm)	Initial Water Depth	Lithology	
0		N/A	10		FILL	- Dark brown sandy fill with stone and wood, dry no odor.
5			72			
			24		SILT	- Brown sandy silt, moist, no odor.
10			106			
					SAND	- Dark grey sand with pebbles, moist, odor.
	Floating NAPL Layer			▽ (13 ft)		
			403			
15						
			482		GRAVEL	- Grey/brown gravel with pebbles, wet, sheen slight odor.
					SAND	- Brown sand with pebbles and cobbles.
20						
25			58			- Coarse brown sand, some pebbles, wet, sheen, odor.
					BORING COMPLETED AT 27 FEET	
30						

GES

Groundwater & Environmental Services, Inc.

Drilling Log

Project: Sun Philadelphia Refinery
Owner: Sun Company, Inc.
Location: 3144 Passyunk Ave., Phila.
Permit No.: N/A
Boring number: SB-20
Total Depth: 27 ft.
Diameter: 6.125 in.
Casing Elevation: N/A
Water Level: Initial 16 ft. Static N/A
Screen Dia.: N/A
Length: N/A
Slot Size: N/A
Casing Dia.: N/A
Length: N/A
Type: N/A
Drilling Method: Hollow-Stem Auger
Sample Method: Split-Spoon
Completion Details: N/A
Driller: B.L. Myers Bros.
Log By: E. Dziedzic
Date: 23 June 1993

Sketch Map

Pollock Street Sewer Vicinity; South Yard Figure attached

Depth (feet)	Grab Water Sample	Well Const.	OVM (ppm)	Initial Water Depth	Lithology
		N/A			FILL - Brown/Tan sandy fill with stones, dry, no odor.
5			97		SAND - Black (stained) sand, odor.
			10		CLAY - Dark brown silty clay, moist, slight odor.
10					
					SILT - Dark brown sandy silt, moist, no odor.
15					- Brown/Black sandy silt, moist, odor.
	Floating NAPL Layer		58	▽	
			51		SAND - Brown sand with pebbles.
20					
25					
			251		GRAVEL - Dark brownish/grey gravel with pebbles, wet, odor, sheen.
					BORING COMPLETED AT 27 FEET.
30					

Groundwater & Environmental Services, Inc.

Drilling Log

Project: Sun Philadelphia Refinery
Owner: Sun Company, Inc.
Location: 3144 Passyunk Ave., Phila.
Permit No.: N/A
Boring number: SB-21
Total Depth: 27 ft. Diameter: 6.125 in.
Casing Elevation: N/A
Water Level: Initial 17 ft. Static N/A
Screen Dia.: N/A
Length: N/A Slot Size: N/A
Casing Dia.: N/A
Length: N/A Type: N/A
Drilling Method: Hollow-Stem Auger
Sample Method: Split-Spoon
Completion Details: N/A
Driller: B.L. Myers Bros.
Log By: E. Dziedzic Date: 23 June 1993

Sketch Map

Pollock Street Sewer Vicinity;
South Yard Figure attached

Depth (feet)	Grab Water Sample	Well Const.	OVM (ppm)	Initial Water Depth	Lithology	
0		N/A	3		FILL	- Tan sandy fill, dry, no odor.
5			17		SAND	- Brown silty sand, dry, no odor.
10			14 106			- Brown fine sand with pebbles, moist, odor.
15			865		GRAVEL/SAND	- Tan gravel and sand with large pebbles, moist, slight odor.
17	Floating NAPL Layer			▽		
19						- Cobble-size gravel.
25			189		SAND	- Dark brown/grey medium sand, wet, odor, sheen.
26			72		GRAVEL	- Gravel with pebbles, wet, odor, sheen.
27					BORING COMPLETED AT 27 FEET.	
30						

GES

Groundwater & Environmental Services, Inc.

Drilling Log

Project: Sun Philadelphia Refinery
Owner: Sun Company, Inc.
Location: 3144 Passyunk Ave., Phila.
Permit No.: N/A
Boring number: SB-22
Total Depth: 20 ft.
Diameter: 6.125 in.
Casing Elevation: N/A
Water Level: Initial 14 ft. Static N/A
Screen Dia.: N/A
Length: N/A
Slot Size: N/A
Casing Dia.: N/A
Length: N/A
Type: N/A
Drilling Method: Hollow-Stem Auger
Sample Method: Split-Spoon
Completion Details: N/A
Driller: B.L. Myers Bros.
Log By: E. Dziedzic
Date: 23 June 1993

Sketch Map

Pollock Street Sewer Vicinity; South Yard Figure attached

Depth (feet)	Grab Water Sample	Well Const.	OVM (ppm)	Initial Water Depth	Lithology
0		N/A			SAND - Brown silty sand, dry, no odor.
7			10		
11					SILT - Dark brown clayey silt, dry, no odor.
14	Floating NAPL Layer			▽ (14 ft)	
15			0.0		SAND - Brown silty sand with large pebbles, moist, no odor.
17					GRAVEL - Cobble-size gravel.
20					AUGER REFUSAL AT 20 FEET
25					
30					

GES

Groundwater & Environmental Services, Inc.

Drilling Log

Project Sun Philadelphia Refinery
Owner Sun Company, Inc.
Location 3144 Passyunk Ave., Phila.
Permit No. N/A
Boring number SB-23
Total Depth 27 ft. Diameter 6.125 in.
Casing Elevation N/A
Water Level: Initial 14 ft. Static N/A
Screen Dia. N/A
Length N/A Slot Size N/A
Casing Dia. N/A
Length N/A Type N/A
Drilling Method Hollow-Stem Auger
Sample Method Split-Spoon
Completion Details N/A
Driller B.L. Myers Bros.
Log By E. Dziedzic Date 29 June 1993

Sketch Map

Pollock Street Sewer Vicinity; South Yard Figure attached

Depth (feet)	Grab Water Sample	Well Const.	OVM (ppm)	Initial Water Depth	Lithology
0–1		N/A			ASPHALT - Asphalt.
1–6			157, 339		FILL - Black sandy fill, dry, slight odor.
6–15		Floating NAPL Layer	14, 278	▽ (14 ft)	SILT - Black sandy silt, dry, no odor.
15–20			515		SAND - Coarse sand, gravel, and pebbles, moist, odor.
20–21			1039		SILT - Tan clayey silt .
21–22					GRAVEL - Pebble-size gravel
22–27					CLAY - Greenish silty clay
27					BORING COMPLETED AT 27 FEET.

Groundwater & Environmental Services, Inc.

Drilling Log

Project Sun Philadelphia Refinery | Owner Sun Company, Inc.

Location 3144 Passyunk Ave., Phila. | Permit No. N/A

Boring number SB-24 | Total Depth 22 ft. Diameter 6.125 in.

Casing Elevation N/A | Water Level: Initial 12 ft. Static N/A

Screen Dia. N/A | Length N/A Slot Size N/A

Casing Dia. N/A | Length N/A Type N/A

Drilling Method Hollow-Stem Auger | Sample Method Split-Spoon

Completion Details N/A

Driller B.L. Myers Bros. | Log By E. Dziedzic Date 25 June 1993

Sketch Map

Pollock Street Sewer Vicinity;
South Yard Figure attached

Depth (feet)	Grab Water Sample	Well Const.	OVM (ppm)	Initial Water Depth	Lithology
0		N/A	0.0		FILL - Dark brown sandy fill with crushed stone, dry, no odor.
4			36		- Black sandy fill with crushed stone, dry, no odor.
5					
9			0.0		
10			15		SAND - Black sand, moist, no odor
12	Floating NAPL Layer		3145	▽	GRAVEL - Black gravel with quartz pebbles, wet, sheen, strong odor.
15					
19					SAND - Grey coarse grained sand, wet, odor.
20					
21			78		
22					BORING COMPLETED AT 22 FEET.
25					
30					

GES

Groundwater & Environmental Services, Inc.

Drilling Log

Project: Sun Philadelphia Refinery
Owner: Sun Company, Inc.
Location: 3144 Passyunk Ave., Phila.
Permit No.: N/A
Boring number: SB-26
Total Depth: 20 ft.
Diameter: 6.125 in.
Casing Elevation: N/A
Water Level: Initial N/A Static N/A
Screen Dia.: N/A
Length: N/A
Slot Size: N/A
Casing Dia.: N/A
Length: N/A
Type: N/A
Drilling Method: Hollow-Stem Auger
Sample Method: Split-Spoon
Completion Details: N/A
Driller: B.L. Myers Bros.
Log By: E. Dziedzic
Date: 29 June 1993

Sketch Map

Pollock Street Sewer Vicinity;
South Yard Figure attached

Depth (feet)	Grab Water Sample	Well Const.	OVM (ppm)	Initial Water Depth	Lithology	
		N/A			ASPHALT	- Asphalt.
					FILL	- Stone fill, dry, no odor.
			75			- Dark brown sandy fill, dry, odor.
5						
			0.0		SILT	- Brown silt, dry, no odor.
			5			
10						
					GRAVEL	- Gravel and pebbles with some silt, wet, no odor.
						- Cobble-size gravel.
15			15			
			33		SAND	- Brown sand, moist.
			3		SILT	- Brown silt, moist.
					GRAVEL	- Cobble-size gravel.
20					AUGER REFUSAL AT 20 FEET.	
25						
30						

Groundwater & Environmental Services, Inc.

Drilling Log

Project: Sun Philadelphia Refinery | Owner: Sun Company, Inc.

Location: 3144 Passyunk Ave., Phila. | Permit No.: N/A

Boring number: SB-27 | Total Depth: 27 ft. | Diameter: 6.125 in.

Casing Elevation: N/A | Water Level: Initial: 15 ft. | Static: N/A

Screen Dia.: N/A | Length: N/A | Slot Size: N/A

Casing Dia.: N/A | Length: N/A | Type: N/A

Drilling Method: Hollow-Stem Auger | Sample Method: Split-Spoon

Completion Details: N/A

Driller: B.L. Myers Bros. | Log By: E. Dziedzic | Date: 29 June 1993

Sketch Map

Pollock Street Sewer Vicinity;
South Yard Figure attached

Depth (feet)	Grab Water Sample	Well Const.	OVM (ppm)	Initial Water Depth	Lithology	
0		N/A			FILL	- Stone fill.
1			28			- Black sandy fill, dry.
2			229			
4			77		SILT	- Grey/Brown sandy silt, dry, slight odor.
10			122			
13			315			
14–15	Floating NAPL Layer			15 ft (water level symbol)	GRAVEL	- Pebble and cobble-size gravel
16			515		SAND	- Brown sand with pebbles, moist, odor.
20			275			
25			1066		GRAVEL	- Gravel, coarse sand and pebbles, wet, sheen, odor.
27					BORING COMPLETED AT 27 FEET.	

Depth scale: 5, 10, 15, 20, 25, 30

Groundwater & Environmental Services, Inc.

Drilling Log

Project: Sun Philadelphia Refinery
Owner: Sun Company., Inc.
Location: 3144 Passyunk Ave., Phila.
Permit No.: N/A
Boring number: SB-28
Total Depth: 22 ft.
Diameter: 6.125 in.
Casing Elevation: N/A
Water Level: Initial: 13 ft. Static: N/A
Screen Dia.: N/A
Length: N/A
Slot Size: N/A
Casing Dia.: N/A
Length: N/A
Type: N/A
Drilling Method: Hollow-Stem Auger
Sample Method: Split-Spoon
Completion Details: N/A
Driller: B.L. Myers Bros.
Log By: E. Dziedzic
Date: 28 June 1993

Sketch Map

Pollock Street Sewer Vicinity; South Yard Figure attached

Depth (feet)	Grab Water Sample	Well Const.	OVM (ppm)	Initial Water Depth	Lithology	
0		N/A			FILL	- Brown sandy fill with crushed stone, dry, no odor.
2.5			3			
4					SILT	- Brown silt, dry, no odor.
5						- Greyish/brown sandy silt, moist, no odor.
10						
13	Floating NAPL Layer		11	▽		- Brown/grey sandy silt, wet, slight odor.
15						
20			4			- Dark brown sandy silt with organic peat, moist, no odor.
22					BORING COMPLETED AT 22 FEET.	
25						
30						

GES

Groundwater & Environmental Services, Inc.

Drilling Log

Project: Sun Philadelphia Refinery
Owner: Sun Company, Inc.
Location: 3144 Passyunk Ave., Phila.
Permit No.: N/A
Boring number: SB-29
Total Depth: 22 ft.
Diameter: 6.125 in.
Casing Elevation: N/A
Water Level: Initial 13 ft. Static N/A
Screen Dia.: N/A
Length: N/A
Slot Size: N/A
Casing Dia.: N/A
Length: N/A
Type: N/A
Drilling Method: Hollow-Stem Auger
Sample Method: Split-Spoon
Completion Details: N/A
Driller: B.L. Myers Bros.
Log By: E. Dziedzic
Date: 28 June 1993

Sketch Map

Pollock Street Sewer Vicinity;
South Yard Figure attached

Depth (feet)	Grab Water Sample	Well Const.	OVM (ppm)	Initial Water Depth	Lithology
		N/A			FILL - Sandy fill with stone, dry, no odor.
			4		
5			0.0		SILT - Tan clayey silt, moist, no odor.
			0.0		
10					
			48		
	Floating NAPL Layer		18	▽	
15					GRAVEL/SAND - Black gravel and grey coarse sand, moist, odor.
			420		
20					SAND - Coarse sand (top), gravel with pebbles (bottom) black, wet, sheen, odor.
			99		
					BORING COMPLETED AT 22 FEET.
25					
30					

GES

Groundwater & Environmental Services, Inc.

Drilling Log

Project: Sun Philadelphia Refinery
Owner: Sun Company, Inc.
Location: 3144 Passyunk Ave., Phila.
Permit No.: N/A
Boring number: SB-31
Total Depth: 22 ft.
Diameter: 6.125 in.
Casing Elevation: N/A
Water Level: Initial: 14 ft.
Static: N/A
Screen Dia.: N/A
Length: N/A
Slot Size: N/A
Casing Dia.: N/A
Length: N/A
Type: N/A
Drilling Method: Hollow-Stem Auger
Sample Method: Split-Spoon
Completion Details: N/A
Driller: B.L. Myers Bros.
Log By: E. Dziedzic
Date: 24 June 1993

Sketch Map

Pollock Street Sewer Vicinity;
South Yard Figure attached

Depth (feet)	Grab Water Sample	Well Const.	OVM (ppm)	Initial Water Depth	Lithology	
0		N/A			ASPHALT	- Asphalt and ballast stone.
1.5			11		FILL	- Grey sandy fill with crushed stone, dry, odor.
4.5–5			142 188		SILT	- Dark grey silt, dry, odor.
8			65			
13			26			- Brown silt, dry, odor.
14				▽		
15.5			11		CLAY	- Brown/Tan banded silty clay, wet, no odor.
20						- Gray clay, some oganic matter, wet, no odor
21			0.0			
22					BORING COMPLETED AT 22 FEET.	

Depth scale: 5, 10, 15, 20, 25, 30

GES

Groundwater & Environmental Services, Inc.

Drilling Log

Project: Sun Philadelphia Refinery
Owner: Sun Company, Inc.
Location: 3144 Passyunk Ave., Phila.
Permit No.: N/A
Boring number: SB-32
Total Depth: 25 ft. Diameter: 6.125 in.
Casing Elevation: N/A
Water Level: Initial 16 ft. Static N/A
Screen Dia.: N/A
Length: N/A Slot Size: N/A
Casing Dia.: N/A
Length: N/A Type: N/A
Drilling Method: Hollow-Stem Auger
Sample Method: Split-Spoon
Completion Details: N/A
Driller: B.L. Myers Bros.
Log By: E. Dziedzic Date: 24 June 1993

Sketch Map

Pollock Street Sewer Vicinity;
South Yard Figure attached

Depth (feet)	Grab Water Sample	Well Const.	OVM (ppm)	Initial Water Depth	Lithology
0–1		N/A	0.0		ASPHALT - Asphalt and ballast stone.
1–4.5					SAND/GRAVEL - Black sand and gravel, dry, slight odor.
5			0.0		SILT - Brown banded silt, dry, no odor.
7.5			3		
10					
12					CLAY - Stiff clay
14					GRAVEL - Pebble and cobble-size gravel.
15					SAND - Brown coarse sand, gravel, and pebbles, moist, strong odor.
16	Floating NAPL Layer		480	▽	
20					
22			465		
24.5					- Pebbles with coarse sand, wet, sheen, odor.
25			26		BORING COMPLETED AT 25 FEET.
30					

Groundwater & Environmental Services, Inc.

Drilling Log

Project	Sun Philadelphia Refinery	Owner	Sun Company, Inc.
Location	3144 Passyunk Ave., Phila.	Permit No.	N/A
Boring number	SB-33	Total Depth	27 ft. Diameter 6.125 in.
Casing Elevation	N/A	Water Level: Initial	20 ft. Static N/A
Screen Dia.	N/A	Length	N/A Slot Size N/A
Casing Dia.	N/A	Length	N/A Type N/A
Drilling Method	Hollow-Stem Auger	Sample Method	Split-Spoon
Completion Details	N/A		
Driller	B.L. Myers Bros.	Log By	E. Dziedzic Date 23 June 1993

Sketch Map

Pollock Street Sewer Vicinity;
South Yard Figure attached

Depth (feet)	Grab Water Sample	Well Const.	OVM (ppm)	Initial Water Depth	Lithology	
		N/A			ASPHALT	- Asphalt and ballast
			44			
			464		SAND	- Black sand with fill, odor.
5						
			31			- Black/Dark brown silty sand, moist, odor.
10						
			10			
					SILT	- Dark grey sandy silt, moist, odor.
15			65			- Grey clayey silt, moist, no odor.
20	Floating NAPL Layer			▽		- Brown sandy silt, moist, slight odor, stained.
			1056		GRAVEL	- Grey gravel, wet, slight odor, stained.
25						
			608		SAND	- Brown sand with gravel and pebbles, wet, odor, no sheen.
					BORING COMPLETED AT 27 FEET	
30						

Groundwater & Environmental Services, Inc.

Drilling Log

GES

Project: Sun Philadelphia Refinery	Owner: Sun Company, Inc.
Location: 3144 Passyunk Ave., Phila.	Permit No.: N/A
Boring number: SB-34	Total Depth: 25 ft. Diameter: 6.125 in.
Casing Elevation: N/A	Water Level: Initial 15 ft. Static N/A
Screen Dia.: N/A	Length: N/A Slot Size: N/A
Casing Dia.: N/A	Length: N/A Type: N/A
Drilling Method: Hollow-Stem Auger	Sample Method: Split-Spoon
Completion Details: N/A	
Driller: B.L. Myers Bros.	Log By: E. Dziedzic Date: 24 June 1993

Sketch Map

Pollock Street Sewer Vicinity;
South Yard Figure attached

Depth (feet)	Grab Water Sample	Well Const.	OVM (ppm)	Initial Water Depth	Lithology	
0–4		N/A			FILL	- Brown sandy fill with stone, dry, no odor.
5			11		SAND	- Black sticky silty sand with fill, slight odor.
7			19			- Black silty sand, sticky, odor, moist.
15	Floating NAPL Layer		11	▽ (15 ft)	SILT	- Brownish/grey sandy silt, wet, slight odor, sheen.
20					GRAVEL	- Pebble and cobble size gravel.
25					BORING COMPLETED AT 25 FEET.	
30						

GES

Groundwater & Environmental Services, Inc.

Drilling Log

Project Sun Philadelphia Refinery
Owner Sun Company, Inc.
Location 3144 Passyunk Ave., Phila.
Permit No. N/A
Boring number SB-35
Total Depth 27 ft. Diameter 6.125 in.
Casing Elevation N/A
Water Level: Initial 14 ft. Static N/A
Screen Dia. N/A
Length N/A Slot Size N/A
Casing Dia. N/A
Length N/A Type N/A
Drilling Method Hollow-Stem Auger
Sample Method Split-Spoon
Completion Details N/A
Driller B.L. Myers Bros.
Log By E. Dziedzic Date 23 June 1993

Sketch Map

Pollock Street Sewer Vicinity;
South Yard Figure attached

Depth (feet)	Grab Water Sample	Well Const.	OVA (ppm)	Initial Water Depth	Lithology	
0		N/A	3		FILL	- Brown sandy fill with stones, dry, no odor.
3			31		SILT	- Brown silt, dry, slight odor.
5						
8			65			
10						
12			79		SAND	- Brown fine sand, moist, odor.
14	Floating NAPL Layer		1151	▽		
15			411		GRAVEL	- Black (stained) gravel with pebbles, odor, wet.
20			608			- Dark brown (stained) gravel with pebbles, odor, wet.
25			17		CLAY	- Tan silty clay, moist, no odor.
27					BORING COMPLETED AT 27 FEET.	
30						

Groundwater & Environmental Services, Inc.

Drilling Log

Project Sun Philadelphia Refinery
Owner Sun Company, Inc.
Location 3144 Passyunk Ave., Phila.
Permit No. N/A
Boring number SB-36
Total Depth 22 ft. Diameter 6.125 in.
Casing Elevation N/A
Water Level: Initial 10 ft. Static N/A
Screen Dia. N/A
Length N/A Slot Size N/A
Casing Dia. N/A
Length N/A Type N/A
Drilling Method Hollow-Stem Auger
Sample Method Split-Spoon
Completion Details N/A
Driller B.L. Myers Bros.
Log By E. Dziedzic Date 25 June 1993

Sketch Map

Pollock Street Sewer Vicinity;
South Yard Figure attached

Depth (feet)	Grab Water Sample	Well Const.	OVM (ppm)	Initial Water Depth	Lithology	
		N/A			FILL	- Crushed stone.
			99			- Black sandy fill, dry, odor.
			121			
5						
			1462			
			872		SAND	- Brown sand with pebbles, moist, odor.
10	Floating NAPL Layer			▽		
			1462			- Brown coarse sand with gravel and pebbles, slight odor, wet.
15						
20			0.0			
					CLAY	- Brown silty clay, wet, no odor.
					BORING COMPLETED AT 22 FEET.	
25						
30						

GES

Groundwater & Environmental Services, Inc.

Drilling Log

Project: Sun Philadelphia Refinery
Owner: Sun Company., Inc.
Location: 3144 Passyunk Ave., Phila.
Permit No.: N/A
Boring number: SB-38
Total Depth: 22 ft.
Diameter: 6.125 in.
Casing Elevation: N/A
Water Level: Initial 10 ft. Static N/A
Screen Dia.: N/A
Length: N/A
Slot Size: N/A
Casing Dia.: N/A
Length: N/A
Type: N/A
Drilling Method: Hollow-Stem Auger
Sample Method: Split-Spoon
Completion Details: N/A
Driller: B.L. Myers Bros.
Log By: E. Dziedzic
Date: 25 June 1993

Sketch Map

Pollock Street Sewer Vicinity;
South Yard Figure attached

Depth (feet)	Grab Water Sample	Well Const.	OVM (ppm)	Initial Water Depth	Lithology	
		N/A			FILL	- Crushed stone.
1			173			- Dark brown sandy fill, crushed stone and wood, dry, odor.
5			159			
6–7			586			
7					SAND	- Brown silty sand, moist, slight odor.
10	Floating NAPL Layer		569	10 ft.		- Interbedded sands, gravels and pebbles, wet, slight odor.
15						
20					SILT	- Dark brown clayey silt, wet, sheen on water, no odor.
21			0.0			
22					BORING COMPLETED AT 22 FEET	
25						
30						

Groundwater & Environmental Services, Inc.

Drilling Log

Project: Sun Philadelphia Refinery — Owner: Sun Company., Inc.

Location: 3144 Passyunk Ave., Phila. — Permit No.: N/A

Boring number: SB-40 — Total Depth: 22 ft. — Diameter: 6.125 in.

Casing Elevation: N/A — Water Level: Initial 11 ft. Static N/A

Screen Dia.: N/A — Length: N/A — Slot Size: N/A

Casing Dia.: N/A — Length: N/A — Type: N/A

Drilling Method: Hollow-Stem Auger — Sample Method: Split-Spoon

Completion Details: N/A

Driller: B.L. Myers Bros. — Log By: E. Dziedzic — Date: 25 June 1993

Sketch Map

Pollock Street Sewer Vicinity;
South Yard Figure attached

Depth (feet)	Grab Water Sample	Well Const.	OVM (ppm)	Initial Water Depth	Lithology
0		N/A	205		FILL - Brown sandy fill, dry, no odor.
3			5		
4					SAND - Greyish/Brown sand, dry, no odor.
5					
7			89		
10			1246		
11	Floating NAPL Layer			▽	
12			657		- Brown coarse sand with gravel and pebbles, wet, slight odor.
15					
20					CLAY - Tan silty clay, moist, no odor.
22					BORING COMPLETED AT 22 FEET.
25					
30					

Groundwater & Environmental Services, Inc.

Drilling Log

Project Sun Philadelphia Refinery
Owner Sun Company, Inc.

Location 3144 Passyunk Ave., Phila.
Permit No. N/A

Boring number SB-41
Total Depth 27 ft. Diameter 6.125 in.

Casing Elevation N/A
Water Level: Initial 14 ft. Static N/A

Screen Dia. N/A
Length N/A Slot Size N/A

Casing Dia. N/A
Length N/A Type N/A

Drilling Method Hollow-Stem Auger
Sample Method Split-Spoon

Completion Details N/A

Driller B.L. Myers Bros.
Log By E. Dziedzic Date 24 June 1993

Sketch Map

North Yard southern perimeter
Figure attached

Depth (feet)	Grab Water Sample	Well Const.	OVM (ppm)	Initial Water Depth	Lithology	
0–1		N/A			ASPHALT	- Asphalt and ballast stone.
1–11			203, 496, 634		SAND	- Black sand with fill, dry, odor.
11–15	Floating NAPL Layer		813	14	GRAVEL	- Gravel, black, moist, sticky, pebbles.
15–22			34, 26		CLAY	- Grey and tan clay, stiff, wet.
22–25					GRAVEL	- Cobble-size gravel.
25–26					CLAY	- Grey clay, wet, odor.
26–27					SAND	- Brown sand and pebbles, wet, odor.
					BORING COMPLETED AT 27 FEET	

Groundwater & Environmental Services, Inc.

Drilling Log

Project: Sun Philadelphia Refinery
Owner: Sun Company, Inc.
Location: 3144 Passyunk Ave., Phila.
Permit No.: N/A
Boring number: SB-42
Total Depth: 22 ft.
Diameter: 6.125 in.
Casing Elevation: N/A
Water Level: Initial: 13 ft. Static: N/A
Screen Dia.: N/A
Length: N/A
Slot Size: N/A
Casing Dia.: N/A
Length: N/A
Type: N/A
Drilling Method: Hollow-Stem Auger
Sample Method: Split-Spoon
Completion Details: N/A
Driller: B.L. Myers Bros.
Log By: E. Dziedzic
Date: 13 August 1993

Sketch Map

Pollock Street Sewer Vicinity;
South Yard Figure attached

Depth (feet)	Grab Water Sample	Well Const.	OVM (ppm)	Initial Water Depth	Lithology
0		N/A			FILL - Ballast stone (cobble size), large.
1			12		SAND - Brown silty sand , some fill, dry
5			5		
7			27		
10					
12			7		GRAVEL - Gravel with large pebbles, moist, no odor
13	Floating NAPL Layer			▽	
15			1774		- Gravel with coarse sand, wet, sheen, strong odor
20			1034		- Gravel with coarse sand, wet, sheen, strong odor
22					BORING COMPLETED AT 22 FEET.
25					
30					

GES

Groundwater & Environmental Services, Inc.

Drilling Log

Project Sun Philadelphia Refinery | Owner Sun Company, Inc.

Location 3144 Passyunk Ave., Phila. | Permit No. N/A

Boring number SB-43 | Total Depth 22 ft. | Diameter 6.125 in.

Casing Elevation N/A | Water Level: Initial 13 ft. | Static N/A

Screen Dia. N/A | Length N/A | Slot Size N/A

Casing Dia. N/A | Length N/A | Type N/A

Drilling Method Hollow-Stem Auger | Sample Method Split-Spoon

Completion Details N/A

Driller B.L. Myers Bros. | Log By E. Dziedzic | Date 13 August 1993

Sketch Map

Pollock Street Sewer Vicinity;
South Yard Figure attached

Depth (feet)	Grab Water Sanmple	Well Const.	OVM (ppm)	Initial Water Depth	Lithology	
		N/A			ASPHALT	- Asphalt and ballast stone
			739		FILL	- Black sand fill, dry, odor
			62			
5					SILT	- Greyish brown sandy silt, moist
			96			
10			186		SAND	- Coarse tan sand, moist, odor
	Floating NAPL Layer			▽		
15			1477			- Coarse sand with some pebbles, wet, strong odor
20			376		GRAVEL	Gravel with coarse to medium sand, wet, sheen, odor
					BORING COMPLETED AT 22 FEET.	
25						
30						

Groundwater & Environmental Services, Inc.

Drilling Log

Project Sun Philadelphia Refinery
Owner Sun Company, Inc.
Location 3144 Passyunk Ave., Phila.
Permit No. N/A
Boring number SB-44
Total Depth 32 ft. Diameter 6.125 in.
Casing Elevation N/A
Water Level: Initial 16 ft. Static N/A
Screen Dia. N/A
Length N/A Slot Size N/A
Casing Dia. N/A
Length N/A Type N/A
Drilling Method Hollow-Stem Auger
Sample Method Split-Spoon
Completion Details N/A
Driller B.L. Myers Bros.
Log By E. Dziedzic Date 13 August 1993

Sketch Map

Pollock Street Sewer Vicinity; South Yard Figure attached

Depth (feet)	Grab Water Sample	Well Const.	OVM (ppm)	Initial Water Depth	Lithology	
0		N/A			ASPHALT	- Asphalt and ballast stone.
1			4		FILL	- Brown sandy fill, dry, no odor
5					SILT	Tan clayey silt, dry, no odor
7			14		SAND	- Tan silty sand, dry, slight odor
10			6			
15			20			- Reddish brown silty sand with peebles, moist, no odor
16				▽		
18					GRAVEL	- Pebble-size gravel
20						- Cobble-size gravel
22					SAND	- Brown medium sand, wet, no odor
25			31			
30			4			- Brown fine sand, wet, no odor
32					BORING COMPLETED AT 32 FEET.	

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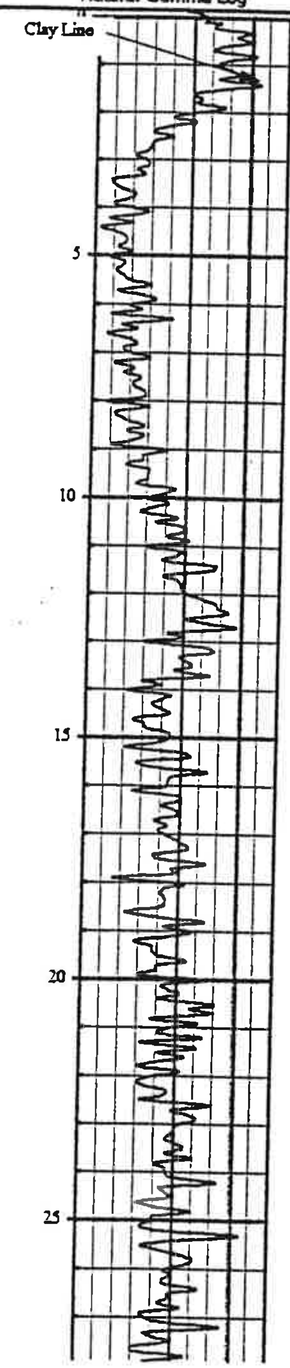
SOIL BORING LOG

Coordinates:	N/A	**BORING NO.**	SB-201
Surface Elevation:	26.28	**Project No.**	SU001E
Casing Below Surface:	N/A	**Client:**	Sun Company, Inc.
Reference Elevation:	N/A	**Location:**	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	**GROUND WATER**	
Start Date:		**Depth Below:**	**Surface**
Comp Date:	01-Aug-97	**At Time of Boring:**	N/A
Weather:		**After One Week:**	N/A
		Surface Conditions:	

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description
0	26.28	Fill	50		na			Fill Material: silt w/sand, organic matter, small rock fragments. Stained black.
5	21.28	Fill	1,250		0	5	0%	Fill Material: sampler plugged @ approx. 5' w/asphaltic material & wood fragments. Stained black, HC odors. Wet.
10	16.28	Fill			4	5	80%	Black stained fill material (rock fragments, brick, coarse sand. Saturated.
12.5	13.78	CL	2,500					Gray micaceous clay, trace silt
15	11.28	CL			1.5	5	30%	Brown micaceous clay, sandy
		SP	10,000					vc brown to red sand w/trace silt, trace md qtz pebbles, trace mica. thin laminae of green sandy silt. Strong HC odor, moist.
20	6.28	GW	10,000		2.5	5	50%	Brown sandy gravel w/trace mica (gravel >4 cm), grades to f-m brn sand w/tr silt and rounded qtz pebbles. HC odor
25	1.28	SW	6,385		1	5	20%	m-vc dark brn sand w/40% gravel. gravel is qtz w/some rock fragments. HC odor. NAPL present.

Natural Gamma Log



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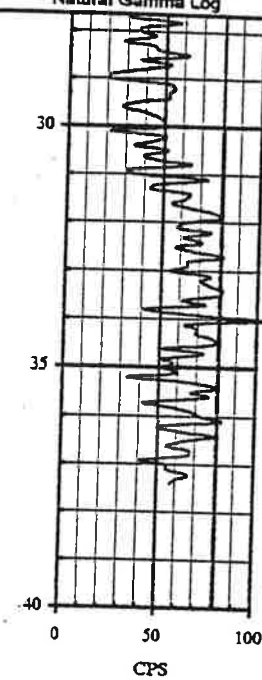
SOIL BORING LOG

Coordinates:	N/A	BORING NO.	SB-201
Surface Elevation:	26.28	Project No.	SU001E
Casing Below Surface:	N/A	Client:	Sun Company, Inc.
Reference Elevation:	N/A	Location:	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	GROUND WATER	
Start Date:		Depth Below:	Surface
Comp Date:	01-Aug-97	At Time of Boring:	N/A
Weather:		After One Week:	N/A
		Surface Conditions:	

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description
30	-3.72	SP			0.75	5	15%	vf-f silty sand, poor recovery (slurry-like mixture ran out of sample tube) Strong HC odor
33	-6.72	SW	10,000					m-vc dark brn sand w/40-45% gravel (3-4 cm) (entire 5-ft interval is a fining upward sequence.)
35	-8.72	SP			2.5	5	50%	vf-f dark gray sand, strong HC odor
37	-10.72	SW	4,500					m-vc sand w/20% gravel (qtz pebbles & rock fragments), strong HC odor
40	-13.72	SP			2.5	5	50%	vf-f dark gray silty sand, HC odor
43	-16.72	SW	305					m-c dark gray to black sands. Abrupt color change @ 44.5-ft to brn m-c sands
45	-18.72	SP			3	5	60%	vf-f brn silty sand,
			250					m-c brn sand w/trace silt
50	-23.72	SP			2	5	40%	vf-f brn silty sand,
		SW	2,025					f-c brn sand w/trace silt, 15% vc sand

Natural Gamma Log



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SOIL BORING LOG

Coordinates:	N/A	BORING NO.	SB-201
Surface Elevation:	26.28	Project No.	SU001E
Casing Below Surface:	N/A	Client:	Sun Company, Inc.
Reference Elevation:	N/A	Location:	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	GROUND WATER	
Start Date:		Depth Below:	Surface
Comp Date:	01-Aug-97	At Time of Boring:	N/A
Weather:		After One Week:	N/A
		Surface Conditions:	

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description	Natural Gamma Log
55	-28.72				0	5	0%	no sample recovery	

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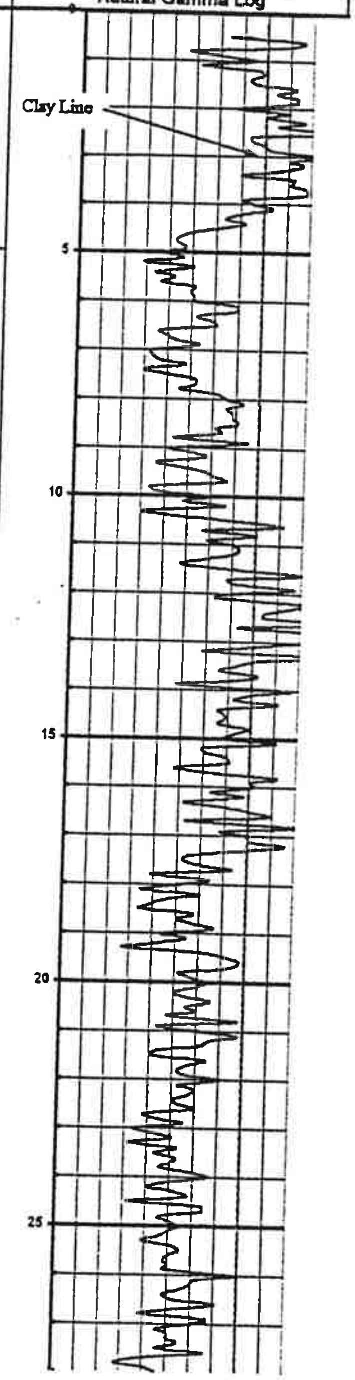
SOIL BORING LOG

Coordinates:	N/A	**BORING NO.**	SB-202B
Surface Elevation:	26.78	**Project No.**	SU001E
Casing Below Surface:	N/A	**Client:**	Sun Company, Inc.
Reference Elevation:	N/A	**Location:**	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	**GROUND WATER**	
Start Date:		**Depth Below:**	**Surface**
Comp Date:	04-Aug-97	**At Time of Boring:**	N/A
Weather:		**After One Week:**	N/A
		Surface Conditions:	

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description
0	26.78	Fill	8,220		na			Fill Material: poorly graded silt, sand and gravel, trace organics/ brick fragments Stained black. Hydrocarbon odor. Dry.
5	21.78	Fill	0		2	5	40%	(wet, HC soaked, flowing up around auger @ 6.5') Fill material: Rock / brick fragments, w/sand & silt. Stained black. Hydrocarbon odor. wet.
10	16.78	Fill	0		2	5	40%	Fill material: coarse poorly graded sand, gravel, & rock fragments, trace brick fragments & mica. Stained black. HC odor. Saturated.
15	11.78	Fill	5,800		0.75	5	15%	(very poor recovery, most likely due to sat. flowing nature of sample. no cohes.) coarse subangular rock frag. w/ sand & organics (peat & wood fragments). trace brick fragments. stained black. HC odor. saturated.
20	6.78	CL SP	8,400		3.5	5	70%	soft, HC saturated clay Brn / gray c sand and rock frag., trace qtz pebbles (rounded) HC odor, staining.
25	1.78	GW CL	9,250		2.5	5	50%	Brown sandy gravel w/ rock frag., some Brn clay, qtz pebbles (md) HC odor, HC saturated, stained. Changes abruptly to Brn/ tan/ gray

Natural Gamma Log



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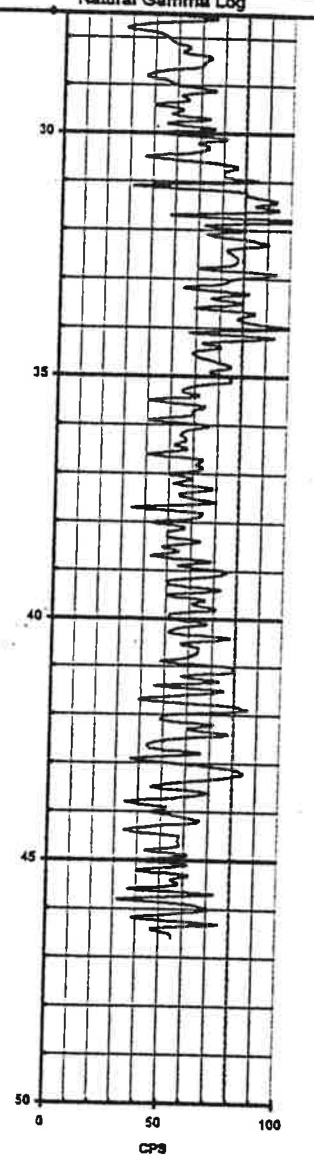
SOIL BORING LOG

Coordinates:	N/A	BORING NO.	SB-202B
Surface Elevation:	26.78	Project No.	SU001E
Casing Below Surface:	N/A	Client:	Sun Company, Inc.
Reference Elevation:	N/A	Location:	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	GROUND WATER	
Start Date:		Depth Below:	Surface
Comp Date:	04-Aug-97	At Time of Boring:	N/A
Weather:		After One Week:	N/A
		Surface Conditions:	

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description
								stippled sandy clay. No staining. HC odor. saturated (H_2O)
30	-3.22	SP	250		3	5	60%	c brn micaceous sand, trace rock frag., Saturated (H2O), strong HC odor
31	-4.22	CL						Abrupt change to Lt brn/gray / orange mottled clay, trace sand; small amt HC staining @ top of clay; no staining past 1" in clay. sat (H_2O).
35	-8.22	CL	400		4	5	80%	Lt brn clay, tr sand. saturated.
38	-11.22	SP						f - m Brn / gray sand, tr. mica saturated (H_2O). slight HC odor, (slight stain on top & outside of sample - none inside. most likely residue)
40	-13.22	SP	450		4	5	80%	f - m Brn / gray micaceous sand. slight HC odor, no staining
44.5	-17.72	SC	150					Abrupt change to brn clayey micaceous sand, bottom 2" of sample
45	-18.22	SP	750		1.5	5	30%	f - m brn / gray micaceous. sand. Trace brn clay at bottom of sample. very slight HC odor. no staining.
50	-23.22	SP	900		2	5	40%	f-m gray micaceous sand. sat.(H2O). no staining. v slight HC odor.

Natural Gamma Log



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SOIL BORING LOG

Coordinates:	N/A	BORING NO.	SB-202B
Surface Elevation:	26.78	Project No.	SU001E
Casing Below Surface:	N/A	Client:	Sun Company, Inc.
Reference Elevation:	N/A	Location:	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	GROUND WATER	
Start Date:		Depth Below:	Surface
Comp Date:	04-Aug-97	At Time of Boring:	N/A
Weather:		After One Week:	N/A
		Surface Conditions:	

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description	Natural Gamma Log
55	-28.22				0	5	0%	no sample recovery due to nature of sample fine flowing saturated sands.	

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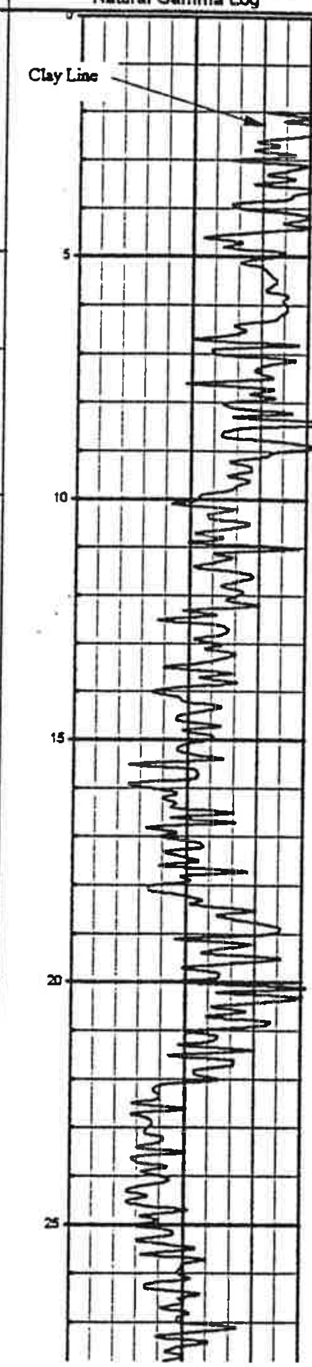
SOIL BORING LOG

Coordinates:	N/A	**BORING NO.**	SB-204
Surface Elevation:	28.13	**Project No.**	SU001E
Casing Below Surface:	N/A	**Client:**	Sun Company, Inc.
Reference Elevation:	N/A	**Location:**	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	**GROUND WATER**	
Start Date:		**Depth Below:**	**Surface**
Comp Date:	05-Aug-97	**At Time of Boring:**	N/A
Weather:		**After One Week:**	N/A
		Surface Conditions:	

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description
0	28.13	Fill	3,250		na			Fill Material: red sandy micaceous clay, trace rock frag. HC odor. Some black stain.
5	23.13	SC	7,500		5	5	100%	Gray clayey, micaceous sand w/ HC odor & staining.
		CL						Grades to gray sandy soft clay. HC odor & slight staining, moist
10	18.13	SC	2,300		4.5	5	90%	dk gray clayey sand grading to lt gray
		CH						blue, plastic clay. Moist HC odor throughout, no staining
14		SP						Change to gray - brn c sand w/subangular gravel and sub rounded qtz pebbles.
15	13.13	GP	6,750		4	5	80%	Angular gravel w/ gray c sand
		CL						Grading to brn sandy micaceous clay, tr silt. wet (throughout). no staining. strong gasoline odor at bottom 6" of sample
20	8.13				4	5	80%	
		ML	9,080					brn clayey micaceous silt, gasoline , odor.
		SP						wet. grading to coarse angular gravel & brn sand, tr silt. wet. gasoline odor.
25	3.13	GW	9,650		3	5	60%	brn / gray/ red subangular gravel & coarse sand. sat. (H2O). gasoline odor.
		SW						first occurrence of ground water saturation

Natural Gamma Log



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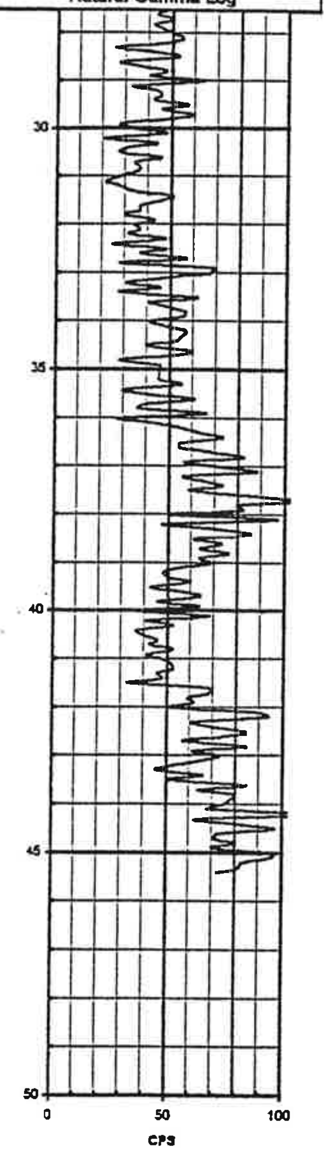
SOIL BORING LOG

Coordinates:	N/A	BORING NO.	SB-204
Surface Elevation:	28.13	Project No.	SU001E
Casing Below Surface:	N/A	Client:	Sun Company, Inc.
Reference Elevation:	N/A	Location:	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	GROUND WATER	
Start Date:		Depth Below:	Surface
Comp Date:	05-Aug-97	At Time of Boring:	N/A
Weather:		After One Week:	N/A
		Surface Conditions:	

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description
								in this interval.
30	-1.87	SW	8,800		2.5	5	50%	c -m brn/ gray sand w/ gravel. sat. strong gasoline odor.
35	-6.87	SP	6,700		2.5	5	50%	f - m gray sand.
36	-7.87	GW						changes abruptly to rounded, gray gravels.
		SW						m-vc sand w/20% gravel (qtz pebbles & rock fragments), strong HC odor
40	-11.87	SP	7,400		4	5	80%	f -m gray micaceous sand, saturated, gasoline odor.
43	-14.87	CH	175					red plastic clay, tr sand, mica; saturated. v slight gasoline odor.
45	-16.87	CH	50		4.5	5	90%	red plastic clay. saturated v little odor, tr sand. entire interval has m - c brn sand stringers 0.25 - 1" sand stringers exhibit gasoline odor.

Natural Gamma Log



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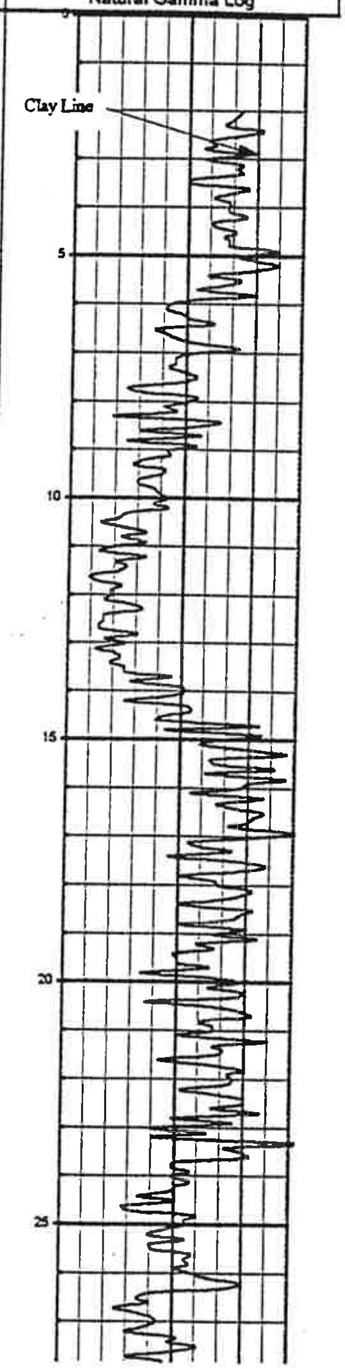
SOIL BORING LOG

Coordinates:	N/A	**BORING NO.**	SB-205
Surface Elevation:	28.78	**Project No.**	SU001E
Casing Below Surface:	N/A	**Client:**	Sun Company, Inc.
Reference Elevation:	N/A	**Location:**	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	**GROUND WATER**	
Start Date:		**Depth Below:**	Surface
Comp Date:	13-Aug-97	**At Time of Boring:**	N/A
Weather:		**After One Week:**	N/A
		Surface Conditions:	

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description
0	28.78	Fill	75	140	na			Fill material: c sand & gravel, tr org. stained black. strong HC odor.
5	23.78	Fill	625	440	1	5	20%	Fill material: m - c sand & gravel. stained black. HC odor.
10	18.78				0	5	0%	absolutely 0 recovery, nothing in plug.
15	13.78	GW			0	5	0%	0 recovery. auger is bringing up gravel; probably pushing lrg gravels in plug - then dropping when sampler is extracted.
20	8.78	SW			0	5	0%	sampler is wet w/ black HC residue. small gravels & sand. no recovery. sampler is going down easily, may be flowing sands.
25	3.78	GW	10000+	2440	1	5	20%	grn / brn/ cream mottled subrounded gravel, c sand, tr brn clay "pockets". moist. HC odor.

Natural Gamma Log



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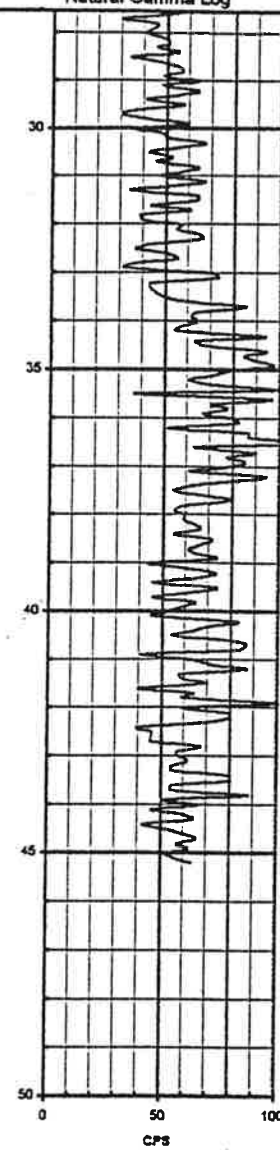
SOIL BORING LOG

Coordinates:	N/A	**BORING NO.**	SB-205
Surface Elevation:	28.78	**Project No.**	SU001E
Casing Below Surface:	N/A	**Client:**	Sun Company, Inc.
Reference Elevation:	N/A	**Location:**	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	**GROUND WATER**	
Start Date:		**Depth Below:**	Surface
Comp Date:	13-Aug-97	**At Time of Boring:**	N/A
Weather:		**After One Week:**	N/A
		Surface Conditions:	

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description
30	-1.22	GW	450	320	3	5	60%	subrounded - lrg (4cm) gravel, w/ c brn sand. sat. HC odor.
34	-5.22	CL						gray/grn sandy micaceous clay. v slight HC odor. grading to gray/grn m sand, tr clay.
35	-6.22	SP	0	240	4.5	5	90%	gray m sand, tr clay. sat. slight HC odor.
36	-7.22	CL						greenish gray micaceous clay w/ silt & f sand. sat. no odor.
37.5	-8.72	CL						cream/ brn mottled soft clay, tr sand. sat. (H_2O). no odor.
38.5	-9.72	ML						dk brn sandy micaceous silt. sat. no odor.
40	-11.22	SP	0	60	4	5	80%	gray/ grn f sand. sat. (H_2O)/ no odor.
								grading to gray/ grn m sand, tr clay. sat. no odor.
		CL						brn micaceous sandy clay. sat. no odor.
43	-14.22	SP						grading to fine gray sand, tr clay, sat. (H_2O) no odor
45	-16.22	SP	10	40	4.5	5	90%	m gray sand. sat. no odor.
46	-17.22	SP						c brn micaceous sand, tr silt.
47.5	-18.72	CL						stiff gray/brn micaceous clay w/tr sand. no odor.
48	-19.22	SP						c brn micaceous sand. sat. no odor.
								grading to c brn micaceous sand, w/clay. no odor.
50	-21.22	SP	15	0	1	5	20%	m - c gray/ brn micaceous sand. sat. no odor.

Natural Gamma Log



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SOIL BORING LOG

Coordinates:	N/A	**BORING NO.**	SB-205
Surface Elevation:	28.78	**Project No.**	SU001E
Casing Below Surface:	N/A	**Client:**	Sun Company, Inc.
Reference Elevation:	N/A	**Location:**	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	**GROUND WATER**	
Start Date:		**Depth Below:**	**Surface**
Comp Date:	13-Aug-97	**At Time of Boring:**	N/A
Weather:		**After One Week:**	N/A
		Surface Conditions:	

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description	Natural Gamma Log
55	-26.22				0	5	0%	no recovery. sampler wet. sample probably flowed out during extraction, indicate - sand.	

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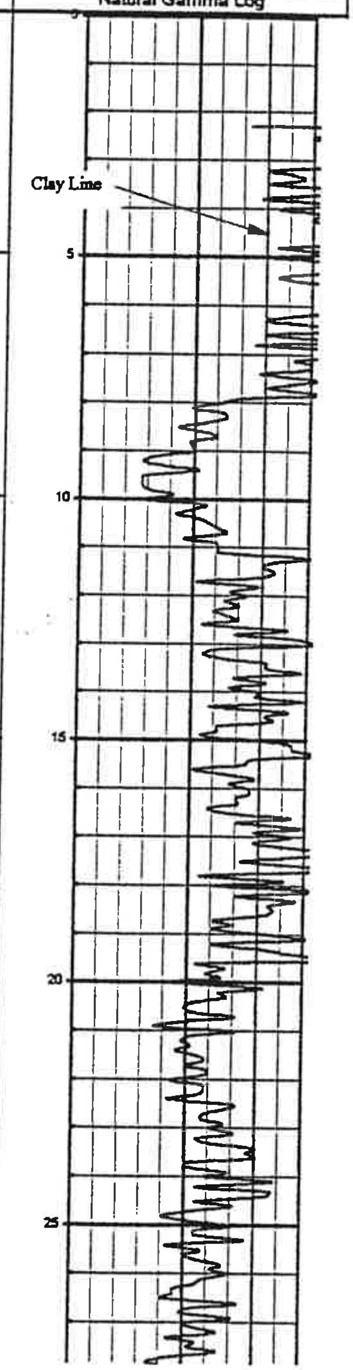
SOIL BORING LOG

Coordinates:	N/A	**BORING NO.**	SB-206
Surface Elevation:	30.33	**Project No.**	SU001E
Casing Below Surface:	N/A	**Client:**	Sun Company, Inc.
Reference Elevation:	N/A	**Location:**	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	**GROUND WATER**	
Start Date:		**Depth Below:**	Surface
Comp Date:	06-Aug-97	**At Time of Boring:**	N/A
Weather:		**After One Week:**	N/A
		Surface Conditions:	

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description
0	30.33	Fill	750		na			Fill Material: loose clay, w/ sand & rock fragments. Stained black. HC odor. Dry.
5	25.33	ML	8,750		5	5	100%	green silt, tr clay, HC odor, dry. grading to grn/ brn/ blk stippled sandy silt. sand lenses, stained black w/ HC odor, moist.
10	20.33	ML	375		5	5	100%	gray/ grn silt w/ clay, tr sand, HC odor
10.5		CL						change abrupt to brn stiff clay, w/ tr silt. no odor.
13.5		CL						change to cream stiff clay
15	15.33	ML	215		5	5	100%	cream silt, some clay. v slight HC odor
19		CL						stiff gray clay, tr sand. HC odor.
20	10.33	CL	7,400		5	5	100%	gray/ grn clay, tr sand. HC odor
21	9.33	GC						brn / grn clayey gravel, tr silt. HC odor.
24		SP						gray/ brn m sand, tr rock frag. HC odor.
25	5.33	SP	4,160		4.5	5	90%	gray - brn, f - m sand. HC sat. (gasoline odor),
		GW						grading to c gravel w/ grn/ brn/ gray

Natural Gamma Log



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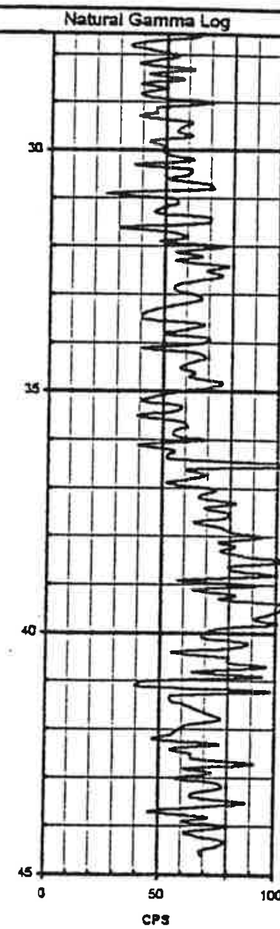
SOIL BORING LOG

Coordinates:	N/A	BORING NO.	SB-206
Surface Elevation:	30.33	Project No.	SU001E
Casing Below Surface:	N/A	Client:	Sun Company, Inc.
Reference Elevation:	N/A	Location:	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	GROUND WATER	
Start Date:		Depth Below:	Surface
Comp Date:	06-Aug-97	At Time of Boring:	N/A
Weather:		After One Week:	N/A
		Surface Conditions:	

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description
								mottled sand. moist. HC odor.
30	0.33	GW	6,410		3.5	5	70%	gray - brn gravel w/ c sand. HC odor. Saturated (H_2O)
35	-4.67	GW	575		4	5	80%	gray gravel w/ c sand, HC odor, sat.
		SP						grading to gray/ brn f - m micaceous sand. HC odor. saturated.
39		CL						grading to lt brn clay, tr sand. slight HC odor.
40	-9.67	CL	185		5	5	100%	gray sandy micaceous clay. slight HC odor,
		SC						grading to gray micaceous clayey sand.
		SC						grading to f gray micaceous clayey sand. HC odor.
45	-14.67	SP	700		5	5	100%	gray - brn f micaceous sand, some clay. slight HC odor.
49.5		CH						red plastic clay. tr sand. v slight HC odor.
50	-19.67	SP	270		5	5	100%	f gray micaceous sand, some clay. sat (H_2O), slight odor
54.5	-24.17	CL						brn/gray sandy micaceous clay. v slight HC odor

Natural Gamma Log



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SOIL BORING LOG

Coordinates:	N/A	**BORING NO.**	SB-206
Surface Elevation:	30.33	**Project No.**	SU001E
Casing Below Surface:	N/A	**Client:**	Sun Company, Inc.
Reference Elevation:	N/A	**Location:**	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	**GROUND WATER**	
Start Date:		**Depth Below:**	Surface
Comp Date:	06-Aug-97	**At Time of Boring:**	N/A
Weather:		**After One Week:**	N/A
		Surface Conditions:	

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description	Natural Gamma Log
55	-24.67	SP	600		5	5	100%	gray/ brn m micaceous sand. sat. (H_2O). HC odor	
58	-27.67	CL						gray/ brn micaceous clay, tr sand	
59	-28.67	SP						m brn sand. no HC odor (below clay)	

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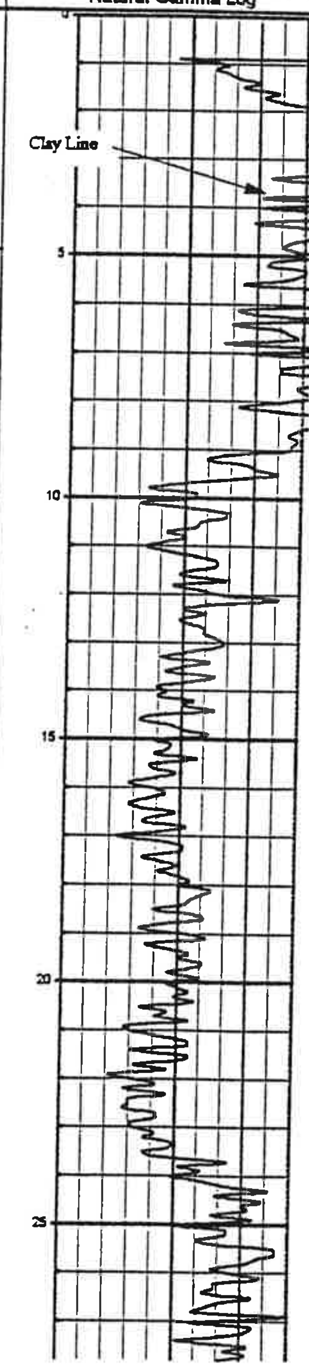
SOIL BORING LOG

Coordinates:	N/A	BORING NO.	SB-207
Surface Elevation:	31.88	Project No.	SU001E
Casing Below Surface:	N/A	Client:	Sun Company, Inc.
Reference Elevation:	N/A	Location:	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	GROUND WATER	
Start Date:		Depth Below:	Surface
Comp Date:	01-Aug-97	At Time of Boring:	N/A
Weather:		After One Week:	N/A
		Surface Conditions:	

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description
0	31.88	Fill	8,200		na			Fill Material: brn silty f sand, tr rock frag. HC staining. HC odor.
5	26.88	CL	305		na			brn - gray silty clay. v slight HC odor. no staining
10	21.88	SP	6,300		0.75	5	15%	f - m gray sand, tr silt. moist. HC odor.
15	16.88	SW	9,815		1	5	20%	m - c brn sand w/ gravel. dry. slight HC odor. no staining. (gravels plugging sampler)
20	11.88				0.75	5	15%	
23.5	8.38	SW	9,390					m-c gray-brn sand & qtz gravel. HC odor. moist.
24	7.88	CH						red plastic clay, tr sand. HC odor
25	6.88	CL	8,800		5	5	100%	brn - red micaceous clay, tr sand. HC odor

Natural Gamma Log



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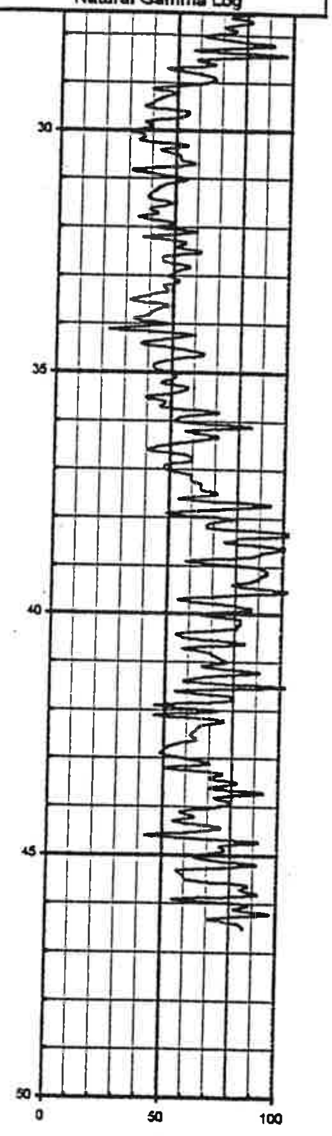
SOIL BORING LOG

Coordinates:	N/A	**BORING NO.**	SB-207
Surface Elevation:	31.88	**Project No.**	SU001E
Casing Below Surface:	N/A	**Client:**	Sun Company, Inc.
Reference Elevation:	N/A	**Location:**	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	**GROUND WATER**	
Start Date:		**Depth Below:**	Surface
Comp Date:	01-Aug-97	**At Time of Boring:**	N/A
Weather:		**After One Week:**	N/A
		Surface Conditions:	

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description
29.75	2.13	SW						c gray sand & gravel. sat. HC odor.
30	1.88	SW	9,100		0.5	5	10%	c sand & rounded gravel HC odor. (sampler plugged w/ gravel)
35	-3.12	SP	2,660		1	5	20%	vf-f brn - gray micaceous sand w/ gravel. sat. HC odor. (sampler plugged w/ sandstone frag.)
40	-8.12	CL	875		4.5	5	90%	cream micaceous clay. sat. (H_2O). HC odor.
41.5	-9.62	CL						brn/gray soft micaceous clay. sat. slight HC odor.
44.5	-12.62	SP						m brn sand. sat.
44.75	-12.87	CL						brn micaceous clay, tr sand. sat. slight HC odor.
45	-13.12	CL	330		5	5	100%	brn/ gray mottled micaceous clay, tr sand sat. v slight HC odor.
								f - m brn sand stringers @ 46.5 &47.5
50	-18.12	CL			2	5	40%	red - brn soft micaceous clay sat. v slight HC odor.
			2,025					thin brn sand stringers, tr silt @53' & 54.5'.

Natural Gamma Log



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SOIL BORING LOG

Coordinates:	N/A	**BORING NO.**	SB-207
Surface Elevation:	31.88	**Project No.**	SU001E
Casing Below Surface:	N/A	**Client:**	Sun Company, Inc.
Reference Elevation:	N/A	**Location:**	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	**GROUND WATER**	
Start Date:		**Depth Below:**	**Surface**
Comp Date:	01-Aug-97	**At Time of Boring:**	N/A
Weather:		**After One Week:**	N/A
		Surface Conditions:	

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description	Natural Gamma Log
55	-23.12	CL	145		5	5	100%	brn micaceous clay. sat. no HC odor.	
		SC						grading to brn clayey sand. sat. no HC odor.	
		CL						grading to brn sandy clay. sat. no HC odor.	

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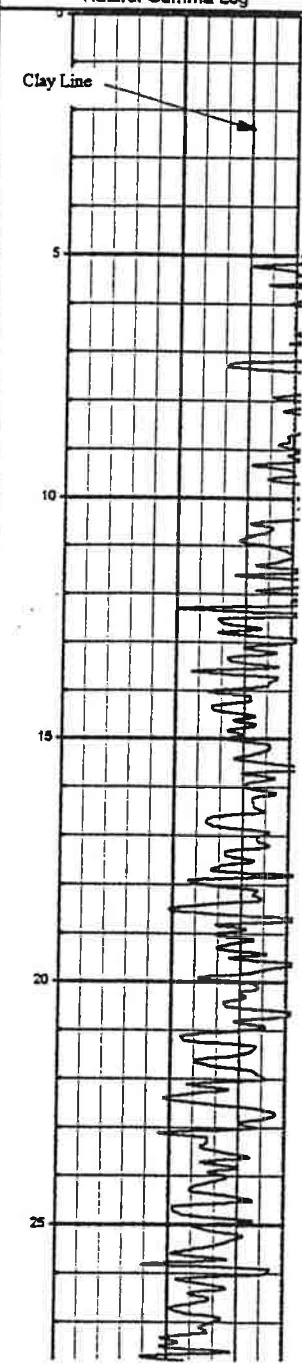
SOIL BORING LOG

Coordinates:	N/A	BORING NO.	SB-208
Surface Elevation:	33.68	Project No.	SU001E
Casing Below Surface:	N/A	Client:	Sun Company, Inc.
Reference Elevation:	N/A	Location:	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	GROUND WATER	
Start Date:		Depth Below:	Surface
Comp Date:	12-Aug-97	At Time of Boring:	N/A
Weather:		After One Week:	N/A
		Surface Conditions:	

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description
0	33.68	ML	265	560	na			gray clayey micaceous silt, small amt of black staining. HC odor.
5	28.68	ML	1,500	580	5	5	100%	greenish gray silt, tr. clay. dry. slight HC odor.
								grading to greenish gray sandy silt
9.5	24.18	ML						moist. slight HC odor.
10	23.68	ML	5,250	2500	3	5	60%	greenish gray micaceous silt, tr. sand. dry.
								no odor.
12	21.68	SP						gray f - m sand, tr. silt, tr. qtz gravel (rnd).
15	18.68	SP	100	480	1	5	20%	f gray sand, sat. flowing. HC odor / sheen.
19	14.68	CL						brn micaceous clay, tr. sand / gravel. (exact location of contact not evident due to flowing sands.; most likely 19' - 20'.)
20	13.68	CH	850	1160	3	5	60%	cream colored clay, tr. silt. b slight HC odor.
								moist
22	11.68	ML						dk brn micaceous silt, w/ clay, tr. gravel.
								moist. slight HC odor.
25	8.68	ML	10000+	5100	3	5	60%	dk brn - gray micaceous silt, tr. sand.
								dry. no odor.
27	6.68	GW						c sandy gravel, gray, subrounded - subangular.

Natural Gamma Log



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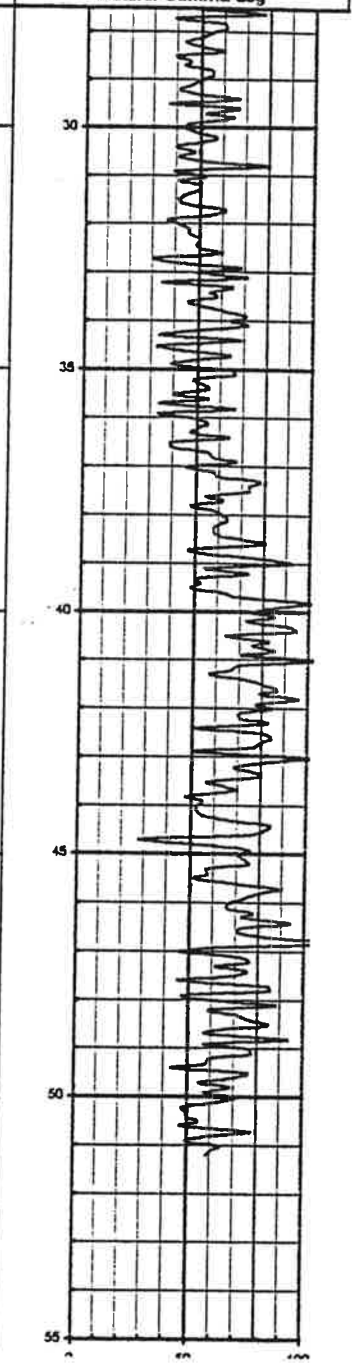
SOIL BORING LOG

Coordinates:	N/A	**BORING NO.**	SB-208
Surface Elevation:	33.68	**Project No.**	SU001E
Casing Below Surface:	N/A	**Client:**	Sun Company, Inc.
Reference Elevation:	N/A	**Location:**	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	**GROUND WATER**	
Start Date:		**Depth Below:**	**Surface**
Comp Date:	12-Aug-97	**At Time of Boring:**	N/A
Weather:		**After One Week:**	N/A
		Surface Conditions:	

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description
								moist. HC odor.
30	3.68	GW	1,960	1120	4	5	80%	subrounded - sub angular gravel, w/ c brn sand. HC odor / HC sheen. sat.
35	-1.32	SP	1,960	1120	4	5	80%	m - c gray micaceous sand. sat. (H_2O).
		GW						slight HC odor, grading to c gray micaceous sandy gravel, sat. slight HC odor
								sat. HC odor.
39	-5.32	SP						grn/ gray f sand, some clay. sat. slight HC odor.
40	-6.32	CL	450	520	5	5	100%	cream/ brn soft clay w/ sand. sat. no odor.
41	-7.32	CL						gray, sandy, micaceous clay. sat. no odor.
		SP						grading to fine gray sand, tr. clay, sat. (H2O) no odor
45	-11.32	SP	230	280	4	5	80%	f - m gray sand, sat. (H2O). slight HC odor.
								slight HC odor.
47.5	-13.82	CL						dk brn sandy micaceous clay. sat. no odor.
49	-15.32	SP						m brn sand lens (app 1") @ 49'
50	-16.32	SP	200	420	4	5	80%	f gray micaceous sand, sat. no odor.
53	-19.32							(c brn sand lens. sat. - 5" thick @ 53')
		SC						grading to brn micaceous clayey sand, tr. silt. grading to gray m sand, tr. clay, tr. org. sat. no odor.

Natural Gamma Log



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SOIL BORING LOG

Coordinates:	N/A	BORING NO.	SB-208
Surface Elevation:	33.68	Project No.	SU001E
Casing Below Surface:	N/A	Client:	Sun Company, Inc.
Reference Elevation:	N/A	Location:	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	GROUND WATER	
Start Date:		Depth Below:	Surface
Comp Date:	12-Aug-97	At Time of Boring:	N/A
Weather:		After One Week:	N/A
		Surface Conditions:	

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description	Natural Gamma Log
55	-21.32	SP	25	320	4	5	80%	gray, m sand. sat. no odor.	0 50 100 CPS
		CL						grading to red/ brn sandy?? micaceous clay.	
								sat. no odor.	
								grading to red/ brn stiff micaceous clay, tr. sand / org.	
								w/ thin gray m sand stringers (1/8" - 1/4").	
								sat. no odor	

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SOIL BORING LOG

Coordinates:	N/A	**BORING NO.**	SB-209b
Surface Elevation:	34.08	**Project No.**	SU001E
Casing Below Surface:	N/A	**Client:**	Sun Company, Inc.
Reference Elevation:	N/A	**Location:**	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	**GROUND WATER**	
Start Date:		**Depth Below:**	Surface
Comp Date:	08-Aug-97	**At Time of Boring:**	N/A
Weather:		**After One Week:**	N/A
		Surface Conditions:	

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description	Natural Gamma Log
0	34.08	CL			na			gray silty micaceous clay. HC odor	
5	29.08	CL			na			gray silty micaceous clay. HC odor	
10	24.08	SC			na			brn - black fine sand. HC stained. gasoline odor. dry.	
15	19.08	CL	8,500	8790	4	5	0.8	brown/ gray mottled stiff clay. dry. slight HC odor. no staining.	
15.5	18.58	SW						gray c sand & qtz frag. HC odor. moist.	
16.5	17.58	CL						stiff brn / gray micaceous clay. moist. no odor.	
18	16.08	GW						gravel w/ brn - gray c sand. v slight gasoline odor. dry	
20	14.08	SW	9,950	1220	1	5	0.2	brn c sand w/ rounded gravel, tr clay. HC odor. dry.	
25	9.08	SP	8,250	10000+	2	5	0.4	gray c sand. HC odor. sat. moist HC odor.	

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SOIL BORING LOG

Coordinates:	N/A	**BORING NO.**	SB-209b
Surface Elevation:	34.08	**Project No.**	SU001E
Casing Below Surface:	N/A	**Client:**	Sun Company, Inc.
Reference Elevation:	N/A	**Location:**	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	**GROUND WATER**	
Start Date:		**Depth Below:**	Surface
Comp Date:	08-Aug-97	**At Time of Boring:**	N/A
Weather:		**After One Week:**	N/A
		Surface Conditions:	

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description	Natural Gamma Log
30	4.08	SW	10000+	10000+	1	5	0.2	gray c sand & gravel. sat. HC odor.	
31	3.08	SW	10000+	2750				gray c sand & subrounded gravel. sat. (H_2O). HC odor	
35								auger refusal, move boring 10-ft to south	

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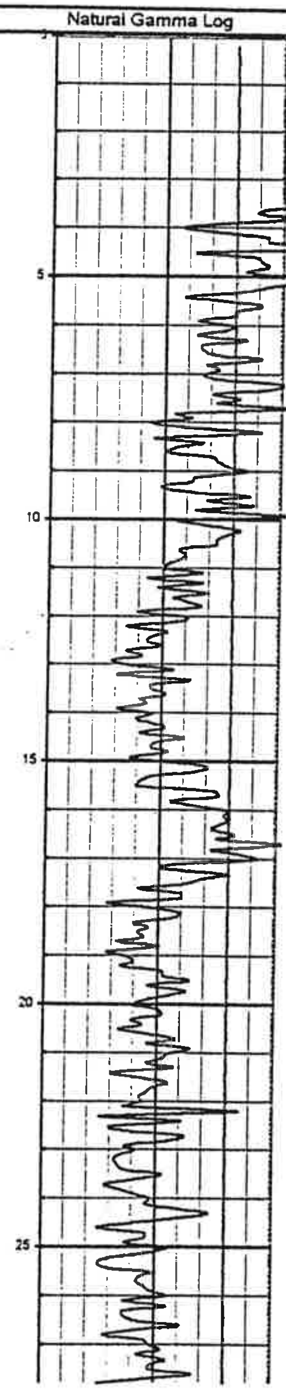
SOIL BORING LOG

Coordinates:	N/A	BORING NO.	SB-210
Surface Elevation:	34.08	Project No.	SU001E
Casing Below Surface:	N/A	Client:	Sun Company, Inc.
Reference Elevation:	N/A	Location:	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	GROUND WATER	
Start Date:		Depth Below:	Surface
Comp Date:	11-Aug-97	At Time of Boring:	N/A
Weather:		After One Week:	N/A
		Surface Conditions:	

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description
0	34.08	Fill	8,200	1900	na			Fill Material: brn clay w/ gravel, brick frag. HC saturated, stained black. HC odor.
5	29.08	SM	6,750	10000+	5	5	100%	gray - brn micaceous, silty sand, tr clay. HC odor. moist. small (0.5' - 1") sand stringers throughout sample. HC odor. stained black.
9	25.08	SP						grades to f - m gray sand. sat. HC odor
10	24.08	SP	*	10000+	5	5	100%	gray m - c sand. HC odor. sat. some black staining.
15	19.08	SP	2,900	900	2.5	5	50%	m gray sand. wet. HC odor.
15.5	18.58	GW						angular to subrounded qtz gravel, w/ sand. v small (1/4") clay stringer btwn gravel & sand dry. slight HC odor.
20	14.08	SP	850	1160	1.5	5	30%	m - c gray sand. sat. no odor. HC odor. moist.
20.5	13.58	GW						brn gravel & sand. sat. no odor.
25	9.08	GW	7,800	6300	3	5	60%	subrounded - rnded qtz gravel, w/ c brn sand. wet. no odor.
		SP						grading to m - c gray sand, tr rounded qtz gravel

Natural Gamma Log



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SOIL BORING LOG

Coordinates:	N/A	BORING NO.	SB-210
Surface Elevation:	34.08	Project No.	SU001E
Casing Below Surface:	N/A	Client:	Sun Company, Inc.
Reference Elevation:	N/A	Location:	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	GROUND WATER	
Start Date:		Depth Below:	Surface
Comp Date:	11-Aug-97	At Time of Boring:	N/A
Weather:		After One Week:	N/A
		Surface Conditions:	

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description
								sequence repeated 3 time in sample - 26',27',28'.
30	4.08	SP	9,370	2240	2	5	40%	m - c gray sand. sat. (H_2O). no HC odor. grading to brn c subangular sand, some gravel. sat. v slight HC odor. (Groundwater occurs @ 30')
35	-0.92	SP	75	220	2.5	5	50%	f gray sand. sat. no odor. grading to m - c gray sand. sat. no odor. grading to c gray sand & subrounded qtz gravel. sat. HC odor.
40	-5.92	SP	500	660	1	5	20%	m gray sand, sat. slight HC odor.
45	-10.92	SC	230	280	4	5	80%	gray clayey, micaceous sand. sat. slight HC odor.
47	-12.92	SP						m gray sand. sat. HC odor. grading to gray/ brn m sand. tr clay sat. slight HC odor.
50	-15.92	CL	0	60	3.5	5	70%	m - c sandy gray clay sat. no odor.
52	-17.92	CL						red micaceous clay, tr sand. sat. no odor.

Natural Gamma Log

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SOIL BORING LOG

Coordinates:	N/A	BORING NO.	SB-210
Surface Elevation:	34.08	Project No.	SU001E
Casing Below Surface:	N/A	Client:	Sun Company, Inc.
Reference Elevation:	N/A	Location:	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	GROUND WATER	
Start Date:		Depth Below:	Surface
Comp Date:	11-Aug-97	At Time of Boring:	N/A
Weather:		After One Week:	N/A
		Surface Conditions:	

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description	Natural Gamma Log
55	-20.92	CL	25	120	4.5	5	90%	red micaceous clay, soft, sat . no odor.	
58	-23.92	SP						small (1/2") sand @ 58' grades to brn, red sandy clay, then	
		CL						back to red clay, tr sand, stiff. sat. no odor	

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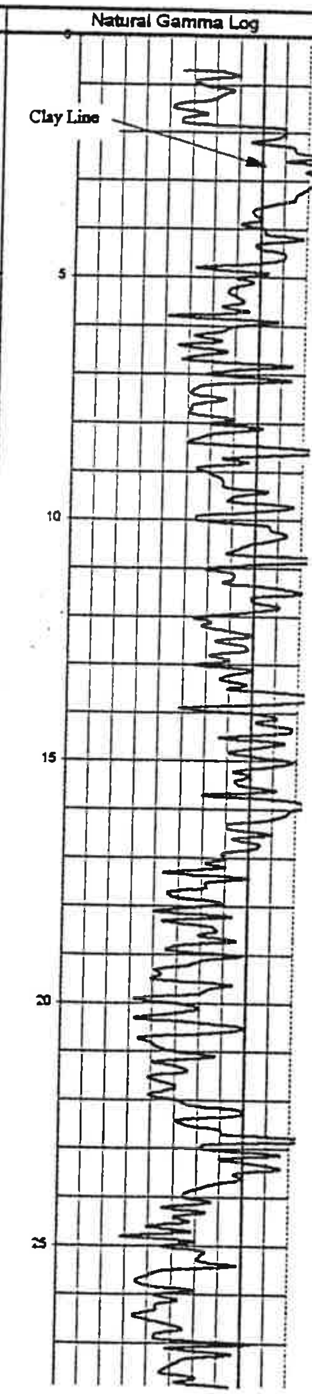
SOIL BORING LOG

Coordinates:	N/A	**BORING NO.**	SB-211
Surface Elevation:	23.53	**Project No.**	SU001E
Casing Below Surface:	N/A	**Client:**	Sun Company, Inc.
Reference Elevation:	N/A	**Location:**	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	**GROUND WATER**	
Start Date:		**Depth Below:**	Surface
Comp Date:	13-Aug-97	**At Time of Boring:**	N/A
Weather:		**After One Week:**	N/A
		Surface Conditions:	

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description
0	23.53	Fill	800	1080	na			Fill material: sandy silt w/rnded gravel tr clay & brick frag. stained black. moist. HC odor.
5	18.53	Fill	1,650	1280	3.5	5	70%	upper 3" fill material, black staining HC odor
5.5	18.03	CL						chnges abruptly to grey clay, some silt, tr sand some black HC staining. odor;
7.5	16.03	ML						chnges abrupt to greenish grey clayey silt, dry. v slight HC odor. tr organics.
10	13.53	CL	2,000	1160	4	5	80%	brn micaceous clay w/ sand. tr silt. moist. HC odor.
12	11.53	ML						chngs abs. to brn/ tan mottled clayey silt w/ gravel. tr sand. HC odor.
14.25	9.28	ML						grey/ tan mottled silt tr sand. dry. HC odor.
15	8.53	ML	1,475	1280	4.5	5	90%	grey / tan mottled silt, damp. HC odor.
		CL						grading to grey/ tan mottled clay, some qtz frag. tr silt, moist. HC odor.
18.5	5.03	GW						rounded gravel w/ coarse sand, some brn micaceous clay pockets. moist. HC odor.
20	3.53	GW	9,290	2820	3	5	60%	subrounded - rounded lg gravel, w/ alternating bands of red/ grey/ tan/ black (HC stain) c sand.
22	1.53							
25	-1.47	SW	7,300	6260	2.5	5	50%	m-c brn sand, wet. slight HC odor. grading

Natural Gamma Log



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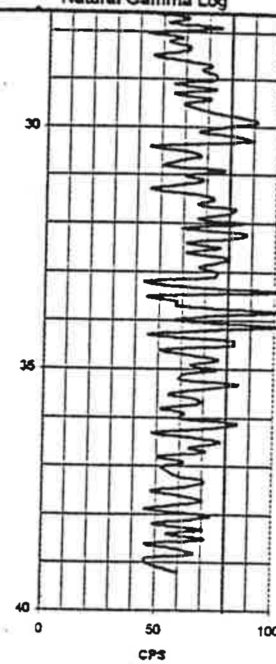
SOIL BORING LOG

Coordinates:	N/A	BORING NO.	SB-211
Surface Elevation:	23.53	Project No.	SU001E
Casing Below Surface:	N/A	Client:	Sun Company, Inc.
Reference Elevation:	N/A	Location:	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	GROUND WATER	
Start Date:		Depth Below:	Surface
Comp Date:	13-Aug-97	At Time of Boring:	N/A
Weather:		After One Week:	N/A
		Surface Conditions:	

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description
		GP						to v c subangular - subrounded gravel
		CL						chng abrupt - @ 30' to grey/ brn micaceous clay. wet. slght HC odor.
30	-6.47	SM	370	320	5	5	100%	grey/ grn f silty sand, tr clay. sat (H2O). no odor. sat. HC odor.
31	-7.47	CL						lt brn f sandy clay w/silt. sat. no odor.
31.5	-7.97	ML						dk brn f sandy silt. tr clay. sat. no odor.
32	-8.47	SM						grey/ grn fine silty sand w/ clay. sat. no odor.
33.5	-9.97	CL						dk brn sandy silt w/ clay & c brn sand stringers ((1/4" thick). sat. no odor.
35	-11.47	SP	0		5	5	100%	v fine grey sand. sat. (H2O). no odor. grading to m brn sand, tr clay, sat. no odor. grading to c brn sand, tr clay. sat. no odor. f sand. sat. no odor.
39.5	-15.97	ML						v fine sandy brn silt. tr clay. sat. no odor.
40	-16.47	SP	0	380	5	5	100%	m-c grey micaceous sand, sat (H2O). no odor.
43	-19.47	SP						c brn micaceous sand, tr gravel (finer to 45') sat. no odor.
45	-21.47	SP	0	320	4.5	5	90%	m-c grey/ brn micaceous sand. sat (H2O). no odor. c brn micaceous sand, tr silt.
50	-26.47	SP						flowing sands. vc brn micaceous sand in auger prevents sampler from going down. abandon hole.

Natural Gamma Log



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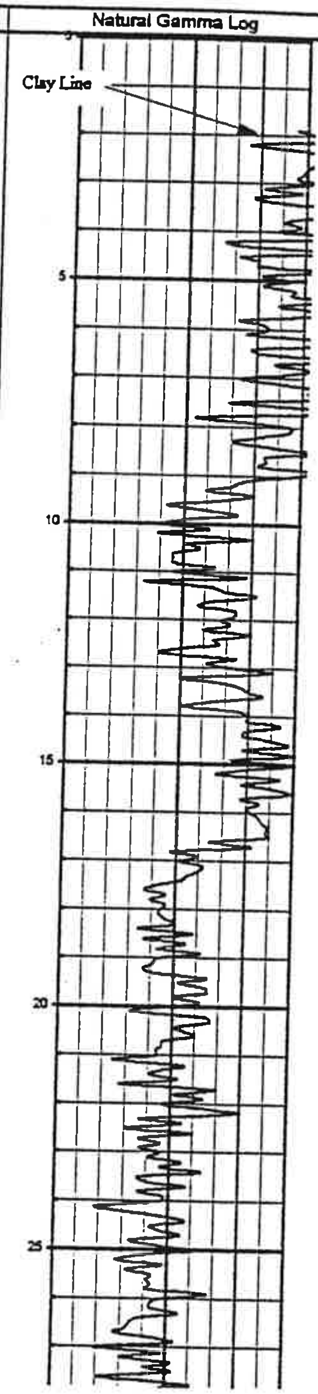
SOIL BORING LOG

Coordinates:	N/A	**BORING NO.**	SB-212
Surface Elevation:	26.28	**Project No.**	SU001E
Casing Below Surface:	N/A	**Client:**	Sun Company, Inc.
Reference Elevation:	N/A	**Location:**	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	**GROUND WATER**	
Start Date:		**Depth Below:**	Surface
Comp Date:	13-Aug-97	**At Time of Boring:**	N/A
Weather:		**After One Week:**	N/A
		Surface Conditions:	

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description
0	26.28	ML	0	620	na			gray - brn silt, tr sand, stained black in places. slight odor. HC odor.
5	21.28	ML	800	380	5	5	100%	grn / gray/ brn micaceous silt, trace sand. dry. v slight HC odor. 2- sand stringers: c sand stained black. HC odor @ 8.0'; c brn sand, partially stained w/ HC odor @ 9.75'. (both 1/2" thick)
10	16.28	SP	0	420	4	5	80%	m-c gray sand, wet v slight HC odor.
12	14.28	ML						brn sandy micaceous silt, damp, no odor.
12.5	13.78	ML						cream/ brn mottled silt, some sand, tr clay & gravel. dry. tight. no odor.
15	11.28	ML/CL	100	500	3.5	5	70%	brn/ tan mottled sandy micaceous clay. sat @ top of sample. dry @ bottom. no odor.
16	10.28	SP						c dk brn micaceous sand. damp. no odor.
		GW						grading to qtz gravel w/ dk brn micaceous sand. dry. no odor.
20	6.28	SW	275	560	1.5	5	30%	c brn sand w/subangular - rounded gravel, tr silt. wet, slight HC odor.
25	1.28	GW	25	400	3	5	60%	subangular - sub rounded gravel w/ c brn sand. sat. slight HC odor. (GW at 26')

Natural Gamma Log



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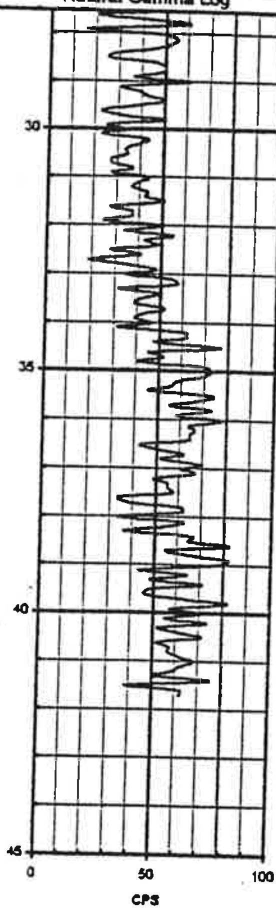
SOIL BORING LOG

Coordinates:	N/A	BORING NO.	SB-212
Surface Elevation:	26.28	Project No.	SU001E
Casing Below Surface:	N/A	Client:	Sun Company, Inc.
Reference Elevation:	N/A	Location:	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	GROUND WATER	
Start Date:		Depth Below:	Surface
Comp Date:	13-Aug-97	At Time of Boring:	N/A
Weather:		After One Week:	N/A
		Surface Conditions:	

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description
30	-3.72	SP	250	700	1	5	20%	c brn micaceous sand. sat (H2O). no odor. empty sampler was lined w/ v f sat. brn sand residue.
35	-8.72	SM	0	440	4.5	5	90%	greenish gray m silty micaceous sand w/ small c sand stringers. sat. no odor.
		SP						grading to c brn sand, tr clay. sat. no odor.
39	-12.72	SW						brn c sand, some gravel, tr silt. sat. no odor.
40	-13.72	SP	0	500	4	5	80%	gray sand grading from f-c. sat (H2O). no odor.
42	-15.72	SM						dk brn silty micaceous sand, sat. no odor.
44.5	-18.22	SW						3" thick layer of c sand & gravel.
45	-18.72	SP	180	440	2.5	5	50%	v f gray sand grading to c gray micaceous sand. sat (H2O). no odor
								brn micaceous f-m sand, some silt. sat. no odor.
49	-22.72	SP						grading to brn c micaceous sand. sat. no odor.
50	-23.72	SP						flowing sands run up augers & prevent further sampling. abandon boring.

Natural Gamma Log



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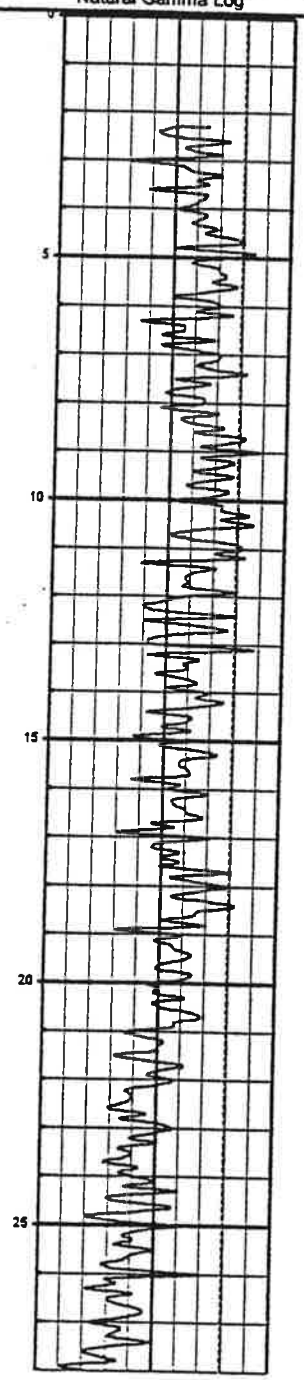
SOIL BORING LOG

Coordinates:	N/A	BORING NO.	SB-213
Surface Elevation:	26.18	Project No.	SU001E
Casing Below Surface:	N/A	Client:	Sun Company, Inc.
Reference Elevation:	N/A	Location:	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	GROUND WATER	
Start Date:		Depth Below:	Surface
Comp Date:	14-Aug-97	At Time of Boring:	N/A
Weather:		After One Week:	N/A
		Surface Conditions:	

S-52

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description
0	26.18	Fill	36	400	na			Silty sand w/subangular gravel, trace clay, stained black, strong HC odor (Fill?)
5	21.18	Fill	636	3040	4	5	0.8	Fill material, tan sandy gravel, slight HC odor
9	17.18	ML						
10	16.18			320	2.5	5	0.5	
		GP	36					Top 2-in. light brn c sandy gravel
		SP						Sharp contact w/m-c brn sand, dry, slight HC odor
		GW						Abrupt change to subangular to subrounded quartz gravel w/ tan m sand, dry, slight HC odor
15	11.18	GW	11	380	1.5	5	0.3	c subrounded gravel w/c brn sand, tr silt, dry, slight HC odor
20	6.18	GW	26	280	1.5	5	0.3	c rounded to subrounded gravel w/ f - m brn micaceous sand, dry, v slight HC odor
25	1.18	GW						Auger Refusal, abandon boring, move boring 15-ft to east

Natural Gamma Log



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SOIL BORING LOG

Coordinates:	N/A	BORING NO.	SB-213
Surface Elevation:	26.18	Project No.	SU001E
Casing Below Surface:	N/A	Client:	Sun Company, Inc.
Reference Elevation:	N/A	Location:	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	GROUND WATER	
Start Date:		Depth Below:	Surface
Comp Date:	14-Aug-97	At Time of Boring:	N/A
Weather:		After One Week:	N/A
		Surface Conditions:	

S-52

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description
30	-3.82				2	5	0.4	(SB-213B)
		SP	3,650	920				m-c grey sand grading to rounded - subrounded gravel w/ c grey sand @ 35'
35	-8.82	GW			0	5	0	empty sampler. most likely saturated sands & gravels. (judging by bottom of last sample)
40	-13.82	SP	0	380	3.5	5	0.7	c grey sand. sat. HC odor. grading to m-f brn sand w/ clay, tr gravel. sat. v slight HC odor.
43.5	-17.32	SW	180	380				c grey sand w/ gravel, several brn silty sand lenses.
45	-18.82	SP	0	160	4.5	5	0.9	v f grey sand grading to m grading grading to c grey sand (fining upward). sat.
48	-21.82	SM						silty brn sand - 2" thick. sat. no odor.
48.5	-22.32	SP						c brn - grey sand, tr gravel. sat. no odor.
50	-23.82	SP						c grey sand. sat. (H2O). no odor. flowing sands prevent further sampling. abandon hole.

Natural Gamma Log

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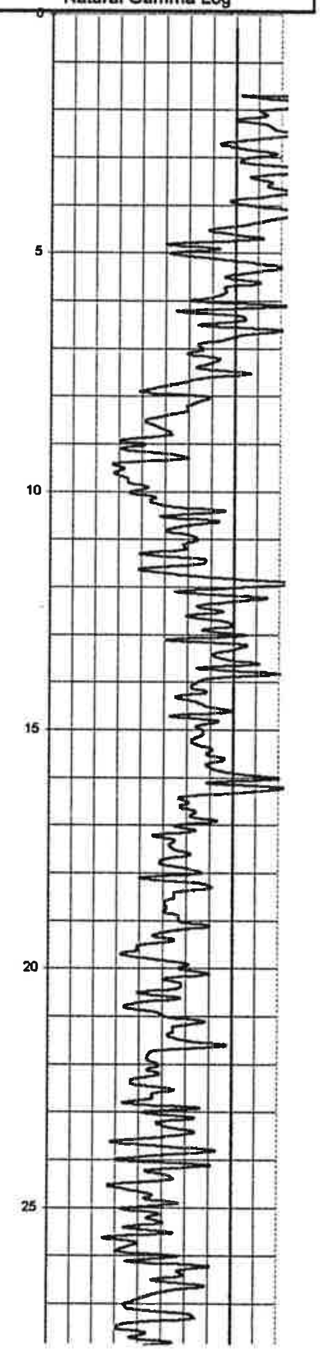
SOIL BORING LOG

		BORING NO.	SB-214
Coordinates:	N/A	Project No.	SU001E
Surface Elevation:	22.53	Client:	Sun Company, Inc.
Casing Below Surface:	N/A	Location:	Philadelphia Refinery (Point Breeze)
Reference Elevation:	N/A	GROUND WATER	
Reference Description:	Ground Surface	Depth Below:	Surface
Start Date:		At Time of Boring:	N/A
Comp Date:	18-Aug-97	After One Week:	N/A
Weather:		Surface Conditions:	

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description
0	22.53	Fill		560	na			Fill material: brn silt w/ sand, tr rock frag. & organics. stained black. HC odor.
5	17.53	ML		4460	2.5	5	50%	gray/ grn sandy micaceous silt, tr clay.
								moist. HC odor.
9	13.53	SP						m sand stained black w/ HC. strong HC odor.
9.9	12.63	GW						rounded gravel w/ c sand. brn. moist. HC odor.
10	12.53				3.5	5	70%	
		GW ML		2180				Top 2": black stained gravel. HC odor. wet. tan/ brn mottled tight dry silt, tr sand. tr clay. slight HC odor.
15	7.53	CL	9,500	7300	3.5	5	70%	Top 2" of interval (16'-17'): sandy silt/ clay
								(saturated)
17	5.53	GC						abrupt change to sandy clayey, gravel. HC odor. bot of interval poorly sorted
18	4.53	GW				5	0%	sandy gravel, tr silt. HC odor. (top of Trenton)
								H_2O @ 18'-19'
20	2.53	SW	9,890	2000	3	5	60%	running sand in top 2' of interval, coarsening downward w/ 30 - 40% gravel @ 23'. HC odor.
23	-0.47	SP						abrupt change to m-c sand. no gravel. coarsens downward to gravely sand.
		SW						HC odor throughout. gray color. Bottom 2' is fining upward sequence as is top 3'
25	-2.47	SP	7,905	760	3	5	60%	m-c sand. HC odor. gray color.

Natural Gamma Log



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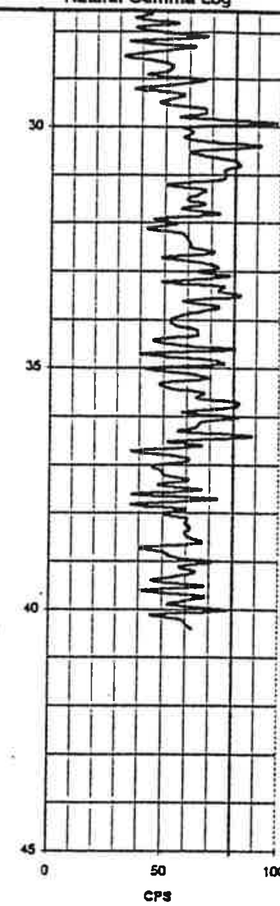
SOIL BORING LOG

Coordinates:	N/A	BORING NO.	SB-214
Surface Elevation:	22.53	Project No.	SU001E
Casing Below Surface:	N/A	Client:	Sun Company, Inc.
Reference Elevation:	N/A	Location:	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	GROUND WATER	
Start Date:		Depth Below:	Surface
Comp Date:	18-Aug-97	At Time of Boring:	N/A
Weather:		After One Week:	N/A
		Surface Conditions:	

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description
30	-7.47				3	5	60%	
32	-9.47	SP	7,400	1080				vf-f sand at top of interval (32' -35') Grain size is uniform throughout 32-35' interval m-c sand. HC odor. greenish yellow, clayey sand @35'.
35	-12.47	SP	300	1060	1	5	20%	vf-f sand (gray) @35'. m-c sand remaining interval. HC odor appears to diminish towards bot. of sample.
		SC/ML						clayey sand/ sandy silt @ 40' in shoe of sampler. no HC odor at that depth.
40	-17.47	SW	250	560	3.5	5	70%	41.5' - 42' vf-m red/brn sand. slight HC odor.
42	-19.47	SW						42'-44.5' m-vc red/ brn sand slight HC odor.
44.5	-21.97	SM/ML						layers of silty sand or sandy silt, red/ brn in color.
45	-22.47	SP	220	480	4	5	80%	46' - 48' m-c red/ brn sand
48	-25.47	SP						48'-48.5' m-c red/ brn sand, tr silt, tr gravel.
48.5	-25.97	SW						m-vc sand w/ 5-10% gravel, qtz pebbles. minor HC odor.
50	-27.47	SP						5' of running sand filled auger, no further sampling possible

Natural Gamma Log



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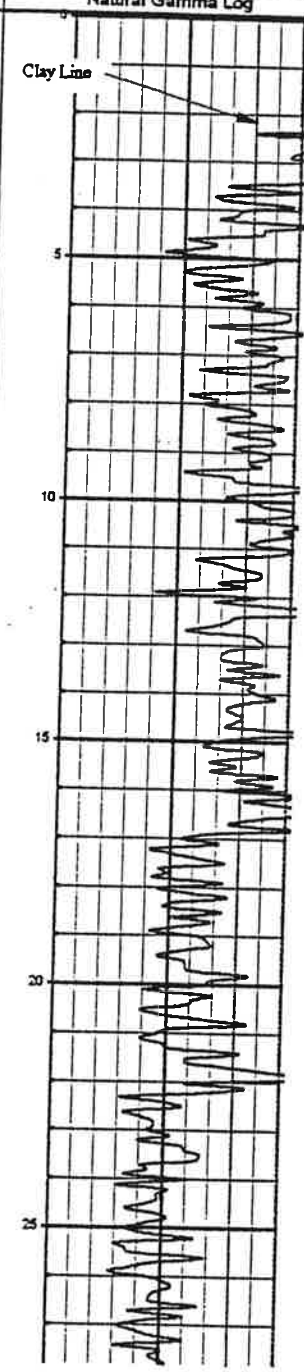
SOIL BORING LOG

Coordinates:	N/A	BORING NO.	SB-215
Surface Elevation:	22.98	Project No.	SU001E
Casing Below Surface:	N/A	Client:	Sun Company, Inc.
Reference Elevation:	N/A	Location:	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	GROUND WATER	
Start Date:		Depth Below:	Surface
Comp Date:	19-Aug-97	At Time of Boring:	N/A
Weather:		After One Week:	N/A
		Surface Conditions:	

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description
0	22.98	Fill			na			Fill Material
5	17.98	Fill	30	300	0.15	5	3%	Fill Material: m sand, gravel, brick.
10	12.98	SP ML SM	65	660	5	5	100%	brn/ orange m-f sand. grades to grn/ gray silt w/sand & orange sand stringers grades to grn/ gray f sand or silty sand @ bottom of sample. no HC odor.
15	7.98	SM	10	320	1.5	5	30%	grn/ gray silty f sand w/ orange m sand stringers. no HC odor.
20	2.98	SW	160	1040	0.5	5	10%	wet, red, gray f- m sand, 5% gravel, w/ cobbles. black stained m sand stringers @ bottom of sample. sm amt - HC odor.
25	-2.02	GW	7,500	10000+	0.3	5	6%	brn/ gray vc sand & gravel, w/ lrg (31/2 cm) cobbles.

Natural Gamma Log



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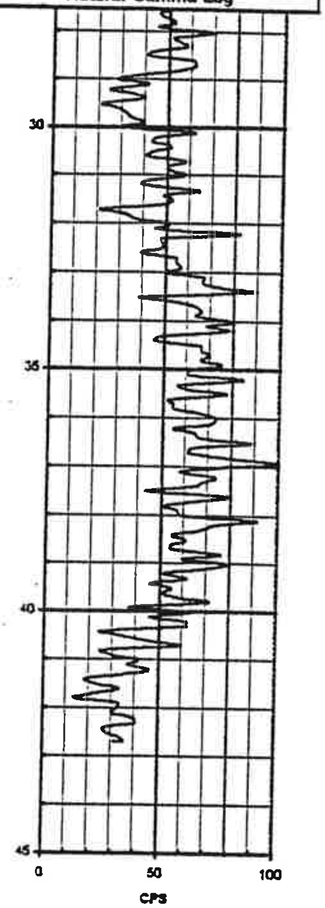
SOIL BORING LOG

Coordinates:	N/A	BORING NO.	SB-215
Surface Elevation:	22.98	Project No.	SU001E
Casing Below Surface:	N/A	Client:	Sun Company, Inc.
Reference Elevation:	N/A	Location:	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	GROUND WATER	
Start Date:		Depth Below:	Surface
Comp Date:	19-Aug-97	At Time of Boring:	N/A
Weather:		After One Week:	N/A
		Surface Conditions:	

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description
30	-7.02				0	5	0%	No recovery
35	-12.02	ML	10	440	5	5	100%	gray, sandy, silt / sandy clay. w/ cobbles, w/1/4"1/2" stringers of gray, f-m sand.
		PT						organic material in bottom of sample (wood, leaf, bark material) grades to f, well-sorted gray sand.
40	-17.02	SP	0	440	4	5	80%	gray m sand w/ orange sand stringers w/ some coarse sand and gravel. no HC odor.
45	-22.02	SP	130	760	1.5	5	30%	gray m -c sand w/ gravel (relatively uniform throughout interval.) HC odor
50	-27.02	SP	0	240,	4	5	80%	grades from gray/ red m-f sand to f - vf sand.
		ML						grades to vf sandy silt/ clay

Natural Gamma Log



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SOIL BORING LOG

Coordinates:	N/A	BORING NO.	SB-215
Surface Elevation:	22.98	Project No.	SU001E
Casing Below Surface:	N/A	Client:	Sun Company, Inc.
Reference Elevation:	N/A	Location:	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	GROUND WATER	
Start Date:		Depth Below:	Surface
Comp Date:	19-Aug-97	At Time of Boring:	N/A
Weather:		After One Week:	N/A
		Surface Conditions:	

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description	Natural Gamma Log
55	-32.02	CL						red clay @ 55'	

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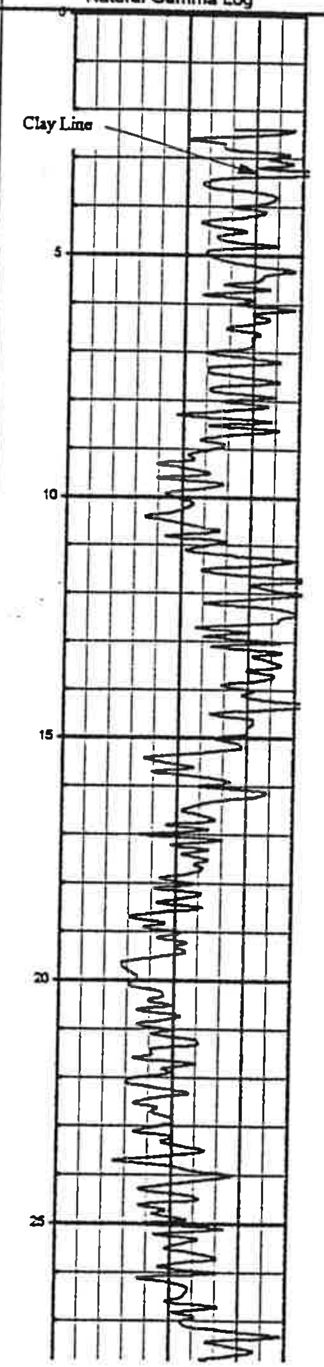
SOIL BORING LOG

Coordinates:	N/A	**BORING NO.**	SB-216
Surface Elevation:	19.58	**Project No.**	SU001E
Casing Below Surface:	N/A	**Client:**	Sun Company, Inc.
Reference Elevation:	N/A	**Location:**	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	**GROUND WATER**	
Start Date:		**Depth Below:**	Surface
Comp Date:	20-Aug-97	**At Time of Boring:**	N/A
Weather:		**After One Week:**	N/A
		Surface Conditions:	

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description
0	19.58	Fill	700	1020	na			surficial material, fill, large cobbles. 1-5' dk brn/ gray fill material, 5% gravel 20% sand, 75% silt. HC odor.
5	14.58	SP	7,500	10000+	4	5	80%	drk gray f-m sand (5-6')
6	13.58	ML						gray/ grn sandy silt, f sand
8	11.58	SM						gray/ grn silty vf-f sand. HC odor.
10	9.58		625	1460	4	5	80%	
11	8.58	SP						m-c sand, gray. HC odor.
12	7.58	CL						gray fissile clay
13	6.58	CL						orange/ red silty clay, hard brittle. 1% gravel, 10% f sand.
15	4.58	GW	8,600	10000+	1	5	20%	greenish, gray sandy gravel w/ cobbles (up to 3 cm). 60 gravel/ 40 % m-c sand. HC odor.
20	-0.42	SW	885	2320	0.3	5	6%	m-c gravely sand, w/ lrg cobble (4 cm) in core barrel @ top of interval. strong HC odor.
25	-5.42	SW	950	2880	0.5	5	10%	f-c dark gray micaceous sand, w/ 5% gravel. w/ clay/ silt layers. HC odor

Natural Gamma Log



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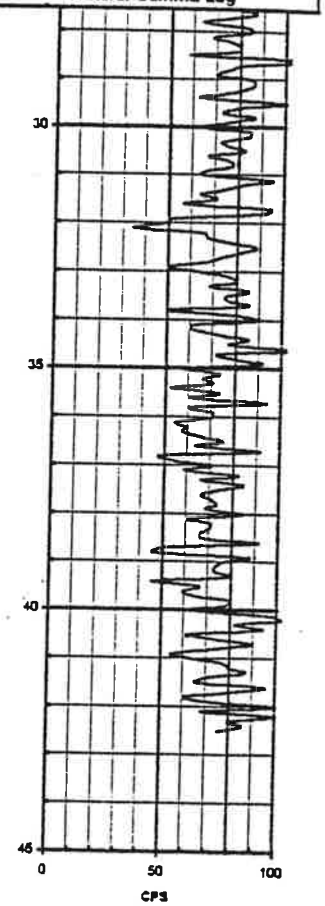
SOIL BORING LOG

Coordinates:	N/A	BORING NO.	SB-216
Surface Elevation:	19.58	Project No.	SU001E
Casing Below Surface:	N/A	Client:	Sun Company, Inc.
Reference Elevation:	N/A	Location:	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	GROUND WATER	
Start Date:		Depth Below:	Surface
Comp Date:	20-Aug-97	At Time of Boring:	N/A
Weather:		After One Week:	N/A
		Surface Conditions:	

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description
30	-10.42	CL	550	1680	5	5	100%	grn/ gray, silty clay/ clayey silt, micaceous. abundant organic material, occasional f-vf sand stringers. no HC odors.
35	-15.42	CL	30	720	5	5	100%	grn/ gray silty clay/ clayey silt, micaceous.
37	-17.42	SP						3" sand layer @ 37',
		CL						color change to reddish brn silty clay,
		PT						abundant organic material (1"-2" seam plant debris, leaves, etc.)
39.5	-19.92	SM						vf-f micaceous silty sand. no HC odor.
40	-20.42	SP	0	640	1	5	20%	f-c gray sand, micaceous, uniform throughout 1' interval, minor clay or silt
		ML						(maroon) at bottom of interval.
								interval 41' -44' silt is laminated w/ thin layers of vf - f sand.
		SP						vf sand. no HC odors.
45	-25.42	ML	0	320	5	5	100%	alternating layers of red clayey silt & red f-m sand.
		SP						12" layer of f-m sand @ 47 -48'.

Natural Gamma Log



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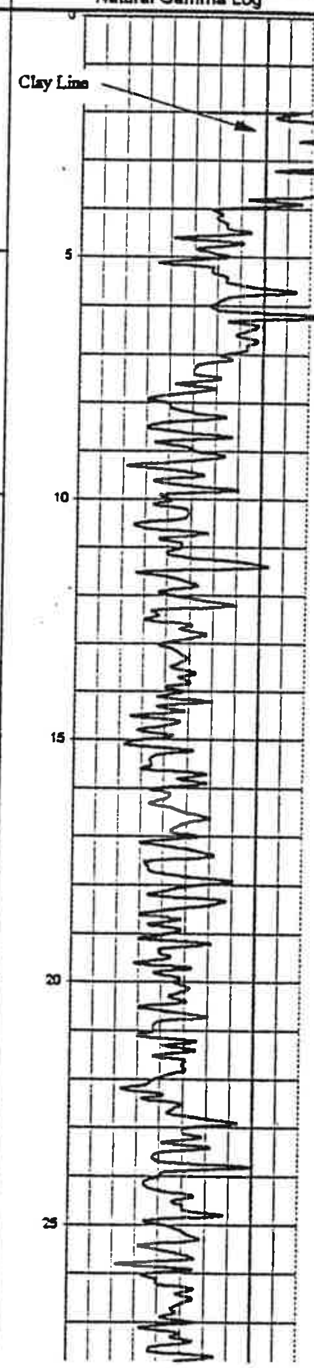
SOIL BORING LOG

Coordinates:	N/A	BORING NO.	SB-217
Surface Elevation:	20.28	Project No.	SU001E
Casing Below Surface:	N/A	Client:	Sun Company, Inc.
Reference Elevation:	N/A	Location:	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	GROUND WATER	
Start Date:		Depth Below:	Surface
Comp Date:	18-Aug-97	At Time of Boring:	N/A
Weather:		After One Week:	N/A
		Surface Conditions:	

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description
0	20.28	Fill	0	300	na			dk brn sandy silt, some gravel. (SB-217A)
5	15.28	CL	2,125	1120	3	5	0.6	
7	13.28	CL						greenish sandy silt or sandy clay
8	12.28	GW						sandy gravel. HC odor. lrg qtz pebbles. abandoned hole. auger refusal - qtz pebbles and cobbles.
10	10.28	ML	0	280	0	5	0	(from cuttings: black , wet silt w/ lrg cobbles. No odor. (SB-217B)
15	5.28	ML	250	400	1	5	0.2	black, wet, sandy silt w/large gravel. lrg cobble. HC odor.
20	0.28	GW	4,750	2400	1	5	0.2	grey m-c sand & gravel, lrg cobbles. HC odor. gravel / cobbles limited recovery.
25	-4.72				0	5	0	No recovery. sat. slight HC odor. (GW at 26')

Natural Gamma Log



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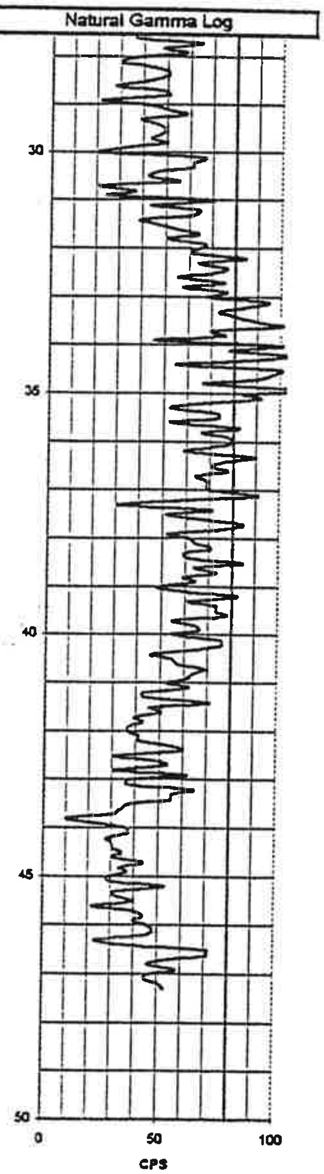
SOIL BORING LOG

Coordinates:	N/A	BORING NO.	SB-217
Surface Elevation:	20.28	Project No.	SU001E
Casing Below Surface:	N/A	Client:	Sun Company, Inc.
Reference Elevation:	N/A	Location:	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	GROUND WATER	
Start Date:		Depth Below:	Surface
Comp Date:	18-Aug-97	At Time of Boring:	N/A
Weather:		After One Week:	N/A
		Surface Conditions:	

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description
								running sands. no further sampling possible. empty sampler was lined w/ v f sat. brn sand.
30	-9.72				0	5	0	No recovery (SB-217C)
35	-14.72	SP	2,625	1180	0.5	5	0.1	grey m-c sand. HC odor.
40	-19.72	SP SM CL	1,250	1080	0.3	5	0.06	grey m sand @ top of sample grades to grey silty sand. bottom of sample - grey sandy clay. no HC odor.
45	-24.72	SP	570	540	1.5	5	0.3	grey/ brn m sand w/ some fine sand. fairly uniform throughout the sample sm amt HC odor
50	-29.72	ML CL	0	260	?			grey sandy silt. grades to grey/ brn sandy clay w/ silt & sand stringers. red/ brn clay w/ vf orange sand. red/ brn sandy, silty clay.



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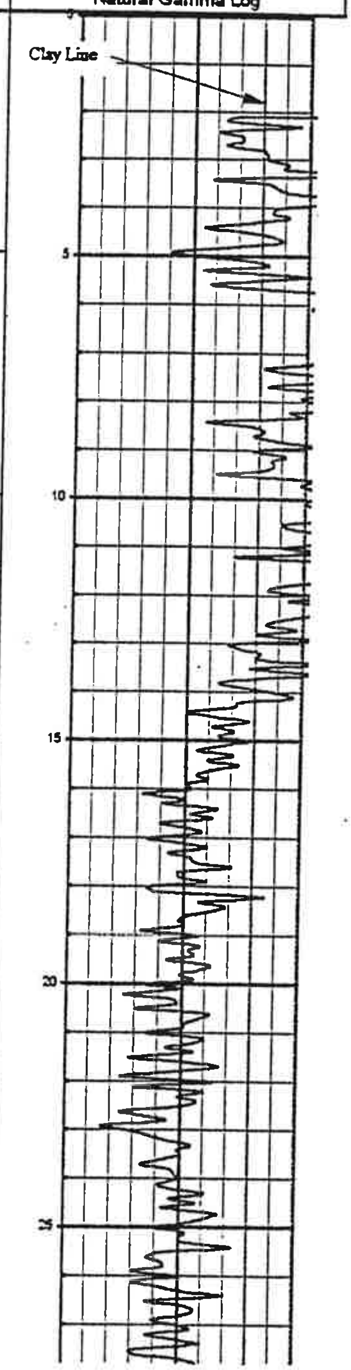
SOIL BORING LOG

Coordinates:	N/A	BORING NO.	SB-218
Surface Elevation:	23.13	Project No.	SU001E
Casing Below Surface:	N/A	Client:	Sun Company, Inc.
Reference Elevation:	N/A	Location:	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	GROUND WATER	
Start Date:		Depth Below:	Surface
Comp Date:	20-Aug-97	At Time of Boring:	N/A
Weather:		After One Week:	N/A
		Surface Conditions:	

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description
0	23.13	Fill			na			Fill Material: black stained
5	18.13	Fill			0	5	0%	no recovery, (descip. from auger cuttings) fill material: black stained gravel & sand,. pieces of brick. dry. no HC odor.
10	13.13				1	5	20%	
		SP	0	1020				grey m-f sand, some silt. grades to mostly f grey sand. no HC odor.
15	8.13				0.5	5	10%	
		SP ML	135	720				dry grey, f sand with some m sand. grades to clayey silt w/ sand & rock frag.
20	3.13	SW	10000+	8700	0.2	5	4%	moist, black c sand w/ gravel. (no cohesion). strong HC odor.
25	-1.87	SW	10000+	8700	0.3	5	6%	moist, brn c - m sand w/ gravel w/ lrg (3 cm) cobbles. stringer of white c sand. strong HC odor.

Natural Gamma Log



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SOIL BORING LOG

Coordinates:	N/A	BORING NO.	SB-218
Surface Elevation:	23.13	Project No.	SU001E
Casing Below Surface:	N/A	Client:	Sun Company, Inc.
Reference Elevation:	N/A	Location:	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	GROUND WATER	
Start Date:		Depth Below:	Surface
Comp Date:	20-Aug-97	At Time of Boring:	N/A
Weather:		After One Week:	N/A
		Surface Conditions:	

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description
30	-6.87	SW	10000+	10000+	0.3	5	6%	wet, red/ brn c sand w gravel. lrg (3 cm) rock frag. strong HC odor.
35	-11.87	SW			3	5	60%	
37	-13.87	SW	1,260	2220				wet, red/ brn m- c sand w/ some f sand. strong HC odor.
		SW	6,150	5480				grades to grey / brn m-vc sand (@ 40') w/ 2% gravel. less HC odor
40	-16.87	CH	10	240	4	5	80%	orange/ grey, plastic clay.
41	-17.87	ML						grey, silt w/ f sand & organic material.
		PT						(abundant organic material, plant material.)
								interval 41' -44' silt is laminated w/v thin layers of vf - f sand. @ 45' vf sand. no HC odors
45	-21.87	SP	110	260	3.5	5	70%	grey f sand grades to grey silt laminated w/ stringers of sand. no HC odor.
		ML						HC odor

Natural Gamma Log

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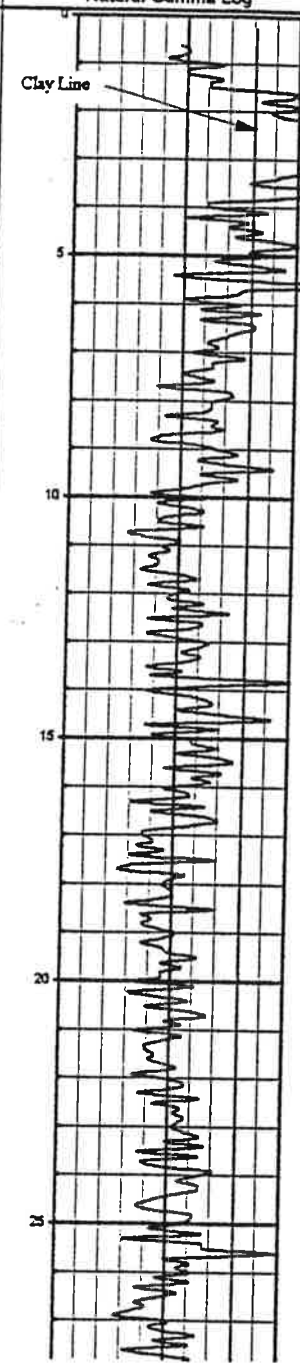
SOIL BORING LOG

Coordinates:	N/A	**BORING NO.**	SB-220
Surface Elevation:	18.13	**Project No.**	SU001E
Casing Below Surface:	N/A	**Client:**	Sun Company, Inc.
Reference Elevation:	N/A	**Location:**	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	**GROUND WATER**	
Start Date:		**Depth Below:**	**Surface**
Comp Date:	21-Aug-97	**At Time of Boring:**	N/A
Weather:		**After One Week:**	N/A
		Surface Conditions:	

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description
0	18.13	Fill	8,650	2300	na			Fill material: black clayey silt & gravel, c sand. HC odor. clay layer (plastic @ 3'-5') perched water coming into the hole.
5	13.13		4,400	4720	2.2	5	44%	
8	10.13	GW						black, silty sandy gravel, v wet.
9	9.13	ML						black, clayey sandy silt, stringers of m sand. strong HC odor.
10	8.13	SW	1,000	1760	0.3	5	6%	red m-vc sandy gravel, poorly sorted, <5 % silt. strong HC odor.
15	3.13	GW	9,350	5100	0.25	5	5%	red, sandy gravel w/ m-c sand, poorly sorted 1 cobble (3cm) in barrel. HC odor.
20	-1.87	SP	9,350	4760	0.75	5	15%	poor sample recovery due to rock in sampler barrel. small fining upward sequence grades from vf-f sand at top through m-c sand to gravely m-vc sand,
		SW						color: grn - gray. HC odor.
25	-6.87	SP	1,450	3780	0.75	5	15%	vf-f sand (brownish grn) @ top of interval.
		SW						m-c sand @ middle of interval

Natural Gamma Log



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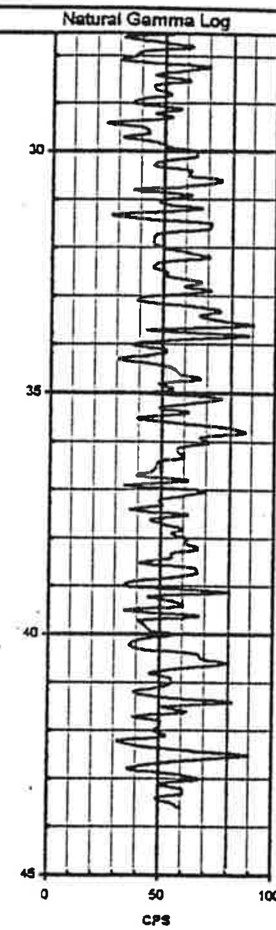
SOIL BORING LOG

Coordinates:	N/A	BORING NO.	SB-220
Surface Elevation:	18.13	Project No.	SU001E
Casing Below Surface:	N/A	Client:	Sun Company, Inc.
Reference Elevation:	N/A	Location:	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	GROUND WATER	
Start Date:		Depth Below:	Surface
Comp Date:	21-Aug-97	At Time of Boring:	N/A
Weather:		After One Week:	N/A
		Surface Conditions:	

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description
								grades to f sand w/ 20 % silt at bottom interval. HC odor
30	-11.87	SP	7,250	10000+	1	5	20%	fining upward sequence- vf-f @ top
		SM						m-c silty sand, 5% silt, grn/ gray color. HC odor. (sheen visible on liquid surface inside sample.)
35	-16.87	SW	400	1860	0.5	5	10%	m-vc grn/ gray sand @ top of interval
		SP						vf-m grained silty sand @ bottom. 5% vc sand. no noticeable odor.
40	-21.87	SP	1,000	2100	3	5	60%	m-c gray sand w/ v c sand @ top of interval.
			15	1080				grades to m-c sand (grn/ gray) at at bottom of interval. w/ 5 % silt. HC odor.
45	-26.87	SW	280	1540	1.5	5	30%	m-c gray sand w/ gravel, & w/ 10% silt. HC odor.
50								Sand run-up in augers. No further sampling possible.

Natural Gamma Log



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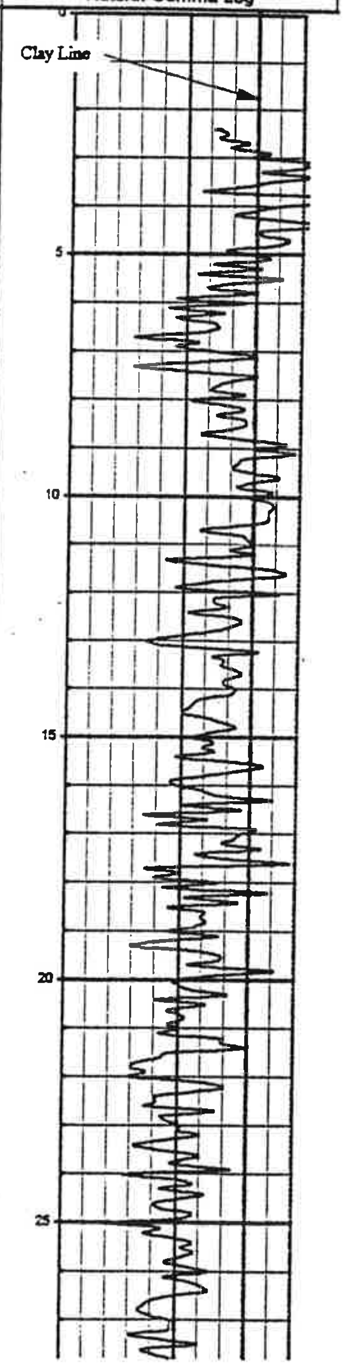
SOIL BORING LOG

Coordinates:	N/A	**BORING NO.**	SB-221
Surface Elevation:	25.08	**Project No.**	SU001E
Casing Below Surface:	N/A	**Client:**	Sun Company, Inc.
Reference Elevation:	N/A	**Location:**	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	**GROUND WATER**	
Start Date:		**Depth Below:**	Surface
Comp Date:	27-Aug-97	**At Time of Boring:**	N/A
Weather:		**After One Week:**	N/A
		Surface Conditions:	

S-44

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description
0	25.08	Fill	na	1520	na			black fill to approx. 4', pieces of china gray/ brn silt @ 4' 20% sand, 75% silt. HC odor.
5	20.08	SP	na	600	5	5	1	grn to blue/gray to orange vf -f grained silty sand. sand and silt content varies throughout interval.
10	15.08	GW	na		0	5	0	(gravel from 10-13' based on drill cutting) 3" of grn clay in bottom of shoe w/ lrg (3") rock plugging sampler. no sample collected.
15	10.08	SP		920	0.25	5	0.05	poor recovery due to rocks in shoe remainder of sample - gray/ brn m sand w/ < 1% c sand <5% fines (including vf - f sand). initial water @ 19.5'
20	5.08	SW		540	0.16	5	0.032	gravel @ 22', 24', & 25 ' (drilling sound) one lrg qtz pebble in shoe prevented recovery. sample: gray/ brn m sand w/ 20% gravel & c - vc sand, < 1% fines
25	0.08	SP		8300	0.16	5	0.032	gravel & rock in shoe prevented sample recovery. sample remaining: gravely f -vc sand poorly sorted gray - brn w/ HC odor.

Natural Gamma Log



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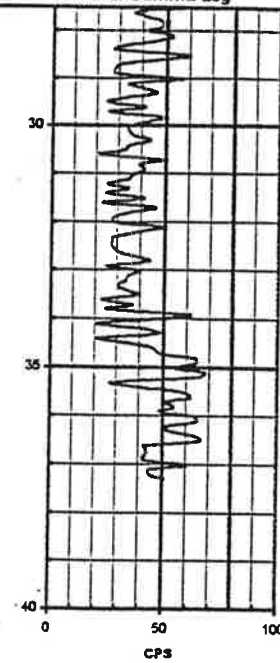
SOIL BORING LOG

Coordinates:	N/A	**BORING NO.**	SB-221
Surface Elevation:	25.08	**Project No.**	SU001E
Casing Below Surface:	N/A	**Client:**	Sun Company, Inc.
Reference Elevation:	N/A	**Location:**	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	**GROUND WATER**	
Start Date:		**Depth Below:**	Surface
Comp Date:	27-Aug-97	**At Time of Boring:**	N/A
Weather:		**After One Week:**	N/A
		Surface Conditions:	

S-44

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description
30	-4.92	SW						
33	-7.92	GP						hit gravel & cobble layer @ 32' - 33' auger refusal. abandon hole & move 5'.
35	-9.92	GW		3000	4	5	0.8	dk gray sandy gravel @ 35' - 35.5', strong HC odor
35.5	-10.42	ML						gray/ blue micaceous silt w/ sand (40%)
36.6	-11.52	GC						muddy gravel, no c- m sand
38	-12.92	GW						clayey, sandy gravel. m - c sand
39.5	-14.42	SW						m - vc gravely sand
40	-14.92	CH						red/ orange plastic silty clay no HC odor unable to advance sampler any further than 41 '. abandoned hole.

Natural Gamma Log



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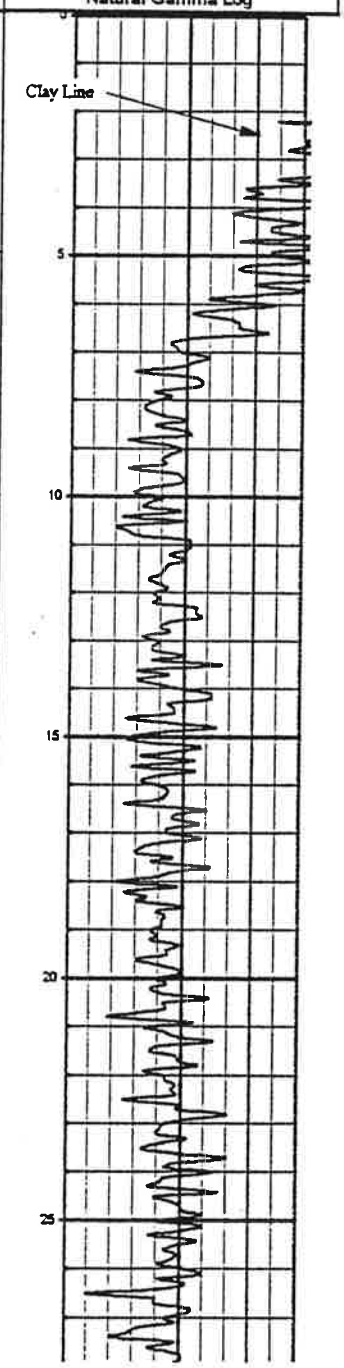
SOIL BORING LOG

Coordinates:	N/A	**BORING NO.**	SB-222b
Surface Elevation:	19.08	**Project No.**	SU001E
Casing Below Surface:	N/A	**Client:**	Sun Company, Inc.
Reference Elevation:	N/A	**Location:**	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	**GROUND WATER**	
Start Date:		**Depth Below:**	**Surface**
Comp Date:	21-Aug-97	**At Time of Boring:**	N/A
Weather:		**After One Week:**	N/A
		Surface Conditions:	

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description
0	19.08	Fill			na			Fill Material: vc sand & gravel w/ some f sand. HC odor.
5	14.08	ML	0	640	1.5	5	30%	gray clayey silt w/ sand
8.5	10.58	SW						red/ gray c sand & gravel. some cobbles (3 cm dia.) no HC odor.
10	9.08	SW	0	300	0.25	5	5%	vc sand & gravel (red), cobbles (1-2 cm dia.) no HC odors
15	4.08	SW	0	300	0.25	5	5%	vc sand & gravel (red), cobbles (1-2 cm) HC odor. color change at bottom w/ black sand stringer
20	-0.92	GW	100	520	0.4	5	8%	wet, red c sand & gravel w/ cobbles (1-2 cm)
25	-5.92	GW	825	1680	0.17	5	3%	wet, m-c sandy gravel (red). HC odor.

Natural Gamma Log



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SOIL BORING LOG

Coordinates:	N/A	**BORING NO.**	SB-222b
Surface Elevation:	19.08	**Project No.**	SU001E
Casing Below Surface:	N/A	**Client:**	Sun Company, Inc.
Reference Elevation:	N/A	**Location:**	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	**GROUND WATER**	
Start Date:		**Depth Below:**	Surface
Comp Date:	21-Aug-97	**At Time of Boring:**	N/A
Weather:		**After One Week:**	N/A
		Surface Conditions:	

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description
30	-10.92	SP	0	120	4	5	80%	gray f-vf sand @ top of interval,
		CL						grades quickly to gray clay w/ vf-f sand w/ v - f stringer (up to 2 in. thick) of sand. evidence of some organic material. no HC odor
35	-15.92	CL	0	440	4	5	80%	gray clay w/f sand stringer
36	-16.92	SC						red/ brn clayey sand, layering of clay & sand
37	-17.92	SP						One lrg cobble (3cm) @ 37 ft. m-c gray sand w/ HC odor.
40	-20.92	SP	1,000	2100	3	5	60%	sand run-up in the augers. unable to sample any further.

Natural Gamma Log

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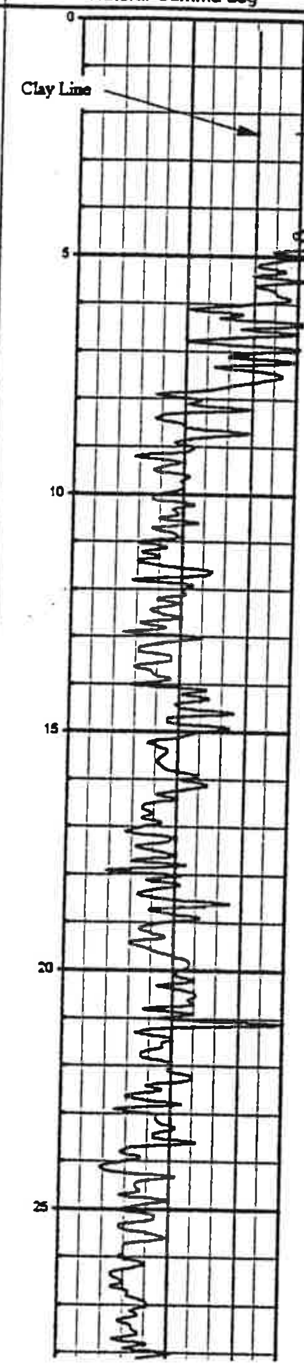
SOIL BORING LOG

Coordinates:	N/A	BORING NO.	SB-223
Surface Elevation:	21.98	Project No.	SU001E
Casing Below Surface:	N/A	Client:	Sun Company, Inc.
Reference Elevation:	N/A	Location:	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	GROUND WATER	
Start Date:		Depth Below:	Surface
Comp Date:	25-Aug-97	At Time of Boring:	N/A
Weather:		After One Week:	N/A
		Surface Conditions:	

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description
0	21.98	Fill	35	200	na			Fill material: large rocks (8-10cm) black gravely, sandy silt. no HC odor.
5	16.98	SP	95	260	3	5	60%	f-m black stained sand.
6.5	15.48	ML						m sandy silt, w/black stained sand stringers. 1 large cobble (3 cm)
7.5	14.48	GW						gravel @ bottom 0.5' of sample no HC odor.
10	11.98	SW	145	480	0.25	5	5%	red c - vc sand & gravel. w/ some blue gravel. no HC odor.
15	6.98	GW	995	1440	2	5	40%	black stained c - vc red sand and gravel, w/ lrg cobbles (3 cm)
20	1.98	GW	265	1000	0.75	5	15%	wet, red c sand and gravel w/ cobbles (1/5-2cm) HC odor
25	-3.02	SP	10,000+	1000	0.25	5	5%	wet, f-m gray/ brn sand - 1st inch of recovery grades quickly to m-c gray brn sand HC odor

Natural Gamma Log



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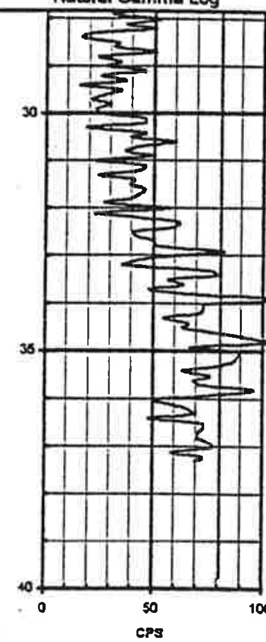
SOIL BORING LOG

Coordinates:	N/A	**BORING NO.**	SB-223
Surface Elevation:	21.98	**Project No.**	SU001E
Casing Below Surface:	N/A	**Client:**	Sun Company, Inc.
Reference Elevation:	N/A	**Location:**	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	**GROUND WATER**	
Start Date:		**Depth Below:**	**Surface**
Comp Date:	25-Aug-97	**At Time of Boring:**	N/A
Weather:		**After One Week:**	N/A
		Surface Conditions:	

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description
30	-8.02				0	5	0%	no recovery, nothing in sampler
35	-13.02	SW	875	2360	1.25	5	25%	strong HC odor, 1/2" of m-vc sandy gravel (gray)
35.1	-13.12	CL						gray, silty clay (<1%sand),~ 9" thick.,
36	-14.02	SW	205	1040				abrupt change back to gray m-vc gravely sand
								no HC odor noticeable in lower interval.
40	-18.02	SP	465	1950	1	5	20%	small fining upward sequence
		SW						abrupt change to f-c grain red / brn micaceous sand, fining upward to vf-f red/ brn micaceous sand.
		GP						gravely lag deposit at bottom of interval,
45	-23.02							sand run-up in augers. impossible to further sample.

Natural Gamma Log



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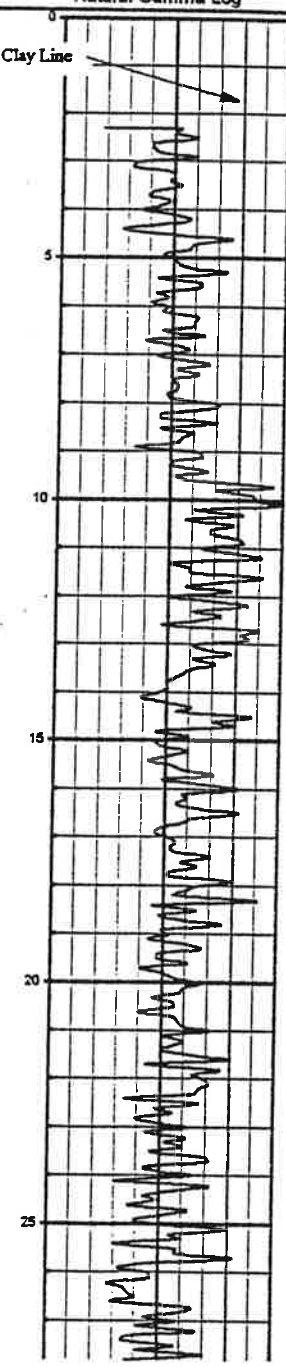
SOIL BORING LOG

Coordinates:	N/A	BORING NO.	SB-224
Surface Elevation:	27.18	Project No.	SU001E
Casing Below Surface:	N/A	Client:	Sun Company, Inc.
Reference Elevation:	N/A	Location:	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	GROUND WATER	
Start Date:		Depth Below:	Surface
Comp Date:	27-Aug-97	At Time of Boring:	N/A
Weather:		After One Week:	N/A
		Surface Conditions:	

S-42

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description
0	27.18	Fill	800	1060	na			Fill material: black w/ gravel sand & some silt
2	25.18	ML	0	460				brn dry micaceous silt, v little clay.
5	22.18				0.33	5	7%	
		SP ML	183	900	0.33	5	7%	top 2" gray/ brn c sand bottom 2" brn/ red sandy silt
10	17.18	ML	0	420	2.5	5	50%	top 1" - c black/ gray sand grades quickly to gray silty, sandy clay w/ orange r sand stringers & lrg (4 cm) cobble @ bottom of sample.
15	12.18	GW	0	440	0.33	5	7%	red/ gray/ blk c sand & gravel 1 large (3 cm) cobble @ top of sample. no HC odor
20	7.18	GW	0	400	1	5	20%	variegated, red/ orange/ black/ blue c sand & gravel w/ cobbles (2 cm). no HC odor.
25	2.18				0	5	0%	no recovery

Natural Gamma Log



INTEGRATED SCIENCE & TECHNOLOGY, INC.

(770) 425-3080 Marietta, Georgia 30060

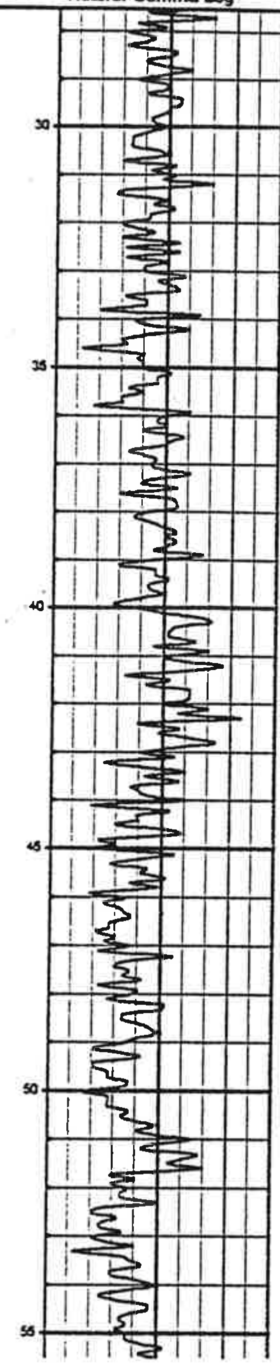
SOIL BORING LOG

Coordinates:	N/A	BORING NO.	SB-224
Surface Elevation:	27.18	Project No.	SU001E
Casing Below Surface:	N/A	Client:	Sun Company, Inc.
Reference Elevation:	N/A	Location:	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	GROUND WATER	
Start Date:		Depth Below:	Surface
Comp Date:	27-Aug-97	At Time of Boring:	N/A
Weather:		After One Week:	N/A
		Surface Conditions:	

S-42

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description
30	-2.82	SP	6,985	6440	0.33	5	7%	may have had up to 3' of vf -f sand - upper portion of sampler -remnant 4")
								1/4" - 1/2" of vf - f sand
		SW						remainder: m- vc sand w/<3% vf - f sand < 1% gravel. strong HC odor. moist.
35	-7.82	SM	9,050	1000+	0.25	5	5%	vf -f silty brn sand to (1/8") m - vc gray/ brn sand w/ < 1% gravel. larger % gravel at bottom of sample interval strong HC odor & sheen along sampler wall.
		SW						
40	-12.82	SM	220	1320	0.2	5	4%	vf - m silty brn/ gray sand slight HC odor.
43	-15.82	SW	3,020	3500				m- vc brn sand w/ <3 % fines grading to vc sandy gravel in bottom 2" of sample.
45	-17.82	SM	680	1300	1	5	20%	vf - m silty brn sand @ top 3"
		SW						m - vc brn sand in remainder of interval. some coarsening downwards.
50	-22.82							unable to push sampler down far enough. running sands.

Natural Gamma Log



INTEGRATED SCIENCE & TECHNOLOGY, INC.

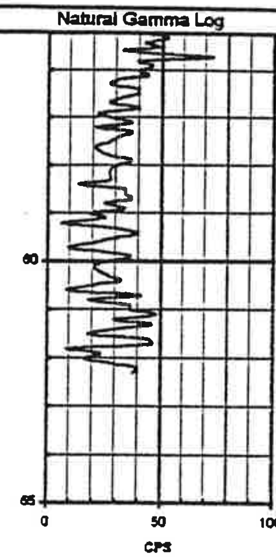
(770) 425-3080 Marietta, Georgia 30080

SOIL BORING LOG

Coordinates:	N/A	BORING NO.	SB-224
Surface Elevation:	27.18	Project No.	SU001E
Casing Below Surface:	N/A	Client:	Sun Company, Inc.
Reference Elevation:	N/A	Location:	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	GROUND WATER	
Start Date:		Depth Below:	Surface
Comp Date:	27-Aug-97	At Time of Boring:	N/A
Weather:		After One Week:	N/A
		Surface Conditions:	

S-42

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description	Natural Gamma Log



INTEGRATED SCIENCE & TECHNOLOGY, INC.

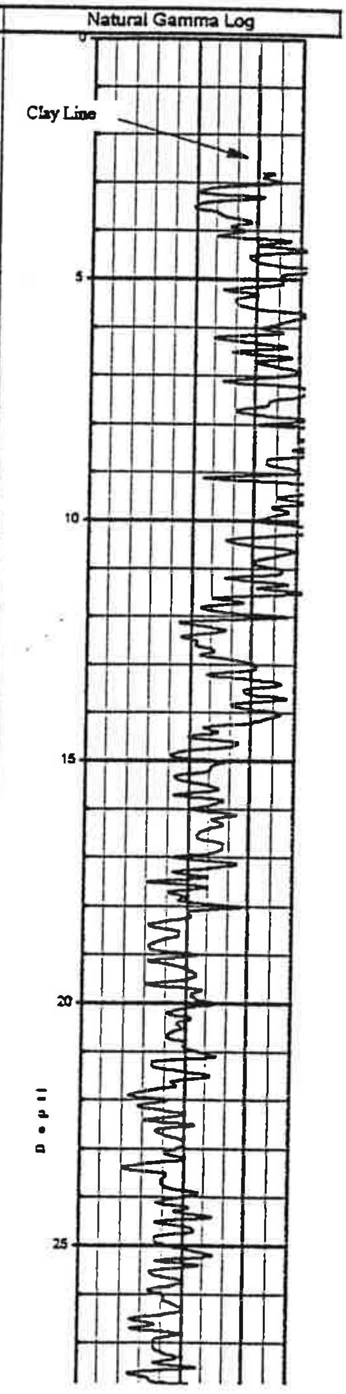
(770) 425-3080 Marietta, Georgia 30060

SOIL BORING LOG

Coordinates:	N/A	BORING NO.	SB-225
Surface Elevation:	18.78	Project No.	SU001E
Casing Below Surface:	N/A	Client:	Sun Company, Inc.
Reference Elevation:	N/A	Location:	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	GROUND WATER	
Start Date:		Depth Below:	Surface
Comp Date:	25-Aug-97	At Time of Boring:	N/A
Weather:		After One Week:	N/A
		Surface Conditions:	

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description
0	18.78	Fill	800	1080	na			Fill material: black/ brn sandy silt w/ gravel
5	13.78	SM	810	760	4	5	80%	top 2' of sample- brn, gray, f sand & silt w/ stringer m sand.
7	11.78	ML						gray sandy silt & clay, grades to gray clay at bottom of the interval.
		CL						
10	8.78	ML	875	3420	2	5	40%	light blue-gray clayey silt w/ 2-3% vf-f grained and little or no HC odor.
12	6.78	SW	30	900				abrupt change @ bottom 6" of sample to poorly sorted m-vc sand w/ 5% gravel up to 3 cm dia. m brn gravel. HC odor.
15	3.78	GW	9,450	7660	1.5	5	30%	(top of sample) black stained, m-c sand & gravel
		GC						(bottom of sample) clayey, sandy variegated (red, green, brn, yellow) gravel. lrg gravel (up to 4 cm). strong HC odor (sheen on H_2O)
20	-1.22	SW	9,050	10000+	0.3	5	6%	red/ brn m-vc micaceous sand & gravel (up to 30% gravel w/ 2-3 cm cobbles. HC odor.
25	-6.22	SP	9,425	3460	0.25	5	5%	(top of interval) vf red, brn sand.

Natural Gamma Log



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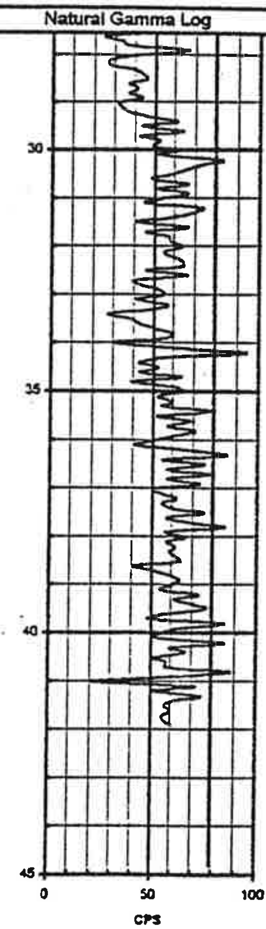
(770) 425-3080 Marietta, Georgia 30060

SOIL BORING LOG

Coordinates:	N/A	BORING NO.	SB-225
Surface Elevation:	18.78	Project No.	SU001E
Casing Below Surface:	N/A	Client:	Sun Company, Inc.
Reference Elevation:	N/A	Location:	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	GROUND WATER	
Start Date:		Depth Below:	Surface
Comp Date:	25-Aug-97	At Time of Boring:	N/A
Weather:		After One Week:	N/A
		Surface Conditions:	

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description
		GW						grades to c -vc sand & gravel @ bottom of sample w/ 1.5 cm cobbles. HC odor.
30	-11.22				0	5	0%	no recovery of sample
35	-16.22	SP	460	1500	2	5	40%	top 4" of sample: f-m gray/ brn sand w/ some coarse sand
		SM						grades to silty f- c silty sand (10 % silt), gray
39	-20.22	SP						bottom of sample: vf - f orange/ brn sand w/ 30% silt. no HC odor.
40	-21.22	SP	220	900	3.5	5	70%	top of sample: fining sequence upward in the top 1' with f - m gray sand.
								middle of sample: m- c gray sand,
43	-24.22	SP						grading to f- vf sand w/ coarse sand stringers.
44	-25.22	SP						vf sand w/ c sand stringers.
45	-26.22	SP	290	1200	1.5	5	30%	gray/ brn m - c sand. fairly uniform no HC odor.
50	-31.22	SP	0	1160	1.5	5	30%	1' brn/ gray m- c sand w/ gray silty stringer approx. 2" thick bottom of sample: micaceous, red/ gray f-vf sand. no HC odor.

Natural Gamma Log



INTEGRATED SCIENCE & TECHNOLOGY, INC.

(770) 425-3080 Marietta, Georgia 30060

SOIL BORING LOG

Coordinates:	N/A	BORING NO.	SB-225
Surface Elevation:	18.78	Project No.	SU001E
Casing Below Surface:	N/A	Client:	Sun Company, Inc.
Reference Elevation:	N/A	Location:	Philadelphia Refinery (Point Breeze)
Reference Description:	Ground Surface	GROUND WATER	
Start Date:		Depth Below:	Surface
Comp Date:	25-Aug-97	At Time of Boring:	N/A
Weather:		After One Week:	N/A
		Surface Conditions:	

Dpth	Elev	USCS	OVA	PID	FT REC	FT ADV	% REC.	Description	Natural Gamma Log
55	-36.22	SP	0	360	2	5	40%	top of sample: 4" - gray f -vf sand approx. 10" m- f gray, brn sand w/ orange-brn c sand stringers. grades to orange m -c sand @ bottom (4 - 5")	
60	-41.22								

Defense Personnel Support Center Philadelphia, PA	Log of Boring No. MW-1	Sheet No. 1 of 1

Client:	U.S. Army Corps of Engineers, Huntsville Division	Boring Started:	1/15/91
Project Number:	3908622	Boring Completed:	5/7/91
Drilling Contractor:	Empire Soil Investigations, Inc.	Boring Diameter:	8 inch
Driller:	R.Flemming	Surface Elevation:	21.59 ft
Logged By:	R.Pomeroy	Well Casing Diameter:	2 inch
Drilling Method:	Hollow Stem Auger	Top of Casing Elev:	21.08 ft
State Plane Coordinates:	222857 N 2723739 E	Elevation Datum:	NGVD
		Type of Drill Rig:	Acker AD-II

Depth	Samp Type	Samp Rec ft	OVA ppm	Blows Per 6"	MATERIAL DESCRIPTION
					FILL AND CONCRETE
	SS		15	2-2 2-2	(CL) CLAY, organic, silty, dark brown, soft, no odor 3 ft - becomes light brown, slightly silty
	SS		5	3-3 3-5	4 ft - becomes light brown-green, no odor
	SS		9	6-6 7-11	6 ft - with dark brown to black streaks, firm, no odor
	SS		7	5-4 4-13	8 ft - becomes light brown and dark brown, with increasing silt content, no odor Qal
	SS		6	15-17 21-22	(SP) SAND, medium to coarse-grained, with few pebbles, brown, dense, no odor Qp
	SS		3	12-13 14-26	19 ft - with some pebbles, and trace silt and clay, medium dense, saturated with water, no odor
	SS		2	15-21 25-24	(SM) SAND, silty, brown, with some pebbles and trace clay, dense, brown, faint petroleum odor Ko
	SS		25	27-4 9-17	29 ft - distinct petroleum odor
					BORING TERMINATED AT 34 FT BGS

Elevation: 20, 15, 10, 5, 0, -5, -10
Depth: 5, 10, 15, 20, 25, 30

Dynamic Penetration Resistance Blows/ft × 8 16 24 32
OVA (ppm) □ 200 400 600 800

SS = Split Spoon ST = Shelby Tube OVA = Organic Vapor Analyzer

10/7/91

ESE

MW-1

REDRILLED WELL 5/7/91

MONITOR WELL CONSTRUCTION

Logged By: R. POMEROY.

Client: USACE

Drilling Contractor: M&R SOIL INVESTIGATION

Location: PHILADELPHIA, PA

Driller's Name: R. FLEMMING

Job Number: M/I

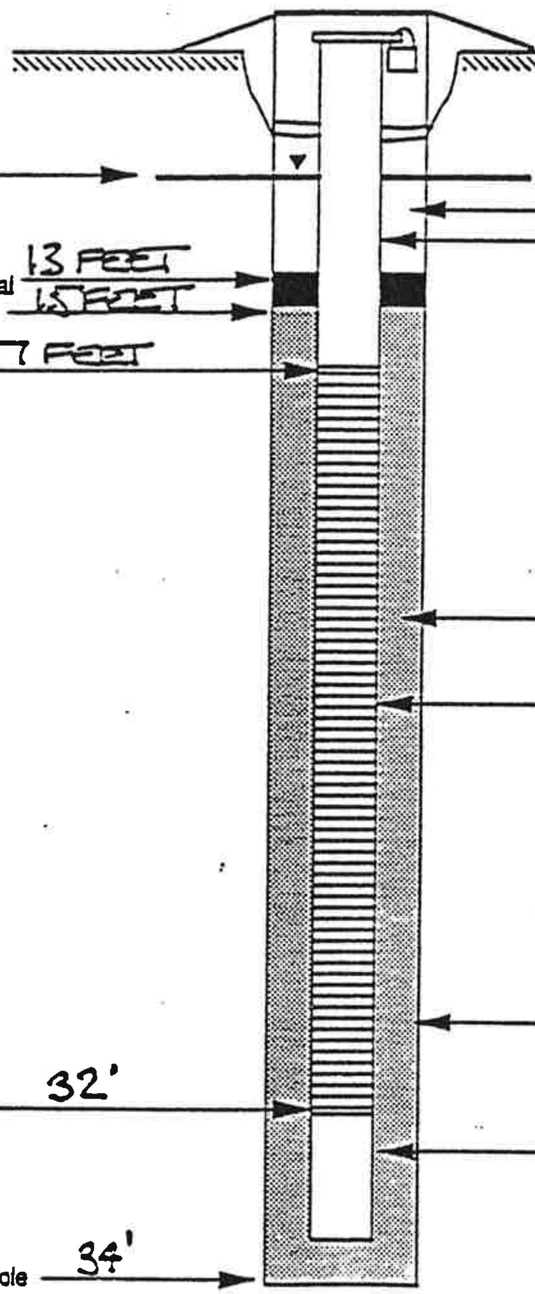
Well Number: MW-1

Date/Time: Start 1/15/91 0800 Finish 1/15/91

Comments: (Lost circulation interval, water level changes, hole collapse interval, etc.)

completed by Empire Soils Investigations. Driller: MATT RAAS

Depths in Reference to Ground Level



Cement/Gravel Antipecolation Pad

Groundwater

Type of Grout

Casing:

Type PVC

Diameter 2"

Top of Bentonite Seal 13 FEET

Top of Gravel Pack 15 FEET

Top of Screen 17 FEET

Couplings: N/A

Type

Number

Depths

Gravel Pack:

Material MORIE #1 SAND.

Screen:

Type PVC

Diameter 2"

Length 15'

Slot Size .010"

Borehole Diameter 8"

Bottom of Screen 32'

Well Sump:

Diameter 2"

Material PVC

Length 2'

Total Depth of Borehole 34'

NOT TO SCALE

... Buildin ...
... Pittsburgh Pa
... Dist
... MW-1A
Hildebrand
... INCLINED ______ DEG. FROM VERT.
... OVERBURDEN —
... INTO ROCK —
... OF HOLE 20.0'

12. MANUFACTURER'S DESIGNATION OF DRILL: CME-55
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 15 | UNDISTURBED
14. TOTAL NUMBER CORE BOXES —
15. ELEVATION GROUND WATER
16. DATE HOLE: STARTED 6/2/92 | COMPLETED 6/2/92
17. ELEVATION TOP OF HOLE
18. TOTAL CORE RECOVERY FOR BORING %
19. SIGNATURE OF INSPECTOR: Parsons

DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
1		Grey, V. Coarse GRAVEL Railroad Ballast (0.0 to 0.9')	—	NS	NS = No Sample 140 lb Hammer 30" Drop
2, 3, 4		Red, SILTY SAND w/ Trace CLAY, Moist, Stiff	68%	S-1 S-2 S-3 S-4R	6 ft auger / H.S. 3" Split Spoon BTEX, TPH, RCRA Metals RCRA Metals R
5			—	NS	
6, 7, 8, 9		Reddish Brown, SANDY SILT w/ Trace CLAY, Moist, Stiff	90%	S-5 S-6 S-7	BTEX TPH RCRA Metals
10			—	NS	
11		Grey, CLAY, Moist, Stiff	85%	S-8 S-9	BTEX TPH
12, 13, 14		Brown, Fine to Medium SAND, w/ Trace Fine quartz GRAVEL, Moist, Loose			
15			—	NS	
16, 17, 18, 19		Brown, Fine to Medium SAND, w/ GRAVEL up to 1" in diameter, Moist, Loose	80%	S-10 S-11	BTEX Gasoline Odor TPH
20			—	NS	

PRELIMINARY INSPECTOR'S LOG CLASSIFICATION NOT FINAL

...36 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT: ADP Building | HOLE NO. MW-1

ADP Building | INSTALLATION: ORL | SHEET 2 OF 2 SHEETS

DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
21		Brown, Medium SAND, w/ 25% Red SHALE and 10% Fine to Large Gravel 3/4 to 2", Moist Dense		5-12	BTEX
22				5-13	TPH Switched To 350 lb Hammer 30" Drop
23					Water contact 21.1' Free Product
24					
25			—	NS	
26		Dark Brown to Brown, Fine to Coarse SAND, w/ 15% 3/4 to 3" GRAVEL, Moist, Dense		5-14	BTEX
27				5-15	TPH
28			—	NS	

Bottom of Boring

HNU Lamp 10.2

Depth	Background ppm	Sample ppm
1.0-5.0	0.5	0.5

HNU Lamp 11.7

Depth	Background ppm	Sample ppm
5.0-9.0	0.3	0.6
10.0-17.0	0.3	40.1
15.0-19.0	4.0	92.4
20.0-24.0	20.0	208.0
25.0-27.0	16.0	153.0

Augering to 20.0'
Drill cleared HNU 300ppm

Worked in Level C to pull augers out and to Auger back down to 28 Ft w/ 8" augers.

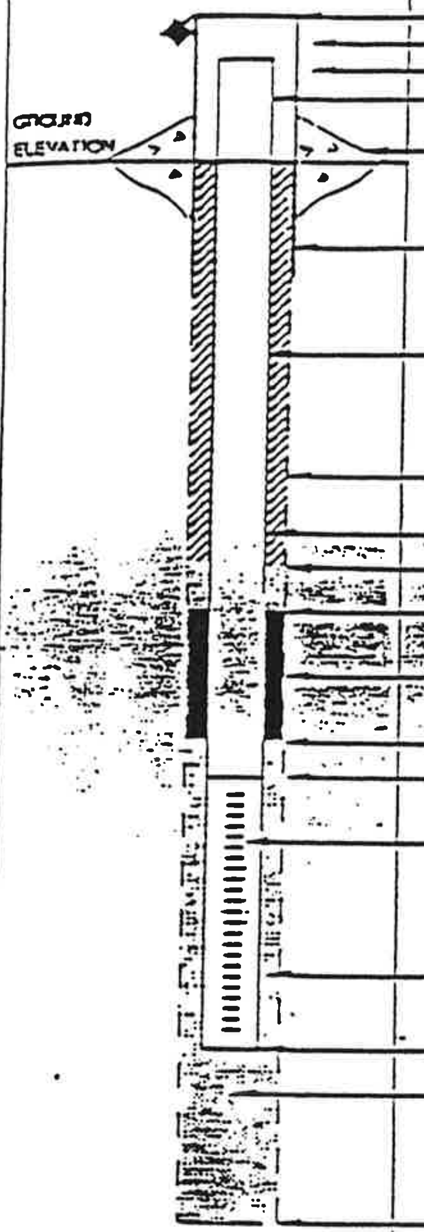
PRELIMINARY INSPECTOR'S LOG CLASSIFICATION NOT FINAL

1836-A (ER 1110-1-1801) GPO 1900 OF-438-603

PROJECT: ADP Building | HOLE NO.: MW-1

MONITORING WELL SHEET

PROJECT: ADP Bldg.
LOCATION: DPSC, Phila. PA.
DRILLER: Hildebrand
PROJECT NO.:
BORING: MW-1
DRILLING METHOD: 8" Auger
ELEVATION:
DATE: 6/2/92
DEVELOPMENT METHOD:
FIELD GEOLOGIST: Parsons



ELEVATION OF TOP OF SURFACE CASING:
ELEVATION OF TOP OF RISER PIPE:
STICK - UP TOP OF SURFACE CASING: 2.5 Ft
STICK - UP RISER PIPE: 2.0 Ft

TYPE OF SURFACE SEAL: Cement

I.D. OF SURFACE CASING: 5½ inch
TYPE OF SURFACE CASING: Box Steel

RISER PIPE I.D.: 4"
TYPE OF RISER PIPE: 4" P.V.C

BOREHOLE DIAMETER: 8"

TYPE OF GROUT: Cement/Bentonite
TOP OF FINE SAND: 7 Ft
ELEVATION/DEPTH OF SEAL: 18 Ft
TYPE OF SEAL: Bentonite Balls

DEPTH TOP OF FILTER PACK: 13 Ft
ELEVATION / DEPTH TOP OF SCREEN: 16 Ft

TYPE OF SCREEN: 4 inch dia P.V.C. Well Screen
SLOT SIZE x LENGTH: 0.010 inch slot 10 Ft Long
I.D. OF SCREEN: 4 inch

TYPE OF FILTER PACK: Sand

ELEVATION / DEPTH BOTTOM OF SCREEN: 26 Ft

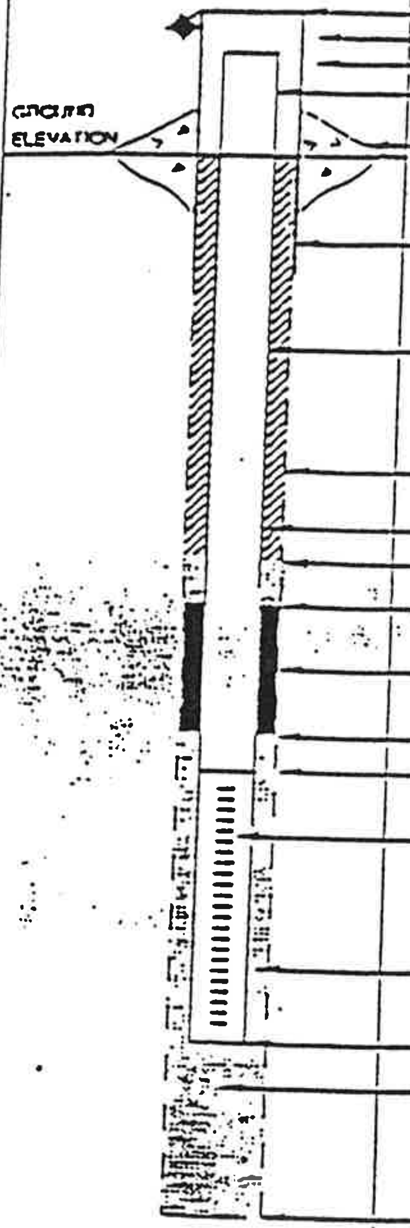
ELEVATION / DEPTH BOTTOM OF :
TYPE OF BACKFILL BELOW OBSERVATION WELL: Sand

ELEVATION / DEPTH OF HOLE: 28 Ft

WELL CONSTRUCTION DIAGRAM

MONITORING WELL SHEET

PROJECT ADP Bldg.	LOCATION DPSC, Phila. PA.	DRILLER Hildebrand
PROJECT NO.	BORING MW-2	DRILLING METHOD 8" Auger
ELEVATION	DATE 6/4/92	DEVELOPMENT METHOD
FIELD GEOLOGIST		



ELEVATION OF TOP OF SURFACE CASING:

ELEVATION OF TOP OF RISER PIPE.

STICK - UP TOP OF SURFACE CASING

STICK - UP RISER PIPE. 0.0 Ft Below Surface

TYPE OF SURFACE SEAL: Cement Grout

I.D. OF SURFACE CASING: 5½ inch

TYPE OF SURFACE CASING: Steel

RISER PIPE I.D.: 4"

TYPE OF RISER PIPE: 4" P.V.C.

BOREHOLE DIAMETER: 8"

TYPE OF GROUT Cement/Bentonite

TOP OF FINE SAND 3.6'

ELEVATION / DEPTH OF SEAL: 6.6'

TYPE OF SEAL Bentonite Balls

DEPTH TOP OF FILTER PACK 11.6'

ELEVATION / DEPTH TOP OF SCREEN: 14.6'

TYPE OF SCREEN: 4 inch dia P.V.C. Well Screen

SLOT SIZE x LENGTH 0.010 inch slot 10 Ft long

I.D. OF SCREEN 4 inch

TYPE OF FILTER PACK Coarse Sand

ELEVATION / DEPTH BOTTOM OF SCREEN: 24.6'

ELEVATION / DEPTH BOTTOM OF : . 27.0'

TYPE OF BACKFILL BELOW OBSERVATION WELL: Coarse Sand

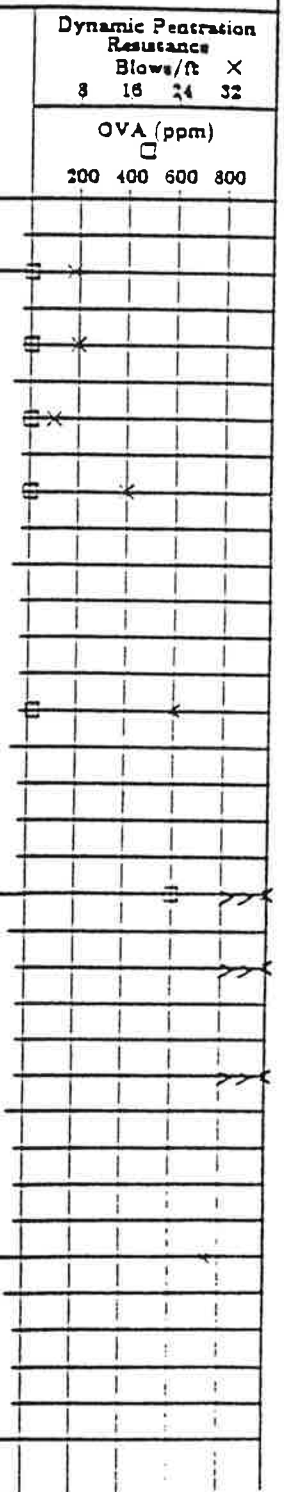
ELEVATION / DEPTH OF HOLE: 27.0'

WELL CONSTRUCTION DIAGRAM

Defense Personnel Support Center Philadelphia, PA	Log of Boring No. MW-2	Sheet No. 1 of 1

Client:	U.S. Army Corps of Engineers, Huntsville Division	Boring Started:	1/15/91
Project Number:	3908622	Boring Completed:	1/15/91
Drilling Contractor:	M & R Soils Investigations, Inc.	Boring Diameter:	8 inch
Driller:	R.Flemming	Surface Elevation:	22.35 ft
Logged By:	R.Pomeroy	Well Casing Diameter:	2 inch
Drilling Method:	Hollow Stem Auger	Top of Casing Elev:	22.11 ft
State Plane Coordinates:	222392 N 2723811 E	Elevation Datum:	NGVD
		Type of Drill Rig:	Mobile B-63

Elevation	Depth	Samp Type	Samp Rec ft	OVA ppm	Blows Per 6"	Well Construction	Lithology	MATERIAL DESCRIPTION
								TOPSOIL
20		SS		0	3-3 4-4			(CL) CLAY, organic, silty, dark brown, soft, no odor 3 ft - black charcoal-like material, moist
	5	SS		0	3-4 4-4			4 ft - becomes mixed with angular gravel and silt, saturated with water, no odor
15		SS		1	2-1 3-4			
		SS		0	4-6 10-11			7.5 ft - becomes, orange and gray, without silt, very soft, moist to wet, no odor 8 ft - becomes moist, hard, no odor
10	10							
	15	SS		15	3-9 15-15			14 ft - becomes silty, with fill material, no odor
5								
	20	SS		600	34-34 34-50			(SC) SAND, clayey, orange-brown, with some pebbles, very dense, moist, strong petroleum odor
0		SS			13-27 34-36			
	25	SS			35-32 15-32			24 ft - becomes saturated, strong petroleum odor
-5								
	30	SS			17-15 15-18			(SP) SAND, coarse to medium-grained, with abundant pebbles and some silt, dense, saturated with petroleum
-10								
								BORING TERMINATED AT 34 FT BGS



SS = Split Spoon ST = Shelby Tube OVA = Organic Vapor Analyzer

CME-55

DISTRICT	171 Dist
HOLE NO. (As shown on drawing title and file number)	MW-2A
NAME OF DRILLER	Hildebrand
DIRECTION OF HOLE	☐ INCLINED ______ DEG. FROM VERT.
THICKNESS OF OVERBURDEN	—
DEPTH DRILLED INTO ROCK	—
TOTAL DEPTH OF HOLE	27.0'
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED: 16 / UNDISTURBED: —
14. TOTAL NUMBER CORE BOXES	—
15. ELEVATION GROUND WATER	
16. DATE HOLE	STARTED: 6/3/92 / COMPLETED: 6/3/92
17. ELEVATION TOP OF HOLE	
18. TOTAL CORE RECOVERY FOR BORING	— %
19. SIGNATURE OF INSPECTOR	[signature]

DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
0–1	Black Top	0.0 to 0.8 Black Top.	—	NS	NS = No Sample 350 lb Hammer 30" Drop
1–3	Fill	0.8 to 1.2 Road Base Coarse Brown to Blk, FILL Rail Road Ties and Gravel w/ 20% CLAY, Moist, Stiff	70%	Fill	6¼" auger I.H.S. 3" Split Spoon
3–5		Brown to Blk SILT, Moist, Stiff		S-1 S-2R S-3 S-4	BTEX BTEX TPH RCRA Metals
5–9		Gray, SILT w/ 5% Fine SAND and Trace Large Gravel 2", Moist Stiff	100%	S-5 S-6 S-7R S-8	BTEX TPH TPH RCRA Metal
9–10			—	NS	Qal
10–12		Gray, SILT, w/ 15% Fine SAND, and Trace Large to Fine GRAVEL ¼ to 2", Moist, Stiff			
12–14		Red to Reddish Brown, SANDY GRAVELLY CLAY, Fine to Coarse Sand and ¾ to 2" Gravel, Moist, V. Stiff	100%	S-9 S-10	BTEX TPH
14–15			—	NS	
15–16		Red to Reddish Brown, SANDY GRAVELLY CLAY, Moist, V. Stiff			
16–19		Reddish Brown, CLAYEY Fine to Medium SAND, w/ 15% Fine to Large GRAVEL ¾ to 2", Moist, V. Dense	85%	S-11 S-12	BTEX TPH QP
19–20			—	NS	Water encountered at 19.6'

PRELIMINARY INSPECTOR'S LOG CLASSIFICATION NOT FINAL

ENG FORM 1836 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT: ADP Building

HOLE NO.: MW-2

DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
21–24		Reddish Brown, CLAYEY Fine to Coarse SAND w/ 15% GRAVEL 3/4 to 2", Wet, V. Dense	95%	S-13 S-14	BTEX TPH Qal
24–25			–	NS	
25–27		Same	75%	S-15 S-16	BTEX TPH
		B.O.H			

HNU Lamp 11.7

Depth	Background ppm	Sample ppm
1.0-5.0	0.8	9.1
5.0-9.0	0.6	0.6
10.0-14.0	0.6	0.5
15.0-19.0	0.6	0.6
20.0-24.0	0.5	0.5
25.0-27.0	0.7	0.7

Unusual Occurrences

During the installation of MW-2 as directed by Baltimore's Representative (Client) 4 inch P.V.C. well screen was sanded in. When the augers were raised the 4" P.V.C. rose one foot, the backfilling was stopped and Baltimore's representative took a five foot drill rod and beat the P.V.C. pipe back down. ORL Personnel and (Pami) suggested a redrill and reset. Baltimore's Representative said no. During sampling of water well, the bottom of the well was found to filled with sand.

PRELIMINARY
INSPECTOR'S LOG
CLASSIFICATION
NOT FINAL

ENG FORM 1836-A (ER 1110-1-1801) GPO 1000 OF - 400-401

PROJECT: FOP Building

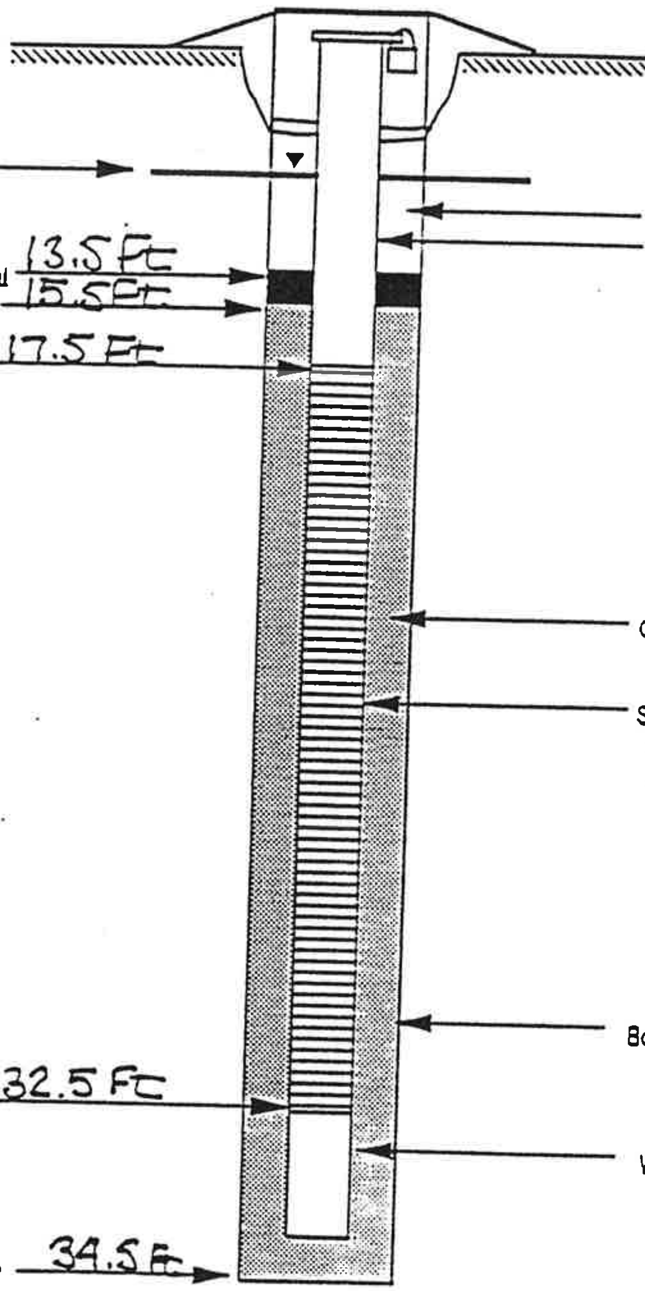
HOLE NO.: MW-2

MW-3

MONITOR WELL CONSTRUCTION

Logged By: RICH POMEROY
Client: US ACE
Drilling Contractor: EMPIRE SOIL INV.
Location: DPSC - PHILADELPHIA
Driller's Name: MATT RAAB
Job Number:
Well Number: MW - 3
Date/Time: Start 5/13/91 Finish 5/13
Comments: (Lost circulation interval, water level changes, hole collapse interval, etc.)

Depths in Reference to Ground Level



Type of Grout PORTLAND IA CEM

Casing:
Type PVC
Diameter 2 INCH

Couplings: INTEGRAL

Type
Number
Depths

Gravel Pack:
Material MORIE #1 SAND

Screen:
Type PVC
Diameter 2 INCH
Length 15 FEET
Slot Size .010 INCH

Borehole Diameter 8 INCH

Well Sump:
Diameter 2 INCH
Material PVC
Length 2 FEET

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Log of Boring No. MW-4

Sheet No. 1 of 1

Client:	U.S. Army Corps of Engineers, Huntsville Division	Boring Started:	5/14/91
Project Number:	3908622	Boring Completed:	5/14/91
Drilling Contractor:	Empire Soil Investigations, Inc.	Boring Diameter:	8 inch
Driller:	M.Raab	Surface Elevation:	21.43 ft
Logged By:	R.Pomeroy	Well Casing Diameter:	2 inch
Drilling Method:	Hollow Stem Auger	Top of Casing Elev:	20.91 ft
State Plane Coordinates:	222159 N 2724223 E	Elevation Datum:	NGVD
		Type of Drill Rig:	Acker AD-II

Samp Type	Samp Rec ft	OVA ppm	Blows Per 6"	MATERIAL DESCRIPTION
				FILL
SS	0.7	7	9-5 3-3	(CL) CLAY, silty, green-gray with orange-brown mottling, firm, moist, no odor
SS	1.0		3-1 1-2	4 ft - becomes green-gray with gray and orange mottling, very soft, no odor Qal
SS	1.3	68	2-1 2-5	6 ft - with fill (cinders, brick, and sand), no odor
SS	1.2	1	15-25 40-30	(SP) SAND, fine to medium-grained, brown, moist, very dense, no odor
SS	0.0		100/6"	14 ft - with one cobble Qp
SS	0.9	5	22-34 44-24	18 ft - becomes fine to coarse-grained with pebbles, dry, no odor
SS	0.0		48-32 28-35	
SS		>1000	32-40 41-45	24 ft - with many pebbles, saturated, petroleum odor
SS	1.3	>1000	38-42 50-30	(GM) GRAVEL, sandy, silty, very dense, saturated, strong petroleum odor Qp

BORING TERMINATED AT 34 FT BGS

Dynamic Pentration Resistance Blows/ft × 8 16 24 32
OVA (ppm) □ 200 400 600 800

SS = Split Spoon ST = Shelby Tube OVA = Organic Vapor Analyzer

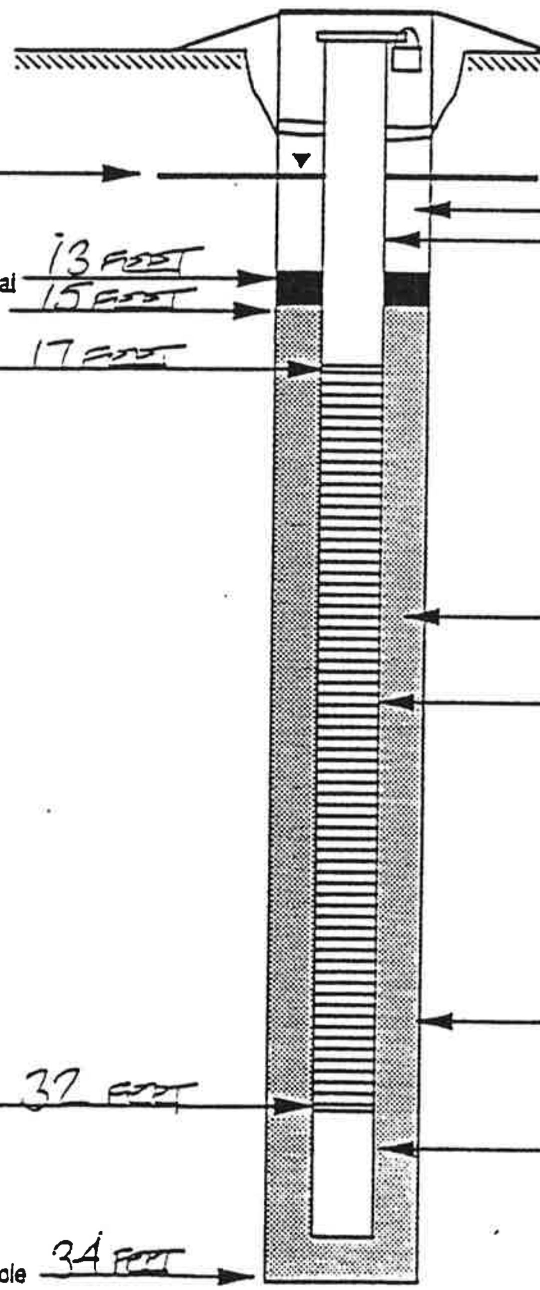
3/28/91 ESE

MW-5

MONITOR WELL CONSTRUCTION

Logged By: Richard Pomeroy
Client: U.S. ACE
Drilling Contractor: EMPIRE SOILS INV.
Location: DPSC – PHILADELPHIA
Driller's Name: MATT RABB
Job Number:
Well Number: MW-5
Date/Time: Start 5/9/91 Finish 5/17/91
Comments: (Lost circulation interval, water level changes, hole collapse interval, etc.)

Depths in Reference to Ground Level



Cement/Gravel Antipecolation Pad

Groundwater

Type of Grout: PORTLAND IA CEMENT

Casing:
Type: PVC
Diameter: 6 INCH

Top of Bentonite Seal: 13 FEET
Top of Gravel Pack: 15 FEET
Top of Screen: 17 FEET

Couplings: N/A
Type
Number
Depths

Gravel Pack:
Material: MORIE #1 SAND

Screen:
Type: PVC
Diameter: 6 INCH
Length: 15 FEET
Slot Size: .010 INCH

Borehole Diameter: 12 1/4 INCH

Bottom of Screen: 32 FEET

Well Sump:
Diameter: 6 INCH
Material: PVC
Length: 2 FEET

Total Depth of Borehole: 34 FEET

NOT TO SCALE

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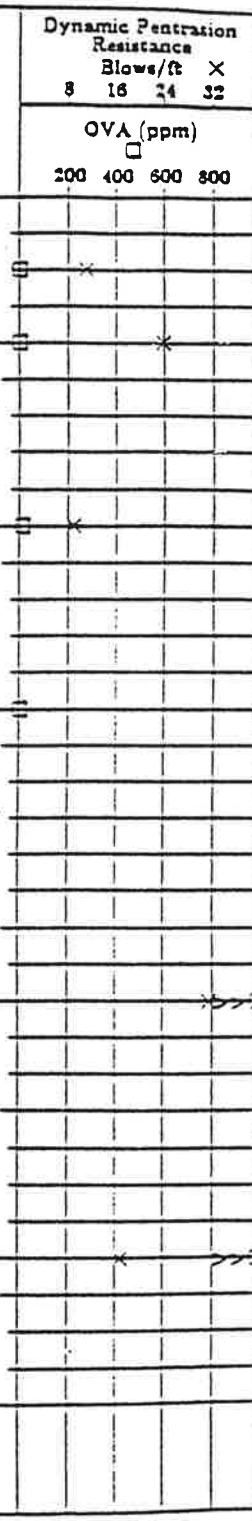
Philadelphia, PA

Log of Boring No. MW-6

Sheet No. 1 of 1

Client:	U.S. Army Corps of Engineers, Huntsville Division	Boring Started:	5/10/91
Project Number:	3908622	Boring Completed:	5/10/91
Drilling Contractor:	Empire Soil Investigations, Inc.	Boring Diameter:	8 inch
Driller:	M.Raab	Surface Elevation:	21.89 ft
Logged By:	R.Pomeroy	Well Casing Diameter:	2 inch
Drilling Method:	Hollow Stem Auger	Top of Casing Elev:	21.48 ft
State Plane Coordinates:	221977 N 2724411 E	Elevation Datum:	NGVD
		Type of Drill Rig:	Acker AD-II

Elevation	Depth	Samp Type	Samp Rec ft	OVA ppm	Blows Per 6"	MATERIAL DESCRIPTION
						TOPSOIL AND FILL Fill
20		SS	1.3	0	5-6 5-15	2 ft - fill becomes black cinders, sand, pebbles, etc., moist, medium dense
	5	SS	1.3	0	9-11 13-13	(CL) CLAY, silty, light brown-gray with some orange mottling, with some sand Qal
15		ST				
	10	SS	1.1	11	7-4 5-20	(SC) SAND, clayey, orange-brown with patches of iron oxide staining, no odor 10 ft - silty clay interval Qp
10						
	15	SS	1.0	1	12-20 20-28	(SP) SAND, medium to coarse-grained with some pebbles, brown with some orange mottling, dense, faint petroleum odor Qp
5						
	20	SS	0.0			
0		SS	1.0	>1000	11-22 10-9	(SC) SAND, clayey, fine to medium-grained, brown, dense, strong petroleum odor 23.5 ft - clayey layer Ko
	25					
-5						
	30	SS	2.0	>1000	4-8 9-8	(SP) SAND, medium to very coarse-grained with few pebbles becoming coarser with depth, brown, medium dense, saturated, strong petroleum odor Ko
-10						
						BORING TERMINATED AT 33 FT BGS



SS = Split Spoon ST = Shelby Tube OVA = Organic Vapor Analyzer

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TEST HOLE/WELL LOG: BORING NO. MW-6D	Sheet No. 1 of 5
Site Name: Defense Personnel Support Center (DPSC) Philadelphia, Pennsylvania	
Date: 1/26/95	Project Number: 2727.001
Logged By: Viresh Singh	Drilled By: Huntingdon-Empire

Elevation: N/A	Detector: HNU	Drilling Method: Mud Rotary		Sampling Method: Split Spoon	
Gravel Pack: Morie #1		Seal: Bentonite		Grout: Cement/Bentonite	
Casing Type: PVC		Diameter: 4"	Length: 64'	Hole Dia.: 8.25"	Depth to Liquid:
Screen Type: PVC	Slot Size: 0.010"	Diameter: 4"	Length: 10'	Total Depth: 86'	Depth to Water:

USCS Class.	Color	Fines (%)	PID Vapor (ppm)	Staining	Sample No.	Depth (ft)	Sample Recovery (%)	Pene. Resist.	LITHOLOGY/REMARKS
Fill			0			1	50	4 4 6 8	(0'-2'): Grayish black, sandy fill
Fill			0			3	75	6 4 4 8	(2'-4'): Same as 0'-2' interval
SC			0			5	75	6 8 12 12	(4'-6'): Light brown clayey silt
SC	Qw		0			7	70	12 14 14 13	(6'-8'): Same as 4'-6' interval
SC / SP			0			9	40	16 18 22 23	(8'-9'): Same as 6'-8' interval (9'-10'): Brown, gravelly, medium grained sand
SP	QP		15			11	50	18 22 26 30	(10'-12'): Same as 9'-10' interval
SP			50			13	60	20 22 48 48	(12'-14'): Brown, gravelly, coarse grained sand, slight petroleum odor
SP			30			15	60	26 30 30 30	(14'-16'): Same as 12'-14' interval
SP			25			17	10	100/ 4"	(16'-18'): Same as 14'-16' interval, reddish brown color
SC	Kw		90		S-25	19	75	10 20 11 32	(18'-20'):Yellowish-brown, slightly clayey, silt

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TEST HOLE/WELL LOG: BORING NO. MW-6D

Sheet No. 2 of 5

Site Name: Defense Personnel Support Center (DPSC) Philadelphia, Pennsylvania			
Date: 1/26/95		Project Number: 2727.001	
Logged By: Viresh Singh		Drilled By: Huntingdon-Empire	
Elevation: N/A	Detector: HNU	Drilling Method: Mud Rotary	Sampling Method: Split Spoon
Gravel Pack: Morie #1		Seal: Bentonite	Grout: Cement/Bentonite
Casing Type: PVC	Diameter: 4"	Length: 64'	Hole Dia.: 8.25" / Depth to Liquid:
Screen Type: PVC	Slot Size: 0.010" / Diameter: 4"	Length: 10'	Total Depth: 86' / Depth to Water:

USCS Class.	Color	Fines (%)	PID Vapor (ppm)	Staining	Sample No.	Depth (ft)	Sample Recovery (%)	Pene. Resist.	LITHOLOGY/REMARKS
SM			250		S-26	21	75	10 13 11 13	(20-22'): Brown, silty, fine to medium grained sand, strong petroleum odor, moist to wet
SW			300			23	100	11 14 15 17	(22'-24'): Brown fine to medium grained sand with traces of silt and clay, water table at 23', strong petroleum odor
SW	Ko		175			25	40	5 18 100/ 5"	(24'-25'): Same as 22'-24' interval (25'-26'): Brown, gravelly, medium to coarse grained sand, strong petroleum odor
SP			400			27	55	32 48 62 30	(26'-28'): Brown, gravelly, medium to coarse grained sand, strong petroleum odor
SP			150	Yes		29	25	15 20 36 38	(28'-30'): Same as 26'-28' interval except stained black
						31		15 18 17 16	No sample recovered, rock blocked tip of split spoon
						33		20 12 11 16	No sample recovered, rock blocked tip of split spoon
SC	Km		3			35	10	6 7 6 6	(34'-36'): Gray, silty, sandy, clay
SW			18			37	50	13 19 10 11	(36'-38'): Brown, fine to medium grained sand
SW			35			39	55	10 10 12 13	(38'-40'): Gray medium to coarse grained sand

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Site Name:	Defense Personnel Support Center (DPSC) Philadelphia, Pennsylvania		
Date:	1/26/95	Project Number:	2727.001
Logged By:	Viresh Singh	Drilled By:	Huntingdon-Empire

Elevation: N/A	Detector: HNU	Drilling Method: Mud Rotary		Sampling Method: Split Spoon	
Gravel Pack: Morie #1		Seal: Bentonite		Grout: Cement/Bentonite	
Casing Type: PVC		Diameter: 4"	Length: 64'	Hole Dia.: 8.25"	Depth to Liquid:
Screen Type: PVC	Slot Size: 0.010"	Diameter: 4"	Length: 10'	Total Depth: 86'	Depth to Water:

USCS Class.	Color	Fines (%)	PID Vapor (ppm)	Staining	Sample No.	Depth (ft)	Sample Recovery (%)	Pene. Resist.	LITHOLOGY/REMARKS
SW			25			41	20	9 12 12 13	(40'-42'): Gray, coarse grained gravelly sand
	Ks					43			No sample retrieved
SW			20			45	20	11 16 13 13	(44'-46'): Brown medium grained sand
SW	K1		70			47	20	5 12 11 14	(46'-48'): Same as 44'-46' interval clay? altered on gamma log!
SW			30			49	10	7 10 11 10	(48'-50'): Same as 46'-48' interval
SW	Kr		50			51	25	11 13 15 16	(50'-52'): Same as 48'-50' interval
SW			20			53	10	22 17 16 15	(52'-54'): Same as 50'-52' interval
SP			7			55	33	21 18 15 17	(54'-56'): Brownish gray, medium to coarse grained sand
SP			17			57	10	21 22 19 17	(56'-58'): Same as 54'-56' interval
			20			59		13 17 15 12	No sample retrieved

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TEST HOLE/WELL LOG: BORING NO. MW-6D

Site Name:	Defense Personnel Support Center (DPSC) Philadelphia, Pennsylvania
Date: 1/26/95	Project Number: 2727.001
Logged By: Viresh Singh	Drilled By: Huntingdon-Empire
Elevation: N/A	Detector: HNU
Drilling Method: Mud Rotary	Sampling Method: Split Spoon
Gravel Pack: Morie #1	Seal: Bentonite
Grout: Cement/Bentonite	
Casing Type: PVC	Diameter: 4"
Length: 64'	Hole Dia.: 8.25"
Depth to Liquid:	
Screen Type: PVC	Slot Size: 0.010"
Diameter: 4"	Length: 10'
Total Depth: 86'	Depth to Water:

USCS Class.	Color	Fines (%)	PID Vapor (ppm)	Staining	Sample No.	Depth (ft)	Sample Recovery (%)	Pene. Resist.	LITHOLOGY/REMARKS
			10			61		20 25 19 19	No sample retrieved
SP			25			63	20	25 27 24 38	(62'-64'): Reddish brown to gray, medium to coarse grained sand
SP			5			65	10	63 50 45 59	(64'-66'): Same as 62'-64' interval
SP	KF		12			67	10	100/ 6"	(66'-68'): Same as 64'-66' interval
SP			5			69	30	100/ 5"	(68'-70'): Same as 66'-68' interval, increasing gravel content
			5			71			No sample retrieved
GP			3			73	65	110 70 65 60	(72'-74'): Same as 68'-70' interval, increasing gravel content
						75			Split spoon refused
SP			50			77	25	100/ 5"	(76'-78'): Same as 72'-74' interval, less gravel
GP			50			79	35	100/ 5"	(78'-80'): Light gray, coarse grained sandy, gravel

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TEST HOLE/WELL LOG: BORING NO. MW-6D

Sheet No. 5 of 5

Site Name:	Defense Personnel Support Center (DPSC) Philadelphia, Pennsylvania		
Date:	1/26/95	Project Number:	2727.001
Logged By:	Viresh Singh	Drilled By:	Huntingdon-Empire
Elevation:	N/A	Detector:	HNU
Drilling Method:	Mud Rotary	Sampling Method:	Split Spoon
Gravel Pack:	Morie #1	Seal:	Bentonite
Grout:	Cement/Bentonite		
Casing Type:	PVC	Diameter:	4"
Length:	64'	Hole Dia.:	8.25"
Depth to Liquid:			
Screen Type:	PVC	Slot Size:	0.010"
Diameter:	4"	Length:	10'
Total Depth:	86'	Depth to Water:	

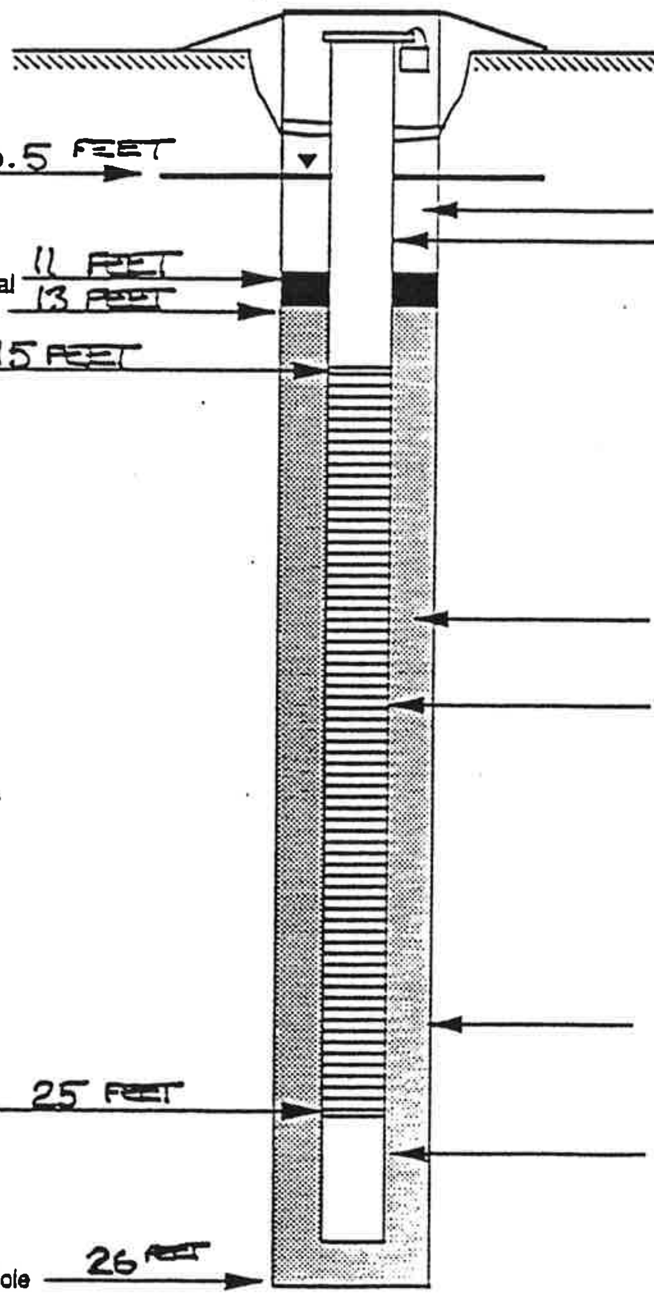
USCS Class.	Color	Fines (%)	PID Vapor (ppm)	Staining	Sample No.	Depth (ft)	Sample Recovery (%)	Pene. Resist.	LITHOLOGY/REMARKS
GP			50			81	40	5 10 20 100	(80'-82'): Same as 78'-80' interval
SP			50			83	10	10 20 75 100	(82'-84'): Light gray, gravelly, coarse grained sand
SP			50			85	25	5 15 67 75	(84'-86'): Same as 82'-84' interval
SP			35			87	10	20 68 100/4"	(86'-88'): Same as 84'-86' interval

MW-7

MONITOR WELL CONSTRUCTION

Logged By: RICHARD POMEROY
Client: U.S.A.C.E.
Drilling Contractor: EMPIRE SOIL INVESTIGAT
Location: DPSC - PHILADELPHIA
Driller's Name: MATT RAAB
Job Number:
Well Number: MW-7
Date/Time: Start 5/8/91 08:30 Finish 5/8/91
Comments: (Lost circulation interval, water level changes, hole collapse interval, etc.)

Depths in Reference to Ground Level



Cement/Gravel Antipecolation Pad

Groundwater 18.5 FEET

Type of Grout PORTLAND IA CEMENT

Casing:
Type PVC
Diameter 2 INCH

Top of Bentonite Seal 11 FEET

Top of Gravel Pack 13 FEET

Top of Screen 15 FEET

Couplings: N/A
Type
Number
Depths

Gravel Pack:
Material MORIE #1 SAND.

Screen:
Type PVC
Diameter 2 INCH
Length 10 FEET
Slot Size .010 INCH

Borehole Diameter 8 INCH

Bottom of Screen 25 FEET

Well Sump: NOT INSTALLED
Diameter
Material
Length

Total Depth of Borehole 26 FEET

NOT TO SCALE

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TEST HOLE/WELL LOG: BORING NO. MW-9

Site Name: Defense Personnel Support Center (DPSC) Philadelphia, Pennsylvania

Date: 12/6/94

Project Number: 2727.001

Logged By: Ed Ashton

Drilled By: Huntingdon-Empire

Elevation:

Detector: HNU

Drilling Method: HSA CME-75

Sampling Method: Split Spoon

Gravel Pack: Morie #1

Seal: Bentonite

Grout: Cement/Bentonite

Casing Type: PVC

Diameter: 4"

Length: 13'

Hole Dia.: 12"

Depth to Liquid: 24'

Screen Type: PVC

Slot Size: 0.010"

Diameter: 4"

Length: 20'

Total Depth: 37'

Depth to Water: 24.5'

USCS Class.	Color	Fines (%)	PID Vapor (ppm)	Staining	Sample No.	Depth (ft)	Sample Recovery (%)	Pene. Resist.	LITHOLOGY/REMARKS
Fill		0	0			1	10	- 5 6 5	(0-9"): asphalt and concrete (9" to 2'): dark brown to black, moist, sand, gravel and concrete fragments (fill)
SC Fill		0				3	50	8 7 7 8	(2'-4'): Gray clayey sand, fine to medium grained, dry to moist, poor to moderately subangular to angular, fragments of brick and concrete, small percentage of silt also present
SC Fill		20 0	0			5	80	3 5 6 6	(4'-4.5'): Same lithology as 2'-4' Interval (4.5'-6'): Brown dry sand, brick shells, gravel and ash
Fill	Fill	0	0			7	60	3 5 5 3	(6'-8'): Black ash with shells and minor amountes of sand, dry
Fill SP/SM		0	0			9	50	3 2 2 2	(8'-10'): Same lithology as 6'-8' interval, except for the presence of a light brown sand layer at 9.5'-9.8' with some mica flakes
Fill SC/Fill		5 10	0			11	70	2 2 2 2	(10'-11'): Brown to black, silty sand with minor percentage of clay, ash, coal, brick and mica flakes (11'-12'): Light brown clayey sand, fine to medium grained, moderately sorted, dry to moist, mica flakes with few pieces of gravel (pebbles and cobbles)
SC/Fill SP/SM	Qal	10 1	0			13	90	2 3 3 3	(12'-13.6'): Same lithology as 11'-12' interval (13.6'-14'): same lithology as 9.5' to 9.8'
CL		70	0			15	80	3 2 3 2	(14'-16'): Brown silty clay with small percentage of sand, fine grained, soft, moderately well sorted, moist with a few fragments of what appears to be coal
CL		70	0			17	80	4 4 5 7	(16'-18'): Same lithology as 14'-16' interval
CL		70	0		GT-4	19	100	5 5 7 7	(18'-20'): Same lithology as 16'-18' interval except for light gray soil color

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TEST HOLE/WELL LOG: BORING NO. MW-9

Sheet No. 2 of 2

Site Name: Defense Personnel Support Center (DPSC) Philadelphia, Pennsylvania			
Date: 12/6/94		Project Number: 2727.001	
Logged By: Ed Ashton		Drilled By: Huntingdon-Empire	
Elevation:	Detector: HNU	Drilling Method: HSA CME-75	Sampling Method: Split Spoon
Gravel Pack: Morie #1		Seal: Bentonite	Grout: Cement/Bentonite
Casing Type: PVC	Diameter: 4"	Length: 13'	Hole Dia.: 12" / Depth to Liquid: 24'
Screen Type: PVC	Slot Size: 0.010" / Diameter: 4"	Length: 20'	Total Depth: 37' / Depth to Water: 24.5'

USCS Class.	Color	Fines (%)	PID Vapor (ppm)	Staining	Sample No.	Depth (ft)	Sample Recovery (%)	Pene. Resist.	LITHOLOGY/REMARKS
CL	Qal	70	0		S-7	21	80	3 5 5 5	(20'-22'): Same lithology as 18'-20' foot interval except for small percentage of plant roots present
CL		80	1.4		S-8	23	100	7 7 6 6	(22'-23.5'): Same lithology as 20'-22' interval (23.5-24'): Tan silty clay with minor sand, fine grained, well sorted, moist to wet, possible petroleum odor, soft, few gravels (pebbles to cobbles) and plant roots
SC		80	7200	Yes		25	80	7 8 9 9	(24'-26'): Light brown silty sandy clay with gravel, fine to medium grained, wet moderately to well sorted, subangular to angular, gravel (pebbles to cobbles), petroleum odors and some apparent staining
SC		50 30	7200	Yes		27	100	27 49 53 75	(26'-27'): Light brown, silty sandy clay with gravel, fine to medium grained, wet, moderately sorted, subangular to angular, petroleum odor, staining and product observed. (27'-28'): Light brown silty sand with clay and gravel (pebbles to cobbles), fine to coarse grained, poorly to moderately sorted, wet, petroleum odor, possible brick fragments
SC SM	Qp	30	160			29	80	20 25 27 26	(28'-30'): Same lithology as 27'-28' interval except for gray color, no clay present, poorly sorted
SP		5	150			31	90	12 30 52 100	(30'-32'): Brown gravelly (pebbles to cobbles, sandstone to milky quartz) sand with minor amounts of silt, wet, subangular to angular, poorly sorted, petroleum odor, fine to coarse grained
SP		5	170			33	80	52 40 67 89	(32'-34'): same lithology as 30'-32' interval
						35			Split spoon to 34' bgs
						37			Total depth 37' bgs Note: water level increased from 24'-24.5' to 16.8', added 5' of screen length, to a height of 3 feet above the static waterlevel intercept any free product layer that may be present.

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TEST HOLE/WELL LOG: BORING NO.	MW-10	Sheet No. 1 of 2

Site Name:	Defense Personnel Support Center (DPSC) Philadelphia, Pennsylvania
Date: 12/1/94	Project Number: 2727.001
Logged By: Ed Ashton	Drilled By: Huntingdon-Empire
Elevation: 16.92	Detector: HNU
Drilling Method: HSA CME-75	Sampling Method: Split Spoon
Gravel Pack: Morie #1	Seal: Bentonite
Grout: Cement/Bentonite	
Casing Type: PVC	Diameter: 4"
Length: 13.6'	Hole Dia.: 12"
Depth to Liquid:	
Screen Type: PVC	Slot Size: 0.010"
Diameter: 4"	Length: 15'
Total Depth: 31.5'	Depth to Water: 16.6'

USCS Class.	Color	Fines (%)	PID Vapor (ppm)	Staining	Sample No.	Depth (ft)	Sample Recovery (%)	Pene. Resist.	LITHOLOGY/REMARKS
SC/Fill		10	0			1	30	0 0 5 8	(0"-8.5"): Asphalt and concrete (8.5"-2'): Brown clayey sand with pebble to cobble sized gravel, fine to coarse grained, poorly to moderately sorted, subangular to angular, traces of brick (fill), dry
SC/Fill		10	0.6			3	30	4 5 7 6	(2'-4'): Black sand with gravel (pebbles to cobbles), small percentage of silt and clay, fine to coarse grained, poorly to moderately sorted, subangular to angular, traces of bricks and shells (fill)
SC/Fill		10	0.6			5	20	3 3 4 2	(4'-6'): Same as 2'-4' interval except slightly moist
SC/Fill		10	0.4			7	40	4 3 8 10	(6'-8'): Same as 4'-6' interval except higher percentage of brick and shells
SC/Fill		10	0.4			9	5	5 5 10 11	(8'-10'): Same as 6'-8' interval except higher percentage of silt, ash and moisture content
SC/Fill		10	0.4			11	60	2 3 2 1	(10'-12'): Same as 8'-10' interval
	Fill					13	0	4 2 5 8	No sample recovered
	Qp					15	0	3 3 1 1	No sample recovered
	Kr					17	0	2 3 2 3	No sample recovered, soil water interface at 17' bgs
CL		80	0.2			19	100	1 1 2 2	(18'-20'): Gray silty clay with minor sand, fine to medium grained, soft, moderately to well sorted

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TEST HOLE/WELL LOG: BORING NO. MW-10

Site Name:	Defense Personnel Support Center (DPSC) Philadelphia, Pennsylvania
Date: 12/1/94	Project Number: 2727.001
Logged By: Ed Ashton	Drilled By: Huntingdon-Empire
Elevation: 16.92	Detector: HNU
Drilling Method: HSA CME-75	Sampling Method: Split Spoon
Gravel Pack: Morie #1	Seal: Bentonite
Grout: Cement/Bentonite	
Casing Type: PVC	Diameter: 4" Length: 13.6'
Hole Dia.: 12"	Depth to Liquid:
Screen Type: PVC	Slot Size: 0.010"
Diameter: 4"	Length: 13.6'
Total Depth: 31.5	Depth to Water: 16.6'

USCS Class.	Color	Fines (%)	PID Vapor (ppm)	Staining	Sample No.	Depth (ft)	Sample Recovery (%)	Pene. Resist.	LITHOLOGY/REMARKS
CL	Yu	80	0.2			21	80	1 1 2 2	(20'-22'): Same as 18'-20' interval
						23	0	3 2 3 2	(22'-24'): No sample recovered
SC/CL CL	K	50 70	0.2			25	90	3 3 4 3	(24'-25'): Brown silty clayey sand with peat, moist to wet, fine to medium grained, moderately to well sorted, petroleum odors (25'-26'): Gray silty clay with fine to medium grained sand, moderately to well sorted, petroleum odors, moist to wet
SC/CL CL		50 70	1			27	80	3 3 2 2	(26'-26.8') Same as 24'-25' interval (26.8'-28') Same as 25'-26' interval
SC		50	10			29	80	4 5 7 7	(28'-30'): Gray silty clayey fine to medium grained sand, subangular to angular, moderately to well sorted, petroleum odor Split spooned to 30' bgs, drilled to 31.5' bgs

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TEST HOLE/WELL LOG: BORING NO. MW-11

Sheet No. 1 of 2

Site Name:	Defense Personnel Support Center (DPSC) Philadelphia, Pennsylvania
Date: 12/12/94	Project Number: 2727.001
Logged By: Ed Ashton	Drilled By: Huntingdon-Empire

Elevation: 20.55	Detector: HNU	Drilling Method: HSA CME-75	Sampling Method: Split Spoon
Gravel Pack: Morie #1		Seal: Bentonite	Grout: Cement/Bentonite
Casing Type: PVC	Diameter: 4"	Length: 17'	Hole Dia.: 12" / Depth to Liquid: 22'
Screen Type: PVC	Slot Size: 0.010" / Diameter: 4"	Length: 15'	Total Depth: 35' / Depth to Water: 22.5'

USCS Class.	Color	Fines (%)	PID Vapor (ppm)	Staining	Sample No.	Depth (ft)	Sample Recovery (%)	Pene. Resist.	LITHOLOGY/REMARKS
SC/Fill		15	0			1	20	3 2 1 1	(0"-8"): Concrete (8"-2'): Brown to black clayey sand with silt and minor gravel, fine to medium grained, moderately sorted, subangular to angular, dry to semi moist
SC/Fill		15	0			3	20	1 1 1 1	(2'-4'): Same as 8"-2' interval
SC/Fill	F	10	1.8			5	30	1 1 2 2	(4'-6'): Brown silty clayey sand with minor gravel and fragments of brick, fine to medium grained, subangular to angular, moderately sorted, moist
SC/Fill CL/Fill		10 50	0			7	30	4 3 2 3	(6'-7'): Same as 4'-6' interval (7'-8'): Orangish red soft silty clay, with brick, sand, gravel and ash
	Pal				T-3	9			(8'-10'): Shelby tube sample
CL		70	0			11	40	1 1 2 4	(10'-12'): Gray silty clay with minor amounts of fine to medium grained sand and gravel, poorly to moderately sorted, semi moist
CL SP		70 10	0.6			13	50	10 6 7 6	(12'-13'): Same as 10'-12' interval (13'-14'): Reddish orange sand with gravel (pebbles to cobbles of milky quartz andsandstone) and minor amounts of silt, fine to coarse grained, subangular to angular, poorly to moderately sorted, dry to semi moist
SP SP/SM	GP	10 15	0			15	50	10 9 9 8	(14'-15'): Same as 13'-14' interval (15'-16'): Same as 14-15' interval except for tannish color and slightly more silt
CL SP		70 2	300			17	70	11 9 10 11	(16'-17'): Orangish silty clay with minor sand, few pieces of gravel, dry to moist (17'-18'): Brown to black sand with minor trace of rounded to subangular pebbles, fine to medium grained, moderately to well sorted, dry, petroleum odor, possible staining
GP		2	200		S-11	19	70	15 19 23 27	(18'-20'): Brown sandy gravel (pebbles to cobbles of milky quartz, sandstone, and other materials) fine to coarse grained, rounded to subangular, poorly to moderately sorted, dry, petroleum odor, possible staining

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TEST HOLE/WELL LOG: BORING NO. MW-11

Sheet No. 2 of 2

Site Name:	Defense Personnel Support Center (DPSC) Philadelphia, Pennsylvania
Date: 12/12/94	Project Number: 2727.001
Logged By: Ed Ashton	Drilled By: Huntingdon-Empire
Elevation: 20.55	Detector: HNU
Drilling Method: HSA CME-75	Sampling Method: Split Spoon
Gravel Pack: Morie #1	Seal: Bentonite
Grout: Cement/Bentonite	
Casing Type: PVC	Diameter: 4"
Length: 17'	Hole Dia.: 12"
Depth to Liquid: 22'	
Screen Type: PVC	Slot Size: 0.010"
Diameter: 4"	Length: 15'
Total Depth: 35'	Depth to Water: 22.5'

USCS Class.	Color	Fines (%)	PID Vapor (ppm)	Staining	Sample No.	Depth (ft)	Sample Recovery (%)	Pene. Resist.	LITHOLOGY/REMARKS
GP		2	300		S-12	21	70	15 20 32 11	(20'-22'): Brownish to red sandy gravel (milky quartz, sandstone, and other minerals), fine to coarse, rounded to subangular, poorly to moderately sorted, moist to wet, petroleum odor, possible staining
GP		1	200			23	100	8 15 11 13	(22'-24'): Brown sandy gravel (milky quartz, sandstone, and other minerals) with minor silt, fine to coarse grained, rounded to subangular, poorly to moderately sorted, petroleum odor, possible staining, product visible on water surface, appears to be motor oil
GP		1	200			25	90	7 20 15 12	(24'-26'): Brown sandy gravel (pebbles to cobbles of milky quartz and sandstone), fine to coarse grained, poorly to moderately sorted, red to green seams of clay, petroleum odor, product observed on water surface, possible staining
GP		1	300			27	100	17 10 16 21	(26'-28'): Same as 24'-26' interval except slightly less gravel
SP		0	300		GT-6	29	100	1 1 2 1	(28'-30'): Brown fine to medium grained, subangular to angular, moderately to well sorted sand with minor amount of gravel (pebbles), wet, petroleum odor
SP		0	300			31	100	3 4 4 3	(30'-32'): Same as 28'-30' interval except for the presence of red sandstone cobbles Split spooned to 32' bgs, drilled to 35' bgs

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TEST HOLE/WELL LOG: BORING NO. MW-12

Site Name:	Defense Personnel Support Center (DPSC) Philadelphia, Pennsylvania
Date: 12/22/94	Project Number: 2727.001
Logged By: Ed Ashton	Drilled By: Huntingdon-Empire
Elevation: 19.72'	[illegible]: HNU
Drilling Method: HSA CME-75	Sampling Method: Split Spoon
Gravel Pack: Morie #1	Seal: Bentonite
Grout: Cement/Bentonite	
Casing Type: PVC	Diameter: 4" / Length: 16'
Hole Dia.: 12"	Depth to Liquid:
Screen Type: PVC	Slot Size: 0.010"
Diameter: 4" / Length: 15'	Total Depth: 32'
Depth to Water:	

USCS Class.	Color	Fines (%)	PID Vapor (ppm)	Staining	Sample No.	Depth (ft)	Sample Recovery (%)	Pene. Resist.	LITHOLOGY/REMARKS
Fill		50	0			1	50	1 2 12	(0-1.6'): Brown moderately sorted silty clay, semi-moist (1.6'-2'): Black sand, brick, gravel and ash fill
Fill	F	50	0			3	80	2 2 36	(2'-3'): Same as 1.6'-2' interval (3'-4'): Brown moderately sorted silty clay, fragments of brick and other fill material present, semi-moist
Fill		10	0.8			5	15	4 5 5 3	(4'-6'): Brown sand, silt, brick, gravel, and ash fill
CL		80	0.8			7	100	5 7 10 21	(6'-8'): Gray, moderately sorted silty clay, 1-2 pebbles, semi-moist
GP			2			9	50	21 15 11 10	(8'-10'): Brownish gray medium to fine grained sand with gravel, fining downwards
SM			2.4			11	52	7 7 10 14	(10'-12'): Brown, slightly silty, fine grained sand overlying blackish medium coarse sand with crushed gravel
SP			5			13	62	21 23 25 29	(12'-14'): Grayish brown medium coarse sand with gravel, fining downwards
SP			10		GT-10	15	48	14 10 11 12	(14'-16'): Same lithology and trend as 12'-14' interval
GP			190		S-19	17	52	20 18 23 23	(16'-18'): Gray medium grained sand overlying black medium coarse sand with gravel, moist, strong petroleum odors
GP			150		S-20	19	52	7 16 20 15	(18'-20'): Black medium to coarse grained gravelly sand, visible sheen, strong odors, water table at 19'

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TEST HOLE/WELL LOG: BORING NO. MW-12

Sheet No. 2 of 2

Site Name: Defense Personnel Support Center (DPSC) Philadelphia, Pennsylvania			
Date: 12/22/94		Project Number: 2727.001	
Logged By: Ed Ashton		Drilled By: Huntingdon-Empire	
Elevation: 19.72'	HNU	Drilling Method: HSA CME-75	Sampling Method: Split Spoon
Gravel Pack: Morie #1		Seal: Bentonite	Grout: Cement/Bentonite
Casing Type: PVC	Diameter: 4"	Length: 16'	Hole Dia.: 12" / Depth to Liquid:
Screen Type: PVC	Slot Size: 0.010"	Diameter: 4" / Length: 15'	Total Depth: 32' / Depth to Water:

USCS Class.	Color	Fines (%)	PID Vapor (ppm)	Staining	Sample No.	Depth (ft)	Sample Recovery (%)	Pene. Resist.	LITHOLOGY/REMARKS
GP			325			21	58	16 16 9 11	(20'-22'): Gray coarse grained gravelly sand, strong petroleum odors
GP			200			23	65	12 14 10 17	(22'-24'): Same as 20'-22' interval
GP	QP		200			25	52	10 12 14 19	(24'-26'): Same as 22'-24' interval
GP SW			300			27	65	15 17 17 23	(26'-27'): Same as 24'-26' interval, execpt, fining downwards (27'-29'): Yellowish brown sand, coarsening downwards, strong petroleum odors and visible sheen
GP			300			29	50	5 7 5 6	(28'-30'): Same as 26'-27' interval, strong petroleum odors Drilled to 32' bgs

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TEST HOLE/WELL LOG: BORING NO. MW-13

Site Name:	Defense Personnel Support Center (DPSC) Philadelphia, Pennsylvania		
Date:	12/13/94	Project Number:	2727.001
Logged By:	Ed Ashton	Drilled By:	Huntingdon-Empire
Elevation: 20.62'	Detector: HNU	Drilling Method: HSA CME-75	Sampling Method: Split Spoon
Gravel Pack: Morie #1	Seal: Bentonite	Grout: Cement/Bentonite	
Casing Type: PVC	Diameter: 4"	Length: 15'	Hole Dia.: 12" / Depth to Liquid: 20'
Screen Type: PVC / Slot Size: 0.010"	Diameter: 4"	Length: 15'	Total Depth: 33' / Depth to Water: 20.2'

USCS Class.	Color	Fines (%)	PID Vapor (ppm)	Staining	Sample No.	Depth (ft)	Sample Recovery (%)	Pene. Resist.	LITHOLOGY/REMARKS
Fill		5	2			1	50	101 14 57 100	(0"-8"): Concrete (8"-2'): Brown sandy clay with brick, gravel fill, and possibly ash
Fill		5	2			3	40	83 14 10 11	(2'-4'): Same as 8"-2' interval
CL Fill		15	0.4			5	50	2 3 2 3	(4'-6'): Brown moderately sorted silty clay with fine grained sand and minor amount of gravel, brick and coal fragments, semi moist
SC		30	0			7	50	3 5 7 7	(6'-8'): Brown, moderately sorted, silty, fine to medium grained sandy clay with rounded to subangular pebbles to cobbles and a few brick fragments, semi moist
SC SP		30 2	0			9	60	7 10 14 12	(8'-9.5'): Same as 6'-8' (9.5'-10'): Brown, moderately sorted fine to medium grained sand with minor amounts of silt and rounded to subangular cobbles of milky quartz and sandstone
SP/GP		0	0			11	70	9 9 9 9	(10'-12'): Same as 9.5'-10' interval except slightly higher percentage of gravel present
SP/GP	GP	0	0			13	80	10 10 12 15	(12'-14'): Brown, poorly to moderately sorted, fine to coarse grained sand with rounded to subangular pebbles to cobbles of milky quartz
SP/GP		0	0			15	90	14 47 30 22	(14'-16'): Same as 12'-14' interval except for slight tannish color in isolated areas
SP/GP CL		0 60	0		S-13	17	90	23 14 27 32	(16'-17.5'): Same as 14'-16' interval (17.5'-17.8'): Red moderately sorted silty clay with minor amounts of pebbles and fine to medium grained, rounded to subangular sand, dry (17.8'-18'): Same as 16'-17.5' interval with slightly more gravel
GP		3	0		S-14	19	50	23 25 27 33	(18'-20'): Brown, poorly to moderately sorted, fine to coarse grained sand with a high percentage of rounded to subangular pebbles to cobbles of milky quartz and sandstone

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TEST HOLE/WELL LOG: BORING NO. MW-13

Site Name: Defense Personnel Support Center (DPSC) Philadelphia, Pennsylvania

Date: 12/13/94

Project Number: 2727.001

Logged By: Ed Ashton

Drilled By: Huntingdon-Empire

Elevation: 20.62'

HNU

Drilling Method: HSA CME-75

Sampling Method: Split Spoon

Gravel Pack: Morie #1

Seal: Bentonite

Grout: Cement/Bentonite

Casing Type: PVC

Diameter: 4"

Length: 16'

Hole Dia.: 12"

Depth to Liquid: 20'

Screen Type: PVC

Slot Size: 0.010"

Diameter: 4"

Length: 15'

Total Depth: 33'

Depth to Water: 20.2'

USCS Class.	Color	Fines (%)	PID Vapor (ppm)	Staining	Sample No.	Depth (ft)	Sample Recovery (%)	Pene. Resist.	LITHOLOGY/REMARKS
GP	Op	3	15		GT-7	21	70	40 42 27 30	(20'-22'): Same as 18'-20' interval, soil water interface at 20' bgs, petroleum odor
GP/ GW		3	150			23	80	40 47 23 27	(22'-24'): Same as 20'-22', strong petroleum odor and sheen observed on water
GP/SP		5	150			25	90	14 16 24 18	(24'- 26'): Brown, moderately sorted, fine to medium grained sand and rounded to subangular pebbles to cobbles of milky quartz and sandstone, minor amount of silt present, petroleum odor
GP/SP		5	150			27	90	10 12 27 3	(26'-28'): Same as 24'-26' interval
SP		1	200			29	50	4 6 4 6	(28'-30'): Brown, moderately sorted, fine to medium grained sand and rounded to subangular pebbles and few cobbles (lower percentage of gravels than 24'-26' interval) petroleum odor
SP CL		1	200			31	90	7 10 9 11	(30'-32'): Same as 28'-30' interval except for soft gray silty clay noted in the last 1" of split spoon Split spooned to 32' bgs, drilled to 33' bgs

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TEST HOLE/WELL LOG: BORING NO. MW-14

Sheet No. 1 of 2

Site Name: Defense Personnel Support Center (DPSC) Philadelphia, Pennsylvania			
Date: 12/7/94		Project Number: 2727.001	
Logged By: Ed Ashton		Drilled By: Huntingdon-Empire	
Elevation: 20.67'	Detector: HNU	Drilling Method: HSA CME-75	Sampling Method: Split Spoon
Gravel Pack: Morie #1		Seal: Bentonite	Grout: Cement/Bentonite
Casing Type: PVC	Diameter: 4"	Length: 17'	Hole Dia.: 12" / Depth to Liquid: 22'
Screen Type: PVC	Slot Size: 0.010"	Diameter: 4" / Length: 15'	Total Depth: 35' / Depth to Water: 22.5'

USCS Class.	Color	Fines (%)	PID Vapor (ppm)	Staining	Sample No.	Depth (ft)	Sample Recovery (%)	Pene. Resist.	LITHOLOGY/REMARKS
Fill	Fill	0	0			1	10	1 1 1 3	(0'-2'): Asphalt, concrete and sand
CL		60	2.5			3	40	5 7 6 7	(2'-4'): Orangish brown, moderately to well sorted, silty clay with minor amount of fine to medium grained sand, orange seams or lenses were noted, dry
CL		60	2.0			5	50	7 8 6 9	(4'-6'): Same as 2'-4' interval
CL		60	0.4			7	80	7 7 9 8	(6'-8'): Same as 4'-6' interval except color is predominantly orange
CL SP		60	9			9	70	6 8 8 11	(8'-9.6'): Same as 6'-8' interval except for presence of 2 cobbles of coal(?) (9.6'-10'): Reddish, poorly to moderately sorted, fine to medium grained sand with minor percentage of subangular to angular pebbles and silt, dry to moist
SP		2			Tube #2	11	80		(10'-12'): Shelby tube collected, mainly sand (as seen in 9.6'-10' interval), not sent for geotechnical analysis
SP		0	100		GT-5	13	40	15 20 13 14	(12'-14'): Brown, poorly to moderately sorted, fine to medium grained sand with traces of subangular to angular pebbles, dry to moist, petroleum odor
SP		0	15			15	50	42 58 37 20	(14'-16'): Red to brown, poorly to moderately sorted, fine to coarse grained sand and subangular to angular pebbles of sandstone, dry to moist, petroleum odor
SP		0	50			17	5	12 12 16 25	(16'-18'): Same as 14'-16' interval
SP		0	300		S-9	19	80	26 38 43 57	(18'-20'): Same as 16'-18' interval except higher pebble and cobble content, minor layer of fractured shale at 19.6'-19.8', moist

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TEST HOLE/WELL LOG: BORING NO. MW-14

Site Name:	Defense Personnel Support Center (DPSC) Philadelphia, Pennsylvania
Date: 12/7/94	Project Number: 2727.001
Logged By: Ed Ashton	Drilled By: Huntingdon-Empire
Elevation: 20.67'	Detector: HNU
Drilling Method: HSA CME-75	Sampling Method: Split Spoon
Gravel Pack: Morie #1	Seal: Bentonite
Grout: Cement/Bentonite	
Casing Type: PVC	Diameter: 4" — Length: 17'
Hole Dia.: 12"	Depth to Liquid: 22'
Screen Type: PVC — Slot Size: 0.010"	Diameter: 4" — Length: 15'
Total Depth: 35'	Depth to Water: 22.5'

USCS Class.	Color	Fines (%)	PID Vapor (ppm)	Staining	Sample No.	Depth (ft)	Sample Recovery (%)	Pene. Resist.	LITHOLOGY/REMARKS
SP		10	300		S-10	21	80	35 34 23 18	(20'-22'): Red to brown, poorly to moderately sorted, gravelly, fine to medium grained sand, minor amounts of silt and clay, petroleum odors, water table at 22' bgs
SP/SM		2	400			23	90	6 7 7 8	(22'-24'): Brown moderately to well sorted, fine to medium grained sand, sheen visible, strong petroleum odors
SP/SM		2	150			25	80	3 8 47 63	(24'-26'): Same as 22'-24' interval
SP/SM		2	400			27	90	15 18 37 44	(26'-27'): Same as 24'-26' interval (27'-28'): Brown sand with increasing amounts of sandstone pebbles and cobbles, as well as reddish orange seams of clayey silt
SP/SM		2	400			29			(28'-30'): Same as 27'-28' interval
SP/SM		2	300			31	100	20 27 34 68	(30'-32'): Same lithology as 28'-30' except silty clay seams are green Split spooned to 32' bgs Drilled to 35' bgs

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TEST HOLE/WELL LOG: BORING NO. MW-15

Site Name: Defense Personnel Support Center (DPSC) Philadelphia, Pennsylvania

Date: 12/20/94 | Project Number: 2727.001

Logged By: Ed Ashton | Drilled By: Huntingdon-Empire

Elevation: 20.58' | Detector: HNU | Drilling Method: HSA CME-75 | Sampling Method: Split Spoon

Gravel Pack: Morie #1 | Seal: Bentonite | Grout: Cement/Bentonite

Casing Type: PVC | Diameter: 4" | Length: 16' | Hole Dia.: 12" | Depth to Liquid: 21'

Screen Type: PVC | Slot Size: 0.010" | Diameter: 4" | Length: 15' | Total Depth: 34' | Depth to Water: 21.2'

USCS Class.	Color	Fines (%)	PID Vapor (ppm)	Staining	Sample No.	Depth (ft)	Sample Recovery (%)	Pene. Resist.	LITHOLOGY/REMARKS
Fill SM		1 80	1			1	80	5 7 8 7	(0'-1'): Black sand, gravel, and fragments of coal (1'-2'): Brown to gray, moderately sorted, silty, slightly clayey, fine to medium grained sand, semi-moist
SM	Qsl	80	0			3	85	9 7 9 8	(2'-4'): Same as 1'-2' interval
SM		80	0			5	70		(4'-6'): Same as 2'-4' interval, except orangish sand grains present
SM SP		80 5	7			7	60	4 6 7 4	(6'-7'): Same as 4'-6' interval (7'-8'): Brown, poorly to moderately sorted, subangular to rounded, gravelly, fine to coarse grained sand, dry to semi moist
SP		3	90			9	95	13 9 15 10	(8'-10'): Same as 7'-8' interval
SP	Qp	3	65			11	60	25 27 18 23	(10'-12'): Same as 8'-10' interval except for a few fragments of brick
						13			No sample recovered, large cobble blocked tip of spoon
SM		60	45			15	50	4 4 3 5	(14'-16'): Brown, moderately sorted, silty, fine to medium grained sand, petroleum odors
SP		5	250			17	75	15 27 29 31	(16'-18'): Same as 14'-16' interval
SP		20	300			19	10	27 40 51 32	(18'-20'): Same as 16'-18' interval except for presence of minor clay content

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TEST HOLE/WELL LOG: BORING NO. MW-15

Site Name: Defense Personnel Support Center (DPSC) Philadelphia, Pennsylvania			
Date: 12/20/94		Project Number: 2727.001	
Logged By: Ed Ashton		Drilled By: Huntingdon-Empire	
Elevation: 20.58'	Drilling Method: HSA CME-75	Sampling Method: Split Spoon	
Gravel Pack: Morie #1	Seal: Bentonite	Grout: Cement/Bentonite	
Casing Type: PVC	Diameter: 4" Length: 16'	Hole Dia.: 12"	Depth to Liquid: 21'
Screen Type: PVC Slot Size: 0.010"	Diameter: 4" Length: 15'	Total Depth: 34'	Depth to Water: 21.2'

USCS Class.	Color	Fines (%)	PID Vapor (ppm)	Staining	Sample No.	Depth (ft)	Sample Recovery (%)	Pene. Resist.	LITHOLOGY/REMARKS
SP	QP	20	250		S-18	21	40	19 40 21 16	(20'-22'): Same as 18'-20' interval except for slightly higher clay content and a few pieces of gravel
SP		2	350			23	30	29 21 17 15	(22'-24'): Brown, poorly sorted, slightly silty, rounded to subangular sandy gravel (pebbles to cobbles of sandstone and milky quartz), petroleum odors
SP	Yw	2	300			25	50	4 5 5 7	(24'-26'): Brown, moderately sorted, fine to medium grained sand, petroleum odors
SP SP/SW		2 3	250		GT-9	27	95	5 8 7 9	(26'-27'): Same as 24'-26' interval (27'-28'): Brown, poorly to moderately sorted gravelly (milky quartz and sandstone) fine to coarse grained sand
SP		2	200			29	60	4 3 3 5	(28'-30'): Same as 27'-28' interval
SP		2	200			31	98	6 6 10 12	(30'-32'): Same as 28'-30' except for blackish-gray color Split spooned to 32' bgs Drilled to 34' bgs

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TEST HOLE/WELL LOG: BORING NO. MW-16

Site Name:	Defense Personnel Support Center (DPSC) Philadelphia, Pennsylvania
Date: 12/16/94	Project Number: 2727.001
Logged By: Ed Ashton	Drilled By: Huntingdon-Empire

Elevation: 20.69'	Detector: HNU	Drilling Method: HSA CME-75	Sampling Method: Split Spoon
Gravel Pack: Morie #1		Seal: Bentonite	Grout: Cement/Bentonite
Casing Type: PVC	Diameter: 4"	Length: 16'	Hole Dia.: 12" / Depth to Liquid:
Screen Type: PVC	Slot Size: 0.010" / Diameter: 4"	Length: 15'	Total Depth: 34' / Depth to Water: 21'

USCS Class.	Color	Fines (%)	PID Vapor (ppm)	Staining	Sample No.	Depth (ft)	Sample Recovery (%)	Pene. Resist.	LITHOLOGY/REMARKS
CL		80	0			1	60	1 1 1 4	(0"-8"): Concrete and asphalt (8"-2'): Brown to gray, moderately to well sorted, slightly sandy, silty clay, orange clay seams present
CL		80	0			3	80	6 7 10 9	(2'-4'): Same as 8"-2' interval
					T-4	5			Shelby tube sample
SC/SM	Gal	90	0			7	100	5 9 10 11	(6'-8') Gray to brown, moderately sorted, silty, clayey, fine to medium grained sand, few fragments of sandstone cobbles
SM		50	0			9	80	1 15 20 14	(8'-10'): Same as 6'-8' interval except for a band of black silty sand from 9.5'-9.7'
CL SP/GP		70 3	0			11	90	1 23 15 19	(10'-11'): Brownish orange, well sorted, silty, slightly sandy, clay, dry to semi moist (11'-12'): Brownish orange, poorly to moderately sorted, fine to coarse grained sandy, rounded to subangular gravel (pebbles to cobbles of milky quartz and sandstone)
SP/GP	GP	3 1	2.8			13	90	16 16 22 24	(12'-14'): Same as 11'-12' interval
SP/GP		2	20		S-15	15	80	18 21 24 15	(14'-16'): Same as 12'-14' interval, nearly equivalent amounts of sand and gravel
SP/GP		2	20		GT-8	17	90	32 27 28 33	(16'-18'): Same as 14'-16' interval
SP/GP		2	4			19	90	14 14 18 21	(18'-20'): Brown to red, poorly sorted, gravelly (pebbles to cobbles of milky quartz and sandstone), fine to coarse grained sand

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TEST HOLE/WELL LOG: BORING NO. MW-16

Sheet No. 2 of 2

Site Name: Defense Personnel Support Center (DPSC) Philadelphia, Pennsylvania			
Date: 12/16/94		Project Number: 2727.001	
Logged By: Ed Ashton		Drilled By: Huntingdon-Empire	
Elevation: 20.69'	Detector: HNU	Drilling Method: HSA CME-75	Sampling Method: Split Spoon
Gravel Pack: Morie #1		Seal: Bentonite	Grout: Cement/Bentonite
Casing Type: PVC	Diameter: 4"	Length: 16'	Hole Dia.: 12" / Depth to Liquid:
Screen Type: PVC	Slot Size: 0.010" / Diameter: 4"	Length: 15'	Total Depth: 34' / Depth to Water: 21'

USCS Class.	Color	Fines (%)	PID Vapor (ppm)	Staining	Sample No.	Depth (ft)	Sample Recovery (%)	Pene. Resist.	LITHOLOGY/REMARKS
SP/GP	gp	2	0		S-16	21	80	23 23 25 28	(20'-22'): Same as 18'-20' interval, wet
SP	Vio	1	0			23	50	58 63 78 97	(22'-24'): Brown, poorly to moderately sorted, gravelly (cobbles to pebbles of milky quartz, sandstone) fine to medium grained sand, wet
GP/ GW		1	0.5			25	95	24 39 49 56	(24'-26'): Brown, poorly sorted, fine to coarse grained, sandy gravel (rounded to semi-rounded, pebbles to cobbles of milky quartz and sandstone)
GP/ GW		1	0.5			27	90	43 67 83 100	(26'-28'): Same as 24'-26' with traces of green sand grains
SM		80	0			29	90	7 4 3 2	(28'-30'): Tan to orangish red, moderately to well sorted, silty, slightly clayey, rounded to subangular sand, wet Split spooned to 30' bgs Drilled to 34' bgs

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TEST HOLE/WELL LOG: BORING NO. MW-17

Sheet No. 1 of 2

Site Name: Defense Personnel Support Center (DPSC) Philadelphia, Pennsylvania			
Date: 12/29/94	Project Number: 2727.001		
Logged By: Ed Ashton	Drilled By: Huntingdon-Empire		
Elevation: 20.49'	Detector: HNU	Drilling Method: HSA CME-75	Sampling Method: Split Spoon
Gravel Pack: Morie #1	Seal: Bentonite	Grout: Cement/Bentonite	
Casing Type: PVC	Diameter: 4"	Length: 14'	Hole Dia.: 12" / Depth to Liquid:
Screen Type: PVC / Slot Size: 0.010"	Diameter: 4"	Length: 15'	Total Depth: 32' / Depth to Water: 19'

USCS Class.	Color	Fines (%)	PID Vapor (ppm)	Staining	Sample No.	Depth (ft)	Sample Recovery (%)	Pene. Resist.	LITHOLOGY/REMARKS
Top soil/ SM	Qal	50	0			1	30	6 6 4 4	(0'-2'): Brown, moderately to well sorted, silty, slightly clayey, fine to medium grained sand, with a few pebbles
SM		50	0			3	25	8 10 13 9	(2'-4'): Same as 2'-4' interval
GP		2	0			5	10	7 9 10 12	(4'-6'): Brownish red, moderately sorted, slightly silty, sand to gravel (pebbles to cobbles of milky quartz to sandstone)
GP		2	0			7	80	13 11 14 11	(6'-8'): Same as 4'-6' interval
SP		1	0			9	15	5 8 9 8	(8'-10'): Brown, moderately sorted, fine to medium grained sand with gravel (less than previous inteval, rounded to subangular pebbles to cobbles of milky quartz) and a minor amount of silt
SP/GP	Qp	1	0			11	15	3 9 5 5	(10'-12'): Same as 8'-10' interval, except for coarser grained sand
SP/GP		1	0			13	90	10 13 14 8	(12'-14'): Same as 10'-12' interval
SP		2	0			15	20	7 12 15 18	(14'-16'): Brown, moderately sorted, rounded to subangularly gravelly (pebbles), fine to medium grained sand
SP/GP		5	0		S-21	17	100	23 15 28 38	(16'-18'): Same as 14'-16' interval, except for higher percentage of cobbles
GP/ GW		0	0		S-22	19	85	15 20 23 16	(18'-20'): Brown, poorly to moderately sorted, rounded to subangularly gravelly (pebbles to cobbles of milky quartz), fine to medium grained sand, moist to wet

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TEST HOLE/WELL LOG: BORING NO. MW-17

Site Name: Defense Personnel Support Center (DPSC) Philadelphia, Pennsylvania			
Date: 12/29/94		Project Number: 2727.001	
Logged By: Ed Ashton		Drilled By: Huntingdon-Empire	
Elevation: 20.49'	Monitor: HNU	Drilling Method: HSA CME-75	Sampling Method: Split Spoon
Gravel Pack: Morie #1		Seal: Bentonite	Grout: Cement/Bentonite
Casing Type: PVC	Diameter: 4" Length: 14'	Hole Dia.: 12"	Depth to Liquid:
Screen Type: PVC Slot Size: 0.010"	Diameter: 4" Length: 15'	Total Depth: 32'	Depth to Water: 19'

USCS Class.	Color	Fines (%)	PID Vapor (ppm)	Staining	Sample No.	Depth (ft)	Sample Recovery (%)	Pene. Resist.	LITHOLOGY/REMARKS
SP		20	0			21	95	6 18 6 73	(20'-22'): Brownish red, well sorted, fine to medium grained sand with minor amounts of silt and semi-rounded milky quartz pebbles
SP		20	0			23	5	100/ 3"	(22'-24'): Same as 20'-22'
SP		20	0		GT-11	25	100	3 10 18 14	(24'-26'): Same as 22'-24' except slightly higher percentage of gravel and silt
SP GP		20 2	0			27	90	83 42 100/ 4"	(26'-27'): Same as 24'-26' interval (27'-28'): Brown, poorly to moderately sorted, medium to coarse grained sandy, rounded to semi-rounded gravel (pebbles to cobbles), moist to wet
CL		60	0			29	30	27 57 100/ 5"	(28'-30'): Red moderately to well sorted silty clay with minor amounts of sand, a few fragments of milky quartz present Split spooned to 30' bgs Drilled to 32' bgs

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TEST HOLE/WELL LOG: BORING NO. **MW-18**

Sheet No. 1 of 2

Site Name: Defense Personnel Support Center (DPSC) Philadelphia, Pennsylvania			
Date: 12/30/94		Project Number: 2727.001	
Logged By: Ed Ashton		Drilled By: Huntingdon-Empire	
Elevation: 18.31'	Drilling Method: HSA CME-75	Sampling Method: Split Spoon	
Gravel Pack: Morie #1	Seal: Bentonite	Grout: Cement/Bentonite	
Casing Type: PVC	Diameter: 4" Length: 10.7'	Hole Dia.: 12"	Depth to Liquid: N/A
Screen Type: PVC Slot Size: 0.010	Diameter: 4" Length: 18'	Total Depth: 32'	Depth to Water: 14'

USCS Class.	Color	Fines (%)	PID Vapor (ppm)	Staining	Sample No.	Depth (ft)	Sample Recovery (%)	Pene. Resist.	LITHOLOGY/REMARKS
Fill		1	0			1	15	7 6 5 5	(0"-4"): Asphalt (4"-2'): Brown to black sand, gravel and possibly ash
Fill SP/Fill		1 20	0			3	70	5 4 4 6	(2'-3.8'): Same as 4"-2' interval (3.8'-4'): Brown sand with silt and minor amount of clay, fine to medium grained, rounded to subangular, poorly to moderately sorted, dry to semi-moist, fragments of cobble sized gravel in the fill zone
SP/Fill	Fill	20	0			5	15	1 2 3 4	(4'-6'): Same as 3.8'-4' interval except higher gravel content and possible ash in fill zone
SP/Fill Fill		20 1				7	30	2 3 4 3	(6'-7'): Same as 4'-6' interval except for presence of brick fragments (7'-8'): Tan to blackish sand, gravel and possibly limestone fill
SM	Br	40	1			9	10	1 1 1 1	(8'-10'): Brown silty sand with minor amounts of clay, fine to medium grained, moderately sorted, rounded to semi-rounded, moist
SP/SM		20	0			11	10	1 9 4 3	(10'-12'): Brown sand with silt and minor clay, fine to medium grained, moderately sorted, rounded to semi-rounded, moist, 1-2 pieces of cobble sized gravel
GP		1	0			13	15	4 2 2 1	(12'-14'): Brown to black coarse grained cobble sized gravel with coarse sand, poorly to moderately sorted, moist to wet (watertable?), rounded to subangular (sand grains), brick fragments present
CL		80	1		S-23	15	90	4 5 5 4	(14'-16'): Brown silty clay with minor fine grained, rounded to semi-rounded sand, moderately to well sorted, orange colored seams present
SM CL		60 80	1			17	95	9 12 24 32	(16'-17'): Brownish orange silty sand with minor clay, fine to medium grained, rounded to subangular, moist to wet, moderately to well sorted (17'-18'): Brownish orange silty clay with minor fine to medium grained, rounded to semi-rounded sand, moist to wet, moderately to well sorted
SM		60	1.5			19	45	9 14 15 15	(18'-20'): Brown silty sand with clay, fine to medium grained moderately to well sorted, rounded to semi-rounded, moist to wet, few fragments of pebble to cobble sized milky quartz present

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TEST HOLE/WELL LOG: BORING NO.	MW-18	Sheet No. 2 of 2

Site Name:	Defense Personnel Support Center (DPSC) Philadelphia, Pennsylvania
Date: 12/30/94	Project Number: 2727.001
Logged By: Ed Ashton	Drilled By: Huntingdon-Empire
Elevation: 18.31'	Detector: HNU
Drilling Method: HSA CME-75	Sampling Method: Split Spoon
Gravel Pack: Morie #1	Seal: Bentonite
Grout: Cement/Bentonite	
Casing Type: PVC	Diameter: 4"
Length: 10.7'	Hole Dia.: 12"
Depth to Liquid: N/A	Screen Type: PVC
Slot Size: 0.010	Diameter: 4"
Length: 18'	Total Depth: 32'
Depth to Water: 14'	

USCS Class.	Color	Fines (%)	PID Vapor (ppm)	Staining	Sample No.	Depth (ft)	Sample Recovery (%)	Pene. Resist.	LITHOLOGY/REMARKS
SP/SM		40	1.2			21	70	9 10 16 16	(20'-22'): Brown sand with gravel (coarse, rounded to semi-rounded milky quartz cobbles)and silt, fine to medium grained, rounded to subangular, poorly to moderately sorted, wet
SP		10	1.6			23	75	26 13 17 16	(22'-24'): Brown sand with minor gravel (rounded milky quartz pebbles) fine to medium grained, poorly to moderately sorted, rounded to subangular, wet
SP	10	0	1.4			25	50	2 2 5 6	(24'-26'): Same as 22'-24' interval except no silt present
SP		0	1.6			27	55	5 7 9 12	(26'-28'): Same as 24'-26' interval except for a few cobble-sized gravels present
SP		0	1.8			29	100	7 12 12 21	(28'-30'): Brown fine grained sand, well sorted, rounded to subangular, wet Split spooned to 30' bgs, drilled to 32' bgs

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TEST HOLE/WELL LOG: BORING NO. MW-19

Site Name: Defense Personnel Support Center (DPSC) Philadelphia, Pennsylvania			
Date: 11/29/94		Project Number: 2727.001	
Logged By: Ed Ashton		Drilled By: Huntingdon-Empire	
Elevation: 21.21'	Direction: NU	Drilling Method: HSA CME-75	Sampling Method: Split Spoon
Gravel Pack: Morie #1		Seal: Bentonite	Grout: Cement/Bentonite
Casing Type: PVC	Diameter: 4"	Length: 15'	Hole Dia.: 12" / Depth to Liquid: N/A
Screen Type: PVC	Slot Size: 0.010" / Diameter: 4"	Length: 15'	Total Depth: 31' / Depth to Water: 18'

USCS Class.	Color	Fines (%)	PID Vapor (ppm)	Staining	Sample No.	Depth (ft)	Sample Recovery (%)	Pene. Resist.	LITHOLOGY/REMARKS
Fill		0	0			1	5	4 6 6 6	(0'-2'): Black ash, cinders, gravel and sand fill
Fill		0	0			3	10	12 6 3 3	(2'-4'): Same as 0'-2' interval with larger gravel
	Fill					5			(4'-6'): Shelby tube sample
SC		80	3			7	40	2 11 1 2	(6'-8'): Dark brown to black silty, sandy clay, semi moist, well sorted, fine fragments of brick and tile, traces of quartz and mica at 8'
SM		100	4		S-1	9	80	4 4 4 4	(8'-10'): Light brown silty clayey fine grained sand, moist, well sorted traces of orange debris, no gravel
SM SC		90	4		GT-1	11	80	3 2 5 6	(10'-11'): Almond silty clayey fine grained sand, well sorted, traces of orange debris, semi moist (11'-12'): Almond silty sandy clay, well sorted, few fragments of gravel, dry to semi-moist
SC	Qa	80	2	Yes		13	80	6 7 7 6	(12'-14'): Same as 11'-12' interval with iron staining present
SP		40	3.5			15	60	5 9 8 8	(14'-16'): Red to light brown silty clay and sand to gravel, medium to coarse grained, poorly sorted sand predominant, semi-rounded milky quartz gravel present, petroleum odor present
SP	? Qp	20	5	Yes	PADER S-1	17	70	11 11 8 7	(16'-18'): Light brown to gray silty clayey sand with gravel, medium to coarse grained, poorly sorted, subangular to angular, moist to wet traces of greenish staining present, petroleum odor present
SP		15	2.5		S-2	19	9	3 5 6 7	(18'-20'): Light brown silty, gravelly sand with some clay matrix, fine to coarse grained, poorly to moderately sorted, subangular to angular, wet, petroleum odor

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TEST HOLE/WELL LOG: BORING NO. MW-19

Sheet No. 2 of 2

Site Name: Defense Personnel Support Center (DPSC), Philadelphia, Pennsylvania			
Date: 11/29/94		Project Number: 2727.001	
Logged By: Ed Ashton		Drilled By: Huntingdon-Empire	
Elevation: 21.21'	Detector: HNU	Drilling Method: HSA CME-75	Sampling Method: Split Spoon
Gravel Pack: Morie #1		Seal: Bentonite	Grout: Cement/Bentonite
Casing Type: PVC	Diameter: 4"	Length: 15'	Hole Dia.: 12" / Depth to Liquid: N/A
Screen Type: PVC / Slot Size: 0.010"	Diameter: 4"	Length: 15'	Total Depth: 31' / Depth to Water: 18'

USCS Class.	Color	Fines (%)	PID Vapor (ppm)	Staining	Sample No.	Depth (ft)	Sample Recovery (%)	Pene. Resist.	LITHOLOGY/REMARKS
GP		20	1.8			21	5	1 2 4 5	(20'-22'): Gray silty fine to coarse, poorly to moderately sorted, subangular to angular sand with coarse pebbles, wet, strong petroleum odors
GP SP		10 5	50			23	80	5 6 5 6	(22'-23'): Same as 20'-22' interval (23'-24'): Gray, moderately sorted, fine to medium grained sand with small percentage of subangular to angular gravel, wet, petroleum odor
SP	gp	10	80			25	80	5 8 80 26	(24'-26'): Same as 23'-24' interval
SP SC		10 60	150			27	90	35 52 38 34	(26'-27'): Same as 24'-26' interval (27'-28'): Brown to red silty sandy clay with gravel, fine to medium grained, moderately sorted, brittle Terminated split spoon sampling at 28' bgs, drilled to 31' bgs to complete construction specification.

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TEST HOLE/WELL LOG: BORING NO.	MW-20	Sheet No. 1 of 2					
Site Name:	Defense Personnel Support Center (DPSC) Philadelphia, Pennsylvania						
Date:	11/30/94	Project Number:	2727.001				
Logged By:	Ed Ashton	Drilled By:	Huntingdon-Empire				
Elevation:	N/A	Detector:	HNU	Drilling Method:	HSA CME-75	Sampling Method:	Split Spoon
Gravel Pack:	Morie #1	Seal:	Bentonite	Grout:	Cement/Bentonite		
Casing Type:	PVC	Diameter:	4"	Length:	16'	Hole Dia.: 12"	Depth to Liquid:
Screen Type:	PVC	Slot Size:	0.010"	Diameter: 4"	Length: 15'	Total Depth: 34'	Depth to Water: 21'

USCS Class.	Color	Fines (%)	PID Vapor (ppm)	Staining	Sample No.	Depth (ft)	Sample Recovery (%)	Pene. Resist.	LITHOLOGY/REMARKS
Fill		0	0			1	60	0 11 14 8	(0"-3"): Asphalt (3"-2'): Black and gray gravel, cinder, sand, brick and ash fill
Fill		0	1			3	80	6 6 7 9	(2'-4'): Same as 3"-2' interval
Fill		0	0.2		S-3	5	90	5 6 3 3	(4'-6'): Same as 2'-4' interval
Fill		0	0.2			7	20	10 10 12 9	(6'-8'): Same as 4'-6' interval
Fill		10	0.1			9	10	4 5 7 15	(8'-10'): Black sand with grayish-orange clay with wood and brick
Fill/SP		20	0.9			11	15	2 3 7 3	(10'-12'): Gray to black, moderately sorted, silty, sandy, clay, semi-moist
Fill/SP		10	1.4			13	60	4 4 3 3	(12'-14'): Black ash, sand, silt, wood, gravel and brick, dry
SC		30	0.8			15	90	2 4 6 9	(14'-16'): Gray, well sorted, silty, sandy, clay, semi-moist
SP		2	0.2		GT-2	17	80	16 15 5 8	(16'-18'): Light brown, poorly to moderately sorted, gravelly (pebbles) fine to coarse grained sand
SM SP		20	5		PADER S-2	19	90	2 7 9 11	(18'-19'): Same as 16'-18' interval (19'-20'): Light brown, poorly sorted gravelly (pebbles to cobbles) sand, dry to semi-moist

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TEST HOLE/WELL LOG: BORING NO. MW-20

Site Name: Defense Personnel Support Center (DPSC) Philadelphia, Pennsylvania			
Date: 11/30/94		Project Number: 2727.001	
Logged By: Ed Ashton		Drilled By: Huntingdon-Empire	
Elevation: N/A	[illegible]: HNU	Drilling Method: HSA CME-75	Sampling Method: Split Spoon
Gravel Pack: Morie #1		Seal: Bentonite	Grout: Cement/Bentonite
Casing Type: PVC	Diameter: 4"	Length: 16'	Hole Dia.: 12" / Depth to Liquid:
Screen Type: PVC	Slot Size: 0.010" / Diameter: 4"	Length: 15'	Total Depth: 34' / Depth to Water: 21'

USCS Class.	Color	Fines (%)	PID Vapor (ppm)	Staining	Sample No.	Depth (ft)	Sample Recovery (%)	Pene. Resist.	LITHOLOGY/REMARKS
SP		15	2		S-4	21	30	12 23 26 64	(20'-22'): Same as 19'-20' interval except for slight increase in silt/clay matrix, water table at 21' bgs
SP		15	1.2			23	50	3 5 9 4	(22'-24'): Brown, poorly sorted, silty, gravelly (pebbles to cobbles), fine to coarse grained sand with some clay matrix
SP		2	2.6			25	50	4 7 9 8	(24'-26'): Gray, poorly to moderately sorted, gravelly (pebbles), fine to medium grained sand
SP		2	1			27	40	7 12 13 12	(26'-28'): Same as 24'-26' interval
SP		2	40			29	60	7 12 13 12	(28'-30'): Same as 26'-28' interval, strong petroleum odor
SP		5	25			31	80	4 4 8 10	(30'-32'): Same as 28'-30' interval Split spoon to 32' bgs Drilled to 34' bgs

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TEST HOLE/WELL LOG: BORING NO. MW-20D

Site Name: Defense Personnel Support Center (DPSC) Philadelphia, Pennsylvania			
Date: 1/4/95		Project Number: 2727.001	
Logged By: Ed Ashton		Drilled By: Huntingdon-Empire	
Elevation: N/A	Drilling Method: Mud Rotary		Sampling Method: Split Spoon
Gravel Pack: Morie #1	Seal: Bentonite		Grout: Cement/Bentonite
Casing Type: PVC	Diameter: 4"	Length: 76'	Hole Dia.: 12" / Depth to Liquid:
Screen Type: PVC Slot Size: 0.010"	Diameter: 4"	Length: 15'	Total Depth: 92' / Depth to Water:

USCS Class.	Color	Fines (%)	PID Vapor (ppm)	Staining	Sample No.	Depth (ft)	Sample Recovery (%)	Pene. Resist.	LITHOLOGY/REMARKS
									(0'-30'): Drilled continuously without split spoon sampling. Lithology identical to MW-20 for first 30'
SP	9r		0.6			31	10		(30'-32'): Brown, moderately to well sorted, fine to medium grained, rounded to subangular sand, minor amounts of silt, moist to wet
GW			0.4			33	7		(32'-34'): Brown, poorly to moderately sorted, fine to coarse grained, sandy gravel (semi rounded pebbles of milky quartz and sandstone)
CL SM	Ku		1			35	50		(34-35.7): Orangish silty clay, stiff, elastic, wet (35.7'-36'): Orangish, well sorted, fine grained sandy, silt
SM	Ko		1.2			37	40		(36'-38'): Orangish, well sorted, red silty, fine grained sand
SM			0			39	10		(38'-40'): Red, moderately to well sorted, silty, fine to medium grained, rounded to subangular, sand, wet
SP/SM			0			41	10		(40'-42'): Red, moderately to well sorted, fine to medium grained, rounded to subangular, sand with minor amounts of silt, clay, and cobbles
SP			0			43	50		(42'-44'): Same as 40'-42' interval
SP			0			45	40		(44'-46'): Same as 42'-44' interval
SP/SM			0			47	60		(46'-48'): Same as 44'-46' interval

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TEST HOLE/WELL LOG: BORING NO. MW-20D	Sheet No. 2 of 4
Site Name: Defense Personnel Support Center (DPSC) Philadelphia, Pennsylvania	
Date: 1/4/95	Project Number: 2727.001
Logged By: Ed Ashton	Drilled By: Huntingdon-Empire

Elevation: N/A	NU	Drilling Method: Mud Rotary			Sampling Method: Split Spoon	
Gravel Pack: Morie #1		Seal: Bentonite			Grout: Cement/Bentonite	
Casing Type: PVC		Diameter: 4"	Length: 76'		Hole Dia.: 12"	Depth to Liquid:
Screen Type: PVC	Slot Size: 0.010"	Diameter: 4"	Length: 15'		Total Depth: 92'	Depth to Water:

USCS Class.	Color	Fines (%)	PID Vapor (ppm)	Staining	Sample No.	Depth (ft)	Sample Recovery (%)	Pene. Resist.	LITHOLOGY/REMARKS
SM	Ko		0			49	80		(48'-50'): Same as 46'-48' interval
SM SP			0			51	50		(50'-51'): Same as 48'-50' interval (51'-52'): Red, moderately to well sorted, fine to medium grained, rounded to subangular, sand with minor silt, wet
SP SM			0			53			(52'-53'): Same as 51'-52' interval (53'-54'): Red, well sorted, fine to medium grained, rounded to subangular clayey sand
SM SC			0			55	90		(54'-55'): Same as 53'-54' interval (55'-56'): Red, moderately to well sorted, silty, clayey, rounded to subangular, fine grained sand, wet
SC SP CL			0			57	95		(56'-56.5'): Same as 55'-56' interval (56.5'-57'): Brown, moderately to well sorted, medium to coarse grained subangular to angular sand (57'-58'): Brown plastic clay, wet
CL			0			59	100		(58'-60'): Same as 57'-58' interval
CL	Km		0			61	40		(60'-62'): Same as 58'-60' interval
CL			0			63	100		(62'-64'): Same as 60'-62' interval
CL			0			65	75	9 8 8 8	(64'-66'): Same as 62'-64' interval
SC	Kr		0			67	10	10 15 10 10	(66'-68'): Dark brown, slightly clayey, slightly clayey, medium to coarse grained sand

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TEST HOLE/WELL LOG: BORING NO. MW-20D

Site Name: Defense Personnel Support Center (DPSC) Philadelphia, Pennsylvania			
Date: 1/4/95		Project Number: 2727.001	
Logged By: Ed Ashton		Drilled By: Huntingdon-Empire	
Elevation: N/A	Detector: HNU	Drilling Method: Mud Rotary	Sampling Method: Split Spoon
Gravel Pack: Morie #1		Seal: Bentonite	Grout: Cement/Bentonite
Casing Type: PVC	Diameter: 4"	Length: 76'	Hole Dia.: 12" / Depth to Liquid:
Screen Type: PVC	Slot Size: 0.010"	Diameter: 4" / Length: 15'	Total Depth: 92' / Depth to Water:

USCS Class.	Color	Fines (%)	PID Vapor (ppm)	Staining	Sample No.	Depth (ft)	Sample Recovery (%)	Pene. Resist.	LITHOLOGY/REMARKS
GP			0			69	30	18 22 28 27	(68'-70'): Dark gray, gravelly, coarse to medium grained sand
GC			0			71	50		(70'-72'): Silty, gravelly, clay
GP			0			73	25		(72'-74'): Gray, gravelly, coarse grained sand, wet
						75			(74'-76'): No sample recovered
	44					77			(76'-78'): No sample recovered
SP			0			79	10		(78'-80'): Slightly blue-gray, gravelly, fine grained sand
						81	0	17 21 37 33	(80'-82'): No sample recovered, rock blocked tip
GP			0			83	60	18 26 35 35	(82'-84'): Slightly blue-gray, slightly sandy, gravel
GP			0			85	10	25 30 60 45	(84'-86'): Same as 82'-84' interval
GP			0			87	30	30 52 65 67	(86'-88'): Grayish green, gravelly, coarse grained sand

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TEST HOLE/WELL LOG: BORING NO. MW-20D

Sheet No. 4 of 4

Site Name: Defense Personnel Support Center (DPSC) Philadelphia, Pennsylvania			
Date: 1/4/96		Project Number: 2727.001	
Logged By: Ed Ashton		Drilled By: Huntingdon-Empire	
Elevation: N/A HNU	Drilling Method: Mud Rotary	Sampling Method: Split Spoon	
Gravel Pack: Morie #1	Seal: Bentonite	Grout: Cement/Bentonite	
Casing Type: PVC	Diameter: 4" Length: 76'	Hole Dia.: 12"	Depth to Liquid:
Screen Type: PVC Slot Size: 0.010"	Diameter: 4" Length: 15'	Total Depth: 92'	Depth to Water:

USCS Class.	Color	Fines (%)	PID Vapor (ppm)	Staining	Sample No.	Depth (ft)	Sample Recovery (%)	Pene. Resist.	LITHOLOGY/REMARKS
GP	KF		0			89	20	35 69 44 78	(88'-90'): Same as 86'-88' interval
GP			0			91	15	18 54 100/ 5"	(90'-92'): Same as 88'-90' interval, except for light gray color

HTW DRILLING LOG

HOLE NO. MW - 21		
1. COMPANY NAME Louis Berger & Associates	2. DRILLING SUBCOTRACTOR SJB Services	SHEET 1 OF 2 SHEETS
3. PROJECT DPSC Expanded Site Investigation	4. LOCATION Philadelphia, Pennslyvania	
5. NAME OF DRILLER Scott Bray	6. MANUFACTURER'S DESIGNATION OF DRILL CME - 550	
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIOMENT 7" I.D., 2 1 /4" O.D. Hollow Stem Auger, 2' x 2" Split Spoon	8. HOLE LOCATION Oregon Ave. Tank Area	
	9. SURFACE LOCATION South Side of Tank Area	
	10. DATE STARTED 6/14/96	11. DATE COMPLETED 6/14/96
12. OVERBURDEN THICKNESS N/A	15. DEPTH GROUNDWATER ENCOUNTERED ~ 16'	
13. DEPTH DRILLED INTO ROCK N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A	
14. TOTAL DEPTH OF HOLE 24'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A	
15. GEOTECHNICAL SAMPLES — DISTURBED / UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES N/A	
20. SAMPLES FOR CHEMICAL ANALYSIS — VOC / METALS / OTHER (SPECIFY) / OTHER (SPECIFY) / OTHER (SPECIFY)	21. TOTAL CORE RECOVERY	
22. DISPOSITION OF HOLE — BACKFILLED / MONITORING WELL / OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR Jeff Farrell	

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS D	GEOTECH SAMPLE OR CORE BOX NO. E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1	Brown SILT and mf GRAVEL	0	20 in.	No Analytical samples collected	7, 9, 9, 10	18-24" Concrete & Cinder Blks.
	2						
Fill	3	Brown SILT, Cinder Blocks Slag and Red Brick Fill	0	18 in.		6, 11, 9, 8	
	4						
	5	Lt. brown SILT	0	24 in.		7, 8	Slightly Plastic
2-	6	Orange brown SILT, trace f Sand				7, 6	Non Plastic
	7	Orange brown SILT, some f Sand, lt. brown Silt	0	24 in.		6, 2, 3, 6	Slightly Plastic
	8						
	9	cf GRAVEL, little mf Sand, little Silt	0	24 in.		14, 15, 15, 11	
	10						
3?	11	Orange brown cf SAND, little Silt, trace f Gravel at bottom	0	20 in.		10, 9, 8, 10	
	12						
	13	Orange brown cf GRAVEL little mf Sand, little Silt	0	20 in.		14, 15, 9	
	14	Orange brown f SAND, some Silt				11	

MRK FORM JUN 89 55-2

HTW DRILLING LOG

MW - 21

PROJECT	INSPECTOR	SHEET 2
DPSC Expanded Site Investigation	J. Farrell	OF 2 SHEETS

ELEV A	DEPTH FT B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS D	GEOTECH SAMPLE OR CORE BOX NO. E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	14						
Qp	15	Orange brown cf GRAVEL and cf SAND, little Silt	0	22		12 13 5 7	moist
Ku	16–17	Brown CLAYEY SILT	0	24		4 8 7 7	
	18	Brown SILTY CLAY					
	19–20	Orange brown CLAYEY SILT	0	18		6 7 10 10	moist
	21–22	Lt. brown CLAYEY SILT Brown cf GRAVEL and mf SAND, little Silt	0	18		5 7 20 22	Wet ~2" Red Brown Siltstone
Ko	23–24	Orange brown cf GRAVEL, little cf Sand, little Silt	0	18		20 19 34 56	Wet
	25		Bottom of	Hole			
	26						
	27						
	28	4 in. Dia. Sch 40 PVC 0.010 in. Slot Screen --->	23' - 13'				
		Morie #1 Sand ------------>	24' - 11'				
	29	Bentonite Chips ---------->	11' - 8'	(1.5 Bags)			
		Hydrated w/5 gal. H2O @ 13:45					
	30	Grouted -------------------->	8' - 2'	1.0 Bag			
	31	(See Well Completion Diagram)					
	32						
	33						
	34						
	35						

LOUIS BERGER & ASSOCIATES, INC.

OVERBURDEN MONITORING WELL CONSTRUCTION SHEET

Well No.: MW-21

Project: DPSC ESI PHASE II

Start Date: JUNE 14, 1996

Project No.: JG 1111-C

End Date: JUNE 14, 1996

Location: OREGON AVENUE TANK AREA

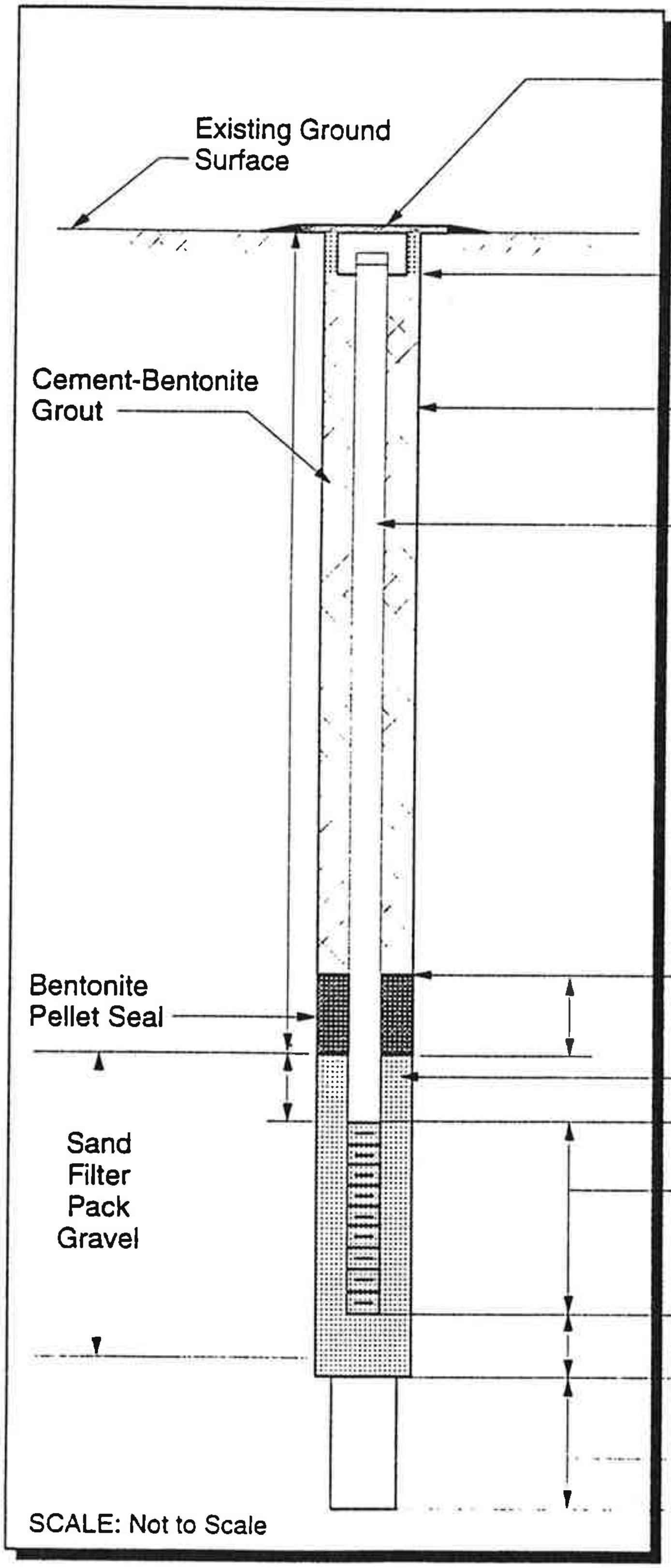
Field Engineer: R. HARDING / J. FARRELL

Drilling Co.: SJB SVCS.

Driller(s): Scott Bray

Drilling Method(s): HSA

Development Method(s): SURGE/PUMP



Size and Length of Lockable Protective SteelCasing: FLUSH MOUNT

Locked? [X] Yes [ ] No.

Depth of Grout/ Bottom of Cement: 2 FEET

Borehole Diameter: 10 INCH

Riser Diameter: 4 INCH

and Material: PVC

Top Depth of Seal: 8FEET

Sand Depth: 11 FEET

Top Depth of Screen: 13 FEET

Screen Diameter, 4 INCH Slot Size, 0.010

and Material: PVC

Bottom Depth of Screen: 23 FEET

Bottom Depth of Sand Filter Pack: 24 FEET

Bottom Depth of Borehole: 24 FEET

Backfill Material: N/A

NOTE: Depths are Feet Below Grade

DPS-MW22/12AUG96

HTW DRILLING LOG

HOLE NO. MW - 22		
1. COMPANY NAME Louis Berger & Associates	2. DRILLING SUBCOTRACTOR SJB Services	SHEET 1 OF 2 SHEETS
3. PROJECT DPSC Expanded Site Investigation	4. LOCATION Philadelphia, Pennslyvania	
5. NAME OF DRILLER Scott Bray	6. MANUFACTURER'S DESIGNATION OF DRILL CME - 550	
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIOMENT 7" I.D., 2 1 /4" O.D. Hollow Stem Auger, 2' x 2" Split Spoon	8. HOLE LOCATION Oregon Ave. Tank Area	
	9. SURFACE LOCATION South of Tank Area & East of Building 46	
	10. DATE STARTED 6/17/96	11. DATE COMPLETED 6/17/96
12. OVERBURDEN THICKNESS N/A	15. DEPTH GROUNDWATER ENCOUNTERED Pearched at 10'; water table at 17'	
13. DEPTH DRILLED INTO ROCK N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A	
14. TOTAL DEPTH OF HOLE 26'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A	
15. GEOTECHNICAL SAMPLES — DISTURBED — UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES N/A	
20. SAMPLES FOR CHEMICAL ANALYSIS — VOC — METALS	OTHER (SPECIFY) — OTHER (SPECIFY) — OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
22. DISPOSITION OF HOLE — BACKFILLED — MONITORING WELL: x	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR Jeff Farrell

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS D	GEOTECH SAMPLE OR CORE BOX NO. E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1	Brown cf GRAVEL Brown CLAYEY SILT	0	15 in.	No Analytical Samples Collected	6 7 9	
	2					9	
	3	Brown SILT, some Gravel some f Sand	0	15 in.		10 11	
Fill	4					10 10	
	5	Brown mf GRAVEL, some Silt, trace f Sand				10 12	
	6	Brown SILT, some mf Sand	0	20 in.		7 11	
Qal	7	Brown SILT, some mf Sand and Red Brick & Gravel Fill	0	24 in.		3 4	
	8					4 7	
	9	Brown cmf GRAVEL and cm Sand	0	24 in.		15 16	
Qp	10					17 18	
	11	Lt. brown f GRAVEL, some Clayey Silt	0	5 in.		19 20	Plastic
	12					17 15	Very Wet
	13	Red brown cmf GRAVEL, some cmf Sand	0	3 in.		17 15	Wet
	14					16 19	

MRK FORM JUN 89 55-2

HTW DRILLING LOG

MW - 22

PROJECT	INSPECTOR	SHEET 2
DPSC Expanded Site Investigation	J. Farrell	OF 2 SHEETS

ELEV A	DEPTH FT B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS D	GEOTECH SAMPLE OR CORE BOX NO. E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
Qp	15	Brown mf GRAVEL, some cmf Sand	0	15		4, 5	Very Wet
Ku	16	Brown mf SAND and SILT Brown SILT, some f Sand				6, 6	
	17, 18	Brown cmf SAND, some Silt Brown SILT, some f Sand Brown GRAVEL, Very Tight and Dry	0	15		10, 32, 42, 25	Wet at Top
	19, 20	Orange brown cmf Gravel, some cmf Sand	0	15		32, 37, 40, 44	Wet
Ko	21, 22	Red brown GRAVEL, trace f Sand	0	12		34, 32, 22, 25	Wet
	23, 24	Brown cmf GRAVEL, little cmf Sand	0	12		28, 26, 30, 36	Red Siltstone
	25, 26	Brown cmf GRAVEL, cm Sand	0	15		25, 27, 32, 28	
	27						
	28	4 in. Dia. Sch 40 PVC 0.010 in. Slot Screen --->	25' - 15'				
		Morie #1 Sand ----------->	25.7' - 13'	(4.5 Bags)			
	29	Bentonite Chips ---------->	13' - 9'	(2.0 Bags)			
		Hydrated w/ gal. H2O @ 15:30					
	30	Grouted ------------------>	9' - 2'	(2.0 Bags)			
	31	(See Well Completion Diagram)					
	32						
	33						
	34						
	35						

LOUIS BERGER & ASSOCIATES, INC.

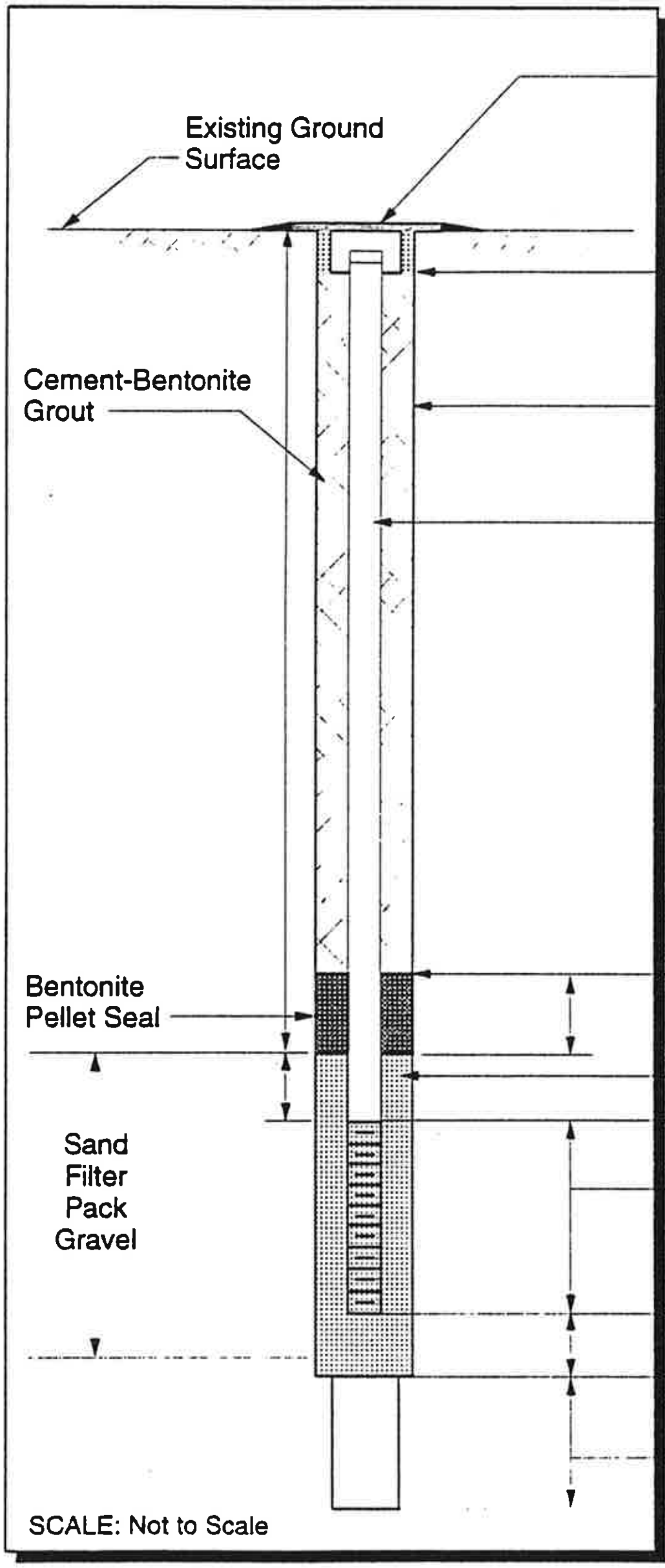
OVERBURDEN MONITORING WELL
CONSTRUCTION SHEET

Well No.: MW-22

Project: DPSC ESI PHASE II
Project No.: JG 1111-C
Location: OREGON AVENUE TANK AREA
Field Engineer: R. HARDING / J. FARRELL

Start Date: JUNE 17, 1996
End Date: JUNE 17, 1996

Drilling Co.: SJB SVCS.
Driller(s): Scott Bray
Drilling Method(s): HSA
Development Method(s): SURGE/PUMP



Size and Length of Lockable Protective SteelCasing: FLUSH MOUNT

Locked? [X] Yes [ ] No.

Depth of Grout/ Bottom of Cement: 2 FEET

Borehole Diameter: 10 INCH

Riser Diameter: 4 INCH
and Material: PVC

Top Depth of Seal: 9 FEET

Sand Depth: 13 FEET

Top Depth of Screen: 15 FEET

Screen Diameter, 4 INCH Slot Size, 0.010
and Material: PVC

Bottom Depth of Screen: 25 FEET

Bottom Depth of Sand Filter Pack: 26 FEET
Bottom Depth of Borehole: 26 FEET
Backfill Material: N/A

NOTE: Depths are Feet Below Grade

DPS-MW22/12AUG96

DRILLING LOG

HOLE NO. MW23	SHEET 1 OF 3 SHEETS	
1. COMPANY NAME: Malcolm Pirnie, Inc.	2. DRILLING CONTRACTOR: SJB Services, Inc.	
3. PROJECT: Defense Personnel Support Center	4. LOCATION: Philadelphia, Pennsylvania	
5. NAME OF DRILLER: T. Miller	6. MANUFACTURER'S DESIGNATION OF DRILL: CME-85	
7. Sizes & Types of Drilling & Sampling Equipment: 6 1/4" HSA; 3" continuous s.s.	8. HOLE LOCATION: 222719.3 North 2718138.8 East	
	9. SURFACE ELEVATION: 21.1'	
	10. DATE STARTED: 6/11/96	11. DATE COMPLETED: 6/11/96
12. OVERBURDEN THICKNESS	15. DEPTH GROUNDWATER ENCOUNTERED: 18.5 feet bgs	
13. DEPTH DRILLED INTO ROCK	16. Depth to Water and Elapsed Time After Drilling Completed: 18.39 feet below mp; 6/20/96	
14. TOTAL DEPTH OF HOLE: 30.0	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): 18.44 feet below mp; 6/28/96	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
N/A			

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (Specify)	OTHER (Specify)	OTHER (Specify)	21. Total Core REC %
(18-20),(20-22),(24-26)			HFS	IR SCAN		

22. DISPOSITION OF HOLE	BACKFILLED	Monitoring Well	OTHER (Specify)	23. SIGNATURE OF INSPECTOR
		X		

ELEV. a	DEPTH b	Blow Counts c	DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
21.1	0						rec 1.7/2.0
20.1	1	2 6 19 18	(0-0.7') mod-dark brn SILT w/ tr f sand (FILL) (0.7-1.7') sharp contact w/ f ang GRAVEL as railroad bedding, crs sand (FILL)	1.8 ppm	Fill		
19.1	2						rec 2.0/2.0
18.1	3	6 9 11 11	(2.0-2.2') gray-brown SILT w/ clay, moist (ML) (2.2-4.0') med brn-orng f silty SAND w/faint bedding fabric (SM)	0.4 ppm			
17.1	4		f silty SAND as above w/iron staining (SM)		Qal		rec 2.0/2.0 moist
16.1	5	6 11 10 10		0.2 ppm			
15.1	6						rec 2.0/2.0
14.1	7	12 12 14 13	(6.0-6.7') brn-orng f silty SAND w/color gradation to med gray-brn mottled Fe stained partings @ 7.5-7.6. (SM) sharp contact	4.0 ppm			
13.1	8		(7.7-8.0') dk red-brn, f-med, poorly sorted SAND (SW)				rec 2.0/2.0 moist
12.1	9	5 5 10 13	(8.0-8.3') dk brn-orng, f-med SAND (SW) (8.3-9.1') gray-brn f silty SAND, thin bedded (SM)	0.6 ppm			
11.1	10		(9.1-10.0') dk gray, poorly sorted				

DRILLING LOG

PROJECT Defense Personnel Support Center, Philadelphia, Pennsylvania	INSPECTOR John Hilton	HOLE NO. MW23	SHEET 2 OF 3 SHEETS

ELEV. a	DEPTH b	Blow Counts c	DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
10.1	11	5 10 14 10	f-med SAND w/ rnd gravel to 1" dia. (SW) As above w/some blk (organic) partings, crs sub-rnd gravel to 1" dia. (SW)	42 ppm			rec 2.0/2.0 moist-wet petroleum odor
9.1 8.1	12 13	15 18 21 17	(12.0-12.3') As above (SW) sharp contact (12.3-14.0') crs, sub-rnd-rnd GRAVEL w/ tr-ltl med-crs sand (GW)	28 ppm			rec 2.0/2.0 dry-moist petroleum odor detected
7.1 6.1	14 15	7 20 23 20	fine-crs, rnd/sub-rnd, poorly sorted GRAVEL w/ brn, f-crs sand (GW)	30 ppm	Qp		rec 2.0/2.0 dry (drained)
5.1 4.1	16 17	15 17 15 14	mod brn-ylw, poorly sorted, f-crs SAND w/ ltl-some, sub-rnd, f gravel (SW)	76 ppm		DPSOS MW-23 (18-20)	rec 2.0/2.0 moist (well drained) petroleum odor
3.1 2.1	18 19	8 11 9 17	(18.0-18.2') As above (SW) (18.2-18.9') poorly sorted, f-crs, sub-rnd GRAVEL w/ ltl-some f-crs sand (GW) (18.9-19.6') mod gray, med SAND w/ f-crs gravel (SP) (19.6-19.9') dk red-brn, f-med SAND (SW)	132 ppm		DPSOS MW-23 (20-22)	rec 1.6/2.0 wet-saturated
1.1 0.1	20 21	15 36 16 13	poorly sorted, f-crs, sub-rnd GRAVEL to 2" dia., Fe stained zonation at approx. 20.7-21.0 (GW)	140 ppm	Xo		rec 1.8/2.0 saturated sheen on gravel surfaces
-0.9 -1.9	22 23	10 41 45 75	(22.0-22.5') crs SAND w/ f gravel (SP) sharp contact (22.5-24.0) poorly sorted, f-crs GRAVEL to > 2" dia., w/ med-crs sand (GW)	144 ppm		DPSOS MW-23 (24-26)	rec 2.0/2.0 saturated LEL = 100% in HSA
-2.9 -3.9	24 25	31 38 41 54	poorly sorted GRAVEL as above, w/ black staining (petroleum) at 25.1-26' bgs (GW)	142 ppm			rec 2.0/2.0 saturated strong petroleum odor
-4.9	26						advanced augers to 30 feet to facilitate well installation
-5.9	27						
-6.9	28						

DRILLING LOG

PROJECT	INSPECTOR	HOLE NO.
Defense Personnel Support Center Philadelphia, Pennsylvania	John Hilton	MW23 SHEET 3 OF 3 SHEETS

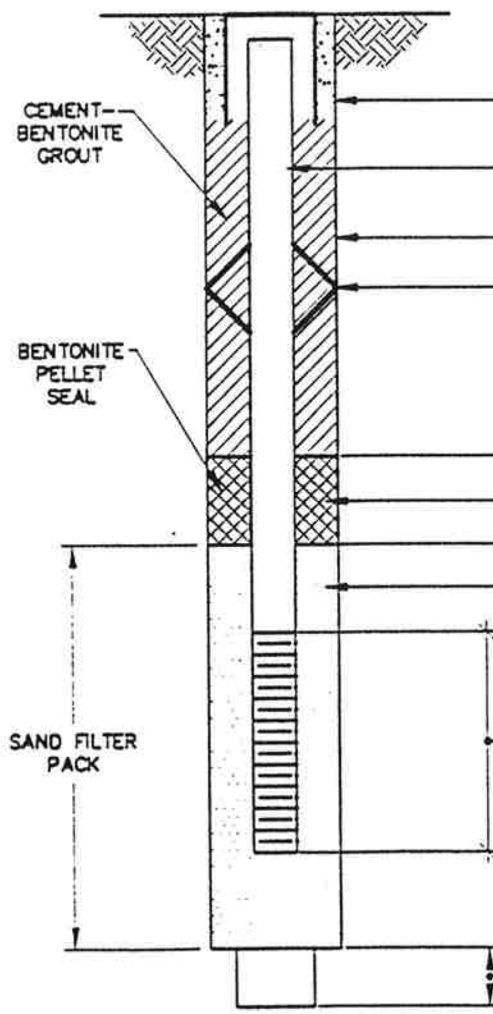
ELEV. a	DEPTH b	Blow Counts c	DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
-7.9	29						
-8.9	30		End of Boring				
-9.9	31						
-10.9	32						
-11.9	33						
-12.9	34						
-13.9	35						
-14.9	36						
-15.9	37						
-16.9	38						
-17.9	39						
-18.9	40						
-19.9	41						
-20.9	42						
-21.9	43						
-22.9	44						
-23.9	45						
-24.9	46						

MALCOLM PIRNIE

OVERBURDEN MONITORING WELL SHEET

WELL NO. MW-23

PROJECT: DPSC	START DATE: 6-11-96	END DATE: 6-11-96	DRILLING CO.: SJB SERVICES
PROJECT NO.: 0285643	FIELD GEOLOGIST: J. HILTON		DRILLER(S): T. MILLER
LOCATION: DPSC, PHILADELPHIA, PA.			DRILLING METHOD(S): 6 1/4" HSA
			DEVELOPMENT METHOD(S): MANUAL PURGE W/ SURGE BLOCK



DEPTH TO TOP OF GROUT/ BOTTOM OF CEMENT 1.5'

RISER DIAMETER AND MATERIAL 4" SCH 40 PVC

BOREHOLE DIAMETER 10.5"

DEPTH TO CENTRALIZERS N/A

DEPTH 9.0'

PELLET SIZE MEDIUM CHIPS

DEPTH 12.7'

SAND SIZE #1 MORIE

DEPTH 15.7'

SCREEN DIAMETER 4"
SLOT SIZE .010
MATERIAL SCH 40 PVC

DEPTH 25.7'
BOTTOM PLUG 26.0'

DEPTH 27.0'
BACKFILL MATERIAL NATIVE SAND & GRAVEL
BOTTOM OF BOREHOLE 30.0'

NOTE: DEPTHS ARE FEET BELOW GRADE

DRILLING LOG

HOLE NO.
MW24

1. COMPANY NAME	2. DRILLING CONTRACTOR	SHEET 1 OF 3 SHEETS
Malcolm Pirnie, Inc.	SJB Services, Inc.	

3. PROJECT: Defense Personnel Support Center	4. LOCATION: Philadelphia, Pennsylvania
5. NAME OF DRILLER: T. Miller	6. MANUFACTURER'S DESIGNATION OF DRILL: CME-85
7. Sizes & Types of Drilling & Sampling Equipment: 6 1/4" HSA; 3" continuous s.s.	8. HOLE LOCATION: 222832.2 North 2718764.9 East
	9. SURFACE ELEVATION: 21.2'
	10. DATE STARTED: 6/13/96 — 11. DATE COMPLETED: 6/13/96
12. OVERBURDEN THICKNESS	15. DEPTH GROUNDWATER ENCOUNTERED: 18.8 feet bgs
13. DEPTH DRILLED INTO ROCK	16. Depth to Water and Elapsed Time After Drilling Completed: 18.6 feet bgs; 6/20/96
14. TOTAL DEPTH OF HOLE: 30.0	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): 18.56 feet below mp; 6/28/96

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
N/A			

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (Specify)	OTHER (Specify)	OTHER (Specify)	21. Total Core REC %
(16-18),(18-20),(20-22)			HFS	IR SCAN		

22. DISPOSITION OF HOLE	BACKFILLED	Monitoring Well	OTHER (Specify)	23. SIGNATURE OF INSPECTOR
		X		

ELEV. a	DEPTH b	Blow Counts c	DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
21.2	0	- -	l. gray SILT w/Fe stained mottling, moist (ML)				Augered through asphalt and concrete prior to starting sampling
20.2	1	3 4		0.2 ppm			rec 0.9/1.0
19.2	2	7 9	l. gray-brn SILT, Fe stained (oxidation) as mottling, tr-ltl f sand throughout silt matrix (ML)				rec 2.0/2.0 moist
18.2	3	10 10		0.2 ppm			
17.2	4	3 8	(4.0-5.6') As above, oxidation staining and mottling decreasing with depth (ML)		Qal		rec 1.6/2.0 moist
16.2	5	8 9		0.2 ppm			
15.2	6	4 18	(6.0-6.2') orng-brn sandy SILT (ML) (6.2-6.7') dk orng-brn, f-med SAND, heavily stained w/ FeO precipitate (SW)				rec 1.9/2.0
14.2	7	25 28	(6.7-7.9) poorly sorted, f-crs, sub-rnd GRAVEL w/ f-crs sand (GW)	0.0 ppm	Qp		
13.2	8	5 10	poorly sorted, 2-3" dia., sub-rnd GRAVEL w/ f-crs sand as above, occasional med-crs sand partings <2" thick (GW)				rec 2.0/2.0 moist
12.2	9	14 25		1.2 ppm			
11.2	10						

DRILLING LOG

PROJECT: Defense Personnel Support Center, Philadelphia, Pennsylvania	INSPECTOR: John Hilton	HOLE NO. MW24 SHEET 2 OF 3 SHEETS

ELEV. a	DEPTH b	Blow Counts c	DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
		- - - -		-			rec 2.0/2.0
10.2	11						
9.2	12	20 30 30 26	As above w/ dk brn-orng f-crs sand throughout (GW)	1.4 ppm			rec 2.0/2.0
8.2	13						
7.2	14	9 10 11 14	mod brn/orng, f-med SAND, w/ tr-ltl silt, heavy Fe oxidation @ 14.0-14.3' interval, faint bedding fabric, micaceous (SW)	22 ppm	9p		rec 2.0/2.0 moist
6.2	15						
5.2	16	14 17 22 25	orng-brn, loose, f-crs SAND, w/ ltl f-crs gravel interbeds < 0.3' thick; preferential Fe oxidation along sand bedding fabric, gravel to 2" dia. (SW)	162 ppm		DPSOS MW-24 (16-18)	rec 2.0/2.0 dry-moist
4.2	17						
3.2	18	5 6 20 25	(18.0-19.2') orng-brn, f-med SAND, tr silt, faint bedding fabric (SW)	160 ppm	Ko	DPSOS MW-24 (18-20)	rec 1.9/2.0 wet-saturated
2.2	19		(19.2-19.9') poorly sorted, f-crs, sub-rnd GRAVEL w/ some med-crs sand (GW)				
1.2	20	12 20 47 28	As above w/ blk-gray product staining at approx. 20.0 - 20.7' w/ cobbles to > 3" dia. (GW)	> 150 ppm		DPSOS MW-24 (20-22)	rec 1.8/2.0 saturated visible free product
0.2	21						
-0.8	22	20 33 22 32	poorly sorted, f-crs, sub-rnd GRAVEL w/ cobbles to > 3" dia, some med-crs sand w/ black product staining approx 22-23' (GW)	> 150 ppm			rec 1.7/2.0 saturated 10% LEL in HSA 18% Oxygen in HSA
-1.8	23						
-2.8	24	2 5 9 13	As above w/ ltl f-med sand partings < 2" thick (GW)	160 ppm			rec 1.1/2.0 saturated
-3.8	25						
-4.8	26						
-5.8	27						
-6.8	28						

DRILLING LOG

PROJECT Defense Personnel Support Center Philadelphia, Pennsylvania	INSPECTOR John Hilton	HOLE NO. MW24 SHEET 3 OF 3 SHEETS

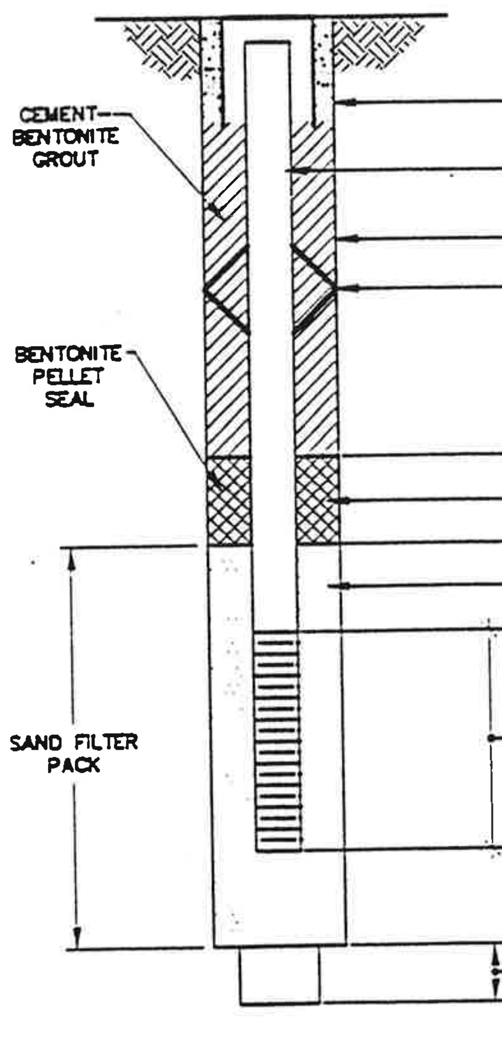
ELEV. a	DEPTH b	Blow Counts c	DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
-7.8	29						
-8.8	30		End of Boring				
-9.8	31						
-10.8	32						
-11.8	33						
-12.8	34						
-13.8	35						
-14.8	36						
-15.8	37						
-16.8	38						
-17.8	39						
-18.8	40						
-19.8	41						
-20.8	42						
-21.8	43						
-22.8	44						
-23.8	45						
-24.8	46						

MALCOLM PIRNIE

OVERBURDEN MONITORING WELL SHEET

WELL NO. MW-24

PROJECT	DPSC
START DATE	6-13-96
END DATE	6-13-96
PROJECT NO.	0285643
FIELD GEOLOGIST	J. HILTON
LOCATION	DPSC, PHILADELPHIA, PA.
DRILLING CO.	SJB SERVICES
DRILLER(S)	T. MILLER
DRILLING METHOD(S)	6 1/4" HSA
DEVELOPMENT METHOD(S)	MANUAL PURGE W/ SURGE BLOCK



DEPTH TO TOP OF GROUT/ BOTTOM OF CEMENT 2.0'

RISER DIAMETER AND MATERIAL 4" SCH 40 PVC

BOREHOLE DIAMETER 10.5"

DEPTH TO CENTRALIZERS N/A

DEPTH 10.3'

PELLET SIZE MEDIUM CHIPS

DEPTH 14.0'

SAND SIZE #1 MORIE

DEPTH 17.2'

SCREEN DIAMETER 4"
SLOT SIZE .010
MATERIAL SCH 40 PVC

DEPTH 26.2'

DEPTH 27.2'

BACKFILL MATERIAL NATIVE SAND & GRAVEL

BOTTOM OF BOREHOLE 30.0'

NOTE: DEPTHS ARE FEET BELOW GRADE

DRILLING LOG

HOLE NO. MW25	SHEET 1 OF 3 SHEETS	
1. COMPANY NAME: Malcolm Pirnie, Inc.	2. DRILLING CONTRACTOR: SJB Services, Inc.	
3. PROJECT: Defense Personnel Support Center	4. LOCATION: Philadelphia, Pennsylvania	
5. NAME OF DRILLER: T. Miller	6. MANUFACTURER'S DESIGNATION OF DRILL: CME-85	
7. Sizes & Types of Drilling & Sampling Equipment: 6 1/4" HSA; 3" continuous s.s.	8. HOLE LOCATION: 221963.3 North 2719104.4 East	
	9. SURFACE ELEVATION: 20.8'	
	10. DATE STARTED: 6/12/96	11. DATE COMPLETED: 6/12/96
12. OVERBURDEN THICKNESS	15. DEPTH GROUNDWATER ENCOUNTERED: 18.5 feet bgs	
13. DEPTH DRILLED INTO ROCK	16. Depth to Water and Elapsed Time After Drilling Completed: 17.78 feet bgs to LNAPL; 6/20/96	
14. TOTAL DEPTH OF HOLE: 30.0	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): 18.02 feet below mp to LNAPL; 6/28/96	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
N/A			

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (Specify)	OTHER (Specify)	OTHER (Specify)	21. Total Core REC %
(18-20),(20-22),(24-26)			HFS	IR SCAN		

22. DISPOSITION OF HOLE	BACKFILLED	Monitoring Well	OTHER (Specify)	23. SIGNATURE OF INSPECTOR
		X		

ELEV. a	DEPTH b	Blow Counts c	DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
20.8	0	6 9 8 9	(0.0-0.5') med orang/brn silty SAND, tr f sand (FILL) (0.5-1.7') crs, sub-rnd slag to 1" dia w/ tr-ltl blk silt as matrix infill (FILL)	0.2 ppm			rec 1.7/2.0 dry
19.8	1						
18.8	2	15 30 13 13	Ash, blk silt and f sand, loose w/ tr-ltl coal clinker, fire brick (FILL)	0.2 ppm	Fill		rec 1.9/2.0 dry
17.8	3						
16.8	4	8 12 13 10	(4.0-4.6') As above w/ crs slag gravel to 1" dia (FILL) sharp contact (4.6-5.0') med brn, f SAND, ltl f gravel (SP)	0.4 ppm			rec 1.8/2.0 dry
15.8	5		(5.0-5.8') lt tan SILT w/ tr-ltl f sand, tr gravel (ML)				moist
14.8	6	12 15 18 13	lt tan SILT as above w/ faint thin bedding fabric w/ tr f-med sand partings to .25" thick, cohesive (ML)	0.0 ppm	Qal		rec 2.0/2.0 moist
13.8	7						
12.8	8	5 15 28 28	(8.0-8.4') As above (ML) grading into (8.4-9.0') mod-dk brn, f-crs SAND, w/ ltl f sub-rnd gravel to 0.5" dia (SW)	4.8 ppm	Qp		rec 1.9/2.0 moist
11.8	9		(9.0-9.9') f-crs, sub-rnd GRAVEL w/ cobbles to 3" dia, some crs sand				
10.8	10						

DRILLING LOG

HOLE NO. MW25

PROJECT	INSPECTOR	SHEET 2 OF 3 SHEETS
Defense Personnel Support Center Philadelphia, Pennsylvania	John Hilton	

ELEV. a	DEPTH b	Blow Counts c	DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
		9 23 40 40	(GW) As above, w/ f-crs sand (GW) Boulder/Cobbles @ approx 9.5 - 10' bgs	14.2 ppm			rec 0.9/2.0 moist
9.8	11						
8.8	12	19 9 8 9	(12.0-12.5') As above (GW) sharp contact				rec 1.7/2.0
7.8	13		(12.5-13.7') med-brn/red, poorly sorted, f-med, loose SAND w/ tr silt (SW)	38 ppm			25 ppm in HSA 18% LEL in HSA moist
6.8	14	14 9 8 16	(14.0-15.2') lt brn-gray, f-med, loose SAND w/ color change to brn-orng @ 14.6'(SW)				rec 1.6/2.0 moist
5.8	15		(15.2-15.6') poorly sorted, f-crs, sub-rnd GRAVEL w/ red-gray silt (GW)	32 ppm			
4.8	16	15 18 20 19	poorly sorted, f-crs, 2-3" dia., sub-rnd/rnd, loose GRAVEL w/ some f-crs sand (GW)				rec 2.0/2.0 moist-wet
3.8	17			100 ppm	9p	DPSOS MW-25 (18-20)	significant petroleum odor
2.8	18	27 22 36 41	As above (GW)				rec 1.4/2.0 saturated
1.8	19			100 ppm		DPSOS MW-25 (20-22)	visible LNAPL product on spoon and gravel surfaces
0.8	20	31 12 12 10	(20.0-20.8') dk red-brn, f-crs, poorly sorted GRAVEL w/ silt and f sand (GW) sharp contact				rec 1.8/2.0 saturated
-0.2	21		(20.8-21.8') dk gray-brn, f-crs, loose SAND, gradational downward to crs sand (SW)	110 ppm			visible, saturated product
-1.2	22	3 7 20 12	(22.0-22.4) dk gray-brn, med-crs, loose SAND (SW) sharp contact				rec 1.5/2.0 saturated
-2.2	23		(22.4-23.5) poorly sorted, f-crs GRAVEL w/ cobbles > 3" dia, some med-crs sand (GW)	110 ppm		DPSOS MW-25 (24-26)	brown liquid product
-3.2	24	5 5 8 12	(24.0-24.8) As above (GW) sharp contact				rec 1.8/2.0 saturated
-4.2	25		(24.8-25.7') med gray-brn, f-crs SAND, fining upward sequence (SW)	130 ppm			product sheen on sand and gravel surfaces
-5.2	26	4 5 15 16	(25.7-25.8') SAND w/ 2" dia gravel (SW)				rec 1.7/2.0
-6.2	27		(26.0-27.0') med dk gray, f-med SAND(SW) (27.0-27.2') poorly sorted GRAVEL w/ med-crs sand (GW)	100 ppm	Ko		saturated free product within spoon
-7.2	28		(27.2-28.0) dk gry-blk, med-crs				

DRILLING LOG

HOLE NO.
MW25

PROJECT	INSPECTOR	SHEET 3 OF 3 SHEETS
Defense Personnel Support Center Philadelphia, Pennsylvania	John Hilton	

ELEV. a	DEPTH b	Blow Counts c	DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
			SAND w/ f gravel (SW)				
-8.2	29						
-9.2	30		End of Boring				
-10.2	31						
-11.2	32						
-12.2	33						
-13.2	34						
-14.2	35						
-15.2	36						
-16.2	37						
-17.2	38						
-18.2	39						
-19.2	40						
-20.2	41						
-21.2	42						
-22.2	43						
-23.2	44						
-24.2	45						
-25.2	46						

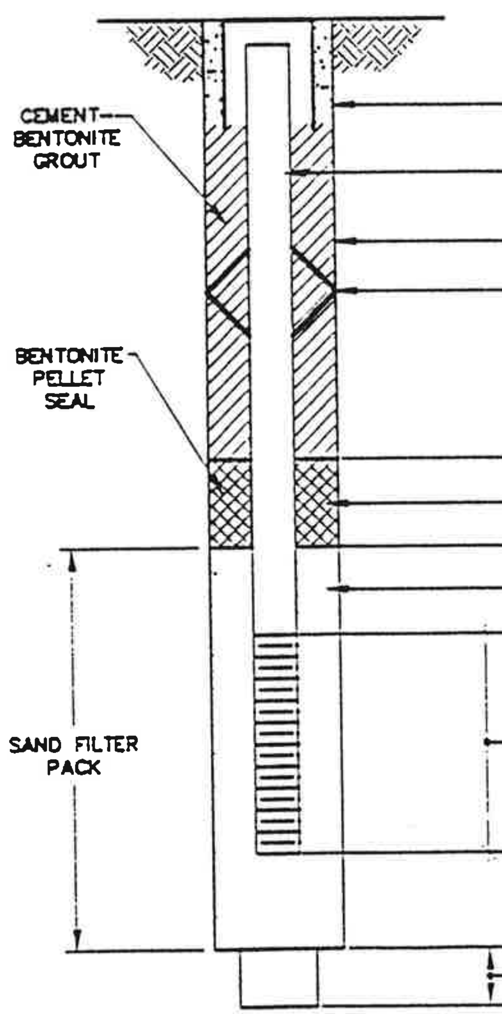
MALCOLM PIRNIE

OVERBURDEN
MONITORING WELL SHEET

WELL NO. MW-25

PROJECT DPSC
START DATE 6-12-96
END DATE 6-13-96
PROJECT NO. 0285643
FIELD GEOLOGIST J. HILTON
LOCATION DPSC, PHILADELPHIA, PA.

DRILLING CO. SJB SERVICES
DRILLER(S) T. MILLER
DRILLING METHOD(S) 8 1/4" HSA
DEVELOPMENT METHOD(S)



DEPTH TO TOP OF GROUT/ BOTTOM OF CEMENT 1.5'
RISER DIAMETER AND MATERIAL 6" SCH 40 PVC
BOREHOLE DIAMETER 12"
DEPTH TO CENTRALIZERS N/A
DEPTH 9.0'
PELLET SIZE MEDIUM CHIPS
DEPTH 13.5'
SAND SIZE #1 MORIE
DEPTH 16.5'
SCREEN DIAMETER 6"
SLOT SIZE .020
MATERIAL SCH 40 PVC
DEPTH 26.5'
DEPTH 26.75'
BACKFILL MATERIAL NATIVE SAND & GRAVEL
BOTTOM OF BOREHOLE 28.0'

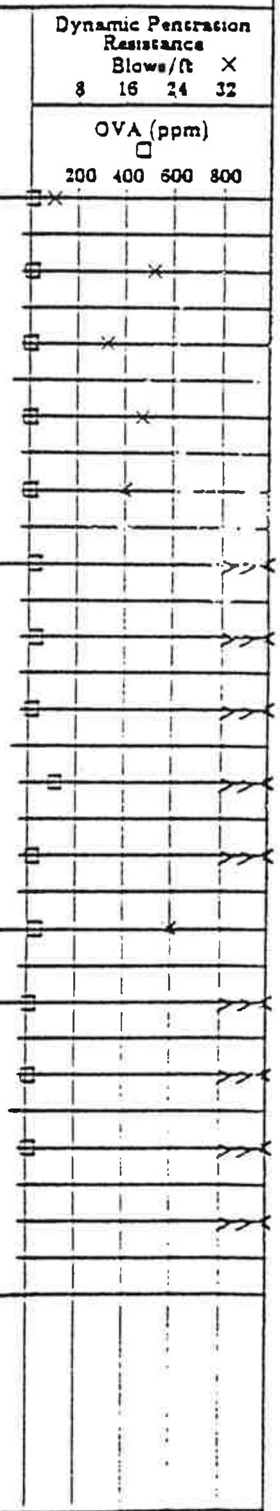
NOTE: DEPTHS ARE FEET BELOW GRADE

Defense Personnel Support Center
Philadelphia, PA

Log of Boring No. SB-1

Client:	U.S. Army Corps of Engineers, Huntsville Division	Boring Started:	1/10/91
Project Number:	3908622	Boring Completed:	1/10/91
Drilling Contractor:	M & R Soils Investigations, Inc.	Boring Diameter:	6 inch
Driller:	J.Lucca	Surface Elevation:	21.20 ft
Logged By:	R.Pomeroy	Well Casing Diameter:	N/A
Drilling Method:	Hollow Stem Auger	Top of Casing Elev:	N/A
State Plane Coordinates:	222378 N · 2725694 E	Elevation Datum:	NGVD
		Type of Drill Rig:	Mobile B-53

Elevation	Depth	Samp Type	Samp Rec ft	OVA ppm	Blows Per 6"	Well Construction	Lithology	MATERIAL DESCRIPTION
20		SS	0.9	7	2-2 2-25			(CL) CLAY, silty, organic, w/grass on surface
		SS	1.7	4	5-10 11-15			2 ft - becomes gray and orange, firm, moist
	5	SS	2.0	1	9-6 7-9			
15		SS	1.5	2	8-12 7-10			6 ft - becomes wet, with slightly angular gravel
		SS	2.0	2	5-7 9-14			8 ft - becomes moist
10	10	SS	1.2	23	28-27 22-30			(SP) SAND, orange and brown, with slight gravel and trace fines
		SS	1.0	26	40-23 26-27			
	15	SS	1.5	9	37-36 36-42			14 ft - becomes brown with some gravel
5		SS	0.8	110	39-27 37-37			
		SS	0.4	18	56-90			18 ft - becomes coarse with slight gravel
0	20	SS	2.0	30	13-10 14-26			(SM) SAND, silty, brown to red brown, with trace gravel
		SS	2.0	7	10-29 36-47			(SP) SAND, with trace gravel and clay, wet
	25	SS	2.0	6	85-58 42-37			24 ft - becomes brown, with some gravel and cobbles
-5		SS	2.0	8	27-27 23-36			
		SS	0.0		100			28 ft - becomes impenetratable
	30							BORING TERMINATED AT 30 FT BGS



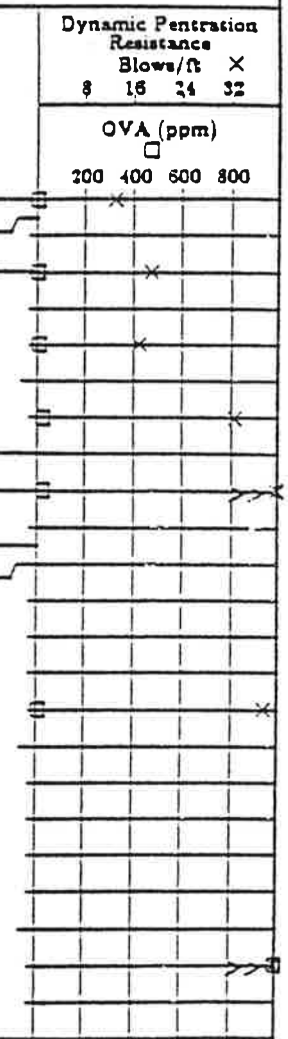
SS = Split Spoon   ST = Shelby Tube   OVA = Organic Vapor Analyzer

Defense Personnel Support Center
Philadelphia, PA

Log of Boring No. SB-3

Client:	U.S. Army Corps of Engineers, Huntsville Division	Boring Started:	1/11/91
Project Number:	3908622	Boring Completed:	1/11/91
Drilling Contractor:	M & R Soils Investigations, Inc.	Boring Diameter:	6 inch
Driller:	J.Lucca	Surface Elevation:	21.50 ft
Logged By:	R.Pomeroy	Well Casing Diameter:	N/A
Drilling Method:	Hollow Stem Auger	Top of Casing Elev:	N/A
State Plane Coordinates:	222228 N 2724299 E	Elevation Datum:	NGVD
		Type of Drill Rig:	Mobile B-53

Elevation	Depth	Samp Type	Samp Rec ft	OVA ppm	Blows Per 6"	Well Construction	Lithology	MATERIAL DESCRIPTION
20		SS	1.8	0	2-4 9-7			TOPSOIL FILL
		SS	1.5	3	9-10 9-10			(CL) CLAY, gray and orange, organic, hard, moist
	5	SS	1.5	4	6-10 7-8			4 ft - becomes slightly silty
15		SS	1.7	24	6-13 20-22			(SM) SAND, silty
	10	SS	1.8	24	16-19 69 100/4"			(CL) CLAY, silty (SP) SAND, clean, very dense (SM) SAND, silty, orange-brown, dense
10								
5	15	SS	1.2	5	13-14 24-22			15 ft - petroleum odor
0	20	SS		1000	42-36 20-16			21 ft - saturated with petroleum
								BORING TERMINATED AT 23 FT BGS



SS = Split Spoon ST = Shelby Tube OVA = Organic Vapor Analyzer

Defense Personnel Support Center
Philadelphia, PA

Log of Boring No. SB-6

Sheet No. 1 of 1

Client:	U.S. Army Corps of Engineers, Huntsville Division	Boring Started:	1/14/91
Project Number:	3908622	Boring Completed:	1/14/91
Drilling Contractor:	M & R Soils Investigations, Inc.	Boring Diameter:	6 inch
Driller:	R.Flemming	Surface Elevation:	21.50 ft
Logged By:	R.Pomeroy	Well Casing Diameter:	N/A
Drilling Method:	Hollow Stem Auger	Top of Casing Elev:	N/A
State Plane Coordinates:	222095 N 2724326 E	Elevation Datum:	NGVD
		Type of Drill Rig:	Mobile B-53

Elevation	Depth	Samp Type	Samp Rec ft	OVA ppm	Blows Per 6"	Well Construction	Lithology	MATERIAL DESCRIPTION
20								FILL AND CONCRETE
		SS	1.4	15	4-2 3-2			(CL) CLAY, green-gray, soft, moist, slight petroleum odor
	5	SS	0.6	160	3-3 4-4			(SP) SAND, coarse, black (resembles asphalt)
15		SS	1.2	7	3-2 2-2			(CL) CLAY, brown, soft, moist
		SS	1.8	26	7-13 34-34			(SM) SAND, silty, with 4 inch petroleum-stained layer
10	10							
	15	SS	1.3	90	45-35 34-30			(SP) SAND, coarse, with moderate pebbles, brown, very dense, no odor
5	20							
0		SS		1000	40-44 38-37			21 ft - becomes coarse to medium grained, with few pebbles, saturated with petroleum
								BORING TERMINATED AT 23 FT BGS

Dynamic Penetration Resistance Blows/ft × 8 16 24 32

OVA (ppm) □ 200 400 600 800

SS = Split Spoon ST = Shelby Tube OVA = Organic Vapor Analyzer

Defense Personnel Support Center
Philadelphia, PA

Log of Boring No. SB-7

Sheet No. 1 of 1

Client:	U.S. Army Corps of Engineers, Huntsville Division	Boring Started:	1/14/91
Project Number:	3908622	Boring Completed:	1/14/91
Drilling Contractor:	M & R Soils Investigations, Inc.	Boring Diameter:	6 inch
Driller:	R.Flemming	Surface Elevation:	21.15 ft
Logged By:	R.Pomeroy	Well Casing Diameter:	N/A
Drilling Method:	Hollow Stem Auger	Top of Casing Elev:	N/A
*State Plane Coordinates:	222084 N 2724423 E	Elevation Datum:	NGVD
		Type of Drill Rig:	Mobile B-53

Elevation	Depth	Samp Type	Samp Rec ft	OVA ppm	Blows Per 6"	Well Construction	Lithology	MATERIAL DESCRIPTION
20								FILL AND CONCRETE
		SS	1.7	120	8-9 8-9			(CL) CLAY, gray-green with black streaks, hard
	5	SS	1.4	100	7-6 6-6			4 ft - becomes moist to wet, firm
15		SS	1.7	58	7-8 17-18			
		SS	0.5	8	21-31 43-60			(SM) SAND, silty, orange-brown (SP) SAND, medium-grained with few pebbles, trace silt, very dense, brown
10	10	SS	0.5	8	34-25 35-24			10 ft - with gray, quartzite pebble
5	15	SS	1.6	2	41-43 46-28			14 ft - with gravel and cobbles
0	20	SS	1.7	1000	17-30 25-20			(CL) CLAY, red-brown, strong petroleum odor (SP) SAND, medium-grained, saturated with petroleum product
								BORING TERMINATED AT 23 FT BGS

Dynamic Penetration Resistance Blows/ft × : 8 16 24 32

OVA (ppm) □ : 200 400 600 800

SS = Split Spoon ST = Shelby Tube OVA = Organic Vapor Analyzer

Drilling Log

FLUOR DANIEL GTI

RECOVERY WELL SUN RW-1

Project SUN/DPSC Owner Sun Company, Inc.
Location Philadephia, PA Proj. No. 01303-0346
Surface Elev. ____ Total Hole Depth 49 ft. Diameter 12 in.
Top of Casing ____ Water Level Initial 18 ft. Static 18.87 ft.
Screen: Dia 6 in. Length 35 ft. Type/Size SCH40PVC, .020 in.
Casing: Dia 6 in. Length 14 ft. Type SCH40PVC
Fill Material #2 Silica Sand Rig/Core Mobile B-61
Drill Co. M & R Soils Invest. Method Hollow Stem Auger
Driller R. Fleming Log By L. Comas Date 5/21/97 Permit # ____
Checked By S. Baggett License No. ____

See Site Map For Boring Location

COMMENTS:

Depth (ft.)	PID (ppm)	Sample ID	Blow Count/ % Recovery	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
-2					
0					Grass and Topsoil (hand-dug to 4').
2					Black, well-graded SAND and fine GRAVEL (fill and slag).
4	0.0		18,15 11,13 50%		Gray (mottled orange), moist, medium dense, fine SAND.
6					Same as above (some silt).
	0.0		3,6 9,10 100%	SM	
8	0.0		4,7 15,14 100%		Same as above (some silt, trace clay).
10	0.0		8,14 23,29 20%		Red-brown, moist, dense GRAVEL (SILTSTONE) and orange-brown, medium SAND.
12	0.0		6,6 8,8 20%		Red-brown, moist, medium dense GRAVEL and orange-brown SAND.
14				GW	
	0.0		5,15 20,20 20%		Moist, dense, well-graded, sub-rounded GRAVEL and SAND.
16	>999		12,15 21,48 30%		Wet, dense, well-graded SAND and sub-rounded GRAVEL (odors, sheen).
18					No return (cobble in Shelby Tube).
20	>999		2,12 10,12		Saturated, medium dense, well-graded SAND and GRAVEL (sheen).
22			10,6 6,6		
24				GW	
26	847		50/5 10%		Saturated, dense, well-graded SAND and GRAVEL (sheen).
28	>999		5,10 15,21 60%		Saturated, medium dense, well-graded SAND and GRAVEL, increasing sand with depth (sheen).
30				SW	

Drilling Log

FLUOR DANIEL GTI

RECOVERY WELL **SUN RW-1**

Project SUN/DPSC Owner Sun Company, Inc.
Location Philadephia, PA Proj. No. 01303-0346

Depth (ft.)	PID (ppm)	Sample ID / Blow Count/ % Recovery	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
30–32	>999	9,9 10,12 60%	SW	Dark brown, saturated, medium dense, fine to medium SAND (sheen).
32–34	>999	5,7 8,11 80%	SW	Same as above.
34–36	>999	15,50/5 20%	SW	Same as above (minor gravel).
36–38	>999	5,7 11,12 100%	SW	Brown, saturated, medium dense, well-graded SAND with fine, sub-rounded GRAVEL (sheen).
38–40	>999	15,35 45,15 80%	SW	
40–42	>999	8,10 15,16 100%	SW	Same as above.
42–44	>999	10,11 17,22 80%	SP	Brown, saturated, medium dense, fine to medium SAND grading into gray, fine sand at 43.5 feet.
44–46	983	7,10 13,23 100%	SP	Brown, saturated, medium dense, fine and some medium SAND, minor gravel.
46–48	997	8,12 30,32 50%	SP	Same as above (dense).
48–49	>999	27,30 30,31 100%	SP	Brown, saturated, very dense, fine and some medium SAND, minor gravel.
49				BORING TERMINATED 49'-0".

Depth scale: 30 – 70 ft.

Drilling Log

FLUOR DANIEL GTI

RECOVERY WELL RW-2

Project SUN/DPSC Owner Sun Company, Inc.
Location DPSC, Philadephia, PA Proj. No. 100233
Surface Elev. ______ Total Hole Depth 35 ft. Diameter 12 in.
Top of Casing ______ Water Level Initial 19 ft. Static 20.19 ft.
Screen: Dia 6 in. Length 20 ft. Type/Size V-WIRE,SCH40PVC,.020 in.
Casing: Dia 6 in. Length 13.5 ft. Type SCH40PVC
Fill Material #1 Silica Sand Rig/Core GEFCO Speedstar 200
Drill Co. Lutz Method 12" O.D. Hollow Stem Auger
Driller R. Tabor Log By L. Comas Date 11/17/97 Permit # ______
Checked By S. Baggett License No. ______

See Site Map For Boring Location

COMMENTS:

PID readings were collected in lab jars and headspace was screened; IR = insufficient recovery.

Depth (ft.)	PID (ppm)	Blow Count/ % Recovery	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
-2				
0				Railroad ballast.
				Hand auger to 5'.
2			ML	Yellow-brown, fine SAND, SILT and CLAY.
4				
6	0.2	8,13 12,15 60%		Yellow-brown, stiff SILTY CLAY.
			SM	White to gray SILT, some fine sand.
8	0.4	10,20 20,30 100%	ML	Gray, moist, very stiff SILT, trace clay (minor mottling).
				Orange-brown SILT, trace clay with gravel.
10	650	34,47 50/2 80%	SW	Gray, moist, fine SAND, trace gravel.
			SM	Brown, fine to medium SAND.
12	232	32,47 68,54 60%	SP	Brown, very dense, fine to medium SAND with gravel.
14	367	21,19 20,18 90%	SW	Orange-brown, dense, well-graded SAND with fine gravel.
16	233	30,28 29,20 80%		Orange-brown, very dense, medium to coarse SAND with fine sub-rounded gravel.
18	809	30,35 32,56 60%	SP	Orange-brown, very dense, coarse SAND and fine GRAVEL, some fine sand.
			SM	Brown, wet, dense, fine SAND.
20	437	9,14 25,34 70%	GM	Brown, wet, dense, fine SAND and coarse subangular GRAVEL.
22	625	62,86 76,89 100%	GP	Brown, saturated, very dense, coarse SAND with medium to coarse subangular/rounded gravel, trace fine sand.
	IR	50/0 0%		
24				

FLUOR DANIEL GTI

RECOVERY WELL **RW-2**

Project SUN/DPSC Owner Sun Company, Inc.
Location DPSC, Philadepphia, PA Proj. No. 100233

Depth (ft.)	Well Completion	PID (ppm)	Sample ID	Blow Count/ % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
24							No recovery.
26		322		5,35 57,58 60%		GP / GC	Brown, saturated, very dense, coarse SAND and medium to coarse GRAVEL (trace clay at 26'; no clay at 27').
28		378		48,48 42,35 100%		GP	Brown, saturated, very dense, medium to coarse SAND, some coarse gravel.
30		804		28,20 21,28 50%		GC	Brown, saturated, dense, coarse SAND and medium to coarse GRAVEL, trace clay.
32		651		40,17 89,30 90%		SM	Brown, saturated, dense, fine to medium SAND grading into brown, saturated, medium to coarse SAND with medium to coarse gravel.
34		644		18,26 31,19 80%		GP	Brown, saturated, dense, medium to coarse SAND with medium and coarse gravel.
		119				CH	Olive-brown, moist, stiff SILTY CLAY.
							BORING TERMINATED 35'-0".
36							
38							
40							
42							
44							
46							
48							
50							
52							
54							
56							

Drilling Log

FLUOR DANIEL GTI

RECOVERY WELL RW-3

See Site Map For Boring Location

Project SUN/DPSC Owner Sun Company, Inc.
Location DPSC, Philadephia, PA Proj. No. 100233
Surface Elev. ______ Total Hole Depth 35 ft. Diameter 12 in.
Top of Casing ______ Water Level Initial 20.8 ft. Static ______
Screen: Dia 6 in. Length 20 ft. Type/Size V-WIRE,SCH40PVC,.020 in.
Casing: Dia 6 in. Length 13 ft. Type SCH40PVC
Fill Material #1 Silica Sand Rig/Core 12" O.D. Hollow Stem Auger
Drill Co. Lutz Method GEFCO Speedstar 200
Driller R. Tabor Log By L. Comas Date 11/18/97 Permit # ______
Checked By S. Baggett License No. ______

COMMENTS:
PID readings were collected in lab jars and headspace was screened.

Depth (ft.)	PID (ppm)	Sample ID	Blow Count/ % Recovery	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
-2					
0				GW	Grass, topsoil.
					Hand auger to 5'.
2					Black, well-graded SAND and GRAVEL, slag, wood fragments.
4					
6	0.0		4,7 9,15 20%	CL	Olive-gray, moist, medium dense SILT, trace clay.
8	0.0		14,15 15,19 100%	SC	Olive-gray, moist, medium dense SILT, trace clay with fine sand.
			37,38 29,44 80%	CL	Olive-gray, moist, hard SILT with clay.
10	6.1			SM	Orange-brown, moist, dense, fine to medium SAND.
			13,33 70,41 70%	CL	Orange-brown, stiff SILT, some clay.
12	11				Olive-gray, very stiff SILT and CLAY.
				GP	Orange-brown, very dense, fine SAND with coarse gravel.
			51,94 50/1 40%		Orange-brown, very dense, medium to coarse SAND and coarse GRAVEL.
14	21.6				Same as above.
			34,26 16,12 60%		
16	56.2			SP	Orange-brown, dense, fine SAND with well-graded gravel.
			13,14 19,34 70%	SC	Orange-brown, moist, medium dense, fine SAND and SILT, trace clay.
18	868			SM	Orange-brown, moist, medium dense, fine SAND.
			74 50/4	GP	Orange-brown, moist, very dense, fine SAND and coarse GRAVEL.
20	1245				
			59,74 90,50/4 60%	GW	Orange-brown, wet, very dense, well-graded GRAVEL with well-graded sand.
22	837				
			26,61 73,83 80%	GM	Orange-brown, wet SILT and fine SAND, some medium gravel.
24	941				

Drilling Log

FLUOR DANIEL GTI

RECOVERY WELL **RW-3**

Project SUN/DPSC Owner Sun Company, Inc.
Location DPSC, Philadephia, PA Proj. No. 100233

Depth (ft.)	Well Completion	PID (ppm)	Sample ID	Blow Count/ % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
24		941				GM	Brown, saturated, very dense, well-graded GRAVEL with fine sand.
26		1245		3,18 58,100 50%		GC	Orange-brown, saturated, very stiff/dense, fine SAND, SILT, some clay with coarse gravel.
28		945		6,17 16,2 30%		SM	Brown, saturated, medium dense, fine to medium SAND with gravel.
30		1346		26,29 39,43 70%		SP	Brown, saturated, very dense, fine SAND with medium sand, some medium and coarse gravel.
32		1160		10,12 17,21 100%			Brown, saturated, medium dense, medium SAND, some medium gravel.
34		1169		11,29 24,13 70%		SW	Brown, saturated, very dense, coarse SAND, some gravel grading to a fine to medium sand with depth.
							BORING TERMINATED 35'-0".
36							
38							
40							
42							
44							
46							
48							
50							
52							
54							
56							

Drilling Log

FLUOR DANIEL GTI

RECOVERY WELL RW-4

Project SUN/DPSC — Owner Sun Company, Inc.
Location DPSC, Philadephia, PA — Proj. No. 100233
Surface Elev. ____ Total Hole Depth 35.3 ft. Diameter 12 in.
Top of Casing ____ Water Level Initial 20.5 ft. Static ____
Screen: Dia 6 in. Length 20 ft. Type/Size V-WIRE,SCH40PVC,.020 in.
Casing: Dia 6 in. Length 15.3 ft. Type SCH40PVC
Fill Material #1 Silica Sand — Rig/Core 12" O.D. Hollow Stem Auger
Drill Co. Lutz — Method GEFCO Speedstar 200
Driller R. Tabor — Log By L. Comas — Date 11/20/97 — Permit # ____
Checked By S. Baggett — License No. ____

See Site Map For Boring Location

COMMENTS:

PID readings were collected in lab jars and headspace was screened.

Depth (ft.)	PID (ppm)	Blow Count/ % Recovery	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
0			GW	Grass, topsoil. Hand auger to 5'. Black, well-graded SAND and GRAVEL and SLAG.
6	186	18,17 14,11 50%	GW	Black, medium dense, well-graded GRAVEL and SAND and SLAG.
			ML	Orange-brown, medium dense SILT.
8	29.7	13,15 18,19 100%	ML	Orange-brown, medium dense SILT grading into tan silt.
10	29.9	16,16 14,22 90%	ML	Tan, moist, medium dense SILT, trace fine SAND.
12	10.0	13,12 16,15 100%	CH	Tan CLAY with silt.
			SP	Tan, medium dense, coarse SAND.
			CL	Orange-brown, stiff CLAY, some moist silt.
			SP	Orange-brown, moist, medium dense, coarse SAND and fine GRAVEL.
14	22.8	19,42 68,48 60%	SM	Gray, moist, dense fine SAND. White sandstone cobble at base.
16	37.2	10,14 26,32 40%	GC	Orange-brown, dense, fine SAND, CLAY, some gravel.
18	921	41,60 86,100 80%	GP	Orange-brown, moist, very dense, medium to coarse SAND and coarse GRAVEL.
20	1206	75/1 5%	GM	Red-brown, very dense SILT, some fine SAND and gravel.
22	1216	5,11 30,38 20%	GM	Red-brown, moist, dense SILT, some sand and gravel.
24	1234	26,14 17,24 100%	GP	

Drilling Log

FLUOR DANIEL GTI

RECOVERY WELL RW-4

Project SUN/DPSC Owner Sun Company, Inc.
Location DPSC, Philadelphia, PA Proj. No. 100233

Depth (ft.)	PID (ppm)	Sample ID / Blow Count / % Recovery	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
24	1234			Brown, saturated, dense, medium to coarse SAND and fine to medium GRAVEL.
26	1073	24,18 16,13 60%	GP	Brown, saturated, dense, medium to coarse SAND and fine to medium GRAVEL.
28	990	17,25 16,18 100%		Brown, saturated, dense, fine and medium SAND, trace medium gravel.
		14,36 52,50 100%	SW	Same as above.
30	1094		GW	Brown, saturated, very dense, fine to medium SAND with well-graded gravel.
32	735	25,30 25,50 100%		Brown, saturated, very dense, fine and medium SAND, trace gravel.
34	NA	19,26 24,18 100%	SW	Same as above.
36				BORING TERMINATED 35'-4".
38				
40				
42				
44				
46				
48				
50				
52				
54				
56				

Drilling Log

FLUOR DANIEL GTI

RECOVERY WELL RW-6

Project: SUN/DPSC	Owner: Sun Company, Inc.
Location: DPSC, Philadephia, PA	Proj. No. 100233
Surface Elev.	Total Hole Depth: 35 ft.
Diameter: 12 in.	Top of Casing
Water Level Initial: 19.95 ft.	Static
Screen: Dia 6 in.	Length 20 ft.
Type/Size: V-WIRE,SCH40PVC,.020 in	Casing: Dia 6 in.
Length 15 ft.	Type SCH40PVC
Fill Material: #1 Silica Sand	Rig/Core: 12" O.D. Hollow Stem Auger
Drill Co. Lutz	Method: GEFCO Speedstar 200
Driller: R. Tabor	Log By: L. Comas
Date: 11/21/97	Permit #
Checked By: S. Baggett	License No.

See Site Map For Boring Location

COMMENTS:

PID readings were collected in lab jars and headspace was screened.

Depth (ft.)	PID (ppm)	Blow Count/ % Recovery	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
-2				
0				Grass, topsoil.
				Hand auger to 5'.
2				Black, well-graded SAND and GRAVEL and SLAG.
4			GW	
6	21.1	21,30 27,25 5%		Very dense, well-graded SAND and GRAVEL.
8	13.8	37,66 50/1 20%	GM	Black, wet, very dense, medium gravel with silt (black, viscous liquid on outside of spoon).
	8.6	26,43 48,44 70%	GC	Black, wet, very dense, medium GRAVEL with silt and clay.
10			ML	Orange-brown, moist SILT, some clay and orange-brown, fine to medium SAND with coarse gravel.
	15.3		GP	
12	52.7	43,33 35,34 60%	GC	Orange-brown, very dense SILT with clay, trace gravel (black staining).
				Orange-brown, medium SAND.
14	88.9	30,26 24,19 50%	SP	Brown, dense, medium SAND, some gravel.
16	233	15,14 17,21 40%		Light brown, dense, fine SAND.
			SM	
18	678	17,17 20,30 60%		Light brown, moist, dense, fine SAND.
			SW	Orange-brown, dense, well-graded SAND and fine to medium GRAVEL.
20	668	15,17 19,20 80%		Brown, wet, very dense, medium to coarse SAND and medium to coarse GRAVEL.
			GP	
22	485	29,33 22,17 70%		Same as above (saturated).
24	693	13,10 8,8 80%	SM	

FLUOR DANIEL GTI

RECOVERY WELL RW-6

Project SUN/DPSC Owner Sun Company, Inc.
Location DPSC, Philadephia, PA Proj. No. 100233

Depth (ft.)	PID (ppm)	Blow Count/ % Recovery	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
24	693		SM	Brown, saturated, medium dense, fine SAND.
26	945	14,44 53,50 100%	SP	Brown, saturated, medium and coarse SAND grading to fine SAND with depth.
28	673	18,11 12,7 100%	SM	Brown, saturated, medium dense, fine SAND.
			SC	Brown, saturated, medium dense, fine SAND, some clay and gravel.
			SM	Brown, saturated, medium dense, fine SAND.
30	653	21,16 14,21 100%	SP	Brown, saturated, medium dense, medium to coarse SAND, trace gravel.
32	845	17,14 14,18 100%	SP	Brown, saturated, medium dense, medium to coarse SAND, trace gravel.
34	821	12,21 25,20 100%	SP	Brown, saturated, dense, medium to coarse SAND grading to gray, - medium to fine sand with depth.
			SW	
36				BORING TERMINATED 35'-0".

Depth scale: 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56

Drilling Log

FLUOR DANIEL GTI

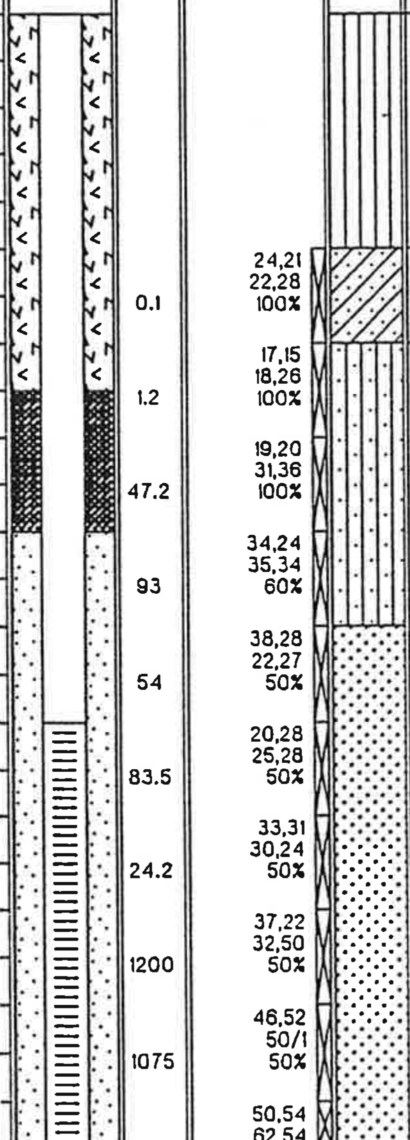
RECOVERY WELL RW-A

Project SUN/DPSC Owner Sun Company, Inc.
Location Passyunk Homes, Philadelphia, PA Proj. No. 100233
Surface Elev. ______ Total Hole Depth 35 ft. Diameter 12 in.
Top of Casing ______ Water Level Initial 23.5 ft. Static 22.12 ft.
Screen: Dia 6 in. Length 20 ft. Type/Size V-WIRE,SCH40PVC,.020 in
Casing: Dia 6 in. Length 15 ft. Type SCH40PVC
Fill Material #1 Silica Sand Rig/Core 12" O.D. Hollow Stem Auger
Drill Co. Lutz Method GEFCO Speedstar 200
Driller R. Tabor Log By L. Comas/J. Filosa Date 12/3/97 Permit # ______
Checked By S. Baggett License No. ______

See Site Map
For Boring Location

COMMENTS:

PID readings were collected in lab jars and headspace was screened.



Depth (ft.)	PID (ppm)	Blow Count/ % Recovery	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
-2				
0				Grass.
			ML	Hand auger to 5'; brown, fine SAND and SILT.
6	0.1	24,21 22,28 100%	SC	Orange-brown, dry, dense SILT and CLAY (some mottling), some fine sand.
8	1.2	17,15 18,26 100%	SM	Same as above (gray).
10	47.2	19,20 31,36 100%	SM	Same as above (very dense, changing to orange, fine sand at 10.5', trace gravel).
12	93	34,24 35,34 60%	SM	Orange, dry, medium, very dense QUARTZ SAND, trace subangular gravel (sand is poorly sorted, but well-rounded).
14	54	38,28 22,27 50%	SP	Brown-reddish, very dense, medium QUARTZ SAND, little sub-angular gravel (quartz), trace fine sand (sand is well to poorly sorted and well-rounded).
16	83.5	20,28 25,28 50%	SP	Same as above (gravel sizes increasing to 0.5").
18	24.2	33,31 30,24 50%	SP	Same as above (brown-orange, dry, very dense, trace silt, no larger pieces).
20	1200	37,22 32,50 50%	SP	Same as above.
22	1075	46,52 50/1 50%	SP	Wet, very dense, medium SAND, little gravel; petroleum odor/staining present.
24	1520	50,54 62,54 60%	SP	23'-24' Brown-reddish, saturated medium SAND, little gravel, very dense.

Drilling Log

FLUOR DANIEL GTI

RECOVERY WELL **RW-A**

Project SUN/DPSC Owner Sun Company, Inc.
Location Passyunk Homes, Philadelphia, PA Proj. No. 100233

Depth (ft.)	Well Completion	PID (ppm)	Sample ID / Blow Count/ % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
24		1520				24'–25' Fine GRAVEL and SAND, petroleum staining/odor (gravel is poorly sorted, subangular to rounded).
26		2075	42,47 35,70 40%			Wet, very dense, medium SAND, little coarse gravel, petroleum odor present, trace silt.
28		1104	82,25 32,39 50%			Same as above (wet, very dense, sand becoming finer, trace silt).
30		1110	27,24 36,35 10%		SP	Same as above (petroleum odors).
32		1302	25,16 14,26 100%			Same as above (dense, gravel is well-rounded, sand is more well-sorted, petroleum odors).
34		1437	25,30 22,25 80%			Same as above (very dense). medium to fine sand with depth.
36						BORING TERMINATED 35'–0".
38						
40						
42						
44						
46						
48						
50						
52						
54						
56						

Drilling Log

FLUOR DANIEL GTI

RECOVERY WELL RW-B

Project SUN/DPSC Owner Sun Company, Inc.
Location Passyunk Homes, Philadelphia, PA Proj. No. 100233
Surface Elev. ______ Total Hole Depth 35 ft. Diameter 12 in.
Top of Casing ______ Water Level Initial 23 ft. Static ______
Screen: Dia 6 in. Length 20 ft. Type/Size V-WIRE,SCH40PVC,.020 in.
Casing: Dia 6 in. Length 14.5 ft. Type SCH40PVC
Fill Material #1 Silica Sand Rig/Core GEFCO Speedstar 200
Drill Co. Lutz Method 12" O.D. Hollow Stem Auger
Driller R. Tabor Log By J. Filosa Date 12/4/97 Permit # ______
Checked By S. Baggett License No. ______

See Site Map For Boring Location

COMMENTS:

Depth (ft.)	PID (ppm)	Sample ID / Blow Count/ % Recovery	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
-2				
0				
1			OL	Grass; brown, dry organic SILT, little fine sand.
2				Hand auger to 5'.
4				
6	0	11,15 10,12 30%	SC	Brown, dry, medium dense SILT, fine sand, trace clay.
7				7'-7.5' Medium dense SILT, trace clay.
8	0	10,13 14,11 50%		
8.5			SM	8.5'-9' Brown to reddish brown, dry, trace fine SAND with silt.
9				9'-10' Same as above (very dense).
10	30	25,34 50/26 90%	SW	10'-11' Brown, dry, medium QUARTZ SAND, trace gravel.
12	18	28,65 56 50%	SP	Brown, dry, very dense, medium QUARTZ SAND, little gravel, poorly sorted, gravel subangular to subrounded; sand is rounded, gravel is quartz, 1/8" - 1/4" diameter.
14	165	11,20 29,60 50%		Same as above (dense).
16	170	34,33 27,55 40%		Same as above (very dense, gravel fragments up to 1/2" diameter.
18	330	30,19 21,21 40%		Same as above (light brown/orange).
20	614	6,7 21,35 20%		Same as above (1" gravel fragments).
22	665	13 100/2 20%	SW	Orange-brown, dry, very dense, medium QUARTZ SAND, grading to silt, little gravel, gasoline odor present.
24	621	25,28 25,46 50%		

Drilling Log

FLUOR DANIEL GTI

RECOVERY WELL **RW-B**

Project SUN/DPSC Owner Sun Company, Inc.
Location Passyunk Homes, Philadelphia, PA Proj. No. 100233

Depth (ft.)	Well Completion	PID (ppm)	Sample ID	Blow Count/ % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
24		621				SW	Same as above (light brown, slightly moist, very dense, less gravel, more fines, black stains in sands, gasoline odor present.
26		897		100/2 30%		SM	Moist to wet, very dense, medium SAND, no gravel, sand is micaceous, gasoline odor/sheen visible in spoon, trace silt.
28		170		104,100 31,28 50%		SP	Wet, very dense, medium SAND, trace silt, sheen present, gasoline odor, little gravel fragments 1/2", subrounded to subangular, sand poorly sorted.
30				0%			No recovery, no sample collected (interval accidentally skipped by driller).
32		547		16,21 47,43 60%			Same as 27'-29' (very dense, 1" silt lense present, gravel fragments smaller.
34		517		21,21 34,14			Same as above (very dense, sheens visible, no silt lenses).
36							BORING TERMINATED 35'-0".
38							
40							
42							
44							
46							
48							
50							
52							
54							
56							

Drilling Log

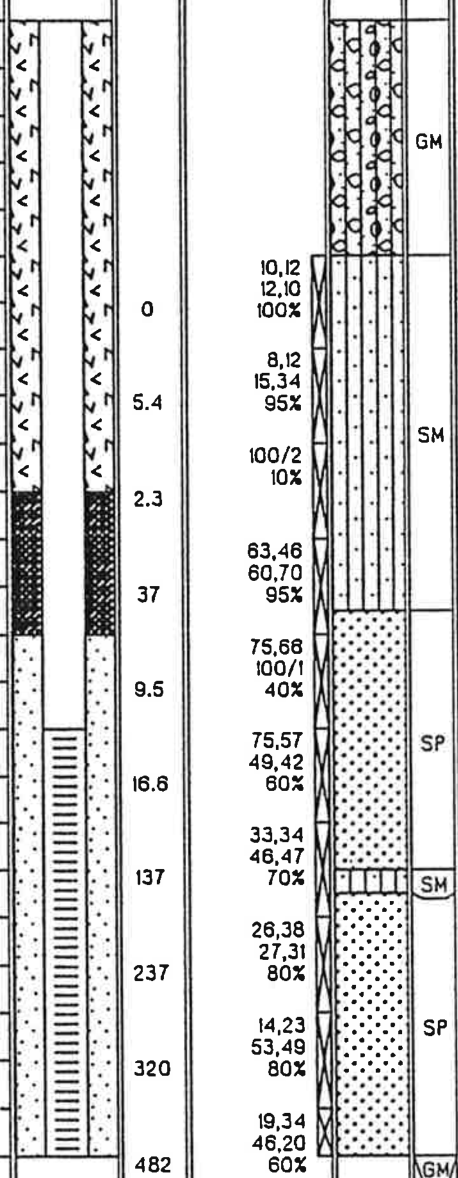
FLUOR DANIEL GTI

RECOVERY WELL RW-C

Project SUN/DPSC Owner Sun Company, Inc.
Location Passyunk Homes, Philadelphia, PA Proj. No. 100233
Surface Elev. ____ Total Hole Depth 35 ft. Diameter 12 in.
Top of Casing ____ Water Level Initial 23 ft. Static ____
Screen: Dia 6 in. Length 20 ft. Type/Size V-WIRE,SCH40PVC,.020 in.
Casing: Dia 6 in. Length 14.6 ft. Type SCH40PVC
Fill Material #1 Silica Sand Rig/Core GEFCO Speedstar 200
Drill Co. Lutz Method 12" O.D. Hollow Stem Auger
Driller R. Tabor Log By J. Filosa Date 12/5/97 Permit # ____
Checked By S. Baggett License No. ____

See Site Map For Boring Location

COMMENTS:



Depth (ft.)	PID (ppm)	Blow Count/ % Recovery	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
-2				
0				ASPHALT/FILL, SAND, SILT, GRAVEL.
2			GM	Hand auger to 5'.
4				
6	0	10,12 12,10 100%		Orange-gray, dry, medium dense SILT, trace fine sand, trace clay.
8	5.4	8,12 15,34 95%	SM	Same as above (trace gravel in bottom 0.5').
10	2.3	100/2 10%		Same as above (very dense).
12	37	63,46 60,70 95%		Same as above (top 8") very dense, dark brown to reddish, medium sand, little, medium gravel; gravel subangular, 1/8-1/4" diameter, poorly sorted.
14	9.5	75,66 100/1 40%		Same as above (very dense).
16	16.6	75,57 49,42 60%	SP	Same as above.
18	137	33,34 46,47 70%	SM	Same as above (3" reddish silt lense).
20	237	26,38 27,31 80%		Same as above (bottom 6" - black-stained, medium sand, little gravel, petroleum odor present, trace silt, gravel subangular to subrounded).
22	320	14,23 53,49 80%	SP	Wet, very dense, medium SAND, little gravel, trace silt; gravel subangular to subrounded, black staining present, petroleum odor present.
24	482	19,34 46,20 60%	GM	

Drilling Log

FLUOR DANIEL GTI

RECOVERY WELL **RW-C**

Project SUN/DPSC Owner Sun Company, Inc.
Location Passyunk Homes, Philadelphia, PA Proj. No. 100233

Depth (ft.)	Well Completion	PID (ppm)	Sample ID	Blow Count/ % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
24		482					Same as above (saturated, sheen visible, gravel is finer, brown, medium sand in bottom 3").
26		202		12,20 37,47 100%			Brown, saturated, very dense, medium SAND, some gravel, trace silt, sand is well-sorted; gravel is fine, subangular and subrounded, petroleum odor present.
28		560		69 100/1 100%			Same as above (1" silt lense, brown, at 28.5', no gravel, gasoline odor/sheen visible).
30		502		19,13 14,21 90%		GM	Same as above (medium dense; two, 1 1/2" silt lenses; petroleum odor).
32		670		8,15 30,30 100%			Same as above (dense, no silt lenses, no gravel).
34		593		13,10 12,23 70%			Same as above.
36							BORING TERMINATED 35'-0".
38							
40							
42							
44							
46							
48							
50							
52							
54							
56							

Drilling Log

FLUOR DANIEL GTI

RECOVERY WELL **RW-D**

Project SUN/DPSC Owner Sun Company, Inc.
Location Passyunk Homes, Philadelphia, PA Proj. No. 100233
Surface Elev. ______ Total Hole Depth 35 ft. Diameter 12 in.
Top of Casing ______ Water Level Initial 23.5 ft. Static ______
Screen: Dia 6 in. Length 20 ft. Type/Size V-WIRE,SCH40PVC,.020 in.
Casing: Dia 6 in. Length 15 ft. Type SCH40PVC
Fill Material #1 Silica Sand Rig/Core GEFCO Speedstar 200
Drill Co. Lutz Method 12" O.D. Hollow Stem Auger
Driller R. Tabor Log By J. Filosa Date 12/8/97 Permit # ______
Checked By S. Baggett License No. ______

See Site Map For Boring Location

COMMENTS:

Depth (ft.)	PID (ppm)	Blow Count/ % Recovery	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
0			OL	Grass; brown organic SILT.
2			OL	Hand auger to 5'.
6	1	5,5 6,9 100%	SM	Brown, dry, medium dense SILT, trace clay, trace fine sand, slight petroleum odor.
8	1.8	9,9 10,10 90%	SM	Same as above (medium dense, slight petroleum odor).
10	2	6,15 50/1 50%	SM	Same as above (slightly moist, very dense).
12	6.1	14,44 42,48 80%	SP	Brown, dry, very dense, medium SAND, little gravel (quartz); sand is poorly sorted, gravel is subangular to subrounded.
14	41	2,3 8,12 80%	SM	Same as above (dry, medium dense, trace gravel, 6" silt lense with fine sand and trace clay at 13.5', grading to brown, medium sand).
16	11	35,36 53/1 50%	SP	Dark brown, dry, very dense, medium SAND, little gravel; sand poorly sorted, gravel (quartz) is subangular to subrounded, gravel – 1/8" to 1/4" diameter (slight petroleum odor).
18	125	13,7 13,16 70%	SM	Brown, dry, medium dense SILT and fine SAND, trace gravel.
20	480	19 100/2 40%	SM	Same as above (dry, very dense, grading to medium, poorly sorted sand and gravel; gravel subangular to subrounded, 1/8" diameter).
22	220	0%		Interval not collected; driller skipped interval accidentally, due to collapse of hole from gravel.
24	113	19,22 24,34 70%	SP	

Drilling Log

RECOVERY WELL RW-D

Project SUN/DPSC Owner Sun Company, Inc.
Location Passyunk Homes, Philadelphia, PA Proj. No. 100233

Depth (ft.)	Well Completion	PID (ppm)	Sample ID	Blow Count/ % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
24		113					Saturated, very dense, medium, poorly sorted SAND, little gravel, subrounded to subangular gravel, petroleum odor present).
26		40		14,11 13,31 80%			Same as above (saturated, medium dense, petroluem odor present).
28		204		22,22 32,38 100%			Same as above (saturated, very dense, petroleum odor present).
30		242		9,5 8,9 50%		SP	Same as above (saturated, medium dense, gravel to 1/4" diameter).
32		372		7,15 27,28 100%			Same as above (saturated, dense, petroleum odor present).
34		404		19,30 25,25			Same as above (saturated, very dense, petroleum odor present).
36							BORING TERMINATED 35'-0".
38							
40							
42							
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46							
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Drilling Log

FLUOR DANIEL GTI

RECOVERY WELL **RW-E**

Project SUN/DPSC Owner Sun Company, Inc.
Location Passyunk Homes, Philadelphia, PA Proj. No. 100233
Surface Elev. ____ Total Hole Depth 35 ft. Diameter 12 in.
Top of Casing ____ Water Level Initial 21.8 ft. Static ____
Screen: Dia 6 in. Length 20 ft. Type/Size V-WIRE,SCH40PVC,.020 in.
Casing: Dia 6 in. Length 15 ft. Type SCH40PVC
Fill Material #1 Silica Sand Rig/Core GEFCO Speedstar 200
Drill Co. Lutz Method 12" O.D. Hollow Stem Auger
Driller R. Tabor Log By J. Filosa Date 12/9/97 Permit # ____
Checked By S. Baggett License No. ____

See Site Map For Boring Location

COMMENTS:

Depth (ft.)	PID (ppm)	Sample ID / Blow Count / % Recovery	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
-2				
0			ASP	ASPHALT, brown organic SILT, fine SAND.
2			OL	Hand auger to 5'.
4				
6	5	15,15 18,14 100%	SM	Brown, dry, dense SILT, trace fine sand, well-compacted, color change to gray.
8	14	12,19 20,20 90%		Same as above (medium dense).
10	36	17,26 50,50/.1 100%		Very dense (top 1.5'); same as above (grading to reddish-orange, dry poorly sorted, medium sand, trace gravel).
12	18.1	11,22 32,35 60%	SP	Reddish-orange, dry, very dense, medium SAND, poorly sorted, little gravel, some silt; gravel is subangular to subrounded quartz, 1/4" diameter and micaceous.
14	14	40,46 49,36 40%		Same as above (very dense, color change to light brown).
16	356	12,15 36,4.5 70%		Same as above (color change to dark brown, gravel is finer and more quartz-like, petroleum odor present). to 1/4" diameter (slight petroleum odor).
18	368	40,33 33,35 40%		Moist, very dense, medium sand, color change to reddish-brown, trace orange silt; petroleum odor present.
20	253	35,41 40,28 50%		Same as above (coarser gravel; gravel is subangular to subrounded, poorly sorted; petroleum odor present, slight sheen, color change to brown).
22	367	17,29 81,25 80%		Dark brown, saturated, very dense, medium SAND, little gravel, poorly sorted, poor compaction; gravel is subangular to subrounded, 1/8" - 1/4" diameter, little coarse quartz sand, trace silt; petroleum odor present).
24	321	29,24 23,30 90%		

FLUOR DANIEL GTI

Drilling Log

RECOVERY WELL RW-E

Project SUN/DPSC Owner Sun Company, Inc.
Location Passyunk Homes, Philadelphia, PA Proj. No. 100233

Depth (ft.)	Well Completion	PID (ppm)	Sample ID	Blow Count/ % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
24		321					Same as above (little coarse sand present, petroleum odor, trace silt).
26		360		25,23 20,15 100%			Same as above (medium dense).
28		340		12,14 13,21 100%			Same as above.
30		322		22,19 20,29 100%		SP	Same as above (1 1/8" diameter gravel fragments present).
32		353		13,18 26,28 100%			Same as above (grading to more medium sand at base of spoon, better sorted and more compacted, trace silt).
34		308		10,10 24,13 100%			Same as above (medium dense).
36							BORING TERMINATED 35'-0".
38							
40							
42							
44							
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48							
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56							

Drilling Log

FLUOR DANIEL GTI

RECOVERY WELL RW-F

Project SUN/DPSC Owner Sun Company, Inc.
Location Passyunk Homes, Philadelphia, PA Proj. No. 100233
Surface Elev. ________ Total Hole Depth 35 ft. Diameter 12 in.
Top of Casing ________ Water Level Initial 20.7 ft. Static ________
Screen: Dia 6 in. Length 20 ft. Type/Size V-WIRE,SCH40PVC,.020 in.
Casing: Dia 6 in. Length 15 ft. Type SCH40PVC
Fill Material #1 Silica Sand Rig/Core GEFCO Speedstar 200
Drill Co. Lutz Method 12" O.D. Hollow Stem Auger
Driller R. Tabor Log By J. Filosa Date 12/10/97 Permit # ________
Checked By S. Baggett License No. ________

See Site Map
For Boring Location

COMMENTS:

Depth (ft.)	Well Completion	PID (ppm)	Sample ID / Blow Count / % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
-2						
0					ASP	ASPHALT, brown organic SILT.
2					OL	Hand auger to 5'.
4						
6		5.2	13,13 16,18 100%		SM	Brown, dry, medium dense SILT and fine SAND, trace clay, well-compacted, color change to gray in base of spoon.
8		20.7	9,18 40,40 50%		SW	Dry, very dense top 8"; same as above (change to medium sand, trace silt and little gravel fragments, some gravel 1/8" diameter, sand has black staining).
10		26.5	60,38 50/1 20%		SP	Dry, very dense, medium SAND, little gravel, poorly sorted gravel fragments 1/8"-1/4" diameter.
12		26.1	18,23 19,20 40%			Same as above (dense).
14		62.3	12,12 15,14 60%			Same as above (medium dense, gravel becomes finer).
16		292	12,11 11,12 60%		SW	Brown, moist, medium dense, medium SAND, well-sorted, trace gravel; petroleum odor present).
18		241	11,9 12,9 40%			Same as above.
20		283	7,9 8,8 80%			Same as above (saturated trace silt and gravel, petroleum odor).
22		273	13,24 20,23 50%		SP	Brown, saturated, dense, medium to coarse SAND and GRAVEL, poor compaction, poorly sorted; gravel 1/8" diameter, trace silt, sheen visible, petroleum odor).
24		300	5,3 12,60 60%			

Drilling Log

FLUOR DANIEL GTI

RECOVERY WELL **RW-F**

Project SUN/DPSC Owner Sun Company, Inc.
Location Passyunk Homes, Philadelphia, PA Proj. No. 100233

Depth (ft.)	Well Completion	PID (ppm)	Sample ID	Blow Count/ % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
24		300				SP	Same as above (medium dense, sand fining at base of spoon; petroleum odor).
26		298		17,29 36,24 100%		SW	Very dense top 1.5'; same as above, bottom 0.5' (brown silt, well-compacted).
28		292		6,9 9,7 60%			Same as above (medium dense, no silt lense, trace silt present within sand).
30		280		13,19 19,21		SP	Same as above (dense, 1/2" diameter gravel fragments, sheen visible, petroleum odor present).
32		259		11,9 12,16			Same as above.
34		275		12,18 24,12			Same as above.
36							BORING TERMINATED 35'-0".
38							
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FLUOR DANIEL GTI

RECOVERY WELL RW-G

Project: SUN/DPSC	Owner: Sun Company, Inc.
Location: Passyunk Homes, Philadelphia, PA	Proj. No. 100233
Surface Elev.	Total Hole Depth: 35 ft.
Diameter: 12 in.	Top of Casing
Water Level Initial: 21.2 ft.	Static
Screen: Dia 6 in.	Length 20 ft.
Type/Size: V-WIRE,SCH40PVC,.020 in.	Casing: Dia 6 in.
Length 15 ft.	Type SCH40PVC
Fill Material: #1 Silica Sand	Rig/Core: GEFCO Speedstar 200
Drill Co. Lutz	Method: 12" O.D. Hollow Stem Auger
Driller: R. Tabor	Log By: J. Filosa
Date: 12/16/97	Permit #
Checked By: S. Baggett	License No.

See Site Map For Boring Location

COMMENTS:

Depth (ft.)	PID (ppm)	Sample ID	Blow Count/ % Recovery	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
0				ML	Grass, brown organic SILT, fine SAND.
2				ML	Hand auger to 5'.
6	152		21,15 17,21 100%	SM	Gray, dry, SILT, fine, micaceous SAND, medium dense, well-compacted, well-sorted.
8	64		12,17 16,16 100%	SM	Same as above (dense, color change to brown, trace gravel).
10	15.9		20,14 17,17 10%	SW	Brown, dry, dense, medium to fine SAND, little gravel; gravel sub-rounded, well-compacted and sorted.
12	134		16,18 44,35 100%	SW	Same as above (very dense, petroleum odor).
14	26		46 50/1 100%	SW	Same as above.
16	535		5,8 17,18 60%	SP	Brown, dry, medium to fine SAND, little gravel, medium dense, larger gravel fragments present, more poorly sorted.
18	783		22,13 14,22 60%	SP	Same as above (slightly moist, dense sand becoming coarser; petroleum odor).
20	482		18,12 17,33 60%	SP	Brown, wet, dense, medium to coarse SAND, little gravel, poor compaction, poor sorting, gravel subangular and subrounded; petroleum odor.
22	651		28,25 24,60 60%	SP	Same as above (saturated, very dense, 1/4"-1/8" diameter gravel, subrounded, petroleum odor, trace silt).
24			60,46 50/1 0%		

FLUOR DANIEL GTI

RECOVERY WELL RW-G

Project SUN/DPSC Owner Sun Company, Inc.
Location Passyunk Homes, Philadelphia, PA Proj. No. 100233

Depth (ft.)	Well Completion	PID (ppm)	Sample ID	Blow Count/ % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
24							No recovery; interval not sampled - driller reports coarse gravel fragments in the hole.
26		1027		28,13 8,14 50%			Brown, medium to coarse SAND, little gravel, very dense, petroleum odor, poorly sorted and compacted, 1/4" - 1/8" diameter gravel fragments present.
28		827		12,16 27,38 100%			Same as above (dense, finer gravel, petroleum odor).
30		54.5		44,28 10,7 100%		SP	Same as above (coarser gravel).
32		591		14,15 20,19 100%			Same as above.
34		760		20,25 33,38 100%			Same as above (finer gravel).
							BORING TERMINATED 35'-0".
36							
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Drilling Log

FLUOR DANIEL GTI

RECOVERY WELL RW-H

Project SUN/DPSC — Owner Sun Company, Inc.

Location Passyunk Homes, Philadelphia, PA — Proj. No. 100233

Surface Elev. ______ Total Hole Depth 35 ft. Diameter 12 in.

Top of Casing ______ Water Level Initial 21.7 ft. Static ______

Screen: Dia 6 in. Length 20 ft. Type/Size V-WIRE,SCH40PVC,.020 in.

Casing: Dia 6 in. Length 15 ft. Type SCH40PVC

Fill Material #1 Silica Sand Rig/Core GEFCO Speedstar 200

Drill Co. Lutz Method 12" O.D. Hollow Stem Auger

Driller R. Tabor Log By J. Filosa Date 12/11/97 Permit # ______

Checked By S. Baggett License No. ______

See Site Map For Boring Location

COMMENTS:

Depth (ft.)	PID (ppm)	Sample ID	Blow Count/ % Recovery	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
-2					
0				ASP	ASPHALT, brown organic SILT and GRAVEL.
2				GM	Hand auger to 5'.
4					
6	44.1		19,15 10,16 60%		5'-5.5' Same as above (medium dense). Gray, dry SILT and fine SAND, well compacted.
8	60		18,12 18,9 30%		Gray, dry, dense SILT and fine SAND, well compacted.
10	139		11,9 9,8 10%	SM	Same as above (medium dense, grading to medium brown sand at base of spoon).
12	128		9,5 5,6 70%		Brown, medium dense SAND, trace silt and gravel grading to gray silt in bottom 8".
14	59.4		6,3 4,8 40%		Gray, dry, medium dense SILT, trace gravel and fine sand.
16	136		7,5 5,8 10%		Same as above (larger gravel and wood fragments present).
18	189		17,18 24,36 50%		Brown, dry, dense, medium to coarse SAND, little gravel, poorly sorted, reddish-brown gravel 1/8"-1/4" diameter; gravel is subangular to subrounded, trace silt, petroleum odor.
20	233		46,62 50/1 60%	SP	Same as above (slightly moist, very dense, finer gravel, petroleum odor, slight staining).
22	262		96,71 100/1 20%		Same as above (wet, very dense, large gravel fragments, petroleum odor, product visible).
24	271		55,55 38,24 80%		

Drilling Log

FLUOR DANIEL GTI

RECOVERY WELL **RW-H**

Project *SUN/DPSC* Owner *Sun Company, Inc.*
Location *Passyunk Homes, Philadelphia, PA* Proj. No. *100233*

Depth (ft.)	Well Completion	PID (ppm)	Sample ID	Blow Count/ % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
24		271				SP	Same as above (saturated, petroleum odor).
26		276		19,25 22,26 100%		SW	Brown, saturated, dense, medium to coarse SAND, little medium gravel, trace SILT, well-sorted, petroleum odor.
28		257		13,20 52,37 100%			Same as above (very dense, less gravel, petroleum odor).
30		299		12,13 15,24 50%			Same as above (medium dense, sheen visible).
32		208		17,19 31,63 100%			Same as above (dense, trace larger gravels, petroleum odor).
34		197		24,34 45,41 100%			Same as above.
							BORING TERMINATED 35'-0".
36							
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42							
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52							
54							
56							

Drilling Log

FLUOR DANIEL GTI

RECOVERY WELL RW-I

Project *SUN/DPSC* Owner *Sun Company, Inc.*
Location *Passyunk Homes, Philadelphia, PA* Proj. No. *100233*
Surface Elev. ______ Total Hole Depth *35 ft.* Diameter *12 in.*
Top of Casing ______ Water Level Initial *21.5 ft.* Static ______
Screen: Dia *6 in.* Length *20 ft.* Type/Size *V-WIRE,SCH40PVC,.020 in.*
Casing: Dia *6 in.* Length *15 ft.* Type *SCH40PVC*
Fill Material *#1 Silica Sand* Rig/Core *GEFCO Speedstar*
Drill Co. *Lutz* Method *12" O.D. Hollow Stem Auger*
Driller *R. Tabor* Log By *J. Filosa* Date *12/12/97* Permit # ______
Checked By *S. Baggett* License No. ______

See Site Map For Boring Location

COMMENTS:

Depth (ft.)	PID (ppm)	Sample ID	Blow Count/ % Recovery	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
-2					
0				ML	Grass, brown organic SILT, sand and gravel.
2					Hand auger to 5'.
4					
6	1		10,15 18,26 20%	SM	Brown, dry, medium dense SILT, little fine sand, trace silt and gravel.
8			35,28 24,28 0%		No recovery; interval not sampled.
10	47		42 50/1 50%	SM	Very dense top 1', gray-brown, dry SILT and fine sand, well-compacted, grading to brown-reddish, medium sand and gravel, trace mica, poorly sorted, gravel subangular to subrounded, slight petroleum odor.
12	40		45 50/1 30%		Brown, dry, very dense, medium SAND, little gravel, poorly sorted, gravel 1/8" diameter, subangular to subrounded.
14	20.9		25,13 49,50 60%		Same as above (very dense).
16	81		36,57 56,35 60%		Same as above (very dense).
18	303		100/1 10%	SP	Brown, dry, very dense, medium to coarse SAND, poorly sorted, no gravel, petroleum odor.
20	210		11,25 17,37 70%		Same as above (moist, dense, little gravel, petroleum odor present).
22	368		37,45 50/1 10%		Same as above (saturated, very dense, petroleum odor, product visible on water).
24	286		25,19 19,50 100%		

Drilling Log

FLUOR DANIEL GTI

RECOVERY WELL **RW-I**

Project SUN/DPSC   Owner Sun Company, Inc.

Location Passyunk Homes, Philadelphia, PA   Proj. No. 100233

Depth (ft.)	Well Completion	PID (ppm)	Sample ID	Blow Count/ % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
24		286					Brown, saturated, dense, medium to coarse SAND, little gravel, trace silt; 1/8" – 1/4" diameter, visible product and sheen.
26		289		5,7 13,15 40%		SP	Same as above (medium dense, petroleum odor).
27							27'–28' Same as above (very dense).
28		284		33,15 38,50 100%			Saturated SAND fining to medium to fine sand, trace silt, petroleum odor.
30		310		6,8 2,4 90%			Brown, saturated, loose, medium SAND, trace gravel, little fine sand, trace silt, petroleum odor present.
32		278		12,19 30,23 100%		SM	Same as above (dense sand becoming coarser, more rounded gravel).
34		276		21,26 19,25 100%			Same as above.
35							BORING TERMINATED 35'-0".
36							
38							
40							
42							
44							
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54							
56							

Drilling Log

FLUOR DANIEL GTI

RECOVERY WELL RW-M

Project: SUN/DPSC	Owner: Sun Company, Inc.
Location: Passyunk Homes, Philadelphia, PA	Proj. No. 100233
Surface Elev. ______	Total Hole Depth 35 ft.
Diameter 12 in.	Top of Casing ______
Water Level Initial ______	Static ______
Screen: Dia 6 in.	Length 20 ft.
Type/Size V-WIRE,SCH40PVC,.020 in.	Casing: Dia 6 in.
Length 15 ft.	Type SCH40PVC
Fill Material #1 Silica Sand	Rig/Core GEFCO Speedstar
Drill Co. Lutz	Method 12" O.D. Hollow Stem Auger
Driller R. Tabor	Log By J. Filosa
Date 12/15/97	Permit # ______
Checked By S. Baggett	License No. ______

See Site Map For Boring Location

COMMENTS:

Depth (ft.)	PID (ppm)	Blow Count/ % Recovery	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
-2				
0			ASP	ASPHALT, brown organic SILT, little gravel.
2			GM	Hand auger to 5'.
4				
6	212	11,12 12,23 100%	SM	Brown, dry, micaceouse SILT, trace fine sand, medium dense.
8	87	28,68 50/1 40%		Very dense top 4"; same as above (7.4' brown, dry, medium sand, little gravel, poorly sorted, well compacted).
10	171	14,17 20,21 50%	SP	Brown, dry, dense, medium to coarse SAND, little gravel, little fine sand, poorly sorted, gravel subangular to subrounded, slight petroleum odor.
12	133	29,22 23,22 70%		Same as above (dense).
14	71	20,15 15,17 60%	SW	Same as above (medium dense, less gravel, sand is better sorted).
16	1037	9,13 12,14 40%		Same as above (more gravel, coarse sand present, poorly sorted, petroleum odor present).
18	1306	16,17 16,21 60%		Same as above (slightly moist, dense).
20	951	33,35 35,36 70%	SP	Same as above (moist, very dense).
22	1083	45,17 15,18 60%		Same as above (wet, dense, sheen visible).
24	984	13,16 60,25 100%	SW	

FLUOR DANIEL GTI

RECOVERY WELL **RW-M**

Project SUN/DPSC　Owner Sun Company, Inc.
Location Passyunk Homes, Philadelphia, PA　Proj. No. 100233

Depth (ft.)	Well Completion	PID (ppm)	Sample ID	Blow Count/ % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
24		984				SW	Saturated, dense, medium to coarse SAND, trace silt, well compacted and sorted, trace fine sand, petroleum odor present).
26		904		23,25 26,31 1005			Same as above (very dense, little gravel, petroleum odor present).
28		1148		20,7 9,10 100%			Same as above (medium dense, visible sheen, petroleum odor present).
30		1225		18,28 24,27 100%			Same as above (very dense, petroleum odor).
32		801		16,24 17,27 100%		ML / SW	Same as above (dense, less gravel, 1" gray sandy silt lense at base of spoon with trace clay, petroleum odor present).
34				21,13 17,16 100%		ML / SW	Same as above (medium dense); brown silt lense at 33.5' then grading to same as above; gray sandy silt lense at base of spoon, trace clay in lower lense.
36							BORING TERMINATED 35'-0".
38							
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FLUOR DANIEL GTI

Drilling Log

PIEZOMETER **SUN PZ-1**

Project SUN/DPSC Owner Sun Company, Inc.
Location Philadephia, PA Proj. No. 01303-0346
Surface Elev. 21.56 ft. Total Hole Depth 35 ft. Diameter 8 in.
Top of Casing 21.24 ft. Water Level Initial ____ Static 18.59 ft.
Screen: Dia 2 in. Length 20 ft. Type/Size SCH40PVC, .020 in.
Casing: Dia 2 in. Length 15 ft. Type SCH40PVC
Fill Material #1 Silica Sand Rig/Core Mobile B-61
Drill Co. M & R Soils Invest. Method Hollow Stem Auger
Driller R. Fleming Log By L. Comas Date 5/22/97 Permit # ____
Checked By S. Baggett License No. ____

See Site Map For Boring Location

COMMENTS:

Depth (ft.)	PID (ppm)	Sample ID / Blow Count/ % Recovery	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
0				Topsoil (hand-dug to 4').
2				Black, dry, well graded SAND and GRAVEL (fill/slag).
4–6	0.0	7,11 17,15 90%	SM	Light tan, moist, medium dense SILT with some fine sand (some orange mottling).
6–8	0.0	12,13 15,15 70%	SM	Same as above (trace clay).
8–10	0.0	11,17 19,21 80%	SM	Same as above.
10–12	0.0	50/5 5%	GW	Black, moist, very dense, fine SAND with gravel.
12–14	0.0	20,25 25,30 20%	GW	Black, moist, very dense, fine SAND with gravel, some organics.
14–16	0.0	20,25 25,30	GW	Gray, dense COBBLES with fine to coarse sand matrix.
16–18	0.0	25,36 50/5	GW	Orange-brown, moist, dense GRAVEL and well-graded SAND.
18–20	>999	7,19 29,22 25%	GW	
20–22	>999	25,42 25,35	GW	Orange-brown, saturated, dense, well-graded SAND and GRAVEL.
24				

Drilling Log

FLUOR DANIEL GTI

PIEZOMETER **SUN PZ-1**

Project SUN/DPSC Owner Sun Company, Inc.
Location Philadephia, PA Proj. No. 01303-0346

Depth (ft.)	Well Completion	PID (ppm)	Sample ID / Blow Count/ % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
24						23'-25' Shelby tube could not be advanced.
26						Saturated, well graded SAND and some GRAVEL.
28						
30					GW	
32						Attempted Shelby tube at 30'-32'; large cobble in tube; medium to fine SAND with some gravel.
34						
36						BORING TERMINATED 35'-0".
38						
40						
42						
44						
46						
48						
50						
52						
54						
56						

Drilling Log

FLUOR DANIEL GTI

PIEZOMETER SUN PZ-2

Project SUN/DPSC Owner Sun Company, Inc.
Location Philadephia, PA Proj. No. 01333-0346
Surface Elev. 21.57 ft. Total Hole Depth 35 ft. Diameter 8 in.
Top of Casing 21.08 ft. Water Level Initial 18 ft. Static 20.77 ft.
Screen: Dia 2 in. Length 20 ft. Type/Size SCH40PVC, .020 in.
Casing: Dia 2 in. Length 15 ft. Type SCH40PVC
Fill Material #1 Silica Sand Rig/Core Mobile B-61
Drill Co. M & R Soils Invest. Method Hollow Stem Auger
Driller R. Fleming Log By L. Comas Date 5/22/97 Permit #
Checked By S. Baggett License No.

See Site Map For Boring Location

COMMENTS:

Depth (ft.)	PID (ppm)	Sample ID	Blow Count/ % Recovery	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
-2					
0					Topsoil (hand-dug to 4').
4–6	100		3,4 3,4 60%	SM	Olive-green, moist, loose, SILT with minor fine sand.
6–8	0.0		5,12 14,22	SM	Olive-gray, moist, medium dense SILT with minor clay.
8–10	15		5,50/5 10%	GW	Orange-brown, dense, medium to coarse SAND and GRAVEL.
10–11				ML	Dark gray, moist SILT with clay.
10–12	86	PZ-2 10-12'	19,27 25,22 60%	GW	Dense, medium to coarse SAND and GRAVEL.
12–14	0.0		50/5 5%	GW	Same as above.
14–16	0.0		16,26 18,26	GW	Same as above.
16–18			50/1		No recovery.
18–20			50/5		No recovery.
20–24				GW	

FLUOR DANIEL GTI

Drilling Log

PIEZOMETER SUN PZ-2

Project SUN/DPSC Owner Sun Company, Inc.
Location Philadephia, PA Proj. No. 01303-0346

Depth (ft.)	Well Completion	PID (ppm)	Sample ID	Blow Count/ % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
24							
25–26							Shelby tube could not be advanced at 25' (no recovery).
28							Medium to coarse SAND and fine GRAVEL.
30						GW	
32							
34							
35							BORING TERMINATED 35'-0".
36							
38							
40							
42							
44							
46							
48							
50							
52							
54							
56							

Drilling Log

FLUOR DANIEL GTI

PIEZOMETER **SUN PZ-3**

Project SUN/DPSC Owner Sun Company, Inc.
Location Philadephia, PA Proj. No. 01303-0346
Surface Elev. 20.84 ft. Total Hole Depth 30 ft. Diameter 8 in.
Top of Casing 20.23 ft. Water Level Initial 18 ft. Static 20.77 ft.
Screen: Dia 2 in. Length 25 ft. Type/Size SCH40PVC, .020 in.
Casing: Dia 2 in. Length 5 ft. Type SCH40PVC
Fill Material #1 Silica Sand Rig/Core Mobile B-61
Drill Co. M & R Soils Invest. Method Hollow Stem Auger
Driller R. Fleming Log By L. Comas Date 5/22/97 Permit # ______
Checked By S. Baggett License No. ______

See Site Map
For Boring Location

COMMENTS:

Depth (ft.)	Well Completion	PID (ppm)	Sample ID	Blow Count/ % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
-2							
0							Grass and Topsoil (hand-dug to 4').
2							Black, well-graded SAND and GRAVEL (fill/slag).
4		0.0		12,16 9,9 80%			Orange-brown, moist, medium dense SILT with minor clay.
6		0.0		12,14 14,12 90%		SM	Same as above.
8		0.0		12,16 19,20 80%			Orange-brown, moist, medium dense SILT with minor clay.
10				16,30 46,46			No recovery; sheen on spoon.
12		>999	PZ-3 12-14'	16,22 23,30			Black, wet, dense, medium and coarse SAND.
14		789	PZ-3 14-15'	10,8 8,7		SW	Same as above. Tan, moist, medium dense, medium and coarse SAND.
16				30,1 50/3			Insufficient recovery.
18		>999	PZ-3 19'	11,18 22,19 50%			Dense, medium and coarse SAND and GRAVEL.
20		>999		3,3 50/5 10%		GW	Same as above.
22							
24							

Drilling Log

FLUOR DANIEL GTI

PIEZOMETER **SUN PZ-3**

Project SUN/DPSC Owner Sun Company, Inc.
Location Philadephia, PA Proj. No. 01303-0346

Depth (ft.)	Well Completion	PID (ppm)	Sample ID	Blow Count/ % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
24							
26						GW	Well-graded SAND, some gravel.
28							
30							Try to push Shelby tube at 30', no recovery. Tube damaged; hole caves in from 30'-35'.
							BORING TERMINATED 30'-0".
32							
34							
36							
38							
40							
42							
44							
46							
48							
50							
52							
54							
56							

Drilling Log

FLUOR DANIEL GTI

PIEZOMETER **SUN PZ-4**

Project SUN/DPSC Owner Sun Company, Inc.
Location Philadephia, PA Proj. No. 01303-0346
Surface Elev. 22.15 ft. Total Hole Depth 36 ft. Diameter 8 in.
Top of Casing 22.04 ft. Water Level Initial 20 ft. Static 21.64 ft.
Screen: Dia 2 in. Length 20 ft. Type/Size SCH40PVC, .020 in.
Casing: Dia 2 in. Length 8.44 ft. Type SCH40PVC
Fill Material #1 Silica Sand Rig/Core Mobile B-51
Drill Co. M & R Soils Invest. Method Hollow Stem Auger
Driller R. Fleming Log By L. Comas Date 6/6/97 Permit # ______
Checked By S. Baggett License No. ______

See Site Map
For Boring Location

COMMENTS:

Collect samples for grain size at 5 foot intervals below water table.

Depth (ft.)	PID (ppm)	Sample ID / Blow Count / % Recovery	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
0				Topsoil.
2				Orange-brown, fine SAND and SILT.
6	0.0	4,6 11,11 100%	SM	Orange-brown, moist, medium dense, fine SAND and SILT (some mottling).
11	2.5	12,17 36,30 60%	GP	Moist, very dense, fine to medium SAND and sub-rounded GRAVEL.
16	5.0	6,6 26,30 40%	CL	Yellow-brown SILTY CLAY.
			GP	Red-brown, moist, dense, fine to medium SAND and GRAVEL.
21	500	4,12 38,37 40%	SM	Yellow-brown, fine SAND and SILT.
			GW	Moist, dense, medium to coarse SAND and medium, sub-rounded GRAVEL (petroleum odors).
26	2500	25,37 50/5 40%	GW	Saturated, very dense, coarse SAND and GRAVEL. Petroleum odors.
30			SW	

Drilling Log

FLUOR DANIEL GTI

PIEZOMETER **SUN PZ-4**

Project SUN/DPSC Owner Sun Company, Inc.
Location Philadephia, PA Proj. No. 01303-0346

Depth (ft.)	Well Completion	PID (ppm)	Sample ID	Blow Count/ % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
30–32		1711		7,5 8,8 100%		SW	Saturated, medium dense, medium to coarse SAND, some gravel.
32–34		2500		10,18 22,25 100%		SW	Saturated, medium dense, medium to coarse SAND; some sub-rounded gravel, fining with depth, gravel at 33 feet.
34–36		1723		12,12 14,20 100%		SP	Saturated, medium dense, medium SAND and some coarse SAND, minor gravel.
36							BORING TERMINATED 36'-0".

Depth scale: 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70

Drilling Log

FLUOR DANIEL GTI

PIEZOMETER **SUN PZ-5**

Project SUN/DPSC Owner Sun Company, Inc.
Location Philadephia, PA Proj. No. 01303-0346
Surface Elev. 21.59 ft. Total Hole Depth 37 ft. Diameter 8 in.
Top of Casing 21.04 ft. Water Level Initial 20 ft. Static 20.10 ft.
Screen: Dia 2 in. Length 20 ft. Type/Size SCH40PVC, .020 in.
Casing: Dia 2 in. Length 7.89 ft. Type SCH40PVC
Fill Material #1 Silica Sand Rig/Core Mobile B-51
Drill Co. M & R Soils Invest. Method Hollow Stem Auger
Driller R. Fleming Log By L. Comas Date 6/6/97 Permit #
Checked By S. Baggett License No.

See Site Map For Boring Location

COMMENTS:

Collect samples for grain size analysis from 15'-35' (5 foot intervals).

Depth (ft.)	Well Completion	PID (ppm)	Sample ID	Blow Count/ % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
0							Grass and Topsoil.
2							Orange-brown, fine SAND and FILL.
6		0.0		3,4 5,8		SM	Blue-gray, moist, loose, fine SAND and SILT, trace clay.
11				9, 50/5			No recovery.
16		5.4		26,33 21,23 80%		SP	Orange-brown, dense, fine SAND with fine sub-rounded gravel.
21		2500		22,21 17,9 80%		GW	Orange-brown, wet, dense, well-graded SAND and GRAVEL.
26		2500		50/1		GP	Saturated, very dense, medium to coarse SAND and sub-rounded/angular GRAVEL, 1" thick clay lense @ 26'.
31						ML	

06/17/1997 lithlog-June.96

Drilling Log

FLUOR DANIEL GTI

PIEZOMETER **SUN PZ-5**

Project SUN/DPSC Owner Sun Company, Inc.
Location Philadephia, PA Proj. No. 01303-0346

Depth (ft.)	Well Completion	PID (ppm)	Sample ID	Blow Count/ % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
30		2500		28,32 27,10		ML	Brown, saturated, fine SANDY CLAY.
						GW	Brown, very dense, medium to coarse SAND and sub-rounded GRAVEL.
32						SP	Brown, saturated, medium to fine SAND.
34							
36		2500		4,14 10,12		SW	Saturated, medium dense, medium to fine SAND grading coarser with depth.
38							BORING TERMINATED 37'-0".
40							
42							
44							
46							
48							
50							
52							
54							
56							
58							
60							
62							
64							
66							
68							
70							

06/17/1997 lithlog-June,96

Drilling Log

FLUOR DANIEL GTI

PIEZOMETER **SUN PZ-6**

Project SUN/DPSC Owner Sun Company, Inc.
Location Philadepnia, PA Proj. No. 01303-0346
Surface Elev. 21.32 ft. Total Hole Depth 37 ft. Diameter 8 in.
Top of Casing 21.26 ft. Water Level Initial 20 ft. Static 19.23 ft.
Screen: Dia 2 in. Length 20 ft. Type/Size SCH40PVC, .020 in.
Casing: Dia 2 in. Length 8.6 ft. Type SCH40PVC
Fill Material #1 Silica Sand Rig/Core Mobile B-51
Drill Co. M & R Soils Invest. Method Hollow Stem Auger
Driller R. Fleming Log By L. Comas Date 6/6/97 Permit #
Checked By S. Baggett License No.

See Site Map For Boring Location

COMMENTS:

Collect samples for grain size analysis from 15'-35' (5 foot intervals).

Depth (ft.)	PID (ppm)	Sample ID	Blow Count/ % Recovery	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
0					Grass and Topsoil (hand auger to 5').
2					Orange-brown, well-graded SAND FILL.
6	1.4		6,6 6,7 80%	SM	Gray, medium dense, mottled, micaceous, fine SAND and SILT.
11	110		14,16 50/4 75%	SW	Black, dry, very dense, fine SAND grading to coarse with depth, minor sub-rounded gravel. Drilling hard at 13' (gravel).
16	118		25,18 37,36 50%	GW	Tan, very dense, well-graded SAND and sub-rounded to sub-angular GRAVEL (1" clay lense at 16').
21	2500		23,33 43,50	GP	Wet, very dense, coarse, sub-rounded/angular GRAVEL with coarse sand.
26	478		10,12 14,14 40%	GP	Brown, saturated, medium dense, coarse to medium, sub-rounded GRAVEL and coarse SAND.
31				GP	

FLUOR DANIEL GTI

Drilling Log

PIEZOMETER **SUN PZ-6**

Project SUN/DPSC　　Owner Sun Company, Inc.
Location Philadelphia, PA　　Proj. No. 01303-0346

Depth (ft.)	Well Completion	PID (ppm)	Sample ID	Blow Count/ % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
30				50/5			
31		2176				GP	Brown, saturated, very dense, coarse SAND and fine GRAVEL with some medium sand and some sub-angular/rounded gravel.
35				15,18 22,26			
36		1461				GW	Brown, saturated, dense, medium to coarse SAND and sub-rounded GRAVEL, grading to medium sand.
37							BORING TERMINATED 37'-0".

Depth scale: 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70

06/17/1997 lithlog-June.96

Versar INC.

1900 Frost Road
Suite 110
Bristol, Pennsylvania 19007

Draft

TEST HOLE/WELL LOG: BORING NO. MW-CSX1

Site Name:	Defense Personnel Support Center (DPSC) Philadelphia, Pennsylvania		
Date:	2/15/95	Project Number:	2727.001
Logged By:	Viresh Singh	Drilled By:	Huntingdon-Empire
Elevation:	N/A	Detector:	HNU
Drilling Method:	HSA CME-75	Sampling Method:	Split Spoon
Gravel Pack:	Morie #1		
Seal:	Bentonite	Grout:	Cement/Bentonite
Casing Type:	PVC	Diameter: 4"	Length: 10'
Hole Dia.:	8.25"	Depth to Liquid:	
Screen Type:	PVC	Slot Size:	0.010"
Diameter:	4"	Length:	40'
Total Depth:	54'	Depth to Water:	

USCS Class.	Color	Fines (%)	PID Vapor (ppm)	Staining	Sample No.	Depth (ft)	Sample Recovery (%)	Pene. Resist.	LITHOLOGY/REMARKS
SP/Fill			0			19	50		(0'-20'): The uppermost 20' of this well is composed of layers of railroad bedding. Lithology is limited to dark brown to black, sandy gravel
SP			0			21	65	2 6 5 4	(20'-22'): Brown, gravelly, coarse grained sand
SP			0			23	55	5 6 5 3	(22'-24'): Same as 20'-22' interval
SP/Fill			0			25	35	5 6 11 5	(24'-26'): Grayish brown, gravelly, coarse grained sand, with wood fragments and crushed gravel fill
SP/Fill			0			27	20	5 8 10 12	(26'-28'): Same as 24'-26' interval
SP/Fill			0			29	10	16 5 5 4	(28'-30'): Same as 26'-28' interval
						31		2 3 4 7	(30'-32'): No sample was recovered from this depth
ML			0			33	85	5 6 7 7	(32'-34'): Gray, slightly fine grained sandy, silt
ML			0			35	95	8 12 18 15	(34'-36'): Same as 32'-34' interval
ML/CL			0			37	95	4 6 7 9	(36'-37'): Same as 34'-36' interval (37'-38'): Light brown silty clay

Versar INC.

1900 Frost Road
Suite 110
Bristol, Pennsylvania 19007

Draft

TEST HOLE/WELL LOG: BORING NO. MW-CSX1

Site Name: Defense Personnel Support Center (DPSC) Philadelphia, Pennsylvania			
Date: 2/15/95		Project Number: 2727.001	
Logged By: Viresh Singh		Drilled By: Huntingdon-Empire	
Elevation: N/A	HNU	Drilling Method: HSA CME-75	Sampling Method: Split Spoon
Gravel Pack: Morie #1		Seal: Bentonite	Grout: Cement/Bentonite
Casing Type: PVC	Diameter: 4"	Length: 10'	Hole Dia.: 8.25" / Depth to Liquid:
Screen Type: PVC / Slot Size: 0.010"	Diameter: 4"	Length: 40'	Total Depth: 54' / Depth to Water:

USCS Class.	Color	Fines (%)	PID Vapor (ppm)	Staining	Sample No.	Depth (ft)	Sample Recovery (%)	Pene. Resist.	LITHOLOGY/REMARKS
ML/CL			0			39	95	8 12 15 18	(38'-40'): Same as 37'-38' interval
ML/CL	Q		0			41	100	14 19 22 22	(40'-41'): Same as 38'-40' interval (41'-42'): Same as 40'-41' interval except increasing silt content
ML//CL			0			43	75	15 19 32	(42'-44'): Same as 41'-42' interval
SM	GR		25			45	90	14 17 21 17	(44'-46'): Yellowish brown to gray, slightly silty, medium grained sand, slightly moist
SP			50			47	70	11 19 24 23	(46'-48'): Gray, gravelly, medium grained sand, moist to wet
SP			30		S-30	49	15	50 40 57 79	(48'-50'): Same as 46'-48' interval
SW			60			51	25	30 29 40	(50'-52'): Gray, gravelly, coarse grained sand, petroleum odor, wet
SW			30			53	70	89 50 80 80	(52'-54'): Same as 50'-52' interval
SP	Wo		30			55	50	150 47 100/ 4"	(54'-56'): Grayish brown, fine to medium grained sand

Versar INC.

1900 Frost Road
Suite 110
Bristol, Pennsylvania 19007

Draft

TEST HOLE/WELL LOG: BORING NO. MW-CSX2

Sheet No. 1 of 2

Site Name:	Defense Personnel Support Center (DPSC) Philadelphia, Pennsylvania
Date: 2/13/95	Project Number: 2727.001
Logged By: Viresh Singh	Drilled By: Huntingdon-Empire

Elevation: N/A	Detector: HNU	Drilling Method: HSA CME-75		Sampling Method: Split Spoon	
Gravel Pack: Morie #1		Seal: Bentonite		Grout: Cement/Bentonite	
Casing Type: PVC		Diameter: 4"	Length: 15'	Hole Dia.: 8.25"	Depth to Liquid:
Screen Type: PVC	Slot Size: 0.010"	Diameter: 4"	Length: 42'	Total Depth: 60'	Depth to Water: 47'

USCS Class.	Color	Fines (%)	PID Vapor (ppm)	Staining	Sample No.	Depth (ft)	Sample Recovery (%)	Pene. Resist.	LITHOLOGY/REMARKS
Fill			0			19		2 2 4 5	(0'-20'): The uppermost 20' of this well is composed of layers of railroad bedding. Lithology is limited to dark brown to black, sandy gravel, with wood fragments
SC			0			21	25	5 3 3 2	(20'-22'): Dark brown, clayey, medium grained sand
SM			0			23	35	2 13 10 6	(22'-24'): Brownish gray, silty, fine grained sand
SP/Fill			0			25	50	5 3 3 3	(24'-26'): Brown, medium to coarse grained sand with brick fragments
SP/Fill			0			27	60	6 5 8 8	(26'-28'): Same as 24'-26' interval
SP			10			29	55	5 5 9 9	(28'-30'): Brown, gravelly, medium to coarse grained sand
CL			1			31	75	8 11 4 3	(30'-32'): Grayish black, slightly silty, clay, wet
CL			0.5			33	65	2 3 8 14	(32'-34'): Gray, silty clay
ML			0			35	90	10 10 10 13	(34'-36'): Gray, slightly clayey, silt
CL			1			37	95	10 11 12 13	(36'-38'): Yellowish brown, clayey silt

Versar INC.

1900 Frost Road
Suite 110
Bristol, Pennsylvania 19007

Draft

TEST HOLE/WELL LOG: BORING NO. MW-CSX2

Site Name: Defense Personnel Support Center (DPSC) Philadelphia, Pennsylvania			
Date: 2/13/95		Project Number: 2727.001	
Logged By: Viresh Singh		Drilled By: Huntingdon-Empire	
Elevation: N/A	Detector: HNU	Drilling Method: HSA CME-75	Sampling Method: Split Spoon
Gravel Pack: Morie #1		Seal: Bentonite	Grout: Cement/Bentonite
Casing Type: PVC	Diameter: 4"	Length: 15'	Hole Dia.: 8.25" / Depth to Liquid:
Screen Type: PVC	Slot Size: 0.010"	Diameter: 4" / Length: 42'	Total Depth: 60' / Depth to Water: 47'

USCS Class.	Color	Fines (%)	PID Vapor (ppm)	Staining	Sample No.	Depth (ft)	Sample Recovery (%)	Pene. Resist.	LITHOLOGY/REMARKS
ML			4			39	95	8 10 14 24	(38'-40'): Yellowish brown, clayey silt
SP			25			41	40	19 32 40 21	(40'-42'): Grayish brown, gravelly, coarse grained sand, petroleum odor
SP			250			43	60	33 13 14 12	(42'-44'): Same as 40'-42' interval
SP			350	Yes	S-27	45	85	27 21 27 27	(44'-46'): Same as 42'-44' interval, moist, petroleum staining
SP			400	Yes	S-28	47	80	27 21 27 28	(46'-48'): Same as 44'-46' interval, wet, very strong petroleum odor, petroleum staining
SP			80	Yes		49	10	20 100/5"	(48'-50'): Same as 46'-48' interval
SW			100	Yes		51	85	20 39 36 55	(50'-52'): Black, gravelly, medium to coarse grained sand, very strong petroleum odor, petroleum staining
SW			150			53	50	39 50 22 26	(52'-54'): Same as 50'-52' interval
SP			200			55	85	11 31 37 61	(54'-56'): Gray, gravelly, medium to coarse grained sand
SP						57	50	35 15 18 8	(56'-58'): Yellowish brown to gray, gravelly, medium to coarse grained sand, wet

DRILLING LOG

1. COMPANY NAME: Malcolm Pirnie, Inc.	2. DRILLING CONTRACTOR: SJB Services, Inc.	HOLE NO. CSX-MW3 / SHEET 1 OF 4 SHEETS
3. PROJECT: Defense Personnel Support Center	4. LOCATION: Philadelphia, Pennsylvania	
5. NAME OF DRILLER: T. Miller	6. MANUFACTURER'S DESIGNATION OF DRILL: CME-85	
7. Sizes & Types of Drilling & Sampling Equipment: 4 1/4" HSA; 3" stndrd s.s. to 24'; 3" cont. s.s. to 52'	8. HOLE LOCATION: 222928.1 North 2717662.9 East	
	9. SURFACE ELEVATION: 48.3'	
	10. DATE STARTED: 6/18/96	11. DATE COMPLETED: 6/19/96
12. OVERBURDEN THICKNESS	15. DEPTH GROUNDWATER ENCOUNTERED: 45 feet bgs	
13. DEPTH DRILLED INTO ROCK	16. Depth to Water and Elapsed Time After Drilling Completed: 45.7 feet bgs; 6/20/96	
14. TOTAL DEPTH OF HOLE: 53.0	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): 45.75 feet below mp; 6/28/96	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
N/A			

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (Specify)	OTHER (Specify)	OTHER (Specify)	21. Total Core REC %
(44-46),(46-48),(48-50)			HFS	IR SCAN		

22. DISPOSITION OF HOLE	BACKFILLED	Monitoring Well	OTHER (Specify)	23. SIGNATURE OF INSPECTOR
		X		

ELEV. a	DEPTH b	Blow Counts c	DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
48.3	0	3 3 4 4	blk coal ash, slag, fine sand, trace f gravel, loose (FILL)				rec 1.2/2.0
47.3	1			0.8 ppm			dry
46.3	2						
45.3	3						
44.3	4	4 4 4 2	(4-4.3') blk-brn slag, coal ash w/ sand and silt (FILL)				rec 1.8/2.0 dry
43.3	5		(4.3-4.8') med-brn-gray SILT w/ trace sand and clay (FILL)	7.2 ppm			moist
42.3	6						
41.3	7						
40.3	8						
39.3	9	6 16	gray-blk SILT w/ slag, cobbles > 3" dia, f gravel (FILL)				rec 0.8/2.0 moist
38.3	10						

DRILLING LOG

HOLE NO. CSX-MW3

PROJECT	INSPECTOR	SHEET
Defense Personnel Support Center, Philadelphia, Pennsylvania	John Hilton	SHEET 2 OF 4 SHEETS

ELEV. a	DEPTH b	Blow Counts c	DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
		5 4		2.3 ppm			
37.3	11						
36.3	12						
35.3	13						
34.3	14	4 3	blk slag, cinders, red brick, wood w/ f sand, f gravel to 0.5" dia (FILL)				rec 1.3/2.0 moist
33.3	15	4 4		1.0 ppm			
32.3	16						
31.3	17						
30.3	18						
29.3	19	4	blk-gray, f-med SAND w/ red brick, f-crs gravel to 2" dia (FILL)				rec 1.5/2.0 moist
28.3	20	4 5 3		0.4 ppm			
27.3	21				Fill		
26.3	22						
25.3	23						
24.3	24	7	As above w/ concrete cobbles > 3" dia (FILL)				rec 1.3/2.0
23.3	25	5 4 3		0.3 ppm			moist
22.3	26	3	blk-brn silty SAND w/ red brick, slag, concrete, mortar (FILL)				rec 1.0/2.0
21.3	27	8 7 6		1.4 ppm			moist
20.3	28						

DRILLING LOG

HOLE NO.	CSX-MW3
PROJECT	Defense Personnel Support Center, Philadelphia, Pennsylvania
INSPECTOR	John Hilton
SHEET 3	OF 4 SHEETS

ELEV. a	DEPTH b	Blow Counts c	DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
19.3	29	3 4 5 4	As above (FILL)	2.8 ppm			rec 1.3/2.0 moist
18.3 17.3	30 31	3 3 6 8	dk blk-gray SILT w/ brn-red clay filling within crs gravel framework, red brick, mortar, wood, coal (FILL)	4.6 ppm			rec 1.3/2.0 moist strong petroleum odor
16.3 15.3	32 33	6 6 11 6	SILT w/ clay, wood (FILL)	36 ppm			rec 0.3/2.0 moist-wet petroleum odor
14.3 13.3	34 35	8 7 8 8	(34-34.2') red brick (FILL) (34.2-35.0') lt brn-gray SILT w/ f sand, oxidized 34.2-34.4' (ML) sharp contact (35.0-35.7') blk-brn SILT w/ peat, bedding fabric (ML/PT)	10.4 ppm			rec 1.7/2.0 moist-wet
12.3 11.3	36 37	1 2 2 1	(35.7-36.0') dk gray-brn SILT w/ f sand (ML)	22 ppm			rec 0.3/2.0 moist-wet
10.3 9.3	38 39	4 12 25 26	(38.0-38.9') brn-red, dense SILT w/ ltl f sand and clay (ML) (38.9-39.3') blk-brn, f-med SAND w/ Fe oxidation, trace silt (SM)	3 ppm			rec 2.0/2.0 wet
8.3 7.3	40 41	32 32 35 31	(39.3-40.0') poorly sorted, f-crs, sub-rnd GRAVEL, some f-med sand (GW) poorly sorted, f-crs, sub-rnd GRAVEL, w/ cobbles >3" dia, little-some f-crs sand infill matrix (GW)	2 ppm			rec 2.0/2.0 moist
6.3 5.3	42 43	17 18 34 35	(42.0-43.1') dk-brn-red, f-med SAND w/ some f-crs, sub-rnd gravel (SW) (43.1-44) poorly sorted, fine-crs, dense GRAVEL, w/little fine sand (GW)	13 ppm			rec 1.9/2.0 wet-saturated
4.3 3.3	44 45	17 23 17 13	(44.0-45.3') poorly sorted GRAVEL as above w/ crs silty sand interbed @ 45.2-45.3' (GW) (45.3-45.8') brn, med-crs grain SAND, trace f gravel, visible	92 ppm		CSX-MW3 (44-46)	rec 1.8/2.0 saturated strong petroleum odor
2.3	46						

DRILLING LOG

PROJECT: Defense Personnel Support Center, Philadelphia, Pennsylvania	INSPECTOR: John Hilton	HOLE NO. CSX-MW3 / SHEET 4 OF 4 SHEETS

ELEV. a	DEPTH b	Blow Counts c	DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
			petroleum product (SW)			CSX-MW3 (46-48)	rec 1.9/2.0
1.3	47	12 11 12 10	brn, med-crs SAND w/ ltl f gravel interbedded, black petroleum staining @ 47.1-47.9' interval (SW)	>100 ppm			saturated strong petroleum odor
0.3	48		(48.0-48.4') blk petroleum stained, med-crs SAND w/ ltl f gravel (SW)			CSX-MW3 (48-50)	rec 1.3/2.0
-0.7	49	20 25 31 24	(48.4-49.3') poorly sorted GRAVEL w/ cobbles > 3" dia w/ f-med sand as matrix infill (GW)	>100 ppm	qp		saturated visible free product
-1.7	50		GRAVEL as above w/ blk petroleum stained f sand partings < 0.2' thick (GW)				petro sheen on gravel surfaces rec 1.2/2.0
-2.7	51	19 20 38 47		120 ppm			saturated sheen and product odor
-3.7	52						
-4.7	53		End of Boring				
-5.7	54						
-6.7	55						
-7.7	56						
-8.7	57						
-9.7	58						
-10.7	59						
-11.7	60						
-12.7	61						
-13.7	62						
-14.7	63						
-15.7	64						

MALCOLM PIRNIE

OVERBURDEN

MONITORING WELL SHEET

WELL NO. CSX-MW3

PROJECT DPSC   START DATE 6-18-96   END DATE 6-19-96

PROJECT NO. 0285643   FIELD GEOLOGIST J. HILTON

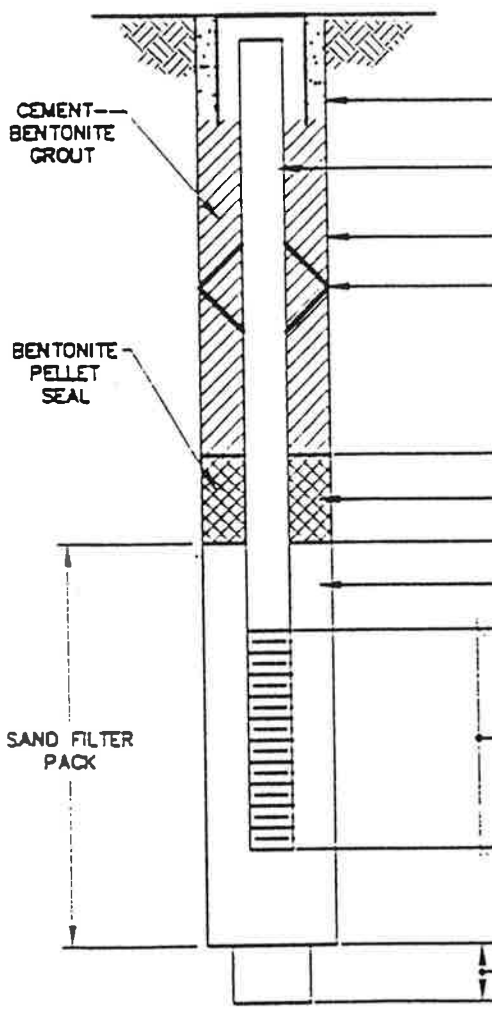
LOCATION CSX RIGHT-OF-WAY, PHILADELPHIA, PA.

DRILLING CO. SJB SERVICES

DRILLER(S) T MILLER

DRILLING METHOD(S) 4 1/4" HSA

DEVELOPMENT METHOD(S) MANUAL PURGE W/ SURGE BLOCK



DEPTH TO TOP OF GROUT/ BOTTOM OF CEMENT 2.0'

RISER DIAMETER AND MATERIAL 2" SCH 40 PVC

BOREHOLE DIAMETER 8.5"

DEPTH TO CENTRALIZERS N/A

DEPTH 35.0'

PELLET SIZE MEDIUM CHIPS

DEPTH 39.0'

SAND SIZE #1 MORIE

DEPTH 42.0'

SCREEN DIAMETER 2"
SLOT SIZE .010
MATERIAL SCH 40 PVC

DEPTH 52.0'

DEPTH 52.5'

BACKFILL MATERIAL NATIVE SAND & GRAVEL

BOTTOM OF BOREHOLE 53.0'

NOTE: DEPTHS ARE FEET BELOW GRADE

DRILLING LOG

HOLE NO.	CSX-MW4
SHEET 1 OF 4 SHEETS	
1. COMPANY NAME	Malcolm Pirnie, Inc.
2. DRILLING CONTRACTOR	SJB Services, Inc.
3. PROJECT	Defense Personnel Support Center
4. LOCATION	Philadelphia, Pennsylvania
5. NAME OF DRILLER	T. Miller
6. MANUFACTURER'S DESIGNATION OF DRILL	CME-85
7. Sizes & Types of Drilling & Sampling Equipment	4 1/4" HSA; 3" stndrd s.s. to 32'; 3" cont. s.s. to 52'
8. HOLE LOCATION	222666.7 North 2717636.7 East
9. SURFACE ELEVATION	47.2'
10. DATE STARTED	6/20/96
11. DATE COMPLETED	6/20/96
12. OVERBURDEN THICKNESS	
15. DEPTH GROUNDWATER ENCOUNTERED	45 feet bgs
13. DEPTH DRILLED INTO ROCK	
16. Depth to Water and Elapsed Time After Drilling Completed	45.33 feet below mp; 6/26/96
14. TOTAL DEPTH OF HOLE	54.2
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	45.38 feet below mp; 6/28/96
18. GEOTECHNICAL SAMPLES	N/A
DISTURBED	
UNDISTURBED	
19. TOTAL NUMBER OF CORE BOXES	

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (Specify)	OTHER (Specify)	OTHER (Specify)	21. Total Core REC %
(46-48),(48-50),(50-52')			HFS	IR SCAN		

22. DISPOSITION OF HOLE	BACKFILLED	Monitoring Well	OTHER (Specify)	23. SIGNATURE OF INSPECTOR
		X		

ELEV. a	DEPTH b	Blow Counts c	DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
47.2	0	3 6 5 3	blk cinders, coal ash, slag, f gravel (FILL)				rec 1.6/2.0 dry
46.2	1			1.6 ppm			
45.2	2						
44.2	3						
43.2	4	12 23 27 13	red brick, mortar, brn silt (FILL)				rec 1.2/2.0 dry
42.2	5			8.2 ppm			
41.2	6						
40.2	7						
39.2	8						
38.2	9	4 3	brn SILT w/ little f sand, red brick, cinders, slag (FILL)				rec 1.6/2.0 moist
37.2	10						

DRILLING LOG

HOLE NO.
CSX-MW4

PROJECT	INSPECTOR	SHEET 2
Defense Personnel Support Center, Philadelphia, Pennsylvania	John Hilton	OF 4 SHEETS

ELEV. a	DEPTH b	Blow Counts c	DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
		3 3		0.3 ppm			
36.2	11						
35.2	12						
34.2	13						
33.2	14		med brn, f SAND w/ ltl, f sub-rnd gravel, slag, coal, concrete (FILL)				rec 1.1/2.0
32.2	15	11 7 5 4		0.2 ppm			moist
31.2	16						
30.2	17						
29.2	18						
28.2	19		med brn, f-med SAND w/ltl f-crs gravel to 2" dia, slag (FILL)				rec 1.0/2.0
27.2	20	7 8 6 6		1.0 ppm			moist
26.2	21						
25.2	22						
24.2	23						
23.2	24		blk coal ash, cinders, slag, w/ brn, med sand parting 24.1-24.4', loose (FILL)				rec 1.6/2.0
22.2	25	7 5 5 5		0.6 ppm			moist-dry
21.2	26						
20.2	27						
19.2	28						

DRILLING LOG

PROJECT: Defense Personnel Support Center, Philadelphia, Pennsylvania	INSPECTOR: John Hilton	HOLE NO. CSX-MW4 SHEET 3 OF 4 SHEETS

ELEV. a	DEPTH b	Blow Counts c	DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
					Fill		
18.2 17.2 16.2 15.2	29 30 31 32	4 6 10 10	lt gray-brn SILT, oxidized Fe staining, tr-ltl f sand, tr blk carbonized silt partings < 0.5" thick @ 30.5, 30.8', very thin bedding fabric (ML)	6.2 ppm	Qal		rec 2.0/2.0 moist
14.2 13.2	33 34	5 4 6 8	med gray SAND w/ oxidized brn partings <0.1' thick, ltl-some silt (SW-SM)	4.8 ppm			rec 2.0/2.0 moist-wet
12.2 11.2	35 36	5 5 11 13	(34.0-35.7') light gray silty SAND, weak dilatancy (SM)	10.8 ppm	Qal		rec 2.0/2.0 moist dry-moist
10.2 9.2	37 38	18 30 40 45	(35.7-36.0') med brn, oxidized, f SAND (SP) (36.0-36.8') gray-brn silty SAND (SM) sharp contact (36.8-37.0') blk vf silty SAND, carbonized (SM) (37.0-37.6') gray-blk, med-crs SAND (SW)	22 ppm			rec 2.0/2.0 moist
8.2 7.2	39 40	36 40 52 47	(37.6-37.0') poorly sorted, fine-crs GRAVEL w/ f sand (GW) (38.0-38.6') GRAVEL w/ sand as above (GW) (38.6-39.0') blk petroleum stained, f-med SAND w/ f gravel (SW) (39.0-39.3') gray-blk, poorly sorted GRAVEL w/ med-crs sand (GW)	24 ppm			rec 2.0/2.0 moist field blank collected @ 1050 moist-dry
6.2 5.2	41 42	31 22 22 21	(39.3-40.0') blk (stained) SAND w/ ltl f-crs gravel (SW) blk med-crs, loose SAND w/ltl f-crs gravel to 2" dia, black petroleum staining throughout (SW)	44 ppm	Qp		
4.2 3.2	43 44	14 13 13 15	(42.0-42.3') blk-brn, f SAND w/ crs gravel, stained (SW) (42.3-43.1') drk brn-orng, fine-crs SAND (SW) (43.1-43.6') blk-brn, f SAND w/ tr silt, stained (SW) (43.6-44.0') gray-blk, med-crs SAND w/ tr f gravel, some staining (SW)	150 ppm			rec 1.9/2.0 moist-wet strong petroleum odor
2.2 1.2	45 46	10 10 10 10	(44.0-44.2') dk brn-blk, f SAND, w/ f gravel, stained (SW) (44.2-46.0) gray-brn, loose, fine-crs SAND w/ tr f gravel (SW)	> 120 ppm			rec 2.0/2.0 water table @ approx 45' bgs petroleum odor

DRILLING LOG

HOLE NO.	CSX-MW4
PROJECT	Defense Personnel Support Center, Philadelphia, Pennsylvania
INSPECTOR	John Hilton
SHEET 4	OF 4 SHEETS

ELEV. a	DEPTH b	Blow Counts c	DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
0.2	47	13 14 10 17	(46.0-47.2') med-crs SAND w/tr f gravel, brn w/ heavy blk petroleum staining 46.5-47.2' (SW)	>100 ppm		CSX-MW4 (46-48) Duplicate CSX-MWA (46-48)	rec 1.7/2.0 saturated strong petroleum odor
			(47.2-47.7') poorly sorted GRAVEL w/ f-med sand (GW)				product on sand and gravel surfaces
-0.8	48	10 28 41 33	(48.0-48.4') gray-blk, stained, med-crs SAND (SW)			CSX-MW4 (48-50)	rec 2.0/2.0
-1.8	49		(48.4-50.0') poorly sorted, dense GRAVEL w/ f sand, heavily stained w/ residual product @ approx. 48.6-49.7' (GW)	>120 ppm			saturated-wet product on gravel and sand
-2.8	50	42 30 40 44	(50.0-51.0') poorly sorted GRAVEL w/ f-med sand, blk petroleum staining (GW)			CSX-MW4 (50-52)	rec 2.0/2.0 saturated
-3.8	51		(51.0-52.0') poorly sorted, fine-crs GRAVEL w/ f sand, densely compacted (GW)	>120 ppm			moist
-6.8	54		End of Boring				

ELEV.	DEPTH
0.2	47
-0.8	48
-1.8	49
-2.8	50
-3.8	51
-4.8	52
-5.8	53
-6.8	54
-7.8	55
-8.8	56
-9.8	57
-10.8	58
-11.8	59
-12.8	60
-13.8	61
-14.8	62
-15.8	63
-16.8	64

MALCOLM PIRNIE

OVERBURDEN MONITORING WELL SHEET

WELL NO. CSX-MW4

PROJECT: DPSC
START DATE: 6-20-96
END DATE: 6-20-96

PROJECT NO.: 0285643
FIELD GEOLOGIST: J. HILTON

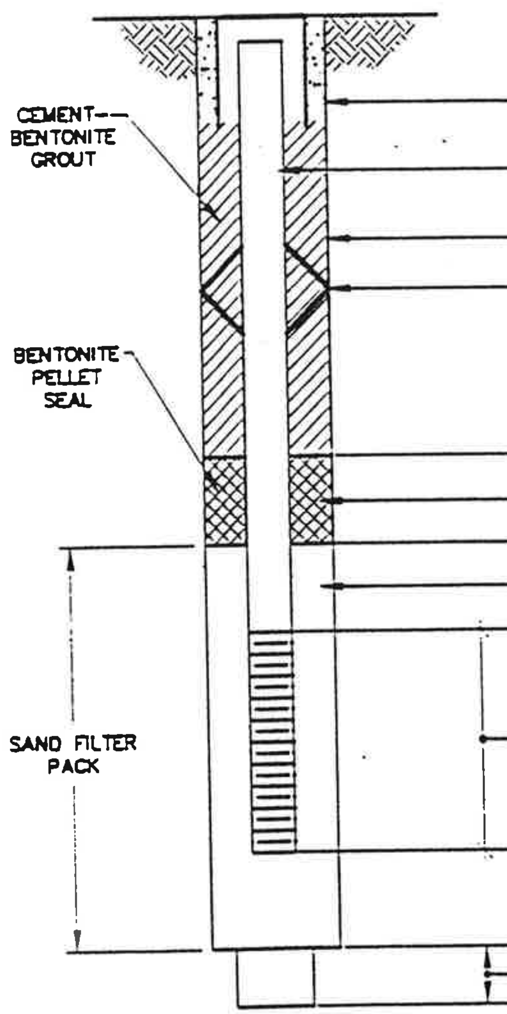
LOCATION: CSX RIGHT-OF-WAY, PHILADELPHIA, PA.

DRILLING CO.: SJB SERVICES

DRILLER(S): T. MILLER

DRILLING METHOD(S): 4 1/4" HSA

DEVELOPMENT METHOD(S): MANUAL PURGE W/ SURGE BLOCK



DEPTH TO TOP OF GROUT/ BOTTOM OF CEMENT:

RISER DIAMETER AND MATERIAL: 2" SCH 40 PVC

BOREHOLE DIAMETER: 8.5"

DEPTH TO CENTRALIZERS: N/A

DEPTH: 36.0'

PELLET SIZE: MEDIUM CHIPS

DEPTH: 40.0'

SAND SIZE: #1 MORIE

DEPTH: 43.0'

SCREEN DIAMETER: 2"
SLOT SIZE: .010
MATERIAL: SCH 40 PVC

DEPTH: 53.0'

DEPTH: 54.0'

BACKFILL MATERIAL: NATIVE SAND & GRAVEL

BOTTOM OF BOREHOLE: 54.2'

NOTE: DEPTHS ARE FEET BELOW GRADE

DRILLING LOG

HOLE NO.	CSX-MW5
1. COMPANY NAME	Malcolm Pirnie, Inc.
2. DRILLING CONTRACTOR	SJB Services, Inc.
SHEET 1	OF 4 SHEETS
3. PROJECT	Defense Personnel Support Center
4. LOCATION	Philadelphia, Pennsylvania
5. NAME OF DRILLER	T. Miller
6. MANUFACTURER'S DESIGNATION OF DRILL	CME-85
7. Sizes & Types of Drilling & Sampling Equipment	4 1/4" HSA 3" standard s.s. to 32' 3" continuous s.s. to 54'
8. HOLE LOCATION	223272.3 North 2717740.3 East
9. SURFACE ELEVATION	49.9'
10. DATE STARTED	6/24/96
11. DATE COMPLETED	6/25/96
12. OVERBURDEN THICKNESS	
15. DEPTH GROUNDWATER ENCOUNTERED	45.8 feet bgs
13. DEPTH DRILLED INTO ROCK	
16. Depth to Water and Elapsed Time After Drilling Completed	44.87 feet below mp; 6/26/96
14. TOTAL DEPTH OF HOLE	54.0
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	45.46 feet below mp; 6/28/96

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
N/A			

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (Specify)	OTHER (Specify)	OTHER (Specify)	21. Total Core REC %
(44-46),(48-50),(52-54)			HFS	IR SCAN		

22. DISPOSITION OF HOLE	BACKFILLED	Monitoring Well	OTHER (Specify)	23. SIGNATURE OF INSPECTOR
		X		

ELEV. a	DEPTH b	Blow Counts c	DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
49.9	0	5 5 4 28	blk coal ash, slag, asphalt, tr-ltl silt and f sand (FILL)	1.0 ppm			rec 1.4/2.0 dry
48.9	1						
47.9	2						
46.9	3						
45.9	4	7 10 12 18	dk brn-blk f SAND, w/ mortar, sub-rnd f-crs gravel, trace ash and silt (FILL)	2.6 ppm			rec 1.5/2.0 moist
44.9	5						
43.9	6						
42.9	7						
41.9	8						
40.9	9	6 5	med-dk brn f SAND as above w/ gravel to 3" dia. (FILL)				rec 0.9/2.0 moist
39.9	10						

DRILLING LOG

HOLE NO. CSX-MW5

PROJECT: Defense Personnel Support Center, Philadelphia, Pennsylvania

INSPECTOR: John Hilton

SHEET 2 OF 4 SHEETS

ELEV. a	DEPTH b	Blow Counts c	DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
		6 5		5.4 ppm			
38.9	11						
37.9	12						
36.9	13						
35.9	14	40 65 33 26	dk brn-gray f SAND w/some f-crs sub-rnd gravel w/cobbles > 3" dia, tr black asphalt (FILL)	8.8 ppm			rec 2.0/2.0 moist
34.9	15						
33.9	16						
32.9	17						
31.9	18						
30.9	19	6 5 6 6	med-brn/gray f SAND, w/ltl crs gravel to 1" dia. (FILL)	2.0 ppm			rec 1.4/2.0 moist
29.9	20						
28.9	21						
27.9	22						
26.9	23						
25.9	24	6 4 5 5	(24.0-24.8') med brn SAND w/ gravel as above (FILL) (24.8-26.0') gry-grn SILT w/tr-ltl f gravel and f sand, wood (FILL)	1.9 ppm			rec 2.0/2.0 moist moist-wet
24.9	25						
23.9	26						
22.9	27						
21.9	28						

DRILLING LOG

PROJECT	INSPECTOR	HOLE NO.
Defense Personnel Support Center, Philadelphia, Pennsylvania	John Hilton	CSX-MW5
		SHEET 3 OF 4 SHEETS

ELEV. a	DEPTH b	Blow Counts c	DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
20.9	29	4 5 8 14	(29.0-29.9') drk brn f silty SAND w/ tr f gravel (FILL)				rec 2.0/2.0 moist
19.9	30		(29.9-30.5') gray-grn SILT w/ crs gravel to 3" dia. (FILL)	2.2 ppm			moist-wet
18.9	31		(30.5-31.0') gray-grn SILT w/ tr clay, brn mottling (FILL)				
17.9	32	4 10 11 8	(32.0-32.4') red-brn f SAND, red brick (FILL)				rec 1.3/2.0
			(32.4-33.0') olive-brn silty SAND, tr f gravel (FILL)				moist
16.9	33		(33.0-33.3') blk coal ash, slag (FILL)	2.2 ppm			dry
15.9	34	5 4 3 3	coal ash, burn debris, slag, coal clinker (FILL)				rec 2.0/2.0 moist-wet
14.9	35			2.0 ppm			
13.9	36	4 4 8 5	burn debris w/ coal, ash, glass, wood, shale (FILL)		Fill		rec 1.7/2.0 wet
12.9	37			1.6 ppm			
11.9	38	6 5 5 5	burn debris as above w/metal, nails, glass (FILL)				rec 1.8/2.0 wet-saturated
10.9	39			0.0 ppm			
9.9	40	6 7 8 9	burn debris as above w/glass, wood, coal, metal (FILL)				rec 1.8/2.0 wet-saturated
8.9	41			2.4 ppm			
7.9	42	9 11 16 15	(42.0-42.7') burn debris as above (FILL) sharp contact				rec 1.8/2.0 wet-saturated - perched water @ 35.6 'bgs
6.9	43		(42.7-43.8') lt gray, dense SILT w/ brn mottling, tr f sand and clay (ML)	1.2 ppm			dry-moist
5.9	44	5 9 30 41	(44.0-44.1') lt gray, dense SILT, ltl clay (ML)		Qal	CSX-MW5 (44-46)	rec 2.0/2.0 moist
4.9	45		(45.1-46.0') gray-brn, med-crs SAND w/ f-crs, sub-rnd gravel to 2" dia. (SW)	120 ppm			strong petroleum odor
3.9	46						

DRILLING LOG

PROJECT	INSPECTOR	HOLE NO.
Defense Personnel Support Center Philadelphia, Pennsylvania	John Hilton	CSX-MW5 SHEET 4 OF 4 SHEETS

ELEV. a	DEPTH b	Blow Counts c	DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
2.9	47	18 20 28 28	(46.0-46.5') SAND w/ gravel as above, dense (SW) (46.5-47.4) lt gray, loose, f-med SAND, ltl-some f-crs gravel (SW)	>100 ppm			rec 2.0/2.0 wet-saturated strong petroleum odor
1.9	48		(47.4-48.0') brn-gray, dense fine-crs GRAVEL w/ sand (GW)			CSX-MW5 (48-50)	
0.9	49	19 30 23 18	(48.0-49.5') GRAVEL w/ f-med sand, gradational color change to lt gray @ 49.1' bgs (GW)	130 ppm	QP		rec 2.0/2.0 strong petroleum odor slight petroleum staining
-0.1	50		(49.5-50.0') gray-brn, loose, med-crs SAND (SW) (50.0-50.5') SAND as above, tr gravel (SW)				rec 1.8/2.0
-1.1	51	10 32 37 35	(50.5-51.8') med brn, dense, f-crs GRAVEL to 2" dia. w/ f sand (GW)	140 ppm			strong petroleum odor
-2.1	52		(52.0-52.6') brn-gray, f-med SAND w/ some f-crs gravel, loose (SW)			CSXMW5 (52-54)	rec 1.6/2.0
-3.1	53	15 28 35 45	(52.6-53.6') poorly sorted, f-crs GRAVEL w/ ltl-some f-med sand (GW)	>100 ppm	KO		staining @ 52.6-53.2'
-4.1	54		End of Boring				
-5.1	55						
-6.1	56						
-7.1	57						
-8.1	58						
-9.1	59						
-10.1	60						
-11.1	61						
-12.1	62						
-13.1	63						
-14.1	64						

MALCOLM PIRNIE

OVERBURDEN MONITORING WELL SHEET

WELL NO. CSX-MW5

PROJECT DPSC

START DATE 6-24-96

END DATE 6-24-96

PROJECT NO. 0285643

FIELD GEOLOGIST J. HILTON

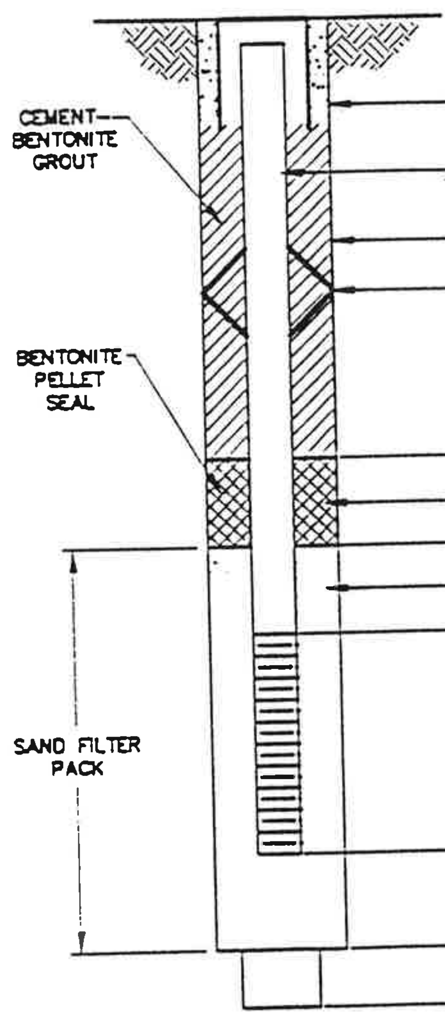
LOCATION CSX RIGHT-OF-WAY, PHILADELPHIA, PA.

DRILLING CO. SJB SERVICES

DRILLER(S) T. MILLER

DRILLING METHOD(S) 4 1/4" HSA

DEVELOPMENT METHOD(S) MANUAL PURGE W/ SURGE BLOCK



DEPTH TO TOP OF GROUT/ BOTTOM OF CEMENT 2.0'

RISER DIAMETER AND MATERIAL 2" SCH 40 PVC

BOREHOLE DIAMETER 8.5"

DEPTH TO CENTRALIZERS N/A

DEPTH 39.5'

PELLET SIZE MEDIUM CHIPS

DEPTH 43.5'

SAND SIZE #1 MORIE

DEPTH 44.0'

SCREEN DIAMETER 2"
SLOT SIZE .010
MATERIAL SCH 40 PVC

DEPTH 53.0'
SUMP TO 53.7'

DEPTH 54.0'

BACKFILL MATERIAL N/A

BOTTOM OF BOREHOLE 54.0'

NOTE: DEPTHS ARE FEET BELOW GRADE

DRILLING LOG

HOLE NO.	CSX-MW6
1. COMPANY NAME	Malcolm Pirnie, Inc.
2. DRILLING CONTRACTOR	SJB Services, Inc.
SHEET 1 OF 4 SHEETS	
3. PROJECT	Defense Personnel Support Center
4. LOCATION	Philadelphia, Pennsylvania
5. NAME OF DRILLER	T. Miller
6. MANUFACTURER'S DESIGNATION OF DRILL	CME-85
7. Sizes & Types of Drilling & Sampling Equipment	4 1/4" HSA 3" stndrd s.s. to 24' 3" cont. s.s. to 52'
8. HOLE LOCATION	222292.9 North 2717662.2 East
9. SURFACE ELEVATION	46.1'
10. DATE STARTED	6/17/96
11. DATE COMPLETED	6/18/96
12. OVERBURDEN THICKNESS	
15. DEPTH GROUNDWATER ENCOUNTERED	44.5 feet bgs
13. DEPTH DRILLED INTO ROCK	
16. Depth to Water and Elapsed Time After Drilling Completed	44.2 feet bgs; 6/20/96
14. TOTAL DEPTH OF HOLE	53.0
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	44.32 feet below mp; 6/28/96
18. GEOTECHNICAL SAMPLES	N/A
DISTURBED	
UNDISTURBED	
19. TOTAL NUMBER OF CORE BOXES	

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (Specify)	OTHER (Specify)	OTHER (Specify)	21. Total Core REC %
(44-46),(48-50),(50-52')			HFS	IR SCAN		

22. DISPOSITION OF HOLE	BACKFILLED	Monitoring Well	OTHER (Specify)	23. SIGNATURE OF INSPECTOR
		X		

ELEV. a	DEPTH b	Blow Counts c	DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
46.1	0	7 26 27 21	blk f SAND w/ f-crs gravel, w/ wood, brick, asphalt, and slag (FILL)	2.0 ppm			rec 2.0/2.0 Drilled and collected standard (5') samples through fill unit moist
45.1	1						
44.1	2						
43.1	3						
42.1	4	3 5 5 6	lt-mod red-brown, f-med SAND, ltl f-crs, sub-rnd gravel (FILL)	0.2 ppm	Fill		rec 1.3/2.0
41.1	5						
40.1	6						
39.1	7						
38.1	8		(8.0-8.2') sandy SILT (FILL) (8.2-9.9') lt-mod brn, f silty SAND,w/ gravel, red-brick, tr clay (FILL)	0.6 ppm			rec 1.9/2.0 moist
37.1	9	4 4					
36.1	10						

DRILLING LOG

HOLE NO. CSX-MW6

PROJECT: Defense Personnel Support Center, Philadelphia, Pennsylvania

INSPECTOR: John Hilton

SHEET 2 OF 4 SHEETS

ELEV. a	DEPTH b	Blow Counts c	DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
		5 22					
35.1	11						
34.1	12						
33.1	13						
32.1	14	8 10 10 8	No recovery	—			rec 0.0/2.0
31.1	15						
30.1	16						
29.1	17						
28.1	18	2 2 6 14	(18.0-18.5') orng-brn fine-crs SAND, w/ tr-ltl f gravel, white plaster (chalk) (FILL) (18.5-19.0') mod brn sandy SILT, trace Fe staining (FILL) (19.0-19.6') mod-drk brn, med-crs SAND w/ gravel, mica schist cobble to > 3" dia (FILL)	0.8 ppm			rec 1.6/2.0 wet
27.1	19						
26.1	20						
25.1	21						
24.1	22						
23.1	23						
22.1	24	5 6 7 6	mod orng-brn, med-crs SAND w/fine-crs, sub-rnd gravel to 2" dia, clay clasts (FILL)	1.8 ppm			rec 1.5/2.0 dry-moist
21.1	25						
20.1	26	7 9 7 12	As above w/ red brick and clay tile (FILL)	3.0 ppm			rec 1.6/2.0
19.1	27						
18.1	28						

DRILLING LOG

PROJECT	INSPECTOR	HOLE NO.
Defense Personnel Support Center, Philadelphia, Pennsylvania	John Hilton	CSX-MW6
		SHEET 3 OF 4 SHEETS

ELEV. a	DEPTH b	Blow Counts c	DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
17.1	29	15 7 6 8			Fill		
16.1 / 15.1	30 / 31	15 7 6 8	drk gray-blk SILT w/ tr-ltl f sand, tr clay (ML)	1.0 ppm			rec 1.1/2.0; moist-wet
14.1 / 13.1	32 / 33	11 13 21 21	(32.0-33.1') mod gray, f SAND, tr-ltl silt (SP-SM); (33.1-33.9') mod brn-gray SAND, Fe oxidation as mottling, tr clay (SP-SM)	2.2 ppm	Qal		rec 1.9/2.0; water w/in borehole perched on silt interval; moist
12.1 / 11.1	34 / 35	13 17 26 30	lt-mod gray, stiff, dense SILT, Fe oxidation 34.0 - 34.5'(ML)	2.2 ppm			rec 2.0/2.0; dry-moist
10.1 / 9.1	36 / 37	20 28 25 32	(36.0-36.3') As above w/ f sand (ML); (36.3-36.9') mod gray, f SAND (SP); (36.9-37.4') blk-gray, f SAND, thin bedded (SP)	6.8 ppm			rec 1.6/2.0; wet; moist-wet
8.1 / 7.1	38 / 39	24 20 19 36	(37.4-37.6') f-crs GRAVEL to 1" dia, crs sand (GW); fine-crs GRAVEL w/ f-med sand, blk organic sand/silt from 38.0-38.6', some f sand and silt interbeds < .1' thick (GW)	16 ppm			rec 2.0/2.0; moist; slight petroleum odor
6.1 / 5.1	40 / 41	29 25 37 19	poorly sorted, fine-crs, sub-rnd GRAVEL w/ f-med sand, black stained gravel and silt @ 41.6-42.0 interval - cobbles throughout to > 3" dia (GW)	12 ppm	Qp		rec 2.0/2.0; petroleum odor
4.1 / 3.1	42 / 43	11 14 15 17	mod gray-brn, poorly sorted, fine-crs SAND w/ f gravel to 0.5" dia (SW)	110 ppm			rec 2.0/2.0; moist-wet; strong gas/petroleum odor
2.1 / 1.1 / 0.1	44 / 45 / 46	12 10 10 15	f-crs SAND w/ some sub-rnd f gravel to 0.25" dia, tr-ltl red-brn silt @ 44-44.5' interval (SW)	110 ppm		CSX-MW6 (44-46)	rec 2.0/2.0; wet-saturated; strong petroleum odor

DRILLING LOG

HOLE NO. CSX-MW6

PROJECT: Defense Personnel Support Center, Philadelphia, Pennsylvania | INSPECTOR: John Hilton | SHEET 4 OF 4 SHEETS

ELEV. a	DEPTH b	Blow Counts c	DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
		18 23 50 50	(46.0-47.1') gray-brn, med-crs SAND w/ oil sheen (SW); sharp contact				rec 2.0/2.0 saturated petroleum odor
-0.9	47			110 ppm			
-1.9	48	4 21 36 36	(47.1-48.0') f-crs, sub-rnd, dense GRAVEL, w/ f-med poorly sorted sand, some oil sheen (GW) poorly sorted GRAVEL as above at 46-48 interval w/ blk hydrocarbon staining @ approx 48.4-48.7', cobble to > 3" dia. (GW)			CSX-MW6 (48-50)	rec 1.2/2.0 saturated
-2.9	49			120 ppm			
-3.9	50	1 4 15 18	(50.0-50.9') poorly sorted GRAVEL as above w/ sand (GW); sharp contact			CSX-MW6 (50-52)	rec 1.6/2.0 saturated
-4.9	51		(50.9-51.6') gray-brn, fine-med SAND (SW)	120 ppm			strong petroleum odor
-5.9	52						
-6.9	53		End of Boring				
-7.9	54						
-8.9	55						
-9.9	56						
-10.9	57						
-11.9	58						
-12.9	59						
-13.9	60						
-14.9	61						
-15.9	62						
-16.9	63						
-17.9	64						

MALCOLM PIRNIE

OVERBURDEN MONITORING WELL SHEET

WELL NO. CSX-MW6

PROJECT DPSC START DATE 6-17-96 END DATE 6-18-96

PROJECT NO. 0285643 FIELD GEOLOGIST J. HILTON

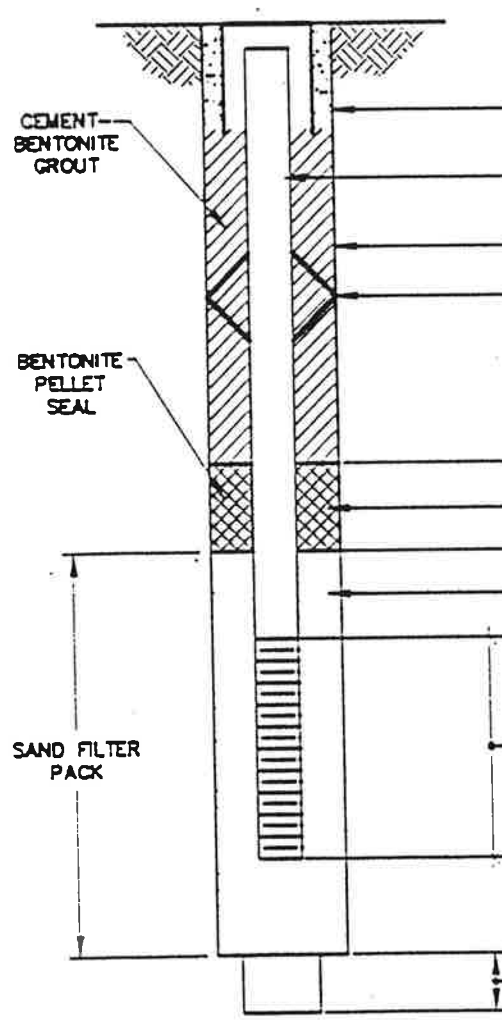
LOCATION CSX RIGHT-OF-WAY, PHILADELPHIA, PA.

DRILLING CO. SJB SERVICES

DRILLER(S) T. MILLER

DRILLING METHOD(S) 4 1/4" HSA

DEVELOPMENT METHOD(S) MANUAL PURGE W/ SURGE BLOCK



DEPTH TO TOP OF GROUT/ BOTTOM OF CEMENT ______

RISER DIAMETER AND MATERIAL 2" SCH 40 PVC

BOREHOLE DIAMETER 8.5"

DEPTH TO CENTRALIZERS N/A

DEPTH 35.5'

PELLET SIZE MEDIUM CHIPS

DEPTH 39.0'

SAND SIZE #1 MORIE

DEPTH 42.0'

SCREEN DIAMETER 2"
SLOT SIZE .010
MATERIAL SCH 40 PVC

DEPTH 52.0'

DEPTH 53.0'

BACKFILL MATERIAL N/A

BOTTOM OF BOREHOLE 53.0'

NOTE: DEPTHS ARE FEET BELOW GRADE

COMPANY NAME: Louis Berger & Associates

TEST PIT NUMBER: 28 TP-O1

PROJECT: DPSC ESI Phase II

WIDTH: 2'

LOCATION: Building 28

LENGTH: 8'

DATE EXCAVATED: 6/20/96

DEPTH: 4'

EXCAVATED BY: L.B.A.

INSPECTED BY: Rich Harding

DEPTH (ft.)	SOIL CLASSIFICATION	REMARKS
	Grass & 4" Topsoil	0 ppm
	Dark brown SILT, some mc Sand and Gravel to pit bottom.	
1	Evidence of 2' wide former trench in the middle of pit to bottom	
2		
3		
4	Sample # 28 TP-01-01 at 4' Analyzed for TPH - GRO and IR-SCAN	0 ppm 9:15
	4' bottom of excavation. No pipe found in pit, but evidence of disturbed soil to 4' deep indicating former trench at 45' from valve pit. Sample collected at this point. See photo #'s 6 & 7	

COMPANY NAME: Louis Berger & Associates

TEST PIT NUMBER: 28 TP-O2

PROJECT: DPSC ESI Phase II

WIDTH: 2'

LOCATION: Building 28

LENGTH: 8'

DATE EXCAVATED: 6/20/96

DEPTH: 3'

EXCAVATED BY: L.B.A.

INSPECTED BY: Rich Harding

DEPTH (ft.)	SOIL CLASSIFICATION	REMARKS
	Grass & 4" Topsoil Dark brown SILT, some mc Sand and Gravel to pit bottom.	0 ppm
1		
2		0 ppm, 3" pipe cut at edge of pit at 2'-6"
	3" Abandoned fuel pipe cut, and not capped.	
3	Sample # 28 TP-02-01 collected at 3' analyzed for TPH + GRO + IRSCAN.	10:15
	3' Bottom of pit Sample collected at 3' deep, 6" directly below invert of pipe at cut pipe end. Pipe was cut at edge of pavement, left uncapped, and unplugged. Pipe found 33' from valve pit.	
4	See photo #'s 8 & 9	

COMPANY NAME: Louis Berger & Associates

TEST PIT NUMBER: 28 TP-O3

PROJECT: DPSC ESI Phase II

WIDTH: 2'

LOCATION: Building 28

LENGTH: 6'

DATE EXCAVATED: 6/20/96

DEPTH: 3'

EXCAVATED BY: L.B.A.

INSPECTED BY: Rich Harding

DEPTH (ft.)	SOIL CLASSIFICATION	REMARKS
	Grass & 4" Topsoil Dark brown SILT, some mc Sand and Gravel to pit bottom of 3'.	0 ppm
1		
2		
	3" Abandoned fuel pipe cut, and not capped.	
3	Sample # 28 TP-03-01, 02, 03,& 04 Collected	11:15
	3' Bottom of pit Sample # 28TP-03-01 (TPH-GRO + IR) 28 TP-03-02 (TPH DUP + IR DUP) 28 TP-03-03 (HFS) 28 TP-03-04 (HFS DUP)	
4	3" pipe cut and left unplugged or capped at edge of pavement 21' from valve pit. See Photo 10 + 11	

COMPANY NAME: Louis Berger & Associates

TEST PIT NUMBER: 28 TP-O4

PROJECT: DPSC ESI Phase II

WIDTH: 2'

LOCATION: Building 28

LENGTH: 6'

DATE EXCAVATED: 6/20/96

DEPTH: 3'

EXCAVATED BY: L.B.A.

INSPECTED BY: Rich Harding

DEPTH (ft.)	SOIL CLASSIFICATION	REMARKS
	Grass & 4" Topsoil	0 ppm
	Crushed 1/2" stone wet, flowing subsurface water	
1	Dark Grey SILT and some Gravel to bottom of pit.	
2		
	3" fuel pipe extending 2' from valve pit, cut and capped at end.	
3	Grey soil, wet. Sample 28TP-04-01 collected and analyzed for TPH-GRO + IR	14:30
4	3' Bottom of pit 3" Fuel Pipe extended from 2' from south wall of valve pit. End cut and capped. No odors or animals or discolorations in soil. See Photo #'s 12 + 13	

COMPANY NAME: Louis Berger & Associates	TEST PIT NUMBER: 28 TP-O5
PROJECT: DPSC ESI Phase II	WIDTH: 2'
LOCATION: Building 28	LENGTH: 8'
DATE EXCAVATED: 6/20/96	DEPTH: 3.5'
EXCAVATED BY: L.B.A.	INSPECTED BY: Rich Harding

DEPTH (ft.)	SOIL CLASSIFICATION	REMARKS
	4" Asphalt	0 ppm
	4" Crushed 1/2" Stone and Gravel	
1	Dark Brown SILT and Gravel to 2.5'	
2		0 ppm
3	Dark Brown to grey silt and sand	10 ppm Diesel Odor
	2" Fuel Pipe XXXXX leading to pump locomotive soil stained with strong diesel odor.	
	Dark brown to grey sand, visibly stained with strong diesel odor.	Samples Collected
4	3.5' Pit Bottom Soil from 2.5' - 3.5' visibly stained with strong diesel odor. Samples collected below pipe elevation at 3.5' Samples: 28TP-05-01 (TPH-DRO, IR) 28TP-05-02 (HFS) 28TP-05-03 (HFS DUP) 28TP-05-04 (TPH-DRO DUP, IR DUP) See Photo # 14	16:00

COMPANY NAME: Louis Berger & Associates

TEST PIT NUMBER: 28 TP-O6

PROJECT: DPSC ESI Phase II

WIDTH: 2'

LOCATION: Building 28

LENGTH: 6'

DATE EXCAVATED: 6/21/96

DEPTH: 2.75'

EXCAVATED BY: L.B.A.

INSPECTED BY: Rich Harding

DEPTH (ft.)	SOIL CLASSIFICATION	REMARKS
	4" Asphalt	0 ppm
	Crushed 1/2" Stone and Gravel, wet with flowing water	
1	Brown m SILT, some Gravel soil wet from runoff of surface puddles + subsurface water perched in stone layer above.	0 ppm
2		
	2" fuel line to locomotive pump, no staining, but diesel odors.	0.5 ppm
	Sample # 28TP-06-01 (TPH-DRO, IR SCAN) Collected here at 12:30	0.5 ppm
3	Bottom of Pit 2.75' 2" Fuel line cut and capped; 28.5' from edge of pavement.	
4	Sample collected just below pipe invert at 2.75'. No apparent soil staining, but strong odor of diesel at and below pipe. See Photo # 15, 16, 17, 20	

COMPANY NAME: Louis Berger & Associates

TEST PIT NUMBER: 28 TP-O7

PROJECT: DPSC ESI Phase II

WIDTH: 2'

LOCATION: Building 28

LENGTH: 6'

DATE EXCAVATED: 6/21/96

DEPTH: 4'

EXCAVATED BY: L.B.A.

INSPECTED BY: Rich Harding

DEPTH (ft.)	SOIL CLASSIFICATION	REMARKS
	Grass & 4" topsoil	0 ppm
1 2 3	Brown m SILT & some mc Sand & Gravel	0 ppm
	3" fill line at 3.5' soil stained with diesel odors	0.5 ppm
4	Dark Brown and Black soil; appeared stained with diesel odors.	0.5 ppm
	Bottom of Pit 4' (1) Sample 28TP-07-01 (TPH-GRO, IR- SCAN) collected at 4', 76' from valve pit (2) Sample 28TP-07-02 (TPH-GRO, IR-SCAN) collected at 4', 70' from valve pit See Photo # 18	10:40 10:45

COMPANY NAME: Louis Berger & Associates

TEST PIT NUMBER: 28 TP-O8

PROJECT: DPSC ESI Phase II

WIDTH: 3'

LOCATION: Building 28

LENGTH: 6'

DATE EXCAVATED: 6/21/96

DEPTH: 3.25'

EXCAVATED BY: L.B.A.

INSPECTED BY: Rich Harding

DEPTH (ft.)	SOIL CLASSIFICATION	REMARKS
	Grass & 4" topsoil	0 ppm
1 2	Brown m SILT & some mc Sand & Gravel	
3	3" pipe at 2.7' soil dark Brown to black; stained with petrol odors	4 ppm
	Dark Brown to black stained with petrol odors sample 28TP-08-01 (TPH, IR SCAN)	4 ppm
4	3.25 Bottom of Pit Sample collected at 11:20. Soil at pipe and 6 " below invert visibly stained and had petrol odors. Sample collected 39' from valve pit See Photo # 19	

COMPANY NAME: Louis Berger & Associates	TEST PIT NUMBER: 28 TP-O9
PROJECT: DPSC ESI Phase II	WIDTH: 2'
LOCATION: Building 28	LENGTH: 6'
DATE EXCAVATED: 6/21/96	DEPTH: 4'
EXCAVATED BY: L.B.A.	INSPECTED BY: Rich Harding

DEPTH (ft.)	SOIL CLASSIFICATION	REMARKS
	Grass & 4" topsoil	0 ppm
1 2	Brown m SILT & some mc Sand & Gravel No Staining or odors	0 ppm
3	Same as 0' to 2' with some construction debris (wood, cut pieces of wire,bricks) indicating former excavation possible pipe trench.	
	Brown m SILT, some mc Sand	0 ppm
4	Sample 28TP-09-01 (TPH, IR SCAN)	
	4' Bottom of Pit No pipe found in pit; but evidence of previous excavation, sample collection at 12:40, 4' Deep, 29' from valve pit, 13' from edge of pavement See Photo # 21	

071

Drilling Report for
The Defense Personnel Support Center
Fuel Contamination Study
South Philadelphia, PA

Prepared by:
CENAB-EN-F
January 1988

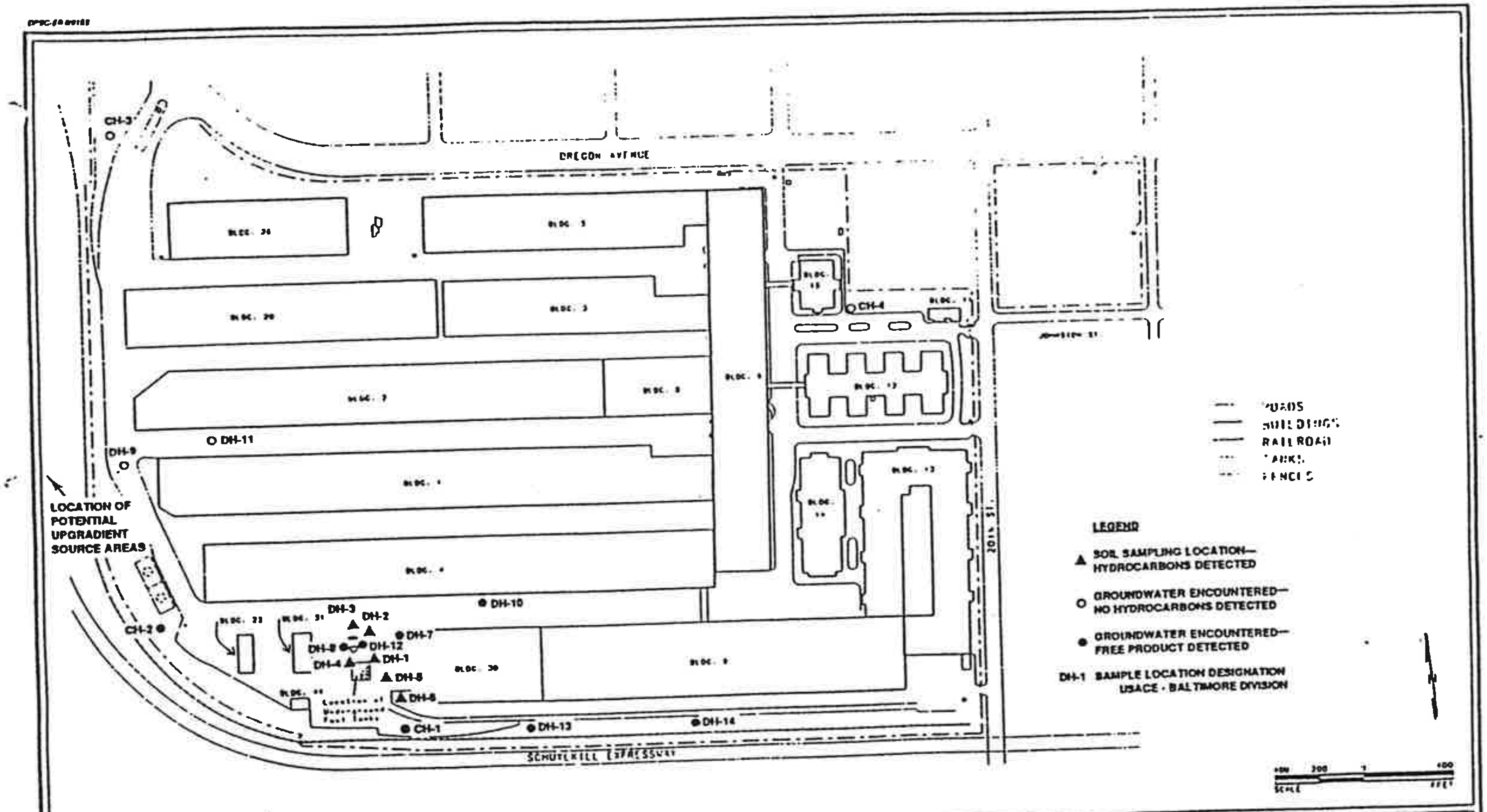


Figure 1-5
PREVIOUS SOIL AND GROUNDWATER SAMPLING LOCATIONS

SOURCES: USACE, 1990; ESE.

U.S. ARMY CORPS OF ENGINEERS
HUNTSVILLE DIVISION

ENVIRONMENTAL SCIENCE
& ENGINEERING, INC.

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1988

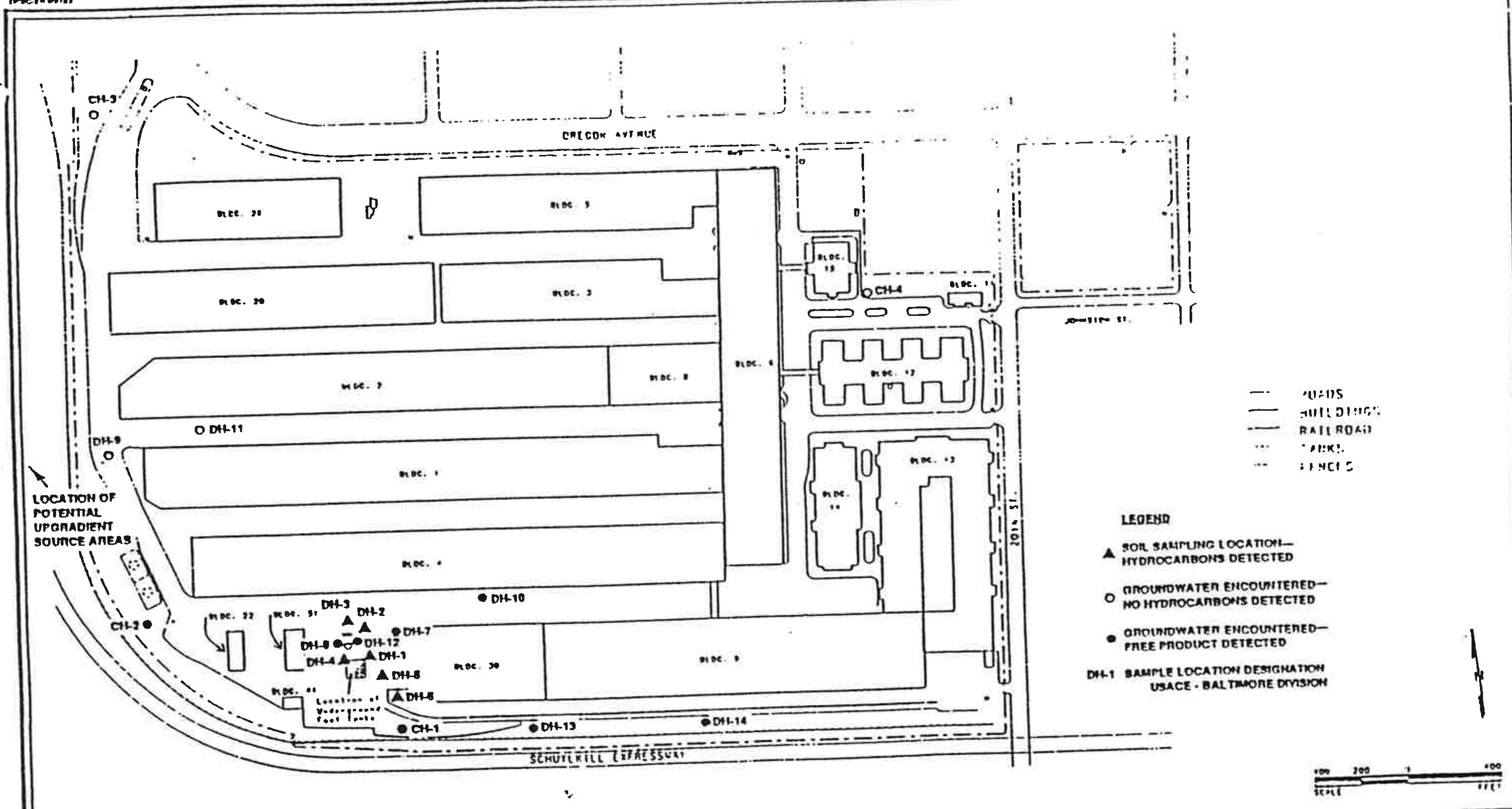


Figure 1-5
PREVIOUS SOIL AND GROUNDWATER SAMPLING LOCATIONS

U.S. ARMY CORPS OF ENGINEERS
HUNTSVILLE DIVISION

ENVIRONMENTAL SCIENCE & ENGINEERING, INC.

USACE, 1990; ESE.

Hole No. DH-

DRILLING LOG

DIVISION	NAD
INSTALLATION	NAB
SHEET	1 OF 1 SHEETS
1. PROJECT	DPSC FUEL CONTAMINATION STUDY
2. LOCATION (Coordinates or Station)	DEFENSE PERSONNEL SUPPORT CENTER PA.
3. DRILLING AGENCY	BDO
4. HOLE NO. (As shown on drawing title and file number)	DH-1
5. NAME OF DRILLER	BOWDEN
6. DIRECTION OF HOLE	☒ VERTICAL ☐ INCLINED ______ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	18.0
8. DEPTH DRILLED INTO ROCK	—
9. TOTAL DEPTH OF HOLE	18.0
10. SIZE AND TYPE OF BIT	SEE REMARKS
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MSL
12. MANUFACTURER'S DESIGNATION OF DRILL	FAILING - F-10
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED 10; UNDISTURBED —
14. TOTAL NUMBER CORE BOXES	—
15. ELEVATION GROUND WATER	NOT ENCOUNTERED
16. DATE HOLE	STARTED 1 DEC. 87; COMPLETED 1 DEC. 87
17. ELEVATION TOP OF HOLE	15.38
18. TOTAL CORE RECOVERY FOR BORING	—
19. SIGNATURE OF INSPECTOR	KASNIA - KRINER

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	0					
14.18	1.2	FILL	concrete parking lot (used a jackhammer)	— / 1.2	—	Continuous samples were obtained by using a 6" hollow stem auger with a 3" split sampler
12.38	3.0	FILL	subbase & fill	64%	1.5 JAR 101 2.0	
11.88	3.5		moist red-brn w/orange lenses sandy silt		3.0 JAR 102 3.5	
9.88	5.5		moist grey with orange lenses micaceous sandy silt w/trace of clay	4.0	5.0 JAR 103 5.5	Augered between 9.0 & 10.0 (without the inner tube) to avoid cobbles
7.88 (Qal)	7.5		moist to wet brown red & grey sandy silt	80%	7.0 JAR 104 7.5	test samples: S-DH-1-109 16.5-17.0 (2645 ppm) S-DH-1-110 17.5-18.0 (140 ppm)
6.38	9.0		moist brownish red silty sand w/some gravel, trace of clay	9.0	8.5 JAR 105 9.0	
5.38	10	?	augered 9.0-10.0 - no samples	— / 10.1		detectable oil smell: S-DH-1-108 strong; S-DH-1-109 strong; S-DH-1-110 strong
(Qp)			moist brown sand with some gravel	63% / 12.5	12.0 JAR 106 12.5	Hole was backfilled on 2 Dec. 1987 with a 5% bentonite grout mix. The hole was still dry after 16 hours.
	15			68% / 15.0	14.5 JAR 107 15.0	
-1.12	16.5			100% / 16.5	16.0 JAR 108	
-1.62	17.0		moist black-brn silty sand with gravel		JAR 109	
			moist to wet brn.-red clayey silt, micaceous	100% / 18.0	17.0 17.5 JAR 110	
			BOH @ 18.0'			
	20		additional test samples: S-DH-1-101 (1.5-2.0) 117 ppm; S-DH-1-103 (5.0-5.5) 46 ppm; S-DH-1-106 (12.0-12.5) <40 ppm			Bldg. #28 SE corner 30' DH-1 HOLE LOCATION

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT DPSC FUEL CONTAMINATION | HOLE NO. DH-1

DRILLING LOG | DIVISION: NAD | INSTALLATION: NAD | Hole No. DH-2 | SHEET 1 OF 1 SHE[ETS]

1. PROJECT: DPSC FUEL CONTAMINATION STUDY
2. LOCATION (Coordinates or Station): DEFENSE PERSONNEL SUPPORT CENTER, PA
3. DRILLING AGENCY: BDO
4. HOLE NO. (As shown on drawing title and file number): DH-2
5. NAME OF DRILLER: BOWDEN
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED ______ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 18.0
8. DEPTH DRILLED INTO ROCK: —
9. TOTAL DEPTH OF HOLE: 18.0
10. SIZE AND TYPE OF BIT: SEE REMARKS
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
12. MANUFACTURER'S DESIGNATION OF DRILL: FAILING - F-10
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED 11 | UNDISTURBED —
14. TOTAL NUMBER CORE BOXES: —
15. ELEVATION GROUND WATER: NOT ENCOUNTER[ED]
16. DATE HOLE: STARTED 1 DEC 87 | COMPLETED 1 DEC 87
17. ELEVATION TOP OF HOLE: 15.31
18. TOTAL CORE RECOVERY FOR BORING: —
19. SIGNATURE OF INSPECTOR: KASNIA-KRINER

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f
15.31	0	FILL	jackhammered through asphalt & concrete	1.2	
14.11	1.2	FILL	moist black silty sandy gravel. (FILL)		JAR 111 (1.4–1.9)
12.31	3.0		moist grey and brown with orange lenses sandy clayey silt	4.0	JAR 112 (3.0–3.5)
Qal	5				JAR 113 (5.0–5.5)
8.81	6.5		moist grey black silty sandy gravel	6.5	
				8.1	JAR 114 (7.6–8.1)
6.31	9.0		moist brown sand	9.0	JAR 115 (10.0–10.5)
	10				
4.31	11.0		moist brown sand with some gravel	11.0 → 11.5	JAR 116 (11.5)
QP				14.0	JAR 117 (13.0–13.5)
	15				JAR 118 (14.5–15.0)
−0.19	15.5		moist brown silty sand with some gravel & a trace of clay.	16.5	JAR 119 (16.0–16.5)
				17.3 → 17.5	JAR 120 (16.8–17.3)
−2.19	17.5		moist brown silty sand		JAR 121
			BOH @ 18.0'		
	20				

REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)

Continuous samples were obtained by using a 6" hollow stem auger with a 3" inner split sampler tube

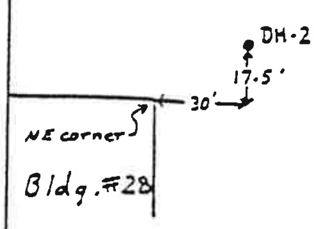
Augered 8.1–9.0' without the inner tube to avoid lar[ge] cobbles.

test samples:
S-DH-2-120
16.8–17.3 (7076 pp[m])
S-DH-2-121
17.5–18.0 (< 40 pp[m])

detectable oil smells:
S-DH-2-114 stron[g]
S-DH-2-115 faint
S-DH-2-116 strong
S-DH-2-117 trace
S-DH-2-118 trace
S-DH-2-119 strong
S-DH-2-120 stron[g]
S-DH-2-121 stron[g]

Hole was back-filled 2 Dec. 87 with a 5% bentonite grout. The hole was still dry

additional test samples:
S-DH-2-111
1.4–1.9 (57 ppm)
S-DH-2-113
5.0–5.5 (44 ppm)
S-DH-2-117
13.0–13.5 (49 ppm)



Hole Location

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. | PROJECT: DPSC Fuel Contamination | HOLE NO. DH-2

DRILLING LOG | DIVISION: NAD | INSTALLATION: Nad | Hole No. DH-[illegible] | SHEET OF 1 SH[illegible]

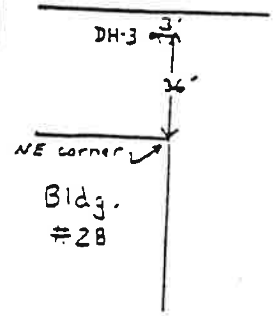
1. PROJECT: DFSC FUEL CONTAMINATION STUDY
2. LOCATION (Coordinates or Station): DEFENSE PERSONNEL SUPPORT CENTER PA
3. DRILLING AGENCY: BDC
4. HOLE NO. (As shown on drawing title and file number): DH-3
5. NAME OF DRILLER: BOWDEN
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED ______ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 18.0
8. DEPTH DRILLED INTO ROCK: —
9. TOTAL DEPTH OF HOLE: 18.0
10. SIZE AND TYPE OF BIT: SEE REMARKS
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
12. MANUFACTURER'S DESIGNATION OF DRILL: FAILING F-10
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 9 | UNDISTUR[BED] —
14. TOTAL NUMBER CORE BOXES: —
15. ELEVATION GROUND WATER: NOT ENCOUNTERE[D]
16. DATE HOLE: STARTED 2 DEC 87 | COMPLETED 2 DEC 8[7]
17. ELEVATION TOP OF HOLE: 15.47
18. TOTAL CORE RECOVERY FOR BORING: —
19. SIGNATURE OF INSPECTOR: KASNIA - KRINER

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
14.07	1.4	FILL	Concrete & asphalt parking lot - jack-hammered	— 1.4	— 1.4	Continuous sampl[es] were obtained b[y] using a 6" hollow stem auger with 3" inner split sampler tube.
11.97	3.5	FILL	moist grey brown clayey silty sand with gravel & cinders (fill)	60% 4.0	JAR 122 1.9 3.5	
Qal 9.97	5 5.5		moist grey with orange lenses clayey sandy silt (micaceous)		JAR 123 4.0 5.0	No sample was r[e]covered between 10.5 - 11.5 due to cobbles blocking the 3" inner tub[e]
6.47	9.0		grey brown sandy gravel	100% 7.4	JAR 124 5.5 6.9 JAR 125 7.4	
5.97	9.5		moist red-grey sand w/ pebbles	33% 9.0	8.4 JAR 126 JAR 127	test samples: S-3-129 16.0-16.5 (< 40 ppm) S-3-130 17.5-18.0 (280 ppm)
3.97	10 11.5		large gravel & cobbles (no sample 10.5-11.5)	67% 10.5 0% 11.5	9.5	
Qp -0.53	15 16.0		moist brown grey sand with some gravel	40% 14.0 80%	13.5 JAR 128 14.0	detectable oil smells: S-DH-3-122 stron[g] S-DH-3-125 stron[g] S-DH-3-126 trace S-DH-3-129 stron[g] S-DH-3-130 stron[g]
-1.53	17.0		moist red brown sand with some gravel	16.5	16.0 JAR 129 16.5	Hole was backfille[d] with a 5% bento-nite grout on 3 Dec. 87.
Ko			moist. brown red clayey silty sand.	100%	17.5 JAR 130	

BOH @ 18.0'

20

additional test samples:
S-3-122
1.4-1.9 (108 ppm)
S-3-123
3.5-4.0 (< 40 ppm)
S-3-126
8.4-9.0 (68 ppm)



Hole location

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT: DFSC FUEL CONTAMINATION | HOLE NO. —

Hole No. DH-4

DRILLING LOG	DIVISION NAD	INSTALLATION NAD	SHEET 1 OF 1 SHEETS

1. PROJECT: DPSC FUEL CONTAMINATION STUDY	10. SIZE AND TYPE OF BIT: SEE REMARKS
2. LOCATION (Coordinates or Station): DEFENSE PERSONNEL SUPPORT CENTER, PA	11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
3. DRILLING AGENCY: BDO	12. MANUFACTURER'S DESIGNATION OF DRILL: FAILING -F-10
4. HOLE NO. (As shown on drawing title and file number): DH-4	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 8; UNDISTURBED —
5. NAME OF DRILLER: BOWDEN	14. TOTAL NUMBER CORE BOXES: —
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED ___ DEG. FROM VERT.	15. ELEVATION GROUND WATER: NOT ENCOUNTERED
	16. DATE HOLE: STARTED 2 DEC 87; COMPLETED 2 DEC 87
7. THICKNESS OF OVERBURDEN: 18.0	17. ELEVATION TOP OF HOLE: 15.61
8. DEPTH DRILLED INTO ROCK: —	18. TOTAL CORE RECOVERY FOR BORING: — %
9. TOTAL DEPTH OF HOLE: 18.0	19. SIGNATURE OF INSPECTOR: KASNIA - KRINER

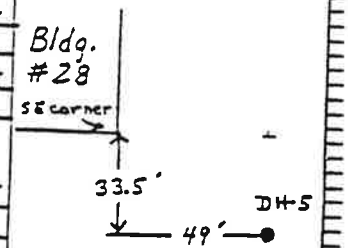
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
15.21	0.4		topsoil, grass, roots, moist			
		FILL	moist sandy slightly clayey micaceous silt with pebbles.	80%	1.2 / JAR 131 / 1.7	Continuous samples were obtained by using a 6" hollow stem auger with a 3" inner split sampler tube.
12.61 / Qwl	3.0 / 5		moist grey with orange lenses sandy slightly clayey micaceous silt.	5.0 / 100% / 7.0	4.5 / JAR 132 / 5.0 / 6.0 / JAR 133 / 6.5	Augered 10.8 to 12.5 without the inner tube to avoid large cobbles & gravel.
8.61 / Qp	7.0 / 10		moist black-grey sand with gravel and cobbles.	7.5 / 40% / 10.0	JAR 134 / 7.5 / 9.0 / JAR 135 / JAR 136	test samples: S-DH-4-137 14.5-15.0 (<40ppm) S-DH-4-138 17.5-18.0 (<40ppm)
4.81	10.8		augered 10.8-12.5 no samples gravel & cobbles	— / 12.5	10.8	detectable oil smell: S-DH-4-132 trace S-DH-4-135 trace S-DH-4-137 strong S-DH-4-138 strong
3.11	12.5 / 15		moist brown sand and gravel	— / 15.0 / —	14.0 / JAR 137 / 15.0 / 17.5	Hole was backfilled 3 Dec. 87 with a 5% bentonite grout mix. The hole was still dry.
Ko -1.8	17.5		moist orange silty sand tr. clay	18.0	JAR 138	
			BOH @ 18.0'			
	20					Bldg. #28 SE corner 15' DH-4 5'

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.

PROJECT: DPSC FUEL CONTAMINATION | HOLE NO. DH-4

DRILLING LOG	DIVISION NAD	INSTALLATION NAB	Hole No. DH-5 SHEET 1 OF 1 SHEETS
1. PROJECT DPSC FUEL CONTAMINATION STUDY		10. SIZE AND TYPE OF BIT SEE REMARKS	
2. LOCATION (Coordinates or Station) DEFENSE PERSONNEL SUPPORT CENTER, PA		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY BDO		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING - F-10	
4. HOLE NO. (As shown on drawing title and file number) DH-5		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 10; UNDISTURBED —	
5. NAME OF DRILLER BOWDEN		14. TOTAL NUMBER CORE BOXES —	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.		15. ELEVATION GROUND WATER -4.77 (at compl.)	
		16. DATE HOLE: STARTED 3 DEC 87; COMPLETED 3 DEC 87	
7. THICKNESS OF OVERBURDEN 21.5		17. ELEVATION TOP OF HOLE 15.13	
8. DEPTH DRILLED INTO ROCK —		18. TOTAL CORE RECOVERY FOR BORING —	
9. TOTAL DEPTH OF HOLE 21.5		19. SIGNATURE OF INSPECTOR KASNIA-KRINER	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	0	FILL	concrete (jackhammered)			
13.83	1.0 / 1.3		subbase	1.0		Continuous samples were obtained by using a 6" hollow stem auger with a 3" inner split sampler tube.
Qal			moist clayey, fine sandy silt with orange seams and lenses.	97%	3.5 JAR 169	
	5		4.7-5.0 = fine orange sand seam	4.0 / 100%	4.0	test samples: S-DH-5-176 18.5-19.0 (44 ppm) S-DH-5-178 21.0-21.5 (9786 ppm)
9.13	6.0				6.0 JAR 170 6.5	
Qp	10		moist orange sand with pebbles, gravel, and cobbles of various colors and mineralogies. (the auger labored through this zone).	6.5 / 0% / 9.0 / 64%	10.5 JAR 171 11.0	detectable gasoline smell: S-DH-5-176 strong S-DH-5-177 strong S-DH-5-178 strong
				11.5 / 56% / 14.0	12.5 JAR 172 13.0	Hole was backfilled 3 Dec. 87 with a 5% bentonite grout mix. Visible gasoline fumes were coming out of the hole prior to backfilling.
-.37	15 / 15.5			84%	15.0 JAR 173 15.5	
Km			moist red-brown micaceous clayey silt/ silty clay	16.5	16.0 JAR 174 16.5	
-2.07	17.2		moist tan silty clay		17.4 JAR 175 17.9	
-2.87	18.0			88%	18.5 JAR 176	
Ko	20		gasoline saturated orange sand with pebbles and gravel, (cobbles near the base).	19.0 / 68%	19.0 / 20.5 JAR 177	
	21.5			21.0 / 21.5	JAR 178	
			BOH @ 21.5			



hole location

additional test samples
S-DH-5-169
3.5-4.0 (44 ppm)
S-DH-5-171
10.5-11.0 (44 ppm)

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT DPSC FUEL CONTAMINATION STUDY | HOLE NO. DH-5

DRILLING LOG

DRILLING LOG	DIVISION NAD	INSTALLATION NAc	Hole No. DH-6 / SHEET 1 OF 1 SHEETS
1. PROJECT	DPSC Fuel Contamination Study	10. SIZE AND TYPE OF BIT	SEE REMARKS
2. LOCATION (Coordinates or Station)	Defense Personnel Support Center PA	11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MSL
3. DRILLING AGENCY	BDO	12. MANUFACTURER'S DESIGNATION OF DRILL	Failing - F-10
4. HOLE NO. (As shown on drawing title and file number)	DH-6	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN	DISTURBED 10 / UNDISTURBED —
5. NAME OF DRILLER	Bowden	14. TOTAL NUMBER CORE BOXES	—
6. DIRECTION OF HOLE	[X] VERTICAL [ ] INCLINED ______ DEG. FROM VERT.	15. ELEVATION GROUND WATER	-4.36 (45 min. after completion)
		16. DATE HOLE	STARTED 4 DEC. 87 / COMPLETED 4 DEC. 87
7. THICKNESS OF OVERBURDEN	20.7	17. ELEVATION TOP OF HOLE	14.94
8. DEPTH DRILLED INTO ROCK	—	18. TOTAL CORE RECOVERY FOR BORING	—
9. TOTAL DEPTH OF HOLE	20.7	19. SIGNATURE OF INSPECTOR	Kasnia-Kriner

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	0 – 0.4	FILL	asphalt			
	0.4 – 0.9	FILL	subbase	—		
13.44	0.9 – 1.5	FILL	not sampled	1.5		Continuous samples were obtained by using a 6" hollow stem auger with a 3" inner split sampler tube.
Qal	1.5 – 6.3		moist light grey with orange lenses and splotches fine sandy silt, trace of clay	100% (to 4.0); 100% (to 6.5)	3.0 JAR 179 3.5; 6.0 JAR 180 6.5	The 6" auger without the inner tube was used to auger through asphalt, concrete, & subbase 0.0 to 1.5 and also to auger through boulders and cobbles 18.5 to 20.4. A 3" drive spoon was used to get sample 188.
8.64	6.3 – 15		moist orange sand with pebbles, gravel, and cobbles of various colors and mineralogies. the sand gets finer with depth	76% (to 9.0); 36% (to 11.5); 56% (to 14.0)	8.0 JAR 181 8.5; 10.0 JAR 182 10.5; 12.5 JAR 183 13.0; JAR 184; 14.5 JAR 185	test samples: S-DH-6-181 8.0-8.5 (<40 ppm) S-DH-6-187 17.5-18.0 (<40ppm) S-DH-6-188 20.2-20.7 (8999 ppm)
QP						
-0.06	15 – 16.5		moist orange silty sand w/pebb. grav. & cobb., trace of clay	96% (to 16.5)	15.0 / 16.0 JAR 186 16.5	
-1.56	16.5 – 18.5		moist orange sand with pebbles, gravel & cobbles of various colors & min.	45% (to 18.5)	17.5 JAR 187 18.0	Hole was backfilled 4 Dec. 87 with a 5% bentonite grout mix
-3.56	18.5 – 20.7	—	augered through gasoline saturated boulders & cobbles	— ; 20.1; 100%	20.2 JAR 188	detectable oil smell: S-6-181 - trace S-6-182 - trace S-6-183 - trace S-6-184 - trace
			BOH @ 20.7			detectable gasoline smell: S-6-187 - strong S-6-188 - strong

hole loc. 22' 41' Bldg #30 SW corner

additional test sample:
S-DH-6-185
14.5-15.0 (<40 ppm)

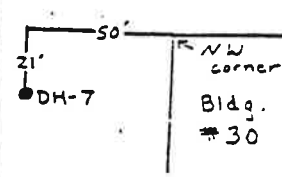
ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT DPSC Fuel Contamination | HOLE NO. DH-6

Hole No. DH-7

DRILLING LOG | DIVISION: NAD | INSTALLATION: NAB | SHEET 1 OF 1 SHEETS

1. PROJECT: DPSC Fuel Contamination Study
2. LOCATION (Coordinates or Station): Defense Personnel Support Center, Pa
3. DRILLING AGENCY: BDO
4. HOLE NO. (As shown on drawing title and file number): DH-7
5. NAME OF DRILLER: Bowden
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 24.0
8. DEPTH DRILLED INTO ROCK: —
9. TOTAL DEPTH OF HOLE: 24.0
10. SIZE AND TYPE OF BIT: SEE REMARKS
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
12. MANUFACTURER'S DESIGNATION OF DRILL: Failing - F-10
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 14 | UNDISTURBED —
14. TOTAL NUMBER CORE BOXES: —
15. ELEVATION GROUND WATER: -5.3 (at completion)
16. DATE HOLE: STARTED 8 DEC 87 | COMPLETED 8 DEC 87
17. ELEVATION TOP OF HOLE: 14.9
18. TOTAL CORE RECOVERY FOR BORING: — %
19. SIGNATURE OF INSPECTOR: Kriner - Kasnia

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	0.4	FILL	asphalt			Continuous samples were obtained by using a 6" hollow stem auger with a 3" inner split sampler tube.
	1.4	FILL	concrete & subbase	— / 1.4	— / 1.4	
12.9	2.0	FILL	moist brown sand w/pebbles		JAR 203 / 2.0	test samples:
Qul			moist grey clayey micaceous silt with orange seams and lenses.	81% / 4.0 / 100%	3.5 / JAR 204 / 4.0 / 4.5 / JAR 205 / 5.0 / 5.5	S-DH-7-204 3.5-4.0 (<40 ppm)
9.4	5 / 5.5					S-DH-7-206 5.5-6.0 (49 ppm)
Qul			moist orange silty clayey sand	6.5 / 48%	JAR 206 / 6.0	S-DH-7-208 12.0-12.5 (<40 ppm)
6.6	8.3			9.0	8.5 / JAR 207 / 9.0	S-DH-7-212 17.5-18.0 (<40 ppm)
Qp	10		moist blackish-grey (locally red grey) sand with pebbles, gravel, and cobbles of various colors and mineralogies.	60% / 11.5 / 60% / 14.0	12.0 / JAR 208 / 12.5 / 14.0 / JAR 209	S-DH-7-214 20.0-20.5 (16,789 ppm) S-DH-7-216 23.5-24.0 (1593 ppm) Hole was backfilled 8 Dec. 87 with a 5% bentonite grout mix.
0.1	14.8 / 15		moist brown silty clay/clayey silt with occasional fine sandy silt seams 3-4" thick and a 1" coarse sand seam 15.7-15.8.	80% / 15.7 / 15.8 / 16.0 / 16.5 / 100%	17.3 / JAR 210 / JAR 211 / 16.5 / 17.5 / JAR 212 / 18.0 / 18.5	The clear bailer showed 2.2 feet of free product on the water table surface.
Vu						
-3.6	18.5		orange moist silty sand with pebbles, gravel, and cobbles.	19.0 / 44%	JAR 213 / 19.0 / 20.0 / JAR 214 / 20.5 / 21.0	detectable gasoline smells: S-DH-7-215 strong S-DH-7-216 strong
Vd	20					
-6.1	21.0		gasoline saturated black-grey sand with pebbles and gravel.	21.5 / 40% / 24.0	JAR 215 / 21.5 / 23.5 / JAR 216	
	24.0		BOH @ 24.0			hole location

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT: DPSC Fuel Contamination | HOLE NO. DH-7

DRILLING LOG | DIVISION: NAD | INSTALLATION: NAD | Hole No. DH-8

SHEET 1 OF 1 SHEETS

1. PROJECT: DPSC Fuel Contamination Study
2. LOCATION (Coordinates or Station): Defense Personnel Support Center, PA.
3. DRILLING AGENCY: BDO
4. HOLE NO. (As shown on drawing title and file number): DH-8
5. NAME OF DRILLER: Bowden
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED ______ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 25.0
8. DEPTH DRILLED INTO ROCK: —
9. TOTAL DEPTH OF HOLE: 25.0
10. SIZE AND TYPE OF BIT: See remarks
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
12. MANUFACTURER'S DESIGNATION OF DRILL: Failing - F-10
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED 12 | UNDISTURBED —
14. TOTAL NUMBER CORE BOXES: —
15. ELEVATION GROUND WATER: -5.05 (95 min. after completion)
16. DATE HOLE: STARTED 9 Dec 87 | COMPLETED 9 Dec 87
17. ELEVATION TOP OF HOLE: 15.45
18. TOTAL CORE RECOVERY FOR BORING: —
19. SIGNATURE OF INSPECTOR: Kriner - Kasnia

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f
	0.4	FILL	asphalt		
	1.2	FILL	concrete	— 1.4	
13.65	1.8	FILL	cinders & gravel		
			moist light brown silt with orange lenses and seams trace of clay	88%	3.0 JAR 217
11.95	3.5			4.0	JAR 218
Qwl	5		moist grey clayey silt with seams and lenses of orange.	100%	4.5 JAR 219 5.0
				6.5	6.0 JAR 220 6.5
8.25	7.2		moist grey-brown sand with pebbles, gravel, and cobbles of various colors and mineralogies	100%	8.5 JAR 221
Qp	10			9.0 80%	9.0
3.95	11.5			11.5	11.0 JAR 222
3.45	12.0	—	augered through cobbles	12.0	11.5
			same as 7.2-11.5	25%	13.5 JAR 223
	15			14.0 60%	14.0
-1.35	16.8			16.5	16.0 JAR 224 16.5
Vm			moist brown clayey silt/silty clay, micaceous.	100%	17.5 JAR 225 18.0
-3.05	18.5		moist brown sand, pebb., gravel, and cobbles (last few feet were gasoline saturated.	19.0	18.5 JAR 226 19.0
Vo	20			80%	21.0 JAR 227
				21.5 23%	21.5
-9.55			BOH @ 25.0	25.0	24.5 JAR 228

REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g

Continuous samples were obtained by using a 6" hollow stem auger with a 3" inner split sampler tube.

test samples:
S-DH-8-218 3.5-4.0 (59 ppm)
S-DH-8-221 8.5-9.0 (79 ppm)
S-DH-8-225 17.5-18.0 (99 ppm)
S-DH-8-227 21.0-21.5 (8595 ppm)
S-DH-8-228 24.5-25.0 (1899 ppm)

The hole was backfilled 9 Dec. 87 with a 5% bentonite grout mix

The clear bailer showed 2" of free product on the water table surface

detectable oil smells:
S-DH-8-221 trace
S-DH-8-222 trace
S-DH-8-223 strong
S-DH-8-224 Faint

detectable gasoline smells:
S-8-226 strong
S-8-227 strong
S-8-229 strong

7.5' 3m-7

hole location | NW corner Bldg #28

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

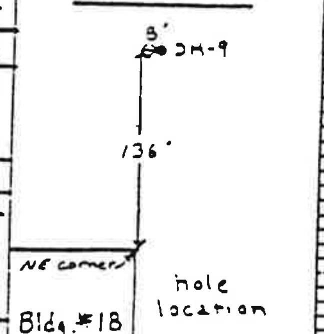
PROJECT: DPSC Fuel Contamination | HOLE NO. DH-8

Hole No. DH-9

DRILLING LOG | DIVISION: NAD | INSTALLATION: NAD | SHEET 1 OF 1 SHEETS

1. PROJECT: DPSC FUEL CONTAMINATION STUDY
2. LOCATION (Coordinates or Station): DEFENSE PERSONNEL SUPPORT CENTER, PA.
3. DRILLING AGENCY: BDO
4. HOLE NO. (As shown on drawing title and file number): DH-9
5. NAME OF DRILLER: BOWDEN
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED ______ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 25.0
8. DEPTH DRILLED INTO ROCK: —
9. TOTAL DEPTH OF HOLE: 25.0
10. SIZE AND TYPE OF BIT: SEE REMARKS
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
12. MANUFACTURER'S DESIGNATION OF DRILL: FAILING - F-10
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED 12 | UNDISTURBED —
14. TOTAL NUMBER CORE BOXES: —
15. ELEVATION GROUND WATER: — 4.45 (10 min. after completion)
16. DATE HOLE: STARTED 9 DEC 87 | COMPLETED 9 DEC 87
17. ELEVATION TOP OF HOLE: 15.05
18. TOTAL CORE RECOVERY FOR BORING: —
19. SIGNATURE OF INSPECTOR: KRINER - KASNIA

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	0	FILL	topsoil, roots, grass	0	0	
13.05	2.0	FILL	black-grey sand, cinders and ash.	100%	1.5 JAR 229 2.0	Continuous samples were obtained by using a 6" hollow stem auger with a 3" inner split sampler tube.
				2.0 2.5	JAR 230	
Qal	5		moist grey brown and orange brown micaceous silty clay	100% 5.0	2.5 3.5 JAR 231 4.0	test samples: 5-9-233 7.5-8.0 (42ppm) 5-9-237 17.0-17.5 (<40ppm) 5-9-239 21.7-22.2 (<40ppm)
8.05	7.0			100% 7.5	6.0 JAR 232 6.5	
5.75	9.3		moist grey brown sandy clayey silt	60% 10.0	7.5 JAR 233 8.0 9.5 JAR 234	The hole was backfilled with a 5% bentonite grout mix on 9 DEC. 87.
QP	10		moist coarse grained grey sand, gravel, and pebbles of various colors and mineralogies.	80% 12.5	10.0 11.0 JAR 235 11.5	The clear bailer showed a possible trace of free product on the water table surface.
				80% 15.0	14.5 JAR 236	
	15		color changes to orange brown at 17.0 feet	40% 17.5	15.0 17.0 JAR 237 17.5	The combustible gas/carbon monoxide detector was activated by strong sulpher smells emitting from this hole. No Fuel oil or gasoline smells were noted in samples
−4.95	20			80% 20.0	19.5 JAR 238	
QP			wet coarse grey sand with pebbles and gravel.	32% 22.5	20.0 21.7 JAR 239 22.2	
−9.95	25			? 25.0	24.5 JAR 240	



ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT: DPSC Fuel Contamination | HOLE NO. DH-9

Hole No. DH-10

DRILLING LOG

DIVISION	NAD
INSTALLATION	N.I.S
SHEET	1 OF 1 SHEETS
1. PROJECT	DPSC FUEL CONTAMINATION STUDY .
2. LOCATION (Coordinates or Station)	DEFENSE PERSONNEL SUPPORT CENTER PA
3. DRILLING AGENCY	BDO
4. HOLE NO. (As shown on drawing title and file number)	DH-10
5. NAME OF DRILLER	BOWDEN
6. DIRECTION OF HOLE	☒ VERTICAL ☐ INCLINED ______ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	25.0
8. DEPTH DRILLED INTO ROCK	—
9. TOTAL DEPTH OF HOLE	25.0
10. SIZE AND TYPE OF BIT	SEE REMARKS
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MSL
12. MANUFACTURER'S DESIGNATION OF DRILL	FAILING - F-10
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED 12 / UNDISTURBED —
14. TOTAL NUMBER CORE BOXES	—
15. ELEVATION GROUND WATER	4.86 (10 min after completion)
16. DATE HOLE	STARTED 9 DEC. 86 / COMPLETED 9 DEC 86
17. ELEVATION TOP OF HOLE	15.24
18. TOTAL CORE RECOVERY FOR BORING	— %
19. SIGNATURE OF INSPECTOR	KRINER - KASNIA

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f
14.24	1.0	FILL	0.0 - 0.4 = asphalt 0.4 - 0.7 = concrete 0.7 - 1.0 = gravel subbase	— 1.0	
Qwl			moist grey clayey silt with orange seams and lenses.	83% 4.0	2.0 JAR 241 2.5
			4" sandstone cobble at 3.5'		
	5		Fine silty sand seam at 5.0-6.0 (orange)	100% 6.5	4.0 JAR 242 4.5 5.5 JAR 243 6.0
8.74	6.5		moist orange-brown sand with pebbles, gravel, and cobbles of various colors and mineralogies.	72% 9.0	JAR 244 7.0 8.5 JAR 245 9.0
Qp	10			56% 11.5	11.0 JAR 246 11.5
				92% 14.0	13.5 JAR 247 14.0
	15			80% 16.5	JAR 248 14.5 16.0 JAR 249 16.5
-0.76	16.0		moist orange-brown silty clay/ clayey silt w/ some fine sand		
-1.76 Vw	17.0		orange-brown sand with pebbles, gravel, and cobbles of various colors and mineralogies.	60% 19.0	18.5 JAR 250 19.0
Vw	20		Soil turns locally grey, black, and red below 20' and is gasoline saturated.	60% 21.5	21.0 JAR 251 21.5
				34% 25.0	24.5 JAR 252
-9.76			BOH @ 25.0	25.0	

REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)

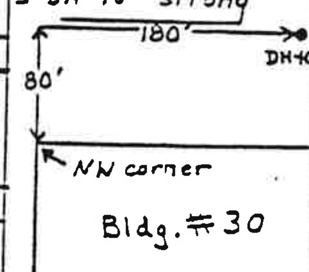
Continuous samples were obtained by using a 6" hollow stem auger with a 3" inner split sampler tube.

test samples:
S-DH-10-242
4.0-4.5 (61 ppm)
S-DH-10-245
8.5-9.0 (< 40ppm)
S-DH-10-250
18.5-19.0 (79 ppm)
S-DH-10-252
24.5-25.0 (833 ppm)

The clear bailer showed 3/4" free product on the groundwater surface.

The hole was back-filled with a 5% bentonite grout mix. 9 Dec. 87.

detectable gasoline odors:
S-DH-10- trace
S-DH-10- strong
S-DH-10- strong



hole location

G FORM 1836 PREVIOUS EDITIONS ARE OBSOLETE.

PROJECT DPSC FUEL CONTAMINATION | HOLE NO.

Hole No. DH-11

DRILLING LOG

DIVISION	NAD
INSTALLATION	NAD
SHEET 1 OF 1 SHEETS	
1. PROJECT	DPSC FUEL CONTAMINATION STUDY
2. LOCATION (Coordinates or Station)	DEFENSE PERSONNEL SUPPORT CENTER PA
3. DRILLING AGENCY	BDO
4. HOLE NO. (As shown on drawing title and file number)	DH-11
5. NAME OF DRILLER	BOWDEN
6. DIRECTION OF HOLE	☒ VERTICAL ☐ INCLINED ______ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	25.0
8. DEPTH DRILLED INTO ROCK	—
9. TOTAL DEPTH OF HOLE	25.0
10. SIZE AND TYPE OF BIT	SEE REMARKS
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MSL
12. MANUFACTURER'S DESIGNATION OF DRILL	FAILING - F-10
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN	DISTURBED 10 / UNDISTURBED —
14. TOTAL NUMBER CORE BOXES	—
15. ELEVATION GROUND WATER	-4.41 (30 min. after completion)
16. DATE HOLE	STARTED 10 DEC. 87 / COMPLETED 10 DEC. 87
17. ELEVATION TOP OF HOLE	15.09
18. TOTAL CORE RECOVERY FOR BORING	—
19. SIGNATURE OF INSPECTOR	KASNIA - KRINER

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f
	0	FILL	0.0-0.2 asphalt 0.2-0.9 concrete 0.9-1.3 gravel subbase	— 1.3	—
13.79	1.3		moist grey micaceous clayey silt with orange seams and lenses	100% 4.0	3.5 JAR 252
Qal	5			100% 6.5	4.0 6.0 JAR 253
8.29	6.8		moist orange fine silty sand		6.5 7.5
7.29	7.8		moist grey clayey silt/ silty clay	100% 9.0	JAR 254 8.0 8.5 JAR 255 9.0
5.09	10		moist orange-brown sand with pebbles, gravel, and cobbles of various colors and mineralogies.	100% 11.5	11.0 JAR 256 11.5
Qp				80% 14.0	13.0 JAR 257 13.5
	15		micaceous black sandy seams at 11.9 and 16.8	72% 16.5	16.0 JAR 258 JAR 259 17.0
				68% 19.0	
-3.61	18.7		moist grey-brown sand with pebbles, gravel, and cobbles of various colors and mineralogies.	48% 21.5	20.5 JAR 260 21.0
	20			57% 22.2	
	22.2	NOT SAMPLED		AUGERED 23.0	
	23.0			75% 25.0	24.5 JAR 261
-9.91	25		BOH @ 25.0'		

REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g

Continuous samples were obtained using a 6" hollow stem auger with a 3" split inner sampler tube.

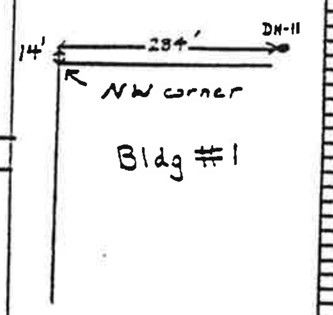
Augered without the 3" inner tube to avoid a cobble 22.2-23.0

test samples:
S-DH-11-254
7.5-8.0 (<40ppm)
S-DH-11-260
20.5-21.0 (105ppm)

The clear bailer showed no notable free product on the groundwater surface.

No fuel smells were noted.

Hole was backfilled 10 Dec. 87 with a 5% bentonite grout mix.



hole location

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT: DPSC Fuel Contamination | HOLE NO. DH-11

DRILLING LOG | DIVISION: NAD | INSTALLATION: NAD | Hole No. DH-12 | SHEET 1 OF 1 SHEETS

1. PROJECT: DPSC Fuel Contamination Study
2. LOCATION (Coordinates or Station): Defense Personnel Support Center, PA.
3. DRILLING AGENCY: BDO
4. HOLE NO. (As shown on drawing title and file number): DH-12
5. NAME OF DRILLER: Bowden
6. DIRECTION OF HOLE: [X] VERTICAL [ ] INCLINED ______ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 25.0
8. DEPTH DRILLED INTO ROCK: —
9. TOTAL DEPTH OF HOLE: 25.0
10. SIZE AND TYPE OF BIT: SEE REMARKS
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
12. MANUFACTURER'S DESIGNATION OF DRILL: Failing F-10
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 13 | UNDISTURBED —
14. TOTAL NUMBER CORE BOXES: —
15. ELEVATION GROUND WATER: −4.86 (45 min. after completion)
16. DATE HOLE: STARTED 10 DEC 87 | COMPLETED 10 DEC 87
17. ELEVATION TOP OF HOLE: 15.34
18. TOTAL CORE RECOVERY FOR BORING: — %
19. SIGNATURE OF INSPECTOR: Kriner - Kasnia

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f
	0		0.0-0.2 = asphalt, 0.2-1.0 = concrete, 1.0-1.5 = gravel & ash	— 1.0	1.5
13.84	1.5	FILL	moist green-grey sandy clayey silt with wood and brick.	83% 4.0	JAR 262 2.0 3.5 JAR 263
11.84	3.5		moist grey clayey micaceous silt with orange seams and lenses. 6.5 = wood or roots (?)	92% 6.5 36% 9.0	JAR 264 4.5 6.0 JAR 265 6.5 8.0 JAR 266 8.5
Qal 7.34	8.0		moist grey-brown sand with pebbles, gravel and cobbles of various colors and mineralogies.	32% 11.5 32% 14.0 80% 16.3	11.0 JAR 267 11.5 13.5 JAR 268 14.0 15.8 JAR 269
Qp −0.96	16.3		moist brown micaceous silty clay / clayey silt	16.5 100%	JAR 270 17.0
−2.16	17.5		grades to moist orange-brown silty sand	19.0	18.5 JAR 271 JAR 272
Vo −4.16	19.5		gasoline saturated coarse sand with pebbles, gravel, and cobbles of various colors and mineralogy. (The clear bailer showed 1" of free product on the water table)	80% 21.5 34%	19.5 21.0 JAR 273 21.5 24.5 JAR 274
−9.66	25		BOH @ 25.0	25.0	

REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)

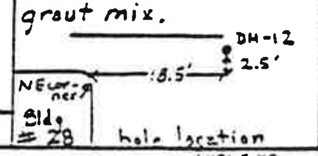
Continuous samples were obtained using a 6" hollow stem auger with a 3" inner sample spoon.

test samples:
S-DH-12-262 1.5-2.0 (309 ppm)
S-DH-12-264 4.0-4.5 (85 ppm)
S-DH-12-265 6.0-6.5 (309 ppm)
S-DH-12-266 8.0-8.5 (146 ppm)
S-DH-12-269 15.8-16.3 (6549 ppm)
S-DH-12-270 16.5-17.0 (< 40 ppm)
S-DH-12-272 19.0-19.5 (4513 ppm)
S-DH-12-274 24.5-25.0 (373 ppm)

detectable oil smell:
S-DH-12-262 trace
S-DH-12-264 trace
S-DH-12-265 strong
S-DH-12-269 strong
S-DH-12-270 trace
S-DH-12-271 trace

detectable gasoline smell:
S-DH-12-272 strong
S-DH-12-273 strong
S-DH-12-274 strong

Hole was backfilled 10 Dec. 87 w/ 5% bentonite grout mix.

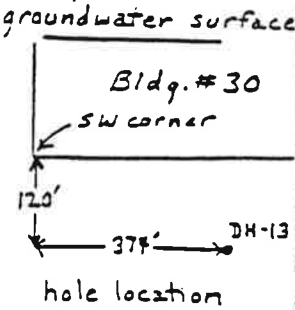


Hole No. DH-13

DRILLING LOG	DIVISION NAD	INSTALLATION NAB	SHEET 1 OF 1 SHEETS

1. PROJECT	DPSC Fuel Contamination Study
2. LOCATION (Coordinates or Station)	Defense Personnel Support Center, PA.
3. DRILLING AGENCY	BDO
4. HOLE NO. (As shown on drawing title and file number)	DH-13
5. NAME OF DRILLER	Bowden
6. DIRECTION OF HOLE	[X] VERTICAL [ ] INCLINED ____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	25.0
8. DEPTH DRILLED INTO ROCK	—
9. TOTAL DEPTH OF HOLE	25.0
10. SIZE AND TYPE OF BIT	SEE REMARKS
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MSL
12. MANUFACTURER'S DESIGNATION OF DRILL	FAILING - F-10
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN	DISTURBED 11 / UNDISTURBED —
14. TOTAL NUMBER CORE BOXES	—
15. ELEVATION GROUND WATER	~ -4.2 (45 min.)
16. DATE HOLE	STARTED 10 DEC. 87 / COMPLETED 10 DEC. 87
17. ELEVATION TOP OF HOLE	~ 16.0 *
18. TOTAL CORE RECOVERY FOR BORING	— %
19. SIGNATURE OF INSPECTOR	Kriner-Kasnia

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	0.6		topsoil, grass, roots		0.6	Continuous samples were obtained by using a 6" hollow stem auger with a 3" inner split sampler tube.
	4.5	FILL	moist black cinders and gravel (fill)	64% / 2.5 / 48%	JAR 275 / 1.1	test samples: S-DH-13-276 5.0-5.5 (227 ppm) S-DH-13-278 9.5-10.0 (65 ppm) S-DH-13-282 17.5-18.0 (65 ppm) S-DH-13-285 24.5-25.0 (6151 ppm)
~10.5	5 / 5.5		moist orange sand with pebb., grav., & cobb.	5.0	5.0 / JAR 276 / 5.5	
~8.0 Qal	8.0		moist orange and grey clayey silt	100% / 7.5	7.0 / JAR 277 / 7.5	
QP	10 / 15 / 16.0		moist orange brown clayey silty sand with pebbles and increasing gravel with depth.	100% / 10.0 / 100% / 12.5 / 32% / 15.0	9.5 / JAR 278 / JAR 279 / 10.5 / 12.0 / JAR 280 / 12.5	detectable gasoline smell: S-DH-13-283 strong S-DH-13-284 strong S-DH-13-285 strong. Hole was backfilled 10 Dec. 87 with a 5% bentonite grout mix.
~0	20 / 21.5		grey and red sand with pebbles, gravel, and cobbles of various colors and mineralogies. medium grained sand seam at 17.0-18.0	32% / 17.5 / 48% / 20.0 / 40%	17.0 / JAR 281 / JAR 282 / 18.0 / 19.5 / JAR 283 / 20.0	The clear bailer showed 10" of free product on the groundwater surface.
~-5.5 Vlo	25		gasoline saturated orange medium to coarse sand. BOH @ 25.0'	22.5 / 56% / 25.0	22.0 / JAR 284 / 22.5 / 24.5 / JAR 285	* elevation was not surveyed and is only approximate
~-9.0						

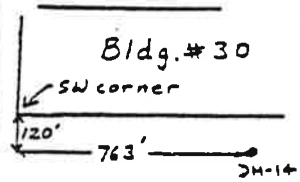


Hole No. DH-14

DRILLING LOG

DIVISION	NAD
INSTALLATION	NnD
SHEET	1 OF 1 SHEETS
1. PROJECT	DPSC Fuel Contamination Study
2. LOCATION (Coordinates or Station)	Defense Personnel Support Center, PA.
3. DRILLING AGENCY	BDO
4. HOLE NO. (As shown on drawing title and file number)	DH-14
5. NAME OF DRILLER	Bowden
6. DIRECTION OF HOLE	☒ VERTICAL ☐ INCLINED ______ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	25.0
8. DEPTH DRILLED INTO ROCK	—
9. TOTAL DEPTH OF HOLE	25.0
10. SIZE AND TYPE OF BIT	SEE REMARKS
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MSL
12. MANUFACTURER'S DESIGNATION OF DRILL	FAILING - F-10
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED 13 / UNDISTURBED —
14. TOTAL NUMBER CORE BOXES	—
15. ELEVATION GROUND WATER	~-3.6 (30 min. after sampling)
16. DATE HOLE	STARTED 11 DEC 87 / COMPLETED 11 DEC 87
17. ELEVATION TOP OF HOLE	~16.0 *
18. TOTAL CORE RECOVERY FOR BORING	—
19. SIGNATURE OF INSPECTOR	KRINER - KASNIA

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	0	FILL	moist topsoil, grass, roots	0		
~15.5	0.5		moist black cinders and ash (fill)	100%	0.5 / JAR 286 / 1.0	Continuous samples were obtained by using a 6" hollow stem auger with a 3" inner split sampler tube.
				2.5		
				100%	4.5 / JAR 287 / 5.0	test samples:
	5 / 5.2			5.0		S-DH-14-287 4.5-5.0 (136 ppm)
~10.0	6.0		moist brown clayey silt with pebbles and gravel			
Qal			moist grey and orange micaceous silt.	100% / 7.0→ / 7.5	6.5 / JAR 288 / JAR 289 / 7.5	S-DH-14-292 14.0-14.5 (56 ppm) S-DH-14-295 17.5-18.0 (1821 ppm)
~8.0	8.0		moist brown clayey siltly sand w/pebbles and gravel	72%		S-DH-14-298 24.5-25.0 (2534 ppm)
~7.0	9.0		moist grey sand with pebbles, gravel, and cobbles of various colors and mineralogies.	10.0	9.5 / JAR 290 / 10.0	detectable oil or gasoline (?) smell:
QP	10			48%	12.0 / JAR 291 / 12.5	S-DH-14- trace S-DH-14- Faint S-DH-14- Faint
~3.5	12.5		moist brown-grey medium to coarse sand.	12.5 / 64%	14.0 / JAR 292 / 14.5	The clear bailer showed 7" of free product on the watertable surface
	15			15.0		
~-0.2	16.2		moist brown silty sand with trace of clay	40%	16.5 / JAR 293	Hole was backfilled 11 Dec. 87 with a 5% bentonite grout mix
Vło	17.0		wet grey-black sand with pebbles, gravel, and cobbles of various colors and mineralogies.	17.0→ / 17.5 / 100%	JAR 294 / JAR 295 / 18.0	
	20		turns grey with depth	20.0 / 32%	19.5 / JAR 296 / 20.0	
~-6.0	22.0		wet grey-brown coarse sand, gravel, and cobbles of various colors and min.	22.5 / 40%	22.0 / JAR 297 / 22.5	
	25		BOH @ 25.0 ft	25.0	24.5 / JAR 298	



hole location

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT: DPSC fuel contamination | HOLE NO.: DH-14

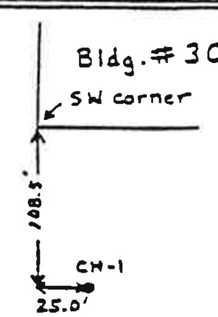
Hole No. CH-1

DRILLING LOG

DIVISION	INSTALLATION	SHEET
NAD	NA	1 OF 1 SHEETS

1. PROJECT: FUEL CONTAMINATION STUDY - DPSC
2. LOCATION (Coordinates or Station): DEFENSE PERSONNEL SUPPORT CENTER PA.
3. DRILLING AGENCY: BDO
4. HOLE NO. (As shown on drawing title and file number): CH-1
5. NAME OF DRILLER: BOWDEN
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED ______ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 18.0'
8. DEPTH DRILLED INTO ROCK: —
9. TOTAL DEPTH OF HOLE: 18.0'
10. SIZE AND TYPE OF BIT: see remarks
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
12. MANUFACTURER'S DESIGNATION OF DRILL: FAILING - F-10
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 7 | UNDISTURBED —
14. TOTAL NUMBER CORE BOXES: —
15. ELEVATION GROUND WATER: NOT ENCOUNTERED
16. DATE HOLE: STARTED 2 DEC. 1987 | COMPLETED 2 DEC. 1987
17. ELEVATION TOP OF HOLE: 16.11
18. TOTAL CORE RECOVERY FOR BORING: — %
19. SIGNATURE OF INSPECTOR: KASNIA - KRINER

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	0	FILL	moist topsoil, grass, roots			Samples were obtained using a 6" hollow stem auger with a 3" inner split sampler tube.
15.41	0.7		moist grey subbase ash and small gravel			
14.71	1.4		moist black cinders	75%	2.0 JAR 139 2.5	
12.11	4.0		moist brown gravelly sand	4.0 100%	4.0 JAR 140 4.5	test samples: S-CH-1-142 8.5 - 9.0 (107 ppm) S-CH-1-145 16.5 - 17.0 (146 ppm)
10.61	5 5.5		moist, grey with orange seams and lenses, micaceous sandy, clayey, silt	6.5 100% 9.0	6.0 JAR 141 6.5 8.5 JAR 142 9.0	Backfilled 3 Dec. 87 with a 5% bentonite grout mix.
7.11	9.0		moist brown gravelly sand	82%	9.0 10.0 JAR 143 10.5	There were no obvious fuel smells in this hole but all samples had an organic stench.
5.71	10 10.4		augered through gravel and cobbles too large to fit inside the sample tube (no samples)	11.2 0% 14.0		The hole was still dry on 3 Dec. 87
1.41	14.7 15		moist brown silty sand w/ varicolored pebbles, gravel, trace clay	53% 15.5	15.0 JAR 144 15.5	
0.61	15.5		moist green-grey and red-grey sand and gravel of various colors & mineralogy	72% 18.0	16.5 JAR 145 17.0	
	20		B.O.H. @ 18.0			



HOLE LOCATION

Hole No. CH-1A

DRILLING LOG	DIVISION NAD	INSTALLATION N..B	SHEET OF / SHEETS

1. PROJECT: DPSC FUEL CONTAMINATION STUDY	10. SIZE AND TYPE OF BIT: SEE REMARKS
2. LOCATION (Coordinates or Station): DEFENSE PERSONNEL SUPPORT CENTER	11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
3. DRILLING AGENCY: BDO	12. MANUFACTURER'S DESIGNATION OF DRILL: FAILING - F-10
4. HOLE NO. (As shown on drawing title and file number): DH-CH-1A	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 6; UNDISTURBED —
5. NAME OF DRILLER: BOWDEN	14. TOTAL NUMBER CORE BOXES: —
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER: −4.7 (at completion)
	16. DATE HOLE: STARTED 7 DEC. 87; COMPLETED 7 DEC. 87
7. THICKNESS OF OVERBURDEN: 25.0	17. ELEVATION TOP OF HOLE: 16.11
8. DEPTH DRILLED INTO ROCK: —	18. TOTAL CORE RECOVERY FOR BORING: — %
9. TOTAL DEPTH OF HOLE: 25.0	19. SIGNATURE OF INSPECTOR: KASNIA · KRINER

ELEVATION (a)	DEPTH (b)	LEGEND (c)	CLASSIFICATION OF MATERIALS (Description) (d)	% CORE RECOVERY (e)	BOX OR SAMPLE NO. (f)	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) (g)
	0			0	0	Hole CH-1A was drilled 11.0' due west of CH-1 in order to extend exploration into the groundwater table.
	0–15		Augered with 6" hollow stem auger & cleaned out with a 3" spoon sampler. No samples were taken. See CH-1 for strata between 0.0 and 15.0 feet.			Samples were obtained by using a 6" hollow stem auger with a 3" inner split sampler tube. Test sample: CH-1A-192 22.0-22.5 (6238 ppm). Bailer showed 1/4" of free product on the groundwater surface
1.1	15			15.0		detectable gasoline odor: S-CH-1A-191 - trace; S-CH-1A-192 - strong; S-CH-1A-193 - strong; S-CH-1A-194 - strong
Qp	15–18.5		moist grey silty sand with pebbles, gravel, and cobbles of various colors and mineralogies.	24% (15.0–17.5)	17.5 JAR 190 18.0	
−2.39	18.5		moist brown silty clay / clayey silt	92% (17.5–20.0)	19.5 JAR 190 20.0	Hole was backfilled 7 Dec, 1987 with a 5% bentonite grout mix.
Vlu	20			20.0	20.9 JAR 191 21.4	
−5.29	21.4		gasoline saturated brown sand with a trace of silt.	100% (20.0–22.5)	22.0 JAR 192	←22.5
Vlo				22.5	JAR 193 23.0	
−7.89	24.0		moist brown clayey fine sandy silt	100% (22.5–25.0)	24.5 JAR 194	Additional test: CH-1A-191 20.9-21.4 (40 ppm)
	25			25.0		

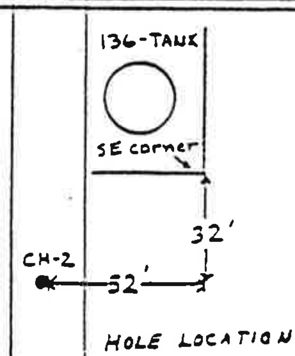
ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. BOH @ 25.0 (TRANSLUCENT) PROJECT DPSC FUEL CONTAMINATION HOLE NO. CH-1A

Hole No. CH-2

DRILLING LOG	DIVISION NAD	INSTALLATION NAD	SHEET 1 OF 1 SHEETS

1. PROJECT: DPSC FUEL CONTAMINATION STUDY	10. SIZE AND TYPE OF BIT: SEE REMARKS
2. LOCATION (Coordinates or Station): DEFENSE PERSONNEL SUPPORT CENTER, PA	11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
3. DRILLING AGENCY: BDO	12. MANUFACTURER'S DESIGNATION OF DRILL: FAILING - F-10
4. HOLE NO. (As shown on drawing title and file number): CH-2	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 8; UNDISTURBED —
5. NAME OF DRILLER: BOWDEN	14. TOTAL NUMBER CORE BOXES: —
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER: NOT ENCOUNTERED
	16. DATE HOLE: STARTED 2 DEC 87; COMPLETED 2 DEC 87
7. THICKNESS OF OVERBURDEN: 17.5	17. ELEVATION TOP OF HOLE: 16.15
8. DEPTH DRILLED INTO ROCK: —	18. TOTAL CORE RECOVERY FOR BORING: — %
9. TOTAL DEPTH OF HOLE: 17.5	19. SIGNATURE OF INSPECTOR: KRINER - KASNIA

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	0			0	0	
15.65	0.5	FILL	moist tan topsoil, roots, gras			Continuous samples were obtained by using a 6" hollow stem auger with a 3" inner split sampler tube.
12.45	3.7		moist black cinders	70%	3.2 JAR 146 3.7	
	5		moist orange brown with orange lenses, locally clayey micaceous silt	4.0 88% 6.5	6.0 JAR 147 6.5	test samples: S-CH-2-148 8.0-8.5 (107 ppm) S-CH-2-153 17.0-17.5 (146 ppm)
				100% 9.0	8.0 JAR 148 8.5	There were no obvious fuel smells in this hole, but all samples had an organic stench
5.15	10 / 11.0			100% 11.5	11.0 JAR 149 11.5	
2.15	14.0		moist grey brown slightly silty & micaceous sand with pebbles & gravel	88% 14.0	13.5 JAR 150	The hole was terminated on a pink sandstone cobble at 17.5'.
1.65	14.5		wet black & grey sand	14.5	JAR 151	The hole was backfilled on 3 Dec. 1987 with a 5% bentonite grout mix. The hole was still dry.
0.85	15 / 15.3		wet black sand, pebbles and gravel		JAR 152 15.0	
	17.5		moist orange brown coarse sand with pebbles.	88% 16.5 100% 17.5	17.5 JAR 153	
			BOH @ 17.5			
	20					
	25					



ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT) | PROJECT: DFSC-FUEL CONTAMINATION | HOLE NO. CH-2

DRILLING LOG | DIVISION: NAD | INSTALLATION: NAB | Hole No. CH-2A | SHEET 1 OF 1 SHEETS

1. PROJECT	DPSC FUEL CONTAMINATION STUDY
2. LOCATION (Coordinates or Station)	DEFENSE PERSONNEL SUPPORT CENTER, PA.
3. DRILLING AGENCY	BDO
4. HOLE NO. (As shown on drawing title and file number)	CH-2A
5. NAME OF DRILLER	BOWDEN
6. DIRECTION OF HOLE	[X] VERTICAL [ ] INCLINED ___ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	25.0
8. DEPTH DRILLED INTO ROCK	—
9. TOTAL DEPTH OF HOLE	25.0
10. SIZE AND TYPE OF BIT	SEE REMARKS
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MSL
12. MANUFACTURER'S DESIGNATION OF DRILL	FAILING F-10
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED: 5 / UNDISTURBED: —
14. TOTAL NUMBER CORE BOXES	—
15. ELEVATION GROUND WATER	−6.45 (at completion)
16. DATE HOLE	STARTED: 8 DEC 87 / COMPLETED: 8 DEC 87
17. ELEVATION TOP OF HOLE	16.15
18. TOTAL CORE RECOVERY FOR BORING	—
19. SIGNATURE OF INSPECTOR	KASNIA - KRINER

ELEVATION (a)	DEPTH (b)	LEGEND (c)	CLASSIFICATION OF MATERIALS (Description) (d)	% CORE RECOVERY (e)	BOX OR SAMPLE NO. (f)	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) (g)
	0				—	Hole CH-2A was drilled 6.5' S-SW of CH-2 in order to extend exploration into the groundwater table.
	5		Augered with a 6" hollow stem auger. No samples were taken. See CH2 for strata between 0.0 & 15.0'.			Samples were obtained using a 6" hollow stem auger with a 3" inner split sampler tube.
	10		additional test samples; CH-2A-197 21.0-21.5 (1712 ppm) CH-2A-199 24.5-25.0 (600 ppm) →			Test sample: CH-2A-198 21.5-21.8 (18,673 ppm)
						A cobble caught in the inner tube at 21.8-25.0 causing 69% sample loss.
1.15	15			15.0	15.0	detectable gasoline odor: S-CH-2A-196 strong S-CH-2A-197 strong S-CH-2A-198 strong S-CH-2A-199 strong
			moist brown sand with pebbles, gravel, & cobbles of various colors & mineralogies	36%	17.0 JAR 195	
−1.35				17.5	17.5	
			17.5-21.2 - color changes to orange	68%	19.5	combustible gas / carbon monoxide meter was triggered by fumes from this hole.
	20			20.0	JAR 196 20.0	
				66%	21.0	
−5.35				21.5	JAR 197	
				100%	JAR 198	Bailer showed 1/16" free product on the groundwater surface.
			21.5-25.0 - color changes to grey brown.	21.8	21.8	
				31%	24.5	Backfilled 8 Dec. 87 w/ 5% bentonite grout mix.
	25				JAR 199	

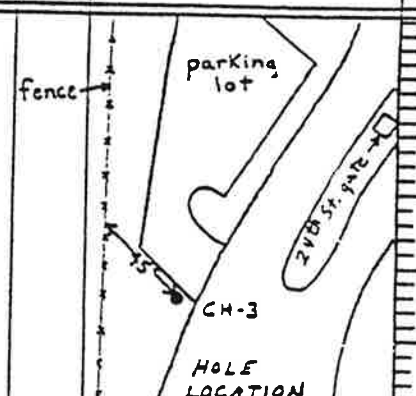
ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. BOHE 25A (TRANSLUCENT) | PROJECT: DPSC FUEL CONTAMINATION | HOLE NO. CH-2A

Hole No. CH-3

DRILLING LOG	DIVISION NAD	INSTALLATION NAW	SHEET 1 OF 1 SHEETS

1. PROJECT: DPSC FUEL CONTAMINATION STUDY	10. SIZE AND TYPE OF BIT: SEE REMARKS
2. LOCATION (Coordinates or Station): DEFENSE PERSONNEL SUPPORT CENTER, PA	11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
3. DRILLING AGENCY: BDO	12. MANUFACTURER'S DESIGNATION OF DRILL: FAILING-10
4. HOLE NO. (As shown on drawing title and file number): CH-3	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED 7; UNDISTURBED —
5. NAME OF DRILLER: BOWDEN	14. TOTAL NUMBER CORE BOXES: —
6. DIRECTION OF HOLE: [X] VERTICAL [ ] INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER: NOT ENCOUNTERED
	16. DATE HOLE: STARTED 2 DEC. 87; COMPLETED 2 DEC 87
7. THICKNESS OF OVERBURDEN: 18.0	17. ELEVATION TOP OF HOLE: 18.76
8. DEPTH DRILLED INTO ROCK: —	18. TOTAL CORE RECOVERY FOR BORING: — %
9. TOTAL DEPTH OF HOLE: 18.0	19. SIGNATURE OF INSPECTOR: KASNIA-KRINER

ELEVATION (a)	DEPTH (b)	LEGEND (c)	CLASSIFICATION OF MATERIALS (Description) (d)	% CORE RECOVERY (e)	BOX OR SAMPLE NO. (f)	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) (g)
	0			0	0	
	0.5	FILL	moist brown topsoil, grass, roots			Continuous samples were obtained using a 6" hollow stem auger with a 3" inner split sampler tube.
			moist black & grey fill (includes cinders, ash, pebbles, sand, coal, wood, pottery)	80%	1.5 JAR 154 2.0	
				4.0		
	5			60%	5.5 JAR 155 6.0	test samples: S-CH-3-156 8.0-8.5 (225 ppm) S-CH-3-160 17.0-17.5 (225 ppm)
				7.0		
				67%	8.0 JAR 156 8.5	There were no obvious fuel smells in this hole, but all samples had an organic stench.
	10			10.0		
				53%	12.5 JAR 157 13.0	Hole was backfilled 3 Dec. 87 with a 5% bentonite grout mix. The hole was still dry.
				13.0		
				73%		
3.56	15 / 15.2	FILL?	moist black sand with pebbles & gravel.	16.0	15.5 JAR 158	
2.56	16.2		moist, grey silty sandy clay	16.2 – 16.7	JAR 159	
1.96	16.8		moist black sand	100%	17.0 JAR 160 17.5	
			BOH @ 18.0'			
	20					



ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT: DPSC FUEL CONTAMINATION | HOLE NO. CH-3

Hole No. CH-3A

DRILLING LOG	DIVISION: NAD	INSTALLATION: NA	SHEET 1 OF 1 SHEETS
1. PROJECT: DPSC Fuel Contamination Study		10. SIZE AND TYPE OF BIT: SEE REMARKS	
2. LOCATION (Coordinates or Station): Defense Personnel Support Center PA.		11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL	
3. DRILLING AGENCY: BDO		12. MANUFACTURER'S DESIGNATION OF DRILL: FAILING F-10	
4. HOLE NO. (As shown on drawing title and file number): CH-3A		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 3; UNDISTURBED —	
5. NAME OF DRILLER: BOWDEN		14. TOTAL NUMBER CORE BOXES: —	
6. DIRECTION OF HOLE: [X] VERTICAL [ ] INCLINED ___ DEG. FROM VERT.		15. ELEVATION GROUND WATER: −4.14 (at completion)	
		16. DATE HOLE: STARTED 8 DEC. 87; COMPLETED 8 DEC. 87	
7. THICKNESS OF OVERBURDEN: 25.0		17. ELEVATION TOP OF HOLE: 18.76	
8. DEPTH DRILLED INTO ROCK: —		18. TOTAL CORE RECOVERY FOR BORING: — %	
9. TOTAL DEPTH OF HOLE: 25.0		19. SIGNATURE OF INSPECTOR: KASNIA-KRINER	

ELEVATION (a)	DEPTH (b)	LEGEND (c)	CLASSIFICATION OF MATERIALS (Description) (d)	% CORE RECOVERY (e)	BOX OR SAMPLE NO. (f)	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) (g)
	0 – 18.0	FILL	Augered 0.0 - 18.0' with a 6" hollow stem auger. No samples were taken. See CH-3 for strata between 0.0 and 18.0' Additional test samples S-CH-3A-200 19.5-20.0 (192 ppm) S-CH-3A-202 24.5-25.0 (103 ppm)			Hole CH-3A was drilled 2.0' from CH-3 in order to extend exploration into the ground-water table. Samples were obtained by using a 6" hollow stem auger with a 3" split inner sample tube. test sample S-CH-3A-201 22.0-22.5 (80 ppm) There were no obvious fuel smells in this hole, but the hole smelled like a cesspool and set off the alarm on the combustible gas/carbon monoxide detector A cobble caught in the inner tube at 20.0-22.5 caused an 84% loss of the sample.
0.76	18.0 – 22.0	FILL Bottom of Fill ?	foul-smelling moist black brown silty sand with pebbles, gravel & cobbles (fill)	18.0 70% 20.0 16%	19.5 JAR 200 20.0 22.0	No bail sample was taken.
−3.24	22.0 – 25		wet black-brown medium to coarse sand, gravel, pebbles, & cobbles - Foul smell.	22.5 32% 25.0	JAR 201 22.5 24.5 JAR 202	Hole was back-filled 8 Dec. 87 with a 5% bentonite grout mix

BOH@25.0'

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

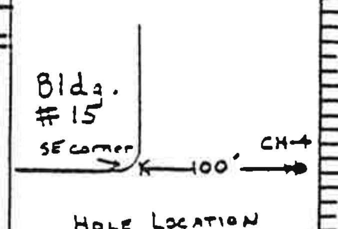
PROJECT: DPSC Fuel Contamination | HOLE NO. CH-3A

Hole No. CH-4

DRILLING LOG	DIVISION: NAD	INSTALLATION: NAD	SHEET 1 OF 1 SHEETS

1. PROJECT: DPSC Fuel Contamination Study	10. SIZE AND TYPE OF BIT: SEE REMARKS
2. LOCATION (Coordinates or Station): Defense Personnel Support Center, Pa	11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
3. DRILLING AGENCY: BDO	12. MANUFACTURER'S DESIGNATION OF DRILL: Failing - F-10
4. HOLE NO. (As shown on drawing title and file number): CH-4	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 8; UNDISTURBED —
5. NAME OF DRILLER: Bowden	14. TOTAL NUMBER CORE BOXES: —
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER: -3.83 (1 hour after completion)
	16. DATE HOLE: STARTED 3 Dec. 87; COMPLETED 3 Dec. 87
7. THICKNESS OF OVERBURDEN: 21.2	17. ELEVATION TOP OF HOLE: 15.17
8. DEPTH DRILLED INTO ROCK: —	18. TOTAL CORE RECOVERY FOR BORING: — %
9. TOTAL DEPTH OF HOLE: 21.2	19. SIGNATURE OF INSPECTOR: Kasnia - Kriner

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	0		moist, brown topsoil, grass, roots	0	0	Continuous samples were obtained by using a 6" hollow stem auger with a 3" inner split sampler tube.
14.47	0.7		moist light orange micaceous clayey silt with light grey fine sandy lenses below 3.5	93%	3.0 JAR 161 3.5	
				4.0		
	5			100%	6.0 JAR 162 6.5	test samples: S-CH-4-164 9.0-9.5 (<40 ppm) S-CH-4-167 18.5-19.0 (172 ppm) S-CH-4-168 20.7-21.2 (191 ppm)
8.17	7.0		gradational change	6.5		
			grades to a moist grey fine sandy silt (locally pink & orange) trace of clay.	100%	9.5 JAR 163	
				9.0	JAR 164 9.5	Between 11.5 & 14.0 the sampler tube was blocked by a 4" cobble causing 84% sample loss.
5.17	10		moist brown fine sandy silt	100%	11.0 JAR 165 11.5	
				11.5		
3.17	12.0	?	lost most of sample recovered a small amount of silt & cobbles	16%		There were no obvious fuel smells in CH-4
1.17	14.0			14.0		
	15		moist orange sand with pebbles and large gravel of various colors.	76%	16.0 JAR 166 16.5	Groundwater data: encountered @ 20.4 @ completion: 19.3 1 hour later: 19.0
				16.5		
				60%	18.5 JAR 167 19.0	Hole was backfilled with a 5% bentonite grout mix 3 Dec. 87
				19.0		
-4.83	20		wet orange brown sand & pebbles.	64%	20.7 JAR 168	
				21.2		
			BOH @ 21.2'			
	25					



ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT: DPSC Fuel Contamination | HOLE NO. CH-4

APPENDIX A

LOGS OF WINTER 1987 SUBSURFACE EXPLORATION

UMC Phila Pa
Balto Dist
A-3
Hilde brand

12. MANUFACTURER'S DESIGNATION OF DRILL: CME-55
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED 13 | UNDISTURBED —
14. TOTAL NUMBER CORE BOXES: —
15. ELEVATION GROUND WATER
16. DATE HOLE: STARTED 6/9/92 | COMPLETED 6/9/92
17. ELEVATION TOP OF HOLE
18. TOTAL CORE RECOVERY FOR BORING: — %
19. SIGNATURE OF INSPECTOR: Kur Parmen

INCLINED ________ DEG. FROM VERT.
OF OVERBURDEN: —
DRILLED INTO ROCK: —
DEPTH OF HOLE: 19.0'

DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
		Rail Road Ballast Gray, V. Coarse GRAVEL	—	NS	NS = No Sample; 350 lb Hammer; 30" Drop; 6¼" auger / HS; 3" split spoon
		Brown. SILT, w/ Trace Very Fine SAND, Moist, Stiff	75%	B351 B352 B353	ATEX TPH RCRA Metal
			—	NS	
		Brown, SILT w/ Trace Very Fine SAND, Moist, Stiff	93%	B354 B355 B356 B357R	ATEX TPH RCRA Metal RCRA Metal
		Brownish Red to Brown, SILTY SAND w/ 25% ¾ to 3" GRAVEL, Moist, Dense			
			—	NS	
		Brown SILT w/ 2" Bands of SAND & GRAVEL, Moist, Stiff	85%	B358 B359R B3510	ATEX BTEX TPH
		Dark Red to Green Fine SAND w/ 25% ¾ to 3" GRAVEL, Moist, V. Dense			HNU Lamp 11.7
			—	NS	
		Brown, Fine to Medium SAND w/ 20% ¾ to 2" GRAVEL, Moist, V. Dense	93%	B3511 B3512 B3513R	ATEX TPH TPH
		Bottom of Boring			Boring Dry on Completion

HNU Lamp 11.7

Depth	Background ppm	Sample ppm
2-4	0.8	1.2
5-9	0.8	1.2
10-14	0.7	2.8
15-19	0.7	8.3

1836 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT: ADP Building
HOLE NO.: B-3

[PROJE]CT: ADP Building	10. SIZE AND TYPE OF BIT: 3" Drive Tube
[LOCA]TION (Coordinates or Station): DPSC, Phila. Pa	11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
[DRILLI]NG AGENCY: Balto Dist	12. MANUFACTURER'S DESIGNATION OF DRILL: CME-55
[HOLE] NO. (As shown on drawing title and file number): B-5	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN — DISTURBED: 10 — UNDISTURBED: —
[NAME] OF DRILLER: Hildebrand	14. TOTAL NUMBER CORE BOXES: —
[DIREC]TION OF HOLE: [VER]TICAL ☐ INCLINED ______ DEG. FROM VERT.	15. ELEVATION GROUND WATER: Dry Completion
	16. DATE HOLE — STARTED: 6/10/92 — COMPLETED: 6/10/92
[THICK]NESS OF OVERBURDEN: —	17. ELEVATION TOP OF HOLE
[DEPTH] DRILLED INTO ROCK: —	18. TOTAL CORE RECOVERY FOR BORING: — %
[TOTA]L DEPTH OF HOLE: 19.0'	19. SIGNATURE OF INSPECTOR: Ken Parsons

[ELEVA]TION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	0.0		Concrete 0.8'			Oil Black Top
	1.0–3.0			—	NS	N.S. = No Sample 350lb Hammer 30" Drop 6⅝" Auger/H.S. 3" Split Spoon
	3.0–5.0		Light Brown, SILT Moist, Stiff	100%	B551 B552 B553	BTEX TPH RCRA Metal
	5.0			—	NS	
	5.0–7.0		Light Brown, CLAYEY SILT Moist, Stiff			
	7.0–9.0		Reddish Brown, CLAYEY SILTY SAND w/25% ¾ to 3" GRAVEL, Moist, Dense	90%	B554 B555 B556	BTEX TPH RCRA Metal Decon Water Very High in Iron (Fe)
	10.0			—	NS	
	11.0–14.0		Same	88%	B557 B558	BTEX TPH
						HNU Lamp 11.7 Depth Background [illegible] ppm

PROJECT: HQP Building

LOCATION (Coordinates or Station): DPSC Phila, Pa

DRILLING AGENCY: Balto Dist

HOLE NO. (As shown on drawing title and file number): B-6

NAME OF DRILLER: Hildebrand

DIRECTION OF HOLE: VERTICAL ☐ INCLINED ______ DEG. FROM VERT.

THICKNESS OF OVERBURDEN: —

DEPTH DRILLED INTO ROCK: —

TOTAL DEPTH OF HOLE: 19.0'

10. SIZE AND TYPE OF BIT: 3" Drive Tape

11. DATUM FOR ELEVATION SHOWN (TBM or MSL)

12. MANUFACTURER'S DESIGNATION OF DRILL: CME-55

13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 8 | UNDISTURBED —

14. TOTAL NUMBER CORE BOXES: —

15. ELEVATION GROUND WATER: Dry Completion

16. DATE HOLE: STARTED 6/10/92 | COMPLETED 6/10/92

17. ELEVATION TOP OF HOLE

18. TOTAL CORE RECOVERY FOR BORING: — %

19. SIGNATURE OF INSPECTOR: Ken Parsons

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	0.0		Black Top 0.2'			NS = No Sample
			Concrete 0.6'			350 lb Hammer
	1.0			—	NS	30" Drop
						6 5/8" Auger I HS
	2.0					3" Split Spoon
	3.0			0.0%		
	4.0					
	5.0		Dark Brown, SILTY CLAY, Moist, Stiff	20%	BG 1 BG 2 BGS 3	BTEX TPH RCRA Metal
	6.0					HNU Lamp 11.7
	7.0					Depth / Background ppm / Sample ppm
	8.0					4-8 / 1.1 / 1.2
						10-14 / 0.7 / 0.7
	9.0			—	NS	15-19 / 0.7 / 0.7
	10.0					
	11.0		Reddish Brown, SILTY CLAY, Moist, Stiff			
	12.0			95%	BGS 4 BGS 5 BGS 6	BTEX TPH RCRA Metal
	13.0		Reddish Brown to Red, CLAYEY SAND w/20% 3/8 to 4" GRAVEL, Moist, Very Dense			
	14.0					

Fill Building

[..]ON (Coordinates or Station) UPCC Phila, Pa

[..]G AGENCY Balto Dist

[..]O. (As shown on drawing title number) B-7

[..]F DRILLER Hildebrand

[..]TION OF HOLE [..]TICAL ☐INCLINED ______ DEG. FROM VERT.

[..]ESS OF OVERBURDEN —

[..] DRILLED INTO ROCK —

[..] DEPTH OF HOLE 19.0'

11. DATUM FOR ELEVATION SHOWN (TBM or MSL)

12. MANUFACTURER'S DESIGNATION OF DRILL CMF-55

13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN | DISTURBED 10 | UNDISTURBED —

14. TOTAL NUMBER CORE BOXES —

15. ELEVATION GROUND WATER 9.2' 9.2'

16. DATE HOLE | STARTED 6/14/94 | COMPLETED 6/14/94

17. ELEVATION TOP OF HOLE

18. TOTAL CORE RECOVERY FOR BORING — %

19. SIGNATURE OF INSPECTOR Kim Pearson

[..]ON	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	0.0 – 3.0	Fill	0-3.0 Rail Road Ballast (Crushed Stone)	—	NS	NS = No Sample 350 lb Hammer 30" Drop 6¼" Auger/H.S. 3" Split Spoon
	3.0 – 5.0		Lt Brown (Tan) SILT, w/ Trace Large Gravel 3" moist, Stiff	70%	S1 S2 S3	BTEX TPH RCRA Metal
	5.0 – 8.0		Same	98%	S4 S5 S6	BTEX TPH RCRA Metals
	8.0 – 9.5		Dark Brown, CLAYEY GRAVELLY SAND, w/ 25% ¾ to 3" Gravel, Medium to Fine Sand, Moist, Dense			
	9.5 – 10.5			—	NS	
	10.5 – 13.0		Lt Brown (Tan) SILT, w/ Trace Large Gravel 2", Moist, Stiff	95%	S7 S8	BTEX TPH HNU Lamp 11.7
	13.0 – 14.5		Reddish Brown, CLAYEY GRAVELLY SAND w/ 30% ¾ to 3" Gravel. Fine to Medium Sand, Moist, Very Dense			
				—	NS	

Depth	Back Ground ppm	Sample ppm
3.0-5.0	1.0	0.6
5.0-9.0	0.6	0.6
10.0-14.0	0.5	0.6

...ct: ADP Building	10. SIZE AND TYPE OF BIT: 3" Drive Tube
...tion (Coordinates or Station): DPSC, Phila. Pa	11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
...ing AGENCY: Balto Dist	12. MANUFACTURER'S DESIGNATION OF DRILL: CME-55
...no. (As shown on drawing title ... number): B-8	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN — DISTURBED: 10 — UNDISTURBED: —
...of DRILLER: Hildebrand	14. TOTAL NUMBER CORE BOXES: —
...tion OF HOLE: ...tical ☐ INCLINED ______ DEG. FROM VERT.	15. ELEVATION GROUND WATER: Dry Completion
...ness OF OVERBURDEN: —	16. DATE HOLE — STARTED: 6/11/92 — COMPLETED: 6/11/92
... DRILLED INTO ROCK: —	17. ELEVATION TOP OF HOLE
... DEPTH OF HOLE: 14.0'	18. TOTAL CORE RECOVERY FOR BORING: — %
	19. SIGNATURE OF INSPECTOR: Ken Parsons

...tion	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	0.0		Black Top 0.6'			NS = No Sample 350lb Hammer 30" Drop 6 5/8" Auger / H.S. 3" Split Spoon
	1.0–2.0			—	NS	
	3.0		(Fill) Black, TAR, GRAVEL			
	4.0		Light Brown, SILTY CLAY, Moist, Stiff	45%	B851 B852 B853	BTEX TPH RCRA Metal
	5.0			—	NS	
	6.0–9.0		Light Brown to Reddish Brown, SILT, w/ Trace Fine SAND, Moist to Wet, Stiff	75%	B854 B855 B856	BTEX TPH RCRA Metal
	10.0			—	NS	
	11.0		Light Brown to Reddish Brown, CLAYEY SAND, w/ 15% 3/8 to 3" GRAVEL, Moist, Dense			
	12.0–14.0		Light Brown, Fine to Medium SAND, Moist, Very Dense	100%	B857 B858	BTEX TPH HNU Lamp 11.7 Depth / Background ppm / Sample ppm 2.5–4.5 / 0.6 / 1.1

HTW DRILLING LOG

HOLE NO.	08 - 01
SHEET 1 OF 1 SHEETS	

1. COMPANY NAME: Louis Berger & Associates	2. DRILLING SUBCOTRACTOR: SJB Services
3. PROJECT: DPSC - Expanded Site Investigation	4. LOCATION: Philadelphia, Pennsylvania
5. NAME OF DRILLER:	6. MANUFACTURER'S DESIGNATION OF DRILL: CME - 550
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT: Skid Mounted Rig	8. HOLE LOCATION: Building 8
	9. SURFACE LOCATION:
	10. DATE STARTED: 7/20/96 — 11. DATE COMPLETED: 7/20/96
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: N/A
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: N/A
14. TOTAL DEPTH OF HOLE: 16'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): N/A
15. GEOTECHNICAL SAMPLES: DISTURBED / UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES: 0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (TPH)	OTHER (PCB)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	1	2	6	1		

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	x			Jeff Farrell

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS (ppm) D	GEOTECH SAMPLE RECOVERY (ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1–2	cmf GRAVEL and FILL	0	3		1, 1, 1, 2	9:15
	3–4	Brown SILT, some mf Gravel	0	3		WH, 1, 1, 1	9:20
	5–6	Brown gray green SILT, trace Sand	-	13	01-01	1, 1, 23, 50	10:00 4th hole 9:25
	7–8	Gray green SILT, some large Cobbles	3	18		10, 16, 23, 25	Hole Moved 10:04
	9–10	Brown cmf SAND and GRAVEL	2	18	01-02	23, 20, 16, 18	10:10
	11–12		2	18	01-03	9, 10, 11, 12	10:20
	13–14	Brown cmf GRAVEL & SAND	0	12	01-04	21, 16, 12, 10	10:30
	15–16		-	4		18, 12, 18, 20	10:40

HTW DRILLING LOG

HOLE NO. 08 - 02	SHEET 1 OF 1 SHEETS	
1. COMPANY NAME: Louis Berger & Associates	2. DRILLING SUBCOTRACTOR: SJB Services	
3. PROJECT: DPSC - Expanded Site Investigation	4. LOCATION: Philadelphia, Pennsylvania	
5. NAME OF DRILLER:	6. MANUFACTURER'S DESIGNATION OF DRILL: CME - 550	
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT: Skid Mounted Rig	8. HOLE LOCATION: Building 8 - Courtyard	
	9. SURFACE LOCATION:	
	10. DATE STARTED: 7/20/96	11. DATE COMPLETED: 7/20/96
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: N/A	
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: N/A	
14. TOTAL DEPTH OF HOLE: 16'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): N/A	
15. GEOTECHNICAL SAMPLES: DISTURBED / UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES: 0	

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (TPH)	OTHER (DUP.)	OTHER (SVOA)	21. TOTAL CORE RECOVERY
	0	1	4	1	3	

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	x			Jeff Farrell

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS (ppm) D	GEOTECH SAMPLE RECOVERY (ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1–2	Dk. brown cmf SAND and FILL	0	0.3		4, 3, 3, 1	11:00
	3–4	Lt. brown SILT, trace Sand	0	0.5		1, 1, 1, 2	11:03
	5–6	Green brown to gray green SILT	1	1.8	02 - 01 02 - 02	2, 2, 4, 6	11:05
	7–8	Lt. brown to green SILT and CLAYEY SILT	0	1.8	02 - 03	9, 10, 15, 16	11:08
	9–10	Brown cmf SAND, some cmf Gravel	1	1.5		14, 17, 18, 17	11:15
	11–12		-	0.0		23, 19, 25, 27	11:20
	13–14	Brown cmf GRAVEL and SAND	1	0.3	02 - 04	31, 20, 12, 12	11:30
	15–16		1	1.2		12, 16, 17, 15	11:35

HTW DRILLING LOG

HOLE NO.	08 - 03
SHEET 1 OF 1 SHEETS	
1. COMPANY NAME	Louis Berger & Associates
2. DRILLING SUBCOTRACTOR	SJB Services
3. PROJECT	DPSC - Expanded Site Investigation
4. LOCATION	Philadelphia, Pennsylvania
5. NAME OF DRILLER	
6. MANUFACTURER'S DESIGNATION OF DRILL	CME - 550
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT	Skid Mounted Rig
8. HOLE LOCATION	Building 8 - Courtyard
9. SURFACE LOCATION	
10. DATE STARTED	7/20/96
11. DATE COMPLETED	7/20/96
12. OVERBURDEN THICKNESS	N/A
15. DEPTH GROUNDWATER ENCOUNTERED	N/A
13. DEPTH DRILLED INTO ROCK	N/A
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	N/A
14. TOTAL DEPTH OF HOLE	16'
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	N/A
15. GEOTECHNICAL SAMPLES	DISTURBED: / UNDISTURBED:
19. TOTAL NUMBER OF CORE BOXES	0
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC: 1; METALS: 1; OTHER (TPH): 5; OTHER (DUP.): ; OTHER (SVOA):
21. TOTAL CORE RECOVERY	
22. DISPOSITION OF HOLE	BACKFILLED: x; MONITORING WELL: ; OTHER (SPECIFY):
23. SIGNATURE OF INSPECTOR	Jeff Farrell

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS (ppm) D	GEOTECH SAMPLE RECOVERY (ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1 2	Dk. brown cmf SAND and FILL	0	0.2		1 1 2 1	12:45
	3 4	Green brown SILT and FILL	1	0.3		1 1 2 2	12:50
	5 6	Green SILT and CLAYEY SILT, moist	2	0.3		1 1 2 1	12:55 Petroleum Odor
	7 8	Green CLAYEY SILT, wet Lt. brown cmf GRAVEL, Dry	1	1.7	03 - 01 03 - 02	15 10 17 19	13:00
	9 10	Green SILTY CLAY, wet some brown cmf Gravel Dry	0	1.8	03 - 03	17 20 22 19	13:05
	11 12	Green SILT and brown cmf SAND, some brown cmf Gravel	1	1.8	03 - 04 03 - 05	17 18 17 15	13:10
	13 14	Brown cmf GRAVEL, some Cobbles	1	1.5	03 - 06	17 18 18 20	13:15
	15 16	Brown cmf GRAVEL, some brown cmf Sand	1	1.3		9 10 11 10	13:20

HTW DRILLING LOG

1. COMPANY NAME Louis Berger & Associates	2. DRILLING SUBCOTRACTOR SJB Services	HOLE NO. 08 - 04 SHEET 1 OF 1 SHEETS
3. PROJECT DPSC - Expanded Site Investigation	4. LOCATION Philadelphia, Pennsylvania	
5. NAME OF DRILLER	6. MANUFACTURER'S DESIGNATION OF DRILL CME - 550	
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT: Skid Mounted Rig	8. HOLE LOCATION Building 8 - Courtyard	
	9. SURFACE LOCATION	
	10. DATE STARTED 7/20/96	11. DATE COMPLETED 7/20/96
12. OVERBURDEN THICKNESS N/A	15. DEPTH GROUNDWATER ENCOUNTERED None	
13. DEPTH DRILLED INTO ROCK N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A	
14. TOTAL DEPTH OF HOLE 16'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A	

15. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES		
			0		
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (TPH)	OTHER (DUP.)	OTHER (PCB)
	0	0	5		3
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR	
	x			Jeff Farrell	

21. TOTAL CORE RECOVERY

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS D	GEOTECH SAMPLE RECOVERY E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1 2	Dk. brown FILL	-	0.1		2 3 3 4	13:35
	3 4	Lt. brown SILT and f SAND	1	1.7	04 - 01	6 4 4 3	13:40
	5 6	Green brown SILT, some f Sand	0	2.0	04 - 02	4 4 5 6	13:45
	7 8		0	1.5	04 - 03	9 9 37 20	13:50
	9 10	Green brown SILT, some brown cmf Gravel with Cobbles	0	0.8		20 22 17 15	13:55
	11 12		-	0.0		19 20 27 17	14:05
	13 14	Brown cmf GRAVEL	0	1.7	04 - 04	20 20 17 19	14:10
	15 16		0	1.3		13 16 12 15	14:15

HTW DRILLING LOG

HOLE NO.	09 - 01
1. COMPANY NAME	Louis Berger & Associates
2. DRILLING SUBCOTRACTOR	SJB Services
SHEET 1 OF 2 SHEETS	
3. PROJECT	DPSC Expanded Site Investigation
4. LOCATION	Philadelphia, Pennslyvania
5. NAME OF DRILLER	Scott Bray
6. MANUFACTURER'S DESIGNATION OF DRILL	CME - 550
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIOMENT	7" OD, 2-1/4" ID Hollow Stem Auger; 2' x 2" Split Spoon
8. HOLE LOCATION	Bldg 9 (Bash St.) Gas Station
9. SURFACE LOCATION	On Access Ramp to Bldg 9
10. DATE STARTED	6/26/96
11. DATE COMPLETED	6/26/96
12. OVERBURDEN THICKNESS	N/A
15. DEPTH GROUNDWATER ENCOUNTERED	None
13. DEPTH DRILLED INTO ROCK	N/A
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	N/A
14. TOTAL DEPTH OF HOLE	24'
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	N/A
15. GEOTECHNICAL SAMPLES	DISTURBED: ; UNDISTURBED:
19. TOTAL NUMBER OF CORE BOXES	N/A
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC: ; METALS: ; TPH: 5; MTBE: 5; Lead: 2
21. TOTAL CORE RECOVERY	
22. DISPOSITION OF HOLE	BACKFILLED: X; MONITORING WELL: ; OTHER (SPECIFY):
23. SIGNATURE OF INSPECTOR	Jeff Farrell

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS (ppm) D	GEOTECH SAMPLE RECOVERY (ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	0-1	Concrete					
	1-2	Concrete Chips/Cinders	-	0.1		-, 1, 2, 2	9:15
	2-4	Brown SAND, some Silt, some Cinders	bottom of Ramp / 0	0.3		2, 2, 2, 3	9:20
	4-6		0	0.8		1, 2, 1, 2	9:25
	6-8		0	1.7	01-01	1, 1, 1, 2	9:27
	8-10	Brown SILT with layers of CLAYEY SILT	0	1.8	01-02, 01-03	4, 5, 4, 4	9:35
	10-12		0	1.5	01-04, 01-05	4, 3, 3, 4	9:40
	12-14	Dk. brown cmf GRAVEL, brown SILT at 14'	1	1.7	01-06, 01-07	8, 16, 19, 27	Photo #24 9:45

HTW DRILLING LOG

HOLE NO. 09 - 01

PROJECT: DPSC Expanded Site Investigation

INSPECTOR: J. Farrell

SHEET 2 OF 2 SHEETS

ELEV A	DEPTH FT B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS (ppm) D	GEOTECH SAMPLE RECOVERY (ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	14						
	15–16		1	0.2		25 27 19 20	9:50
	17–18	Brown cmf GRAVEL	0	0.3		28 25 26 26	9:55
	19–20		0	1.2	01-08	7 10 10 12	10:00
	21						
	22						
	23						
	24						
	25						
	26						
	27						
	28						
	29						
	30						
	31						
	32						
	33						
	34						
	35						

HTW DRILLING LOG

HOLE NO.	09 - 02
1. COMPANY NAME	Louis Berger & Associates
2. DRILLING SUBCOTRACTOR	SJB Services
SHEET 1 OF 1 SHEETS	
3. PROJECT	DPSC Expanded Site Investigation
4. LOCATION	Philadelphia, Pennslyvania
5. NAME OF DRILLER	Scott Bray
6. MANUFACTURER'S DESIGNATION OF DRILL	CME - 550
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIOMENT	7" OD, 2-1/4" ID Hollow Stem Auger; 2' x 2" Split Spoon
8. HOLE LOCATION	Bldg 9 (Bash St.) Gas Station
9. SURFACE LOCATION	North side of Bldg 9
10. DATE STARTED	6/27/96
11. DATE COMPLETED	6/27/96
12. OVERBURDEN THICKNESS	N/A
15. DEPTH GROUNDWATER ENCOUNTERED	None
13. DEPTH DRILLED INTO ROCK	N/A
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	N/A
14. TOTAL DEPTH OF HOLE	16'
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	N/A
15. GEOTECHNICAL SAMPLES	DISTURBED: ; UNDISTURBED:
19. TOTAL NUMBER OF CORE BOXES	N/A
21. TOTAL CORE RECOVERY	
23. SIGNATURE OF INSPECTOR	Jeff Farrell

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	TPH	MTBE	Lead
			7	4	3

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)
	X		

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS (ppm) D	GEOTECH SAMPLE RECOVERY (ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1–2	Concrete / Dk. green CLAYEY SILT	-	0.0		-, -, -, 12	11:30
	3–4	Dk. green CLAYEY SILT	2	0.5		8, 8, 10, 12	11:35
	5–6	Green SILT, Red Brick and Cinder Block Fill	5	0.8		2, 2, 2, 3	13:10
	7–8	Green SILT, Red Brick Fill	11	0.1	02-01, 02-02	3, 3, 2, 2	13:15
	9–10	Green SILT, Red Brick Fill	6	1.5		7, 6, 8, 9	13:20
	11–12	Green SILT / Brown cmf GRAVEL, some cmf Sand	25	1.0		6, 7, 8, 7	13:25
	13–14	Brown cmf GRAVEL, some cmf Sand	7	1.2	02-03, 02-04, 02-05	4, 6, 6, 5	13:30
	15–16	Brown cmf GRAVEL, cmf SAND	6	1.2		7, 8, 8, 7	13:35

HTW DRILLING LOG

HOLE NO.	09-03
1. COMPANY NAME	Louis Berger & Associates
2. DRILLING SUBCOTRACTOR	SJB Services
SHEET 1 OF 1 SHEETS	
3. PROJECT	DPSC Expanded Site Investigation
4. LOCATION	Philadelphia, Pennslyvania
5. NAME OF DRILLER	Scott Bray
6. MANUFACTURER'S DESIGNATION OF DRILL	CME - 550
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIOMENT	7" OD, 2-1/4" ID Hollow Stem Auger; 2' x 2" Split Spoon
8. HOLE LOCATION	Bldg 9 (Bash St.) Gas Station
9. SURFACE LOCATION	North side of Bldg 9
10. DATE STARTED	6/27/96
11. DATE COMPLETED	6/27/96
12. OVERBURDEN THICKNESS	N/A
15. DEPTH GROUNDWATER ENCOUNTERED	None
13. DEPTH DRILLED INTO ROCK	N/A
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	N/A
14. TOTAL DEPTH OF HOLE	12'
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	N/A
15. GEOTECHNICAL SAMPLES	DISTURBED: ; UNDISTURBED:
19. TOTAL NUMBER OF CORE BOXES	N/A
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC: ; METALS: ; TPH: 2; MTBE: 1; Lead: 1
21. TOTAL CORE RECOVERY	
22. DISPOSITION OF HOLE	BACKFILLED: X; MONITORING WELL: ; OTHER (SPECIFY):
23. SIGNATURE OF INSPECTOR	Jeff Farrell

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS (ppm) D	GEOTECH SAMPLE RECOVERY (ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1	Reinforced Conc. Roller Bit	90	0.2		1	11:00
						Conc.	
	2	Brown SILT, some f Sand, wet				6	
						10	
	3	No Recovery	-	0.0		6	11:05
						6	
	4					4	
						4	
	5	Dk. brown to black cmf GRAVEL, pieces of Red Brick	70	0.2		6	11:10
						3	
	6					4	
						3	
	7		70	0.2		3	11:13
						2	
	8					3	
						2	
	9	Dk. green SILT, little f Sand	250	1.8	03-01	2	11:16
						4	
	10					3	
						1	
	11	Dk. green cm SAND and cmf GRAVEL	50	0.7	03-02	3	Photo # 26 11:25
						7	
	12					6	
						50/2	
	13		Refusal at 12'				Possible Concrete Vault
	14						

HTW DRILLING LOG

1. COMPANY NAME Louis Berger & Associates	2. DRILLING SUBCOTRACTOR SJB Services	HOLE NO. 09 - 04 SHEET 1 OF 1 SHEETS
3. PROJECT DPSC Expanded Site Investigation	4. LOCATION Philadelphia, Pennslyvania	
5. NAME OF DRILLER Scott Bray	6. MANUFACTURER'S DESIGNATION OF DRILL CME - 550	
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIOMENT	7" OD. 2-1/4" ID Hollow Stem Auger 2' x 2" Split Spoon	8. HOLE LOCATION Bldg 9 (Bash St.) Gas Station 9. SURFACE LOCATION North side on Bldg 9
10. DATE STARTED 6/27/96	11. DATE COMPLETED 6/27/96	
12. OVERBURDEN THICKNESS N/A	15. DEPTH GROUNDWATER ENCOUNTERED None	
13. DEPTH DRILLED INTO ROCK N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A	
14. TOTAL DEPTH OF HOLE 16'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A	
15. GEOTECHNICAL SAMPLES	DISTURBED / UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES N/A

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	TPH	MTBE	Lead	21. TOTAL CORE RECOVERY
			7	3	2	

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X			Jeff Farrell

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS (ppm) D	GEOTECH SAMPLE RECOVERY (ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1	Roller Bit Through Concrete & Asphalt	90	0.2		- -	11:40
	2	Lt. brown SILT, little f Sand				12 12	
	3 4	No Recovery	-	0.0		9 12 12 14	11:45
	5 6	Green SILT, some Gravel, little f Sand, and pieces of Red Brick	130	0.8	04-03	3 2 2 2	11:50
	7		400	1.0	04-04 04-07 04-08	4 4	11:55
	8	cmf GRAVEL and CINDER Fill				6 4	
	9 10	Green SILT, some f Sand	180	1.7	04-05	6 6 7 6	12:00
	11 12	Gray green CLAYEY SILT, some green Gravel	25	1.7	04-06	8 8 10 12	12:05
	13 14	cmf GRAVEL and SAND	25	0.8	04-01 04-02	10 12 11 12	12:10
	15 16		5	1.7		12 11 12 14	12:15
	17	PID Reading of 1,100 @ botttom of borehole through augers LEL Reading of 50% @ bottom of borehole through augers					

HTW DRILLING LOG

HOLE NO.	28 - 01
SHEET 1 OF 1 SHEETS	
1. COMPANY NAME	Louis Berger & Associates
2. DRILLING SUBCOTRACTOR	SJB Services
3. PROJECT	DPSC - Expanded Site Investigation
4. LOCATION	Philadelphia, Pennsylvania
5. NAME OF DRILLER	Scott Bray
6. MANUFACTURER'S DESIGNATION OF DRILL	CME - 550
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT	7" OD, 2-1/4" ID Hollow Stem Auger; 2' x 2" Split Spoon
8. HOLE LOCATION	Building 28 Gas Station
9. SURFACE LOCATION	
10. DATE STARTED	6/19/96
11. DATE COMPLETED	6/19/96
12. OVERBURDEN THICKNESS	N/A
15. DEPTH GROUNDWATER ENCOUNTERED	None
13. DEPTH DRILLED INTO ROCK	N/A
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	N/A
14. TOTAL DEPTH OF HOLE	16.0
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	N/A
15. GEOTECHNICAL SAMPLES	DISTURBED: ; UNDISTURBED:
19. TOTAL NUMBER OF CORE BOXES	N/A
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC: ; METALS: ; OTHER (TPH): 3; OTHER (SPECIFY): ; OTHER (SPECIFY):
21. TOTAL CORE RECOVERY	
22. DISPOSITION OF HOLE	BACKFILLED: x; MONITORING WELL: ; OTHER (SPECIFY):
23. SIGNATURE OF INSPECTOR	Jeff Farrell

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS (ppm) D	GEOTECH SAMPLE RECOVERY (ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1	Augered 6 in. Concrete	0	0.5		-, 2	9:30
	2	Lt. brown SILT, trace Sand				3, 5	
	3		0	2.0		5, 6	9:35
	4	Brown CLAYEY SILT				6, 6	Plastic
	5	Brown green CLAYEY SILT	0	2.0		6, 6	9:40 Moist
	6					7, 6	
	7	Brown SILT and CLAY	0	2.0	01 - 01	8, 9	9:45 Moist
	8	Green brown SILT, dry				10, 9	
	9		0	1.3		20, 19	9:50
	10	Dark brown cmf SAND				17, 18	
	11	Dark brown cmf GRAVEL, some cmf Sand, little Silt	0	1.3		6, 6	9:55
	12					7, 7	
	13		0	1.7		8, 9	10:00
	14	Dark brown to red cmf SAND, some Silt				7, 9	
	15	Dark brown cmf GRAVEL, some cmf Sand	0	1.8	01 - 03	10, 11	10:05
	16				01 - 04	7, 11	

HTW DRILLING LOG

HOLE NO. 28 - 02		
1. COMPANY NAME: Louis Berger & Associates	2. DRILLING SUBCOTRACTOR: SJB Services	SHEET 1 OF 1 SHEETS
3. PROJECT: DPSC - Expanded Site Investigation	4. LOCATION: Philadelphia, Pennsylvania	
5. NAME OF DRILLER: Scott Bray	6. MANUFACTURER'S DESIGNATION OF DRILL: CME - 550	
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT: 7" OD, 2-1/4" ID Hollow Stem Auger; 2' x 2" Split Spoon	8. HOLE LOCATION: Bldg. 28 Gas Station	
	9. SURFACE LOCATION	
	10. DATE STARTED: 6/19/96	11. DATE COMPLETED: 6/19/96
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: None	
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: N/A	
14. TOTAL DEPTH OF HOLE: 16.0	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): N/A	
15. GEOTECHNICAL SAMPLES — DISTURBED: ; UNDISTURBED:	19. TOTAL NUMBER OF CORE BOXES: N/A	
20. SAMPLES FOR CHEMICAL ANALYSIS — VOC: ; METALS:	OTHER (TPH): 6; OTHER (SPECIFY): ; OTHER (SPECIFY):	21. TOTAL CORE RECOVERY
22. DISPOSITION OF HOLE — BACKFILLED: X; MONITORING WELL:	OTHER (SPECIFY):	23. SIGNATURE OF INSPECTOR: Jeff Farrell

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS (ppm) D	GEOTECH SAMPLE RECOVERY (ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1 2	Augered Green SILT, trace Sand	0	1.0		- 3 6 7	10:25
	3 4	Brown SILT, little f Sand	0	1.0	02 - 01 02 - 02	10 9 6 7	10:30
	5 6	Green SILT, some f Sand	0	1.7		14 14 5 7	10:35
	7 8	Green SILT, little Sand Green CLAYEY SILT	0	1.5		15 16 18 17	10:40
	9 10	Green cmf SAND	0	1.7		17 17 21 16	10:45 Slight petroleum odor
	11 12	Green CLAYEY SILT, lt. brown cmf GRAVEL, little cmf Sand	0	1.0		14 19 17 18	10:50
	13 14	Dk. brown cmf GRAVEL, little cmf Sand	0	1.8		15 22 17 20	10:55
	15 16	Dk. brown cmf GRAVEL	0	2.0	02 - 03	18 17 19 20	11:00

HTW DRILLING LOG

1. COMPANY NAME Louis Berger & Associates	2. DRILLING SUBCOTRACTOR SJB Services	HOLE NO. 28 - 03 SHEET 1 OF 1 SHEETS
3. PROJECT DPSC - Expanded Site Investigation	4. LOCATION Philadelphia, Pennsylvania	
5. NAME OF DRILLER Scott Bray	6. MANUFACTURER'S DESIGNATION OF DRILL CME - 550	
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT 7" OD, 2-1/4" ID Hollow Stem Auger 2' x 2" Split Spoon	8. HOLE LOCATION Building 28 Gas Station 9. SURFACE LOCATION	
	10. DATE STARTED 6/19/96	11. DATE COMPLETED 6/19/96
12. OVERBURDEN THICKNESS N/A	15. DEPTH GROUNDWATER ENCOUNTERED None	
13. DEPTH DRILLED INTO ROCK N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A	
14. TOTAL DEPTH OF HOLE 14'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A	
15. GEOTECHNICAL SAMPLES: DISTURBED / UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES N/A	
20. SAMPLES FOR CHEMICAL ANALYSIS: VOC / METALS / OTHER (TPH) 6 / OTHER (SPECIFY) / OTHER (SPECIFY)	21. TOTAL CORE RECOVERY	
22. DISPOSITION OF HOLE: BACKFILLED x / MONITORING WELL / OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR Jeff Farrell	

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS (ppm) D	GEOTECH SAMPLE RECOVERY (ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1	Augered first ft.	0	0.8		- -	11:25
	2	Green brown SILT, some Sand				4 3	
	3	Green SILT, trace f Sand	0	1.8		6 6	11:30
	4					8 7	
	5	Dk. brown f SAND, little Silt	0	0.5		7 7	11:40
	6	Green SILT, some f Sand				7 6	
	7	Dk. green SILT, some f Sand	0	1.8	03 - 01 03 - 02	7 11	11:45
	8					11 12	Slight petroleum odor
	9	Green CLAYEY SILT Red Siltstone fragments	0	2.0		17 27	11:50
	10	Green cmf SAND				15 18	Slight petroleum odor
	11	Green SILT, trace f Sand, cmf GRAVEL, some cmf	0	1.8	03 - 03 03 - 04	19 27	12:05
	12	Sand and Red Siltstone Layers				18 13	
	13		0	1.7		19 27	12:10
	14					18 13	Petroleum odor
	15						
	16						

HTW DRILLING LOG

HOLE NO. 28 - 04	SHEET 1	OF 1 SHEETS
1. COMPANY NAME: Louis Berger & Associates	2. DRILLING SUBCOTRACTOR: SJB Services	
3. PROJECT: DPSC - Expanded Site Investigation	4. LOCATION: Philadelphia, Pennsylvania	
5. NAME OF DRILLER: Scott Bray	6. MANUFACTURER'S DESIGNATION OF DRILL: CME - 550	
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT: 7" OD. 2-1/4" ID Hollow Stem Auger; 2' x 2" Split Spoon	8. HOLE LOCATION: Bldg. 28 Gas Station	
	9. SURFACE LOCATION:	
	10. DATE STARTED: 6/20/96	11. DATE COMPLETED: 6/20/96
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: None	
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: N/A	
14. TOTAL DEPTH OF HOLE: 16'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): N/A	
15. GEOTECHNICAL SAMPLES: DISTURBED / UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES: N/A	

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (TPH)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
			4			

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	x			Jeff Farrell

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS (ppm) D	GEOTECH SAMPLE RECOVERY (ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1–2	Augered 6". Lt. brown SILT, Cinder Block Fragments	0	0.7		-, 3, 11, 6	8:40
	3–4	Lt. brown SILT, little Sand	3	1.7		5, 6, 6, 4	8:45
	5–6	Lt. brown CLAYEY SILT	15	1.3		4, 3, 3, 3	8:50
	7–8	Lt.brown CLAYEY SILT to SILTY CLAY, little f Sand	20	2.0	04 - 01	10, 7, 7, 5	8:55 Slight petroleum odor
	9–10	Dk. brown cmf GRAVEL, some cmf Sand	6	1.5		20, 22, 15, 16	9:00 Slight petroleum odor
	11–12	Orange cmf Sand	2	1.2		24, 22, 15, 14	9:05
	13–14	Dk. brown cm GRAVEL; Lt. brown cmf SAND	0	1.5	04 - 02	9, 7, 7, 6	9:10
	15–16	Dark brown cmf SAND, some cmf Gravel	1	0.5		20, 17, 17, 16	9:15

HTW DRILLING LOG

HOLE NO.	28 - 05
1. COMPANY NAME	Louis Berger & Associates
2. DRILLING SUBCOTRACTOR	SJB Services
SHEET 1 OF 1 SHEETS	
3. PROJECT	DPSC - Expanded Site Investigation
4. LOCATION	Philadelphia, Pennsylvania
5. NAME OF DRILLER	Scott Bray
6. MANUFACTURER'S DESIGNATION OF DRILL	CME - 550
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT	7" OD, 2-1/4" ID Hollow Stem Auger; 2' x 2" Split Spoon
8. HOLE LOCATION	Bldg 28 Gas Station
9. SURFACE LOCATION	
10. DATE STARTED	6/20/96
11. DATE COMPLETED	6/20/96
12. OVERBURDEN THICKNESS	N/A
15. DEPTH GROUNDWATER ENCOUNTERED	None
13. DEPTH DRILLED INTO ROCK	N/A
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	N/A
14. TOTAL DEPTH OF HOLE	16'
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	N/A
15. GEOTECHNICAL SAMPLES	DISTURBED: ; UNDISTURBED:
19. TOTAL NUMBER OF CORE BOXES	N/A
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC: ; METALS: ; OTHER (TPH): 3; OTHER (HFS): 1; OTHER (SPECIFY):
21. TOTAL CORE RECOVERY	
22. DISPOSITION OF HOLE	BACKFILLED: X; MONITORING WELL: ; OTHER (SPECIFY):
23. SIGNATURE OF INSPECTOR	Jeff Farrell

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS (ppm) D	GEOTECH SAMPLE RECOVERY (ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1–2	Brown green SILT, some mf Sand, staining in lower interval	3	1.2		-, -, 6, 8	9:20
	3–4		1	1.5		7, 7, 6, 4	9:25 Photo # 14/15
	5–6	No Recovery	-	0 in.		7, 6, 6, 4	9:30
	7–8	Gray green SILT, little Sand	6	0.7	05 - 01	10, 7, 8, 9	Photo # 16 9:40 Strong petroleum odor
	9–10	(9) Gray green SILT, little Sand; Dk. brown cmf GRAVEL, some cmf Sand	10	2.0		42, 54, 32, 12	Photo # 17 10:30 Strong petroleum odor
	11–12	Gray green SILT; Dk. brown cmf GRAVEL, some cmf Sand	36	1.5		12, 12, 14, 15	10:40 Photo # 18
	13–14	Dk. brown cmf GRAVEL, some cmf Sand; Orange brown cmf SAND	30	1.8	05 - 02, 05 - 03	10, 12, 6, 6	10:43
	15–16	Dk. brown mf SAND grading into cmf GRAVEL	30	1.5		9, 8, 8, 6	10:50

HTW DRILLING LOG

HOLE NO. 28 - 06

1. COMPANY NAME Louis Berger & Associates	2. DRILLING SUBCOTRACTOR SJB Services
SHEET 1 OF 1 SHEETS	
3. PROJECT DPSC - Expanded Site Investigation	4. LOCATION Philadelphia, Pennsylvania
5. NAME OF DRILLER Scott Bray	6. MANUFACTURER'S DESIGNATION OF DRILL CME - 550
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT 7" OD, 2-1/4" ID Hollow Stem Auger 2' x 2" Split Spoon	8. HOLE LOCATION Bldg. 28 Gas Station
	9. SURFACE LOCATION
	10. DATE STARTED 6/20/96 — 11. DATE COMPLETED 6/20/96
12. OVERBURDEN THICKNESS N/A	15. DEPTH GROUNDWATER ENCOUNTERED None
13. DEPTH DRILLED INTO ROCK N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A
14. TOTAL DEPTH OF HOLE 16'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A
15. GEOTECHNICAL SAMPLES — DISTURBED — UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES N/A
20. SAMPLES FOR CHEMICAL ANALYSIS — VOC — METALS — OTHER (SPECIFY) — OTHER (SPECIFY) — OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
22. DISPOSITION OF HOLE — BACKFILLED x — MONITORING WELL — OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR Jeff Farrell

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS (ppm) D	GEOTECH SAMPLE RECOVERY (ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1	No Recovery - Gravel in the shoe of the spoon	-	0		- 3 5 6	10:55
	2						
	3	Green SILT, some f Sand	2	1.5		5 6 9 9	10:58 Photo # 19
	4						
	5	Green gray SILT Staining on all intervals	3	1.8		6 7 6 8	11:00 Photo # 20
	6						
	7		2	2.0	06 - 01 06 - 02	8 7 6 22	11:03
	8						
	9	Dk. brown cmf GRAVEL	1	1.8		15 17 16 17	11:06
	10						
	11		2	1.5		11 12 14 14	11:10
	12						
	13		1	0.7		12 13 15 22	11:15
	14	Green cmf SAND					
	15	Gray green cmf SAND	1	1.8	06 - 03 06 - 04	12 12 14 17	11:25
	16	Dk. brown cmf GRAVEL					

HTW DRILLING LOG

HOLE NO. 28 - 07

1. COMPANY NAME Louis Berger & Associates	2. DRILLING SUBCOTRACTOR SJB Services
SHEET 1 OF 1 SHEETS	
3. PROJECT DPSC - Expanded Site Investigation	4. LOCATION Philadelphia, Pennsylvania
5. NAME OF DRILLER Scott Bray	6. MANUFACTURER'S DESIGNATION OF DRILL CME - 550
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT 7" OD. 2-1/4" ID Hollow Stem Auger 2' x 2" Split Spoon	8. HOLE LOCATION Building 28 Gas Station
	9. SURFACE LOCATION
	10. DATE STARTED 6/20/96 — 11. DATE COMPLETED 6/20/96
12. OVERBURDEN THICKNESS N/A	15. DEPTH GROUNDWATER ENCOUNTERED None
13. DEPTH DRILLED INTO ROCK N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A
14. TOTAL DEPTH OF HOLE 16'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A
15. GEOTECHNICAL SAMPLES — DISTURBED / UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES N/A
20. SAMPLES FOR CHEMICAL ANALYSIS — VOC / METALS / OTHER (TPH) / OTHER (SPECIFY) / OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
22. DISPOSITION OF HOLE — BACKFILLED: X / MONITORING WELL / OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR Jeff Farrell

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS (ppm) D	GEOTECH SAMPLE RECOVERY (ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
		Augered 6 "				-	
	1		1	0.7		3	13:05
						6	
	2	Brown SILT and CINDER FILL				7	
						6	
	3	Green brown SILT	1	1.5		6	13:10
						7	
	4					9	
						9	
	5					5	13:13
			1	1.2		5	
	6					5	
						6	
	7		2	2.0	07 - 01	6	13:17
					07 - 02	8	
	8	Dk. brown cm SAND				9	
		Green SILT				16	
	9		1	1.0		18	13:25
		Dk. brown cmf GRAVEL				20	
	10	Brown cmf SAND				16	
						12	
	11	Dk. brown cmf GRAVEL, some cmf Sand	3	1.2		14	13:30
						14	
	12					22	
		Dk. brown cm GRAVEL, some cobbles				13	
	13		4	1.8	07 - 03	10	13:35
					07 - 04	11	
	14	Brown cmf SAND				14	
		Dk. brown cm GRAVEL, some cobbles				17	
	15		1	1.7		13	13:40
		Orange cmf SAND				11	
	16					10	

HTW DRILLING LOG

HOLE NO. 28 - 08

1. COMPANY NAME Louis Berger & Associates	2. DRILLING SUBCOTRACTOR SJB Services	SHEET 1 OF 1 SHEETS
3. PROJECT DPSC - Expanded Site Investigation	4. LOCATION Philadelphia, Pennsylvania	
5. NAME OF DRILLER Scott Bray	6. MANUFACTURER'S DESIGNATION OF DRILL CME - 550	
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT 7" OD, 2-1/4" ID Hollow Stem Auger 2' x 2" Split Spoon	8. HOLE LOCATION Bldg. 28 Gas Station 9. SURFACE LOCATION	
	10. DATE STARTED 6/20/96	11. DATE COMPLETED 6/20/96
12. OVERBURDEN THICKNESS N/A	15. DEPTH GROUNDWATER ENCOUNTERED None	
13. DEPTH DRILLED INTO ROCK N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A	
14. TOTAL DEPTH OF HOLE 16'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A	
15. GEOTECHNICAL SAMPLES: DISTURBED / UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES N/A	
20. SAMPLES FOR CHEMICAL ANALYSIS: VOC / METALS / OTHER (TPH) 4 / OTHER (SPECIFY) / OTHER (SPECIFY)	21. TOTAL CORE RECOVERY	
22. DISPOSITION OF HOLE: BACKFILLED X / MONITORING WELL / OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR Jeff Farrell	

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS (ppm) D	GEOTECH SAMPLE RECOVERY (ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1	CINDER BLOCK and GRAVEL FILL	1	0.5		-, -, 3, 2	14:20
	2	Orange brown cm SAND					
	3	Orange brown SILT	1	1.8		6, 6, 6, 7	14:25 Slight Petroleum Odor
	4	Gray green SILT					
	5-6		0	1.7		4, 3, 3, 2	14:30
	7-8		1	2.0		3, 4, 7, 7	14:35
	9	Gray green CLAYEY SILT Gray cmf GRAVEL Dk. brown cm SAND	1	1.8	08 - 01	15, 16, 26, 32	Photo 21 14:40
	11-12		1	1.2		8, 16, 22, 25	15:05
	13-14		1	1.3		15, 19, 17, 15	15:10
	15-16	Brown cm SAND	5	2.0	08 - 02	15, 14, 11, 10	15:15

HTW DRILLING LOG

HOLE NO. 28 - 09

1. COMPANY NAME Louis Berger & Associates	2. DRILLING SUBCOTRACTOR SJB Services	SHEET 1 OF 1 SHEETS
3. PROJECT DPSC - Expanded Site Investigation	4. LOCATION Philadelphia, Pennsylvania	
5. NAME OF DRILLER Scott Bray	6. MANUFACTURER'S DESIGNATION OF DRILL CME - 550	
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT 7" OD, 2-1/4" ID Hollow Stem Auger 2' x 2" Split Spoon	8. HOLE LOCATION Bldg. 28 Gas Station	
	9. SURFACE LOCATION	
	10. DATE STARTED 6/20/96	11. DATE COMPLETED 6/20/96
12. OVERBURDEN THICKNESS N/A	15. DEPTH GROUNDWATER ENCOUNTERED None	
13. DEPTH DRILLED INTO ROCK N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A	
14. TOTAL DEPTH OF HOLE 16.0'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A	

15. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES		
			N/A		

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (TPH)	OTHER (HFS)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
			2	2		

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	x			Jeff Farrell

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS (ppm) D	GEOTECH SAMPLE RECOVERY (ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1 2	Brown SILT, little mf Gravel	0 ppm	2.0		1 3 6 6	15:25
	3 4	Dk. brown cmf GRAVEL, little cmf Sand	1 ppm	1.0		6 6 6 7	15:30
	5 6	Dk. brown cmf SAND	5 ppm	1.3	09-01	5 3 3 2	15:35
	7 8	Dk. brown cmf SAND, some Gravel	1 ppm	1.2		3 4 4 5	15:40
	9 10	Green cmf SAND, some cmf Gravel, little Silt, wet	2 ppm	0.8		1 1 2 1	15:45
	11 12	No Recovery	-	0.0		1 1 1 1	16:05
	13 14	Brown cmf GRAVEL, some cmf Sand	36 ppm	0.7		22 5 8 9	16:10 Strong Gasoline Odor
	15 16	Brown cmf GRAVEL, some cmf Sand Brown cmf SAND	30 ppm	1.0	09-02 09-03	7 11 15 13	16:15 Strong Gasoline Odor

HTW DRILLING LOG

HOLE NO.	28 - 10
1. COMPANY NAME	Louis Berger & Associates
2. DRILLING SUBCOTRACTOR	SJB Services
SHEET 1 OF 1 SHEETS	
3. PROJECT	DPSC - Expanded Site Investigation
4. LOCATION	Philadelphia, Pennsylvania
5. NAME OF DRILLER	Scott Bray
6. MANUFACTURER'S DESIGNATION OF DRILL	CME - 550
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT	7" OD, 2-1/4" ID Hollow Stem Auger; 2' x 2" Split Spoon
8. HOLE LOCATION	Building 28 - Gas Station
9. SURFACE LOCATION	
10. DATE STARTED	6/21/96
11. DATE COMPLETED	6/21/96
12. OVERBURDEN THICKNESS	N/A
15. DEPTH GROUNDWATER ENCOUNTERED	None
13. DEPTH DRILLED INTO ROCK	N/A
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	N/A
14. TOTAL DEPTH OF HOLE	16.0'
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	N/A
15. GEOTECHNICAL SAMPLES	DISTURBED: ; UNDISTURBED:
19. TOTAL NUMBER OF CORE BOXES	N/A
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC: ; METALS: ; OTHER (TPH): 4 ; OTHER (SPECIFY): ; OTHER (SPECIFY):
21. TOTAL CORE RECOVERY	
22. DISPOSITION OF HOLE	BACKFILLED: x ; MONITORING WELL: ; OTHER (SPECIFY):
23. SIGNATURE OF INSPECTOR	Jeff Farrell

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS (ppm) D	GEOTECH SAMPLE RECOVERY (ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1–2	Dk. brown SILT cmf GRAVEL and cmf SAND	1	1.5		4 3 4 3	8:50
	3–4	Dk. brown mf SAND, some Silt Red brown SILT, some f Sand	1	1.8		6 3 7 2	8:55
	5–6	Dk. brown mf SAND	1	2.0		4 3 4 3	9:00
	7–8	Dk. brown mf SAND, thin mica layer at 7'	1	2.0	10-01	3 2 2 3	9:05
	9–10		1	1.3		3 2 1 1	9:10
	11–12		1	0.8		2 2 2 4	9:15
	13–14	cmf GRAVEL, some cmf Sand	9	2.0		6 6 7 6	9:20
	15–16	Dk. brown cmf GRAVEL, some f Sand	37	2.0	10-02	10 12 11 14	9:25 Strong Diesel Odor

HTW DRILLING LOG

1. COMPANY NAME: Louis Berger & Associates	2. DRILLING SUBCOTRACTOR: SJB Services	HOLE NO. 28 - 11; SHEET 1 OF 1 SHEETS
3. PROJECT: DPSC - Expanded Site Investigation	4. LOCATION: Philadelphia, Pennsylvania	
5. NAME OF DRILLER: Scott Bray	6. MANUFACTURER'S DESIGNATION OF DRILL: CME - 550	
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT: 7" OD, 2-1/4" ID Hollow Stem Auger; 2' x 2" Split Spoon	8. HOLE LOCATION: Building 28 Gas Station	
	9. SURFACE LOCATION:	
	10. DATE STARTED: 6/21/96	11. DATE COMPLETED: 6/21/96
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: None	
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: N/A	
14. TOTAL DEPTH OF HOLE: 16.0'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): N/A	
15. GEOTECHNICAL SAMPLES: DISTURBED / UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES: N/A	
20. SAMPLES FOR CHEMICAL ANALYSIS: VOC / METALS / OTHER (SPECIFY) / OTHER (SPECIFY) / OTHER (SPECIFY)	21. TOTAL CORE RECOVERY	
22. DISPOSITION OF HOLE: BACKFILLED X / MONITORING WELL / OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR: Jeff Farrell	

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS (ppm) D	GEOTECH SAMPLE RECOVERY (ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1	Concrete	0	0.4	No Analytical samples collected	-, -, 2, 4	14:20
	2	Lt. brown SILT					
	3–4	Brown SILT, some f Sand	1	1.8		5, 6, 6, 7	14:25
	5–6	Green SILT,some f Sand	1	1.7		11, 5, 5, 4	14:30
	7	Gray green CLAYEY SILT	1	2.0		5, 5, 14, 22	Wet 14:35
	8	Orange cmf GRAVEL, dry					
	9		0	1.7		13, 12, 14, 22	14:40
	10	Green cmf SAND					
	11	Green SILT,some f Sand	1	1.7		13, 5, 6, 7	14:50
	11–12	Green to brown mf SAND					
	13	Green mf SAND	0	2.0		9, 8, 9, 11	15:00
	14	Lt. brown mf GRAVEL, some cmf Sand					
	15–16	Dk. brown cmf GRAVEL	1	1.7		13, 11, 9, 9	15:05

HTW DRILLING LOG

HOLE NO. 28 - 12

1. COMPANY NAME Louis Berger & Associates	2. DRILLING SUBCOTRACTOR SJB Services — SHEET 1 OF 1 SHEETS
3. PROJECT DPSC - Expanded Site Investigation	4. LOCATION Philadelphia, Pennsylvania
5. NAME OF DRILLER Scott Bray	6. MANUFACTURER'S DESIGNATION OF DRILL CME - 550
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT 7" OD, 2-1/4" ID Hollow Stem Auger 2" x 2" Split Spoon	8. HOLE LOCATION Bldg. 28 Gas Station 9. SURFACE LOCATION
	10. DATE STARTED 6/21/96 — 11. DATE COMPLETED 6/21/96
12. OVERBURDEN THICKNESS N/A	15. DEPTH GROUNDWATER ENCOUNTERED None
13. DEPTH DRILLED INTO ROCK N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A
14. TOTAL DEPTH OF HOLE 16'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A
15. GEOTECHNICAL SAMPLES — DISTURBED — UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES N/A
20. SAMPLES FOR CHEMICAL ANALYSIS — VOC — METALS — OTHER (TPH): 1 — OTHER (SPECIFY) — OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
22. DISPOSITION OF HOLE — BACKFILLED: x — MONITORING WELL — OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR Jeff Farrell

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS (ppm) D	GEOTECH SAMPLE RECOVERY (ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1–2	No Recovery	-	0.0		-, -, 4, 8	15:25
	3–4	Brown gray green banded SILT, moist	2	1.5		8, 7, 6, 8	Photo # 22 15:30 Staining Visible
	5–6	No Recovery	-	0.0		4, 4, 4, 5	15:35
	7–8	Green SILT f Sand , Black Staining	12	2.0	12 -O1	12, 14, 10, 11	Photo # 23 15:40 Staining Visible Petroleum Odor
	9–10	Dark brown cmf GRAVEL	1	0.5		32, 25, 13, 20	15:45
	11–12		1	2.0		18, 17, 12, 22	15:55
	13–14	No Recovery	-	0.0		13, 11, 15, 17	16:00
	15–16	No Recovery	-	0.0		1, 2, 2, 2	16:05

HTW DRILLING LOG

1. COMPANY NAME Louis Berger & Associates	2. DRILLING SUBCOTRACTOR SJB Services	HOLE NO. 28 - 13 SHEET 1 OF 1 SHEETS
3. PROJECT DPSC - Expanded Site Investigation	4. LOCATION Philadelphia, Pennsylvania	
5. NAME OF DRILLER Scott Bray	6. MANUFACTURER'S DESIGNATION OF DRILL CME - 550	
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT 7" OD, 2-1/4" ID Hollow Stem Auger 2' x 2" Split Spoon	8. HOLE LOCATION Bldg. 28 Gas Station 9. SURFACE LOCATION	
	10. DATE STARTED 6/24/96	11. DATE COMPLETED 6/24/96
12. OVERBURDEN THICKNESS N/A	15. DEPTH GROUNDWATER ENCOUNTERED None	
13. DEPTH DRILLED INTO ROCK N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A	
14. TOTAL DEPTH OF HOLE 16 '	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A	
15. GEOTECHNICAL SAMPLES: DISTURBED / UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES N/A	
20. SAMPLES FOR CHEMICAL ANALYSIS: VOC / METALS / OTHER (TPH) 2 / OTHER (SPECIFY) / OTHER (SPECIFY)	21. TOTAL CORE RECOVERY	
22. DISPOSITION OF HOLE: BACKFILLED x / MONITORING WELL / OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR Jeff Farrell	

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS (ppm) D	GEOTECH SAMPLE RECOVERY (ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1	Concrete	0	1.0		-	
						-	10:55
	2	Brown SILT				6	
						12	
	3	Brown green SILT, some f Sand	0	1.7		6	
						6	10:57
	4					7	
						7	
	5	Brown CLAYEY SILT	0	1.3		8	
						6	11:00
	6					5	
						6	
	7		1	2.0		8	
						8	11:05
	8	Green CLAYEY SILT, some f Sand				12	
						18	Slight Petroleum Odor
	9	Green brown cmf SAND, little Gravel	1	2.0		22	
						12	11:10
	10					10	
						8	Strong Petroleum Odor
	11	Dk. brown cmf GRAVEL	1	1.5		17	
						16	11:15
	12	Brown cmf SAND				18	
						20	
	13		3	1.8		17	
						16	11:20
	14	Brown cmf GRAVEL				14	
						12	
	15	Dk. brown cmf GRAVEL, little cmf Sand	6	2.0	13 - 01	17	
						16	11:25
	16					18	
						14	

HTW DRILLING LOG

HOLE NO. 28 - 14	SHEET 1 OF 1 SHEETS	
1. COMPANY NAME: Louis Berger & Associates	2. DRILLING SUBCOTRACTOR: SJB Services	
3. PROJECT: DPSC - Expanded Site Investigation	4. LOCATION: Philadelphia, Pennsylvania	
5. NAME OF DRILLER: Scott Bray	6. MANUFACTURER'S DESIGNATION OF DRILL: CME - 550	
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT: 7" OD, 2-1/4" ID Hollow Stem Auger; 2' x 2" Split Spoon	8. HOLE LOCATION: Bldg. 28 Gas Station	
	9. SURFACE LOCATION:	
	10. DATE STARTED: 6/24/96	11. DATE COMPLETED: 6/24/96
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: None	
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: N/A	
14. TOTAL DEPTH OF HOLE: 16.0'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): N/A	
15. GEOTECHNICAL SAMPLES: DISTURBED / UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES: N/A	
20. SAMPLES FOR CHEMICAL ANALYSIS: VOC / METALS / OTHER (SPECIFY) / OTHER (SPECIFY) / OTHER (SPECIFY)	21. TOTAL CORE RECOVERY	
22. DISPOSITION OF HOLE: BACKFILLED x / MONITORING WELL / OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR: Jeff Farrell	

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS (ppm) D	GEOTECH SAMPLE RECOVERY (ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1	CONCRETE FILL	0	1.0	No Analytical Samples Collected	-	12:00
						-	
	2	Green SILT, little f Sand				6	
						5	
	3	CONCRETE FILL	0	1.7		6	12:05
						5	
	4	Green SILT, little f Sand				7	
						3	
	5	Lt. brown SILT, little Sand	0	0.5		6	12:10
						7	
	6					5	
						6	
	7	Brown CLAYEY SILT, Wet	1	2.0		17	12:15
						18	
	8					20	
						22	Plastic
	9	Green brown cmf GRAVEL, some cmf Sand	1	2.0		12	12:20
						11	
	10					9	
						10	Petroleum Odors
	11		1	1.5		8	12:25
						10	
	12	Brown SILT, some f Sand				8	
						6	Petroleum Odors
	13	cmf GRAVEL, little cmf Sand	1	1.5		10	12:30
						12	
	14					16	
						18	
	15	Dk. brown cmf GRAVEL, some cmf Sand	2	2.0		10	12:35
						10	
	16					12	
						10	

HTW DRILLING LOG

HOLE NO.	28 - 15
SHEET 1 OF 1 SHEETS	
1. COMPANY NAME	Louis Berger & Associates
2. DRILLING SUBCOTRACTOR	SJB Services
3. PROJECT	DPSC - Expanded Site Investigation
4. LOCATION	Philadelphia, Pennsylvania
5. NAME OF DRILLER	Scott Bray
6. MANUFACTURER'S DESIGNATION OF DRILL	CME - 550
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT	7" OD, 2-1/4" ID Hollow Stem Auger; 2' x 2" Split Spoon
8. HOLE LOCATION	Building 28 Gas Station
9. SURFACE LOCATION	
10. DATE STARTED	6/24/96
11. DATE COMPLETED	6/24/96
12. OVERBURDEN THICKNESS	N/A
15. DEPTH GROUNDWATER ENCOUNTERED	None
13. DEPTH DRILLED INTO ROCK	N/A
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	N/A
14. TOTAL DEPTH OF HOLE	16'
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	N/A
15. GEOTECHNICAL SAMPLES	DISTURBED: ; UNDISTURBED:
19. TOTAL NUMBER OF CORE BOXES	N/A
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC: ; METALS: ; OTHER (SPECIFY): ; OTHER (SPECIFY): ; OTHER (SPECIFY):
21. TOTAL CORE RECOVERY	
22. DISPOSITION OF HOLE	BACKFILLED: X; MONITORING WELL: ; OTHER (SPECIFY):
23. SIGNATURE OF INSPECTOR	Jeff Farrell

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS (ppm) D	GEOTECH SAMPLE RECOVERY (ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1–2	Concrete; Brown SILT, little f Sand	0	0.7	No Analytical samples collected	-, -, 6, 7	13:40
	3–4	Brown SILT, some f Sand	0	1.2		7, 6, 5, 6	13:45
	5–6		0	1.8		10, 7, 7, 5	13:50
	7–8	Green brown SILT, some Sand; Dk. brown cmf SAND	1	2.0		7, 7, 6, 5	13:53
	9–10		2	0.3		4, 4, 5, 6	13:55; Strong Petroleum Smell
	11–12	Dk. brown cmf SAND, little cmf Gravel	1	1.7		14, 15, 17, 39	14:00
	13–14	Brown cmf GRAVEL; Dk. brown cmf SAND	1	1.5		5, 7, 7, 7	14:05
	15–16	Brown cmf GRAVEL	1	1.5		7, 9, 9, 8	14:15

HTW DRILLING LOG

HOLE NO.	28 - 16
1. COMPANY NAME	Louis Berger & Associates
2. DRILLING SUBCOTRACTOR	SJB Services
SHEET	1 OF 1 SHEETS
3. PROJECT	DPSC - Expanded Site Investigation
4. LOCATION	Philadelphia, Pennsylvania
5. NAME OF DRILLER	Scott Bray
6. MANUFACTURER'S DESIGNATION OF DRILL	CME - 550
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT	7" OD, 2-1/4" ID Hollow Stem Auger; 2' x 2" Split Spoon
8. HOLE LOCATION	Building 28 Gas Station
9. SURFACE LOCATION	
10. DATE STARTED	6/24/96
11. DATE COMPLETED	6/24/96
12. OVERBURDEN THICKNESS	N/A
15. DEPTH GROUNDWATER ENCOUNTERED	None
13. DEPTH DRILLED INTO ROCK	N/A
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	N/A
14. TOTAL DEPTH OF HOLE	16'
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	N/A
15. GEOTECHNICAL SAMPLES	DISTURBED: ; UNDISTURBED:
19. TOTAL NUMBER OF CORE BOXES	N/A
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC: ; METALS: ; OTHER (TPH): 2; OTHER (SPECIFY): ; OTHER (SPECIFY):
21. TOTAL CORE RECOVERY	
22. DISPOSITION OF HOLE	BACKFILLED: x; MONITORING WELL: ; OTHER (SPECIFY):
23. SIGNATURE OF INSPECTOR	Jeff Farrell

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS (ppm) D	GEOTECH SAMPLE RECOVERY (ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1	Concrete	0	1.0	No Analytical samples collected	-, -, 4, 4	15:10
	2	Brown SILT, little f Sand					
	3		2.5	1.0		8, 8, 7, 6	15:15
	4						
	5	Green CLAYEY SILT, little f Sand	4	1.2		5, 5, 4, 6	15:20
	6						
	7	Green CLAYEY SILT, moist	2	2.0	16 - 01	8, 6, 7, 7	15:23
	8	Dk. brown mf SAND	50				
	9		50	0.5		27, 37, 24, 28	15:28
	10						
	11	Green CLAYEY SILT, little cmf Gravel	1	2.0		8, 16, 20, 10	15:35
	12						
	13	cmf GRAVEL	0	2.0		8, 16, 13, 10	15:40
	14	cmf SAND					
	15	cmf SAND and mf GRAVEL	1	2.0		16, 20, 10, 13	15:45
	16						

HTW DRILLING LOG

HOLE NO.	28 - 17
SHEET	1 OF 1 SHEETS
1. COMPANY NAME	Louis Berger & Associates
2. DRILLING SUBCOTRACTOR	SJB Services
3. PROJECT	DPSC - Expanded Site Investigation
4. LOCATION	Philadelphia, Pennsylvania
5. NAME OF DRILLER	Scott Bray
6. MANUFACTURER'S DESIGNATION OF DRILL	CME - 550
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT	7" OD, 2-1/4" ID Hollow Stem Auger; 2' x 2" Split Spoon
8. HOLE LOCATION	Building 28 Gas Station
9. SURFACE LOCATION	
10. DATE STARTED	6/24/96
11. DATE COMPLETED	6/24/96
12. OVERBURDEN THICKNESS	N/A
15. DEPTH GROUNDWATER ENCOUNTERED	None
13. DEPTH DRILLED INTO ROCK	N/A
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	N/A
14. TOTAL DEPTH OF HOLE	16.0'
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	N/A
15. GEOTECHNICAL SAMPLES	DISTURBED: ; UNDISTURBED:
19. TOTAL NUMBER OF CORE BOXES	N/A
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC: ; METALS: ; OTHER (TPH): 2; OTHER (SPECIFY): ; OTHER (SPECIFY):
21. TOTAL CORE RECOVERY	
22. DISPOSITION OF HOLE	BACKFILLED: x; MONITORING WELL: ; OTHER (SPECIFY):
23. SIGNATURE OF INSPECTOR	Jeff Farrell

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS (ppm) D	GEOTECH SAMPLE RECOVERY (ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1–2	Concrete; Brown SILT, little mf Gravel	0	0.8		-, -, 6, 8	16:05
	3–4	Concrete; Brown SILT, little mf Gravel	0	1.3		4, 6, 4, 4	16:08
	5–6	Gray green SILT, little f Sand	2	1.0		12, 4, 3, 3	16:12
	7–8	Gray green CLAYEY SILT; Cobbles at bottom	8	2.0	17 - 01	8, 40, 99, 61	16:20
	9–10	Gray green CLAYEY SILT, Rock chips; Dk. brown mf SAND	12	0.8		8, 15, 14, 8	16:23
	11–12	Lt. brown cmf SAND, little Gravel	1	1.5		13, 13, 16, 21	16:28
	13–14		3	1.7		8, 17, 12, 13	16:30
	15–16	Dk. brown cmf GRAVEL, some cmf Sand	1	2.0		12, 17, 15, 17	16:35

HTW DRILLING LOG

HOLE NO. 28 - 18

1. COMPANY NAME Louis Berger & Associates	2. DRILLING SUBCOTRACTOR SJB Services
SHEET 1 OF 1 SHEETS	
3. PROJECT DPSC - Expanded Site Investigation	4. LOCATION Philadelphia, Pennsylvania
5. NAME OF DRILLER Scott Bray	6. MANUFACTURER'S DESIGNATION OF DRILL CME - 550
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT 7" OD, 2-1/4" ID Hollow Stem Auger 2' x 2" Split Spoon	8. HOLE LOCATION Bldg. 28 Gas Station
	9. SURFACE LOCATION
	10. DATE STARTED 6/25/96 — 11. DATE COMPLETED 6/25/96
12. OVERBURDEN THICKNESS N/A	15. DEPTH GROUNDWATER ENCOUNTERED None
13. DEPTH DRILLED INTO ROCK N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A
14. TOTAL DEPTH OF HOLE 12.3'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A
15. GEOTECHNICAL SAMPLES — DISTURBED — UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES N/A
20. SAMPLES FOR CHEMICAL ANALYSIS — VOC — METALS	OTHER (SPECIFY) — OTHER (SPECIFY) — OTHER (SPECIFY) — 21. TOTAL CORE RECOVERY
22. DISPOSITION OF HOLE — BACKFILLED: x — MONITORING WELL	OTHER (SPECIFY) — 23. SIGNATURE OF INSPECTOR Jeff Farrell

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS (ppm) D	GEOTECH SAMPLE RECOVERY (ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1	Concrete & Cinders	3	0.3		-	8:55
						-	
	2	Lt. brown SILT, little f Sand				1	
						7	
	3	Concrete & Cinders	3	1.3		7	8:58
						7	
	4	Lt. brown SILT, little f Sand				5	
						6	
	5	Lt. brown green SILT, trace Sand	1	1.2		8	9:00
						4	
	6					5	
						4	
	7	Brown green SILT, little Sand	1	2.0		5	9:05
						6	
	8	mf GRAVEL, brown cmf Sand				7	
						12	
	9	Dk. brown GRAVEL, some cmf Sand	1	1.7		16	9:10
						12	
	10	Green mf SAND				14	
						13	
	11	Dk. brown mf GRAVEL	0	1.5		8	9:15
						7	
	12					30	
						120	
	13	Refusal at 12'-4 "					
	14						
	15						
	16						

HTW DRILLING LOG

1. COMPANY NAME Louis Berger & Associates	2. DRILLING SUBCOTRACTOR SJB Services	HOLE NO. 28 - 19 SHEET 1 OF 1 SHEETS
3. PROJECT DPSC - Expanded Site Investigation	4. LOCATION Philadelphia, Pennsylvania	
5. NAME OF DRILLER Scott Bray	6. MANUFACTURER'S DESIGNATION OF DRILL CME - 550	
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT 7" OD, 2-1/4" ID Hollow Stem Auger 2' x 2" Split Spoon	8. HOLE LOCATION Building 28 Gas Station	
	9. SURFACE LOCATION	
	10. DATE STARTED 6/25/96	11. DATE COMPLETED 6/25/96
12. OVERBURDEN THICKNESS N/A	15. DEPTH GROUNDWATER ENCOUNTERED None	
13. DEPTH DRILLED INTO ROCK N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A	
14. TOTAL DEPTH OF HOLE 16.0'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A	
15. GEOTECHNICAL SAMPLES — DISTURBED / UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES N/A	
20. SAMPLES FOR CHEMICAL ANALYSIS — VOC / METALS / OTHER (SPECIFY) / OTHER (SPECIFY) / OTHER (SPECIFY)		21. TOTAL CORE RECOVERY
22. DISPOSITION OF HOLE — BACKFILLED: X / MONITORING WELL / OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR Jeff Farrell	

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS (ppm) D	GEOTECH SAMPLE RECOVERY (ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
		Concrete & Cinders			No Analytical	-	
	1	Red siltstone,	0	0.7	samples	7	9:35
		Dk. brown mf GRAVEL			collected	5	
	2	Green SILT, little Sand				9	
						10	
	3	Lt. brown f SANDY SILT,	0	1.5		10	9:45
		some Sand				8	
	4					6	
		Brown CLAYEY SILT, wet				5	
	5		0	0.8		7	9:50
						7	
	6					6	
						6	
	7		2	2.0		8	9:55
		Gray green SILT, some				10	
	8	mf Gravel				12	
		Brown cmf GRAVEL and				17	
	9	green mf SAND	1	1.5		12	10:00
						14	
	10	Dk. brown cmf GRAVEL				16	
						10	
	11	Dk. brown cm SAND	1	1.7		10	10:05
		Dk. brown cmf SAND				14	
	12					11	
		Dk. brown cmf GRAVEL				14	
	13		1	1.7		13	10:10
						10	
	14					11	
						14	
	15		1	1.3		10	10:15
						12	
	16					8	

HTW DRILLING LOG

HOLE NO. 28 - 20

1. COMPANY NAME Louis Berger & Associates	2. DRILLING SUBCOTRACTOR SJB Services
SHEET 1 OF 1 SHEETS	
3. PROJECT DPSC - Expanded Site Investigation	4. LOCATION Philadelphia, Pennsylvania
5. NAME OF DRILLER Scott Bray	6. MANUFACTURER'S DESIGNATION OF DRILL CME - 550
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT 7" OD, 2-1/4" ID Hollow Stem Auger 2' x 2" Split Spoon	8. HOLE LOCATION Bldg. 28 Gas Station
	9. SURFACE LOCATION
	10. DATE STARTED 6/25/96 11. DATE COMPLETED 6/25/96
12. OVERBURDEN THICKNESS N/A	15. DEPTH GROUNDWATER ENCOUNTERED None
13. DEPTH DRILLED INTO ROCK N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A
14. TOTAL DEPTH OF HOLE 16.0'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A
15. GEOTECHNICAL SAMPLES: DISTURBED / UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES N/A
20. SAMPLES FOR CHEMICAL ANALYSIS: VOC / METALS / OTHER (SPECIFY) / OTHER (SPECIFY) / OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
22. DISPOSITION OF HOLE: BACKFILLED x / MONITORING WELL / OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR Jeff Farrell

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS (ppm) D	GEOTECH SAMPLE RECOVERY (ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1–2	Concrete & Cinders Lt. green to brown SILT, little mf Gravel, Very Dry	0	0.7		-, 7, 7, 7	10:40
	3–4	Concrete & Cinders Lt. green to brown SILT, little mf Gravel, Very Dry	0	1.5		14, 17, 13, 12	10:45
	5–6	Lt. brown SILT, little f Sand	0	0.8		10, 7, 6, 5	10:50
	7–8	Brown CLAYEY SILT, some f Sand Green SILT, some f Sand	0	2.0		8, 7, 11, 16	10:53
	9–10	Brown cmf SAND Brown cmf GRAVEL	1	1.7		16, 13, 16, 17	10:55
	11–12	Brown cmf GRAVEL	1	0.7		20, 18, 10, 5	11:15
	13–14	Brown cmf SAND	1	0.2		10, 12, 10, 18	11:20
	15–16	Brown cmf SAND, some Silt	0	0.2		17, 12, 14, 18	11:25

HTW DRILLING LOG

1. COMPANY NAME Louis Berger & Associates	2. DRILLING SUBCOTRACTOR SJB Services	HOLE NO. 28 - 21 SHEET 1 OF 1 SHEETS
3. PROJECT DPSC - Expanded Site Investigation	4. LOCATION Philadelphia, Pennsylvania	
5. NAME OF DRILLER Scott Bray	6. MANUFACTURER'S DESIGNATION OF DRILL CME - 550	
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT	7" OD, 2-1/4" ID Hollow Stem Auger 2' x 2" Split Spoon	8. HOLE LOCATION Bldg 28 Gas Station 9. SURFACE LOCATION
10. DATE STARTED 6/25/96	11. DATE COMPLETED 6/25/96	
12. OVERBURDEN THICKNESS N/A	15. DEPTH GROUNDWATER ENCOUNTERED None	
13. DEPTH DRILLED INTO ROCK N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A	
14. TOTAL DEPTH OF HOLE 16.0'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A	
15. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED
19. TOTAL NUMBER OF CORE BOXES N/A		
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC / METALS / OTHER (SPECIFY) / OTHER (SPECIFY) / OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
22. DISPOSITION OF HOLE	BACKFILLED: X / MONITORING WELL / OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR Jeff Farrell

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS (ppm) D	GEOTECH SAMPLE RECOVERY (ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	0–2	Asphalt & Concrete Brown green SILT, some f Sand	0	0.7	No analytical samples collected	- - 6 7	11:40
	2–4	Lt. brown to green SILT, some f Sand	0	1.8		16 10 7 12	11:45
	4–6	Gray to lt. brown SILT some f Sand Green SILT, some f Sand, moist	0	2.0		10 4 3 5	11:48
	6–8	Gray green CLAYEY SILT	0	1.5		10 5 50/2" Refusal	11:52
	8–10	Boulder Drilled Through No Recovery		-			12:05
	10–12	Dk. brown cmf GRAVEL, some cmf Sand	0	0.5		14 30 55 21	12:10
	12–14	NO RECOVERY	-	0.0		10 12 10 16	12:15
	14–16	Dk. brown cmf GRAVEL	6	1.0		16 17 16 22	12:20

HTW DRILLING LOG

1. COMPANY NAME Louis Berger & Associates	2. DRILLING SUBCOTRACTOR SJB Services	HOLE NO. 28 - 22 SHEET 1 OF 1 SHEETS
3. PROJECT DPSC - Expanded Site Investigation	4. LOCATION Philadelphia, Pennsylvania	
5. NAME OF DRILLER Scott Bray	6. MANUFACTURER'S DESIGNATION OF DRILL CME - 550	
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT: 7" OD, 2-1/4" ID Hollow Stem Auger; 2' x 2" Split Spoon	8. HOLE LOCATION Bldg 28 Gas Station 9. SURFACE LOCATION	
	10. DATE STARTED 6/25/96	11. DATE COMPLETED 6/25/96
12. OVERBURDEN THICKNESS N/A	15. DEPTH GROUNDWATER ENCOUNTERED None	
13. DEPTH DRILLED INTO ROCK N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A	
14. TOTAL DEPTH OF HOLE 16'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A	
15. GEOTECHNICAL SAMPLES: DISTURBED / UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES N/A	
20. SAMPLES FOR CHEMICAL ANALYSIS: VOC / METALS / OTHER (SPECIFY) / OTHER (SPECIFY) / OTHER (SPECIFY)	21. TOTAL CORE RECOVERY	
22. DISPOSITION OF HOLE: BACKFILLED X / MONITORING WELL / OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR Jeff Farrell	

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS (ppm) D	GEOTECH SAMPLE RECOVERY (ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1–2	Asphalt & Concrete Gray green SILT, trace Sand	0	1.0		-, -, 6, 7	13:50
	3–4	Asphalt & Concrete Gray green SILT, trace Sand	0	1.5		7, 5, 6, 7	14:00
	5–6	No Recovery	-	-		7, 6, 8, 7	14:04
	7–8	Gray green CLAYEY SILT Dk. brown cmf GRAVEL	0	2.0		8, 11, 15, 16	14:07
	9–10	Dk. brown cmf SAND, some cmf Gravel	0	1.5		17, 11, 16, 14	14:10
	11–12	Brown cmf SAND	2	1.7		16, 18, 15, 21	14:15
	13–14	Rock in Shoe of Spoon No Recovery	-	-		24, 23, 19, 26	14:20
	15–16	No Recovery	-	-		24, 16, 23, 19	14:24

HTW DRILLING LOG

HOLE NO. 28 - 23			
1. COMPANY NAME Louis Berger & Associates	2. DRILLING SUBCOTRACTOR SJB Services	SHEET 1 OF 1 SHEETS	
3. PROJECT DPSC - Expanded Site Investigation	4. LOCATION Philadelphia, Pennsylvania		
5. NAME OF DRILLER Scott Bray	6. MANUFACTURER'S DESIGNATION OF DRILL CME - 550		
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT	7" OD, 2-1/4" ID Hollow Stem Auger 2' x 2" Split Spoon	8. HOLE LOCATION Bldg 28 Gas Station	
		9. SURFACE LOCATION	
		10. DATE STARTED 6/25/96	11. DATE COMPLETED 6/25/96
12. OVERBURDEN THICKNESS N/A		15. DEPTH GROUNDWATER ENCOUNTERED None	
13. DEPTH DRILLED INTO ROCK N/A		16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A	
14. TOTAL DEPTH OF HOLE 16'		17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A	
15. GEOTECHNICAL SAMPLES	DISTURBED / UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES N/A	

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	TPH	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
			2			

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X			Jeff Farrell

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS (ppm) D	GEOTECH SAMPLE RECOVERY (ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	0–1	Concrete				-	14:45
	1	Lt. brown SILT, trace Sand	0	1.0		-	very wet beneath
	2					5	concrete - underlying
						7	silt dry
	3		1	1.5		-	14:50
						3	
						8	
	4					6	
	5	Green CLAYEY SILT, moist in lower interval	1	1.3		5	14:55
						6	
	6					9	
						7	
	7		10	2.0	23-01	7	15:00
						9	
						13	
	8	Brown cmf SAND				11	Petroleum odor at 7ft.
	9	Brown cmf SAND	0	1.5		14	15:05
		Brown cmf GRAVEL				16	
	10					23	
						31	
	11		0	1.3		10	15:10
						13	
	12					16	
						18	
	13		0	1.5		15	15:15
						16	
	14					19	
						22	
	15		0	1.3		16	15:20
						15	
	16					13	
						19	

HTW DRILLING LOG

HOLE NO.	28 - 24
SHEET 1 OF 1 SHEETS	

1. COMPANY NAME: Louis Berger & Associates	2. DRILLING SUBCOTRACTOR: SJB Services
3. PROJECT: DPSC - Expanded Site Investigation	4. LOCATION: Philadelphia, Pennsylvania
5. NAME OF DRILLER: Scott Bray	6. MANUFACTURER'S DESIGNATION OF DRILL: CME - 550
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT: 7" OD, 2-1/4" ID Hollow Stem Auger; 2' x 2" Split Spoon	8. HOLE LOCATION: Bldg 28 Gas Station
	9. SURFACE LOCATION
	10. DATE STARTED: 6/25/96 — 11. DATE COMPLETED: 6/25/96
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: None
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: N/A
14. TOTAL DEPTH OF HOLE: 16'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): N/A
15. GEOTECHNICAL SAMPLES: DISTURBED — UNDISTURBED —	19. TOTAL NUMBER OF CORE BOXES: N/A
20. SAMPLES FOR CHEMICAL ANALYSIS: VOC — METALS — TPH 2 — OTHER (SPECIFY) — OTHER (SPECIFY) —	21. TOTAL CORE RECOVERY
22. DISPOSITION OF HOLE: BACKFILLED X — MONITORING WELL — OTHER (SPECIFY) —	23. SIGNATURE OF INSPECTOR: Jeff Farrell

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS (ppm) D	GEOTECH SAMPLE RECOVERY (ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1	Concrete	0	0.8		-, -, 5, 6	15:45
	2	Lt. brown SILT, trace f Sand					
	3		0	1.8		5, 7, 7, 6	15:50
	4						
	5	Asphalt & Fill Green SILT, little f Sand	4	1.3		10, 5, 8, 7	15:55
	6	Brown CLAYEY SILT					
	7		0	2.0		8, 7, 9, 13	16:00
	8	Brown cmf GRAVEL,					
	9		0	0.5		9, 50/3, Refusal	16:05
	10						
	11	Red siltstone layer at 11'	2	0.8		32, 28, 29, 35	16:10
	12						
	13	No Recovery	-	0.0		28, 25, 26, 23	16:15
	14						
	15	cmf GRAVEL	2	0.8	24-01	24, 27, 26, 21	16:20
	16						

HTW DRILLING LOG

HOLE NO.	28-25
1. COMPANY NAME	Louis Berger & Associates
2. DRILLING SUBCOTRACTOR	SJB Services
SHEET	1 OF 1 SHEETS
3. PROJECT	DPSC - Expanded Site Investigation
4. LOCATION	Philadelphia, Pennsylvania
5. NAME OF DRILLER	Scott Bray
6. MANUFACTURER'S DESIGNATION OF DRILL	CME - 550
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT	7" OD, 2-1/4" ID Hollow Stem Auger 2' x 2" Split Spoon
8. HOLE LOCATION	Bldg 28 Gas Station
9. SURFACE LOCATION	
10. DATE STARTED	6/26/96
11. DATE COMPLETED	6/26/96
12. OVERBURDEN THICKNESS	N/A
15. DEPTH GROUNDWATER ENCOUNTERED	None
13. DEPTH DRILLED INTO ROCK	N/A
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	N/A
14. TOTAL DEPTH OF HOLE	16'
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	N/A
15. GEOTECHNICAL SAMPLES	DISTURBED: ; UNDISTURBED:
19. TOTAL NUMBER OF CORE BOXES	N/A
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC: ; METALS: ; TPH: 2 ; OTHER (SPECIFY): ; OTHER (SPECIFY):
21. TOTAL CORE RECOVERY	
22. DISPOSITION OF HOLE	BACKFILLED: X ; MONITORING WELL: ; OTHER (SPECIFY):
23. SIGNATURE OF INSPECTOR	Jeff Farrell

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS (ppm) D	GEOTECH SAMPLE RECOVERY (ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	0–1	Lt. Brown SAND and SILT					
	1–2	Dk. brown SILT, some f Sand	2	2.0		1, 3, 3, 4	12:30
	2–4	Brown SILT, little f Sand	4	2.0		6, 8, 8, 9	12:35 Somewhat plastic
	4–6	Green brown SILT	4	2.0		9, 10, 12, 15	12:40
	6–8		1	1.8		7, 8, 9, 7	12:43
	8–10	Dk. brown cmf SAND	10	1.7		13, 16, 14, 12	12:47
	10–12	Brown cmf GRAVEL, some cmf Sand	13	1.9	25-01	12, 13, 14, 6	12:55
	12–14	Dk. brown to black cm SAND, little Silt	17	0.3		39, 24, 26, 27	13:00
	14–16		19	0.2		22, 27, 30, 29	13:05

HTW DRILLING LOG

HOLE NO. 28-26

1. COMPANY NAME: Louis Berger & Associates	2. DRILLING SUBCOTRACTOR: SJB Services
SHEET 1 OF 1 SHEETS	
3. PROJECT: DPSC - Expanded Site Investigation	4. LOCATION: Philadelphia, Pennsylvania
5. NAME OF DRILLER: Scott Bray	6. MANUFACTURER'S DESIGNATION OF DRILL: CME - 550
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT: 7" OD, 2-1/4" ID Hollow Stem Auger; 2" x 2" Split Spoon	8. HOLE LOCATION: Bldg 28 Gas Station
	9. SURFACE LOCATION
	10. DATE STARTED: 6/26/96 — 11. DATE COMPLETED: 6/26/96
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: None
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: N/A
14. TOTAL DEPTH OF HOLE: 12'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): N/A
15. GEOTECHNICAL SAMPLES: DISTURBED / UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES: N/A
20. SAMPLES FOR CHEMICAL ANALYSIS: VOC / METALS / TPH: 5 / OTHER (SPECIFY) / OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
22. DISPOSITION OF HOLE: BACKFILLED: X / MONITORING WELL / OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR: Jeff Farrell

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS (ppm) D	GEOTECH SAMPLE RECOVERY (ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	0–2	Lt. brown SILT, some Sand	12	2.0		6, 8, 6, 7	13:21; Photo # 25
	2–4	Lt. green to brown SILT, trace f Sand	40	1.7		6, 8, 6, 6	13:25
	4–6		80	1.7	26-01, 26-02	6, 7, 5, 4	13:30
	6–8	Green SILT	5	2.0		7, 8, 8, 7	13:35 WET
	8–10	Brown cmf SAND, little Gravel	40	2.0		15, 17, 19, 22	13:40
	10–12	cmf GRAVEL and SAND	65	1.2	26-03	27, 50/0	13:50
	12–14		Refusal at 12'				
	14–16						

HTW DRILLING LOG

HOLE NO.	28-27
1. COMPANY NAME	Louis Berger & Associates
2. DRILLING SUBCOTRACTOR	SJB Services
SHEET	1 OF 1 SHEETS
3. PROJECT	DPSC - Expanded Site Investigation
4. LOCATION	Philadelphia, Pennsylvania
5. NAME OF DRILLER	Scott Bray
6. MANUFACTURER'S DESIGNATION OF DRILL	CME - 550
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT	7" OD, 2-1/4" ID Hollow Stem Auger; 2' x 2" Split Spoon
8. HOLE LOCATION	Bldg 28 Gas Station
9. SURFACE LOCATION	
10. DATE STARTED	6/27/96
11. DATE COMPLETED	6/27/96
12. OVERBURDEN THICKNESS	N/A
15. DEPTH GROUNDWATER ENCOUNTERED	None
13. DEPTH DRILLED INTO ROCK	N/A
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	N/A
14. TOTAL DEPTH OF HOLE	14.0'
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	N/A
15. GEOTECHNICAL SAMPLES	DISTURBED: ; UNDISTURBED:
19. TOTAL NUMBER OF CORE BOXES	N/A
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC: ; METALS: ; OTHER (SPECIFY): ; OTHER (SPECIFY): ; OTHER (SPECIFY):
21. TOTAL CORE RECOVERY	
22. DISPOSITION OF HOLE	BACKFILLED: X; MONITORING WELL: ; OTHER (SPECIFY):
23. SIGNATURE OF INSPECTOR	Jeff Farrell

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS (ppm) D	GEOTECH SAMPLE RECOVERY (ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1	Concrete	-	0.2	No Analytical	- -	14:30
	2	Brown SILT, some c Gravel			Samples collected	4 12	
	3	Green brown SILT, little f Sand	1	2.0		6 9	14:35
	4					7 6	
	5	Green brown SILT, little f Sand	2	1.2		8 7	14:40
	6	Brown to lt. brown SILT				8 9	
	7	Green brown SILT, some f Sand	1	1.7		9 11	14:45
	8	Brown SILT, some Sand				11 12	
	9	Brown cmf SAND grading to brown cmf GRAVEL	4	1.8		18 22	14:50
	10					26 30	
	11	Brown mf SAND	2	1.7		15 18	14:55
	12	Orange m SAND; Brown cmf GRAVEL				20 12	
	13		1	1.7		15 15	15:00
	14					21 27	
	15						
	16						

HTW DRILLING LOG

HOLE NO.	28-28
1. COMPANY NAME: Louis Berger & Associates	2. DRILLING SUBCOTRACTOR: SJB Services
SHEET 1 OF 1 SHEETS	
3. PROJECT: DPSC - Expanded Site Investigation	4. LOCATION: Philadelphia, Pennsylvania
5. NAME OF DRILLER: Scott Bray	6. MANUFACTURER'S DESIGNATION OF DRILL: CME - 550
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT: 7" OD, 2-1/4" ID Hollow Stem Auger; 2' x 2" Split Spoon	8. HOLE LOCATION: Bldg 28 Gas Station
	9. SURFACE LOCATION:
	10. DATE STARTED: 6/27/96 — 11. DATE COMPLETED: 6/27/96
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: None
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: N/A
14. TOTAL DEPTH OF HOLE: 16'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): N/A
15. GEOTECHNICAL SAMPLES: DISTURBED / UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES: N/A
20. SAMPLES FOR CHEMICAL ANALYSIS: VOC / METALS / TPH: 2 / OTHER (SPECIFY) / OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
22. DISPOSITION OF HOLE: BACKFILLED: X / MONITORING WELL / OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR: Jeff Farrell

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS (ppm) D	GEOTECH SAMPLE RECOVERY (ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1	Concrete & Asphalt	0	0.7		-	15:45
						-	
	2	Brown SAND, some Silt, Asphalt				5	
						6	
	3	Lt brown SILT, little f Sand	3	1.9		10	15:50
						11	
	4					12	
						14	
	5	Green brown CLAYEY SILT, little f Sand	2	0.7		6	15:53
						4	
	6					5	
						6	
	7	Green brown CLAYEY SILT Brick fragments at 7.5'	1	2.0		7	15:56
						8	MOIST
	8					9	
						7	
	9		0	2.0		6	16:00
						9	
	10	Brown cmf SAND grading to cmf GRAVEL BROWN				20	
						22	
	11	Dk. brown cmf SAND	0	1.3		6	16:03
						8	
	12					9	
						12	
	13	Brown cmf GRAVEL	15	1.5	28-01	15	16:15
						10	
	14					18	
						9	
	15		2	1.7		10	16:20
						12	
	16					13	
						13	

HTW DRILLING LOG

HOLE NO. 28-29		
1. COMPANY NAME: Louis Berger & Associates	2. DRILLING SUBCOTRACTOR: SJB Services	SHEET 1 OF 1 SHEETS
3. PROJECT: DPSC - Expanded Site Investigation	4. LOCATION: Philadelphia, Pennsylvania	
5. NAME OF DRILLER: Scott Bray	6. MANUFACTURER'S DESIGNATION OF DRILL: CME - 550	
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT: 7" OD, 2-1/4" ID Hollow Stem Auger; 2' x 2" Split Spoon	8. HOLE LOCATION: Bldg 28 Gas Station	
	9. SURFACE LOCATION:	
	10. DATE STARTED: 6/27/96	11. DATE COMPLETED: 6/27/96
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: None	
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: N/A	
14. TOTAL DEPTH OF HOLE: 16'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): N/A	
15. GEOTECHNICAL SAMPLES — DISTURBED: / UNDISTURBED:	19. TOTAL NUMBER OF CORE BOXES: N/A	
20. SAMPLES FOR CHEMICAL ANALYSIS — VOC: / METALS: / OTHER (SPECIFY): / OTHER (SPECIFY): / OTHER (SPECIFY):	21. TOTAL CORE RECOVERY:	
22. DISPOSITION OF HOLE — BACKFILLED: X / MONITORING WELL: / OTHER (SPECIFY):	23. SIGNATURE OF INSPECTOR: Jeff Farrell	

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS (ppm) D	GEOTECH SAMPLE RECOVERY (ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
		Asphalt				-	
	1	cmf SAND, SILT, CINDER and BRICK FILL	1	1.2		6	16:30
						6	
	2					6	
						5	
	3		0	1.7		5	16:35
						6	
	4					7	
						6	
	5		0	0.8		7	16:40
						7	
	6					6	
		Green CLAYEY SILT, trace f Sand				5	
	7		4	2.0		7	16:42
						6	Slightly Wet
	8					2	
						19	
	9		0	1.2		22	16:45
		Orange cmf GRAVEL				28	
	10					30	
		Green SILTY CLAY				16	
	11		0	0.5		10	16:50
						20	
	12					10	
		Orange cmf GRAVEL				38	
	13		3	0.8		47	16:55
						52	
	14					59	
						13	
	15		4	1.5		17	17:00
		Brown mf SAND and				14	
	16	mf GRAVEL, some cmf Sand				12	

HTW DRILLING LOG

1. COMPANY NAME Louis Berger & Associates	2. DRILLING SUBCOTRACTOR SJB Services	HOLE NO. 46-01 SHEET 1 OF 1 SHEETS
3. PROJECT DPSC - Expanded Site Investigation	4. LOCATION Philadelphia, Pennsylvania	
5. NAME OF DRILLER	6. MANUFACTURER'S DESIGNATION OF DRILL CME - 550	
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT 7" OD, 2-1/4" ID Hollow Stem Auger 2' x 2" Split Spoon	8. HOLE LOCATION Building 46 - 01	
	9. SURFACE LOCATION West side of building	
	10. DATE STARTED 6/7/96	11. DATE COMPLETED 6/7/96
12. OVERBURDEN THICKNESS N/A	15. DEPTH GROUNDWATER ENCOUNTERED N/A	
13. DEPTH DRILLED INTO ROCK 0 Ft	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A	
14. TOTAL DEPTH OF HOLE 16.0 Ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A	

15. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES			
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	TPH	MTBE	Pb	21. TOTAL CORE RECOVERY
			8	4	4	
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR		
	XX			Jeff Farrell		

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS (ppm) D	GEOTECH SAMPLE RECOVERY (ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1 2	Predominately FILL material	15 ppm	1.5	01-2.0	4 4 6 7	14:25
	3 4	Brn SILT some m-f Gravel	0 ppm	0.3		4 4 3 4	
	5 6	Brn SILT some m-f Gravel	0 ppm	1.7		1 1 2 1	
	7 8	Brn SILT some clay	0 ppm	2.0		1 2 5 6	
	9 10	10 inches Brn fine SAND Brn cmf SAND some m-f Gravel	0 ppm	1.3		11 13 13 15	
	11 12	Brn cmf SAND, thin layer red siltstone, some f-c Gravel	0 ppm	2.0	02-12.0	7 8 7 7	15:07
	13 14	Brn cmf SAND some f-c Gravel	0 ppm	2.0	03-14.0	13 13 15 20	15:15
	15 16	Brn cmf SAND	0 ppm	1.5	04-16.0	10 11 13 15	15:20

HTW DRILLING LOG

HOLE NO.	46-02
1. COMPANY NAME: Louis Berger & Associates	2. DRILLING SUBCOTRACTOR: SJB Services
SHEET 1 OF 1 SHEETS	
3. PROJECT: DPSC - Expanded Site Investigation	4. LOCATION: Philadelphia, Pennsylvania
5. NAME OF DRILLER:	6. MANUFACTURER'S DESIGNATION OF DRILL: CME - 550
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT: 7" OD, 2-1/4" ID Hollow Stem Auger; 2' x 2" Split Spoon	8. HOLE LOCATION: Building 46 - 02
	9. SURFACE LOCATION: West side of building
10. DATE STARTED: 6/7/96	11. DATE COMPLETED: 6/7/96
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: N/A
13. DEPTH DRILLED INTO ROCK: 0 Ft	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: N/A
14. TOTAL DEPTH OF HOLE: 16.0 Ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): N/A
15. GEOTECHNICAL SAMPLES: DISTURBED: ; UNDISTURBED:	19. TOTAL NUMBER OF CORE BOXES:

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	TPH	MTBE	Pb	21. TOTAL CORE RECOVERY
			8	4	4	

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	XX			Jeff Farrell

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS (ppm) D	GEOTECH SAMPLE RECOVERY (ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1–2		10 ppm	1.8	05-2.0	4, 4, 6, 6	15:35
	3–4	Brn CMF SAND some tan mf gravel	0 ppm	1.3		4, 3, 3, 6	15:40
	5–6	Light tan m GRAVEL some silt, trace clay	0 ppm	1.5		1, 1, 1, 1	15:50
	7–8	Light Brn f SAND some silt, trace clay	0 ppm	1.5	06-08.0	1, 2, 4, 5	16:00
	9–10	Light Brn f SAND some cm gravel	0 ppm	1.8		7, 9, 10, 13	16:05
	11–12	Brn f clayey SILT / Brn CMF SAND some m gravel	0 ppm	1.8	07-12.0	10, 12, 12, 13	16:10
	13–14	Light Brn CMF SAND	0 ppm	1.8		15, 19, 20, 22	16:20
	15–16	Brn cm SAND, some f brn gravel	0 ppm	1.7	08-16.0	10, 11, 12, 10	16:35

HTW DRILLING LOG

HOLE NO. BSAST - O1		
1. COMPANY NAME Louis Berger & Associates	2. DRILLING SUBCOTRACTOR N/A Hand Augered Hole	SHEET 1 OF 1 SHEETS
3. PROJECT DPSC - Expanded Site Investigation, Phase II	4. LOCATION Philadelphia, Pennsylvania	
5. NAME OF DRILLER	6. MANUFACTURER'S DESIGNATION OF DRILL	
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT 4 " Hand Auger 2 " Hand Auger	8. HOLE LOCATION Bulk Storage AST's	
	9. SURFACE LOCATION Adjacent to valve	
	10. DATE STARTED 6/7/96	11. DATE COMPLETED 6/7/96
12. OVERBURDEN THICKNESS N/A	15. DEPTH GROUNDWATER ENCOUNTERED N/A	
13. DEPTH DRILLED INTO ROCK N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A	
14. TOTAL DEPTH OF HOLE 2.5'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A	
15. GEOTECHNICAL SAMPLES — DISTURBED: ; UNDISTURBED:	19. TOTAL NUMBER OF CORE BOXES 0	
20. SAMPLES FOR CHEMICAL ANALYSIS — VOC: ; METALS: Pb ; OTHER (SPECIFY): ; OTHER (SPECIFY): ; OTHER (SPECIFY):	21. TOTAL CORE RECOVERY	
22. DISPOSITION OF HOLE — BACKFILLED: x ; MONITORING WELL: ; OTHER (SPECIFY):	23. SIGNATURE OF INSPECTOR Jeff Farrell	

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS D	GEOTECH SAMPLE RECOVERY E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
		FILL cinders gravel, bricks,			01 - 0.5		
	1	and clay	0 ppm		01 - 2.6		10:45
	2	wet at 2'					11:15
	3						
	4	Location moved due to obstructions					
	5						
	6						
	7						
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						

HTW DRILLING LOG

1. COMPANY NAME Louis Berger & Associates	2. DRILLING SUBCOTRACTOR N/A Hand Augered Hole	HOLE NO. BSAST - O2 SHEET 1 OF 1 SHEETS
3. PROJECT DPSC - Expanded Site Investigation, Phase II	4. LOCATION Philadelphia, Pennsylvania	
5. NAME OF DRILLER	6. MANUFACTURER'S DESIGNATION OF DRILL	
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT: 4 " Hand Auger; 2 " Hand Auger	8. HOLE LOCATION Bulk Storage AST's	
	9. SURFACE LOCATION Adjacent to valve	
	10. DATE STARTED 6/7/96	11. DATE COMPLETED 6/7/96
12. OVERBURDEN THICKNESS N/A	15. DEPTH GROUNDWATER ENCOUNTERED N/A	
13. DEPTH DRILLED INTO ROCK N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A	
14. TOTAL DEPTH OF HOLE N/A	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A	
15. GEOTECHNICAL SAMPLES: DISTURBED 0; UNDISTURBED 0	19. TOTAL NUMBER OF CORE BOXES N/A	

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY) (1)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
		Pb		TPH (IR-D20)		

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	x			Jeff Farrell

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS D	GEOTECH SAMPLE RECOVERY E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1	FILL cinders gravel, bricks, clay sand, & silt	0 ppm		02 - 0.5'		11:40
	2						
	3						
	4				02 - 5.0'		12:20
	5						
	6	Location moved due to obstructions					
	7						
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						

HTW DRILLING LOG

HOLE NO.	BSAST - O3
1. COMPANY NAME	Louis Berger & Associates
2. DRILLING SUBCOTRACTOR	N/A Hand Augered Hole
SHEET 1 OF 1 SHEETS	
3. PROJECT	DPSC - Expanded Site Investigation, Phase II
4. LOCATION	Philadelphia, Pennsylvania
5. NAME OF DRILLER	
6. MANUFACTURER'S DESIGNATION OF DRILL	N/A
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT	4 " Hand Auger 2 " Hand Auger
8. HOLE LOCATION	Bulk Storage Facility AST's (South Tank)
9. SURFACE LOCATION	Adjacent to valve
10. DATE STARTED	6/7/96
11. DATE COMPLETED	6/7/96
12. OVERBURDEN THICKNESS	N/A
15. DEPTH GROUNDWATER ENCOUNTERED	N/A
13. DEPTH DRILLED INTO ROCK	N/A
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	N/A
14. TOTAL DEPTH OF HOLE	2.8'
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	N/A
15. GEOTECHNICAL SAMPLES	DISTURBED: / UNDISTURBED:
19. TOTAL NUMBER OF CORE BOXES	N/A
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC: / METALS: / OTHER (SPECIFY): / OTHER (SPECIFY) (1): TPH (IR-D20) / OTHER (SPECIFY):
21. TOTAL CORE RECOVERY	
22. DISPOSITION OF HOLE	BACKFILLED: X / MONITORING WELL: / OTHER (SPECIFY):
23. SIGNATURE OF INSPECTOR	Jeff Farrell

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS D	GEOTECH SAMPLE RECOVERY E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1	FILL cinders gravel, bricks, clay, sand, & silt	0 ppm		03 - 2.8'		13:00
	2						
	3	at 2.8'					
	4						
	5						
	6	Location moved due to obstructions					
	7						
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						

HTW DRILLING LOG

1. COMPANY NAME Louis Berger & Associates	2. DRILLING SUBCOTRACTOR N/A Hand Augered Hole	HOLE NO. BSAST - O4 SHEET 1 OF 1 SHEETS
3. PROJECT DPSC - Expanded Site Investigation, Phase II	4. LOCATION Philadelphia, Pennsylvania	
5. NAME OF DRILLER	6. MANUFACTURER'S DESIGNATION OF DRILL N/A	
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT 4 " Hand Auger	8. HOLE LOCATION Bulk Storage Facility AST's (North Tank) 9. SURFACE LOCATION Adjacent to valve	
	10. DATE STARTED 6/26/96	11. DATE COMPLETED 6/26/96
12. OVERBURDEN THICKNESS N/A	15. DEPTH GROUNDWATER ENCOUNTERED N/A	
13. DEPTH DRILLED INTO ROCK N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A	
14. TOTAL DEPTH OF HOLE 5'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A	
15. GEOTECHNICAL SAMPLES — DISTURBED: 0; UNDISTURBED: 0	19. TOTAL NUMBER OF CORE BOXES 0	
20. SAMPLES FOR CHEMICAL ANALYSIS — VOC: ; METALS: ; OTHER (SPECIFY): SVOA; OTHER (SPECIFY) (1): TPH (IR-D20); OTHER (SPECIFY):	21. TOTAL CORE RECOVERY	
22. DISPOSITION OF HOLE — BACKFILLED: x; MONITORING WELL: ; OTHER (SPECIFY):	23. SIGNATURE OF INSPECTOR Rich A. Harding	

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS D	GEOTECH SAMPLE RECOVERY E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1	Lt. brown cmf GRAVEL	0 ppm	1'			15:55
	2	Dk. brown to black cmf GRAVEL	3 ppm	1'			16:00
	3		3 ppm	1'			16:05
	4		3 ppm	1'			16:10
	5		3 ppm	1'	BSAST - O4 - O1		TPH -SVOA 16:15
	6						
	7						
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						

HTW DRILLING LOG

HOLE NO.	BSAST - O5
1. COMPANY NAME: Louis Berger & Associates	2. DRILLING SUBCOTRACTOR: N/A Hand Augered Hole
SHEET 1 OF 1 SHEETS	
3. PROJECT: DPSC - Expanded Site Investigation, Phase II	4. LOCATION: Philadelphia, Pennsylvania
5. NAME OF DRILLER	6. MANUFACTURER'S DESIGNATION OF DRILL: N/A
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT: 4 " Hand Auger	8. HOLE LOCATION: Bulk Storage Facility AST's (North Tank)
	9. SURFACE LOCATION: North East Side of Tank
	10. DATE STARTED: 6/26/96 — 11. DATE COMPLETED: 6/26/96
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: N/A
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: N/A
14. TOTAL DEPTH OF HOLE: 5'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): N/A
15. GEOTECHNICAL SAMPLES: DISTURBED 0; UNDISTURBED 0	19. TOTAL NUMBER OF CORE BOXES: 0
20. SAMPLES FOR CHEMICAL ANALYSIS: VOC —; METALS (1) Pb; OTHER (SPECIFY) TPH I-R DRO; OTHER (SPECIFY) (1) TPH (IR-DUP); OTHER (SPECIFY) —	21. TOTAL CORE RECOVERY
22. DISPOSITION OF HOLE: BACKFILLED X; MONITORING WELL —; OTHER (SPECIFY) —	23. SIGNATURE OF INSPECTOR: Rich A. Harding

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS D	GEOTECH SAMPLE RECOVERY E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1	Lt. brown cmf GRAVEL	0 ppm		O5 - O1		16:20
	2	Brown cmf GRAVEL	1 ppm				16:23
	3	Brown SILT, some mf Sand	1 ppm				16:25
	4		4 ppm				16:27
	5		8 ppm		O5 - O2 O5 - O3		16:35
	6						
	7						
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						

HTW DRILLING LOG

HOLE NO. BSAST - 06

1. COMPANY NAME Louis Berger & Associates	2. DRILLING SUBCOTRACTOR N/A Hand Augered Hole	SHEET 1 OF 1 SHEETS
3. PROJECT DPSC - Expanded Site Investigation, Phase II	4. LOCATION Philadelphia, Pennsylvania	
5. NAME OF DRILLER	6. MANUFACTURER'S DESIGNATION OF DRILL N/A	
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT 4 " Hand Auger	8. HOLE LOCATION Bulk Storage Facility AST's (North Tank)	
	9. SURFACE LOCATION South Side of Tank	
	10. DATE STARTED 6/26/96	11. DATE COMPLETED 6/26/96
12. OVERBURDEN THICKNESS N/A	15. DEPTH GROUNDWATER ENCOUNTERED N/A	
13. DEPTH DRILLED INTO ROCK N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A	
14. TOTAL DEPTH OF HOLE 5'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A	
15. GEOTECHNICAL SAMPLES — DISTURBED: 0; UNDISTURBED: 0	19. TOTAL NUMBER OF CORE BOXES 0	
20. SAMPLES FOR CHEMICAL ANALYSIS — VOC: ; METALS (Pb): 3; OTHER (4): TPH IR-DRO; OTHER: ; OTHER (SPECIFY):	21. TOTAL CORE RECOVERY	
22. DISPOSITION OF HOLE — BACKFILLED: X; MONITORING WELL: ; OTHER (SPECIFY):	23. SIGNATURE OF INSPECTOR Rich A. Harding	

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS D	GEOTECH SAMPLE RECOVERY E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1	Brown cmf GRAVEL	0 ppm		06 - 01 ; 06 - 02 06 - 03		16:45
	2	Brown cmf GRAVEL, some SAND	1 ppm				16:50
	3		1 ppm				16:55
	4	Gray green cmf SAND	90 ppm				17:00
	5		90 ppm		06 - 04 ; 06 - 05 06 - 06 ; 06 - 07		17:05
	6						
	7						
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						

HTW DRILLING LOG

HOLE NO.	BSOL- 01
1. COMPANY NAME	Louis Berger & Associates
2. DRILLING SUBCOTRACTOR	SJB Services
SHEET 1 OF 1 SHEETS	
3. PROJECT	DPSC - Expanded Site Investigation
4. LOCATION	Philadelphia, Pennsylvania
5. NAME OF DRILLER	Scott Bray
6. MANUFACTURER'S DESIGNATION OF DRILL	CME - 550
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT	7" OD, 2-1/4" ID Hollow Stem Auger; 2' x 2" Split Spoon
8. HOLE LOCATION	Bulk Storage Facility Oil Lines
9. SURFACE LOCATION	
10. DATE STARTED	6/13/96
11. DATE COMPLETED	6/13/96
12. OVERBURDEN THICKNESS	N/A
15. DEPTH GROUNDWATER ENCOUNTERED	None
13. DEPTH DRILLED INTO ROCK	N/A
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	N/A
14. TOTAL DEPTH OF HOLE	16.0'
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	N/A
15. GEOTECHNICAL SAMPLES	DISTURBED: ; UNDISTURBED:
19. TOTAL NUMBER OF CORE BOXES	N/A
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC: ; METALS: ; OTHER (SPECIFY): ; OTHER (SPECIFY): ; OTHER (SPECIFY):
21. TOTAL CORE RECOVERY	
22. DISPOSITION OF HOLE	BACKFILLED: X ; MONITORING WELL: ; OTHER (SPECIFY):
23. SIGNATURE OF INSPECTOR	Jeff Farrell

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS (ppm) D	GEOTECH SAMPLE RECOVERY (ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1 2	8" Tan CM Sand w/gravel 8" Black M-F Sand	25	1.3		7 7 6 7	15:05
	3 4	Gray Black F Sand w/Silt	11	0.5		2 2 2 2	15:10
	5 6	Gray Green F Sand w/Silt & Clay	13	1.7		1 1 2 1	Photo #11 15:15
	7 8	Gray Green F Sand w/Silt & Clay	13	2.0		5 7 6 7	Petroleum Smell 15:20
	9 10	Gray Brown Fine Sand w/silt	9	2.0		7 7 9 8	15:25
	11 12	8 in.Gray Brown Fine Sand w/silt 10 in. Redorange Fine Sand & some silt	5	1.5		10 11 9 11	15:30
	13 14	Gray Brown CMF Sand	25	2.0		10 9 7 8	15:35 Petroleum Smell
	15 16	Gray Brown CMF Sand	10	1.7		10 11 7 9	9:44

HTW DRILLING LOG

HOLE NO.	BSOL- 02
1. COMPANY NAME	Louis Berger & Associates
2. DRILLING SUBCOTRACTOR	SJB Services
SHEET	1 OF 1 SHEETS
3. PROJECT	DPSC - Expanded Site Investigation
4. LOCATION	Philadelphia, Pennsylvania
5. NAME OF DRILLER	Scott Bray
6. MANUFACTURER'S DESIGNATION OF DRILL	CME - 550
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT	7" OD. 2-1/4" ID Hollow Stem Auger; 2' x 2" Split Spoon
8. HOLE LOCATION	Bulk Fuel Storage Area
9. SURFACE LOCATION	
10. DATE STARTED	6/13/96
11. DATE COMPLETED	6/13/96
12. OVERBURDEN THICKNESS	N/A
15. DEPTH GROUNDWATER ENCOUNTERED	None
13. DEPTH DRILLED INTO ROCK	N/A
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	N/A
14. TOTAL DEPTH OF HOLE	16.0'
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	N/A
15. GEOTECHNICAL SAMPLES	DISTURBED: ; UNDISTURBED:
19. TOTAL NUMBER OF CORE BOXES	N/A
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC: ; METALS: ; OTHER (SPECIFY): ; OTHER (SPECIFY): ; OTHER (SPECIFY):
21. TOTAL CORE RECOVERY	
22. DISPOSITION OF HOLE	BACKFILLED: X ; MONITORING WELL: ; OTHER (SPECIFY):
23. SIGNATURE OF INSPECTOR	Jeff Farrell

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS (ppm) D	GEOTECH SAMPLE RECOVERY (ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1, 2	Lt Tan Coarse Sand & Gravel Dk Black M-F Sand & Silt	10	1.3		9, 7, 5, 5	16:10
	3, 4	Gray Green Silt w/ Sand	17	1.5		5, 3, 5, 3	Petroleum odor 16:15
	5, 6	Gray Green Silt & Clay w/ Sand	19	1.2		4, 3, 4, 2	Photo #12 16:20
	7, 8	Gray Green Sand w/Silt	20	2.0		4, 4, 8, 8	Photo #13 16:25
	9, 10	6" Gray Green Sand w/Silt 18" Fine Sand	16	2.0		5, 5, 9, 8	16:30
	11, 12	Gray Green Silt & Clay w/Fine Sand	40	1.0		7, 7, 12, 11	16:35
Qp (Based on no recovery)	13, 14			0.0		18, 19, 15, 14	16:40 Petroleum odor
	15, 16			0.0		12, 13, 15, 15	16:45

HTW DRILLING LOG

HOLE NO.	BSOL- 03
SHEET 1 OF 1 SHEETS	
1. COMPANY NAME: Louis Berger & Associates	2. DRILLING SUBCOTRACTOR: SJB Services
3. PROJECT: DPSC - Expanded Site Investigation	4. LOCATION: Philadelphia, Pennsylvania
5. NAME OF DRILLER: Scott Bray	6. MANUFACTURER'S DESIGNATION OF DRILL: CME - 550
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT: 7" OD, 2-1/4" ID Hollow Stem Auger; 2' x 2" Split Spoon	8. HOLE LOCATION: Bulk Fuel Storage Area
	9. SURFACE LOCATION
	10. DATE STARTED: 6/18/96 — 11. DATE COMPLETED: 6/18/96
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: None
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: N/A
14. TOTAL DEPTH OF HOLE: 16.0'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): N/A
15. GEOTECHNICAL SAMPLES: DISTURBED / UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES: N/A
20. SAMPLES FOR CHEMICAL ANALYSIS: VOC / METALS / OTHER (SPECIFY) / OTHER (SPECIFY) / OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
22. DISPOSITION OF HOLE: BACKFILLED X / MONITORING WELL / OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR: Jeff Farrell

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS (ppm) D	GEOTECH SAMPLE RECOVERY (ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1 2	Lite Brown C-F Gravel Little sand	0	0.8		4 3 3 4	10:40
	3 4	Lite Brn C-F Gravel L/Sand Blk. Coarse FS Gravel Brown Silt w/ Trace Sand	1	1.8		3 2 2 2	10:43
	5 6	Lt. Brown Silt w/Trace Sand	0	1.5		10 5 6 4	10:50
	7 8	Lt. Brown Silt w/Trace Sand	1	2.0		7 8 5 4	10:55
	9 10	Brown Silt w/some Sand Brown CMF Sand w/some Silt	1	2.0		4 5 7 7	11:00
	11 12	Brown Silt w/some Sand	1	2.0		6 6 7 9	11:05
	13 14	Gray Green CMF Sand w/ little Silt	1	2.0		6 8 8 7	11:10
	15 16	Red Brown CMF Gravel little CMF Sand	1	1.7		12 13 16 18	11:15

HTW DRILLING LOG

HOLE NO. BSOL- 04			
1. COMPANY NAME Louis Berger & Associates	2. DRILLING SUBCOTRACTOR SJB Services	SHEET 1 OF 1 SHEETS	
3. PROJECT DPSC - Expanded Site Investigation	4. LOCATION Philadelphia, Pennsylvania		
5. NAME OF DRILLER Scott Bray	6. MANUFACTURER'S DESIGNATION OF DRILL CME - 550		
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT	7" OD, 2-1/4" ID Hollow Stem Auger 2' x 2" Split Spoon	8. HOLE LOCATION Bulk Fuel Storage Area	
		9. SURFACE LOCATION	
		10. DATE STARTED 6/18/96	11. DATE COMPLETED 6/18/96
12. OVERBURDEN THICKNESS N/A		15. DEPTH GROUNDWATER ENCOUNTERED None	
13. DEPTH DRILLED INTO ROCK N/A		16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A	
14. TOTAL DEPTH OF HOLE 16.0'		17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A	
15. GEOTECHNICAL SAMPLES	DISTURBED / UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES N/A	
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC / METALS	OTHER (SPECIFY) / OTHER (SPECIFY) / OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
22. DISPOSITION OF HOLE	BACKFILLED X / MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR Jeff Farrell

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS (ppm) D	GEOTECH SAMPLE RECOVERY (ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1–2	Blk. Cinder Fl	- -	0.5		2, 2, 2, 1	11:35
	3–4		-	0.0		2, 2, 3, 6	11:40
	5–6	GreenGray M-F Sand w/ some Silt Lt. Brown CMF Sand	0	1.7		5, 4, 4, 3	11:50
	7–8	Gray Green M-F Sand w/ some silt	1	2.0		5, 6, 6, 5	11:55
	9–10	Lt. Brown CMF Sand Lt. Brown F Sand w/some Silt	0	1.5		7, 8, 7, 6	Wet 12 Noon
	11–12	Green Brown Silt w/some Sand	0	2.0		9, 8, 8, 8	12:05
	13–14	Dark Brown CMF Gravel w/Red Brick	1	1.8		7, 8, 8, 8	12:10
	15–16	Dark Brown CMF Gravel w/CMF Sand	1	1.0		14, 15, 15, 16	12:15

HTW DRILLING LOG

1. COMPANY NAME Louis Berger & Associates	2. DRILLING SUBCOTRACTOR SJB Services	HOLE NO. BSOL- 05 SHEET 1 OF 1 SHEETS
3. PROJECT DPSC - Expanded Site Investigation	4. LOCATION Philadelphia, Pennsylvania	
5. NAME OF DRILLER Scott Bray	6. MANUFACTURER'S DESIGNATION OF DRILL CME - 550	
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT 7" OD, 2-1/4" ID Hollow Stem Auger 2' x 2" Split Spoon	8. HOLE LOCATION Bulk Fuel Storage Area 9. SURFACE LOCATION	
	10. DATE STARTED 6/18/96	11. DATE COMPLETED 6/18/96
12. OVERBURDEN THICKNESS N/A	15. DEPTH GROUNDWATER ENCOUNTERED None	
13. DEPTH DRILLED INTO ROCK N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A	
14. TOTAL DEPTH OF HOLE 16.0'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A	
15. GEOTECHNICAL SAMPLES: DISTURBED / UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES N/A	
20. SAMPLES FOR CHEMICAL ANALYSIS: VOC / METALS / OTHER (SPECIFY) / OTHER (SPECIFY) / OTHER (SPECIFY)	21. TOTAL CORE RECOVERY	
22. DISPOSITION OF HOLE: BACKFILLED X / MONITORING WELL / OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR Jeff Farrell	

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS (ppm) D	GEOTECH SAMPLE RECOVERY (ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1–2	Blk. Cinder FI Brn Silt	1	1.0		3 4 4 4	13:15
	3–4	Brown Silt Some Black CMF Sand	1	0.3		4 5 6 4	13:20
	5–6			0.0		4 4 5 6	13:25
	7–8	Brown CMF Sand w/little Silt Fill	0	2.0		3 4 6 6	13:30
	9–10	Brown CMF Sand Fill Brown Silt w/little Sand	0	2.0		6 7 8 8	13:35
	11–12	Brown Silt w/little Sand Dark Brown CMF Gravel	1	1.7		3 6 7 8	13:40
	13–14	Dark Brown CMF Gravel	0	1.7		7 8 8 7	13:45
	15–16	Dark Brown CMF Gravel	1	0.7		6 8 8 7	13:50

HTW DRILLING LOG

HOLE NO. BSOL- 06			
1. COMPANY NAME Louis Berger & Associates	2. DRILLING SUBCOTRACTOR SJB Services	SHEET 1 OF 1 SHEETS	
3. PROJECT DPSC - Expanded Site Investigation	4. LOCATION Philadelphia, Pennsylvania		
5. NAME OF DRILLER Scott Bray	6. MANUFACTURER'S DESIGNATION OF DRILL CME - 550		
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT	7" OD. 2-1/4" ID Hollow Stem Auger; 2' x 2" Split Spoon	8. HOLE LOCATION Bulk Fuel Storage Area	
		9. SURFACE LOCATION	
		10. DATE STARTED 6/18/96	11. DATE COMPLETED 6/18/96
12. OVERBURDEN THICKNESS N/A		15. DEPTH GROUNDWATER ENCOUNTERED None	
13. DEPTH DRILLED INTO ROCK N/A		16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A	
14. TOTAL DEPTH OF HOLE 16.0'		17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A	
15. GEOTECHNICAL SAMPLES	DISTURBED / UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES N/A	
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC / METALS	OTHER (SPECIFY) / OTHER (SPECIFY) / OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
22. DISPOSITION OF HOLE	BACKFILLED X / MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR Jeff Farrell

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS (ppm) D	GEOTECH SAMPLE RECOVERY (ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1–2	Blk. Brown Silt some F Sand	0	0.7		1, 1, 1, 1	14:25
	3–4	Blk. Brown Silt some F Sand	0	0.7		1, 2, 2, 2	14:30
	5–6	Brown F Silt some Sand	0	1.7		5, 5, 3, 4	14:35
	7–8	Gray Green F Sand w/Silt	1	1.7		3, 5, 3, 4	14:40
	9–10	Gray Green F Sand w/Silt	0	2.0		6, 6, 7, 9	14:45
	11–12	Dark Brown CMF Gravel	1	1.5		5, 7, 7, 6	14:50
	13–14	Dark Brown CMF Gravel	0	1.2		15, 15, 17, 19	14:55
	15–16			0.0		14, 12, 14, 15	15:00

HTW DRILLING LOG

HOLE NO.	BSOL- 07
1. COMPANY NAME: Louis Berger & Associates	2. DRILLING SUBCOTRACTOR: SJB Services
SHEET 1 OF 1 SHEETS	
3. PROJECT: DPSC - Expanded Site Investigation	4. LOCATION: Philadelphia, Pennsylvania
5. NAME OF DRILLER: Scott Bray	6. MANUFACTURER'S DESIGNATION OF DRILL: CME - 550
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT: 7" OD, 2-1/4" ID Hollow Stem Auger; 2" x 2" Split Spoon	8. HOLE LOCATION: Bulk Fuel Storage Area
	9. SURFACE LOCATION:
	10. DATE STARTED: 6/18/96 — 11. DATE COMPLETED: 6/18/96
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: None
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: N/A
14. TOTAL DEPTH OF HOLE: 16.0'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): N/A
15. GEOTECHNICAL SAMPLES: DISTURBED / UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES: N/A
20. SAMPLES FOR CHEMICAL ANALYSIS: VOC / METALS / OTHER (SPECIFY) / OTHER (SPECIFY) / OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
22. DISPOSITION OF HOLE: BACKFILLED X / MONITORING WELL / OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR: Jeff Farrell

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS (ppm) D	GEOTECH SAMPLE RECOVERY (ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1–2	Top Soil Lite Brown Silt w/F Sand	0	0.7		2 2 3 4	15:25
	3–4	Dark Brown Silt w/MF Sand	0	0.7		4 3 2 4	15:30
	5–6	Dark Brown Silt w/MF Sand	0	0.7		4 3 4 4	15:35
	7–8	Gray Green Silt some F Sand	0	2.0		4 7 7 6	15:40
	9–10	Gray Green Silt	0	1.7		4 8 8 7	15:45
	11–12	- QP Based on no recovery		0.0		5 7 7 4	15:50
	13–14	-		0.0		5 7 6 4	15:55
	15–16	-		0.0		5 6 6 4	16:00

HTW DRILLING LOG

HOLE NO. BSOL- 08		
1. COMPANY NAME: Louis Berger & Associates	2. DRILLING SUBCOTRACTOR: SJB Services	SHEET 1 OF 1 SHEETS
3. PROJECT: DPSC - Expanded Site Investigation	4. LOCATION: Philadelphia, Pennsylvania	
5. NAME OF DRILLER: Scott Bray	6. MANUFACTURER'S DESIGNATION OF DRILL: CME - 550	
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT: 7" OD. 2-1/4" ID Hollow Stem Auger; 2' x 2" Split Spoon	8. HOLE LOCATION: Bulk Fuel Storage Area	
	9. SURFACE LOCATION:	
	10. DATE STARTED: 6/18/96	11. DATE COMPLETED: 6/18/96
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: None	
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: N/A	
14. TOTAL DEPTH OF HOLE: 16.0'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): N/A	
15. GEOTECHNICAL SAMPLES: DISTURBED / UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES: N/A	
20. SAMPLES FOR CHEMICAL ANALYSIS: VOC / METALS / OTHER (SPECIFY) / OTHER (SPECIFY) / OTHER (SPECIFY)	21. TOTAL CORE RECOVERY	
22. DISPOSITION OF HOLE: BACKFILLED X / MONITORING WELL / OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR: Jeff Farrell	

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS (ppm) D	GEOTECH SAMPLE RECOVERY (ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1–2	Top Soil Lite Brown M-F Sand & some Silt	0	1.5		2 2 1 2	16:15
	3–4	Lite Brown Silt Little Sand	0	1.0		Weight of Hammer	16:18
	5–6	Lite Brown Silt Little Sand	0	1.5		4 3 5 3	16:20
	7–8	Lite Brown Silt Little Sand	0	2.0		2 3 4 3	16:25
	9–10	Lite Brown M-F Sand	0	1.8		6 6 7 8	16:30
	11–12	Lite Brown Silt Little Sand	0	2.0		5 5 7 4	16:35
	13–14	Lite Brown Silt Little Sand Brown CMF Gravel	0	1.7		5 5 7 4	16:40 Wet
	15–16	Lite Brown Silt Little Sand Brown CMF Gravel	0	2.0		9 10 11 14	

HTW DRILLING LOG

HOLE NO.	OR-01
SHEET 1 OF 2 SHEETS	

1. COMPANY NAME: Louis Berger & Associates	2. DRILLING SUBCOTRACTOR: SJB Services
3. PROJECT: DPSC Expanded Site Investigation Phase II	4. LOCATION: Philadelphia, Pennslyvania
5. NAME OF DRILLER: Scott Bray	6. MANUFACTURER'S DESIGNATION OF DRILL: CME - 550
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIOMENT: 7" O.D., 2 1 /4" I.D. Hollow Stem Auger, 2' x 2" Split Spoon	8. HOLE LOCATION: OREGON AVE. TANK AREA
	9. SURFACE LOCATION:
	10. DATE STARTED: 96/06/10 — 11. DATE COMPLETED: 6/10/96
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: None
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: N/A
14. TOTAL DEPTH OF HOLE: 20'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): N/A
15. GEOTECHNICAL SAMPLES: DISTURBED / UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES: N/A
20. SAMPLES FOR CHEMICAL ANALYSIS: VOC / METALS / OTHER (TPH) / OTHER (SPECIFY) / OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
22. DISPOSITION OF HOLE: BACKFILLED: X / MONITORING WELL / OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR: Rich Harding

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS(ppm) D	GEOTECH SAMPLE RECOVERY(ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1	Augered only					
	2						
	3						
	4						
	5	Brown f SAND, some Silt	0	1.0		8, 3, 4	
	6	Brown SILT, some f Sand, moist				5	
	7	Lt. brown SILT, mottled and with orange layering	0	2.0		9, 10, 10	
	8					12	
	9	Tan SILT	0	1.7		20, 21	
	10	Red SILT, some cmf Gravel, iron stained				19, 17	
	11	Tan and brown SILT, trace f Sand, mottled	0	0.5		10, 12, 9	sample next to next interval
	12					11	6" Recovery
	13	Reddish brown cmf SAND, some mf Gravel, trace Silt	0	1.7	OR-01-01 12'-14' (invert	10, 10, 11	10:30
	14					10	

HTW DRILLING LOG

HOLE NO.
OR-O1

PROJECT	INSPECTOR	SHEET 2 OF 2 SHEETS
DPSC Expanded Site Investigation		

ELEV A	DEPTH FT B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS D	GEOTECH SAMPLE OR CORE BOX NO. E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	14						
	15–16	Reddish brown mottled cmf SAND, little f Gravel, trace Silt, mottled		1.0		7 10 11 11	
	17–18			1.0		17 18 16 20	
	19–20		0	1.7	OR-01-02 18'-20'	12 14 18 18	10:45
	21						
	22						
	23						
	24						
	25						
	26						
	27						
	28						
	29						
	30						
	31						
	32						
	33						
	34						
	35						

HTW DRILLING LOG

HOLE NO. OR-02		
1. COMPANY NAME: Louis Berger & Associates	2. DRILLING SUBCOTRACTOR: SJB Services	SHEET 1 OF 2 SHEETS
3. PROJECT: DPSC Expanded Site Investigation Phase II	4. LOCATION: Philadelphia, Pennsylvania	
5. NAME OF DRILLER: Scott Bray	6. MANUFACTURER'S DESIGNATION OF DRILL: CME - 550	
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIOMENT: 7" O.D., 2 1 /4" I.D. Hollow Stem Auger, 2' x 2" Split Spoon	8. HOLE LOCATION: OREGON AVE. TANK AREA	
	9. SURFACE LOCATION:	
	10. DATE STARTED: 96/06/10	11. DATE COMPLETED: 6/10/96
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: None	
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: N/A	
14. TOTAL DEPTH OF HOLE: N/A	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): N/A	
15. GEOTECHNICAL SAMPLES: DISTURBED / UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES: N/A	
20. SAMPLES FOR CHEMICAL ANALYSIS: VOC / METALS / OTHER (TPH) / OTHER (SPECIFY) / OTHER (SPECIFY)	21. TOTAL CORE RECOVERY	
22. DISPOSITION OF HOLE: BACKFILLED / MONITORING WELL / OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR: Rich Harding	

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS(ppm) D	GEOTECH SAMPLE RECOVERY(ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1	Augered only					
	2						
	3						
	4						
	5	Tan SILT, moist with orange mottling				3 4	
	6		0	0.8		3 6	
	7	Tan SILT for 8" Brown SILT, iron stained and mottled intervals	0	2.0		5 7	
	8					9 8	
	9	Iron stained SILT	0	1.0		8 12	
	10	Brown mf SAND, some Gravel				7 6	
	11	Grey SILT	0	0.3		12 15	
	12					18 20	
	13	Brown cmf SAND, some Silt, mottled	0	0.5	OR-02-01 12'-14'	12 12	11:40
	14					13 12	

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HTW DRILLING LOG

HOLE NO.
OR-O2

PROJECT	INSPECTOR	SHEET 2 OF 2 SHEETS
DPSC Expanded Site Investigation		

ELEV A	DEPTH FT B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS D	GEOTECH SAMPLE OR CORE BOX NO. E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	14						
	15 16	Brown cmf SAND, some f Gravel, trace Silt		0.0		10 10 10 19	
	17 18	Brown cmf SAND, trace f Gravel, trace Silt, some mottling		0.0		9 10 12 12	
	19 20	Brown cmf SAND, some mf Gravel, little Silt	0	1.5	OR-02-02 18'-20'	8 10 12 13	
	21						
	22						
	23						
	24						
	25						
	26						
	27						
	28						
	29						
	30						
	31						
	32						
	33						
	34						
	35						

HTW DRILLING LOG

HOLE NO.	OR-03
1. COMPANY NAME	Louis Berger & Associates
2. DRILLING SUBCOTRACTOR	SJB Services
SHEET 1 OF 1 SHEETS	
3. PROJECT	DPSC Expanded Site Investigation Phase II
4. LOCATION	Philadelphia, Pennslyvania
5. NAME OF DRILLER	Scott Bray
6. MANUFACTURER'S DESIGNATION OF DRILL	CME - 550
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIOMENT	7" O.D., 2 1/4" I.D. Hollow Stem Auger, 2' x 2" Split Spoon
8. HOLE LOCATION	OREGON AVE. TANK AREA
9. SURFACE LOCATION	ADJACENT TO BERM
10. DATE STARTED	96/06/10
11. DATE COMPLETED	6/10/96
12. OVERBURDEN THICKNESS	N/A
15. DEPTH GROUNDWATER ENCOUNTERED	None
13. DEPTH DRILLED INTO ROCK	N/A
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	N/A
14. TOTAL DEPTH OF HOLE	N/A
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	N/A
15. GEOTECHNICAL SAMPLES	DISTURBED: / UNDISTURBED:
19. TOTAL NUMBER OF CORE BOXES	N/A
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC: / METALS: / OTHER (TPH): / OTHER (SPECIFY): / OTHER (SPECIFY):
21. TOTAL CORE RECOVERY	
22. DISPOSITION OF HOLE	BACKFILLED: / MONITORING WELL: / OTHER (SPECIFY):
23. SIGNATURE OF INSPECTOR	Rich Harding

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS(ppm) D	GEOTECH SAMPLE RECOVERY(ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1 2	Dk. brown SILT, trace mf Sand, Brick and Debris Fragments	0	1.6		4 4 4 4	
	3 4	Dk. brown to yellow SILT, trace mf Sand, Brick and Debris Fragments	0	1.4		6 6 8 10	
	5 6		0	1.3		6 7 13 7	
	7 8	Tan to reddish brown cmf SAND and SILT, trace f Gravel at 11" Brown f SAND	0	1.4		8 13 9 11	
	9 10	Brown cmf SAND and GRAVEL Brown mf SAND at bottom	0	1.6		12 13 11 12	
	11 12	Brown cmf SAND, little f Gravel	0	1.5	OR-03-01 10'-12'	8 11 11 12	14:05
	13 14		0	0.8		11 13 13 7	
	15 16	Large rock fragment in spoon	0	0.8		10 10 10 19	14:20

HTW DRILLING LOG

HOLE NO. OR-04

1. COMPANY NAME: Louis Berger & Associates	2. DRILLING SUBCOTRACTOR: SJB Services
SHEET 1 OF 1 SHEETS	
3. PROJECT: DPSC Expanded Site Investigation Phase II	4. LOCATION: Philadelphia, Pennslyvania
5. NAME OF DRILLER: Scott Bray	6. MANUFACTURER'S DESIGNATION OF DRILL: CME - 550
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIOMENT: 7" O.D., 2 1/4" I.D. Hollow Stem Auger, 2' x 2" Split Spoon	8. HOLE LOCATION: OREGON AVE. TANK AREA
	9. SURFACE LOCATION: ADJACENT TO BERM
	10. DATE STARTED: 96/06/10 — 11. DATE COMPLETED: 6/10/96
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: None
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: N/A
14. TOTAL DEPTH OF HOLE: N/A	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): N/A
15. GEOTECHNICAL SAMPLES: DISTURBED / UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES: N/A
20. SAMPLES FOR CHEMICAL ANALYSIS: VOC: X; METALS; OTHER (TPH); OTHER (SPECIFY); OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
22. DISPOSITION OF HOLE: BACKFILLED: XX; MONITORING WELL; OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR: Rich Harding

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS(PPM) D	GEOTECH SAMPLE RECOVERY(ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1–2	Lt. brown SILT, some Gravel	0	1.5		6, 6, 7, 9	
	3–4	Dk. brown SILT, some Gravel	0	1.5		7, 4, 5, 5	
	5–6	Dk. brown SILT, mixed with Gravel and Fill	0	2.0		3, 5, 7, 7	
	7–8	Brown SAND and SILT, some Gravel	0	1.3		6, 5, 7, 6	
	9–10	Brown SAND and c GRAVEL	0	1.3		5, 6, 4, 4	
	11–12	Brown c SAND, some Silt	0	1.5	OR-04-01	4, 3, 4, 4	15:15
	13–14	Grey f SAND and FILL with red brick fragments	0	1.0		5, 6, 5, 3	
	15–16	Dk. brown to black f SAND and FILL	0	1.3	OR-04-02	5, 5, 7, 8	14:20

MRK FORM JUN 89 55-2

HTW DRILLING LOG

HOLE NO. OR-05

1. COMPANY NAME: Louis Berger & Associates	2. DRILLING SUBCOTRACTOR: SJB Services
SHEET 1 OF 1 SHEETS	
3. PROJECT: DPSC Expanded Site Investigation Phase II	4. LOCATION: Philadelphia, Pennslyvania
5. NAME OF DRILLER: Scott Bray	6. MANUFACTURER'S DESIGNATION OF DRILL: CME - 550
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIOMENT: 7" O.D., 2 1/4" I.D. Hollow Stem Auger, 2' x 2" Split Spoon	8. HOLE LOCATION: OREGON AVE. TANK AREA
	9. SURFACE LOCATION: ADJACENT TO BERM
	10. DATE STARTED: 96/06/10 — 11. DATE COMPLETED: 6/10/96
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: None
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: N/A
14. TOTAL DEPTH OF HOLE: N/A	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): N/A
15. GEOTECHNICAL SAMPLES — DISTURBED: — UNDISTURBED:	19. TOTAL NUMBER OF CORE BOXES: N/A
20. SAMPLES FOR CHEMICAL ANALYSIS — VOC: — METALS: — OTHER (TPH): — OTHER (SPECIFY): — OTHER (SPECIFY):	21. TOTAL CORE RECOVERY:
22. DISPOSITION OF HOLE — BACKFILLED: XX — MONITORING WELL: — OTHER (SPECIFY):	23. SIGNATURE OF INSPECTOR: Rich Harding

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS(ppm) D	GEOTECH SAMPLE RESULTS(ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1–2	Lt. tan cmf SAND, some Gravel	PID Down	1.3		1, 2, 1, 1	
	3–4	Brown SAND and SILT	PID Down	0.3		2, 2, 2, 2	
	5–6	Brown cmf SAND and SILT	PID Down	1.3		2, 4, 5, 4	
	7–8	Brown mf SAND and SILT, some Gravel	PID Down	1.1		3, 5, 4, 4	
	9–10	3" Recovery Rock plugged spoon	PID Down	0.3		6, 7, 7, 9	
	11–12	Brown mf SAND and SILT, trace cmf Gravel	0	1.0	OR-05-01	2, 4, 1, 4	15:15
	13–14		0	1.0		6, 6, 4, 6	
	15–16	Dk. brown to black mf SAND, stained, oil odor	4	1.0	OR-05-02 OR-05-03	18, 19, 19, 20	14:20

HTW DRILLING LOG

HOLE NO. OR-06			
1. COMPANY NAME Louis Berger & Associates	2. DRILLING SUBCOTRACTOR SJB Services		SHEET 1 OF 1 SHEETS
3. PROJECT DPSC Expanded Site Investigation Phase II	4. LOCATION Philadelphia, Pennsylvania		
5. NAME OF DRILLER Scott Bray	6. MANUFACTURER'S DESIGNATION OF DRILL CME - 550		
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIOMENT 7" O.D., 2 1/4" I.D. Hollow Stem Auger, 2' x 2" Split Spoon	8. HOLE LOCATION OREGON AVE. TANK AREA		
	9. SURFACE LOCATION ADJACENT TO BERM		
	10. DATE STARTED 96/06/11	11. DATE COMPLETED 6/11/96	
12. OVERBURDEN THICKNESS N/A	15. DEPTH GROUNDWATER ENCOUNTERED None		
13. DEPTH DRILLED INTO ROCK N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A		
14. TOTAL DEPTH OF HOLE N/A	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A		
15. GEOTECHNICAL SAMPLES: DISTURBED / UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES N/A		
20. SAMPLES FOR CHEMICAL ANALYSIS: VOC / METALS / OTHER (TPH) / OTHER (SPECIFY) / OTHER (SPECIFY)	21. TOTAL CORE RECOVERY		
22. DISPOSITION OF HOLE: BACKFILLED / MONITORING WELL / OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR Rich Harding		

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS(ppm) D	GEOTECH SAMPLE RECOVERY(ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1	Lt. brown mf SILTY CLAY				2	
						3	8:40
			0	1.7		2	
	2					2	
	3	Brown cmf SAND and SILT				2	
						1	
			0	0.6		2	8:50
	4					2	
	5	Brown mf CLAYEY SILT				2	
						2	
			0	0.8		3	8:55
	6					6	
	7	Grey f SAND, trace Silt				10	Noticeable
			0 - 12	2.0		10	Oil Odor at 8'
						11	9:00
	8					14	
	9					10	
			10	2.0		11	Photo #3
						11	9:05
	10					12	
	11	Brown cmf SAND, some Silt				10	
			5	2.0	OR-05-01	10	9:15
						10	Oil Odor
	12					13	
	13	Brown m SAND, some Gravel				12	
			0	1.5		13	9:20
						12	No Oil Odor
	14					15	
	15	Brown cmf SAND, some Gravel				25	
			4	2.0	OR-05-02	21	9:25
					OR-05-03	22	
	16					18	

HTW DRILLING LOG

HOLE NO. OR-08

1. COMPANY NAME Louis Berger & Associates	2. DRILLING SUBCOTRACTOR SJB Services	SHEET 1 OF 1 SHEETS
3. PROJECT DPSC - Expanded Site Investigation	4. LOCATION Philadelphia, Pennsylvania	
5. NAME OF DRILLER Scott Bray	6. MANUFACTURER'S DESIGNATION OF DRILL CME - 550	
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT 7" O.D. , 2-1/4" I.D. Hollow Stem Auger; 2' x 2" Split Spoon	8. HOLE LOCATION Oregon Ave. Tank Area	
	9. SURFACE LOCATION	
	10. DATE STARTED 96/06/11	11. DATE COMPLETED 96/06/11
12. OVERBURDEN THICKNESS N/A	15. DEPTH GROUNDWATER ENCOUNTERED None	
13. DEPTH DRILLED INTO ROCK N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A	
14. TOTAL DEPTH OF HOLE 16'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A	
15. GEOTECHNICAL SAMPLES: DISTURBED / UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES N/A	
20. SAMPLES FOR CHEMICAL ANALYSIS: VOC / METALS / OTHER (TPH): 2 / OTHER (SPECIFY) / OTHER (SPECIFY)	21. TOTAL CORE RECOVERY	
22. DISPOSITION OF HOLE: BACKFILLED: X / MONITORING WELL / OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR Jeff Farrell	

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS(ppm) D	GEOTECH SAMPLE RECOVERY(ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1 2	Black Asphalt	0	0.5		4 4 4 5	10:50
	3 4	Black SILT	0	2.0		4 3 4 5	10:55
	5 6	Brown gray SILT	0	1.5		2 2 1 4	11:00
	7 8	Orange brown SAND, little Silt	0	2.0		8 8 8 9	11:08
	9 10	Orange cmf SAND	0	1.7		6 8 9 7	11:14
	11 12	Brown Tan Orange SILT Brown cm SAND	0	1.7	O8 - O1	6 7 8 10	11:20
	13 14	Orange Brown cmf SAND, trace Silt	4	1.8		7 8 9 12	11:30
	15 16	Reddish Brown cmf SAND little Gravel	4	1.5	O8 - O2	10 11 9 9	11:40

HTW DRILLING LOG

HOLE NO.	OR-09
SHEET 1	OF 2 SHEETS

1. COMPANY NAME Louis Berger & Associates	2. DRILLING SUBCOTRACTOR SJB Services
3. PROJECT DPSC Expanded Site Investigation	4. LOCATION Philadelphia, Pennsylvania
5. NAME OF DRILLER Scott Bray	6. MANUFACTURER'S DESIGNATION OF DRILL CME - 550
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIOMENT 7" O.D., 2 1/4" I.D. Hollow Stem Auger, 2' x 2" Split Spoon	8. HOLE LOCATION OREGON AVENUE TANK AREA
	9. SURFACE LOCATION
	10. DATE STARTED 96/06/13 — 11. DATE COMPLETED 6/13/96
12. OVERBURDEN THICKNESS N/A	15. DEPTH GROUNDWATER ENCOUNTERED NONE
13. DEPTH DRILLED INTO ROCK N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A
14. TOTAL DEPTH OF HOLE 20 ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A
15. GEOTECHNICAL SAMPLES — DISTURBED — UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES N/A
20. SAMPLES FOR CHEMICAL ANALYSIS — VOC — METALS	OTHER (TPH) — OTHER (HFS) — OTHER (SPECIFY) — 21. TOTAL CORE RECOVERY
22. DISPOSITION OF HOLE — BACKFILLED: X — MONITORING WELL	OTHER (SPECIFY) — 23. SIGNATURE OF INSPECTOR Jeff Farrell

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS(ppm) D	GEOTECH SAMPLE RESULTS(ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1 2 3 4 5	Asphalt Concrete slurry mix for 4.5 ft No samples Rollerbil used with approximately 100 gallons of water					Probably used to stabilize excavation 14:00
	6 7	Gray brown f SAND		0.2		2 2 1 6	14:10
	8 9	Orange Brown cmf SAND		0.2		13 11 10 9	14:15
	10 11	Brown cmf SAND		0.0		6 9 8 7	14:20
	12 13	Red Brown cmf SAND				9 7 7 8	14:25
	14	Brown cm SAND				8 8	14:30

HTW DRILLING LOG

PROJECT DPSC Expanded Site Investigation	INSPECTOR J. Farrell	OR - 09 SHEET 2 OF 2 SHEETS

ELEV A	DEPTH FT B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS D	GEOTECH SAMPLE RECOVERY E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	15						
	16–17	Orange brown cm SAND				9 10 11 11	14:35
	18						
	19						
	20						
	21						
	22						
	23						
	24						
	25						
	26						
	27						
	28						
	29						
	30						
	31						
	32						
	33						
	34						
	35						

HTW DRILLING LOG

HOLE NO.	OR-10
1. COMPANY NAME	Louis Berger & Associates
2. DRILLING SUBCOTRACTOR	SJB Services
SHEET 1 OF 1 SHEETS	
3. PROJECT	DPSC - Expanded Site Investigation
4. LOCATION	Philadelphia, Pennsylvania
5. NAME OF DRILLER	Scott Bray
6. MANUFACTURER'S DESIGNATION OF DRILL	CME - 550
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT	7" O.D. , 2-1/4" I.D. Hollow Stem Auger; 2' x 2" Split Spoon
8. HOLE LOCATION	Oregon Ave. Tank Area
9. SURFACE LOCATION	
10. DATE STARTED	96/06/11
11. DATE COMPLETED	96/06/11
12. OVERBURDEN THICKNESS	N/A
15. DEPTH GROUNDWATER ENCOUNTERED	None
13. DEPTH DRILLED INTO ROCK	N/A
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	N/A
14. TOTAL DEPTH OF HOLE	16'
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	N/A
15. GEOTECHNICAL SAMPLES	DISTURBED: ; UNDISTURBED:
19. TOTAL NUMBER OF CORE BOXES	N/A
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC: ; METALS: ; OTHER (TPH): 2 ; OTHER (SPECIFY): ; OTHER (SPECIFY):
21. TOTAL CORE RECOVERY	
22. DISPOSITION OF HOLE	BACKFILLED: X ; MONITORING WELL: ; OTHER (SPECIFY):
23. SIGNATURE OF INSPECTOR	Jeff Farrell

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS(ppm) D	GEOTECH SAMPLE RECOVERY(ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1	Concrete		0.2		-	14:45
						-	
		Wash				3	
	2					5	
		Lt. Brown mf SAND, some				4	
	3	SILT		1.8		3	14:50
						3	
	4					4	
		No Recovery Possible				5	
	5	Wash				2	15:00
				0.3		3	
	6					5	
		Gray black mf SAND &				6	
	7	SILT some Gravel		1.0		3	15:08
						3	
	8					2	
		Gray brown mf SAND some				4	
	9	Silt		0.8		3	15:15
						3	
	10					6	
		Dark Brown mf SAND,				1	
	11	some Gravel		0.7	10 - 01	1	15:20
						2	
	12					1	
		Dark Brown cmf SAND				2	
	13	some Gravel		0.3		2	15:25
						2	
	14					2	
		Dark Brown cm SAND				1	
	15		4	1.3	10 - 02	2	15:30
						1	
	16					1	

HTW DRILLING LOG

HOLE NO.	OR-11
1. COMPANY NAME	Louis Berger & Associates
2. DRILLING SUBCOTRACTOR	SJB Services
SHEET	1 OF 1 SHEETS
3. PROJECT	DPSC - Expanded Site Investigation
4. LOCATION	Philadelphia, Pennsylvania
5. NAME OF DRILLER	Scott Bray
6. MANUFACTURER'S DESIGNATION OF DRILL	CME - 550
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT	7" O.D. , 2-1/4" I.D. Hollow Stem Auger; 2' x 2" Split Spoon
8. HOLE LOCATION	Oregon Ave. Tank Area
9. SURFACE LOCATION	
10. DATE STARTED	96/06/11
11. DATE COMPLETED	96/06/11
12. OVERBURDEN THICKNESS	N/A
15. DEPTH GROUNDWATER ENCOUNTERED	None
13. DEPTH DRILLED INTO ROCK	N/A
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	N/A
14. TOTAL DEPTH OF HOLE	16'
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	N/A
15. GEOTECHNICAL SAMPLES	DISTURBED: / UNDISTURBED:
19. TOTAL NUMBER OF CORE BOXES	N/A
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC: / METALS: / OTHER (TPH): 2 / OTHER (SPECIFY): / OTHER (SPECIFY):
21. TOTAL CORE RECOVERY	
22. DISPOSITION OF HOLE	BACKFILLED: X / MONITORING WELL: / OTHER (SPECIFY):
23. SIGNATURE OF INSPECTOR	Jeff Farrell

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS(ppm) D	GEOTECH SAMPLE RECOVERY(ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1–2	Concrete Wash	0	0.3		-, -, 4, 4	15:54
	3–4	Wash with some cmf SAND	0	0.7		2, 3, 4, 6	15:57
	5–6	Mostly wash, some mf SAND	0	0.5		5, 4, 3, 6	16:00
	7–8	Dark Brown cmf SAND (Below Liner)	2	0.5	11 - O1	3, 4, 3, 4	16:05
	9–10	Dark Brown cmf SAND, some Gravel	0	0.5		3, 4, 3, 4	16:10
	11–12		0	0.5		1, 2, 1, 2	16:14
	13–14		1	0.5	11 - O2	1, 1, 2, 1	16:20
	15–16	Red Brown cm SAND, some Gravel	3	0.3	11 - O3	1, 1, 1, 2	16:25

HTW DRILLING LOG

HOLE NO.	OR-12
SHEET 1 OF 1 SHEETS	

1. COMPANY NAME Louis Berger & Associates	2. DRILLING SUBCOTRACTOR SJB Services
3. PROJECT DPSC - Expanded Site Investigation	4. LOCATION Philadelphia, Pennsylvania
5. NAME OF DRILLER Scott Bray	6. MANUFACTURER'S DESIGNATION OF DRILL CME - 550
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT 7" O.D. , 2-1/4" I.D. Hollow Stem Auger; 2' x 2" Split Spoon	8. HOLE LOCATION Oregon Ave. Tank Area
	9. SURFACE LOCATION
	10. DATE STARTED 96/06/12 — 11. DATE COMPLETED 96/06/12
12. OVERBURDEN THICKNESS N/A	15. DEPTH GROUNDWATER ENCOUNTERED None
13. DEPTH DRILLED INTO ROCK N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A
14. TOTAL DEPTH OF HOLE 16'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A
15. GEOTECHNICAL SAMPLES — DISTURBED: — UNDISTURBED:	19. TOTAL NUMBER OF CORE BOXES N/A
20. SAMPLES FOR CHEMICAL ANALYSIS — VOC: 1; METALS: ; OTHER (TPH): 3; OTHER (SPECIFY): ; OTHER (SPECIFY):	21. TOTAL CORE RECOVERY
22. DISPOSITION OF HOLE — BACKFILLED: X; MONITORING WELL: ; OTHER (SPECIFY):	23. SIGNATURE OF INSPECTOR Jeff Farrell

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS(ppm) D	GEOTECH SAMPLE RECOVERY(ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	0–2	Concrete Orange brown mf SAND, some Silt (Wash)	0	0.3		- - 4 4	9:10
	2–4	Dk. brown cmf SAND	0	0.3		3 3 4 3	9:15
	4–6	Dk. brown cmf SAND, some Gravel	0	0.5		4 4 2 3	9:20
	6–8	Gray brown SILT and f SAND	1	1.3	12 - O1 12 - O2	1 1 2 2	Smell of Oil 9:23
	8–10		1	0.7		2 3 3 4	9:26
	10–12	Green gray cmf SAND, some Gravel	1	1.3		4 4 3 4	9:29
	12–14	Brown orange cm SAND	1	1.3		4 4 4 6	9:36
	14–16	Brown cmf SAND	1	1.5	12 - O3	6 12 22 21	9:44

HTW DRILLING LOG

HOLE NO.	OR-13
SHEET 1 OF 1 SHEETS	
1. COMPANY NAME	Louis Berger & Associates
2. DRILLING SUBCOTRACTOR	SJB Services
3. PROJECT	DPSC - Expanded Site Investigation
4. LOCATION	Philadelphia, Pennsylvania
5. NAME OF DRILLER	Scott Bray
6. MANUFACTURER'S DESIGNATION OF DRILL	CME - 550
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT	7" O.D. , 2-1/4" I.D. Hollow Stem Auger; 2' x 2" Split Spoon
8. HOLE LOCATION	
9. SURFACE LOCATION	OREGON AVE. TANK AREA
10. DATE STARTED	96/06/12
11. DATE COMPLETED	96/06/12
12. OVERBURDEN THICKNESS	N/A
15. DEPTH GROUNDWATER ENCOUNTERED	NONE
13. DEPTH DRILLED INTO ROCK	N/A
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	N/A
14. TOTAL DEPTH OF HOLE	16'
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	N/A
19. TOTAL NUMBER OF CORE BOXES	N/A
21. TOTAL CORE RECOVERY	
23. SIGNATURE OF INSPECTOR	Jeff Farrell

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED				
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (TPH)	OTHER (SPECIFY)	OTHER (SPECIFY)	
	1		2			
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)			
	X					

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS(ppm) D	GEOTECH SAMPLE RECOVERY(ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1–2	Concrete and asphalt Lt. brown mf SAND and SILT	0	0.8		-, -, 4, 4	10:25
	3–4	Orange brown f SAND, some Silt	0	1.5		6, 6, 6, 6	10:30
	5–6	Orange brown f SAND and SILT	0	1.5		9, 12, 12, 11	10:40
	7–8	Red orange mf SAND, some Silt Gray f SAND, some Silt	3	1.8	13 - O1 13 - O2	6, 7, 7, 6	10:45 Smell of Oil
	9–10	Gray brown f SAND, some Silt	2	1.8		7, 7, 9, 8	10:50
	11–12	Red orange cmf SAND, some Gravel	1	1.7	13 - O3	7, 7, 6, 4	11:15
	13–14	Red mf SAND, some Silt	0	1.5		14, 13, 14, 17	11:22
	15–16	Orange brown cmf SAND	1	1.7		12, 13, 9, 7	11:25

HTW DRILLING LOG

HOLE NO.	OR-14
1. COMPANY NAME	Louis Berger & Associates
2. DRILLING SUBCOTRACTOR	SJB Services
SHEET 1 OF 1 SHEETS	
3. PROJECT	DPSC - Expanded Site Investigation
4. LOCATION	Philadelphia, Pennsylvania
5. NAME OF DRILLER	Scott Bray
6. MANUFACTURER'S DESIGNATION OF DRILL	CME - 550
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT	7" O.D. , 2-1/4" I.D. Hollow Stem Auger; 2' x 2" Split Spoon
8. HOLE LOCATION	Oregon Ave. Tank Area
9. SURFACE LOCATION	
10. DATE STARTED	96/06/12
11. DATE COMPLETED	96/06/12
12. OVERBURDEN THICKNESS	N/A
15. DEPTH GROUNDWATER ENCOUNTERED	None
13. DEPTH DRILLED INTO ROCK	N/A
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	N/A
14. TOTAL DEPTH OF HOLE	16'
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	N/A
15. GEOTECHNICAL SAMPLES	DISTURBED: ; UNDISTURBED:
19. TOTAL NUMBER OF CORE BOXES	N/A
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC: 1; METALS: ; OTHER (TPH): 3; OTHER (SPECIFY): ; OTHER (SPECIFY):
21. TOTAL CORE RECOVERY	
22. DISPOSITION OF HOLE	BACKFILLED: XX; MONITORING WELL: ; OTHER (SPECIFY):
23. SIGNATURE OF INSPECTOR	Jeff Farrell

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS(ppm) D	GEOTECH SAMPLE RECOVERY(ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1	Asphalt	0	0.5		- - -	11:45
	2	Gray SILT and f SAND				6	
	3	Orange brown f SAND and SILT	0	1.7		6 6 4 3	11:50
	4						
	5	Orange brown mf SAND Coarsening downward	0	1.8		3 6 7 9	11:55
	6						
	7		0	2.0		12 11 13 10	12:00
	8						
	9	Lt. brown mf SAND	1	2.0	14 - O1	9 9 7 10	12:05
	10						
	11	Orange brown mf SAND / Red orange cmf SAND, some Gravel	2	2.0	14 - O2	5 4 4 10	12:10
	12						
	13	Brown cmf SAND	2	2.0		13 15 14 16	12:15
	14						
	15	Lt. brown cmf SAND and GRAVEL	0	2.0	14 - 03	24 30 23 24	12:22
	16						

HTW DRILLING LOG

HOLE NO. OR-15			
1. COMPANY NAME: Louis Berger & Associates	2. DRILLING SUBCONTRACTOR: SJB Services	SHEET 1 OF 1 SHEETS	
3. PROJECT: DPSC - Expanded Site Investigation	4. LOCATION: Philadelphia, Pennsylvania		
5. NAME OF DRILLER: Scott Bray	6. MANUFACTURER'S DESIGNATION OF DRILL: CME - 550		
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT: 7" O.D., 2-1/4" I.D. Hollow Stem Auger; 2' x 2" Split Spoon	8. HOLE LOCATION: Oregon Ave. Tank Area		
	9. SURFACE LOCATION:		
	10. DATE STARTED: 96/06/12	11. DATE COMPLETED: 96/06/12	
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: N/A		
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: N/A		
14. TOTAL DEPTH OF HOLE: 16'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): N/A		
15. GEOTECHNICAL SAMPLES: DISTURBED / UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES: N/A		

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (TPH)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
			2			

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	XX			Jeff Farrell

ELEV. A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS(ppm) D	GEOTECH SAMPLE RECOVERY(ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1	Asphalt	0	1.0		0	13:30
						0	
	2	Orange brown f SAND				4	
						5	
	3	Orange brown SILT	0	1.5		4	13:35
						5	
	4					6	
						9	
	5		0	1.5		16	13:40
						5	
	6					4	
						4	
	7	Lt. brown f SAND	0	1.8		5	13:45
						7	
	8					7	
						6	
	9	Lt. brown f SAND / Orange cmf SAND	0	2.0	15 - O1	9	13:50
						7	
	10					8	
						8	
	11	f SAND and SILT / Orange brown cm SAND	0	2.0		5	14:15
						4	
	12					6	
						7	
	13	Orange brown cm SAND, little Gravel	0	1.7		10	14:20
						8	
	14					12	
						11	
	15	Orange brown cm SAND, some Gravel	0	1.3		10	14:25
						13	
	16					11	
						13	

HTW DRILLING LOG

HOLE NO.	OR-16
1. COMPANY NAME	Louis Berger & Associates
2. DRILLING SUBCONTRACTOR	SJB Services
SHEET	1 OF 1 SHEETS
3. PROJECT	DPSC - Expanded Site Investigation
4. LOCATION	Philadelphia, Pennsylvania
5. NAME OF DRILLER	Scott Bray
6. MANUFACTURER'S DESIGNATION OF DRILL	CME - 550
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT	7" O.D. , 2-1/4" I.D. Hollow Stem Auger; 2' x 2" Split Spoon
8. HOLE LOCATION	Oregon Ave. Tank Area
9. SURFACE LOCATION	
10. DATE STARTED	96/06/12
11. DATE COMPLETED	96/06/12
12. OVERBURDEN THICKNESS	N/A
15. DEPTH GROUNDWATER ENCOUNTERED	N/A
13. DEPTH DRILLED INTO ROCK	N/A
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	N/A
14. TOTAL DEPTH OF HOLE	16'
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	N/A
15. GEOTECHNICAL SAMPLES	DISTURBED: ; UNDISTURBED:
19. TOTAL NUMBER OF CORE BOXES	N/A

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (TPH)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
			4			

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	x			Jeff Farrell

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS(ppm) D	GEOTECH SAMPLE RECOVERY(ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1–2	Lt. brown f SAND, some Silt	0	1.0		-, -, 4, 5	14:45
	3–4	Lt. brown SILT and f SAND	0	1.8		5, 9, 9, 7	14:50
	5–6	Brown f SAND	0	2.0		9, 9, 7, 8	14:55
	7–8	Orange brown f SAND, some Silt	0	2.0	16 - O1	5, 7, 9, 7	15:00
	9–10	Orange brown cm SAND and GRAVEL	0	1.7		5, 3, 4, 7	15:20
	11–12	Orange brown cmf SAND, some Gravel	0	2.0		9, 9, 11, 13	15:30
	13–14		0	1.8		9, 7, 10, 12	15:35
	15–16		0	1.8	16 - O2	9, 12, 11, 7	15:40

HTW DRILLING LOG

HOLE NO. OR-17

1. COMPANY NAME Louis Berger & Associates	2. DRILLING SUBCOTRACTOR SJB Services	SHEET 1 OF 1 SHEETS
3. PROJECT DPSC - Expanded Site Investigation	4. LOCATION Philadelphia, Pennsylvania	
5. NAME OF DRILLER Scott Bray	6. MANUFACTURER'S DESIGNATION OF DRILL CME - 550	

7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIPMENT	7" O.D. , 2-1/4" I.D. Hollow Stem Auger; 2' x 2" Split Spoon	8. HOLE LOCATION OREGON AVE. TANK AREA	
		9. SURFACE LOCATION	
		10. DATE STARTED 96/06/12	11. DATE COMPLETED 96/06/12
12. OVERBURDEN THICKNESS N/A		15. DEPTH GROUNDWATER ENCOUNTERED NONE	
13. DEPTH DRILLED INTO ROCK N/A		16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A	
14. TOTAL DEPTH OF HOLE 16		17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A	

15. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES			
			N/A			
20. SAMPLES FOR CHEMICAL ANALYSIS	**VOC**	**METALS**	**OTHER (TPH)**	**OTHER (SPECIFY)**	**OTHER (SPECIFY)**	**21. TOTAL CORE RECOVERY**
			2			
22. DISPOSITION OF HOLE	**BACKFILLED**	**MONITORING WELL**	**OTHER (SPECIFY)**	**23. SIGNATURE OF INSPECTOR**		
	X			Jeff Farrell		

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS(ppm) D	GEOTECH SAMPLE RECOVERY(ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
		Asphalt				-	
	1		0	0.5		-	15:55
		Dk. brown mf SAND				6	
	2					7	
						5	
	3	Lt. tan SILT and f	0	1.5		6	16:00
		SAND				7	
	4					6	
						10	
	5					10	16:05
			0	0.0		9	
	6					7	
						12	
	7	Orange brown	0	2.0		14	16:08
		cmf SAND				12	
	8					12	
		Orange brown cmf				12	
	9	SAND, some Gravel	0	2.0	17 - 01	13	16:12
						14	
	10					12	
						10	
	11		0	2.0		7	16:15
						10	
	12					10	
						10	
	13		0	1.3		10	16:20
						7	
	14					8	
						10	
	15		0	2.0		8	16:25
						7	
	16					4	

HTW DRILLING LOG

HOLE NO.	OR-18	
1. COMPANY NAME: Louis Berger & Associates	2. DRILLING SUBCOTRACTOR: SJB Services	SHEET 1 OF 2 SHEETS
3. PROJECT: DPSC Expanded Site Investigation	4. LOCATION: Philadelphia, Pennslyvania	
5. NAME OF DRILLER: Scott Bray	6. MANUFACTURER'S DESIGNATION OF DRILL: CME - 550	
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIOMENT: 7" O.D., 2 1 /4" I.D. Hollow Stem Auger, 2' x 2" Split Spoon	8. HOLE LOCATION: OREGON AVENUE TANK AREA	
	9. SURFACE LOCATION:	
	10. DATE STARTED: 96/06/13	11. DATE COMPLETED: 6/13/96
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: NONE	
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: N/A	
14. TOTAL DEPTH OF HOLE: 20 ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): N/A	

15. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES: N/A			
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (TPH)	OTHER (HFS)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2		4	1		
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR		
	X			Jeff Farrell		

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS(ppm) D	GEOTECH SAMPLE RECOVERY(ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
						3	
	1		0	1.0		3	9:00
		Lt. brown SILT and				3	
	2	f SAND				2	
						4	
	3	Brown f SAND, some Silt	0	1.3		3	9:05
						4	
	4					3	
		Lt. tan f SAND and SILT				3	
	5					3	9:10
			0	1.3		4	
	6					3	
						6	
	7		2	1.8		6	9:15
		Stained f SAND and SILT				6	
	8					6	Photo #4 Staining
						14	Photo 5/6
	9		2.5	2.0	18 - 01	12	9:20
		Remainder gray mf SAND,				13	
	10	some Silt				16	Visible Oil at Top
		Gray mf Sand, some Silt				10	
	11	lenses	7	2.0	18 - 02	12	9:25
					18 - 03	12	
	12					13	Oil Smell
		Gray cmf SAND				10	
	13		2	1.8		11	9:30
						10	
	14					9	

HTW DRILLING LOG

OR - 18

PROJECT	INSPECTOR	SHEET 2
DPSC Expanded Site Investigation	J. Farrell	OF 2 SHEETS

ELEV A	DEPTH FT B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS D	GEOTECH SAMPLE RECOVERY E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
		Gray cmf Sand	2.5	1.8		10	
	15				18 - 04	9	9:35
					18 - 05	11	
	16					9	Oil Smell
		Gray cmf SAND, some				19	
	17	Gravel, oily at the bottom	1.5	1.7		20	9:40
		interval				22	
	18					19	Oil Smell
						10	Photos 7/8
	19		7	1.5	18 - 06	6	
		Red orange SILT and SAND			18 - 07	8	9:45
	20	(No Oil)				7	
	21						
	22						
	23						
	24						
	25						
	26						
	27						
	28						
	29						
	30						
	31						
	32						
	33						
	34						
	35						

HTW DRILLING LOG

HOLE NO.	OR-19
SHEET 1 OF 2 SHEETS	

1. COMPANY NAME: Louis Berger & Associates	2. DRILLING SUBCOTRACTOR: SJB Services
3. PROJECT: DPSC Expanded Site Investigation	4. LOCATION: Philadelphia, Pennslyvania
5. NAME OF DRILLER: Scott Bray	6. MANUFACTURER'S DESIGNATION OF DRILL: CME - 550
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIOMENT: 7" O.D., 2 1/4" I.D. Hollow Stem Auger, 2' x 2" Split Spoon	8. HOLE LOCATION: OREGON AVE. TANK AREA
	9. SURFACE LOCATION:
	10. DATE STARTED: 96/06/13 — 11. DATE COMPLETED: 6/13/96
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: 18 feet BGS
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: N/A
14. TOTAL DEPTH OF HOLE: N/A	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): N/A
15. GEOTECHNICAL SAMPLES: DISTURBED: — UNDISTURBED: —	19. TOTAL NUMBER OF CORE BOXES: N/A

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (TPH)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
			3			

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X			Jeff Farrell

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS(ppm) D	GEOTECH SAMPLE RECOVERY(ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1–4	Augered to 4 feet					
	5–6	Dk. brown cm SAND, some Silt	1	1.5		4, 6, 4, 4	10:35
	7–8	Gray green f SAND, some Silt and clay, coarsening downward	3	1.5		4, 6, 4, 3	Photo 9 10:40 Oil Odor
	9–10		2	1.0		5, 6, 7, 6	10:45 Oil Odor
	11–12	Gray cmf SAND and SILT	3	1.5		5, 6, 7, 6	11:05 Oil Odor
	13–14	Reddish brown cm SAND and GRAVEL	28	1.8	19 - 01, 19 - 02	10, 11, 6, 9	11:10

HTW DRILLING LOG

HOLE NO. OR-19

PROJECT: DPSC Expanded Site Investigation

INSPECTOR:

SHEET 2 OF 2 SHEETS

ELEV A	DEPTH FT B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS D	GEOTECH SAMPLE OR CORE BOX NO. E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	14						
	15 16	Reddish brown cm SAND and GRAVEL	25	2.0		10 12 14 18	11:15
	17 18	Orange brown cm SAND	26	1.8		10 9 8 7	11:20
	19 20	Reddish brown cm SAND, wet	26	1.3		10 9 8 7	No Oil Odor 11:25
	21						
	22						
	23						
	24						
	25						
	26						
	27						
	28						
	29						
	30						
	31						
	32						
	33						
	34						
	35						

HTW DRILLING LOG

HOLE NO.	OR-20
SHEET 1 OF 2 SHEETS	

1. COMPANY NAME Louis Berger & Associates	2. DRILLING SUBCOTRACTOR SJB Services
3. PROJECT DPSC Expanded Site Investigation	4. LOCATION Philadelphia, Pennslyvania
5. NAME OF DRILLER Scott Bray	6. MANUFACTURER'S DESIGNATION OF DRILL CME - 550
7. SIZES AND TYPE OF DRILLING AND SAMPLING EQUIOMENT 7" O.D., 2 1 /4" I.D. Hollow Stem Auger, 2' x 2" Split Spoon	8. HOLE LOCATION OREGON AVENUE TANK AREA 9. SURFACE LOCATION
	10. DATE STARTED 96/06/13 — 11. DATE COMPLETED 6/13/96
12. OVERBURDEN THICKNESS N/A	15. DEPTH GROUNDWATER ENCOUNTERED NONE
13. DEPTH DRILLED INTO ROCK N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A
14. TOTAL DEPTH OF HOLE N/A	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A
15. GEOTECHNICAL SAMPLES — DISTURBED: — UNDISTURBED:	19. TOTAL NUMBER OF CORE BOXES N/A
20. SAMPLES FOR CHEMICAL ANALYSIS — VOC: — METALS: — OTHER (TPH): 3 — OTHER (SPECIFY): — OTHER (SPECIFY):	21. TOTAL CORE RECOVERY
22. DISPOSITION OF HOLE — BACKFILLED: X — MONITORING WELL: — OTHER (SPECIFY):	23. SIGNATURE OF INSPECTOR Jeff Farrell

ELEV A	DEPTH FT. B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS (ppm) D	GEOTECH SAMPLE OR CORE BOX NO.(ft) E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	1–4	Augered to 4 ft.					
	4–6	Top Soil Red Brick FILL	25	0.3		5, 5, 2, 2	11:50
	6–8	RED BRICK FILL grading into gray black CLAY and SILT	5	0.5		6, 2, 3, 6	Photo 9 11:55 Oil Odor
	8–10	Gray CLAY and SILT and cmf SAND	20	1.0		6, 3, 4, 3	12:00 Oil Odor
	10–12	Gray mf SAND	30	1.8	20 - 01 20 - 02	3, 5, 5, 5	12:05 Oil Odor
	12–14	(Gray mf SAND to ~13.5 ft) Gray cmf SAND, some Gravel	18	1.8		5, 7, 7, 4	12:10

HTW DRILLING LOG

HOLE NO.
OR-20

PROJECT	INSPECTOR	SHEET 2
DPSC Expanded Site Investigation	J. Farrell	OF 2 SHEET"

ELEV A	DEPTH FT B	DESCRIPTION OF MATERIALS C	FIELD SCREENING RESULTS D	GEOTECH SAMPLE OR CORE BOX NO. E	ANALYTICAL SAMPLE NO. F	BLOW COUNTS G	REMARKS H
	15	Gray cmf SAND, some Gravel	14	1.8		5	
						7	12:15
	16	Orange cm SAND				8	
						7	
	17					10	
			25	2.0		9	12:20
	18					10	
						11	
	19	Lt. brown cmf SAND, some Gravel, moist				7	
			33	1.7	20 - 03	9	TPH
	20					11	12:25
						9	
	21						
	22						
	23						
	24						
	25						
	26						
	27						
	28						
	29						
	30						
	31						
	32						
	33						
	34						
	35						

DRILLING LOG

HOLE NO.	DPS-MWS1
1. COMPANY NAME	Malcolm Pirnie, Inc.
2. DRILLING CONTRACTOR	SJB Services, Inc.
SHEET 1 OF 3 SHEETS	
3. PROJECT	Defense Personnel Support Center
4. LOCATION	Philadelphia, Pennsylvania
5. NAME OF DRILLER	T. Miller
6. MANUFACTURER'S DESIGNATION OF DRILL	CME-850
7. Sizes & Types of Drilling & Sampling Equipment	4 1/4" HSA 2" continuous s.s.
8. HOLE LOCATION	221879.6 North 2717866.2 East
9. SURFACE ELEVATION	24.2'
10. DATE STARTED	8/20/96
11. DATE COMPLETED	8/20/96
12. OVERBURDEN THICKNESS	
15. DEPTH GROUNDWATER ENCOUNTERED	25 feet bgs
13. DEPTH DRILLED INTO ROCK	
16. Depth to Water and Elapsed Time After Drilling Completed	22.11 feet below mp to water; 8/23/96
14. TOTAL DEPTH OF HOLE	32.0
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	
18. GEOTECHNICAL SAMPLES	N/A
DISTURBED	
UNDISTURBED	
19. TOTAL NUMBER OF CORE BOXES	

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (Specify)	OTHER (Specify)	OTHER (Specify)	21. Total Core REC %
(20-24),(26-28),(28-30)			HFS	IR SCAN		

22. DISPOSITION OF HOLE	BACKFILLED	Monitoring Well	OTHER (Specify)	23. SIGNATURE OF INSPECTOR
		X		

ELEV. a	DEPTH b	Blow Counts c	DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
24.2	0	2 2 2 2	dk brn-blk SILT w/ tr f sand, coal, brick (FILL)	0.5 ppm			rec 1.3/2.0 moist
23.2	1						
22.2	2	12 10 7 7	(2.0-3.5') mod brn SILT, tr f sand, f gravel, coal (FILL)	Fill 0.8 ppm			rec 2.0/2.0 moist
21.2	3						
20.2	4	2 2 3 4	(3.5-4.0') mod brn SILT w/ tr f sand, clay and rootlets (ML) lt ylw-brn SILT w/ tr f sand and lt gry clay laminae (ML)	0.8 ppm			rec 2.0/2.0 moist
19.2	5						
18.2	6	5 5 5 6	SILT w/ f sand as above (ML)	Da 0.2 ppm			rec 2.0/2.0 moist
17.2	7						
16.2	8	3 5 6 6	lt gry, f SAND w/ tr-ltl silt, few oxidized partings (SM)	0.5 ppm			rec 2.0/2.0 moist
15.2	9						
14.2	10						

DRILLING LOG

PROJECT	INSPECTOR	HOLE NO.
Defense Personnel Support Center, Philadelphia, Pennsylvania	John Hilton	DPS-MWS1
		SHEET 2 OF 3 SHEETS

ELEV. a	DEPTH b	Blow Counts c	DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
		5 5 6 7	lt gry sandy SILT w/ brn sand partings to 0.3' thick (ML)				rec 1.8/2.0
13.2	11			0.2 ppm			moist-wet
12.2	12		(12.0-12.2') As above (ML)				
		4 10 12 12	(12.2-13.5') f-med, poorly sorted SAND w/ ltl f gravel to 0.5" dia. (SW)				rec 1.5/2.0
11.2	13			17.4 ppm			moist dry slight petroleum odor
10.2	14	7 14 12 12	dk gry-brn f-crs, broken GRAVEL w/ f-med sand (GW)				rec 0.9/2.0
9.2	15			28 ppm			dry-moist strong petroleum odor
8.2	16	12 12 11 12	mod brn, poorly sorted, f-crs, sub-rnd GRAVEL w/ some med-crs sand w/in gravel matrix (GW)				rec 1.8/2.0
7.2	17			20 ppm			dry-moist petroleum odor
6.2	18		(18.0-18.4') As above (GW)				rec 1.7/2.0
		6 10 11 13	(18.4-19.7') dk brn-orng, med-crs SAND and f GRAVEL to 0.25" dia (SW/GW)				
5.2	19			28 ppm			strong petroleum odor
4.2	20	10 11 13 13	dk brn, f-crs, poorly sorted GRAVEL and f-med SAND, tr-ltl clay @ 21.3 - 21.6' (GW/SW)				rec 1.8/2.0
3.2	21			130 ppm			
2.2	22	18 11 8 19	GRAVEL as above w/ f-crs SAND (GW/SW)			DPSSP-MWS-1 (22-24)	rec 1.3/2.0
1.2	23			> 150 ppm			very strong petroleum odor LEL = 30% in augers
0.2	24	10 16 23 22	dk gry-brn, f-crs, subrnd GRAVEL and SAND w/ gravel > 2" dia., med-crs sand partings < 0.2' thick (GW/SW)				rec 1.5/2.0
-0.8	25 ▽			> 150 ppm			wet-saturated
-1.8	26	10 20 12 12	(26.0-27.0') GRAVEL and SAND as above (GW/SW)			DPSSP-MWS-1 (26-28)	rec 1.2/2.0
-2.8	27		(27.0-27.2') dk gry f-med SAND (SW)	> 150 ppm			saturated sheen on water
-3.8	28						

DRILLING LOG

PROJECT	INSPECTOR	HOLE NO.
Defense Personnel Support Center Philadelphia, Pennsylvania	John Hilton	DPS-MWS1 SHEET 3 OF 3 SHEETS

ELEV. a	DEPTH b	Blow Counts c	DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
		9 13 15 17	(28.0-28.6') SAND as above w/ petroleum staining at approx. 28.4-28.6' (SW) sharp contact (28.6-29.7') SAND and GRAVEL (SW/GW)	>150 ppm Vo		DPSSP-MWS-1 (28-30)	saturated petroleum sheen and odor petroleum staining
-4.8	29						
-5.8	30	12 22 26 20	(30.0-30.4') drk brn-gry, f-med SAND (SW) (30.4-31.4') drk gry, f-med SAND and f-crs GRAVEL to 2" dia. (SW/GW)	>150 ppm			saturated water at 23' bgs in augers
-6.8	31						
-7.8	32		End of Boring				
-8.8	33						
-9.8	34						
-10.8	35						
-11.8	36						
-12.8	37						
-13.8	38						
-14.8	39						
-15.8	40						
-16.8	41						
-17.8	42						
-18.8	43						
-19.8	44						
-20.8	45						
-21.8	46						

MALCOLM PIRNIE

OVERBURDEN MONITORING WELL SHEET

WELL NO. DPSSP-MWS-1

PROJECT DPSC - NAPL INV. START DATE 8-20-96 END DATE 8-20-96

PROJECT NO. 0285643 FIELD GEOLOGIST J. HILTON

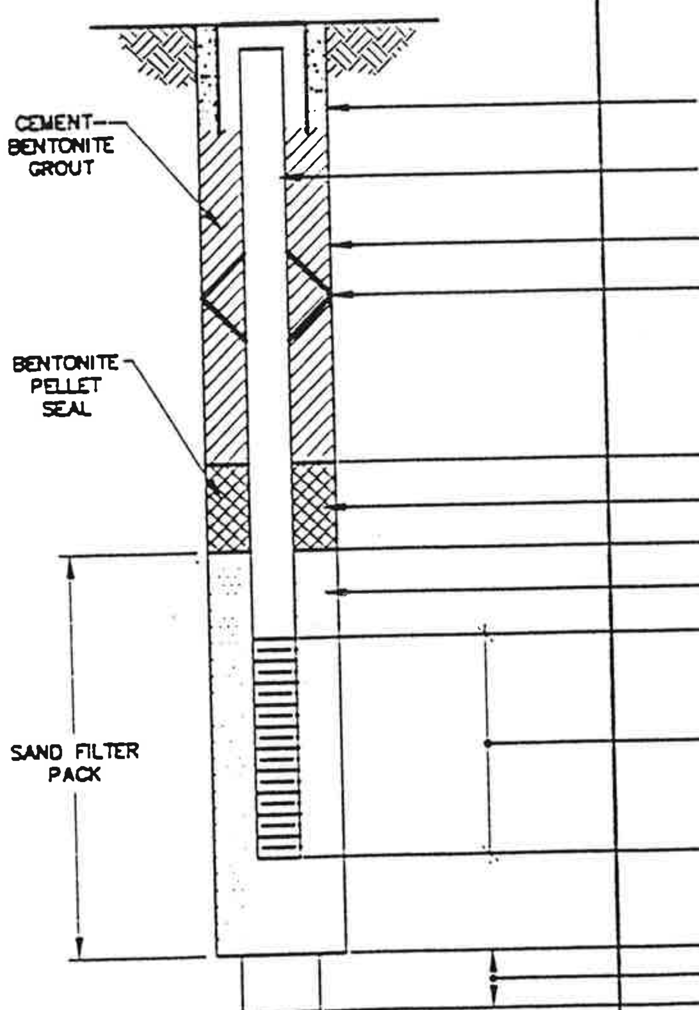
LOCATION DPSC SOUTH, PASSYUNK HOMES

DRILLING CO. SJB SERVICES

DRILLER(S) T. MILLER

DRILLING METHOD(S) 4 1/4" HSA

DEVELOPMENT METHOD(S) MANUAL PURGE W/ SURGE BLOCK



DEPTH TO TOP OF GROUT/ BOTTOM OF CEMENT 1.5'

RISER DIAMETER AND MATERIAL 2" SCH 40 PVC

BOREHOLE DIAMETER 8"

DEPTH TO CENTRALIZERS N/A

DEPTH 13.0'

PELLET SIZE MEDIUM CHIPS

DEPTH 17.0'

SAND SIZE #0 MORIE

DEPTH 20.1'

SCREEN DIAMETER 2"
SLOT SIZE .010
MATERIAL SCH 40 PVC

DEPTH 30.1'

DEPTH 31.0'

BACKFILL MATERIAL NATIVE SAND & GRAVEL

BOTTOM OF BOREHOLE 32.0'

NOTE: DEPTHS ARE FEET BELOW GRADE

DRILLING LOG

1. COMPANY NAME: Malcolm Pirnie, Inc.	2. DRILLING CONTRACTOR: SJB Services, Inc.	HOLE NO. DPS-MWS2 SHEET 1 OF 2 SHEETS
3. PROJECT: Defense Personnel Support Center	4. LOCATION: Philadelphia, Pennsylvania	
5. NAME OF DRILLER: T. Miller	6. MANUFACTURER'S DESIGNATION OF DRILL: CME-850	
7. Sizes & Types of Drilling & Sampling Equipment: 4 1/4" HSA; 2" continuous s.s.	8. HOLE LOCATION: 221471.0 North 2718614.1 East	
	9. SURFACE ELEVATION: 20.5'	
	10. DATE STARTED: 8/21/96	11. DATE COMPLETED: 8/21/96
12. OVERBURDEN THICKNESS	15. DEPTH GROUNDWATER ENCOUNTERED: 18 feet bgs	
13. DEPTH DRILLED INTO ROCK	16. Depth to Water and Elapsed Time After Drilling Completed: 17.63 feet below mp to water; 8/23/96	
14. TOTAL DEPTH OF HOLE: 28.0	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
N/A			

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (Specify)	OTHER (Specify)	OTHER (Specify)	21. Total Core REC %
(18-20),(20-22),(26-28)			HFS	IR SCAN		

22. DISPOSITION OF HOLE	BACKFILLED	Monitoring Well	OTHER (Specify)	23. SIGNATURE OF INSPECTOR
		X		

ELEV. a	DEPTH b	Blow Counts c	DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
20.5	0	2 4 6 2	dk brn SILT w/ tr f sand, micaceous, increasing sand content w/ depth (FILL)	Fill 1.2 ppm			rec 1.6/2.0 dry
19.5	1						
18.5	2	15 10 8 8	(2.0-2.2') orng-brn f SAND w/ tr silt (SM) sharp contact .M=SAND (2.2-2.9') dense, micro-laminated SILT and CLAY (ML/CL) (2.9-3.8') mod gray, f SAND w/ some silt (SM)	1.8 ppm		DPSSP-MWS-2 (2-4)	rec 1.8/2.0 dry black discoloration slight petroleum odor
17.5	3						
16.5	4	2 5 6 7	SAND w/ some silt as above, slight petroleum odor especially w/in black discolored laminae (SM)	3.4 ppm Qal			rec 1.6/2.0 moist
15.5	5						
14.5	6	5 7 7 7	SAND as above w/ increased silt content, tr blk discolored laminae (SM)	10.4 ppm			rec 1.8/2.0 moist-wet faint petroleum odor
13.5	7						
12.5	8	3 10 14 10	(8.0-9.0') olive-gry SILT w/ tr-ltl f sand, tr clay (ML)				rec 1.7/2.0 wet
11.5	9		(9.0-9.7') brn-orng f-med SAND w/ some f-crs, subrnd gravel (SW)	28 ppm Qp			dry
10.5	10						

DRILLING LOG

PROJECT: Defense Personnel Support Center, Philadelphia, Pennsylvania	INSPECTOR: John Hilton	HOLE NO. DPS-MWS2; SHEET 2 OF 2 SHEETS

ELEV. a	DEPTH b	Blow Counts c	DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
9.5	11	8 9 8 8	mod brn, f-med SAND, tr-ltl, fine, subrnd gravel (SW)	30 ppm			rec 1.5/2.0 petroleum odor
8.5 7.5	12 13	5 8 10 11	(12.0-13.1') As above (SW) (13.1-13.7') f GRAVEL w/ ltl f-med sand (GP)	15 ppm			rec 1.7/2.0 dry
6.5 5.5	14 15	7 9 8 9	orng-brn, f-med SAND w/ ltl f gravel (SW) med sand partings to 0.2' thick	14.8 ppm			rec 1.2/2.0 dry
4.5 3.5	16 17	9 11 12 10	No Recovery	QP –			rec 0.0/2.0
2.5 1.5	18 19	4 5 5 5	med gry-brn, f-crs SAND w/ minor sorting as crs sand partings to 0.1' thick (SW)	> 150 ppm		DPSSP-MWS-2 (18-20)	rec 1.5/2.0 very strong light petroleum odor wet-saturated 100% LEL
0.5 -0.5	20 21	2 4 5 7	SAND as above w/ tr f, subrnd gravel to 0.25" dia., ltl sorting as thin-bedded partings (SW)	> 130 ppm		DPSSP-MWS-2 (20-22)	rec 1.6/2.0 strong petroleum odor 100% LEL
-1.5 -2.5	22 23	5 7 9 27	f-crs, rnd-subrnd GRAVEL w/ ltl f sand (GW)	150 ppm			rec 0.9/2.0 significant petroleum odor and sheen water measured @ 19' bgs in augers
-3.5 -4.5	24 25	12 10 11 9	mod brn, f-crs SAND, minor sorting as crs partings > 0.2' thick, some darkened staining (SW)	> 140 ppm			rec 1.2/2.0 saturated petroleum odor and sheen
-5.5 -6.5	26 27	12 11 10 9	(26.0-26.5') mod brown-red, f-crs SAND w/ tr f gravel to 0.5" dia. (SW) (26.5-27.5') loose, med-crs SAND, black staining w/in med sand partings @ 26.5-26.9'	> 150 ppm		DPSSP-MWS-2 (26-28)	rec 1.5/2.0 very strong petroleum odor
-7.5	28		End of Boring				

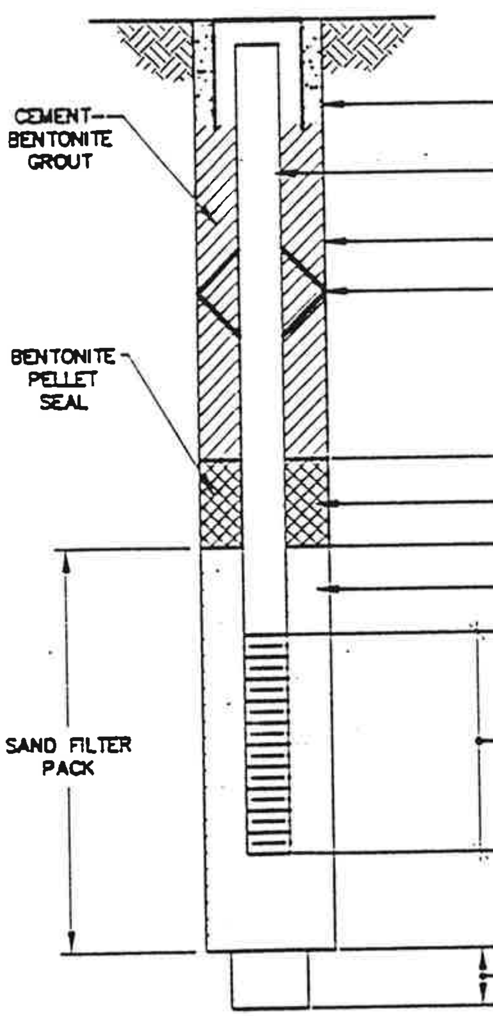
MALCOLM PIRNIE

OVERBURDEN MONITORING WELL SHEET

WELL NO. DPSSP-MWS-2

PROJECT DPSC - NAPL INV.	START DATE 8-21-96
END DATE 8-21-96	
PROJECT NO. 0285643	FIELD GEOLOGIST J. HILTON
LOCATION DPSC SOUTH, PASSYUNK HOMES	

DRILLING CO.	SJB SERVICES
DRILLER(S)	S. GARDNER
DRILLING METHOD(S)	4 1/4" HSA
DEVELOPMENT METHOD(S)	MANUAL PURGE W/ SURGE BLOCK



DEPTH TO TOP OF GROUT/ BOTTOM OF CEMENT 1.5'

RISER DIAMETER AND MATERIAL 2" SCH 40 PVC

BOREHOLE DIAMETER 8"

DEPTH TO CENTRALIZERS N/A

DEPTH 10.0'

PELLET SIZE MEDIUM CHIPS

DEPTH 14.0'

SAND SIZE #0 MORIE

DEPTH 16.85'

SCREEN DIAMETER 2"
SLOT SIZE .010
MATERIAL SCH 40 PVC

DEPTH 26.85'

DEPTH 28.0'

BACKFILL MATERIAL NATIVE SAND & GRAVEL

BOTTOM OF BOREHOLE 28.0'

NOTE: DEPTHS ARE FEET BELOW GRADE

DRILLING LOG

HOLE NO.	DPS-MWS3
1. COMPANY NAME	Malcolm Pirnie, Inc.
2. DRILLING CONTRACTOR	SJB Services, Inc.
SHEET 1 OF 2 SHEETS	
3. PROJECT	Defense Personnel Support Center
4. LOCATION	Philadelphia, Pennsylvania
5. NAME OF DRILLER	T. Miller
6. MANUFACTURER'S DESIGNATION OF DRILL	CME-850
7. Sizes & Types of Drilling & Sampling Equipment	4 1/4" HSA 2" continuous s.s.
8. HOLE LOCATION	221507.7 North 2719177.2 East
9. SURFACE ELEVATION	16.2'
10. DATE STARTED	8/22/96
11. DATE COMPLETED	8/22/96
12. OVERBURDEN THICKNESS	
15. DEPTH GROUNDWATER ENCOUNTERED	14 feet bgs
13. DEPTH DRILLED INTO ROCK	
16. Depth to Water and Elapsed Time After Drilling Completed	13.15 feet below mp to water; 8/23/96
14. TOTAL DEPTH OF HOLE	24.0
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
N/A			

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (Specify)	OTHER (Specify)	OTHER (Specify)	21. Total Core REC %
(14-16),(16-18),(22-24)			HFS	IR SCAN	EXPANDED	

22. DISPOSITION OF HOLE	BACKFILLED	Monitoring Well	OTHER (Specify)	23. SIGNATURE OF INSPECTOR
		X		

ELEV. a	DEPTH b	Blow Counts c	DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
16.2	0	2 3 3 4	(0.0-0.6) brn-blk SILT w/ tr f sand (FILL) sharp contact (0.6-1.4) med-crs SAND w/ weathered mica schist cobbles, coal (FILL)	5.8 ppm			rec 1.4/2.0 dry
15.2	1						
14.2	2	4 7 7 13	mod brn-red f SAND grading to drk stained blk @ 3.3', tr clay, coal, clay brick pieces (FILL)	13.4 ppm		DPSSP-MWS-3 (2-4)	moist rec 2.0/2.0 moist faint petroleum odor
13.2	3						
12.2	4	3 3 3 3	dk gry-blk SILT w/ tr-ltl f sand, tr clay, coal and red brick pieces (FILL)	78 ppm Fill			rec 2.0/2.0 moist very faint petroleum odor
11.2	5						
10.2	6	2 3 2 4	(6.0-6.6') drk brn SILT w/ slight increase in sand content (FILL) (6.6-7.8') mod gry-brn SILT w/ black-stained laminae (ML) (7.8-8.0') lt brn-orng SILT w/ f sand (ML)	74 ppm Q.!			rec 2.0/2.0 moist
9.2	7						
8.2	8	1 4 9 7	orng-brn SILT, oxidized w/ tr-ltl f, micaceous sand and clay as laminae (ML)	36 ppm			rec 1.8/2.0 moist
7.2	9						
6.2	10						

DRILLING LOG

PROJECT	INSPECTOR	HOLE NO.
Defense Personnel Support Center, Philadelphia, Pennsylvania	John Hilton	DPS-MWS3
		SHEET 2 OF 2 SHEETS

ELEV. a	DEPTH b	Blow Counts c	DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
		13	(10.0-11.6') SILT as above (ML)				rec 2.0/2.0
5.2	11	12 12 12		9.5 ppm			moist
				Qal			
4.2	12		(11.6-12.0') drk gry-brn, f, micaceous SAND and SILT (SC)				
		4 7	(12.0-12.9') micaceous SAND and SILT as above (SC)				rec 1.8/2.0
3.2	13	13 12	(12.9-13.8')drk brn-orng, f-med SAND and f-crs, subrnd GRAVEL (SW/GW)	14.8 ppm			moist-wet
2.2	14		drk brn, f-crs SAND and f-crs GRAVEL w/ sorted sand (matrix) interbeds (SW/GW)			DPSSP-MWS-3 (14-16)	petroleum odor
		4 7					rec 1.7/2.0
1.2	15	12 30		>120 ppm			wet-saturated very strong petroleum odor
0.2	16		f-crs, subrnd GRAVEL w/ tr-ltl f-med sand, loose, cobbles > 3" dia. (GW)	Qp		DPSSP-MWS-3 (16-18)	rec 1.2/2.0
-0.8	17	31 47 26 38	Sampled with 3" split-spoon	>110 ppm		Duplicate DPSSP-MWS-6 (16-18)	saturated very strong petroleum odor sheen on all gravel surfaces
-1.8	18		mod brn-ylw f-crs GRAVEL and SAND, ltl black staining @ 18.0-18.3' (GW/SW)				rec 1.5/2.0
-2.8	19	6 7 10 14		>100 ppm			saturated petroleum sheen & odor
-3.8	20		(20.0-20.6') GRAVEL and SAND as above (GW/SW)				rec 1.3/2.0
		7 10	sharp contact				saturated
-4.8	21	7 8	(20.6-21.3') drk brn, f-med SAND w/ tr f gravel, dk blk discoloration @ 20.6-20.8' (SW)	>100 ppm			petroleum odor & sheen, discoloration
-5.8	22		drk brn SAND as above w/ dk brn-blk discoloration at approx. 22.9-23.0' (SW)	Ko		DPSSP-MWS-3 (22-24)	rec 1.4/2.0
-6.8	23	2 4 9 9		>150 ppm			saturated petroleum odor & sheen, discoloration
-7.8	24		End of Boring				
-8.8	25						
-9.8	26						
-10.8	27						
-11.8	28						

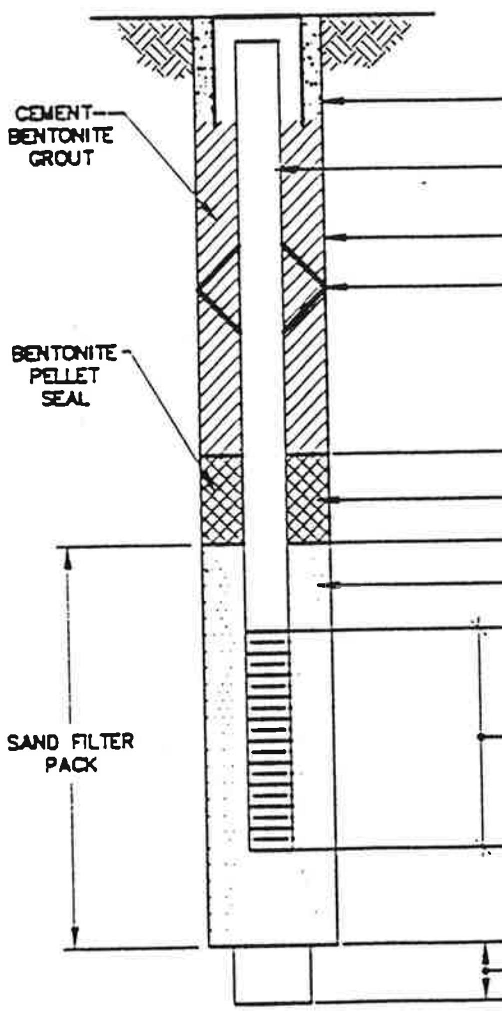
MALCOLM PIRNIE

OVERBURDEN MONITORING WELL SHEET

WELL NO. DPSSP-MWS-3

PROJECT: DPSC - NAPL INV.	START DATE: 8-22-96
END DATE: 8-22-96	
PROJECT NO.: 0285643	FIELD GEOLOGIST: J. HILTON
LOCATION: DPSC SOUTH, PASSYUNK HOMES	

DRILLING CO.	SJB SERVICES
DRILLER(S)	T. MILLER
DRILLING METHOD(S)	4 1/4" HSA
DEVELOPMENT METHOD(S)	MANUAL PURGE W/ SURGE BLOCK



DEPTH TO TOP OF GROUT/ BOTTOM OF CEMENT 1.5'

RISER DIAMETER AND MATERIAL 2" SCH 40 PVC

BOREHOLE DIAMETER 8"

DEPTH TO CENTRALIZERS N/A

DEPTH 5.0'

PELLET SIZE MEDIUM CHIPS

DEPTH 9.0'

SAND SIZE #0 MORIE

DEPTH 12.0'

SCREEN DIAMETER 2"
SLOT SIZE .010
MATERIAL SCH 40 PVC

DEPTH 22.0'

DEPTH 23.0'

BACKFILL MATERIAL NATIVE SAND & GRAVEL

BOTTOM OF BOREHOLE 24.0'

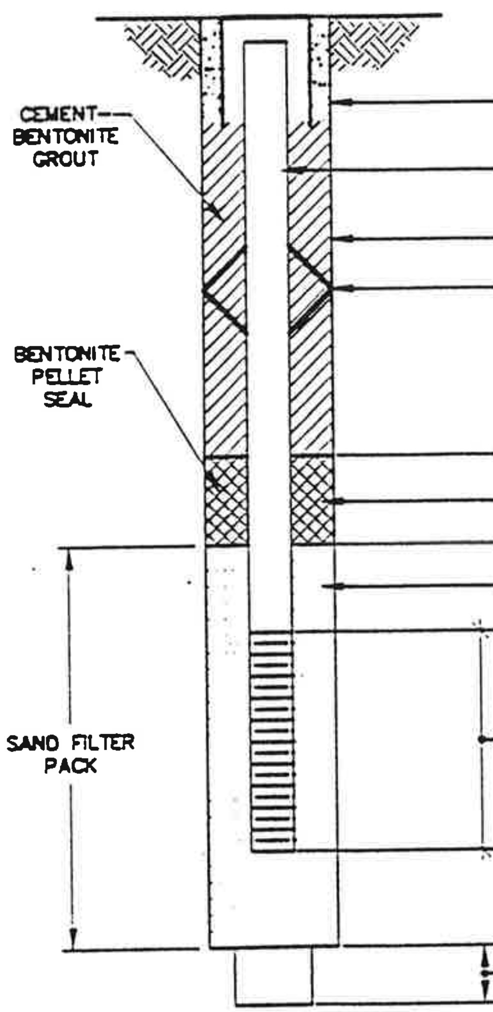
NOTE: DEPTHS ARE FEET BELOW GRADE

MALCOLM PIRNIE

OVERBURDEN MONITORING WELL SHEET

WELL NO. DPSSP-MWS-4

PROJECT	DPSC – NAPL INV.
START DATE	8-22-96
END DATE	8-22-96
PROJECT NO.	0285643
FIELD GEOLOGIST	J. HILTON
LOCATION	DPSC SOUTH, PASSYUNK HOMES
DRILLING CO.	SJB SERVICES
DRILLER(S)	T. MILLER
DRILLING METHOD(S)	4 1/4" HSA
DEVELOPMENT METHOD(S)	MANUAL PURGE W/ SURGE BLOCK



DEPTH TO TOP OF GROUT/ BOTTOM OF CEMENT	1.5'
RISER DIAMETER AND MATERIAL	2" SCH 40 PVC
BOREHOLE DIAMETER	8"
DEPTH TO CENTRALIZERS	N/A
DEPTH	8.0'
PELLET SIZE	MEDIUM CHIPS
DEPTH	12.0'
SAND SIZE	#0 MORIE
DEPTH	15.0'
SCREEN DIAMETER	2"
SLOT SIZE	.010
MATERIAL	SCH 40 PVC
DEPTH	25.0'
DEPTH	26.0'
BACKFILL MATERIAL	NATIVE SAND & GRAVEL
BOTTOM OF BOREHOLE	26.2'

NOTE: DEPTHS ARE FEET BELOW GRADE

DRILLING LOG

HOLE NO. DPS-MWS5		
1. COMPANY NAME: Malcolm Pirnie, Inc.	2. DRILLING CONTRACTOR: SJB Services, Inc.	SHEET 1 OF 3 SHEETS
3. PROJECT: Defense Personnel Support Center	4. LOCATION: Philadelphia, Pennsylvania	
5. NAME OF DRILLER: T. Miller	6. MANUFACTURER'S DESIGNATION OF DRILL: CME-850	
7. Sizes & Types of Drilling & Sampling Equipment: 4 1/4" HSA; 2" continuous s.s.	8. HOLE LOCATION: 221547.9 North 2719959.3 East	
	9. SURFACE ELEVATION: 15.4'	
	10. DATE STARTED: 8/23/96	11. DATE COMPLETED: 8/23/96
12. OVERBURDEN THICKNESS	15. DEPTH GROUNDWATER ENCOUNTERED: 9 feet bgs	
13. DEPTH DRILLED INTO ROCK	16. Depth to Water and Elapsed Time After Drilling Completed: 11.74 feet below mp to water; 8/27/96	
14. TOTAL DEPTH OF HOLE: 28.8	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
N/A			

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (Specify)	OTHER (Specify)	OTHER (Specify)	21. Total Core REC %
(14-16),(24-26),(26-28)			HFS	IR SCAN		

22. DISPOSITION OF HOLE	BACKFILLED	Monitoring Well	OTHER (Specify)	23. SIGNATURE OF INSPECTOR
		X		

ELEV. a	DEPTH b	Blow Counts c	DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
15.4	0	3 3 5 6	(0.0-0.7') dk brn-blk SILT w/ tr f sand (FILL) (0.7-1.4') blk-brn, med-crs SAND, w/ glass, brick, coal (FILL)	0.4 ppm			rec 0.4/2.0 moist
14.4	1						
13.4	2	7 6 4 6	(2.0-2.5') SAND w/ misc. debris, as above (FILL) (2.5-3.7') lt brn-orng SILT w/ tr-ltl f sand w/ metal, coal, glass, ash (FILL)	0.8 ppm			rec 1.7/2.0 moist
12.4	3						
11.4	4	12 7 7 7	(4.0-4.4') SILT as above (FILL) (4.4-5.6') Ash & burn debris, glass, coal (FILL)	Fill 2.2 ppm			rec 1.6/2.0 moist-dry
10.4	5						
9.4	6	8 6 2 1	(6.0-6.9') Ash & burn debris as above (FILL) (6.9-7.7') dk brn, f SAND and SILT, oxidized w/ Fe staining, brick, glass, coal (FILL)	9.4 ppm			rec 1.7/2.0 moist-wet
8.4	7						
7.4	8	WOH WOH 1 1	Silt, sand and ash, burn debris as above (FILL)	3.6 ppm			rec 1.1/2.0 wet
6.4	9						
5.4	10						

DRILLING LOG

HOLE NO.	DPS-MWS5
PROJECT	Defense Personnel Support Center, Philadelphia, Pennsylvania
INSPECTOR	John Hilton
SHEET 2	OF 3 SHEETS

ELEV. a	DEPTH b	Blow Counts c	DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
		1 2 2 2	(10.0-10.1') burn debris as above (FILL) (10.1-10.9') mod brn, f-med SAND w/ tr-ltl sub-rnd gravel (FILL)				rec 0.9/2.0 saturated
4.4	11			2.6 ppm			perched water in auger @ 9.3' bgs
3.4	12	WOH WOH WOH WOH	(12.0-13.4') blk-gry SILT w/ ltl-some clay (FILL)	Fill			rec 2.0/2.0 saturated
2.4	13		(13.4-14.0') SILT w/ ltl blk ash and wood debris (FILL)	7.4 ppm			not organic peat
1.4	14	1 1 2 4	(14.0-14.2') SILT w/ burn debris (FILL) (14.2-15.4') gry-brn SILT w/ blk carbonized rootlets, some clay (ML)			DPSSP-MWS-5 (14-16)	rec 1.4/2.0 saturated
0.4	15			17.6 ppm			
-0.6	16	1 2 1 3	(16.0-16.7') mod brn, f SAND w/ ltl f-crs, subrnd gravel to 0.75" dia. (SW) (16.7-16.9') blk-gry, med-crs SAND w/ tr f gravel to 0.25" dia. (SW)	Qal			rec 0.9/2.0 saturated
-1.6	17			7.0 ppm			
-2.6	18	4 5 4 5	(18.0-18.2') blk-gry SAND as above (SW) (18.2-18.7') crs GRAVEL to 2" dia. w/ tr-ltl silt, tr clay (GW)				rec 0.7/2.0 saturated
-3.6	19			5.8 ppm			faint petroleum/burn odor
-4.6	20	4 13 9 11	lt brn, f-crs, subrnd GRAVEL w/ ltl silt and f sand w/ color change to drk gry @ 20.6' (GW)	Qp			rec 0.7/2.0 saturated
-5.6	21			4.8 ppm			slight odor as above
-6.6	22	2 6 13 14	GRAVEL w/ silt and sand as above (GW)				rec 1.2/2.0 saturated
-7.6	23			5.6 ppm			
-8.6	24	1 3 3 3	(24.0-24.5') drk brn, f-med SAND, tr petroleum sheen (SW) gradational to (24.5-25.8') mod brn, f SAND, w/ some sorting (SW)	Ko		DPSSP-MWS-5 (24-26)	rec 1.8/2.0 saturated
-9.6	25			90 ppm			significant petroleum odor and sheen
-10.6	26	9 10 11 20	(26.0-26.5') dk gry, f-med SAND w/ some f-crs gravel w/ cobbles to 3" dia. (SW) sharp contact (26.5-27.4') med-drk gry, loose, f-med SAND (SW)			DPSSP-MWS-5 (26-28) Duplicate DPSSP-MWS-7	rec 1.4/2.0
-11.6	27			150 ppm			very strong petroleum odor
-12.6	28						

DRILLING LOG

HOLE NO.
DPS-MWS5

...l Support Center ...asyl...	INSPECTOR John Hilton	SHEET 3 OF 3 SHEETS

DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
End of Boring			(26-28)	

PROJECT Defense Personnel Support Center Philadelphia, Pennsylvania

HOLE NO. DPS-MWS5

HOLE NO. DPS-SBS1
SHEET 1 OF 2 SHEETS

...nia

...NATION OF DRILL

...9.9 East

11. DATE COMPLETED 8/26/96

...NCOUNTERED

...ime After Drilling Completed

...ASUREMENTS (SPECIFY)

...CORE BOXES

...cify)	OTHER (Specify)	21. Total Core REC %

...URE OF INSPECTOR

...ple No.	Analytical Sample No. g	REMARKS h
		rec 0.8/1.5
		manhole invert @ approx. 22' bgs water in sewer @ 16' bgs auger 0.5' through blacktop
		rec 0.0/2.0
		rec 0.4/2.0
		moist
		rec 1.8/2.0
		moist
		rec 1.9/2.0
		moist
		slight petroleum odor

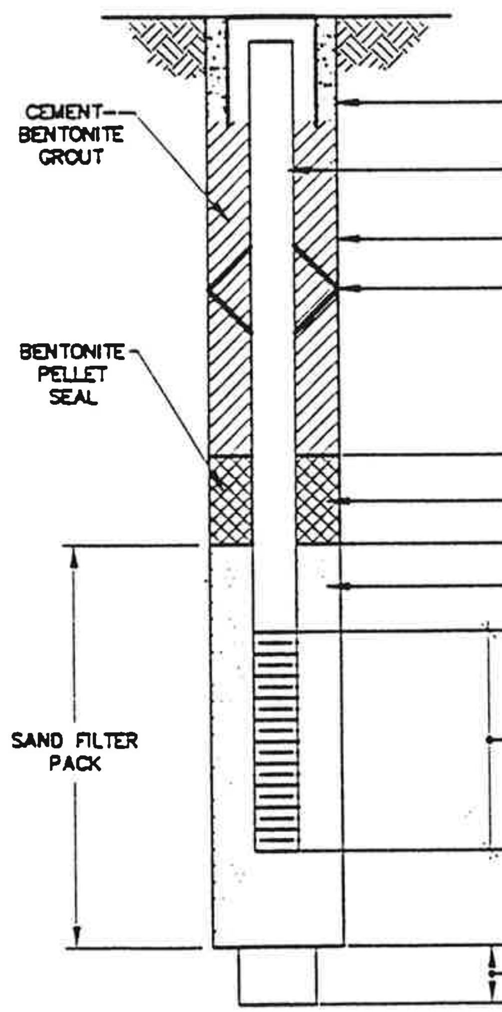
HOLE NO. DPS-SBS1

MALCOLM PIRNIE

OVERBURDEN MONITORING WELL SHEET

WELL NO. DPSSP-MWS-5

PROJECT: DPSC - NAPL INV.	START DATE: 8-23-96
END DATE: 8-23-96	
PROJECT NO.: 0285643	FIELD GEOLOGIST: J. HILTON
LOCATION: DPSC SOUTH, PENROSE AVE.	
DRILLING CO.: SJB SERVICES	
DRILLER(S): T. MILLER	
DRILLING METHOD(S): 4 1/4" HSA	
DEVELOPMENT METHOD(S): MANUAL PURGE W/ SURGE BLOCK	



DEPTH TO TOP OF GROUT/ BOTTOM OF CEMENT 1.5'

RISER DIAMETER AND MATERIAL 2" SCH 40 PVC

BOREHOLE DIAMETER 8"

DEPTH TO CENTRALIZERS N/A

DEPTH 10.0'

PELLET SIZE MEDIUM CHIPS

DEPTH 16.0'

SAND SIZE #0 MORIE

DEPTH 18.0'

SCREEN DIAMETER 2"
SLOT SIZE .010
MATERIAL SCH 40 PVC

DEPTH 28.0'

DEPTH 28.8'

BACKFILL MATERIAL NATIVE SAND & GRAVEL

BOTTOM OF BOREHOLE 28.8'

NOTE: DEPTHS ARE FEET BELOW GRADE

DRILLING LOG

HOLE NO.	DPS-SBS1
1. COMPANY NAME	Malcolm Pirnie, Inc.
2. DRILLING CONTRACTOR	SJB Services, Inc.
SHEET 1 OF 2 SHEETS	
3. PROJECT	Defense Personnel Support Center
4. LOCATION	Philadelphia, Pennsylvania
5. NAME OF DRILLER	T. Miller
6. MANUFACTURER'S DESIGNATION OF DRILL	CME-850
7. Sizes & Types of Drilling & Sampling Equipment	2 1/4" HSA; 2" continuous s.s.
8. HOLE LOCATION	221861.8 North 2718059.9 East
9. SURFACE ELEVATION	22.6'
10. DATE STARTED	8/26/96
11. DATE COMPLETED	8/26/96
12. OVERBURDEN THICKNESS	
15. DEPTH GROUNDWATER ENCOUNTERED	21 feet bgs
13. DEPTH DRILLED INTO ROCK	
16. Depth to Water and Elapsed Time After Drilling Completed	
14. TOTAL DEPTH OF HOLE	24.0
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	
18. GEOTECHNICAL SAMPLES	N/A
DISTURBED	
UNDISTURBED	
19. TOTAL NUMBER OF CORE BOXES	
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC: ; METALS: ; OTHER (Specify): ; OTHER (Specify): ; OTHER (Specify):
21. Total Core REC %	
22. DISPOSITION OF HOLE	BACKFILLED: GROUT; Monitoring Well: ; OTHER (Specify):
23. SIGNATURE OF INSPECTOR	

ELEV. a	DEPTH b	Blow Counts c	DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
22.6	0		(0.0-0.5') asphalt blacktop				rec 0.8/1.5
			(0.5-1.3') dk brn-blk, olive SILT w/ tr-ltl f sand, tr f gravel (FILL)				manhole invert @ approx. 22' bgs
21.6	1	3 4 4		5.4 ppm			water in sewer @ 16' bgs; auger 0.5' through blacktop
20.6	2		No Recovery				
19.6	3	3 3 7 3		Fill			rec 0.0/2.0
18.6	4		(4.0-4.4') dk brn SILT w/ tr sand, ltl f gravel (FILL)				rec 0.4/2.0
17.6	5	4 4 4 2		0.8 ppm			moist
16.6	6		lt gry, f SAND, tr silt, brown mottling (SP)				rec 1.8/2.0; moist
15.6	7	2 3 4 7		1.6 ppm; Qal			
14.6	8		(8.0-9.2') SAND as above (SP)				rec 1.9/2.0
13.6	9	3 5 9 10	gradational to	3.6 ppm			moist; slight petroleum odor
			(9.2-9.9') dk brn, f-med SAND w/ ltl subrnd. f gravel (SW)	Qp			
12.6	10						

DRILLING LOG

PROJECT	INSPECTOR	HOLE NO.
Defense Personnel Support Center Philadelphia, Pennsylvania	John Hilton	DPS-SBS1 SHEET 2 OF 2 SHEETS

ELEV. a	DEPTH b	Blow Counts c	DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
11.6	11	10 10 15 21	(10.0-10.3') lt-mod gry, med-crs SAND (SW) (10.3-11.8') mod-drk brn, loose, f-med SAND w/ tr-ltl f gravel (SW)	0.6 ppm			rec 1.8/2.0 dry petroleum odor
10.6	12						
9.6	13	13 12 11 14	(12.0-12.9') SAND w/ Fe staining, ltl f gravel as above (SW) (12.9-13.9') mod gry, loose, f-med SAND w/ tr-ltl f gravel (SW)	10.8 ppm			rec 1.9/2.0 dry
8.6	14						
7.6	15	13 12 10 17	gry-brn, loose, f-med SAND, tr-ltl f gravel, some sand partings to < 0.3' thick (SW)	5.6 ppm			rec 1.8/2.0
6.6	16						
5.6	17	11 15 12 12	mod gry-brn, loose, f-med SAND w/ ltl-some fine, subrnd gravel (SW)	1.8 ppm			rec 1.8/2.0 dry-moist
4.6	18			Qp			
3.6	19	5 7 6 9	mod-dk, brn-gry, loose, med-crs SAND w/ tr f gravel (SW)	2.6 ppm			rec 1.4/2.0 dry-moist petroleum odor
2.6	20						
1.6	21	9 17 15 11	(20.0-20.7') SAND w/ f gravel as above (SW) grading into (20.7-21.3') brn-gry, f-med SAND and f-crs GRAVEL (SW/GW)	7.8 ppm			
0.6	22		(21.3-21.5') drk brn-gry SILT w/ tr f sand (ML) (22.0-22.3') lt-mod brn SILT (ML) sharp contact	Ku			
-0.5	23	8 9 15 32	(22.3-23.3') dk brn, f SAND, tr f gravel, w/ blk petroleum staining 22.6-23.0' (SW)	Ko > 150 ppm			
-1.5	24		(23.3-23.8') mod brn, med-crs SAND and f-crs, subrnd GRAVEL (SW/GW) End of Boring				
-2.5	25						
-3.5	26						
-4.5	27						
-5.5	28						

DRILLING LOG

HOLE NO.	DPS-SBS2
1. COMPANY NAME	Malcolm Pirnie, Inc.
2. DRILLING CONTRACTOR	SJB Services, Inc.
SHEET 1 OF 2 SHEETS	
3. PROJECT	Defense Personnel Support Center
4. LOCATION	Philadelphia, Pennsylvania
5. NAME OF DRILLER	T. Miller
6. MANUFACTURER'S DESIGNATION OF DRILL	CME-850
7. Sizes & Types of Drilling & Sampling Equipment	2 1/4" HSA 2" continuous s.s.
8. HOLE LOCATION	221863.2 North 2718269.1 East
9. SURFACE ELEVATION	20.8'
10. DATE STARTED	8/27/96
11. DATE COMPLETED	8/27/96
12. OVERBURDEN THICKNESS	
15. DEPTH GROUNDWATER ENCOUNTERED	20 feet bgs
13. DEPTH DRILLED INTO ROCK	
16. Depth to Water and Elapsed Time After Drilling Completed	
14. TOTAL DEPTH OF HOLE	20.0
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	19.1 ft bgs to LNAPL in augers 8/27/96
18. GEOTECHNICAL SAMPLES	N/A
DISTURBED	
UNDISTURBED	
19. TOTAL NUMBER OF CORE BOXES	

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (Specify)	OTHER (Specify)	OTHER (Specify)	21. Total Core REC %
(16-18)			HFS	IR SCAN		

22. DISPOSITION OF HOLE	BACKFILLED	Monitoring Well	OTHER (Specify)	23. SIGNATURE OF INSPECTOR
	GROUT			

ELEV. a	DEPTH b	Blow Counts c	DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
20.8	0						rec 1.2/1.5
19.8	1	7 7 6	(0.5-0.8') brn-red SAND w/ ltl silt (FILL) (0.8-1.7') ylw-brn mttld SILT and f sand w/ red brick and f gravel (FILL)	Fill 0.2 ppm			augered 0.5' through asphalt pavement
18.8	2						
17.8	3	6 7 8 12	(2.0-3.1') brn-orng SILT and sand, thin bedding fabric (ML) (3.1-4.0') lt gry, f SAND, some silt (SM)	0.2 ppm			rec 2.0/2.0 moist
16.8	4		lt gry SAND w/ Fe stained motling, ltl-some silt (SM)				rec 1.3/2.0
15.8	5	8 5 5 6		2.6 ppm Qal			moist
14.8	6		SAND as above w/ silt, tr f gravel (SM)				rec 2.0/2.0
13.8	7	5 6 5 6		11 ppm			moist
12.8	8		(8.0-8.4') SAND as above (SM)				rec 1.0/2.0
11.8	9	4 6 17 35	(8.4-8.6') dk brn-blk discoloration (SW) (8.6-9.0') mod brn, f-med SAND, ltl f-crs gravel to 2" dia. (SW)	Qp 21 ppm			slight odor
10.8	10						

DRILLING LOG

PROJECT Defense Personnel Support Center, Philadelphia, Pennsylvania	INSPECTOR John Hilton	HOLE NO. DPS-SBS2 / SHEET 2 OF 2 SHEETS

ELEV. a	DEPTH b	Blow Counts c	DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
		10 21 30 31	(10.0-10.7') dk brn-orng, f-med SAND, heavy Fe staining, ltl-some f-crs gravel (SW)				rec 1.8/2.0 dry
9.8	11		(10.7-11.8') f-crs, subrnd GRAVEL to 2" dia., ltl f sand (GW)	20 ppm			
8.8	12	40 13 11 9	(12.0-13.0') mod brn, f-med SAND and GRAVEL grading to orng-brn @ 12.7' (SW/GW)				rec 1.9/2.0 dry
7.8	13		(13.0-13.3') red-orng, denseSILT w/ tr clay (ML)	14.8 ppm			dry
			(13.3-13.9') brn-red, f SAND w/ ltl silt (SM)				moist
6.8	14	11 20 24 15	mod brn, f-med SAND and f-crs GRAVEL >2" dia., faint bedding fabric as sorted micaceous sand partings <0.2' thick w/ variable gravel content (SW/GW)	QP 19.6 ppm			rec 1.7/2.0 dry-moist
5.8	15						
4.8	16	24 18 13 15	(16.0-17.0') SAND and GRAVEL as above (SW/GW) sharp contact			DPSSP-SBS-2 (16-18)	rec 2.0/2.0
3.8	17		(17.0-18.0') dk orng-brn, f-med SAND, Fe stained, tr f gravel (SW)	> 150 ppm			very strong petroleum odor
2.8	18	10 14 28 27	(18.0-18.4') dk brn, f SAND, some discoloration (SW)				rec 1.5/2.0
1.8	19		(18.4-19.5') dk brn, f SAND and f-crs GRAVEL to > 2" dia. (SW/GW)	> 150 ppm			saturated w/ LNAPL LNAPL level @ 19.1 ' bgs at boring termination
0.8	20		End of Boring				LNAPL minimum of 0.7' thick measured in bottom of augers
-0.2	21						
-1.2	22						
-2.2	23						
-3.2	24						
-4.2	25						
-5.2	26						
-6.2	27						
-7.2	28						

DRILLING LOG

HOLE NO.	DPS-SBS3
1. COMPANY NAME	Malcolm Pirnie, Inc.
2. DRILLING CONTRACTOR	SJB Services, Inc.
SHEET 1 OF 2 SHEETS	
3. PROJECT	Defense Personnel Support Center
4. LOCATION	Philadelphia, Pennsylvania
5. NAME OF DRILLER	T. Miller
6. MANUFACTURER'S DESIGNATION OF DRILL	CME-850
7. Sizes & Types of Drilling & Sampling Equipment	2 1/4" HSA 2" continuous s.s.
8. HOLE LOCATION	221549.1 North 2718254.6 East
9. SURFACE ELEVATION	21.2'
10. DATE STARTED	8/27/96
11. DATE COMPLETED	8/27/96
12. OVERBURDEN THICKNESS	
15. DEPTH GROUNDWATER ENCOUNTERED	
13. DEPTH DRILLED INTO ROCK	
16. Depth to Water and Elapsed Time After Drilling Completed	18.75 ft to LNAPL in augers- LNAPL - 1.1 ft thick
14. TOTAL DEPTH OF HOLE	22.0
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	
18. GEOTECHNICAL SAMPLES	N/A
DISTURBED	
UNDISTURBED	
19. TOTAL NUMBER OF CORE BOXES	
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC: ; METALS: ; OTHER (Specify): ; OTHER (Specify): ; OTHER (Specify):
21. Total Core REC %	
22. DISPOSITION OF HOLE	BACKFILLED: GROUT; Monitoring Well: ; OTHER (Specify):
23. SIGNATURE OF INSPECTOR	

ELEV. a	DEPTH b	Blow Counts c	DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
21.2	0		lt brn-gry SILT w/ tr f sand, lt brn Fe oxidation @ 0.0-0.4' bgs (ML)				rec 1.5/2.0 dry
20.2	1	3 6 5 6		0.2 ppm			
19.2	2		brn-orng mottld, micaceous, f SAND w/ some silt (SM)	Qal			rec 2.0/2.0 dry
18.2	3	8 12 12 13		0.4 ppm			
17.2	4		SAND w/ silt as above (SM)				rec 1.6/2.0 dry
16.2	5	8 6 7 7		1.8 ppm			
15.2	6		lt brn-orng, f SAND w/ some silt, sharp color change to lt gry-olive @ 6.0-6.2' (SM)				rec 2.0/2.0 moist
14.2	7	12 6 6 8		3.4 ppm			
13.2	8		(8.0-9.7') SAND w/ silt as above w/ tr f gravel (SM)				rec 1.8/2.0
12.2	9	4 3 5 6		3.8 ppm			
11.2	10		(9.7-9.8') dk brn, Fe stained, f SAND				

DRILLING LOG

PROJECT	INSPECTOR	HOLE NO. / SHEET
Defense Personnel Support Center Philadelphia, Pennsylvania	John Hilton	DPS-SBS3 SHEET 2 OF 2 SHEETS

ELEV. a	DEPTH b	Blow Counts c	DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
			w/ tr-ltl silt (SM)				rec 0.7/1.2
10.2	11	6 6 50	dk brn, f SAND and GRAVEL (SW/GW) cobbles and boulders as per drilling character	Qp 28 ppm			spoon refusal @ approx. 10.7' bgs
9.2	12		brn-gry, f-med SAND and f-crs GRAVEL to >3"dia., gradational color change to lt-mod gry @ 12.0-12.2' (SW/GW)				rec 0.8/2.0
8.2	13	12 18 20 25		10.2 ppm			dry
7.2	14	4 7 10 10	dk gry, f-med SAND w/ tr f gravel to 0.5" dia., blk discoloration @ 15.1-15.3' (SW)				rec 1.3/2.0 dry-moist
6.2	15			22 ppm			petroleum odor
5.2	16	5 6 9 12	brn-orng, micaceous, f-crs SAND w/ ltl silt (SM)	Ko			rec 1.7/2.0 moist
4.2	17			92 ppm			strong petroleum odor
3.2	18	13 18 18 17	dk brn-gry, f-med SAND and f-crs GRAVEL >2-3" dia. (SW/GW)				rec 1.6/2.0 saturated w/ LNAPL
2.2	19			>150 ppm			
1.2	20	15 17 13 21	SAND and GRAVEL as above w/ tr silt (SW/GW)				LNAPL measured in augers @ 18.75' to 19.85' bgs
0.2	21			>150 ppm			
-0.8	22		End of Boring				
-1.8	23						
-2.8	24						
-3.8	25						
-4.8	26						
-5.8	27						
-6.8	28						

DRILLING LOG

HOLE NO. DPS-SBS4	SHEET 1 OF 2 SHEETS	
1. COMPANY NAME: Malcolm Pirnie, Inc.	2. DRILLING CONTRACTOR: SJB Services, Inc.	
3. PROJECT: Defense Personnel Support Center	4. LOCATION: Philadelphia, Pennsylvania	
5. NAME OF DRILLER: T. Miller	6. MANUFACTURER'S DESIGNATION OF DRILL: CME-850	
7. Sizes & Types of Drilling & Sampling Equipment: 2 1/4" HSA; 2" standard ss to 15 ft bgs; 2" continuous ss to 21 ft bgs	8. HOLE LOCATION: 221485.6 North 2718428.9 East	
	9. SURFACE ELEVATION: 21.1'	
	10. DATE STARTED: 8/27/96	11. DATE COMPLETED: 8/27/96
12. OVERBURDEN THICKNESS	15. DEPTH GROUNDWATER ENCOUNTERED	
13. DEPTH DRILLED INTO ROCK	16. Depth to Water and Elapsed Time After Drilling Completed	
14. TOTAL DEPTH OF HOLE: 21.0	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
N/A			

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (Specify)	OTHER (Specify)	OTHER (Specify)	21. Total Core REC %

22. DISPOSITION OF HOLE	BACKFILLED	Monitoring Well	OTHER (Specify)	23. SIGNATURE OF INSPECTOR
	GROUT			

ELEV. a	DEPTH b	Blow Counts c	DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
21.1	0	1 3 6 15	(0.0-1.5) dk brn SILT w/ tr f sand, color gradation to lt brn @ 0.0-0.7' (FILL)				rec 1.5/2.0
20.1	1			0.2 ppm			moist
19.1	2		(1.5-1.9') lt-med brn, f SAND w/ tr f gravel (FILL)				
18.1	3						borehole located 30 feet south of DPSSP-SBS-5
17.1	4			Fill			
16.1	5	3 3 3 6	(5.0-6.2') mod gry-brn SAND and silt w/ lt orng mottling (FILL)				rec 1.7/2.0
15.1	6			1.4 ppm			moist slight petroleum odor
14.1	7		(6.2-6.7') dk gry, f-med SAND w/ tr gravel (FILL)				moved drilling rig 10 ft south of original SBS-4
13.1	8						
12.1	9						slag backfill and spoon refusal @ 9.5 ft bgs
11.1	10						

DRILLING LOG

HOLE NO. DPS-SBS4

PROJECT: Defense Personnel Support Center, Philadelphia, Pennsylvania
INSPECTOR: John Hilton
SHEET 2 OF 2 SHEETS

ELEV. a	DEPTH b	Blow Counts c	DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
		12 12 16 17	mod-dk gry-brn, f-crs SAND and f-crs, subrnd GRAVEL to 1" dia. (SW/GW)				rec 1.6/2.0
10.1	11			28 ppm			strong petroleum odor
9.1	12			QP			
8.1	13						
7.1	14						
6.1	15	7 7 14 14	(15.0-16.3') mod brn, f SAND, sorted as fine partings w/ color changes (SW)				rec 1.7/2.0
5.1	16		(16.3-16.7') orng-brn f-med SAND and f GRAVEL (SW/GW)	62 ppm			strong petroleum odor
4.1	17	4 6 10 10	(17.0-18.1') lt brn-gry, f-med SAND w/ tr f gravel w/in partings >0.2' thick (SW)	Ko			rec 1.7/2.0
3.1	18		(18.1-18.7') brn-gry f-med SAND and GRAVEL (SW/GW)	>150 ppm			petroleum odor
2.1	19	4 5 14 16	(19.0-20.0) gry, f-med SAND w/ tr f gravel (SW)				rec 1.8/2.0 saturated
1.1	20		(20.0-20.8) dk gry f-med SAND and f-crs GRAVEL (SW/GW)	>150 ppm			
0.1	21		End of Boring				
-0.9	22						
-1.9	23						
-2.9	24						
-3.9	25						
-4.9	26						
-5.9	27						
-6.9	28						

DRILLING LOG

Field	Entry
HOLE NO.	DPS-SBS5
1. COMPANY NAME	Malcolm Pirnie, Inc.
2. DRILLING CONTRACTOR	SJB Services, Inc.
SHEET	SHEET 1 OF 2 SHEETS
3. PROJECT	Defense Personnel Support Center
4. LOCATION	Philadelphia, Pennsylvania
5. NAME OF DRILLER	T. Miller
6. MANUFACTURER'S DESIGNATION OF DRILL	CME-850
7. Sizes & Types of Drilling & Sampling Equipment	2 1/4" HSA 2" continuous s.s.
8. HOLE LOCATION	221523.3 North 2718432.5 East
9. SURFACE ELEVATION	20.8'
10. DATE STARTED	8/26/96
11. DATE COMPLETED	8/26/96
12. OVERBURDEN THICKNESS	
15. DEPTH GROUNDWATER ENCOUNTERED	20 feet bgs
13. DEPTH DRILLED INTO ROCK	
16. Depth to Water and Elapsed Time After Drilling Completed	
14. TOTAL DEPTH OF HOLE	22.0
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	19.05 ft bgs to LNAPL in augers 8/26/96
18. GEOTECHNICAL SAMPLES	N/A
DISTURBED	
UNDISTURBED	
19. TOTAL NUMBER OF CORE BOXES	
20. SAMPLES FOR CHEMICAL ANALYSIS	(20-22)
VOC	
METALS	
OTHER (Specify)	HFS
OTHER (Specify)	IR SCAN
OTHER (Specify)	
21. Total Core REC %	
22. DISPOSITION OF HOLE	
BACKFILLED	GROUT
Monitoring Well	
OTHER (Specify)	
23. SIGNATURE OF INSPECTOR	

ELEV. a	DEPTH b	Blow Counts c	DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
20.8 19.8	0 1	3 4 7 9	(0.0-0.6') mod gry-brn SILT (FILL) sharp transition (0.6-1.8') lt brn SAND and SILT w/ tr gravel (FILL)	Fill 0.8 ppm			rec 1.8/2.0 dry
18.8 17.8	2 3	11 14 14 13	(2.0-2.6') SILT as above w/ red brick sharp contact (2.6-3.7') lt-mod brn SILT and f SAND (ML/SC)	2.0 ppm			rec 1.7/2.0 dry moist
16.8 15.8	4 5	10 4 7 7	mod brn f SAND grading to gry at 4.2' w/ some silt (SC)	30 ppm Qal			rec 1.8/2.0 moist
14.8 13.8	6 7	4 5 7 9	lt olive-gry f SAND and SILT, tr Fe staining as mottling (SC)	22 ppm			rec 1.9/2.0 moist
12.8 11.8 10.8	8 9 10	4 7 7 11	(8.0-8.2') SAND and SILT as above (SC) grading to (8.2-9.2') mod gry-brn SILT w/ tr f sand and clay (ML) (9.2-9.9') dk brn-gry, f SAND, ltl f, subrnd gravel to 0.5" dia. (SW)	~~20.3 ppm~~ Qp			rec 1.9/2.0 dry

DRILLING LOG

HOLE NO. DPS-SBS5

PROJECT: Defense Personnel Support Center, Philadelphia, Pennsylvania

INSPECTOR: John Hilton

SHEET 2 OF 2 SHEETS

ELEV. a	DEPTH b	Blow Counts c	DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
		5 9 11 17	(10.0-10.3') dk brn, loose, f-med SAND (SW) (10.3-11.2') mod gry-brn, med-crs SAND, tr f gravel (SW)				rec 1.5/2.0 dry-moist
9.8	11		(11.2-11.5') br f-med SAND and GRAVEL to 1" dia. (SW/GW)	6.8 ppm			
8.8	12	12 12 13 12	SAND and GRAVEL as above (SW/GW)				petroleum odor rec 1.3/2.0 dry-moist
7.8	13			1.5 ppm Qp			
6.8	14	9 9 9 9	mod-dk orng/brn, loose SAND grading to lt gry @ 14.6', some f-crs gravel to 1" dia. (SW)				rec 1.6/2.0 dry
5.8	15			5 ppm			
4.8	16	6 8 10 10	lt gry, loose, f-med SAND w/ tr-ltl f, subrnd gravel (SW)	Vo			rec 1.4/2.0 dry
3.8	17			> 150 ppm			
2.8	18	9 9 10 11	lt-mod gry-brn, f-med SAND, ltl-some f gravel (SW)				rec 1.7/2.0 saturated w/ LNAPL
1.8	19			> 150 ppm			
0.8	20	12 14 16 18	SAND w/ ltl-some gravel as above (SW)			DPSSP-SBS-5 (20-22)	rec 1.8/2.0 LNAPL level @ 19.05', water @ 20.7' bgs at borehole termination
-0.2	21			> 150 ppm			
-1.2	22		End of Boring				
-2.2	23						
-3.2	24						
-4.2	25						
-5.2	26						
-6.2	27						
-7.2	28						

DRILLING LOG

HOLE NO.	DPS-SBS6
1. COMPANY NAME	Malcolm Pirnie, Inc.
2. DRILLING CONTRACTOR	SJB Services, Inc.
SHEET 1 OF 2 SHEETS	
3. PROJECT	Defense Personnel Support Center
4. LOCATION	Philadelphia, Pennsylvania
5. NAME OF DRILLER	T. Miller
6. MANUFACTURER'S DESIGNATION OF DRILL	CME-850
7. Sizes & Types of Drilling & Sampling Equipment	2 1/4" HSA; 2" continuous s.s.
8. HOLE LOCATION	221540.7 North 2718877.2 East
9. SURFACE ELEVATION	19.0'
10. DATE STARTED	8/27/96
11. DATE COMPLETED	8/27/96
12. OVERBURDEN THICKNESS	
15. DEPTH GROUNDWATER ENCOUNTERED	16 feet bgs
13. DEPTH DRILLED INTO ROCK	
16. Depth to Water and Elapsed Time After Drilling Completed	
14. TOTAL DEPTH OF HOLE	20.0
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	
18. GEOTECHNICAL SAMPLES	N/A
DISTURBED	
UNDISTURBED	
19. TOTAL NUMBER OF CORE BOXES	

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (Specify)	OTHER (Specify)	OTHER (Specify)	21. Total Core REC %
(16-18)			HFS	IR SCAN		

22. DISPOSITION OF HOLE	BACKFILLED	Monitoring Well	OTHER (Specify)	23. SIGNATURE OF INSPECTOR
	GROUT			

ELEV. a	DEPTH b	Blow Counts c	DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
19.0	0	2, 3, 6, 11	(0.0-0.9') gry-brn SILT w/ tr f sand (ML)				rec 1.4/2.0 dry-moist
18.0	1		(0.9-1.4') SAND and SILT w/ tr-ltl f gravel (SM)	19.4 ppm			
17.0	2	8, 9, 8, 11	(2.0-2.7') gry-blk SILT w/ carbonaceous plant frags, tr clay (ML)				rec 2.0/2.0 dry-moist
16.0	3		(2.7-4.0) lt brn-orng, f SAND w/ some silt (SM)	14.6 ppm			
15.0	4	4, 4, 6, 8	lt brn-orng, micaceous f SAND grading to brn-blk @ 4.7' bgs, ltl silt and organic plant debris (SM)	Qal			rec 1.6/2.0 moist
14.0	5			26 ppm			
13.0	6	4, 5, 13, 13	(6.0-7.3') lt brn, micaceous f SAND and silt, faint bedding fabric (SM)				rec 1.8/2.0 moist-wet petroleum odor
12.0	7			54 ppm			
			(7.3-7.8') dk brn SAND and GRAVEL w/ blk discoloration @ 7.6-7.8' (SW/GW)				
11.0	8	17, 20, 26, 25	(8.0-8.5') brn-orng, f-crs SAND w ltl f gravel (SW)	Qp			rec 1.4/2.0 dry
10.0	9		(8.5-9.4') f-crs GRAVEL and brn, f-med SAND (GW/SW)	36 ppm			
9.0	10						

DRILLING LOG

PROJECT: Defense Personnel Support Center, Philadelphia, Pennsylvania	INSPECTOR: John Hilton	HOLE NO. DPS-SBS6 SHEET 2 OF 2 SHEETS

ELEV. a	DEPTH b	Blow Counts c	DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
8.0	11	13 18 17 16	GRAVEL and SAND as above w/ some sorted sand partings w/in gravel matrix (GW/SW)	34 ppm			rec 1.5/2.0 dry
7.0	12						
6.0	13	12 8 9 7	orng-brn, loose, f-crs SAND w/ tr, f gravel to 0.25" dia. (SW)	22 ppm QP			rec 1.6/2.0 dry
5.0	14						
4.0	15	6 3 5 5	SAND as above, grading to med brn, w/ tr f gravel (SW)	> 150 ppm			rec 1.3/2.0 dry strong petroleum odor
3.0	16					DPSSP-SBS-6 (16-18)	
2.0	17	7 6 6 7	(16.0-16.2') orng-brn, f-crs SAND w/ tr-ltl gravel (SW) (16.2-17.4') gry-brn, f-med SAND, black staining (SW)	> 150 ppm Ko			rec 1.4/2.0 saturated w/ LNAPL
1.0	18						
0.0	19	4 6 15 13	(18.0-19.1') SAND w/ blk staining as above (SW) (19.1-19.7') dk gry-blk, f SAND and f-crs GRAVEL (SW/GW)	> 150 ppm			rec 1.7/2.0 saturated
-1.0	20		End of Boring				
-2.0	21						
-3.0	22						
-4.0	23						
-5.0	24						
-6.0	25						
-7.0	26						
-8.0	27						
-9.0	28						

DRILLING LOG

HOLE NO. DPS-SBS7		
1. COMPANY NAME Malcolm Pirnie, Inc.	**2. DRILLING CONTRACTOR** SJB Services, Inc.	**SHEET 1 OF 2 SHEETS**
3. PROJECT Defense Personnel Support Center	**4. LOCATION** Philadelphia, Pennsylvania	
5. NAME OF DRILLER T. Miller	**6. MANUFACTURER'S DESIGNATION OF DRILL** CME-850	
7. Sizes & Types of Drilling & Sampling Equipment 2 1/4" HSA; 2" continuous s.s.	**8. HOLE LOCATION** 221542.6 North 2719054.8 East	
	9. SURFACE ELEVATION 18.9'	
	10. DATE STARTED 8/26/96	**11. DATE COMPLETED** 8/26/96
12. OVERBURDEN THICKNESS	**15. DEPTH GROUNDWATER ENCOUNTERED**	
13. DEPTH DRILLED INTO ROCK	**16. Depth to Water and Elapsed Time After Drilling Completed**	
14. TOTAL DEPTH OF HOLE 20.0	**17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)**	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
N/A			

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (Specify)	OTHER (Specify)	OTHER (Specify)	21. Total Core REC %

22. DISPOSITION OF HOLE	BACKFILLED	Monitoring Well	OTHER (Specify)	23. SIGNATURE OF INSPECTOR
	GROUT			

ELEV. a	DEPTH b	Blow Counts c	DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
18.9	0	1 2 2 4	dk brn SILT grading to lt orng-brn, tr-ltl f sand (FILL)	Fill 14.6 ppm			rec 1.5/2.0 moist
17.9	1						
16.9	2	3 3 3 4	(2.0-2.6') orng-brn SILT, tr-ltl f SAND (ML) (2.6-3.0') mod brn, f SAND, tr-ltl f gravel to 0.25" dia, tr silt (SW) (3.0-3.6') brn-gry SILT w/ tr-ltl f sand (ML)	0.2 ppm			rec 1.6/2.0 moist slight petroleum odor
15.9	3						
14.9	4	2 2 2 5	brn-blk SILT w/ ltl f sand increasing w/in silt matrix with depth, native shell material, carbonized plant frags (ML)	42 ppm			rec 1.6/2.0 moist
13.9	5						
12.9	6	2 4 4 5	(6.0-6.8') SILT as above w/ plant frags (ML) (6.8-8.0') dk gry-blk, micaceous, f SAND w/ ltl silt (SC)	Qa! 20 ppm			rec 2.0/2.0 moist
11.9	7						
10.9	8	3 4 6 7	dk gry-brn f SILT and SAND (ML/SC)	58 ppm			rec 2.0/2.0
9.9	9						
8.9	10						

DRILLING LOG

HOLE NO.	DPS-SBS7
PROJECT	Defense Personnel Support Center Philadelphia, Pennsylvania
INSPECTOR	John Hilton
SHEET 2	OF 2 SHEETS

ELEV. a	DEPTH b	Blow Counts c	DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
7.9	11	6 9 12 12	(10.0-10.3') SILT and SAND as above (ML/SC) (10.3-10.7') dk gry-blk, loose, f-med SAND (SW) (10.7-11.7') gry-brn, f-med SAND and f GRAVEL to 1" dia. (SW/GW)	104 ppm			rec 1.7/2.0 dry cobbles > 2" dia.
6.9	12						
5.9	13	20 12 9 9	(12.0-12.5') SAND and GRAVEL as above (SW/GW) (12.5-12.9') blk-gry discolored (stained) SAND (SW) (12.9-13.5') dk gry-blk, f-med SAND and f-crs GRAVEL to 1" dia. (SW/GW)	Qp >100 ppm			rec 1.5/2.0 moist
4.9	14						
3.9	15	8 8 8 8	(14.0-14.3') SAND and GRAVEL as above (SW/GW) (14.3-15.0') lt gry-brn, f-med SAND w/ tr gravel (SW) (15.0-15.6') med SAND w/ some f GRAVEL to 0.5" dia. (SW)	134 ppm			rec 1.6/2.0 dry-moist petroleum odor
2.9	16						
1.9	17	4 6 7 7	brn, f-med SAND w/ blk staining @ 16.9-17.1' bgs, tr-ltl f gravel to 0.25" dia. (SW)	Ko >150 ppm			rec 1.4/2.0 saturated strong petroleum odor
0.9	18						
-0.1	19	5 5 7 9	brn-gry, f-crs SAND w/ some partings as sorted lenses of crs sand (SW)	>150 ppm			rec 1.7/2.0 petroleum sheen on all surfaces
-1.1	20		End of Boring				
-2.1	21						
-3.1	22						
-4.1	23						
-5.1	24						
-6.1	25						
-7.1	26						
-8.1	27						
-9.1	28						

DRILLING LOG

HOLE NO. DPS-SBS8	SHEET 1 OF 2 SHEETS	
1. COMPANY NAME: Malcolm Pirnie, Inc.	2. DRILLING CONTRACTOR: SJB Services, Inc.	
3. PROJECT: Defense Personnel Support Center	4. LOCATION: Philadelphia, Pennsylvania	
5. NAME OF DRILLER: T. Miller	6. MANUFACTURER'S DESIGNATION OF DRILL: CME-850	
7. Sizes & Types of Drilling & Sampling Equipment: 2 1/4" HSA; 2" continuous s.s.	8. HOLE LOCATION: 221516.1 North 2719427.0 East	
	9. SURFACE ELEVATION: 12.8'	
	10. DATE STARTED: 8/27/96	11. DATE COMPLETED: 8/27/96
12. OVERBURDEN THICKNESS:	15. DEPTH GROUNDWATER ENCOUNTERED: 8 feet bgs	
13. DEPTH DRILLED INTO ROCK:	16. Depth to Water and Elapsed Time After Drilling Completed:	
14. TOTAL DEPTH OF HOLE: 16.0	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
N/A			

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (Specify)	OTHER (Specify)	OTHER (Specify)	21. Total Core REC %
(10-12)			HFS	IR SCAN		

22. DISPOSITION OF HOLE	BACKFILLED	Monitoring Well	OTHER (Specify)	23. SIGNATURE OF INSPECTOR
	GROUT			

ELEV. a	DEPTH b	Blow Counts c	DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
12.8	0	9 5 5 10	blk SILT, f sand, tr f gravel, ash (FILL)	84 ppm			rec 1.8/2.0 dry-moist
11.8	1						
10.8	2	11 6 4 3	(2.0-2.6') As above (FILL) (2.6-2.8') brn, f-med SAND, ltl f gravel (FILL) (2.8-3.0') blk-gry SILT and SAND w/ plant frags (FILL) (3.0-3.5') brn f-med SAND and f GRAVEL (FILL)	60 ppm Fill			rec 1.5/2.0 moist
9.8	3						
8.8	4	6 5 6 4	SAND and GRAVEL as above (FILL)	48 ppm			rec 0.5/2.0 moist
7.8	5						
6.8	6	10 13 16 7	(6.0-6.4') SAND w/ crs angular gravel, brick frags (FILL) (6.4-6.7') dk gry-blk, f SAND and silt w/ carbonized plant frags (SM)	12 ppm Qal			rec 0.7/2.0
5.8	7						
4.8	8	5 11 28 18	(8.0-8.3') gry-blk SILT w/ tr f sand (ML) (8.3-8.7') f-crs GRAVEL and dk gry-brn, f SAND (GW/SW)	Qp 110 ppm			rec 0.7/2.0 wet strong petroleum odor
3.8	9						
2.8	10						

DRILLING LOG

PROJECT: Defense Personnel Support Center, Philadelphia, Pennsylvania	INSPECTOR: John Hilton	HOLE NO. DPS-SBS8
		SHEET 2 OF 2 SHEETS

ELEV. a	DEPTH b	Blow Counts c	DESCRIPTION OF MATERIALS d	Field Screening Results e	Geotech Sample or Core Box No. f	Analytical Sample No. g	REMARKS h
		6	(10.0-10.3') mod brn, f SAND (SP)				rec 1.5/2.0
1.8	11	14 12 14	(10.3-11.5') brn f-med SAND and f-crs GRAVEL (SW/GW)	>150 ppm		DPSSP-SBS-8 (10-12)	wet very strong petroleum odor
0.8	12	8	dk brn, f-med SAND and f-crs, subrnd GRAVEL to 1" dia., staining @ 13.1-13.2' interval (SW/GW)	QP			rec 1.6/2.0
-0.2	13	14 12 14		>150 ppm			very strong petroleum odor
-1.2	14	12	(14.0-14.3') SAND and GRAVEL as above, black staining (SW/GW)				rec 1.4/2.0
-2.2	15	14 14 14	(14.3-15.4') mod brn, f-crs SAND w/ some sorting as crs partings >0.1' thick, preferential staining @ 15.0-15.1, 15.2-15.4' intervals (SW)	>150 ppm			
-3.2	16		End of Boring				
-4.2	17						
-5.2	18						
-6.2	19						
-7.2	20						
-8.2	21						
-9.2	22						
-10.2	23						
-11.2	24						
-12.2	25						
-13.2	26						
-14.2	27						
-15.2	28						

Soil Boring Logs
Sun DPSC, Philadelphia, PA

Boring Number	Street Location	Date
SB-1	Taylor Terrace and Pollock Terrace	5-Sep-96

Blow Ct	Depth		PID (ppm)	Stratigraphic Description
GP	2	Fill		Sand and silt, fine, brown; trace coal and fine gravel, trace roots, dry, no odor
GP	4	SM		Sand and silt, very fine, brown; laminated with orange-brown silt, trace roots, hard, dry, no odor
GP	6			
GP	8	ML		Sandy silt, gray to orange-brown; laminated, trace mica, trace roots, medium stiff, low plasticity, moist, no odor
GP	10			
3, 17 50, 38	12		42	Sand, coarse to gravelly, stained black; some silt
19, 50/5	14		16.5	Sand and gravel, coarse, red-brown to yellowish-brown; poorly sorted, dry, slight PHC odor
15, 22 25, 27	16		12	
12,15 28, 40	18	GW	38	
25, 41 50/4	20		42	As above, angular gravel weathering green (schist) and red (siltstone)
10, 17 50/3	22		21	
50/0	24		—	
35, 50/4	26		195	24.0 - 24.8 Clayey gravel Sand and gravel, medium to coarse, stained black; very strong PHC odor
50/5	28		405	
33, 25 50/4	30	SW	272	Sand, medium to coarse, stained black; trace rounded fine gravel, wet, strong PHC odor
24, 30 35,37	32	SP	310	Sand, medium to coarse, stained black; well sorted, strong PHC odor, wet
33, 35 36, 37	34		322	
	36		320	Sand, fine to medium; well sorted, wet, strong PHC odor
	38			End of Boring = 36 ft
	40			
	42			

SAMPLE INFORMATION		
Depth	TPH-GR	TPH-DRO

Shelby Tube Collection	
Depth	Recovery

1. Boring completed using hollow-stem auger methods.
2. Soil samples collected using 2"-diameter splitspoons and 2-7/8"-diameter Shelby Tubes
3. Boring log completed by Matthias Ohr
4. Boring elevation: 23.97 feet msl
5. Depth to FPH 24.80 feet bgs
   Depth to Water 24.85 feet bgs
   App. FPH (static) 0.05 feet
6. Actual FPH thickness by baildown test: 0.01 ft

Soil Boring Logs
Sun DPSC, Philadelphia, PA

Boring Number	Street Location	Date
SB-2	Taylor Terrace and Curtin	25-Sep-96

Blow Ct	Depth		PID (ppm)	Stratigraphic Description
				Grass and Topsoil
	2	Fill		Fine sand and silt, trace coal, light orange-brown
	4	SM		Silt and very fine sand, light orange-brown, laminated, dry, no odor
9, 12 15,11	6		1.1	Silt and very fine sand, trace clay, light yellowish brown; micaceous, laminated with few oxidized seams, low plasticity, dry, no odor
	8			
	10	ML		Silt, some clay, light brown to light gray, moist, no odor
4, 3 12, 50/5	12	CH	1.9	Clay, little silt, light brown to gray; medium to high plasticity, moist, no odor
	14	GP		Gravel; angular rock fragments, dry
14, 25 50/2	16	SW	4.9	Sand, fine to medium, brownish-yellow; trace gravel, occasional layers of gravelly medium sand, dry, faint odor
22, 55 50/4	18		3.9	
40, 48 48, 66	20	GW	—	Gravel and sand, fine to coarse; multicolored angular rock fragments in yellowish-brown sand, very poorly sorted, dry, no odor
	22			Sand, medium to coarse, reddish-brown; trace fine rounded gravel, wet,
14, 22 19, 28	24	SW	161	strong odor; dark gray stained at 23 ft
36, 48 42, 38	26		216	Sand, coarse, dark gray stained; some fine gravel, little fine and medium sand, granular texture, wet, strong odor
	28			
50, 50/2	30	GW	316	Gravel , fine, dark brown to dark gray stained; some fine to coarse sand, wet, strong odor
48, 24 40, 44	32		—	As above, more poorly sorted, multi-colored and stained, wet, strong odor
				End of Boring = 32 ft
	34			
	36			
	38			
	40			
	42			

SAMPLE INFORMATION		
Depth	TPH-GR	TPH-DRO

Shelby Tube Collection	
Depth	Recovery

1. Boring completed using hollow-stem auger methods.
2. Soil samples collected using 2"-diameter splitspoons and 2-7/8"-diameter Shelby Tubes
3. Boring logged by Matthias Ohr of Dames & Moore
4. Boring elevation: 23.60 feet msl
5. Depth to FPH 21.55 feet bgs
   Depth to Water 21.59 feet bgs
   App. FPH (static 0.04 feet
6. Actual FPH thickness by baildown test: 0.04 ft

Soil Boring Logs
Sun DPSC, Philadelphia, PA

Boring Number	Street Location	Date
SB-4	Bigler Terrace and 24th Street	5-Sep-96

Blow Ct	Depth (ft)	Soil Type
GP	2	SM
GP	4	
GP	6	ML
GP	8	
GP	10	
GP	12	SW
48, 50/4	14	GW
34, 27 / 24, 28	16	
16, 14 / 24, 21	18	
20, 25 / 50/4	20	SP
48, 50/1	22	SW
15, 15 / 22, 30	24	
12, 13 / 37, 50/5	26	GW
14, 50/5	28	
16, 12 / 10, 12	30	ML
8, 7 / 10, 12	32	SM
	34	
	36	
	38	
	40	
	42	

PID (ppm)

Stratigraphic Description

Silty sand, fine, light brown to orange-brown; laminated, dry, no odor

Silt, light brown to orange-brown; mottled and stratified, some sand, fine, little root matter, trace clay, moist, no odor

Silt, gray with pockets of purple-gray; some clay, soft, medium plasticity, moist, no odor

Sand, medium to coarse, brown; poorly sorted, little gravel, fine, moist, PHC odor

Sand, medium to coarse, and gravel, fine to medium, brown; poorly sorted, rounded, dry, no odor

Sand, medium to coarse, and gravel, fine, reddish to orange-brown; subangular, dry, PHC odor

Sand, fine to medium, purple-brown; trace silt, moist, strong PHC odor

Sand, fine to coarse, reddish-brown; little gravel, low strength, subrounded, moist, strong PHC odor, grading to a clayey, gravelly, sand

Sand, medium to coarse, and gravel, fine to medium, reddish-brown; loose, wet, strong PHC odor
Increasing angular gravel

Clayey silt and sand, fine, reddish-brown; soft, micaceous, low plasticity, stratified silt, grey-brown, moist, strong PHC odor.

Silty sand, fine, brown to reddish-brown; trace sand, medium, loose, wet, strong PHC odor

End of Boring = 32 ft

SAMPLE INFORMATION		
Depth	TPH-GR	TPH-DRO

Shelby Tube Collection	
Depth	Recovery

1. Boring completed using hollow-stem auger methods.
2. Soil samples collected using 2"-diameter splitspoons and 2-7/8"-diameter Shelby Tubes
3. Boring logged by Matthias Ohr of Dames & Moore
4. Boring elevation: 21.72 feet msl
5. Depth to FPH 19.45 feet bgs
   Depth to Water 21.55 feet bgs
   App. FPH (static) 2.10 feet
6. Actual FPH thickness by baildown test: 1.55 ft

Soil Boring Logs
Sun DPSC, Philadelphia, PA

Boring Number	Street Location	Date
SB-5	Packer Terrace and 24th Street	11-Sep-96

Blow Ct	Depth		PID (ppm)	Stratigraphic Description
3, 4		Fill	0	Silt, brown; some sand, fine, root matter, coal, moist, no odor
10, 14	2			
14, 17		SM	0	Silt and sand, fine, orange-brown; laminated, moist, no odor
15, 14	4			
7, 11			0.5	
10, 11	6			Silt and sand, fine to medium, reddish-brown; laminated, micaceous, low plasticity,
6,6		ML	0.5	wet, no odor
9,9	8			
6,8			3.0	
20, 25	10			Sand, coarse, and gravel fine to coarse, black stained; dry, hard, PHC odor
50/4			—	Sand, medium to coarse, and gravel, fine to coarse, reddish-brown, dry, PHC odor
	12	GW		
21, 31			7.0	Sand, fine to medium, stained green; moist, PHC odor
22, 32	14			
7, 10			22	
18, 30	16			
17, 18			20	
18, 18	18	GC		Silty clay and gravel, coarse, gray-red; little sand, fine, medium plasticity
16, 27			277	
50, 50	20	GM		Sand, fine to coarse, silt and gravel, fine to medium, reddish-brown; moist to
50/5			225	slighty wet, strong PHC odor
	22			
50/5			—	
	24			
42, 50/4			230	Sand, fine to medium, and gravel, fine to coarse, weathering green (schist), wet,
	26	SW		PHC odor
30, 50/5			285	
	28			
24, 35			238	Sand, fine to medium, gravel, fine, brown stained; little silt, wet, strong PHC odor
46, 50/4	30			Black stained layer, strong PHC odor
36, 50/3			245	
	32			Sand and gravel, fine to coarse, brown; wet, strong PHC odor
8, 22			245	Sand, fine to medium, stained brown; little gravel, fine, little silt, wet, strong
27, 22	34	SP		PHC odor
	36			End of Boring = 34 ft
	38			
	40			
	42			

SAMPLE INFORMATION			
Depth	TPH-GR	TPH-DRO	

Shelby Tube Collection	
Depth	Recovery

1. Boring completed using hollow-stem auger methods.
2. Soil samples collected using 2"-diameter splitspoons and 2-7/8"-diameter Shelby Tubes
3. Boring logged by Ed Belland of Dames & Moore
4. Boring elevation: 21.48 feet msl
5. Depth to FPH 20.77 feet bgs
   Depth to Water 20.80 feet bgs
   App. FPH (static) 0.03 feet
6. Actual FPH thickness by baildown test: 0.01 ft

Soil Boring Logs
Sun DPSC, Philadelphia, PA

Boring Number	Street Location	Date
SB-7	Bigler Terrace and 24th Street	9-Sep-96

Blow Ct	Depth		PID (ppm)	Stratigraphic Description
2, 4			—	Sand, fine, and silt, light orange-brown; some root matter, dry, no odor
6, 8	2	SM		Decreasing grain size
8, 10			2.1	
8, 10	4			Silt, light brown to orange-brown; laminated, trace clay and sand, very fine,
4, 5		ML	1.6	roots and wood, low plasticity, moist, no odor
6, 7	6			Silt and sand, fine, dark brown to black partings with creosote odor
4, 5			7.0	
7, 8	8			Clayey silt and sand, fine, light brown to gray brown; laminated, occasional soft
5, 8		ML/CL	2.5	black matter
18, 22	10			Sand, fine, dark gray to black stained; dry to moist, slight PHC odor
10, 15			5.2	
22, 20	12	SW		Sand, medium to coarse, brown; little gravel, fine, subrounded, occasional
35, 50/5			10	sand, fine to medium, green, pockets, loose, dry, slight PHC odor
	14			Increasing gravel content, gray-brown
20, 28			15	
14, 18	16	SP		Sand, fine, gray-brown; little silt, moist, slight PHC odor
32, 50/3			14	Gravel, fine to medium, and sand, fine to coarse, brown to orange-brown; poorly
	18	GW		sorted, some silt and clay, pockets, gray, dry, slight PHC odor
10, 18			253	Clay, reddish-brown; some silt, occasional sand, fine, seams, mottled, yellowish-
25, 50/5	20	CL		brown, medium stiff, low plasticity, dry-moist, slight PHC odor
5, 7			315	
50/5	22			
11, 18		GW	395	Gravel, fine to medium, and sand, medium to coarse, brown to reddish-brown;
20, 16	24			poorly sorted, subangular, little fine material, wet, PHC odor
15, 22			224	
17, 20	26			Strong PHC odor
18, 21			330	
18, 21	28			Sand, medium to coarse, and gravel, fine, brown to darkgray; poorly sorted, angular
23, 50/4		SW	475	wet, strong PHC odor
	30			
15, 11			410	Sand, medium to coarse, brown; sorted, trace gravel and sand, fine, wet, PHC odor
11, 16	32			
	34			End of Boring = 32 ft
	36			
	38			
	40			
	42			

SAMPLE INFORMATION		
Depth	TPH-GR	TPH-DRO

Shelby Tube Collection	
Depth	Recovery
18 - 20	
25 - 27	refusal
27 - 29	refusal

1. Boring completed using hollow-stem auger methods.
2. Soil samples collected using 2"-diameter splitspoons and 2-7/8"-diameter Shelby Tubes (coll. at well install)
3. Boring logged by Matthias Ohr of Dames & Moore
4. Boring elevation: 21.73 feet msl
5. Depth to FPH 19.82 feet bgs
   Depth to Water 21.85 feet bgs
   App. FPH (static) 2.03 feet
6. Actual FPH thickness by baildown test: 1.85 ft

Soil Boring Logs
Sun DPSC, Philadelphia, PA

Boring Number	Street Location	Date
SB-8	Packer Terrace and 23rd Street	11-Sep-96

Blow Ct	Depth	USCS	PID (ppm)	Stratigraphic Description
3, 5		Fill	0.1	Silt, reddish-brown; some sand, fine, little gravel, fine to coarse, micaceous, roots, moist, no odor
9, 9	2			
12, 10		ML	1.2	
9, 7	4			Sand, fine to medium, and silt, brown; some sand, coarse, moist, no odor
3, 4			41	
5, 4	6			Silt and sand, fine, light gray to gray; laminated, micaceous, moist, PHC odor
3, 3			18	wet at 7 feet below ground surface
3, 4	8			
2, 2		CL	24	Clayey silt, darkgray to black stained; some sand, fine, wet PHC odor
3, 3	10	SM		Silt and sand, fine, gray to black stained; laminated, wet, PHC odor
5, 5		GM	9.3	
5, 5	12			Sand, fine to medium, and gravel, coarse, brown to black stained; little silt, dry,
17, 9			4.1	slight PHC odor
5, 5	14			
10, 10		SW	32	Sand, fine to medium, gray; trace gravel, fine, and silt, micaceous, dry, no odor
5, 5	16			
4, 4			215	
4, 3	18			Sand, fine to coarse, and gravel, fine to coarse, gray; wet, strong PHC odor
3, 3		GW	188	
5, 6	20			
3, 10			274	Gravel, fine to coarse, and sand, medium to coarse, brown to greenish-red; poorly sorted, subrounded, loose, wet, strong PHC odor
16, 9	22			
11, 11			273	
12, 16	24			
6, 7		SP	216	Silty sand, fine, reddish-brown and green; mottled, micaceous, soft, wet, PHC odor
8, 17	26			
3, 11			294	Sand, fine, greenish-brown; trace silt and sand, medium, medium soft, moist to wet, PHC odor
13, 18	28			
	30			End of Boring = 28 ft
	32			
	34			
	36			
	38			
	40			
	42			

SAMPLE INFORMATION		
Depth	TPH-GR	TPH-DRO

Shelby Tube Collection	
Depth	Recovery

1. Boring completed using hollow-stem auger methods.
2. Soil samples collected using 2"-diameter splitspoons and 2-7/8"-diameter Shelby Tubes
3. Boring logged by Ed Belland of Dames & Moore
4. Boring elevation: 18.97 feet msl
5. Depth to FPH 17.45 feet bgs
   Depth to Water 17.46 feet bgs
   App. FPH (static) 0.01 feet
6. Actual FPH thickness by baildown test: 0.01 ft

Soil Boring Logs
Sun DPSC, Philadelphia, PA

Boring Number	Street Location	Date
SB-9	Curtin Terrace and 23rd Street	17-Sep-96

Blow Ct	Depth	USCS	PID (ppm)	Stratigraphic Description
2, 3		ML	2.6	Sand, very fine, and silt, brown to orange-brown; trace clay, medium soft, nonplastic, dry, no odor
5, 9	2			
4, 3			2.0	
4, 4	4			
4, 4		ML/CL	2.8	Clayey silt, orange-brown; organic matter (dark brown), roots, soft, moist, no odor
8, 9	6			
12, 8			4.8	
8, 5	8	ML		Sand, very fine, and silt, brown; micaceous, dry slight organic and PHC odor
7, 8			1.8	
19, 14	10			Sand, fine, brown; loose, little silt, dry, PHC odor
8, 11		GM	3.4	Silt, reddish-brown to green; little clay, some gravel, fine, subrounded, stiff, dry, slight PHC odor
11, 14	12			
19, 15		SP	4.5	Sand, fine to coarse, brown; well sorted, grading to sand, medium, brown to dark gray, trace gravel, dry, slight PHC odor
17, 29	14			
16		GW	1.9	
17, 18	16			
16, 22			51	Gravel and sand, fine to coarse, multicolored; poorly sorted, loose, wet, slight PHC odor
13, 12	18			
10, 12			312	
25, 21	20			Strong PHC odor, decreasing gravel content
11, 17			245	
10, 11	22			
10, 10		SP	256	Sand, medium, brown to dark gray; well sorted, laminated, little sand, fine to coarse, loose, wet, strong PHC odor
12, 14	24			
ST			297	
	26			
6, 8		SM	82	Silty sand, fine, dark brown; well sorted, moist to wet, PHC odor
10, 14	28			
	30			End of Boring = 28 ft
	32			
	34			
	36			
	38			
	40			
	42			

SAMPLE INFORMATION		
Depth	TPH-GR	TPH-DRO

Shelby Tube Collection	
Depth	Recovery
14 - 16	refusal
24 - 26	

1. Boring completed using hollow-stem auger methods.
2. Soil samples collected using 2"-diameter splitspoons and 2-7/8"-diameter Shelby Tubes
3. Boring logged by Matthias Ohr of Dames & Moore
4. Boring elevation: 17.96 feet msl
5. Depth to FPH 16.00 feet bgs
   Depth to Water 16.03 feet bgs
   App. FPH (static) 0.03 feet
6. Actual FPH thickness by baildown test: 0.02 ft

Soil Boring Logs
Sun DPSC, Philadelphia, PA

Boring Number	Street Location	Date
SB-11	Bigler Terrace and 22nd Street	10-Sep-96

Blow Ct	Depth		PID (ppm)	Stratigraphic Description
2, 4			0.3	Silt, and sand, very fine, light orange-brown to orange-brown; laminated,
6, 5	2	ML		trace clay, very soft, roots and wood, moist, no odor
2, 4			0.4	
4, 5	4			
3, 4			66	Sand, very fine, and silt, light brown; no odor
6, 6	6			Sandy silt, grayish-brown; roots, slight, moist, PHC odor
9, 8			85	
10, 9	8			Sand, fine to coarse, grayish-brown; trace gravel, fine, angular to subangular,
10, 50/5		SW	—	loose, dry, slight PHC odor
	10			
50/4		GW	25	Sand, fine to coarse, and gravel, fine to medium, brownish-white; poorly sorted,
17, 21	12			angular to subrounded, trace green silt, loose, dry, slight PHC odor
13, 19			33	
19, 16	14	SP		Sand, medium, brown; trace sand, coarse, loose, dry, slight PHC odor
12, 15			172	Sand, fine to medium, brown; little sand, coarse, and gravel, fine, subrounded,
18, 12	16	SW		micaceous, loose, moist, PHC odor
10, 11			125	Dark gray to black staining
14, 11	18			
8, 4		SP	226	Sand, fine, brown; trace silt, micaceous, moist, strong PHC odor
5, 9	20			Increasing sand content, medium to coarse, and gravel, fine, content
11, 15			210	
19, 18	22	GW		Sand, coarse, and gravel, brown; wet, strong PHC odor
9, 11			145	
15, 12	24			Sand, fine to medium, greenish-brown; little silt, loose, wet, strong PHC odor
10, 12			185	
17, 22	26	SP		Sand, coarse, and gravel, fine, light brownish-yellow; well sorted, wet, strong
16, 18			195	PHC odor
27, 24	28			
10, 28			305	Sand, coarse, yellowish-brown; some sand, medium, trace gravel, fine, wet,
25, 29	30			strong PHC odor
20, 13			360	
16, 20	32			Sand, medium to coarse, yellowish-brown; well sorted, trace gravel, loose,
6, 12			46	wet, strong PHC odor
15, 16	34	ML		Silt, greenish-gray to orange-brown; laminated, some sand, fine, soft,
				slight plasticity, moist, slight PHC odor
	36			
	38			End of Boring = 34 ft
	40			
	42			

SAMPLE INFORMATION		
Depth	TPH-GR	TPH-DRO

Shelby Tube Collection	
Depth	Recovery
13.5 - 15.5	

1. Boring completed using hollow-stem auger methods.
2. Soil samples collected using 2"-diameter splitspoons and 2-7/8"-diameter Shelby Tubes
3. Boring logged by Matthias Ohr of Dames & Moore
4. Boring elevation: 18.82 feet msl
5. Depth to FPH 16.29 feet bgs
   Depth to Water 16.32 feet bgs
   App. FPH (static) 0.03 feet
6. Actual FPH thickness by baildown test: 0.31 ft

Soil Boring Logs
Sun DPSC, Philadelphia, PA

Boring Number	Street Location	Date
SB-12	Moyamensing Ave and Penrose Ferry	17-Sep-96

Blow Ct	Depth		PID (ppm)	Stratigraphic Description
7, 9		Fill	24	Blacktop and gravel
11, 13	2			Fill, sand and gravel, stained black; slight waste odor, wet
11, 15		GC	15	
22, 13	4			Clayey sand, medium to coarse, and gravel, fine, stained dark gray to dark
9, 8			9.5	brown, strong waste and sewer odor, wet
24, 17	6			
5, 7			6.4	Silty clay, light brown; wood at 6.5 ft, medium plasticity, moist, slight odor
9, 32	8	CL		
24, 28			330	Sand and gravel, fine to coarse, stained black to multicolored; poorly sorted,
32, 27	10			moist to wet, sheen and strong gasoline odor
12, 13		GW	285	
17, 50/4	12			
29, 32			325	
34, 25	14			Black stained, sheen, and strong gasoline odor
11, 24			293	Sand, medium to coarse, brown; trace gravel, fine, moderately well sorted,
20, 19	16	SW		wet, strong gasoline odor
11, 13			300	Stained black at 16.5 ft
20, 29	18			Sand, medium, brown; trace gravel, fine, wet, sheen and strong gasoline odor
12, 15			333	
18, 18	20	SP		Sand, fine, gray; trace sand, medium, well sorted, wet, strong gasoline odor
	22			End of Boring = 20 ft
	24			
	26			
	28			
	30			
	32			
	34			
	36			
	38			
	40			
	42			

SAMPLE INFORMATION		
Depth	TPH-GR	TPH-DRO

Shelby Tube Collection	
Depth	Recovery

1. Boring completed using hollow-stem auger methods.
2. Soil samples collected using 2"-diameter splitspoons and 2-7/8"-diameter Shelby Tubes
3. Boring logged by Matthias Ohr of Dames & Moore
4. Boring elevation: 12.68 feet msl
5. Depth to FPH — feet bgs
   Depth to Water 10.30 feet bgs
   App. FPH (static) 0.00 feet
6. Actual FPH thickness by baildown test: —

Soil Boring Logs
Sun DPSC, Philadelphia, PA

Boring Number	Street Location	Date
SB-13	Curtin Street and Penrose Avenue	18-Sep-96

Blow Ct	Depth	Unit	PID (ppm)	Stratigraphic Description
4, 9		Fill	0.7	Grass and top soil
11, 9	2			
4, 3			0.9	Fill: cinders, brick fragments, concrete hash, nails and other metal pieces, mixed with dark brown sand, loose, dry, no odor
2, 1	4			
2, 3			1.1	
50/5	6			
	8			
5, 7			1.2	
4, 3	10			
2, 1		PT	0.3	Organic Silt and sand, dark brown; some wood, trace gravel and fill components
1, 1	12			
2, 1			4.1	
1, 2	14			
12, 1		Fill	0.6	Fill: as above, wet
2, 1	16			
2, 3			0.5	
4, 6	18	PT		Organic silt and clay, abundant wood material, dark brown, soft, moist
8, 10		SC	0.8	Clayey sand, dark brown to gray; trace gravel, fine, very soft, saturated, no odor
14, 18	20			

End of Boring = 20 ft

22 24 26 28 30 32 34 36 38 40 42

SAMPLE INFORMATION		
Depth	TPH-GR	TPH-DRO

Shelby Tube Collection	
Depth	Recovery

1. Boring completed using hollow-stem auger methods.
2. Soil samples collected using 2"-diameter splitspoons and 2-7/8"-diameter Shelby Tubes
3. Boring logged by Matthias Ohr of Dames & Moore
4. Boring elevation: feet msl
5. Depth to FPH — feet bgs
   Depth to Water 11 feet bgs
   App. FPH (static) 0.00 feet
6. Actual FPH thickness by baildown test: —

Soil Boring Logs
Sun DPSC, Philadelphia, PA

Boring Number	Street Location	Date
SB-14	Schley Street and Lanvale Place	1-Nov-96

Blow Ct	Depth	Unit	PID (ppm)	Stratigraphic Description
	0	Fill		Asphalt (0.2 ft) and concrete (0.5 ft)
	2–4			Fill: silt and sand, fine to medium, dark gray; some rubber and ceramic pieces, slag, dry to moist
4, 2 4, 4	6		7.5	As above, slight PHC odor
	8–10			Wet at 9 ft
4, 3 4, 5	11–12		13	
2, 50/4	13		17	As above with wood and fine gravel, wet, sheen and PHC odor
20, 13 22, 20	15–16		17	No cuttings (soft Fill))
	18			
pushed	20	CH	0	Clay; olive-gray to green; high plasticity, wet, slight PHC odor
pushed	22–24	PT	—	Peat, dark brown; wood and organic silt, wet, slight PHC odor
	24			End of Boring = 24 ft

Depth scale: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42

SAMPLE INFORMATION		
Depth	TPH-GR	TPH-DRO

Shelby Tube Collection	
Depth	Recovery

1. Boring completed using hollow-stem auger methods.
2. Soil samples collected using 2"-diameter splitspoons and 2-7/8"-diameter Shelby Tubes
3. Boring logged by Matthias Ohr of Dames & Moore
4. Boring elevation: 15.15 feet msl
5. Depth to FPH — feet bgs
   Depth to Water feet bgs
   App. FPH (static) 0.00 feet
6. Actual FPH thickness by baildown test:

Soil Boring Logs
Sun DPSC, Philadelphia, PA

Boring Number	Street Location	Date
SB-16	Taylor Terrace and Hulseman Terrace	19-Sep-96

Blow Ct	Depth		PID (ppm)	Stratigraphic Description
2, 5			0.5	Top Soil and roots
7, 12	2			
8, 11		ML	0.2	Silt, brown and light gray laminated; little sand, fine, trace clay, medium soft, dry to moist, no odor
12, 9	4			
10, 11			0.2	
10, 12	6			
7, 8			0.2	As above, more frequent oxidation horizons, orange-brown
11, 10	8			
6, 7			0.6	
7, 7	10			
5, 6			0.2	
7, 7	12			As above, abundant plant anf wood fragments at 12.5 ft; orange-brown hard pan at 13 ft with networked roots
18, 20			0.5	
50/2	14	GW		Sand and gravel, fine to coarse, orange to reddish-brown; poorly sorted, dry
15, 16			0.3	Sand, medium to coarse, light brown to yellowish-brown; little gravel, fine, moderately well sorted, loose, moist, no odor
18, 16	16	SW		
15, 15			0.3	
15, 28	18	GW		Gravelly sand, medium to coarse, light gray and brown, wet, no odor
10, 7		SM	0.6	Sand, fine, and silt, reddish-brown to black, moist, no odor
8, 7	20			
3, 8		SW	0.6	Sand, medium to coarse, light brownn to yellowish-brown; little gravel, fine, loose and granular, wet, no odor
6, 6	22			
8, 9			1.2	
11, 15	24			Gravel, sub-angular, white and light brown; little sand, medium, wet, very slight solvent odor
6, 8		GW	17	
5, 5	26	SW		Sand and large pieces of red sandstone and siltstone
	28			End of Boring = 26 ft
	30			
	32			
	34			
	36			
	38			
	40			
	42			

SAMPLE INFORMATION		
Depth	TPH-GR	TPH-DRO

Shelby Tube Collection	
Depth	Recovery

1. Boring completed using hollow-stem auger methods.
2. Soil samples collected using 2"-diameter splitspoons and 2-7/8"-diameter Shelby Tubes
3. Boring logged by Matthias Ohr of Dames & Moore
4. Boring elevation: 22.24 feet msl
5. Depth to FPH — feet bgs
   Depth to Water 19.70 feet bgs
   App. FPH (static) 0.00 feet
6. Actual FPH thickness by baildown test: —

Soil Boring Logs
Sun DPSC, Philadelphia, PA

Boring Number	Street Location	Date
SB-17	Geary Terrace and 24th Street	19-Sep-96

Blow Ct	Depth	USCS	PID (ppm)	Stratigraphic Description
3, 5			0.3	Top Soil and roots
13, 15	2	Fill		Silty sand fill, brown; ceramic fragments
5, 7			0.6	
9, 12	4			
9, 10		ML	1.2	Silt, light gray to light brown; little sand, fine, and clay, laminated, occasional
9, 9	6			oxidized laminations, root network, moist, no odor
12, 10			1.4	
9, 12	8			As above, micaceous
10, 6			1.6	Silty fine sand, light gray to light brown laminated
7, 4	10			
3, 5			1.7	Silt to grading to clayey silt, brown and orange-brown laminated, soft, no odor
10, 8	12			
3, 14		CL	1.3	Clay, some silt, brown, low plasticity, no odor
8, 8	14			Gravel, fine to medium, in silt and clay,; poorly sorted
10, 15		GM	1.0	
25, 22	16			Sand, fine to medium, reddish-brown; little gravel, black, moist, no odor
18, 15		SW	2.2	
14, 10	18			Sand, medium, and gravel, fine, brown, moist, no odor
15, 13		GW	—	
24, 18	20			Sand, fine to coarse, and gravel, fine, brown; poorly sorted, poor recovery, wet,
16, 10			1.2	no odor
9, 6	22			
11, 12			6.1	
13, 9	24			
10, 8		SM	155	Sand, fine to medium, and silt, dark gray stained, yellowish-brown, wet, light odor
10, 14	26	CL		Clay, red and yellow; hard, dry
11, 15			263	Sand, fine, yellowish-brown; little silt, wet, PHC odor
28, 23	28	SP		
	30			End of Boring = 28 ft
	32			
	34			
	36			
	38			
	40			
	42			

SAMPLE INFORMATION		
Depth	TPH-GR	TPH-DRO

Shelby Tube Collection	
Depth	Recovery

1. Boring completed using hollow-stem auger methods.
2. Soil samples collected using 2"-diameter splitspoons and 2-7/8"-diameter Shelby Tubes
3. Boring logged by Matthias Ohr of Dames & Moore
4. Boring elevation: 19.82 feet msl
5. Depth to FPH — feet bgs
   Depth to Water 17.60 feet bgs
   App. FPH (static) 0.00 feet
6. Actual FPH thickness by baildown test: —

Soil Boring Logs
Sun DPSC, Philadelphia, PA

Boring Number	Street Location	Date
SB-18	Bigler Terrace and Croskey Terrace	19-Sep-96

Blow Ct	Depth	USCS	PID (ppm)	Stratigraphic Description
				Blacktop and road base gravel
	2			
	4	ML		Clayey silt, light brown to orange-brown; little sand, very fine, mottled, soft, moist, no odor
4, 4 5, 6	6		31	
	8			
	10	GW		Sand, fine to coarse, and gravel
6, 8 10, 11	12	SP	26	Sand, fine to medium, light gray to light brown; loose, dry, nor odor
ST	14	GC	15	Gravel and silt/clay, brown; poorly sorted, dry, no odor
ST	16	GW	23	Sand, fine to coarse, and gravel, fine to medium, multi-colored; moist, slight odor
	18		221	As above; wet, very strong PHC odor
4, 10 12, 16	20			
	22			
17, 13 15, 11	24	SP	318	Sand, medium, brown to dark gray; trace sand, fine and coarse; well sorted, loose, saturated, strong PHC odor
	26			End of Boring = 25 ft
	28			
	30			
	32			
	34			
	36			
	38			
	40			
	42			

SAMPLE INFORMATION		
Depth	TPH-GR	TPH-DRO

Shelby Tube Collection	
Depth	Recovery
13 - 15	refusal
15 - 17	refusal

1. Boring completed using hollow-stem auger methods.
2. Soil samples collected using 2"-diameter splitspoons and 2-7/8"-diameter Shelby Tubes
3. Boring logged by Matthias Ohr of Dames & Moore
4. Boring elevation: 19.96 feet msl
5. Depth to FPH 17.17 feet bgs
   Depth to Water 19.38 feet bgs
   App. FPH (static) 2.21 feet
6. Actual FPH thickness by baildown test: 1.88 ft

Soil Boring Logs
Sun DPSC, Philadelphia, PA

Boring Number	Street Location	Date
SB-19	Bigler Terrace and Bonsall Terrace	20-Sep-96

Blow Ct	Depth	USCS	PID (ppm)	Stratigraphic Description
	0			Blacktop and road base gravel
	2–4	ML		Silt, light gray and orange-brown mottled; little clay and sand, fine, moist, slight plasticity, micaceous, no odor
7, 8 / 9, 8	6		2.1	
	8			As above; light brown
49, 40 / 45, 46	12	GW	25	Sand, fine to coarse, and gravel, fine to coarse, brown to yellowish-brown; very poorly sorted, gravel as angular bedrock fragments, dry, no odor
22, 31 / ST	16		16.5	As above; dry, no odor
12, 34 / 50/3	20		297	As above; wet, very strong PHC odor
				As above; reddish-brown, wet, very strong PHC odor
ST	22		242	
34, 57/3	26		230	As above; brown to dark gray stained, saturated, very strong PHC odor
18, 50 / 50/3	28		254	

End of Boring = 28 ft

SAMPLE INFORMATION		
Depth	TPH-GR	TPH-DRO

Shelby Tube Collection	
Depth	Recovery
16 - 18	refusal
20 - 22	refusal

1. Boring completed using hollow-stem auger methods.
2. Soil samples collected using 2"-diameter splitspoons and 2-7/8"-diameter Shelby Tubes
3. Boring logged by Matthias Ohr of Dames & Moore
4. Boring elevation: 22.13 feet msl
5. Depth to FPH 19.36 feet bgs
   Depth to Water 21.65 feet bgs
   App. FPH (static) 2.29 feet
6. Actual FPH thickness by baildown test: 1.99 ft

Soil Boring Logs
Sun DPSC, Philadelphia, PA

Boring Number	Street Location	Date
SB-20	2413 Bigler Terrace	24-Sep-96

Blow Ct	Depth		PID (ppm)	Stratigraphic Description
			-	Top Soil and roots
	2			Silt and sand, very fine, light brown; trace clay, dry, no odor
	4	ML		
8, 14 14, 18	6		—	Silt grading to clayey silt, light brown to orange-brown mottled; little sand, very fine, slight plasticity, moist, no odor
	8			
	10			
24, 41 14, 16	12	GW	20	Gravel and sand, fine to medium, brown; poorly sorted, dry, no odor
		SP		Sand, medium, dark brown and reddish-brown laminated; trace sand, coarse, well sorted, dry, no odor
	14			
14, 24 34, 25	16	GW	55	Sand, medium to coarse, and gravel, fine to medium, multi-colored; poorly sorted, loose, dry, very slight odor As above; moist, slight PHC odor
25, 26	18		75	
26, 24		GM		Silt, fine sand and gravel mixture, reddish-brown, moist, PHC odor
36, 50/2	20	GW	—	Sand, medium to coarse, and gravel, fine, dark gray (sand) to reddish-brown (gravel), wet with rainbow colored sheen, strong PHC odor and venting
5, 21 13, 50	22		269	
	24			
48, 49 47, 46	26	SW	310	Sand, medium to coarse, multi-colored; some gravel, fine and rounded, moderately well sorted, wet, strong PHC odor and venting
ST	28	SM	365	Silt and sand, fine, brown; wet, strong PHC odor Grading to medium to coarse sand and silt
	30			End of Boring = 28 ft
	32			
	34			
	36			
	38			
	40			
	42			

SAMPLE INFORMATION		
Depth	TPH-GR	TPH-DRO

Shelby Tube Collection	
Depth	Recovery
27 - 29	

1. Boring completed using hollow-stem auger methods.
2. Soil samples collected using 2"-diameter splitspoons and 2-7/8"-diameter Shelby Tubes (during well install.)
3. Boring logged by Matthias Ohr of Dames & Moore
4. Boring elevation: 22.10 feet msl
5. Depth to FPH 19.06 feet bgs
   Depth to Water 21.10 feet bgs
   App. FPH (static) 2.04 feet
6. Actual FPH thickness by baildown test: 0.1 ft

Soil Boring Logs
Sun DPSC, Philadelphia, PA

Boring Number	Street Location	Date
SB-21	3022 S 23rd Street	26-Sep-96

Blow Ct	Depth	Unit	PID (ppm)	Stratigraphic Description
HA	2	Fill		Top Soil and Grass Silt and very fine sand, few ceramic fragments
HA	4	ML		Clayey silt, light brown; little sand, very fine, slight plasticity, moist, no odor
HA	6			
	8			
	10			
4, 8 14, 11	12	SW	0.4	Sand, fine to coarse, brownish-yellow; little silt, trace gravel, fine, no odor At 11 ft: Silty sand and fine gravel, reddish-brown to black, granular, no odor
	14	GW		Gravel and sand mixture, poorly sorted
14, 15 13, 14	16		0.9	Sand, fine to coarse, and gravel, fine, multi-colored; loose, dry, no odor
ST, 50/2	18		—	As above; moist, slight PHC odor
7, 12 21, 19	20		215	Sand, fine to coarse, and gravel, fine to medium, multi-colored; very poorly sorted, few black stained seams, wet, strong PHC odor
	22			
7, 8 11, 10	24	SW	243	Sand, fine to coarse, brown; little silt and trace gravel, fine, wet, strong odor
ST				
8, 10 12, 14	26	SP	221	Sand, fine, brown; some silt, micaceous, wet, strong PHC odor
	28			
11, 18 19, 14	30	SW	301	Sand, fine to coarse, brown and stained black; trace gravel, fine, wet, strong PHC odor
	32			End of Boring = 30 ft
	34			
	36			
	38			
	40			
	42			

SAMPLE INFORMATION

Depth	TPH-GR	TPH-DRO

Shelby Tube Collection

Depth	Recovery
17 - 19	refusal
24 - 26	refusal

1. Boring completed using hollow-stem auger methods.
2. Soil samples collected using 2"-diameter splitspoons and 2-7/8"-diameter Shelby Tubes
3. Boring logged by Matthias Ohr of Dames & Moore
4. Boring elevation: 20.98 feet msl
5. Depth to FPH 18.86 feet bgs
   Depth to Water 19.22 feet bgs
   App. FPH (static) 0.36 feet
6. Actual FPH thickness by baildown test: 0.36 ft

Soil Boring Logs
Sun DPSC, Philadelphia, PA

Boring Number	Street Location	Date
SB-22	Hartranft Rd and South 26th Street	14-Oct-96

Blow Ct	PID (ppm)	Depth (ft)	Unit	Stratigraphic Description
		0	Fill	Black-top and surface fill
		2–14	ML	Silt and very fine sand; brown and orange-brown laminated, dry, no odor
				Silt; little fine sand and clay; light brown and light gray laminated, dry to moist, no odor
		14–18	GP	Gravel and cobbles; little fine to medium sand, white to light brown, dry, no odor
		18–21	SW	Fine to coarse sand; little rounded fine gravel, dry, slight odor
		21–32	GW	Gravel amd sand; poorly sorted mixture of fine to coarse sand and fine to medium gravel, multi-colored, moist, slight odor
				wet at 24.5 ft
				Gravel, sand, and clay; poorly sorted clayey to sandy gravel, brownish-yellow, wet, slight odor
		32–42	SP	Sand; medium, light brown, trace fine sand; very well sorted, wet, strong gasoline odor (no staining apparent)
				Sand, medium to coarse, brown; trace fine gravel
		42		End of Boring = 42 ft

SAMPLE INFORMATION		
Depth	TPH-GR	TPH-DRO

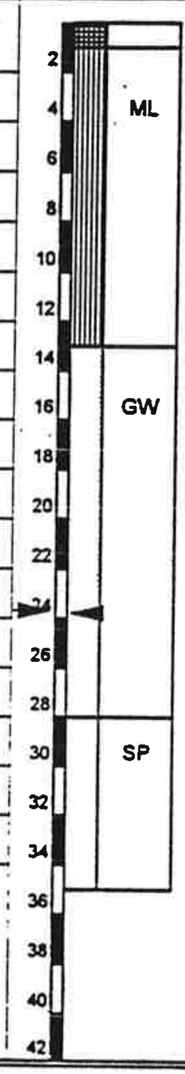
Shelby Tube Collection	
Depth	Recovery

1. Boring completed using hollow-stem auger methods.
2. Soil samples collected using 2"-diameter splitspoons and 2-7/8"-diameter Shelby Tubes
3. Boring logged by Matthias Ohr of Dames & Moore
4. Boring elevation: feet msl
5. Depth to FPH 24.49 feet bgs
   Depth to Water 24.50 feet bgs
   App. FPH (static) 0.01 feet
6. Actual FPH thickness by baildown test: 0.01

Soil Boring Logs
Sun DPSC, Philadelphia, PA

Boring Number	Street Location	Date
SB-23	Hartranft Rd and South 26th Street	25-Oct-96

Blow Ct | PID (ppm) | Stratigraphic Description



Asphalt

Silt and very fine sand; light brown to orange brown laminated, dry no odor

Sand and gravel; poorly sorted mixture of fine to coarse sand and fine gravel, orange brown, few black stains, no odor

As above; slight odor

Wet at 24 ft; poorly sorted sand and gravel mixture; red and brown, slight odor

As above; strong gasoline odor and free-phase hydrocarbon

Sand; fine, gray to brown; well sorted with trace silt and fine gravel; coarsening toward bottom; wet and free-phase hydrocarbon, very strong gasolinbe odor; black staining at 30.5 ft

End of Boring = 35 ft

SAMPLE INFORMATION		
Depth	TPH-GR	TPH-DRO

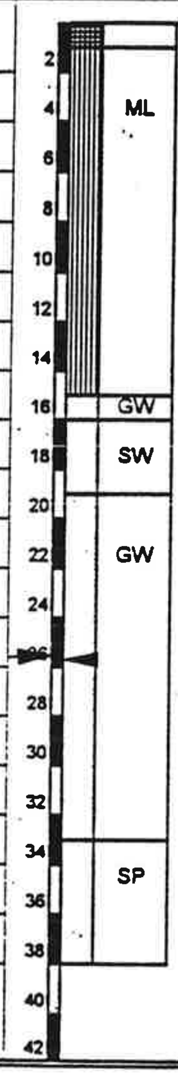
Shelby Tube Collection	
Depth	Recovery

1. Boring completed using hollow-stem auger methods.
2. Soil samples collected using 2"-diameter splitspoons and 2-7/8"-diameter Shelby Tubes
3. Boring logged by Ed Belland of Dames & Moore
4. Boring elevation: feet msl
5. Depth to FPH 23.63 feet bgs
   Depth to Water 23.65 feet bgs
   App. FPH (static) 0.02 feet
6. Actual FPH thickness by baildown test: 0.02 ft

Soil Boring Logs
Sun DPSC, Philadelphia, PA

Boring Number	Street Location	Date
SB-24	Hartranft Rd and South 26th Street	28-Oct-96

Blow Ct | PID (ppm) | Stratigraphic Description



Tpo Soil

Silt and very fine sand, brownish-yellow, dry to moist, no odor

Silt, brown to gray laminated; trace clay, moist, no odor

Sand and gravel, stained black, slight odor, dry

Sand, fine, light brown to gray; some fine to coarse gravel, dry, no odor

Sand and gravel, brown to reddish-brown; poorly sorted mixture of fine to coarse sand and fine to coarse gravel, moist, slight odor

As above; multi-colored

Wet at 26 ft

As above; wet and strong odor, free-phase hydrocarbon at 28 to 30 ft.

As above; stained black

Sand; fine to medium, light brown; well sorted sand, wet, strong odor

End of Boring = 38 ft

SAMPLE INFORMATION		
Depth	TPH-GR	TPH-DRO

Shelby Tube Collection	
Depth	Recovery

1. Boring completed using hollow-stem auger methods.
2. Soil samples collected using 2"-diameter splitspoons and 2-7/8"-diameter Shelby Tubes
3. Boring logged by Ed Belland of Dames & Moore
4. Boring elevation: feet msl
5. Depth to FPH 25.66 feet bgs
   Depth to Water 25.72 feet bgs
   App. FPH (static) 0.06 feet
6. Actual FPH thickness by baildown test: 0.06 ft

Soil Boring Logs
Sun DPSC, Philadelphia, PA

Boring Number	Street Location	Date
SB-26	South 26th Street	30-Oct-96

Blow Ct	PID (ppm)	Depth (ft)	Symbol	Stratigraphic Description
		0–1	Fill	Fill; top soil and construction debris
		1–11	ML	Silt; brownish-yellow, dry, no odor
				As above; light brown to gray laminated, moist, no odor
		11–16	GW	Sand and gravel; reddish-brown; poorly sorted mixture of fine to corase sand and gravel, moist, slight petroleum odor
		16–17	SP	Sand; fine, stained black; little medium sand, dry, slight odor
		17–27	GW	Sand and gravel; multi-colred; poorly sorted mixture of fine to coarse sand and gravel, moist, no odor
				As above, stained black at 23 ft, slight odor
				Sand and gravel, stained black; poorly sorted silt-sand-gravel mixture, wet, strong gasoline odor
		27–32	SW	Sand, fine to medium, stained black; some gravel, wet, strong gasoline odor
		32–35	SP	Sand, fine, stained black; little medium to coarse sand, wet, strong gasoline odor
				End of Boring = 35 ft

Depth scale: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42

SAMPLE INFORMATION		
Depth	TPH-GR	TPH-DRO

Shelby Tube Collection	
Depth	Recovery

1. Boring completed using hollow-stem auger methods.
2. Soil samples collected using 2"-diameter splitspoons and 2-7/8"-diameter Shelby Tubes
3. Boring logged by Ed Belland of Dames & Moore
4. Boring elevation: feet msl
5. Depth to FPH 25.10 feet bgs
   Depth to Water 25.15 feet bgs
   App. FPH (static) 0.15 feet
6. Actual FPH thickness by baildown test: 0.15 ft

Soil Boring Logs
Sun DPSC, Philadelphia, PA

Boring Number	Street Location	Date
SB-27	South 26th Street	30-Oct-96

Blow Ct	PID (ppm)	Depth	Unit	Stratigraphic Description
		0–1	Fill	Fill
		1–13	ML	Silt and very fine sand; orange brown and light brown laminated, dry, no odor
				As above; gray
		13–26	GW	Sand and gravel; brown to reddish-brown; poorly sorted mixture of fine to coarse sand and gravel, dry to moist, no odor
				As above; multicolored, slight odor
				Asabove, wet, strong gasoline odor
		26–27	SP	Fine sand, reddish-brown; trace silt, micaceous, wet, strong odor
		27–29	GW	Sand and gravel; poorly sorted mixture, stained black, wet, strong gasoline odor
		29–35	SP	Sand; fine to medium, stained black; trace coarse sand, wet, strong gasoline odor
				As above; light brown with stained black partings, coarsening toward bottom, wet, strong gasoline odor
				End of Boring = 35 ft

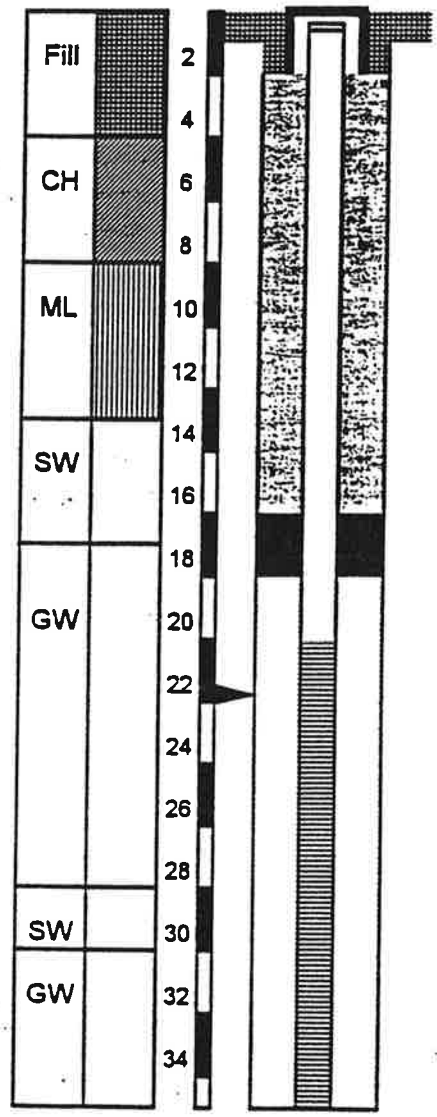
Depth scale (ft): 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42

SAMPLE INFORMATION		
Depth	TPH-GR	TPH-DRO

Shelby Tube Collection	
Depth	Recovery

1. Boring completed using hollow-stem auger methods.
2. Soil samples collected using 2"-diameter splitspoons and 2-7/8"-diameter Shelby Tubes
3. Boring logged by Ed Belland of Dames & Moore
4. Boring elevation: feet msl
5. Depth to FPH 24.95 feet bgs
   Depth to Water 24.97 feet bgs
   App. FPH (static) 0.02 feet
6. Actual FPH thickness by baildown test: 0.02 ft

Monitoring Well Construction Details
PH-1 (Passyunk Homes)
Sun DPSC Project, Philadelphia, PA

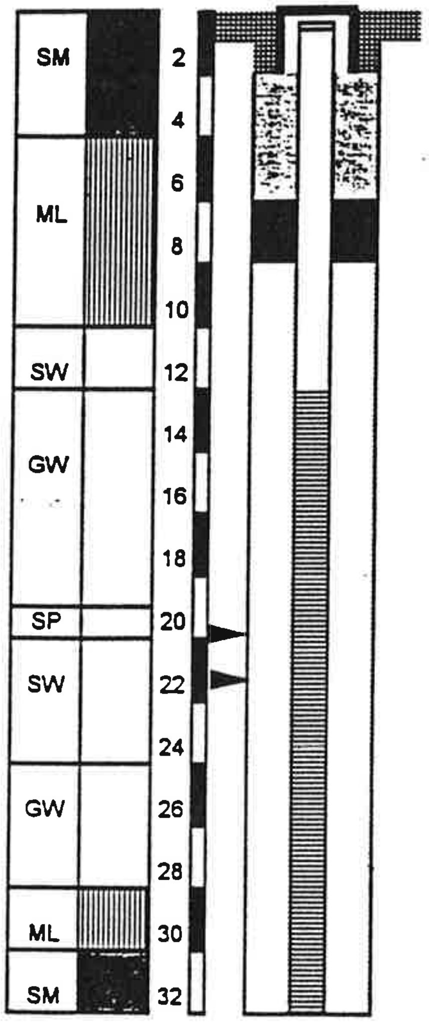


Surface Elevation:	23.82 ft msl	
PVC Elevation:	23.39 ft msl	
Total Depth:	35 ft	
Well Diameter:	2 inch	
Borehole Diameter:	6 inch	
Screen Slot Size:	0.020 inch	
Screen Interval:	20 - 35 ft	
Depth to FPHC:	—	16-Oct-96
Depth to Water:	21.93 ft	16-Oct-96
Depth to FPHC:	—	15-Nov-96
Depth to Water:	21.53 ft	15-Nov-96

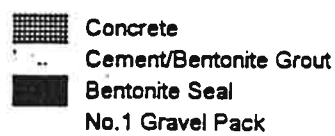
Concrete
Cement/Bentonite Grout
Bentonite Seal
No.1 Gravel Pack

Notes 1. Well was completed using hollow-stem auger methods on August 27, 1996, M&R Soil Investigations of Egg Harbor City, New Jersey.

Monitoring Well Construction Details
PH-2 (Passyunk Homes)
Sun DPSC Project, Philadelphia, PA

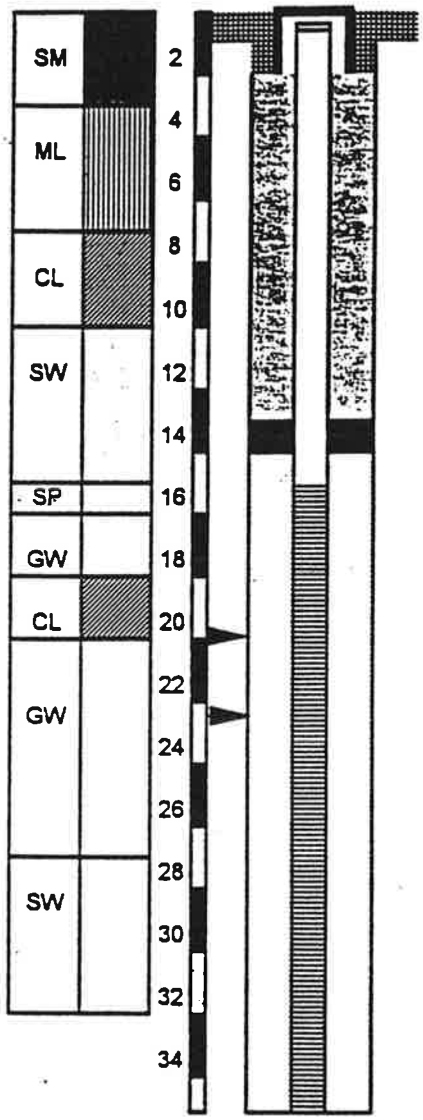


Surface Elevation:	21.72 ft msl	
PVC Elevation:	21.30 ft msl	
Total Depth:	32 ft	
Well Diameter:	4 inch	
Borehole Diameter:	10 inch	
Screen Slot Size:	0.020 inch	
Screen Interval:	12 - 32 ft	
Depth to FPHC:	19.12 ft	24-Oct-96
Depth to Water:	19.13 ft	24-Oct-96
Depth to FPHC	19.40 ft	15-Nov-96
Depth to Water	20.71 ft	15-Nov-96



Notes: 1. Well was completed using hollow-stem auger methods on October 22, 1996 M&R Soil Investigations of Egg Harbor City, New Jersey.

Monitoring Well Construction Details
PH-3 (Passyunk Homes)
Sun DPSC Project, Philadelphia, PA

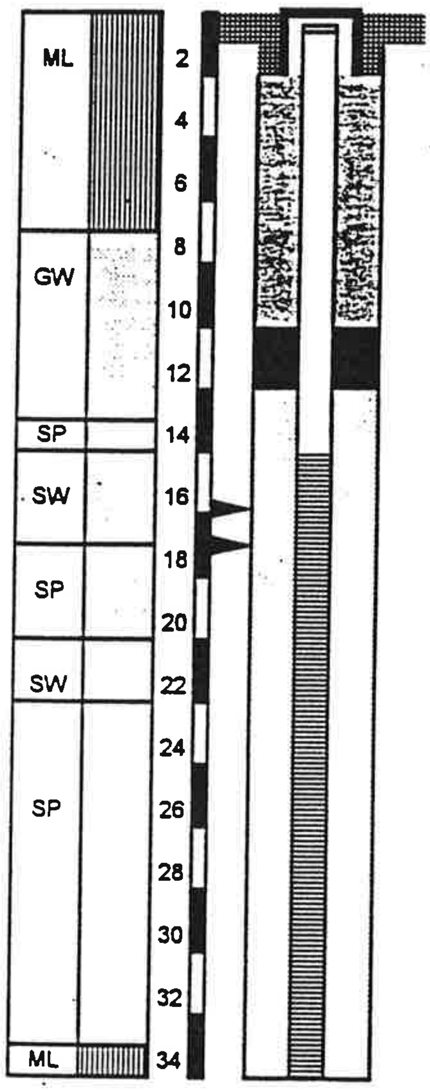


Surface Elevation:	22.50 ft msl	
PVC Elevation:	22.24 ft msl	
Total Depth:	35 ft	
Well Diameter:	4 inch	
Borehole Diameter:	10 inch	
Screen Slot Size:	0.020 inch	
Screen Interval:	15 - 35 ft	
Depth to FPHC:	19.44 ft	24-Oct-96
Depth to Water:	21.80 ft	24-Oct-96
Depth to FPHC:	19.75 ft	15-Nov-96
Depth to Water:	21.82 ft	15-Nov-96

Concrete
Cement/Bentonite Grout
Bentonite Seal
No.1 Gravel Pack

Notes: 1. Well was completed using hollow-stem auger methods on October 21, 1996 M&R Soil Investigations of Egg Harbor City, New Jersey.

Monitoring Well Construction Details
PH-4 (Passyunk Homes)
Sun DPSC Project, Philadelphia, PA

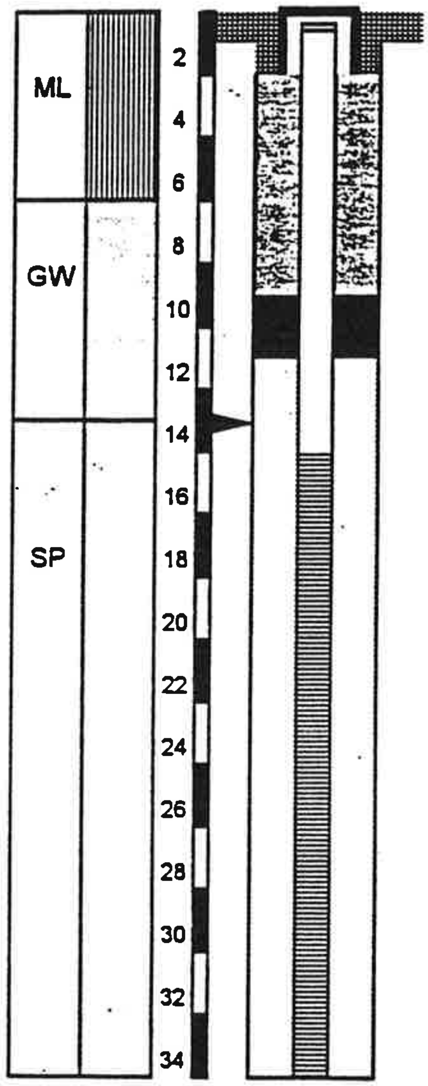


Surface Elevation:	18.82 ft msl	
PVC Elevation:	18.25 ft msl	
Total Depth:	34 ft	
Well Diameter:	4 inch	
Borehole Diameter:	10 inch	
Screen Slot Size:	0.020 inch	
Screen Interval:	14- 34 ft	
Depth to FPHC:	15.44 ft	24-Oct-96
Depth to Water:	16.50 ft	24-Oct-96
Depth to FPHC:	15.66 ft	15-Nov-96
Depth to Water:	17.07 ft	15-Nov-96

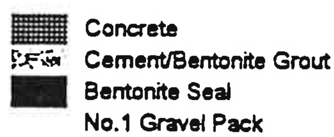
Concrete
Cement/Bentonite Grout
Bentonite Seal
No.1 Gravel Pack

Notes: 1. Well was completed using hollow-stem auger methods on October 18, 1996 M&R Soil Investigations of Egg Harbor City, New Jersey.

Monitoring Well Construction Details
PH-5 (Passyunk Homes)
Sun DPSC Project, Philadelphia, PA

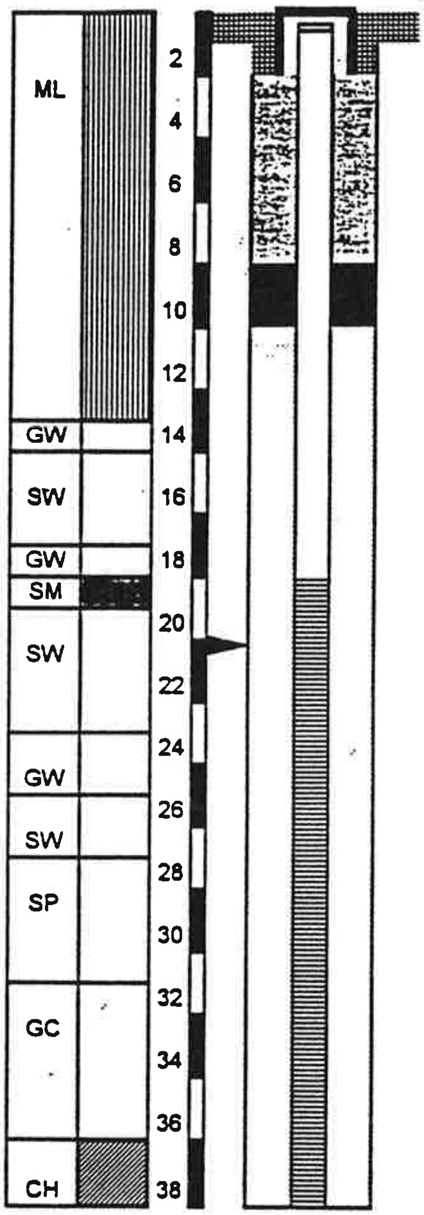


Surface Elevation:	15.30 ft msl	
PVC Elevation:	15.04 ft msl	
Total Depth:	33.5 ft	
Well Diameter:	4 inch	
Borehole Diameter:	10 inch	
Screen Slot Size:	0.020 inch	
Screen Interval:	13.5 - 33.5 ft	
Depth to FPHC:	—	24-Oct-96
Depth to Water:	12.52 ft	24-Oct-96
Depth to FPHC:	—	15-Nov-96
Depth to Water:	12.95 ft	15-Nov-96



Notes 1. Well was completed using hollow-stem auger methods on October 17, 1996 M&R Soil Investigations of Egg Harbor City, New Jersey.

Monitoring Well Construction Details
PH-6 (Passyunk Homes)
Sun DPSC Project, Philadelphia, PA

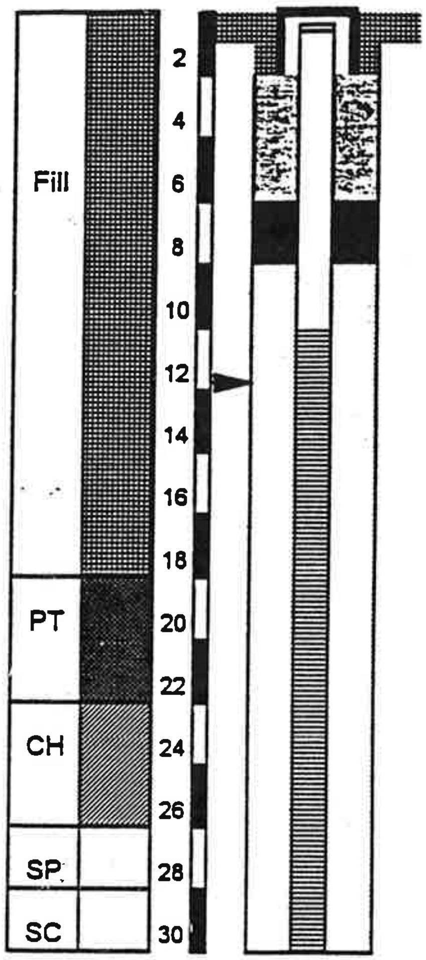


Surface Elevation:	22.24 ft msl	
PVC Elevation:	22.04 ft msl	
Total Depth:	38 ft	
Well Diameter:	4 inch	
Borehole Diameter:	10 inch	
Screen Slot Size:	0.020 inch	
Screen Interval:	18 - 38 ft	
Depth to FPHC:	—	24-Oct-96
Depth to Water:	19.60 ft	24-Oct-96
Depth to FPHC:	—	15-Nov-96
Depth to Water:	19.84 ft	15-Nov-96

Concrete
Cement/Bentonite Grout
Bentonite Seal
No.1 Gravel Pack

Notes: 1. Well was completed using hollow-stem auger methods on October 17, 1996 M&R Soil Investigations of Egg Harbor City, New Jersey.

Monitoring Well Construction Details
PH-7 (Packer Ave & 20th St)
Sun DPSC Project, Philadelphia, PA



Surface Elevation:	14.90 ft msl	
PVC Elevation:	14.56 ft msl	
Total Depth:	30 ft	
Well Diameter:	4 inch	
Borehole Diameter:	10 inch	
Screen Slot Size:	0.020 inch	
Screen Interval:	10 - 30 ft	
Depth to FPHC:	—	31-Oct-96
Depth to Water:	11.50 ft	31-Oct-96
Depth to FPHC:	—	15-Nov-96
Depth to Water:	12.75 ft	15-Nov-96

Concrete
Cement/Bentonite Grout
Bentonite Seal
No.1 Gravel Pack

Notes 1. Well was completed using hollow-stem auger methods on October 25, 1996
M&R Soil Investigations of Egg Harbor City, New Jersey.