40.0

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301 Maryland State Line to I-95 Boring No.: B-4-09

Contract: 28-113-01

Boring Location: Sta. 680+08.82, 173.00' Lt. C.L.

Boring Surface Elev.: + 57.85 Reference:

IN. IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D. **Casing Size:** 3 1/4 Inches

From Depth of: From Depth of: To: To: Hollow Stem Auger: 0.0

Water Level Readings

Depth of Casing Depth of Water Time **Depth of Hole** Elev. of Water Date 31.1 2/2/09 40.0 38.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Ft.; Dia. U-Sample Boring: U-Samples: Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Gary Truver

Helpers: T. Kane

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Rema	ırks
	2/2/09	1	0.5' 2.0'	2 3 3	Moist firm brown silt w/trace of fine to coarse sand. 10" RECOVERY 6" of topsoil.	
		2	2.0'	4	Moist stiff brown clayey silt w/some fine A-4(5)	
2.8			4.0'	4 4 7 10	sand, trace of coarse sand. 22" RECOVERY	
		3	4.0'	2 4 5 7	Moist stiff brown clayey silt w/some fine sand, trace of coarse sand. A-4(5)	
5.6			6.0'		19" RECOVERY	
		4	6,0' 8.0'	6 6 8 9	Moist stiff orange clayey fine sandy silt w/ A-4(2) some coarse sand. 20" RECOVERY	
8.4		5	8.0'	4 5 7 9	Moist medium dense orange fine to coarse sand and gravel w/some silt. 18" RECOVERY	
11.2		6	10.0'	7 7 10 11	Moist very stiff orange clay w/some fine sand, trace of coarse sand. A-6(12) 21" RECOVERY	
14		7	12.0'	6 13 17 15	Moist medium dense orange coarse to fine sand and gravel w/trace of silt. 20" RECOVERY	
		8	14.0'	6 9 10 11	Moist very stiff orange fine to coarse sandy silt w/some clay, trace of gravel. A-4(0) 4" clay lens @	15.0'.

Remarks:

Reviewed By: Maureen Kelley Soils Supervisor: Randy Ferguson

F.A. Project: U.S. 301 Maryland State Line to I-95 **Contract:** 28-113-01

Depth	Daily		Sample					
(ft.)	Progress	No.	Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
16.8		9	16.0'	11 12 15 12		Moist very stiff orange fine sandy silt w/some	A-4(0)	3" clay lens @ 17.0'.
	1			12		coarse sand, trace of gravel.		
			18.0'			19" RECOVERY		
		10	18.0'	3 7		Moist stiff pink fine sandy clay w/trace of	A-6(9)	
			19.0'			coarse sand.		
19.6		10A	19.0'	10 11		11" RECOVERY Moist very stiff light brown clayey silt w/	A-4(0)	
		11	20.0' 20.0'	11		trace of fine to coarse sand and gravel.		
		11	20.0	11 26 27 26		9" RECOVERY Moist very dense orange coarse sand and	A-1-b	
				26		gravel w/some fine sand and silt.		
			22.0'			15" RECOVERY		
22.4		12	22.0'	13 13		Moist medium dense orange gravel and coarse	A-1-b	
				11 13		sand w/some silt and fine sand.		
		13	24.0' 24.0'	14	-	20" RECOVERY		
		13	24.0	14 18 16 16		No Sample Recovery		
25.2				16		DDAET		
			26.0'			0" RECOVERY		
		14	26.0'	6 7	11111111	Moist medium dense orange coarse sand and	A-1-b	
				13 15	13131313	giaver w/trace or sitt and time sand.		
					1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1:			
28		15	28.0' 28.0'	11		17" RECOVERY	A-1-b	
	•		20.0	11 13 11		Moist medium dense orange gravel and coarse sand w/trace of silt and fine sand.	A-1-0	
				14		ii ii		
			30.0		121212121	TOWN DECOMPDA	4	
		16	30.0'	14 14 14 14		No Sample Recovery		Water encountered at 31.1'.
30.8				14				
		17	32.0' 32.0'	2	**************************************	ii 0" RECOVERY	A-1-b	
			02.0	4 4 4		gravel w/trace of silt.	A-1-0	
33.6				4				
33.0	1		34.0'			10" DECOVEDY		
		18	34.0'	1 6	1:1:1:1:1:	Wet medium dense brown coarse to fine sand	A-1-b	
				9 12		and gravel w/trace of silt.		
			00.01			15. 16. 16.		
36.4	1	19	36.0' 36.0'	9		18 RECOVERY	A-1-b	
70	1				10000000000 10000000000 10000000000	to fine sand w/trace of silt.	7 X 1 U	
	1				1: 1:	(i)		
	1		38.0'		111111111	20" RECOVERY		
		20	38.0'	/	1: 1:	No Sieve Analysis		pH sample sent to GTA for
39.2				9		iii		testing.
			40.01		100000000000000000000000000000000000000	E 16" RECOVERY		
			40.0'		1:1:1:1:1:	End of Boring.		
42								

Symbol Description

Strata symbols

Silt



Silty low plasticity clay



Low plasticity clay



Silty sand



Poorly graded sand with silt



Poorly graded clayey silty sand



Well graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

Notes:

- 1. Exploratory borings were drilled on 2/2/2009 using a 3 1/4-inch diameter hollow stem auger. Rig is a Trailor Mounted CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

50.0

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301 Maryland State Line to I-95 Boring No.: B-4-10W

Contract: 28-113-01

Boring Location: Sta. 683+80.18, 364.00' Lt. C.L.

Boring Surface Elev.: + 53.62 Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Depth of Casing Depth of Water Time **Depth of Hole** Elev. of Water Date 1/30/09 40.0 38.0 36.1

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Ft.; Dia. U-Sample Boring: U-Samples: Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Bill Holden

Helpers: D. Zmijewski

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
	1/30/09	1	0.5'	2 4 5		Moist stiff brown clayey silt w/trace of fine to	A-4(7)	5" of topsoil, 8" of frost.
			0.01	3		coarse sand.		
			2.0'	2		18" RECOVERY		
	1 _	2	2.0	2 4 4 4		Moist firm brown clayey fine to coarse sandy	A-4(1)	
2.8			4.0'	4		silt w/trace of gravel. 21" RECOVERY		IG
		3	4.0'	3 3 3 5		Moist firm brown fine to coarse sandy silt.	A-4(0)	
5.6			6.0			18" RECOVERY	15	
	-	4	6.0'	3		Moist firm brown clayey silt w/some coarse	A-4(3)	
	_			3 3 5 7		to fine sand, trace of gravel.	. ,	
				· /		2 2 , 1 3 g		
	1							
	-		8.0'			21" RECOVERY		
8.4]	U-1	8.0'			Wet orange brown mottled silty fine to coarse		Pressed Shelby Tube, 15"
						sand, trace of gravel.		recovery.
	1					β		
			10.0'			15" RECOVERY		
		5	10.0'	6 5 6 6		Moist medium dense brownish orange silty	A-2-4(0)	
	-			6		coarse to fine sand w/trace of gravel.		
11.2								
1								
	1		12.0'	E		22" RECOVERY		
	-	6	12.0'	5 5 4 5		Moist loose brownish orange silty fine to	A-2-4(0)	
	_			5		coarse sand w/trace of gravel.		
	1		14.0'			20" RECOVERY		
14	-	7	14.0'	4	11111111		A-1-b	
<u> </u>		'	1 7.0	4 4 5 5		Moist loose brownish orange coarse sand w/	A-1-0	
				5	11111111	some fine sand, trace of silt and gravel.		
	1							
	1		16.0'		11111111111111111111111111111111111111	22" RECOVERY		

Remarks:

Reviewed By: Maureen Kelley Soils Supervisor: Randy Ferguson

F.A. Project: U.S. 301 Maryland State Line to I-95 **Contract:** 28-113-01

Boring No.: B-4-10W

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
16.8		8	16.0'	5 6 6 7		Moist medium dense brownish orange coarse sand w/some fine sand and silt, trace of gravel.	A-1-b	
			18.0'	2		21" RECOVERY		
		9	18.0'	3 6 8 8		Moist stiff grayish red clayey silt w/some	A-4(3)	
				8		coarse to fine sand.		
19.6			00.01			AND DECOMEDY		
		10	20.0'	5		22" RECOVERY Moist medium dense brownish orange coarse	A-1-b	
				5 6 6 7		sand w/some fine sand and silt, trace of	71 1 0	
				'		gravel.		
			22.0'			20" RECOVERY		
22.4		11	22.0'	2 5 7 10		Moist medium dense brownish orange coarse	A-1-b	
				7 10		sand w/some fine sand and silt, trace of		
						gravel.		
		12	24.0'	2		20" RECOVERY		
		12	24.0'	3 4 4 5		Moist loose light brown and orange fine to coarse sand w/some silt, trace of gravel.	A-2-4(0)	
25.2				5		coarse sand w/some snt, trace of graver.		
			26.0'			22" RECOVERY		
		13	26.0'	3 3	111111	Wet loose light brown and orange fine to	A-2-4(0)	
				3 4 5		coarse sand w/some silt, trace of gravel.	112 1(0)	
				3	11.63 4 3 1 1 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
28			28.0'			20" RECOVERY		
		14	28.0'	2 2 2 4		Wet very loose brown silty fine sand.	A-2-4(0)	
				2 4				
							4 —	
		15	30.0' 30.0'	3		22" RECOVERY	12.40	
30.8		15	30.0	3 3 2		Wet loose brown fine sand w/some silt, trace of coarse sand.	A-2-4(0)	
				3		or coarse saind.		
			32.0'			21" RECOVERY		
		16	32.0'	1		Wet very loose brown fine sand w/some silt,	A-2-4(0)	
				1 2		trace of coarse sand.		
33.6								
00.0			34.0'			23" RECOVERY		
		17	34.0'	2 3 3 3		Wet loose brown fine sand w/some silt, trace	A-2-4(0)	
				3		of coarse sand and gravel.		
36.4		18	36.0' 36.0'	3 8	11111	23" RECOVERY Wet medium dense brownish black fine to	A-3	Water encountered at 36.1'.
00.4				8 6 9		coarse sand w/trace of silt and gravel.	Δ-3	vi ater encountered at 30.1.
				9				
			38.0'			22" RECOVERY		
		19	38.0'	3 8		Wet medium dense brownish black coarse to	A-3	
39.2				3 8 7 8		fine sand w/trace of silt and gravel.		
39.2								
			40.0'	4		22" RECOVERY		
		20	40.0'	4 9 8 9		Wet medium dense brownish black fine to	A-3	Washed out augers using
				9		coarse sand w/trace of silt and gravel.		mud/water mix.
40			40.01			22" BECOVERY		
42		21	42.0' 42.0'	4 6		23" RECOVERY Saturated medium dense brownish black fine	A-2-4(0)	Washed out augers using
				6		Saturated medium dense brownish black fille	A-2-4(0)	vi asiled out augers using

F.A. Project: U.S. 301 Maryland State Line to I-95 **Contract:** 28-113-01 Boring No.: B-4-10W

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
				10 12	1:612 3:0:6 2:612 3:0:6 664 3 3:0:6	sand w/some coarse sand and silt, trace of		mud/water mix.
					130 3 3.13 0 6. 120 1 4 4 3 6 6 120 1 4 3 3 6 6	gravel.		
		22	44.0' 44.0'	7	120 1 7 120 12 6 1 4 3 4 1 6 6 7 6 1 3 4 1 6 6	19" RECOVERY	A 2 4(0)	Weshed out our and using
44.8		22	44.0	7 8 11	66 44-1664 66 9 13664 66 14 1664	Saturated medium dense brownish orange fine sand w/some coarse sand and silt, trace of	A-2-4(0)	Washed out augers using mud/water mix.
				10		gravel.		mud/water mix.
			46.0'		00 2 13:00 00 13:10 00 1 23:00 00 1 23:00	19" RECOVERY		
		23	46.0'	8 8	######################################	Saturated medium dense brownish orange fine	A-2-4(0)	Washed out augers using
				8 8 10 11		to coarse sand w/some silt, trace of gravel.	,	mud/water mix.
47.6								
			48.0'			22" RECOVERY		II 1 CTL C
		24	48.0'	7 9 12 15		No Sieve Analysis		pH sample sent to GTA for testing.
				15	61111166 11111166			testing.
			50.01		66143166 126171261 66433166	ANI DECOVEDA		
50.4			50.0'			22" RECOVERY End of Boring.		
						Zite of Boring.		
						DRAFI		
53.2								
						OR BIDI		
		\mathbf{V}						
				_	_			
56			_					
						GUST 20	15	
						1001/0		
				1		3001 Z0		
58.8								
61.6								
64.4								
67.2								

Symbol Description

Strata symbols



Low plasticity clay



Silty low plasticity clay



Silty sand



Poorly graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

Notes:

- 1. Exploratory borings were drilled on 1/30/2009 using a 3 1/4-inch diameter hollow stem auger. Rig is a Trailor Mounted CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

40.0

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301 Maryland State Line to I-95 Boring No.: B-4-11

Contract: 28-113-01

Boring Location: Sta. 687+52.09, 341.00' Lt. C.L.

Boring Surface Elev.: + 46.96 Reference:

Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: IN. Lbs. 30 D-Sampler: S-Sampler: U-Sampler: IN. Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Time Depth of Hole **Depth of Casing Depth of Water** Elev. of Water Date 2/4/09 28.0 26.0 24.2

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Ft.; Dia. U-Sample Boring: U-Samples: Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Jason Truver

Helpers: D. Zmijewski

							•	_
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
	2/3/09	1	0.0'	6 7 6 7		Moist medium dense orange clayey coarse sand and gravel, trace of fine sand.	A-2-7(2)	
			2.0'	6		12" RECOVERY		
2.8			4.0'	6 6 5 5		Moist medium dense orange coarse sand w/ some silt and gravel, trace of fine sand. 20" RECOVERY	A-I-b	IG
		3	4.0'	3 _4	314357	Moist loose orange coarse sand w/ some	A-1-b	
5.6			6.0'	5 2	11111111111111111111111111111111111111	gravel and silt, trace of fine sand. 15" RECOVERY	15	
		4	6.0' 8.0'	2 3 2 3		Moist loose orange coarse sand, trace of silt, fine sand, and gravel. 17" RECOVERY	A-1-b	
8.4		5	10.0'	2 2 3 2		Moist loose orange coarse sand, trace of silt, fine sand, and gravel. 14" RECOVERY	A-1-b	
11.2		6	10.0'	3 4 4 3		Moist loose yellow coarse sand w/ some fine sand and silt, trace of gravel. 20" RECOVERY	A-1-b	
14		7	12.0'	5 5 7 7		Moist medium dense yellow coarse sand, trace of fine sand, silt, and gravel. 18" RECOVERY	A-1-b	
		8	14.0'	4 3 3 4		Moist loose orange coarse sand w/ some silt, trace of fine sand and gravel.	A-1-b	

Remarks:

Reviewed By: Maureen Kelley Soils Supervisor: Randy Ferguson

F.A. Project: U.S. 301 Maryland State Line to I-95 **Contract:** 28-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"			Sample Description	Class./G.I.	Remarks
			16.0'		10 E	/ 17:0 14 1:6	18" RECOVERY		
		9	16.0'	4 3	14.4	1411	Moist loose orange coarse sand w/ some	A-1-b	
16.8				4 3 5 6			gravel, trace of silt and fine sand.		
				6			graver, trace or sint and time said.		
			18.0'				18" RECOVERY		
		10	18.0'	3 4	111	1:1:1:1:	Moist loose orange coarse sand, trace of silt,	A-1-b	
				6		1:1:1:1: 1:1:1:1:	fine sand, and gravel.		
				7	111		inc sand, and graver.		
19.6					1:1:	1:1:1:1: 1:1:1:1: 1:1:1:1:			
			20.0'		1:1:		16" DECOVEDY		
		11	20.0'	6 10 18 13	1:1: 1:1:	1:1:1:1: 1:1:1:1:	Moist medium dense orange coarse sand and	A-1-b	Contains cemented sands.
				18	1:1:	1:1:1:1: 1:1:1:1:	gravel w/ some fine sand, trace of gravel.		
				13	111		graver wy some rine sand, trace or graver.		
					1:1:	1:1:1:1: 1:1:1:1: 1:1:1:1:			
			22.0'		111	1:1:1:1: 1:1:1:1:	14" RECOVERY		
22.4		12	22.0'	7 7	11		Wet medium dense yellow, orange, and white	A-2-4(0)	
				7 7 5 4			mottled fine to coarse sand w/ some silt, trace	()	
				4			of gravel.		
							or graver.		
			24.0'		ni E	1777	18" RECOVERY		
		13	24.0'	3 4		1411E 1411E 1111E	Wet loose brown and light brown fine sand w/	A-3	Water encountered at 24.2'.
				3 4	136		some coarse sand trace of silt and gravel		
25.2				4	11.0		IJRAFI		
					111	1111			
			26.0'		-		21" RECOVERY		
		14	26.0'	3 4			Wet loose brown and light brown fine sand w/	A-2-4(0)	
				6 10			some coarse sand and silt, trace of gravel.		
		\sim	20.01				15 DECOVEDY		
28	•	15	28.0' 28.0'	3	H		15" RECOVERY	A 2 4(0)	
		13	20.0	3 3 5			Wet loose orange fine to coarse sand w/ some	A-2-4(0)	
				5			silt, trace of gravel.		
			Λ						
			30.0'				14" RECOVERY		
		16	30.0'	7	ı		Wet medium dense orange fine sand w/ some	A-2-4(0)	
30.8			_	16 16 18			silt, trace of coarse sand.	11 2 1(0)	
				18			sitt, trace of coarse saine.		
			32.0'				18" RECOVERY		
		17	32.0'	1 14		ME	Wet medium dense orange fine sand w/ some	A-3	Contains cemented sands.
				13 30		(###	coarse sand, trace of silt and gravel.		
33.6			0.4.51				A.II D.E.C.		
		40	34.0' 34.0'	13			24" RECOVERY	1 2 4/2	
		18	34.0	13 14 19 22			Wet dense orange fine sand w/ some coarse	A-2-4(0)	
				22			sand and silt, trace of gravel.		
			36.0'				20" RECOVERY		
36.4		19	36.0'	28			Wet very dense orange fine to coarse sand,	A-3	
55.7				28 36 21 42	1:1		trace of silt and gravel.	Α-3	
				42			trace of sift and graver.		
					H				
			38.0'			搠	16" RECOVERY		
		20	38.0'	11 21 21 20	1		Indication of wet dense orange fine to coarse		pH sample sent to GTA for
				21	131	14316 14316 13316	and trace of cilt and gravel		testing.
39.2				20	iii iii	13.11E. 1771E	-		
					111	11116			
			40.0'		ļi:i	i i iii I i i i i	TO RECOVERT		
							End of Boring.		
<u> </u>									
42					1				
. 76									

Symbol Description

Strata symbols

Clayey sand



Silty sand



Poorly graded sand with silt



Well graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

Notes:

- 1. Exploratory borings were drilled on 2/3/2009 using a 3 1/4-inch diameter hollow stem auger. Rig is a Track CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

40.0

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301 Maryland State Line to I-95 Boring No.: B-4-12

Contract: 28-113-01

Boring Location: Sta. 690+81.42, 192.00' Lt. C.L.

Boring Surface Elev.: + 28.06 Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Depth of Water Time **Depth of Hole Depth of Casing** Elev. of Water Date 1/26/09 5.1 10.0 8.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Ft.; Dia. U-Sample Boring: U-Samples: Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Jason Truver

Helpers: D. Zmijewski

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
	1/26/09	1	0.5'	2 1 10		Wet stiff brown clayey coarse sandy silt w/ some fine sand, trace of gravel.	A-4(1)	Topsoil - 6".
		2	2.0' 2.0'	3		12" RECOVERY	A 4(2)	
2.8		_	2.0	3 4 5 5		Wet stiff brown clayey coarse sandy silt w/	A-4(2)	
2.0			4.0'	5		some gravel, trace of fine sand. 18' RECOVERY		IG
		3	4.0'	1 1 1 2		Wet soft gray and orange mottled gravelly and coarse sandy silt w/ some fine sand.	A-4(0)	
5.6			6.0'			8" RECOVERY	15	
		4	6.0'	1 5		No Sample Recovery		
				7 6				
			8.0'			0" RECOVERY		
8.4		5	8.0'	1 2 1	11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Wet very loose yellow fine to coarse sand w/ some silt, trace of gravel.	A-2-4(0)	
			10.0'	1	11111111111111111111111111111111111111	18" RECOVERY		
-		6	10.0'	2	0:6343:66	Wet loose yellow and light brown coarse sand	A-1-b	
				2 3 4 4		w/ some fine sand, trace of silt and gravel.	71 1 0	
11.2				4		m, some mile suma, made of sme and graven		
			12.0'			24!! RECOVERY		
		7	12.0'	1	*: (123:EP	24" RECOVERY Saturated loose orange fine to coarse sand w/	A-2-4(0)	
				1 4 5 10		some silt, trace of gravel.	11-2-7(0)	
				10		some sitt, auce of graver.		
14			14.0'		11111111111111111111111111111111111111	12" RECOVERY		
'4		8	14.0'	10	## 143 FF F	Saturated medium dense orange fine to coarse	A-2-4(0)	
				10 10 12 15	06313366 0613366 0613366 0613366	sand w/ some silt, trace of gravel.	11 2 7(0)	
	1		16.0'		01173700	20" RECOVERY		

Remarks:

Reviewed By: Maureen Kelley Soils Supervisor: Randy Ferguson

F.A. Project: U.S. 301 Maryland State Line to I-95 **Contract:** 28-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
16.8		9	16.0'	9 11 11 14		Saturated medium dense orange fine to coarse	A-3	
10.0	1			11 14		sand, trace of silt and gravel.		
	1		10.0			24" RECOVERY		
	-	10	18.0' 18.0'	5	21111	24" RECOVERY Saturated dense orange fine sand w/ some	A-2-4(0)	
	=			5 15 24 13	0:63 13:67 0:613 13:67 0:613 3:60	coarse sand and silt, trace of gravel.	11 2 .(0)	
19.6	-				11 (1 4 3 1 5 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	-		
10.0			20.0'		100 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	20" RECOVERY		
	-	11	20.0'	6 10 13 18	(31.44-11.6) (31.44-11.6)	Saturated medium dense orange fine sand w/	A-3	
				18		some coarse sand, trace of silt and gravel.		
			22.0'		00 3 1 3 10 0 00 1 3 1 3 10 0 00 1 3 3 10 0	22" RECOVERY		
22.4		12	22.0'	5 5	00143166 00143166	Saturated medium dense orange fine sand w/	A-2-4(0)	
				18 20	00 14 15 0 F	some coarse sand and silt, trace of gravel.	(-)	
			24.0'		1217371	21" RECOVERY		
		13	24.0'	9 10 11 16		Saturated medium dense orange fine sand w/	A-3	
25.2				16		some coarse sand, trace of silt and gravel.		
			26.0'		00 0 1 1 1 1 1 0 0 00 1 1 1 1 1 1 1 1 1	21" RECOVERY		
		14	26.0'	14	100143164 100143164 100143164	Saturated dense orange fine sand w/ some	A-3	
				14 16 25 36	0:63 13:00 0:613 3:06 0:6173:00	coarse sand, trace of silt.		
					00 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
28			28.0'		12 1 2 2 2 2 2	22" RECOVERY	\rightarrow	
		15	28.0'	9 10 18	13 44 1 6 1 13 1 2 1 2 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1	Saturated medium dense orange fine sand w/ some coarse sand, trace of silt.	A-3	
	-			18 21	17 1 7 3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	some coarse sand, trace of sitt.		
	-		30.0'		EFFA.F6	24" RECOVERY	4 -	
	-	16	30.0'	9		Saturated dense orange fine sand w/ some	A-3	
30.8				9 14 23 24	(1) A 1 (1)	coarse sand, trace of silt and gravel.		
	-				(14 14 15 16 1 (16 14 15 16 1			
	-	17	32.0' 32.0'	9	100 1 7 3 10 U 100 1 4 3 10 U 100 1 3 3 10 U	20" RECOVERY		
	-	''	32.0	14 26 26	(51.43-3167 (51.43-3167 (51.43-3167	goorga and trace of silt and gravel	A-3	
	-			26		coarse sand, trace or sint and graver.		
33.6	-		34.0'		00111100 001111100	24" RECOVERY		
	_	18	34.0'	10 13 16 22		Saturated medium dense orange fine sand w/	A-3	
	-			16 22	(15) 4 3 (C) (15) 4 3 (C) (15) 4 3 (C)	some coarse sand, trace of silt.		
	-				(36.14-)36 ((36.13-13-6 ((36.13-13-6 (
36.4	-	19	36.0' 36.0'	8	1001410	23" RECOVERY	A-3	
30.4	1		00.0	8 10 16 26		Saturated medium dense orange fine sand w/ some coarse sand, trace of silt.	A-3	
				20	(10) (10)			
	1		38.0'	<u>L</u>		18" RECOVERY		
	1	20	38.0'	8 13 18 24		Saturated dense orange fine sand with some		pH sample sent to GTA for
39.2	1			18 24	(34.1°17):41 (34.1°17):41 (34.1°17):41	silt.		testing.
]		40.5		0.6343066 0.6343066 0.6343000	2/11/2021/2021		
			40.0'		<u>liidii.iibi</u>	24" RECOVERY End of Boring		
						Lite of Boring		
42]							
	1							

Symbol Description

Strata symbols



Silty low plasticity clay



Clayey sand



Silty sand



Poorly graded sand with silt



Well graded sand

DRAFT NOT FOR BIDDING AUGUST 2015

Notes:

- 1. Exploratory borings were drilled on 1/26/2009 using a 3 1/4-inch diameter hollow stem auger. Rig is a ATV CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

F.A. Project: U.S. 301 Maryland State Line to I-95 Boring No.: B-4-20

Contract: 28-113-01

Boring Location: Sta. 700+36.79, 224.00' Lt. C.L.

Boring Surface Elev.: + 44.17 Reference:

Wt. of Casing Hammer: Average Fall: IN. Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: IN. Lbs. 30 D-Sampler: S-Sampler: U-Sampler: IN. Type of: Split Barrel O.D. 2 O.D.

IN. IN. Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0 40.0

Water Level Readings

Depth of Casing Time **Depth of Water** Depth of Hole Elev. of Water Date 1/22/09 26.0 24.0 22.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Jason Truver

Helpers: D. Zmijewski

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
2.8	1/22/09	2	1.0' 2.0' 2.0'	3 3 1 5 6 6		Moist firm brown fine sandy silt w/ some coarse sand, trace of gravel. 10" RECOVERY Moist stiff brown clayey silt w/ some fine to coarse sand, trace of gravel.	A-4(0) A-4(3)	Topsoil - 9".
			4.0	5		18" RECOVERY		JG
	•	3	4.0'	5 6 7 8		Moist stiff orange and gray clayey fine sandy silt, trace of coarse sand.	A-6(6)	
5.6			6.0'			15" RECOVERY	45	
		4	6.0	8 11 10 10		Moist very stiff orange and yellow mottled fine sandy silt, trace of coarse sand.	A-4(0)	
8.4		5	8.0' 8.0'	2 2 5 7		23" RECOVERY Moist firm orange and yellow mottled fine sandy silt, trace of coarse sand.	A-4(0)	
11.2		6	10.0' 10.0'	7 8 10 10		20" RECOVERY Moist medium dense orange-yellow mottled silty fine sand. 22" RECOVERY	A-2-4(0)	
		7	12.0'	4 6 9 9		Moist medium dense brown fine to coarse sand w/ some silt, trace of gravel.	A-2-4(0)	
14		8	14.0' 14.0'	4 8 14 13		18" RECOVERY Moist medium dense brown coarse sand and gravel w/ some fine sand and silt. 18" RECOVERY	A-1-b	
		9	16.0'	11 8	1:6343:64 1:1111:11	Moist medium dense orange and vellow	A-1-b	

Remarks:

Reviewed By: Maureen Kelley Soils Supervisor: Randy Ferguson

F.A. Project: U.S. 301 Maryland State Line to I-95 **Contract:** 28-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Clas	ss./G.I. Remarks
				9 11	coarse to fine sand w/ some gravel, trace of silt.	
			18.0'		20" RECOVERY	
		10	18.0'	4 4 5 6	Wet loose yellow fine to coarse sand, trace of silt and gravel.	A-3
40.0				6	Site and graver.	
19.6			20.0'	_	Alef Lifet 18" RECOVERY	
		11	20.0'	5 5 5 6	Wet loose yellow fine to coarse sand, trace of silt and gravel.	A-3
				6	Site and graver.	
			22.0'		AREI 1785 22" RECOVERY	
22.4		12	22.0'	3 6 12 13	Wet medium dense orange fine to coarse sand and gravel w/ some silt.	1-b
				13	and graver wy some sna	
		40	24.0'	E	13" RECOVERY	2.4(2)
		13	24.0'	5 10 5 6	Wet medium dense orange fine to coarse sand w/ some silt and gravel.	2-4(0)
25.2				6		
		14	26.0' 26.0'	4	18" RECOVERY	
		14	26.0	4 7 4 4	Wet medium dense orange coarse to fine sand w/ some silt, trace of gravel.	L-1-b
				4	GHERE BEREE CONTROL	
28	A	15	28.0' 28.0'	5	18" RECOVERY	
			20.0	5 8 10 13	Saturated medium dense orange fine sand w/ A-2 some coarse sand and silt, trace of gravel.	2-4(0)
	•			10		
		16	30.0' 30.0'	8	20" RECOVERY	2.400
30.8		10	30.0	8 11 14 16	Saturated medium dense orange fine sand w/ A-2 some coarse sand and silt, trace of gravel.	2-4(0)
				10		
		17	32.0' 32.0'	8	22" RECOVERY	2.4(0)
		''	32.0	8 11 14 16	Saturated medium dense orange fine sand w/ A-2 some coarse sand and silt, trace of gravel.	2-4(0)
33.6					33569 ************************************	
		18	34.0' 34.0'	9	22" RECOVERY Saturated medium dense orange fine sand w/ A-2	2-4(0)
		10	04.0	9 11 13 18	some coarse sand and silt, trace of gravel.	2-4(0)
					1995 1996 1996	
36.4		19	36.0' 36.0'	8	21" RECOVERY Saturated dense orange fine to coarse sand, A	A-3
30.4			00.0	8 18 24 25	trace of silt and gravel.	3-3
					13255 3366 3366 3466	
		20	38.0' 38.0'	18	14" RECOVERY	pH sample sent to GTA for
				18 20 22 31	with some silt.	testing.
39.2					3.000 3.7000 3.7000 1.7000	
			40.0'		24" RECOVERY End of Boring	
					2.10 01 201.116	
42						

Symbol Description

Strata symbols

Silty sand



Silty low plasticity clay



Low plasticity clay



Poorly graded sand with silt



Well graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

Notes:

- 1. Exploratory borings were drilled on 1/22/2009 using a 3 1/4-inch diameter hollow stem auger. Rig is a ATV CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

40.0

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301 Maryland State Line to I-95 Boring No.: B-4-27

Contract: 28-113-01

Boring Location: Sta. 707+51.38, 263.00' Lt. C.L.

Boring Surface Elev.: + 49.71 Reference:

IN. IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Depth of Casing Depth of Water Time **Depth of Hole** Elev. of Water Date 1/21/09 30.0 28.0 26.6

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dave Burt

Helpers: D. Zmijewski

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
	1/21/09	1	0.5'	4 4 4		Moist firm brown fine sandy silt w/ some clay	A-4(0)	Topsoil - 6".
				-		and gravel, trace of coarse sand.		
			2.0'		WW	12" RECOVERY		
2.8	_	2	2.0'	5 6		Moist medium dense orange silty fine sand w/	A-2-4(0)	_
2.6				5		some coarse sand, trace of gravel.		
						TOR BILL		
		N.	4.0'			18" RECOVERY		
		3	4.0'	4 3 3		Moist loose orange coarse to fine sand w/	A-1-b	
				4		some silt, trace of gravel.	4	
5.6							15	
			6.0'			17" RECOVERY		
		4	6.0'	5 6 5 5		Moist medium dense orange fine to coarse	A-2-4(0)	
				5		sand w/ some silt, trace of gravel.		
			8.0'			21" RECOVERY		
8.4		5	8.0'	5 6 7 2		Moist medium dense orange coarse sand and	A-1-b	
				7 2	:513,3:66 :5177:56 :6177:66	gravel w/ some fine sand and silt.		
					(% (%)) ((() () () () (() () () ()			
			10.0'		00111100 00111100	16" RECOVERY		
		6	10.0'	1 3 4 3		Moist loose orange coarse to fine sand w/	A-1-b	
11.2				3		some silt, trace of gravel.		
11.2								
			12.0'			18" RECOVERY		
		7	12.0'	3 2 6 7		Moist loose orange and yellow coarse to fine	A-1-b	
				6 7		sand w/ some silt, trace of gravel.		
14			14.0'			20" RECOVERY		
		8	14.0'	5 6		Moist medium dense orange and yellow	A-1-b	
				5 6 9 6		coarse sand w/ some gravel, trace of fine sand		
						and silt.		
			16.0'			16" RECOVERY		

Remarks:

Reviewed By: Maureen Kelley Soils Supervisor: Randy Ferguson

F.A. Project: U.S. 301 Maryland State Line to I-95 **Contract:** 28-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
16.8	-	9	16.0'	7 7 5 5		Moist medium dense orange and yellow coarse to fine sand w/ some silt, trace of gravel.	A-1-b	
-		10	18.0' 18.0'	5		23" RECOVERY	A 1 1.	
		10	16.0	5 6 5 6	136 14-116 136 14-136 136 14-136	Moist medium dense orange and yellow coarse to fine sand w/ some silt, trace of	A-1-b	
				6		gravel.		
19.6			20.0'		156 14 15 G	21" RECOVERY		
		11	20.0'	3 5 5 5	11.01.23.10	Moist loose orange and yellow coarse to fine	A-1-b	
				5 5		sand w/ some silt, trace of gravel.		
					666 (446) (466) (567 (1000) (467 (448) (466)			
00.4		12	22.0' 22.0'	5		21" RECOVERY		
22.4		12	22.0	5 8 20 26		Moist medium dense yellow, orange, and brown coarse to fine sand w/ some silt and	A-1-b	
				26		gravel.		
			24.0'			18" RECOVERY		
		13	24.0'	14 17		Moist dense yellow, orange, and brown gravel	A-1-b	
05.0				24 21		and coarse sand w/ some fine sand, trace of		
25.2					(4 (4) F	silt.		
			26.0'		1261436	18" RECOVERY		
		14	26.0'	22 18 11	13.13.13.13.14.1 15.13.13.14.14.14.14.14.14.14.14.14.14.14.14.14.	Moist medium dense yellow, orange, and	A-1-b	
				13	1.613316	brown gravel and coarse sand w/ some fine sand, trace of silt.		
	N	. 17	20.01		i: 13:0 1: 1.1:0			
28		15	28.0' 28.0'	2	15 4 3 6 1 15 4 3 6 1 16 4 1 6 1	18" RECOVERY Wet loose yellow fine to coarse sand, trace of	A-3	
	•			2 3 4 5	1916 136 14 14 16 166 1 7 191	silt and gravel.		
): (] 4 3 : 6 (: (: (: (: (: (: (: (: (: (:			
			30.0'			24" RECOVERY		
30.8		16	30.0'	5 5 7		Saturated medium dense yellow fine to coarse	A-3	
30.8				7		sand, trace of silt and gravel.		
					(1) 13 (1) (2) 13 (1) (1)			
		17	32.0' 32.0'	2 3	10011111	24" RECOVERY Saturated loose yellow fine to coarse sand,	A-3	
				3 3 4	(1) 13:0 (3) 13 13:0 (4) 13 13:0	trace of silt.	71 5	
33.6				,	11.03 4 3 6 1 1 4 1 1 1 1 1 1 1 1 1 2 2 3 1 3 1 0 1			
33.0			34.0'		156 3 A. A. G. 126 3 A A. G. 126 3 A A. G.	24" RECOVERY		
		18	34.0'	10 6 4 4		Saturated loose orange fine to coarse sand,	A-3	
				4	1.01111	trace of silt and gravel.		
36.4		19	36.0' 36.0'	8		24" RECOVERY Saturated medium dense orange fine sand w/	A-2-4(0)	
30.4				8 9 10 10		some silt and coarse sand, trace of gravel.	A-2-4(0)	
				10		6		
			38.0'			24" RECOVERY		
		20	38.0'	5 6 7 9		Saturated medium dense orange brown silty		pH sample sent to GTA for
39.2				7 9		fine to coarse sand.		testing.
00.2								
			40.0'			24" RECOVERY		
						End of Boring		
42								
72								

Symbol Description

Strata symbols



Silty low plasticity clay



Silty sand



Poorly graded sand with silt



Well graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

Notes:

- 1. Exploratory borings were drilled on 1/20/2009 using a 3 1/4-inch diameter hollow stem auger. Rig is a ATV CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

34.0'

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to I-95 **Boring No.:** BR1-04-01

Contract: 25-113-01

Boring Location: Sta. 688+30.49, 67' Rt. C.L.

Boring Surface Elev.: 32.06 Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: IN. Lbs. 30 D-Sampler: S-Sampler: 2 IN. Type of: Split Barrel O.D. IN. IN. O.D. U-Sampler: 3 Ball Sampler Core Bit: O.D.

To: To: **Casing Size:** 3 1/4 Inches From Depth of:

Hollow Stem Auger: From Depth of: 0.0'

Water Level Readings

Elev. of Water **Depth of Water** Time **Depth of Hole Depth of Casing** Date 28.3 32.1 2/15/08 4.0' 4.0' 3.8'

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 76.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corperation **Driller:** Dave Burt

Helpers: J. Hillebrand

Depth	Daily	l	Sample					
(ft.)	Progress	No.	Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
		1	0.0'	1 4		Saturated firm brown silt with some fine sand,	A-4(6)	
				4 4 4		trace of coarse sand and gravel.		
			-0.0'			20" RECOVERY		
—	R	2	2.0'	3			A-4(0)	
2.49				3 5 8 9		fine sand red and clay, trace of gravel.		
-		4		9				
			4.0'	2		15" RECOVERY	4	
		3	4.0'	3 5 18 18		Wet medium dense brown gravelly coarse sand with some fine sand and silt.	A-4(2)	
4.98				18		sand with some time sand and siit.		
			6.0'			18" RECOVERY		
		4	6.0'	10 13 15 14		Wet medium dense brown gravelly coarse	A-2-4(0)	
				15 14		sand with some silt and fine sand.		
7.47								
			8.0'			24" RECOVERY		
		5	8.0'	8		Moist medium dense brown coarse sandy	A-2-4(0)	
				8 12 12 13		gravel, trace of silt and fine sand.	(*)	
				10				
 								
9.96		6	10.0' 10.0'	19		4" RECOVERY	A 2 4(0)	
		0	10.0	19 19 15 13		Moist dense brown fine sandy gravel with some coarse sand, trace of silt.	A-2-4(0)	
				13		some coarse sand, trace or sint.		
<u> </u>								
			12.0'			18" RECOVERY		
12.45		7	12.0'	16 16 17 18		Saturated dense brown coarse to fine sand,	A-2-4(0)	
				17	1: 1:	trace of silt.		

Remarks: Mud Rotary @ 34.0

Reviewed By: Maureen Kelly Soils Supervisor: Randy Ferguson

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
(11)		8	\ 14.0' <i>j</i>	12	1:019 1:00 1:01	6" RECOVERY	A-2-6(0)	
			14.0'	12 12 13 8	130 33.120 130 33.120		A-2-0(0)	
14.94				8	neer ander Derrotein	gravel with some fine sand, trace of silt.		
					00111101 00111101			
			16.0'			5" RECOVERY		
		9	16.0'	5	HATE THE	Saturated medium dense brown fine sandy	A-2-4(0)	
				5 9 8 11	110 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	gravel with some coarse sand, trace of silt.	(*)	
					000 1 3 3 0 0 0 000 1 1 3 3 0 0 0 0 0 1 3 3 0 0	,		
17.43					100 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
			18.0'		1217131 1217131	24" RECOVERY		
		10	18.0'	6 8 7 11		Saturated medium dense brown fine sand with	A-2-4(0)	
				7 11		some silt and coarse sand.		
19.92			20.0'		-	16" RECOVERY		Dance Committee Challes Turks
		U-1	20.0'			No Sample Recovery - Tube Bent		Press Sample - Shelby Tube
			22.0'		-	0" RECOVERY		
22.41						IJRAFI		
		11	24.0'	5		Saturated medium dense brown fine sand with	A-2-4(0)	
		VI. 1	24.0	5 8 8 10		some silt and coarse sand, trace of gravel	A-2-4(0)	
24.9		•		10		some sin and coarse sand, trace of graver.		
			26.0			19" RECOVERY	4	
			20.0				1 5	
						iUS1 70		
				1		3001 20		
27.39								
		12	29.0'	8	-	N.S.A - Sample sent to GTA lab.		pH Sample
				8 10 17 20		Thomas dumpic sem is difficult.		pri aminpro
29.88				20				
			31.0'			20" RECOVERY		
		13	31.0'	15 19		Saturated dense brown fine sand with some	A-2-4(0)	
				15 19 21 23		silt, coarse sand, and gravel.	(-)	
20.07				23				
32.37								
			33.0'			24" RECOVERY		
		14	34.0'	10 10		Saturated medium dense brown fine sand with	A-2-4(0)	
24.00				11		some coarse sand and silt, trace of gravel.	11 2 7(0)	
34.86				10		some course saile and sitt, truce of graver.		
			36.0'			12" RECOVERY		
			3.2.0					
27.05								
37.35								

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I.	Remarks
39.84		15	39.0'	9 12 15 20	Saturated medium dense reddish-brown fine sand with some silt and coarse sand, trace of	
			44.0		gravel.	
			41.0'		24" RECOVERY	
42.33						
		16	44.0'	6	Saturated dense brown fine sand with some A-3	
44.82				6 15 18 25	silt and coarse sand.	
			46.0'		18" RECOVERY	
47.31	N	11		Т	FOR BIDDII	VG.
		V '		ı		NO
49.8		17	49.0'	10 15 20 23	Saturated dense gray silty fine sand, trace of coarse sand.	
					JUS ZU 3	
			51.0'		20" RECOVERY	
52.29						
		18	54.0'	10		
54.78		10	34.0	10 15 23 23	Saturated dense gray silty fine sand, trace of coarse sand and gravel.	
			56.0'		20" RECOVERY	
57.27						
		19	59.0'	18 15 20 20	Saturated dense gray silty fine sand, trace of A-2-4(0)	
59.76				20 20	coarse sand and gravel.	

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Clas	s./G.I. Remarks
(,	- 5.555		61.0'		24" RECOVERY	
62.25						
		20	64.0'	10 12 13 13		1-3
64.74				13 13	with some coarse sand, trace of gravel and seashells.	
			66.0'		20" RECOVERY	
67.23						
		21	69.0'	13 15 17 24		n-3
69.72				17 24	coarse sand and gravel.	
	_					
		+4	71.0'		24" RECOVERY	
		N١			MUK DIDD	ING
72.21						
					DIJOT OO4	
		22	74.0'	12 14	Saturated dense gray fine sand with some silt, A-2	-4(0)
74.7				12 14 17 24	trace of coarse sand, gravel, and organic	
					matter.	
			76.0'		24" RECOVERY Boring Terminated at 75.8'	
					Borning Terminated at 73.6	
77.19						
79.68						
82.17						

Symbol Description

Strata symbols

Silt



Poorly graded clayey silty sand



Silty sand



Well graded gravel with silt



Poorly graded gravel with silt



Well graded sand with silt



Poorly graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

Notes:

1. Exploratory borings were drilled on 2/15/2008 using a 3 1/4-inch diameter continuous flight power auger. Rig is a Truck CME

55

- No free water was encountered at the time of drilling or when re-checked the following day.
- 3. Boring locations were taped from existing features and elevations extrapolated from the final design schematic plan.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

F.A. Project: U.S. 301, Maryland State Line to I-95 **Boring No.:** BR1-04-02

Contract: 25-113-01

Boring Location: Sta. 691+01.78, 67' Rt. C.L.

Boring Surface Elev.: + 30.60 Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: IN. Lbs. 30 D-Sampler: S-Sampler: 2 IN. Type of: Split Barrel O.D. O.D.

IN. IN. U-Sampler: 3 Ball Sampler Core Bit: O.D.

To: To: **Casing Size:** 3 1/4 Inches From Depth of: Hollow Stem Auger: From Depth of: 0.0' 56.0'

Water Level Readings

Depth of Water Time Depth of Hole **Depth of Casing** Elev. of Water Date 2/29/2008 6.0' 6.0' 4.5'

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 75.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corperation Driller: Jason Truver

Helpers: T. Kane

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
		1	0.0'	1 3 5 5		Moist loose brown gravel with some clay, trace of fine to coarse sand.	A-4(3)	
2.49		2	2.0'	6 6 7 7		Moist medium dense brown silty coarse to fine sand with some gravel.	A-4(6)	1G
4.98		3	4.0' 4.0' 6.0'	2 1 2 3		14" RECOVERY Wet very loose brown coarse sand with some fine sand and gravel, trace of silt. 11" RECOVERY	A-4(3)	
7.47		4	6.0'	3 3 11 10	V	Wet medium dense brown coarse sand with some fine sand and clay, trace of gravel. 16" RECOVERY	A-6(3)	
9.96		5	8.0'	4 4 16 16		Wet medium dense brown silty coarse sand with some fine sand, trace of gravel. 9" RECOVERY	A-1-b	
		6	10.0'	8 8 7 7		Wet medium dense brown coarse sand with some fine sand, trace of silt and gravel. 7" RECOVERY	A-2-4(0)	
12.45		7	12.0'	1 2 4 5	M++++++++++	Saturated loose brown fine to coarse sand with some silt, trace of gravel.	A-2-4(0)	

Remarks: Mud Rotary @ 56.0

Reviewed By: Maureen Kelly Soils Supervisor: Randy Ferguson

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

	I	ı	1	1	1			
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
(,	- 33	8	14.0' /	3		13" RECOVERY	A-4(0)	
14.94			14.0'	3 7 7 7		Wet medium dense brown fine to coarse sand with some silt, trace of gravel.	A-4(0)	
			16.0'			17" RECOVERY		
		9	16.0'	8 13 16 20		Wet medium dense brown fine to coarse sand with some silt, trace of gravel.	A-1-b	
17.43			18.0'			16" RECOVERY		
		10	18.0'	2 6 10 12		Saturated medium dense brown fine sand with some silt and coarse sand, trace of gravel.	A-2-4(0)	
19.92			20.0'		-	10" RECOVERY		
22.41						DRAFT		
24.9	N	11	24.0'	6 6 6 7		Saturated medium dense brown silty fine sand with some coarse sand, trace of gravel.	A-2-4(0)	1G
27.39			26.0	lU		3UST 20	15	
		12	29.0'	7		Saturated medium dense brown fine sand with	A-1-b	
29.88		12	29.0	7 13 16 18		some coarse sand, trace of silt.	A-1-0	
			31.0'			16" RECOVERY		
32.37								
34.86		13	34.0'	9 11 18 16		Saturated medium dense brown fine sand with some silt and coarse sand, trace of gravel.	A-2-4(0)	
			36.0'		-	15" RECOVERY		
37.35								

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
		14	39.0'	11 11 12 10		Saturated medium dense brown fine sand with	A-2-4(0)	
39.84				12 10		some coarse sand and silt.		
			44.01			1 (III PEGOVERNA		
			41.0'			16" RECOVERY		
40.00								
42.33								
		15	44.0'	9	1111111		A 2 4(0)	
44.82		15	44.0	9 10 13 16		Saturated medium dense brownish-gray fine sand with some coarse sand, trace of silt.	A-2-4(0)	
						DDAET		
			46.0'			19" RECOVERY		
47.31	R							
					11 2. 10 to 12 23 to 14 14 15 to	OR BIDI	<i></i>	IG
49.8		16	49.0'	9 13 16		Saturated medium dense brownish-gray fine sand with some silt, trace of coarse sand and	A-2-4(0)	
49.0				19		gravel.		
			51.0'			17" RECOVERY		
52.29								
		17	54.0'	9 15 17 24		Saturated dense gray silty fine sand with some	A-2-4(0)	
54.78				17 24		coarse sand.		
			56.0'			20" RECOVERY		
						20 RECOVERT		
57.27								
		18	58.0'	8 12 18 44		Saturated hard gray fine sandy silt with some	A-2-4(0)	
				44		clay, trace of coarse sand and seashells.		
59.76			60.0'			24" RECOVERY		

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth	Daily	l Na	Sample	Blows/6"	Coronia Deceriation	Class /C.I	Domonico
(ft.)	Progress	No.	Sample Depth	Blows/6	Sample Description	Class./G.I.	Remarks
62.25							
		19	63.0'	9 15 19 25	Saturated dense gray silty fine sand, trace of	A-2-4(0)	
				19 25	coarse sand.		
64.74							
04.74			65.0'		24" RECOVERY		
67.23							
		20	68.0'	5	3044 Section 4 decrease 4 section and decide with	A 2 4(0)	
		20	00.0	5 8 15 16	Saturated very stiff gray fine sandy silt with some coarse sand and clay, trace of gravel.	A-2-4(0)	
				10			
69.72			70.0'		24" RECOVERY		
	N	1					
		M			OR BIDI	711	
72.21	•			•			
			_				
		21	73.0'	8 15 20 22	Saturated hard gray fine sandy silt, trace of	A-2-4(0)	
				22	coarse sand.		
74.7			75.01		244 DEGOVERY		
			75.0'		24" RECOVERY Boring Terminated at 75.0'		
77.19							
79.68							
. 5.55							
00.47							
82.17							

Symbol Description

Strata symbols



Poorly graded gravel with clay



Silty sand



Well graded sand with silt



Poorly graded clayey silty sand



Poorly graded sand with silt



Poorly graded sand

DRAFT NOT FOR BIDDING AUGUST 2015

Notes:

- Exploratory borings were drilled on 2/29/2008 using a
 1/4-inch diameter continuous flight power auger. Rig is a ATV CME 55
- No free water was encountered at the time of drilling or when re-checked the following day.
- 3. Boring locations were taped from existing features and elevations extrapolated from the final design schematic plan.
- These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

35.0

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to I-95 **Boring No.:** BR1-04-03

Contract: 25-113-01

Boring Location: Sta. 689+88.45, 50' Lt. C.L.

Boring Surface Elev.: + 29.17 Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: 2 Type of: Split-Barrel O.D. IN. IN. O.D. U-Sampler: 3 Ball Sampler

Core Bit: O.D.

To: To: **Casing Size:** 3 1/4 Inches From Depth of: Hollow Stem Auger: From Depth of: 0.0

Water Level Readings

Depth of Water Time **Depth of Hole Depth of Casing** Elev. of Water Date 2/19/2008 5.5' 6.0' 6.0'

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 75.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corperation **Driller:** Dave Burt

Helpers: A. Joseph

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks	
		1	0.0'	2 2 4 4	Saturated firm brown silt with some fine sand, trace of coarse sand. A-4(0)	
2.49	N	2	2.0'	3 3 2 2	Saturated firm brown silt, trace of fine to coarse sand. A-4(0)	
		3	4.0' 4.0'	1	16" RECOVERY Saturated medium dense brown fine to coarse A-1-a	
4.98				1 2 1 8	sand and gravel, little silt.	
		4	6.0' 6.0'	17 10 9 10	3" RECOVERY Wet medium dense grayish-brown coarse to fine sand with some gravel and silt. A-1-b	
7.47			8.0'		17" RECOVERY	
		5	8.0'	2 3 6 8	Saturated loose grayish-brown silty coarse to fine sand, trace of gravel. A-1-b	
9.96			10.0'		14" RECOVERY	
		6	10.0'	6 6 7	Saturated medium dense brown fine to coarse sand with some silt, trace of gravel. A-7-5(2)	
12.45		7	12.0' 12.0'	4 5 6 6	Saturated medium dense brown fine sand with some coarse sand, trace of silt and gravel. A-2-7(1)	

Remarks: Mud Rotary @ 35.0°

Reviewed By: Maureen Kelly Soils Supervisor: Randy Ferguson

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

14.0 14.0 14.0 14.0	Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
14.94 16.07 16.07 16.07 17.43 18.07 18.0	,,	, 3. 300	8	\ 14.0' <i>/</i>	1			Λ 7 5(2)	
17.42 18.0° 18.0° 19.0	14.94		Ü	14.0'	5 7 7			A-7-3(2)	
17.43 18.0 18.0 19.0 18.0 19.0			0		8			A 2 7(1)	
18.0			9	16.0	9 10 12		i I	A-2-7(1)	
Saturated medium dense brown fine sand with some coarse sand. 10	17.43								
19.92			4.0		10				
19.92			10	18.0	12		il	A-7-5(4)	
11 24.0 15 24.0 15 24.0 15 24.0 2					16		some silt and coarse sand.		
11 24.0 15 24.0 15 24.0 15 24.0 2									
24.9 24.9 24.9 25.0 26.0 27.39 29.88 29.88 29.88 29.88 29.88 20.3 31.0 31.0 34.0 36.0 36.0 36.0 37 RECOVERY 35 Saturated medium dense brown fine sand with some coarse sand and silt. Saturated medium dense brown fine sand with some coarse sand and silt. 17" RECOVERY A -2-4(0) 36.0 17" RECOVERY	19.92			20.0'			24" RECOVERY		
24.9 24.9 24.9 25.0 26.0 27.39 29.88 29.88 29.88 29.88 29.88 20.3 31.0 31.0 34.0 36.0 36.0 36.0 37 RECOVERY 35 Saturated medium dense brown fine sand with some coarse sand and silt. trace of sravel sand with some coarse sand and silt. 17" RECOVERY A-2-4(0) 36.0 17" RECOVERY									
24.9 24.9 24.9 25.0 26.0 27.39 29.88 29.88 29.88 29.88 29.88 20.3 31.0 31.0 34.0 36.0 36.0 36.0 37 RECOVERY 35 Saturated medium dense brown fine sand with some coarse sand and silt. Saturated medium dense brown fine sand with some coarse sand and silt. 17" RECOVERY A -2-4(0) 36.0 17" RECOVERY									
24.9 24.9 24.9 25.0 26.0 27.39 29.88 29.88 29.88 29.88 29.88 20.3 31.0 31.0 34.0 36.0 36.0 36.0 37 RECOVERY 35 Saturated medium dense brown fine sand with some coarse sand and silt. Saturated medium dense brown fine sand with some coarse sand and silt. 17" RECOVERY A -2-4(0) 36.0 17" RECOVERY									
24.9 24.9 24.9 25.0 26.0 27.39 29.88 29.88 29.88 29.88 29.88 20.3 31.0 31.0 34.0 36.0 36.0 36.0 37 RECOVERY 35 Saturated medium dense brown fine sand with some coarse sand and silt. trace of sravel sand with some coarse sand and silt. 17" RECOVERY A-2-4(0) 36.0 17" RECOVERY									
24.9 24.9 24.9 25.0 26.0 27.39 29.88 29.88 29.88 29.88 29.88 20.3 31.0 31.0 34.0 36.0 36.0 36.0 37 RECOVERY 35 Saturated medium dense brown fine sand with some coarse sand and silt. Saturated medium dense brown fine sand with some coarse sand and silt. 17" RECOVERY A -2-4(0) 36.0 17" RECOVERY	22.44								
24.9 24.9 24.9 25.0 26.0 27.39 29.88 29.88 29.88 29.88 29.88 20.3 31.0 31.0 34.0 36.0 36.0 36.0 37 RECOVERY 35 Saturated medium dense brown fine sand with some coarse sand and silt. Saturated medium dense brown fine sand with some coarse sand and silt. 17" RECOVERY A -2-4(0) 36.0 17" RECOVERY	22.41								
24.9 26.0° 27.39 12 28.0° 30 30 30 30 31.0° 13 34.0° 34.86 36.0° 36.0° 30 30 30 30 30 30 30 30 30									
24.9 26.0° 27.39 12 28.0° 30 30 30 30 31.0° 13 34.0° 34.86 36.0° 36.0° 30 30 30 30 30 30 30 30 30							_		
24.9 26.0° 27.39 12 28.0° 30 30 30 30 31.0° 13 34.0° 34.86 36.0° 36.0° 30 30 30 30 30 30 30 30 30									
27.39 12 29.0° 5 8 Saturated medium dense brown fine sand with some coarse sand and silt. 13 34.0° 7 14 14 15 34.0° 3 36.0° 17" RECOVERY 13 36.0° 17" RECOVERY 17" RECOVERY 17" RECOVERY 17" RECOVERY			11	24.0'	11			A-5(0)	
27.39 12 29.0' 5 8 8 10	24.9		A .		12		some coarse sand and silt, trace of gravel.		
27.39 12 29.0'									
27.39 12 29.0'				26.0			15" RECOVERY	4	
27.39 12 29.0'							21161 70	16	
27.39 12 29.0'									
12 29.0' 5 Saturated medium dense brown fine sand with some coarse sand and silt. A-2-4(0)	27.39					1			
31.0' 31.0' 31.0' 17" RECOVERY 13 34.0' 37 14 15 34.86 36.0' 36.0' 17" RECOVERY 17" RECOVERY A-2-4(0) some coarse sand, trace of silt.									
31.0' 31.0' 31.0' 17" RECOVERY 13 34.0' 37 14 15 34.86 36.0' 36.0' 17" RECOVERY 17" RECOVERY A-2-4(0) some coarse sand, trace of silt.									
31.0' 31.0' 31.0' 17" RECOVERY 13 34.0' 37 14 15 34.86 36.0' 36.0' 17" RECOVERY 17" RECOVERY A-2-4(0) some coarse sand, trace of silt.									
31.0' 31.0' 31.0' 17" RECOVERY 13 34.0' 37 14 15 34.86 36.0' 36.0' 17" RECOVERY 17" RECOVERY A-2-4(0) some coarse sand, trace of silt.			12	20.0'	5			A 2 4(0)	
31.0' 31.0' 31.0' 17" RECOVERY 13 34.0' 37 14 15 34.86 36.0' 36.0' 17" RECOVERY 17" RECOVERY A-2-4(0) some coarse sand, trace of silt.			12	29.0	5 8		il	A-2-4(0)	
32.37 13 34.0'	29.88				10		some coarse sand and sm.		
32.37 13 34.0'									
13 34.0' 3 Saturated medium dense brown fine sand with some coarse sand, trace of silt. 34.86 36.0' 17" RECOVERY				31.0'			17" RECOVERY		
13 34.0' 3 Saturated medium dense brown fine sand with some coarse sand, trace of silt. 34.86 36.0' 17" RECOVERY									
13 34.0' 3 Saturated medium dense brown fine sand with some coarse sand, trace of silt. 34.86 36.0' 17" RECOVERY									
13 34.0' 3 Saturated medium dense brown fine sand with some coarse sand, trace of silt. 34.86 36.0' 17" RECOVERY	32.37								
34.86 36.0' 36.0' 36.0' 17" RECOVERY									
34.86 36.0' 36.0' 36.0' 17" RECOVERY									
34.86 36.0' 36.0' 36.0' 17" RECOVERY									
34.86 36.0' 36.0' 36.0' 17" RECOVERY			12	34.0'	3		Cotymotod modium donor bureau fire and 124	A 2 4(0)	
36.0' 17" RECOVERY	04.00		13	04.0	7 14		·I	A-2-4(U)	
36.0'	34.86				15		some course said, trace or sitt.		
36.0'									
37.35				36.0'		64 13 15 E	17" RECOVERY		
37.35 EFFARES STATES ST						0:1143168 0:1143168 0:1143168			
37.35									
	37.35					mirici. Gridica			

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class	ss./G.I. Remarks
			·			
39.84		14	39.0'	6 11 14 20	Saturated medium dense brown fine sand with some silt and coarse sand.	2-4(0)
			41.0'		17" RECOVERY	
42.33						
		15A	44.0'	7 11	Saturated dense brown silty fine sand, trace of A-2-	2-4(0)
44.82			45.0'	23	coarse sand.	
		15B	45.5' 46.0'	23	Saturated dense gray silty fine sand, trace A	A-3
		15B	46.0' 46.3'		Saturated dense gray silty fine sand, trace Coarse gravel 4" RECOVERY Saturated dense gray silty fine sand, trace of	
47.31			0	T	coarse sand. BIDD	ING
49.8		16	49.0' 51.0'	8 14 23 25	Saturated dense gray silty fine sand, trace of coarse sand and gravel. 15" RECOVERY	2-4(0)
52.29		\ U-1	52.0' 52.0'		No recovery. 0" RECOVERY	Press Sample - Shelby Tube.
54.78		17	54.0'	13 11 17 19	Saturated very stiff gray fine sandy silt, trace of coarse sand and seashells.	2-4(0)
54.76				19	of coarse saild and seasiletis.	
			56.0'		15" RECOVERY	
57.27						
59.76		18	59.0'	9 10 22 26	Saturated hard gray fine sandy silt, trace of coarse sand and gravel. A-2-	2-4(0)

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
(111)	·		61.0'			24" RECOVERY		
00.05	-							
62.25	-							
	_							
04.74	-	19	64.0'	13 19 26 34		Saturated dense gray silty fine sand, trace of	A-2-4(0)	
64.74	-			34		coarse sand, gravel, and seashells.		
			66.01			24" BECOVEDY		
	_		66.0'			24" RECOVERY		
67.23	-							
07.23	1							
	-							
69.72	_	20	69.0'	11 15 18 42		Saturated hard gray fine sandy silt with some	A-2-4(0)	
09.72]			42		clay, trace of coarse sand and gravel.		
		١.,	71.0'			24" DECOVERY		
	- N		71.0			24' RECOVERY		JG
72.21		A						
12.21]							
		21	73.0'	8 30 50/3"		Saturated very dense gray silty fine sand with	A-2-4(0)	
	_			50/3"		some coarse sand.		
74.7	-							
, 4.7			75.0'			Boring Terminated at 74.8'		
	-					8" RECOVERY		
	-							
77.19	-							
	-							
	_							
79.68	1							
]							
	-							
	-							
82.17	1							
]							
	-							
	-							
	1	I			I			1

Symbol Description

Strata symbols

Silt

Silty sand

1.00000

Poorly graded sand with silt



Poorly graded clayey silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

Notes:

1. Exploratory borings were drilled on 2/19/2008 using a 3 1/4-inch diameter continuous flight power auger. Rig is a Truck CME

55

- No free water was encountered at the time of drilling or when re-checked the following day.
- 3. Boring locations were taped from existing features and elevations extrapolated from the final design schematic plan.
- These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

F.A. Project: U.S. 301, Maryland State Line to I-95 Boring No.: BR1-04-04

Contract: 25-113-01

Boring Location: Sta. 689+44.36, 52' Rt. C.L.

Boring Surface Elev.: + 30.37 Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: IN. Lbs. 30 D-Sampler: S-Sampler: U-Sampler: IN. Type of: Split-Barrel O.D. 2 O.D.

IN. IN. 3 Ball Sampler Core Bit: O.D.

To: To: **Casing Size:** 3 1/4 Inches From Depth of: Hollow Stem Auger: From Depth of: 0.0' 38.0'

Water Level Readings

Depth of Water Time **Depth of Hole Depth of Casing** Elev. of Water Date 2/15/2008 4.0' 6.0' 6.0'

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 75.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corperation Driller: Cecil Velazlo

Helpers: T. Kane

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks
		1	0.0'	1 2 2 3	Saturated soft brownish-gray silt, trace of fine to coarse sand and gravel. A-3
2.49	N	2	2.0'	2 2 2 1	Saturated soft brownish-gray silt, trace of fine to coarse sand. A-4(0)
4.98		3	4.0'	1 1 2 2	Saturated soft grayish-black silt with some fine sand, clay, and organic matter, trace of coarse sand and gravel. A-4(5)
7.47		4	6.0'	1 5 10 13	Saturated stiff gray silt with some fine sand, trace of coarse sand, gravel, clay, and organic matter. A-4(0)
		5A	8.0' 8.0' 9.0'	2 12	Saturated very stiff gray silt with some fine to coarse sand and gravel, trace of organic A-4(0)
9.96		5B	9.0'	14 11	matter. 12" RECOVERY Saturated medium dense brown coarse to fine sand with some silt, trace of gravel. 8" RECOVERY
12.45		7	12.0'	5 6 7 6	Saturated medium dense brownish-gray fine to coarse sand with some silt, trace of gravel. A-2-4(0)

Remarks: Mud Rotary @ 38.0'

Reviewed By: Maureen Kelly Soils Supervisor: Randy Ferguson

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
	J	8	14.0'	2		16" RECOVERY	A 2 4(0)	
14.94			14.0'	2 3 5 6		Saturated loose brown silty fine to coarse sand, trace of gravel.	A-2-4(0)	
			16.0'			12" RECOVERY		
		9	16.0'	2 6		Saturated medium dense brown fine sand with	A-2-4(0)	
				2 6 7 7		some silt and coarse sand, trace of gravel.		
17.43								
		10	18.0' 18.0'	2		18" RECOVERY	A 2 4(0)	
		10	10.0	2 5 7 9		Saturated medium dense brown fine sand with some silt and coarse sand, trace of gravel.	A-2-4(0)	
19.92			20.0'			17" RECOVERY		
			20.0			1/ KLEOVEKI		
22.41						DRAFI		
22.41								
	R							
		11	24.0'	6 5 6 8		Saturated medium dense brown fine sand with some silt and coarse sand.	A-2-4(0)	
24.9				8		some sin and coarse sand.		
			00.0			101 DECOVERY		
			26.0			19"RECOVERY	15	
						JUOI ZU		
27.39								
		12	29.0'	2		Saturated medium dense brown fine sand with	A-2-4(0)	
29.88				2 6 10 11		some silt and coarse sand, trace of gravel.		
			31.0'			16" RECOVERY		
32.37								
		11.4	04.01					.
34.86		U-1	34.0'			Saturated orange/brown fine sand with some coarse sand, trace of gravel	A-3	Press Sample - Shelby Tube.
54.00						;; 		
			36.0'			24" RECOVERY		
		13	36.0'	2 5 14 19	11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Saturated medium dense brown fine sand with	A-2-4(0)	
				14 19		some coarse sand and silt.		
37.35								

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Damth	Deiba		Commis					
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
			38.0'			24" RECOVERY		
					erikiter Verraeu Gerijaner Verraeu			
		11	39.0'	13			(0)	
39.84		14	39.0	13 15 21 19		Saturated dense brown fine sand with some coarse sand and silt.	A-2-4(0)	
39.04				19		course said and site.		
			41.0'			20" RECOVERY		
			41.0			20 RECOVER I		
42.33								
		15	44.0'	7		Saturated dense gray silty fine sand, trace of	A-2-4(0)	
44.82		13	44.0	7 13 28 23		coarse sand.	A-2-4(0)	
				23		BBAET		
			46.0'			16" RECOVERY		
			40.0					
47.31	R							
		10	40.0	6		·()R BII JI		
		16	48.0′	6 11 20 22		Saturated dense gray fine sand with some silt, trace of coarse sand and gravel.	A-2-4(0)	
				22		trace of course said and graver.		
49.8			F0.01			16" RECOVERY	15	
			50.0'			16" RECOVERY		
52.29								
		17	53.0'	12		C. (. (. 1 . 1	A 2 4(0)	
		17	33.0	12 16 19 23		Saturated dense gray silty fine sand with some coarse sand, trace of gravel.	A-2-4(0)	
				23		6		
54.78			55.0'			24" RECOVERY		
			50.0			24 NEOTEKI		
57.27								
31.21								
		18	58.0'	8		Saturated dense gray fine sand with some	A-2-4(0)	
			55.0	8 14 21 23		clay, trace of coarse sand.	M-2-4(U)	
59.76			60.0'			24" RECOVERY		
\vdash			30.0			2. A200.2A4		

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Darit	Daller		Com-1-			<u> </u>
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I.	Remarks
00.05						
62.25						
		19	63.0'	11		
		13	03.0	11 14 29 42	Saturated hard gray fine sandy silt, trace of coarse sand and gravel. A-4(0)	
				42		
64.74			65.0'		24" RECOVERY	
67.23						
		20	68.0'	10 10 16 22	Saturated very stiff gray fine sandy silt with A-4(0)	
				16 22	some coarse sand and clay, trace of gravel and	
69.72					organic matter.	
03.72			70.0'		24" RECOVERY	
					OR BIDDII	
		V 1				
72.21						
		04	70.0	7		
		21	73.0'	7 13 24 29	Saturated hard gray fine sandy silt with some A-4(0) clay, trace of coarse sand, gravel, and organic	
				29	matter.	
74.7			75.0'		24" RECOVERY	
					Boring Terminated at 75.0'	
77.19						
79.68						
00.47						
82.17						

KEY TO SYMBOLS

Symbol Description

Strata symbols

Silt

Well graded sand with silt

Silty sand

Poorly graded sand

Poorly graded sand with silt



Poorly graded clayey silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

Notes:

- Exploratory borings were drilled on 2/15/2008 using a
 1/4-inch diameter continuous flight power auger. Rig is a ATV CME 55
- No free water was encountered at the time of drilling or when re-checked the following day.
- 3. Boring locations were taped from existing features and elevations extrapolated from the final design schematic plan.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

F.A. Project: U.S. 301, Maryland State Line to I-95 **Boring No.:** BR1-04-05

Contract: 25-113-01

Boring Location: Sta. 690+58.49, 67' Rt. C.L.

Reference: **Boring Surface Elev.:** + 31.21

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: IN. Lbs. 30 D-Sampler: S-Sampler: IN. Type of: Split-Barrel O.D. 2 IN. IN. O.D. U-Sampler: 3 Ball Sampler Core Bit: O.D.

To: To: **Casing Size:** 3 1/4 Inches From Depth of:

Hollow Stem Auger: From Depth of: 0.0' 51.0'

Water Level Readings

Depth of Casing Depth of Water Time **Depth of Hole** Elev. of Water Date 2/20/2008 6.0' 6.0' 3.8'

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 75.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corperation **Driller:** Dave Burt

Helpers: A. Joseph/T. Kane

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks
		1	2.0'	1 2 4 3	Wet firm brown coarse sandy silt with some fine sand and clay, trace of gravel. 24" RECOVERY
2.49		2	2.0'	2 2 3 4	Wet loose brown coarse sand with some gravel fine sand and clay. 14" RECOVERY
4.98		3	4.0'	1 5 7 14	Wet medium dense brown gravelly coarse sand, trace of fine sand and silt. 15" RECOVERY
7.47		4	6.0'	7 17 17 17 14	Wet dense brown gravelly coarse sand with some fine sand and silt. 22" RECOVERY
9.96		5	8.0'	4 10 8 7	Saturated medium dense brownish-gray coarse to fine sand with some silt, trace of gravel.
3.30		6	10.0' 10.0'	3 3 3 3	Wet loose brownish-gray coarse to fine sand, trace of silt and gravel. 17" RECOVERY
12.45		7	12.0'	5 4 4 5	Saturated loose brownish-gray coarse to fine sand, trace of silt and gravel. A-2-4(0)

Remarks: Mud Rotarty @ 51.0'

Reviewed By: Maureen Kelly Soils Supervisor: Randy Ferguson

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

		1	٠.	I	1		Г	T
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
	J	8	14.0'	3	ine da diline Die vysikali	16" RECOVERY	A-2-4(0)	
4404			14.0'	3 4 6 7	6 6 1 3 4 6 6 6 6 1 4 1 1 6 6		112 1(0)	
14.94				,		trace of silt and gravel.		
			16.0'		1:61);;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;	16" RECOVERY		
		9	16.0'	6 7	/********** 	No Sample Recovery		
				10 11	1:01/13/00 1:01/13/00 1:01/17/:01			
17.43					esanaec Hiliniei			
			18.0'		06143166 October	0" RECOVERY		
		10	18.0'	7 10	######################################		A-2-4(0)	
				11 15	106193966 126173760 126173760	with some gravel, trace of silt.		
):(1:):(1 (::11::::(
19.92			00.01		1.61331.0 1.61331.66	011 D 7 G 0 V 7 D V		
19.92			20.0'		::::::::::::::::::::::::::::::::::::::	9" RECOVERY		
					1:61 / 3:66 1:61 / 3:66 3:61 / 6:56			
					0.61143.66 0.61143.66			
					016 13 316 6 376 1 7 316 1 46 1 3 3 1 6 6			
					# 6 1 3 4 1 6 6 12 6 1 4 1 1 6 6 12 6 1 6 1 1 6 6 6	DRAFT		
22.41						IJRAFI		
					0563 (316) 10613 2006 0361 7396 (
					n () 4 3 6 6 () () () ()			
	R				(CE) 13:05 (CE) 13:05 (CE) 13:00			
		11	24.0'	7 10 7 11		Saturated medium dense brown fine sand with	A-4(0)	
24.9		N 1		7 11	12 12 12 12 12 12 12 12 12 12 12 12 12 1	some coarse sand and silt, trace of gravel.		
					130 13.1127 110 11127 111 11127			
			26.0	l <u> </u>		16" RECOVERY	_	
			20.0			10 KECOVEKI	115	
						SUST 20		
27.39				1		5001 20		
21.39					0:6143:66 0:6173:66 66133:66			
					120 JULI 120 120 JULI 120 L 120 JULI 120 L			
					pie i reject. Georgiae Liceionie			
		40	20.01	0	111111111111111111111111111111111111111			
		12	29.0'	9 10 18 19		Saturated medium dense brown fine sand with	A-2-4(0)	
29.88				19		some silt and coarse sand.		
			31.0'			17" RECOVERY		
32.37								
		13	34.0'	9		Saturated medium dense brown fine sand with	A-2-4(0)	
34.86				9 10 13 17		some coarse sand, trace of silt.		
				.,				
			36.0'			16" RECOVERY		
07.05								
37.35								

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
39.84		14	39.0'	10 12 15 20	#	Saturated medium dense brown fine sand with some coarse sand, trace of silt.	A-2-4(0)	
			41.0'			17" RECOVERY		
			41.0		(11) (11) (11) (11) (12) (13) (14) (14) (14) (15) (14) (14) (15)	17 RECOVER I		
42.33					1914.10f. 1917.100 1917.106 1917.100 1913.106			
					rei fance Geldalde Fritzisch Geldalter Geldalter			
44.82		15	44.0'	7 12 18 18		Saturated medium dense brownish-gray fine sand with some silt and coarse sand.	A-2-4(0)	
			46.0'			19" RECOVERY		
47.31						OR BIDI		IG
		'						
49.8		16	49.0'	10 18 22 28		Saturated dense gray fine sand with some silt, trace of coarse sand and gravel.	A-2-4(0)	
			51.0'	10	-	20" RECOVERY		
52.29								
		17	53.0'	12		Saturated very dense grayish-green fine sand	A-2-4(0)	
				12 22 32 39		with some silt and coarse sand, trace of gravel.	Λ-2-4(0)	
54.78			55.0'		_	14" RECOVERY		
57.27								
		18	58.0'	10		Saturated dense grayish-green silty fine sand	A-2-4(0)	
				10 16 22 30		with some coarse sand, trace of gravel.	112 1(0)	
59.76			60.0'		-	24" RECOVERY		

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth	Daily	1	Sample					
(ft.)	Progress	No.	Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
62.25								
		19	63.0'	7		Saturated medium dense grayish-green silty	A-2-4(0)	
				7 12 16 20		fine sand with some coarse sand, trace of	, ,	
04.74						gravel.		
64.74			65.0'			24" RECOVERY		
67.23								
		20	68.0'	7	инжи		4.2.4(0)	
		20	00.0	7 7 16 16		Saturated medium dense grayish-green fine sand with some coarse sand and clay.	A-2-4(0)	
				10		$)$ R Δ F I		
69.72			70.0'			24" RECOVERY		
	N	1						
		M				OR BIDI		IG
72.21	-			_				
			_			NIOT OO		
						4HST 20	15	
		21	74.0'	7		Saturated dense grayish-green fine sand with	A-4(0)	
74.7				7 12 22 25		some clay, trace of coarse sand.	A-4(0)	
			76.0'			24" RECOVERY		
]	Boring Terminated at 76.0'		
77.19								
79.68								
82.17								
	1			1				

KEY TO SYMBOLS

Symbol Description

Strata symbols



Poorly graded clayey silty sand



Well graded sand with silt



Poorly graded sand with silt



Silty sand



Poorly graded sand

DRAFT NOT FOR BIDDING AUGUST 2015

Notes:

- Exploratory borings were drilled on 2/20/2008 using a
 1/4-inch diameter continuous flight power auger. Rig is a Truck CME
 - 55

- No free water was encountered at the time of drilling or when re-checked the following day.
- 3. Boring locations were taped from existing features and elevations extrapolated from the final design schematic plan.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

51.0'

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to I-95 **Boring No.:** BR1-04-06

Contract: 25-113-01

Boring Location: Sta. 688+75.08, 67' Lt. C.L.

Boring Surface Elev.: + 30.20 Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: IN. Lbs. 30 D-Sampler: S-Sampler: 2 IN. Type of: Split-Barrel O.D. O.D.

IN. IN. U-Sampler: 3 Ball Sampler Core Bit: O.D.

To: To: **Casing Size:** 3 1/4 Inches From Depth of: Hollow Stem Auger: From Depth of: 0.0'

Water Level Readings

Depth of Water Time **Depth of Hole Depth of Casing** Elev. of Water Date 2/18/2008 10.0' 10.0 7.4'

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 76.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corperation Driller: Bill Holden

Helpers: T. Kane

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
		1	0.0'	3 5 5 5	Saturated stiff brownish-gray silt with some clay, trace of fine to coarse sand and gravel.	A-4(4)	
2.49		2	2.0'	4 6 9 11	Wet stiff gray silt with some clay, coarse sand, and gravel, trace of fine sand.	A-4(7)	IG
4.98		3	4.0' 4.0' 6.0'	25 41 50/5"	8" RECOVERY Moist very dense brown gravel with some coarse sand, trace of silt and fine sand. 11" RECOVERY	A-4(2)	
7.47		4	6.0'	19 11 12 11	Wet medium dense brown gravelly fine to coarse sand with some silt.	A-1-b	
9.96		5	8.0'	6 6 9 11	Wet medium dense brownish-gray coarse to fine sand with some silt, trace of gravel.	A-1-b	
		6	10.0'	7 10 11 13	Wet medium dense brownish-gray coarse to fine sand with some silt, trace of gravel.	A-1-b	
12.45		7	12.0'	6 12 9 13	Wet medium dense brownish-gray fine to coarse sand with some gravel and silt.	A-4(0)	

Remarks: Mud Rotary @ 51.0

Reviewed By: Maureen Kelly Soils Supervisor: Randy Ferguson

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth	Daily		Sample					
(ft.)	Progress	No.	Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
		8	14.0' / 14.0'	7 0		18" RECOVERY	A-2-4(0)	
14.94			14.0	7 9 9 13		Saturated medium dense brown silty fine sand with some coarse sand.	(-/	
17.34						with some coarse sailu.		
			10.01			14" DECOVEDY		
		9	16.0' 16.0'	5	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	14" RECOVERY Saturated medium dense brown fine sand with	A-6(8)	
				5 7 9 14):(173,1;0°C	some coarse sand and silt.	A-0(0)	
				14	(1111) 1217/1216 141146			
17.43					110 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
		40	18.0'	7		18" RECOVERY		
		10	18.0'	7 13 23 18		Saturated dense brown fine sand with some	A-4(7)	
				18		silt and coarse sand, trace of gravel.		
19.92			20.0'			17" RECOVERY		
22.41						DRAFT		
22.41								
		—		7			$A \vdash C$	
		11	24.0'	7 13 15 23		Saturated medium dense brown fine sand with	A-4(3)	
24.9		A .		23		some silt and coarse sand.		
			26.0			18" RECOVERY	4	
						4UST 20	16	
						3UST 20		
27.39								
		12	29.0'	11	:::::::::::::::::::::::::::::::::::::::	Saturated dense brown fine sand with some	A-3	
00.00		'-		11 12 19 22			A-3	
29.88				22		course sund, trace of sitt.		
			31.0'			17" RECOVERY		
					11			
32.37								
					,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			
					n (
		13	34.0'	10		Saturated dense brown fine to coarse sand,	A-1-b	
34.86				10 17 21 23			71 1 0	
34.00				23				
					1. (1 4 1 1 1 1 1 1-1 1-1 1 1 1 1 1 1 1 1 1 1 1			
			36.0'			24" RECOVERY		
<u> </u>								
_					pat advitit f het i aane v jee i a aie e			
37.35)::1::1:::0 ::11:::0			

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth	Daily	l	Sample			a: /a:	
(ft.)	Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
					100 100 100 100 100 100 100 100 100 100		
39.84		14	39.5'	13 18 21 24	Saturated dense brown fine sand with some coarse sand, trace of silt.	A-1-b	
42.33			41.5'		Title 17" RECOVERY		
42.00					GET JANGE MET JANGE		
44.82		15	44.0'	17 24 41 50/5"	Saturated very dense brown silty fine sand, trace of coarse sand.	A-1-b	
			46.0'		17" RECOVERY		
47.31			0	Τ	FOR BIDI		IG
49.8		16	49.0'	12 18 30 36	Saturated dense gray silty fine sand, trace of coarse sand and gravel.	A-1-b	
52.29			51.0'		19" RECOVERY		
54.78		17	54.0'	12 18 24 26	Saturated dense gray silty fine sand with some coarse sand, trace of gravel.	A-3	
			56.0'		17" RECOVERY		
57.27							
59.76		18	59.0'	7 15 17 34	Saturated hard gray fine sandy silt with some clay, trace of coarse sand and gravel.	A-3	
		<u> </u>			CHESCEPE CONTROL CONTR		

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./0	G.I. Remarks
(10.)	1.1091000		61.0'		21" RECOVERY	
60.05						
62.25						
64.74		19	64.0'	7 16 24 24	Saturated hard gray fine sandy silt, trace of coarse sand.	0)
04.74				24	coarse sand.	
			66.0'		22" RECOVERY	
			00.0		22 KBCOVBAT	
67.23						
			00.01	42	DDAET	
69.72		20	69.0'	13 16 20 23	Saturated hard gray fine sandy silt, trace of A-2-4(coarse sand and gravel.	0)
				23		
	R		71.0'		20" RECOVERY	NIO
		\mathbf{M}			20 RECOVERY	NG
72.21	•			•		
			_			_
					I 31181 2011	
		21	74.0'	12	Saturated very stiff gray fine sandy silt, trace A-2-4(0)
74.7				12 14 16 24	of coarse sand and gravel.	
			76.0'		24" RECOVERY Boring Terminated at 76.0'	
					Bornig Terminated at 70.0	
77.19						
79.68						
82.17						
02.17						

KEY TO SYMBOLS

Symbol Description

Strata symbols



Silty low plasticity clay



Well graded gravel with silt



Silty sand



Poorly graded sand with silt



Poorly graded clayey silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

Notes:

- Exploratory borings were drilled on 2/18/2008 using a
 1/4-inch diameter continuous flight power auger. Rig is a ATV CME 55
- No free water was encountered at the time of drilling or when re-checked the following day.
- 3. Boring locations were taped from existing features and elevations extrapolated from the final design schematic plan.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

56.0'

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to I-95 Boring No.: BR1-04-07

Contract: 25-113-01

Boring Location: Sta. 691+01.90, 29' Lt. C.L.

Boring Surface Elev.: + 31.50 Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: IN. Lbs. 30 D-Sampler: S-Sampler: 2 IN. Type of: Split Barrel O.D. IN. IN. O.D.

U-Sampler: 3 Ball Sampler Core Bit: O.D.

To: To: **Casing Size:** 3 1/4 Inches From Depth of: Hollow Stem Auger: From Depth of: 0.0'

Water Level Readings

Depth of Water Time **Depth of Hole Depth of Casing** Elev. of Water Date 2/29/2008 8.0 6.0' 4.0'

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 75.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corperation Driller: Jason Truver

Helpers: T. Kane

- ·	- ·	1		1	1	T		
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
(11.)	1 Togrooo	1	0.0'	1		Wet firm brownish-gray coarse to fine sandy	A-4(2)	
				1 2 3 6		silt with some clay, trace of gravel.	11 1(2)	
			2.0'	0		11" RECOVERY		
2.49		2	2.0'	8 9 9		Moist medium dense brown coarse sand with	A-1-b	
		V		9		some fine sand and silt, trace of gravel.	<i></i> / `	
				_				
			4.0'_			15" RECOVERY		
		3	4.0'	3	1.153515151 1.151151515151 1.15115151515	Wet loose brown coarse sand with some fine	A-2-4(0)	
4.98				3 3 4 4		sand and gravel, trace of silt.		
4.90				1	1:1:1:1:1:1:1:1:1	J		
		4	6.0' 6.0'	3	10000000000000000000000000000000000000	17" RECOVERY Wet loose brown coarse to fine sand with	A 2 4(0)	
		-	0.0	3 4 5 7	onivicio Certaino Carainer.	some silt, trace of gravel.	A-2-4(0)	
				7	ner erer Gerenen	some sin, trace of graver.		
7.47								
			8.0'			14" RECOVERY		
		5	8.0'	10 8 5 5	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Wet medium dense brown coarse to fine sand	A-7-5(3)	
				5 5	121 12.1101. 1201 12101 1211 13101	with some silt and gravel.		
					(11)3156 (11)3156			
0.00			40.0		100 1 (4) 0 F 100 1 (4) 0 F 100 1 Y 1 (6) 1	10" DECOVEDY		
9.96		6	10.0' 10.0'	4		19" RECOVERY Wet medium dense brownish-gray coarse to	A-2-4(0)	
			10.0	4 6 7 7		fine sand, trace of silt and gravel.	A-2-4(0)	
				7		The said, trace of sit and graver.		
			12.0'		1:1:1:1:1:1:1:1: 1:1:1:1:1:1:1:1: 1:2:1:1:1:1	15" RECOVERY		
12.45		7	12.0'	3 3 10 11		Saturated medium dense brown fine to coarse	A-2-4(0)	
				10		sand with some silt, trace of gravel.		

Remarks: Mud Rotary @ 56.0'

Reviewed By: Maureen Kelly Soils Supervisor: Randy Ferguson

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
	<u> </u>	8	14.0' /	17		14" RECOVERY	A-2-5(0)	
14.94		ŭ	14.0'	17 17 20 26		Wet dense brown coarse to fine sand, trace of silt and gravel.	A-2-3(0)	
		0	16.0'	6	1313 1311 1313 1311 1313 1311	16" RECOVERY	1.0.1(0)	
		9	16.0'	6 6 9 11	pretrike Gertang Gertang Gertang Gertang	Saturated medium dense brown fine sand with some coarse sand and silt, trace of gravel.	A-2-4(0)	
17.43						ON DESCOVED V		
		10	18.0' 18.0'	7 8	176 1 7 116 12 45 1 1 1 1 1 1 1 1 1 15 1 1 1 1 1 1 1 1 1	8" RECOVERY No Sample Recovery		
				7 8 9 10				
19.92			20.0'		11	0" RECOVERY		
					eei poet mii paine mii paine mii paine mii paine mii paine mii paine mii paine			
22.41					in i Anter. Mei i anter Mei i anter Mei i anter. Mei i anter. Mei i anter. Mei i anter. Mei i anter.	DRAFT		
				0				10
24.9		11	24.0'	8 10 10 17		Saturated medium dense brown fine sand with some coarse sand and silt, trace of gravel.	A-2-4(0)	NG
			26.0			19" RECOVERY	1 5	
27.39				\U		GUST 20		
21.59);;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;			
					2001 1300 C 1501 1310 C 1501 1410 C 1501 1410 C			
20.00		12	29.0'	12 11 11 12	000 000 000 000 000 000 000 000 000 00	Saturated medium dense brown fine sand with some coarse sand, trace of silt.	A-2-4(0)	
29.88				12	00111110 1201111111 12011111111			
$\vdash \vdash \vdash$			31.0'			16" RECOVERY		
32.37								
$\vdash \vdash \vdash$					11111111111111111111111111111111111111			
04.00		13	34.0'	7 10 12 17		Saturated medium dense brown fine sand with some coarse sand and silt.	A-2-4(0)	
34.86				17		some course sand and sit.		
			36.0'			16" RECOVERY		
					16143166 16143166 16143166			
37.35					6114366 2017261 4113366			

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
					0017300 0617306 0017300 0617300			
					120 1 4 3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
		14	39.0'	8 10 10 14	100 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	, Saturated integrand delibe of own time band with	A-2-4(0)	
39.84				10 14	1111 1111 1111 1111 1111 1111 1111 1111 1111	some coarse sand, trace of silt.		
					0:63 (436) 1:613 33:66 1:613 33:66			
			41.0'			23" RECOVERY		
					00010000 00010000 00010000 00010000			
42.33					0001111100 00011111100 00011111100			
					120 3 2 4 1 1 1 1 120 1 3 3 3 1 1 120 1 3 3 3 1 1 120 1 3 3 3 1 1			
					11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
44.82		15	44.0'	8 12 17 20		Saturated medium dense brownish gray fine sand with some silt and coarse sand.	A-2-4(0)	
44.02				20				
			46.0'			20" RECOVERY		
47.31				_			-	
						FOR BIDI		J(j
		A .		•				
		16	49.0'_	10 10 11		Saturated medium dense gray fine sand with	A-2-4(0)	
49.8				11 13		some silt, trace of coarse sand and gravel.	15	
				10		JUS1 20		
			51.0'		-	18" RECOVERY		
52.29								
					_			
54.78		U-1	54.0'			No recovery.		Press Sample - Shelby Tube.
			56.0'			0" RECOVERY		
57.27								
		17	58.0'	9 10 15 17		Saturated medium dense gray silty fine sand with some coarse sand, trace of gravel.	A-2-4(0)	
				17		man some course sand, trace of graver.		
59.76			60.0'			24" RECOVERY		

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth	Daily	Ι	Sample		1			
(ft.)	Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
62.25								
		18	63.0'	10 12		Saturated medium dense gray clayey fine sand	A-2-4(0)	
				10 12 15 16		with some coarse sand, trace of gravel.		
64.74								
64.74			65.0'			24" RECOVERY		
67.23								
		19	68.0'	9			4.4(0)	
		19	00.0	9 11 15 26		Saturated very stiff gray fine sandy silt, trace of coarse sand.	A-4(0)	
				20		\square R Δ F \square		
69.72			70.0'			24" RECOVERY		
	A	1						
		M				OR BIDI		
72.21				_				
		20	73.0'	10 11 13 15		Saturated medium dense gray fine sand with	A-2-4(0)	
				15	0014304 0017000 0017000	some silt, trace of coarse sand.		
74.7			75.0'		erranier Berganer Bergener Bergener	24" RECOVERY		
			73.0		# 64 1 4 1 F 1 L	Boring Terminated at 75.0'		
77.19								
79.68								
82.17								
-								
<u> </u>								

KEY TO SYMBOLS

Symbol Description

Strata symbols



Poorly graded clayey silty sand



Silty sand



Well graded sand with silt



Poorly graded sand with silt



Clayey sand



silt

DRAFT NOT FOR BIDDING AUGUST 2015

Notes:

- Exploratory borings were drilled on 2/28/2008 using a
 1/4-inch diameter continuous flight power auger. Rig is a ATV CME 55
- 2. No free water was encountered at the time of drilling or when re-checked the following day.
- 3. Boring locations were taped from existing features and elevations extrapolated from the final design schematic plan.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

36.0'

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to I-95 **Boring No.:** BR1-04-08

Contract: 25-113-01

Boring Location: Sta. 688+30.49, 29' Rt. C.L.

Boring Surface Elev.: + 32.54 Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: IN. Lbs. 30 D-Sampler: S-Sampler: 2 IN. Type of: Split-Barrel O.D. IN. IN. O.D. 3 Ball Sampler

U-Sampler: Core Bit: O.D.

To: To: **Casing Size:** 3 1/4 Inches From Depth of: Hollow Stem Auger: From Depth of: 0.0'

Water Level Readings

Depth of Water Time **Depth of Hole Depth of Casing** Elev. of Water Date 2/18/2088 10.0' 10.0 8.0'

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 75.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corperation **Driller:** Dave Burt

Helpers: J. Hiilebrand

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks
		1	2.0'	5555	Saturated stiff brown silt, trace of fine to coarse sand. 8" RECOVERY
2.49		2	2.0'	3 4 5 5	Saturated stiff brown silt with some fine to coarse sand, trace of gravel. 10" RECOVERY
4.98		3	4.0'	5 18 17 31	Wet dense brown silty gravel with some A-2-4(0) coarse to fine sand.
7.47		4	6.0'	27 18 14 27	Wet medium dense brown coarse sandy gravel with some fine sand and silt. 24" RECOVERY
9.96		5	8.0'	12 9 12 10	Wet medium dense brown coarse sandy gravel with some silt and fine sand. 3" RECOVERY
		6	10.0'	4 6 10 9	Wet medium dense brown coarse to fine sand with some silt, trace of gravel.
12.45		7	12.0'	3 4 6 7	Saturated loose brown coarse to fine sand, A-1-b trace of silt and gravel.

Remarks: Mud Rotary @ 36.0

Reviewed By: Maureen Kelly Soils Supervisor: Randy Ferguson

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I.	Remarks
14.94		8	14.0' <i>/</i> 14.0'	3 10 8 8	Wet medium dense brown fine to coarse sand with some gravel and silt. A-1-b	
17.43		9	16.0' 16.0'	8 8 9 7	12" RECOVERY Saturated medium dense brown fine sand with some silt and coarse sand, trace of gravel. A-1-b	
17.40			18.0'		24" RECOVERY	
		10	18.0'	10 11 9 8	Saturated medium dense brown fine sand with Some coarse sand and silt, trace of gravel.	
19.92			20.0'		24" RECOVERY	
22.41					DRAFT	
	N	11	24.0'	8 11	Saturated medium dense brown fine sand with A-2-4(0)	IG
24.9	ı	,		11 12	some silt, coarse sand, and gravel.	
27.39			26.0	VU	GUST 2015	
29.88		12	29.0'	6 6 12 15	Saturated medium dense reddish-brown fine to coarse sand with some silt, trace of gravel.	
			31.0'		24" RECOVERY	
32.37						
		40	24.01	7		
34.86		13	34.0'	7 7 12 16	Saturated medium dense reddish-brown fine sand with some silt and coarse sand, trace of gravel.	
			36.0'		24" RECOVERY	
37.35						

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth	Daily		Sample			
(ft.)	Progress	No.	Depth	Blows/6"	Sample Description Class./G.I.	Remarks
39.84		14	39.0'	11 11 16 15	Saturated medium dense reddish-brown silty fine sand with some coarse sand, trace of gravel. A-2-4(0)	
			41.0'		18" RECOVERY	
42.33		U-1	42.0'		Saturated dense orange and brown fine sand with some coarse sand. A-3	Press Sample - Shelby Tube.
		15	43.5' 43.5'	6 15 17 20	18" RECOVERY Saturated dense brown fine sand with some A-3 coarse sand, trace of silt and gravel.	
44.82			45.5'		24" RECOVERY	
47.31			O'	Т	OR BIDDIN	IG
49.8		16	49.0' 51.0'	8 10 12 20	Saturated medium dense gray silty fine sand, trace of coarse sand. A-2-4(0) 18" RECOVERY	
52.29						
54.78		17	54.0'	15 19 20 22	Saturated dense gray silty fine sand with some coarse sand, trace of gravel.	
57.27			56.0'		20" RECOVERY	
59.76		18	59.0'	14 12 20 18	Saturated dense gray silty fine sand, trace of coarse sand and gravel. A-2-4(0)	

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G	I. Remarks
			61.0'		20" RECOVERY	
00.05						
62.25						
		19	64.0'	10 11 12 14	Saturated very stiff gray fine sandy silt, trace A-2-4(0)
64.74				12 14	of coarse sand and gravel.	
			66.0'		24" RECOVERY	
67.23						
		20	69.0'	10 10 14 13	Saturated very stiff gray fine sandy silt, trace A-2-4(0)
69.72				14 13	of coarse sand, gravel, and organic matter.	
	_	_				_ _
			71.0'		24" RECOVERY	
		V				
72.21						
		21	73.0'	18		<u> </u>
		21	73.0	18 27 31 40	Saturated hard gray fine sandy silt with some A-2-4(Color, trace of coarse sand, gravel, and organic	
					matter.	
74.7			75.0'		24" RECOVERY	
					Boring Terminated at 75.0'	
77.19						
79.68						
82.17						

KEY TO SYMBOLS

Symbol Description

Strata symbols

ПППП

Silt

Silty sand

1.63333 1.63333 1.63333 Poorly graded sand with silt

Poorly graded sand



Poorly graded clayey silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

Notes:

1. Exploratory borings were drilled on 2/18/2008 using a 3 1/4-inch diameter continuous flight power auger. Rig is a Truck CME

55

- No free water was encountered at the time of drilling or when re-checked the following day.
- 3. Boring locations were taped from existing features and elevations extrapolated from the final design schematic plan.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

F.A. Project: U.S. 301, Maryland State Line to I-95 Boring No.: BR1-05-01

Contract: 25-113-01

Boring Location: Sta. 674+48.48, 75' Lt. C.L.

Boring Surface Elev.: + 51.47 Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: 2 Type of: Split Barrel O.D. IN. IN. O.D.

U-Sampler: 3 Ball Sampler Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 76'

Water Level Readings

Depth of Water Time **Depth of Hole Depth of Casing** Elev. of Water Date 24.5 Dry 1/24/0851.0' 28.8' 1/28/08 1/29/08 28.8 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 76.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corperation Driller: Jason Turner

Helpers: J. Hillebrand

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
		1	0.0'	4 3 4 7		et firm brown coarse sandy silt w/some ne sand and clay, trace of gravel.	A-1-b	
2.49		2	2.0'	7 10 11 14		/et medium dense brown silty coarse to fine and, trace of gravel.	A-1-b	IG
4.98		3	4.0'	4 7 6 7	A JA JA LA LAI	8" RECOVERY Vet medium dense brown coarse sand w/ ome fine sand, gravel, and clay.	A-1-b	
7.47		4	6.0' 6.0'	5 4 3 6		18" RECOVERY Vet firm brown coarse sandy silt w/ some ne sand and clay, trace of gravel. 12" RECOVERY	A-1-b	
9.96		5	8.0'	5 7 5 5	(1) (1) (1) (1) (1) (1)	Vet medium dense brown coarse to fine sand / some silt, trace of gravel.	A-2-4(0)	
		6	10.0'	6 7 7 7		Ioist medium dense brown coarse to fine and w/ some gravel and silt.	A-2-4(0)	
12.45		7	12.0'	5 5 7 8		Joist medium dense brown coarse to fine and w/ some gravel and silt.	A-3	

Remarks:

Reviewed By: Maureen Kelly Soils Supervisor: Randy Ferguson

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth	Daily		Sample					
(ft.)	Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
		8	\ 14.0' /	4		18" RECOVERY	A-1-b	
4464			14.0'	4 5 7 7		Moist medium dense brown coarse to fine		
14.94				'		sand w/ some silt, trace of gravel.		
\vdash								
<u> </u>			16.0'			20" RECOVERY		
		9	16.0'	7 8 9 10		Moist medium dense brown coarse sand w/	A-3	
				10		some fine sand and silt, trace of gravel.		
17.43								
			18.0'			24" RECOVERY		
		10	18.0'	8		Moist medium dense brown coarse to fine	A-3	
				8 8 9 8		sand w/ some silt, trace of gravel.		
						_		
40.00								
19.92			20.0'			24" RECOVERY		
<u> </u>								
						DDAET		
22.41						DRAFT		
		11	24.0'	3	.) 9961			
		/ 1	24.0	3 4 5 5		Saturated loose brown fine to coarse sand w/ some silt, trace of gravel.	A-3	
24.9		4 ,		5		some sin, trace of graver.		
			26.0		1. (1 J 1 J 1 L 	20" RECOVERY		
						4UST 20	16	
						GUST 20		
27.39								
27.00					, tirii. 			
					120 22 22 10 1 120 1 2 2 2 10 1 100 1 2 3 3 6 0			
<u> </u>		40	00.01					
		12	29.0'	6 2 4 7		Saturated loose brown coarse to fine sand w/	A-2-4(0)	
29.88				7		some silt, trace of gravel.		
			31.0'			24" RECOVERY		
						· - -		
32.37								
52.51								
				<u> </u>	ЩЩ			
		13	34.0'	4 6 8 9			A-3	
34.86				9		sand, trace of silt and gravel.		
			36.0'		(** 144) (* 6 (* 144) (* 6 (* 144) (* 6	12" RECOVERY		
			30.0		(*************************************	12 RECOVERT		
27.25					1261			
37.35	l	l	1		H:::::::::::::::::::::::::::::::::::::			l

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
(11.)	1 10g1633		Бори		000 7400 000 33 300 0 320 70 300 0 460 3 300 0			
					130 3 3.310 6 120 1 4 32 4 120 1 3 3 20 6 120 1 7 120 1 120 1 7 120 1			
		14	39.0'	5 9 10	13(13, 13 0 0 13(13, 13 0 0 13(13, 13 0 0	Saturated medium dense brown fine to coarse	A-4(0)	
39.84				10 11	126 1 3 300 6 126 1 7 126 1 126 1 3 3 2 6 126 1 3 3 2 6 126 1 3 3 2 6 6			
			41.0'		166 1 7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	20" RECOVERY		
42.33								
					120 3 1 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
					66 1) 3 1 6 6 1 6 7 3 3 1 6 7 1 7 7 7 3 1 6 7 1 7 7 7 3 1 6 7			
44.82		15	44.0'	4 7 9 11	136 1 3 3 3 1 1 6 136 1 7 3 3 1 1 1 136 1 3 3 1 1 1 1 136 1 3 1 3 1 1 1 1 1 1 1 1 1 1 1 1 1 1	sand w/ some coarse sand, trace of silt and	A-4(0)	
					126 14 12 26 126 1 7 2 2 2 126 1 4 12 2 7 2 1 1 1 1 1 2 2 12 2 1 1 1 1 2 2	gravel.		
			46.0'			24" RECOVERY		
47.04					0631000 13732300 12613300 12613300 12613300			
47.31				Т	60		\mathcal{I}	JG
		11						N O
		16	49.0'	9 10 14	1341 Y 1361 14 1 1 1 1 1 1 1 1 14 1 1 1 1 1 1 1 1 14 1 1 1 1	Sample selected for corrolson potential		pH Testing.
49.8				14 16		testing.	15	
			51.0'	10	126 1 7 3 1 1 1 12 1 4 3 1 6 4 1 2 1 1 3 1 2 1 6 1 2 3 1 3 1 2 1 6		10	
		17	51.0'	17 25 35 23		Saturated dense brown fine sand w/ some silt and coarse sand.	A-2-4(0)	
52.29				23		and course sand.		
			53.0'		-	20" RECOVERY		
54.78		18	54.0'	6 11 11 11	#	some coarse sand, trace of silt.	A-2-4(0)	
					66 6 3 9 6 6 66 8 3 4 3 6 6 66 8 8 3 9 6 6 86 8 8 9 8 8 8 8			
			56.0'		# (1 / 9) # (# (1 / 4) # (# (1 / 1) # (1 # (1 / 1) # (1	24" RECOVERY		
F7.07								
57.27					pop 1 3 3 5 6 6 10 6 3 4 3 5 6 6 3 6 6 7 7 7 7 7 6 6 10 6 7 7 7 7 7 7 7 7			
					1001 7430 U 1001 4330 C 1701 TOUCH 1701 130 C 1707 LICH			
		19	59.0'	9	h: (1 / 4 / 4 / 4 / 4 / 4 / 4 / 4 / 4 / 4 /	Saturated medium dense reddish brown fine	A-2-4(0)	
59.76				9 11 13 17		sand w/ some silt, trace of coarse sand and gravel.	(*,	
						<i>B</i>		

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
()			61.0'			15" RECOVERY		
	-							
62.25	1							
	=							
	-	20	64.0'	9 10 11 13	12 () 4 () 12 () 2 () 1 () 12 () 2 (Saturated medium dense brown fine sand w/	A-4(0)	
64.74	-			11 13		some silt, trace of coarse sand and gravel.		
	=							
			66.0'			14" RECOVERY		
	-				126 1 7 7 2 1 1 126 1 4 3 2 2 126 1 1 1 1 2 2 1			
67.23	-				156 13.3361 126 14 3361 126 14 3361			
	-				66 2 1 3 6 6 156 2 3 4 3 6 6 166 3 4 3 3 6 6			
					riciriici Grijaici			
	-	21	69.0'	10		Saturated medium dense gray silty fine sand	A-4(0)	
69.72	-			10 13 17 24		w/ some coarse sand, trace of gravel.	(-)	
	=							
			71.0'			20" RECOVERY		
		M				UK BIDI		JG
72.21				•		O .		
	-		_					
	-					21181 20	15	
]	22	74.0'	10		Catanata dana amaiah aman sila Sina and	A 4(0)	
74.7			74.0	10 19 20 24		Saturated dense grayish green silty fine sand w/ some coarse sand, trace of gravel.	A-4(0)	
	-					-		
	_		76.0'			24" RECOVERY		
	-					Boring Terminated at 76.0'		
77.19								
	-							
	-							
	-							
79.68]							
	-							
	_							
82.17	1							
52.17]							
]							
	-							
L	1							

KEY TO SYMBOLS

Symbol Description

Strata symbols



Silty low plasticity clay



Silty sand



Poorly graded clayey silty sand



Poorly graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

Notes:

- Exploratory borings were drilled on 1/24/2008 using a
 3 1/4-inch diameter continuous flight power auger. Rig is a truck mounted
 CME 55.
- No free water was encountered at the time of drilling or when re-checked the following day.
- 3. Boring locations and elevations were surveyed by Century Engineering using information contained in the project development scope.
- These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

F.A. Project: U.S. 301, Maryland State Line to I-95 **Boring No.:** BR1-05-02

Contract: 25-113-01

Boring Location: Sta. 678+38.38, 85' Rt. C.L.

Boring Surface Elev.: 61.28 Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: Wt. of Sample Hammer: IN. Lbs. 30 2 Type of: Split Barrel O.D.

Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: D-Sampler: S-Sampler: IN. IN. IN. O.D. U-Sampler: 3 Ball Sampler Core Bit: O.D.

To: To: **Casing Size:** 3 1/4 Inches From Depth of:

Hollow Stem Auger: From Depth of: 0.0' 56.0'

Water Level Readings

Time **Depth of Hole Depth of Casing Depth of Water** Elev. of Water Date 28.8 61.3 1/24/08 32.5' 76.0

 $\begin{array}{c} 61.3 \\ 61.3 \end{array}$

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 76.0' Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corperation **Driller:** Dan Taylor

Helpers: T. Kane

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks
		1	2.0'	2 4 4 5	Wet firm brownish gray silt w/ some fine sand and clay, trace of coarse sand and gravel. 18" RECOVERY
2.49		2	2.0' 4.0'	3 4 6 6	Saturated stiff brown silty clay w/ some fine to coarse sand, trace of gravel. 23" RECOVERY
4.98		3	4.0' 5.0'	2 4	Wet firm brown fine to coarse sandy silt w/ some clay, trace of gravel. 10" RECOVERY
		3A	5.0' 6.0'	5 3	Wet loose brown silty fine sand w/ some A-1-b coarse sand.
7.47		4	6.0' 8.0'	6 9 10 5	9" RECOVERY Moist medium dense brown coarse sandy gravel w/ some fine sand and silt. 19" RECOVERY
9.96		5	8.0'	6 8 9 9	Moist medium dense brown gravelly coarse sand w/ some silt, trace of fine sand.
3.30		6	10.0'	2 5 5 5 5	Wet loose brown coarse sand w/ some silt and fine sand, trace of gravel. 17" RECOVERY
12.45		7	12.0'	5 3 5 5	Wet loose brown silty fine to coarse sand, trace of gravel. A-6(12)

Remarks: Mud Rotary @ 56.0°

Reviewed By: Maureen Kelly Soils Supervisor: Randy Ferguson

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	·	ass./G.I.	Remarks
14.94		8	14.0' / 14.0'	2 4 7 9	Saturated stiff brown silty clay w/ some fine sand, trace of coarse sand.	A-6(5)	
		9	16.0' 16.0' 17.0'	9 9	18" RECOVERY Wet very stiff gray silty fine sandy clay. 9" RECOVERY	A-4(3)	
17.43		9A	17.0'	12 11	ininininini	-2-4(0)	
		10	18.0' 18.0'	3 4 6 10	9" RECOVERY	-2-4(0)	
19.92			20.0'		20" RECOVERY		
		U-1	20.0'		Saturated medium dense brown coarse to fine sand w/ some gravel, trace silt	-2-4(0)	Press Sample - Shelby Tube.
22.41			22.0'		24" RECOVERY		
24.9		11	24.0'	11 13 16 12	Moist medium dense brown silty gravel w/ some fine to coarse sand.	A-1-b	1G
27.39			26.0'	l	3US 201	5	
29.88		12	29.0'	11 15 17 14	Moist dense brown fine sandy gravel w/ some silt, trace of coarse sand.	A-1-b	
			31.0'		15" RECOVERY		
32.37							
34.86		13	34.0'	10 10 9 8	Wet medium dense brown fine sandy gravel w/ some silt, trace of coarse sand.	A -4(0)	
37.35			36.0'		9" RECOVERY		

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

D #	l 5 "						
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	-	44		6			
39.84		14	39.0'	6 7 7 7	Saturated stiff brownish gray coarse sandy silt w/ some fine sand, trace of gravel.	A-2-4(0)	
			41.0'		11" RECOVERY		
42.33							
44.82		15	44.0'	4 5 7 8	Saturated medium dense brownish gray silty fine to coarse sand.	A-2-4(0)	
			46.0'		15" RECOVERY		
			40.0				
47.31	N			Т	FOR BIDI)IV	JG
		V '		I		JII'	
49.8		16	49.0'	12 10 11 13	Saturated medium dense brown silty fine sand w/ some coarse sand.	A-2-4(0)	
			54.0	10			
			51.0'		16" RECOVERY		
52.29							
54.78		17	54.0'	12 14 19 22	Saturated dense brown silty fine sand w/ some coarse sand, trace of gravel.	A-2-4(0)	
				22			
			56.0'		20" RECOVERY		
57.27							
		18	59.0'	8 9 13 13	Saturated medium dense brown silty fine sand	A-2-4(0)	
59.76				13 13	w/ some coarse sand, trace of gravel.		

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
(11.)	1.09.000		61.0'			15" RECOVERY		
62.25								
		19	64.0'	7		Saturated medium dense brownish gray silty	A-2-4(0)	
64.74				7 10 15 17		fine sand w/ some coarse sand.	112 4(0)	
			66.0'			15" RECOVERY		
67.23								
69.72		20	69.0'	9 15 16 18		Saturated dense brownish gray silty fine sand	A-2-4(0)	
09.72				18		w/ some coarse sand.		
		H	71.0'		-	15" RECOVERY		IG
		V						
72.21								
						DITOT OO	4 -	
						-11.51 7()	15	
		21	74.0'	14		Saturated dense gray silty fine sand, trace of	A-2-4(0)	
74.7				14 17 19 22		coarse sand and gravel.	112 1(0)	
			76.0'			20" RECOVERY		
						Boring Terminated at 76.0'		
77.19								
79.68								
<u> </u>								
00.47								
82.17								

KEY TO SYMBOLS

Symbol Description

Strata symbols

Silty low plasticity clay

Low plasticity clay

Clayey sand



Silty sand



Poorly graded sand with silt



Poorly graded sand

DRAFT NOT FOR BIDDING AUGUST 2015

Notes:

- Exploratory borings were drilled on 1/24/2008 using a 3 1/4-inch diameter continuous flight power auger. Rig is a truck mounted CME 55.
- No free water was encountered at the time of drilling or when re-checked the following day.
- 3. Boring locations and elevations were surveyed by Century Engineering using information contained in the project development scope.
- These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

F.A. Project: U.S. 301, Maryland State Line to I-95 **Boring No.:** BR1-05-03

Contract: 25-113-01

Boring Location: Sta. 675+58.34, at C.L.

Boring Surface Elev.: + 59.65 Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: IN. IN. Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: 2 Type of: Split Barrel O.D. O.D.

IN. IN. U-Sampler: 3 Ball Sampler Core Bit: O.D.

To: To: **Casing Size:** 3 1/4 Inches From Depth of: Hollow Stem Auger: From Depth of: 0.0' 76.0'

Water Level Readings

Depth of Water Time **Depth of Hole Depth of Casing** Elev. of Water Date 1/24/08 1/25/08 31.7' Dry 76.0' 27.5' 27.5 1/28/08 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 76.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Gary Turner

Helpers: D. Zmijewski

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
		1	0.0'	3 4 3 4		Saturated firm brown clayey silt w/ some coarse sand, trace of fine sand.	A-4(2)	
			2.0'	2		15" RECOVERY		
2.49		2	2.0	3 5 5 8		Saturated stiff brown silt w/ some clay, trace of fine to coarse sand.	A-1-a	IG
		3	4.0' 4.0'	6		20" RECOVERY Wet very stiff brown fine sandy silt w/ some	A-4(2)	
4.98				6 8 12 14		coarse sand and clay, trace of gravel.	15	
			6.0'			22" RECOVERY		
		4	6.0'	10 12 13 15	onivicti certice certice certice certice onivite provency	Wet medium dense brown gravelly coarse sand w/ some silt and fine sand.	A-1-b	
7.47			8.0'		66433966 110321201 100321201 10033966 10033966 10033966	19" RECOVERY		
		5	8.0'	6 9 10 10	0001001001 00010000 00010000 00010000 00010000 00010000 00010000	Wet medium dense brown gravelly coarse sand w/ some fine sand and silt.	A-1-b	
9.96			10.0'		136 1 3 3 1 1 6 6 136 1 7 3 1 6 1 1 136 1 4 4 4 4 4 4 4 4 4 4	20" RECOVERY		
		6	10.0'	10 12 15 14		Wet medium dense brown coarse sand w/some fine sand, silt, and gravel.	A-3	
			12.0'			19" RECOVERY		
12.45		7A	12.0' 13.0'	4 8		Saturated very stiff brown fine sandy silt, trace of coarse sand. 12" RECOVERY	A-2-4(0)	
		7B	13.0' 13.5'	10		Wet medium dense brown fine sand w/ some	A-2-4(0)	
		7C	13.5'	8		\silt and coarse sand, trace of gravel.	A-6(8)	

Remarks:

Reviewed By: Maureen Kelly Soils Supervisor: Randy Ferguson

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth	Daily		Sample	l				
(ft.)	Progress	No.	Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
		U-1	14.0' <i>/</i> 14.0'			6" RECOVERY	A-6(11)	
14.94			14.0			Saturated very stiff brownish gray silty clay, trace of coarse sand and gravel.	` ,	
17.54						6" RECOVERY		
						Saturated very stiff tan clay with some fine		
		8A	16.0' 16.0'	2		sand	A-2-4(0)	
		8B	16.5' /	4		Saturated firm brownish gray clayey silt w/		
		8C	16.5' \ 17.0' /		V ///	some fine sand.	A-4(3)	
17.43		80	17.0'	5 7		Saturated stiff brown fine sandy silt w/ some	A-2-4(0)	
			18.0'			clay, trace of coarse sand.		
		9	18.0'	8 17 25 22		6" RECOVERY Seturated danse gears to fine and w/ silt	A-2-4(0)	
				22		Saturated dense coarse to fine sand w/ silt, trace gravel.		
					, 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	12" RECOVERY		
19.92			20.0'			Saturated dense brown coarse sandy gravel w/		
					iir ii ii er. Nic i faicu	some fine sand and silt. 13" RECOVERY		
					(66133)66 (66133)66	13 RECOVERT		
					pat salatiet. Nasi salati Pat salatiet			
					anirida Eliliet Eliliet			
00.44								
22.41						DRAFT		
				_				
		10	24.0'	7 12		Saturated medium dense brown gravelly	A-2-4(0)	
24.9		1 ,		14 18	1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1	coarse sand, trace of fine sand and silt.		
			26.0		1:1:1:1:1:1:1:1: 1:1:1:1:1:1:1:1:1:1:1:	17" RECOVERY	4	
						3UST 20	15	
						7U31 /U		
27.39				. •				
		11	29.0'	6		Wat madium dance business according	A 2 4(0)	
		''	29.0	6 11 10 13		Wet medium dense brown coarse sand w/ some gravel and fine sand, trace of silt.	A-2-4(0)	
29.88				13		some graver and time same, trace of sitt.		
					1: 1:			
			31.0'			18" RECOVERY		
					1:1:1:1:1:1:1:			
32.37								
					1:1:1:1:1:1:1: 1:1:1:1:1:1:1:1: 1:			
		12	34.0'	6 7		Wet medium dense brown gravelly coarse	A-2-4(0)	
24.00			07.0	7 15 18		sand, trace of fine sand and silt.	A-2-4(0)	
34.86				18		sand, trace of thic said and sitt.		
			36.0'			20" RECOVERY		
37.35					liiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii			

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

13 39.0' 3 39.0' 12 39.0' 12 39.0' 12 39.0' 13 39.0' 14 39.0' 15 39.0' 16 39.0' 17 39.0' 18 39.0' 19 39.0' 19 39.0' 10	Depth	Daily	l	Sample					Ι
41.0		Progress	No.	Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
42.33 44.82 14									
42.33 14	39.84		13	39.0'	9 12 11 12	000 1 4 3 0 0 0 100 1 2 3 0 0 0 100 1 2 3 1 0 0 100 1 3 3 1 0 0 100 1 3 3 1 0 0		A-2-4(0)	
14 44.0' 5	40.00			41.0'		# (1 3 9) # (# 1 4 4 1 # 6 # 1 3 1 3 1 # 6 # 1 3 3 3 4 6 # 1 3 3 3 6 6 # 1 3 3 3 6 6 # 1 3 3 3 6 6 6 # 1 3 3 3 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	11" RECOVERY		
46.0' Argument	42.33					101132:06			
47.31 47.31 47.31 49.0' 10 13 33 51.0' 10 10 13 34 37 51.0' 10 10 13 10 10 13 13 10 10 10	44.82		14	44.0'	9 7 7 9	661 (306) 661 (306)		A-2-4(0)	
15 49.0' 10 Saturated medium dense brown fine sand w/ some silt and coarse sand, trace of gravel. 51.0' 10 10 10 10 10 10 10	47.31			46.0'					
49.8		l			Π	000 10000 000 10000 000 0000 000 10000 000 10000 000 10000			1G
52.29 16 54.0' 10 10 10 10 10 10 10 10 10 10 10 10 10	49.8		15	A	10 11 13 17		some silt and coarse sand, trace of gravel.	A-2-4(0)	
56.0' 57.27 57.27 19" RECOVERY 19" RECOVERY 110	52.29			51.0'		-	19" RECOVERY		
56.0' 57.27 57.27 19" RECOVERY 19" RECOVERY 110			16	54.0'	10	1111111111	Caturated madium dance brown fine and w/	A 4(0)	
57.27 17 59.0' 12 13151 Saturated dense brown fine sand w/ some A-2-4(0)	54.78		10		10 19 22	12 1 4 1 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2	some coarse sand and silt, trace of gravel.	A-4(0)	
17 59.0' 12 13161 Saturated dense brown fine sand w/ some A-2-4(0)	57.27			56.0'		(36.14-136) (38.14-136) (38.14-136)	19" RECOVERY		
59.76 17 59.0' 15 15 15 15 15 15 15 1						66113066 6613066 66143066			
	59.76		17	59.0'	12 15 29 30		Saturated dense brown fine sand w/ some coarse sand and silt, trace of gravel.	A-2-4(0)	

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
			61.0'			22" RECOVERY		
00.05					11011111111111111111111111111111111111			
62.25					611)466 6011466 6011466			
					000 13 300 0 320 1 2 3 4 6 6 60 1 3 4 6 6 60 1 3 4 7 6 6			
		18	64.0'	13 22 29 32		Saturated very dense brown fine sand w/	A-2-4(0)	
64.74				29 32	00114004 121121000 121121000 121121000	some coarse sand and silt.		
			66.0'		601139166 60114166 60113166	19" RECOVERY		
					66173366 6614366 6617366 6611366			
67.23					155 14 1 16 f. 156 1 7 7 1 1 1 1 156 1 7 7 1 1 1 1 1			
					oritori Celloco Ciloco Celloco Celloco			
					06143166 03117330 66113166			
		19	69.0'	15		Saturated medium dense brown fine sand w/	A-2-4(0)	
69.72				15 13 17 19	1:01 (4:04 1:01 (4:04 1:01 (4:04	some coarse sand and silt.	A-2-4(0)	
	R		71.0'		(64) y (64) 10 (14) 16 (16 (14) 16 (16 (16) 16 (16)	19" RECOVERY		
		M				UR BIIJI		J(j
72.21	•				6 4 4 1 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6			
					renganer Prittier Ernare Ernare		4 —	
					1111 66 1217 121 1211 121 1211 121	21191 20	15	
		20	74.0'	10				
74.7		20	74.0	19 30 36 40	eniddie Deirbei Geldre Geldre Geldre	Saturated very dense brown fine sand, trace of silt and coarse sand.	A-3	
					1001 / 1000 1001 / 1000 1001 / 1000 1001 / 1000 1001 / 1000			
			76.0'		11, 12, 11, 11, 12, 13, 14, 14, 14, 14, 14, 14, 14, 14, 14, 14	24" RECOVERY		
						Boring Terminated at 76.0'		
77.19								
79.68								
82.17								

KEY TO SYMBOLS

Symbol Description

Strata symbols

Low plasticity clay

Silt

1.63333 1.63333 1.63333 Poorly graded sand with silt

Silty sand

00 00 00 00 00 00 0 00 00 00 00 00 00 0

Well graded sand with silt

Poorly graded sand

DRAFT NOT FOR BIDDING AUGUST 2015

Notes:

- Exploratory borings were drilled on 1/24/2008 using a
 3 1/4-inch diameter continuous flight power auger. Rig is a truck mounted
 CME 55.
- No free water was encountered at the time of drilling or when re-checked the following day.
- 3. Boring locations and elevations were surveyed by Century Engineering using information contained in the project development scope.
- These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

29.0'

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to I-95 Boring No.: BR1-05-04

Contract: 25-113-01

Boring Location: Sta. 677+82.45, 89' Rt. C.L.

Boring Surface Elev.: + 57.17 Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: IN. IN. Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: 2 Type of: Split Barrel O.D. IN. IN. O.D. U-Sampler: 3 Ball Sampler

To: To: **Casing Size:** 3 1/4 Inches From Depth of:

Hollow Stem Auger: From Depth of: 0.0'

O.D.

Water Level Readings

Core Bit:

Depth of Water Time Depth of Hole **Depth of Casing** Elev. of Water Date 2/29/08 3/3/08 28.4' Dry 49.0 18.1 3/4/08 18.1 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 76.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corperation Driller: Gary Turner

Helpers: J. Hillebrand

D (1)	Б. 11	1					
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
		1	1.0'	6 7	Wet stiff brown silty fine sandy clay w/s	ome A-4(1)	4" Asphalt - 6" Road Base
			2.0'		coarse sand, trace of gravel. 12" RECOVERY		
2.49		2	2.0'	12 13 15 17	Moist medium dense brown gravelly coar	rse A-1-a	
				15 17	sand w/ some silt, trace of fine sand.		
		M	4.0'		14" RECOVERY	ハーノロい	
		3	4.0'	14 12 8	Wet very stiff brown gravelly fine sandy	silt A-1-b	
4.98				8 8	w/ some coarse sand and clay.		
			Λ		DIICT		
			6.0'		- 18" RECOVERY		
		4	6.0'	5	Wet stiff brown silty fine sandy clay, trac	ce of A-2-4(0)	
				5 6 8	coarse sand and gravel.		
7.47							
			8.0'		20" RECOVERY		
		5	8.0'	5 5 6 7	Wet medium dense brown silty fine sand,	, A-4(0)	
				6 7	trace of gravel and coarse sand.		
9.96			10.0'		10" RECOVERY		
		6	10.0'	11 9	Saturated very stiff brown silty clay w/ so	ome A-2-4(0)	
				11 9 11 12	fine sand, trace of coarse sand.		
			12.0'		12" RECOVERY		
12.45		U-1	12.0'		Saturated medium dense light brown coan	rse to A-3	Press Sample - Shelby Tube.
12.10					fine sand, trace silt and gravel		
			14.0'		24" RECOVERY		
		7	14.0'	4 5	Saturated stiff brown silty clay w/ some f	ine A-2-4(0)	
				4 5 9 11	sand, trace of coarse sand.		

Remarks: Mud Rotary @ 29.0

Reviewed By: Maureen Kelly Soils Supervisor: Randy Ferguson

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

16.0 16.0	Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
8	(111)								
18.0 18.0					5			1.2.7(0)	
18.0 18.0			0	16.0	8 11 27			A-2-5(0)	
19 18.0 20 20 20 20 20 20 20	17.43								
19.92 19.92			0		16				
19.92 19.92			9	16.0	20 26 30			A-1-b	
19.92 10 24.0 16 24.0 16 24.0 16 24.0 16 24.0 16 24.0 26.0						0341493614 04413364 13534366			
22.41 10 24.0 \$\frac{1}{28}\$ Moist dense brown coarse sandy gravel w/ \ \frac{1}{2} \frac	19.92			20.0'		dieirdied Geeldseg Geeldseg	18" RECOVERY		
22.41 10 24.0' 19 20 20 20 20 20 20 20 20 20 20 20 20 20						00111100 00111100 00111100 00111100			
24.9 10 24.0° 16 30 Moist dense brown coarse sandy gravel w/ A-2-4(0) 24.9 11 29.0° 11 4						1201 (4)00			
10 24.0 16 25 25 25 25 25 25 25 2						128 12 32126			
10 24.0 16 25 26.0 24.0 16 25 26.0 24.0 25 26.0 25 26.0	22.41					60133166 60133166 60133166			
10 24.0° 16 28 28 28 28 28 28 28 2							DRAFI		
27.39 AUST 20 15 Substitute of fine sand and silt. 11 29.0' 11 14 13 13 13 14 14 14 14 14 14 14 14 14 14 14 14 14			10	24 0'	16		Moist done a brown goarse gandy gravel w/	A 2 4(0)	
27.39 AUST 20 15 Substitute of fine sand and silt. 11 29.0' 11 14 13 13 13 14 14 14 14 14 14 14 14 14 14 14 14 14	24.9			21.0	20 26 30			A-2-4(0)	
27.39 27.39 11						13 13 13 13 13 13 13 13 13 13 13 13 13 1	\cdot () R R H) H) \	
27.39 11 29.0' 11 12 13 13 14 13 14 13 14 14			N	26.0'		100 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	14"'RECOVERY		
29.88 29.88 31.0' Wet medium dense brown coarse sandy gravel, trace of fine sand and silt. 8" RECOVERY 12 34.0' 15 14 14 14 14 14 14 14 14 14 14 14 14 14									
29.88 29.88 31.0' Wet medium dense brown coarse sandy gravel, trace of fine sand and silt. 8" RECOVERY 12 34.0' 15 14 14 14 14 14 14 14 14 14 14 14 14 14	27.39						21181 20	15	
11 29.0' 14 13 14 13 14 13 17 14 13 17 14 13 17 14 13 17 14 13 17 14 13 17 14 14 14 14 15 17 18 18 18 18 18 18 18					10		JUU 1 20		
29.88 31.0' 31.0' 8" RECOVERY 12 34.0' 15 15 14 14 14 14 14 14 14 14 14 14 14 14 14						ices same c icesanier.			
31.0' 8" RECOVERY 32.37 12 34.0' 15 14 14 14 14 15 15 14 14 14 14 14 14 14 14 14 15 15 16 16 16 16 16 16 16 16 16 16 16 16 16			11	29.0'	11 14 13	128 13 1:1; 6	Wet medium dense brown coarse sandy	A-2-4(0)	
31.0' 8" RECOVERY 32.37 12 34.0' 12 14 14 14 14 14 14 14 14 14 14 14 14 14	29.88				17	61134166 61144166 6114466	graver, trace of time sand and sint.		
32.37 12 34.0' 12 15 14 14 14 14 14 14 14 14 14 14 14 14 14				31.0'			8" RECOVERY		
32.37 12 34.0' 15 14 14 14 14 14 14 14						(1614 1166 (1617 1316) (1617 1316)			
12 34.0' 12 15 Wet medium dense brown coarse sandy gravel, trace of fine sand and silt. 34.86 36.0' 8" RECOVERY	32.37					1000 1000 1 1000 1000 1 1000 1000 1000			
12 34.0' 12 15 Wet medium dense brown coarse sandy gravel, trace of fine sand and silt. 34.86 36.0' 8" RECOVERY						riciriici Asrianea Hilianea Mgaranea			
36.0' 8" RECOVERY						04143166 24173266 44173266 44173266			
36.0' 8" RECOVERY			12	34.0'	12 15		Wet medium dense brown coarse sandy	A-2-4(0)	
	34.86				14 14		gravel, trace of fine sand and silt.		
37.35 				36.0'			8" RECOVERY		
	37.35								

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
39.84		13	39.0'	7 5 7 7	Saturated medium dense brown fine sand w/some coarse sand and silt, trace of gravel.	A-2-4(0)	
40.00			41.0'		10" RECOVERY		
42.33							
44.82		14	44.0'	10 10 13 15	Saturated medium dense brown fine sand w/ some coarse sand and silt.	A-2-4(0)	
47.31			46.0'		DRAFT		
	N	15	49.0'	13 19 30 35	Saturated dense brown fine sand w/ some	A-2-4(0)	IG
49.8			51,0'	35	coarse sand and silt, trace of gravel. 18" RECOVERY	15	
52.29							
54.78		16	54.0'	12 11 15 13	Saturated medium dense brown fine to coarse sand, trace of silt and gravel.	A-2-4(0)	
57.27		17	56.0' 56.0'	21 20 22 34	19" RECOVERY N.S.A.		pH Testing.
			58.0'		ifficit 1 1905 13 1905 13 1905 13 1905 13 1905 13 1905 13 1905 13 1905 13 1905 13 1905 14 1905 14 1905 14 1905 14 1905 14 1905 14 1905 14 1905 14 1905 14 1905 15 1905 16 1905 16 1905 17 1905 18 19 19 19 19 19 19 19 19 19 19 19 19 19		
59.76		18	59.0'	12 14 17 19	Saturated dense brown fine sand w/ some coarse sand, trace of silt and gravel.	A-3	
			61.0'				

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

O O I I I I	25-115							
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
62.25			·		(1111) (1111) (1111) (1111)			
					130 33.130 1. 120 1 4 3 32 6 120 1 4 3 3 6 6 120 1 4 7 5 7 6 1 7			
					66133166 66133166 8613366			
		19	64.0'	16		Cataractal complement Caracanal and	A 2 4(0)	
64.74			04.0	16 21 36 50/3"		Saturated very dense brown fine sand w/ some coarse sand, trace of silt.	A-2-4(0)	
				00,0	# 11 3 1 K C 12 1 1 1 1 K C 14 1 1 1 1 K C 14 1 1 1 1 K C			
			65.8'			21" RECOVERY		
67.23					######################################			
					156143166 1761717617 176113186			
					100 (
					erijairer. Norigairer. Norigairer			
69.72		20	69.0'	17 30 50 80		Saturated very dense brown fine sand w/ some silt, trace of coarse sand and gravel.	A-2-4(0)	
00.112				80		some sitt, trace of coarse said and graver.		
			71.0'			15" RECOVERY		
			71.0		-	13 RECOVER I		
70.04	R							
72.21						OR BIDI		
	"	'		•				
			_					
		21	74.0'	24 24 19 31		Saturated hard gray fine sandy silt, trace of	A-2-4(0)	
74.7				19 31		coarse sand and gravel.		
			76.0'			20" RECOVERY Boring Terminated at 76.0'		
						Borning Fornimated at 70.0		
77.19								
79.68								
82.17								
84.66								
]							

KEY TO SYMBOLS

Symbol Description

Strata symbols

Low plasticity clay



Silty sand



Clayey sand



Poorly graded sand with silt



Poorly graded gravel with silt

DRAFT NOT FOR BIDDING **AUGUST 2015**

Notes:

- Exploratory borings were drilled on 2/29/2008 using a 3 1/4-inch diameter continuous flight power auger. Rig is a truck mounted CME 55.
- No free water was encountered at the time of drilling or when re-checked the following day.
- 3. Boring locations and elevations were surveyed by Century Engineering using information contained in the project development scope.
- 4. These logs are subject to the limitations, conclusions, recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

34.0'

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to I-95 Boring No.: BR1-05-05

Contract: 25-113-01

Boring Location: Sta. 675+37.70, 75' Lt. C.L.

Boring Surface Elev.: 54.29 Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: 2 Type of: Split Barrel O.D. IN. IN. O.D. U-Sampler: 3 Ball Sampler Core Bit: O.D.

To: To: **Casing Size:** 3 1/4 Inches From Depth of:

Hollow Stem Auger: From Depth of: 0.0'

Water Level Readings

Time **Depth of Water** Elev. of Water Depth of Hole **Depth of Casing** Date 2/27/08 2/29/08 27.5' 14.5' 26.8 39.8 34.0' 17.5'

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 75.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corperation Driller: Gary Turner

Helpers: J. Hillebrand

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I.	Remarks
		1	2.0'	3 5 5 5	Saturated stiff brown silt w/ some fine sand and clay, trace of coarse sand and gravel. 12" RECOVERY	
2.49		2	2.0' 4.0'	3 5 5 5 5	Saturated stiff brown silt w/ some clay, trace of fine to coarse sand. 24" RECOVERY	G
4.98		3	4.0' 6.0'	3 5 10 12	Saturated stiff brown silt w/ some clay, trace of fine to coarse sand and gravel. 12" RECOVERY	
7.47		4	6.0'	5 10 10 10	Moist medium dense brown coarse sand w/ some fine sand, trace of silt and gravel. A-2-4(0) A-2-4(0) A-2-4(1) A-2-4(1) A-2-4(1)	
		5	8.0'	2 5 6 10	Saturated stiff brown silt w/ some clay, trace of fine to coarse sand and gravel. A-2-4(0)	
9.96		U-1	10.0' 10.0' 10.9'		24" RECOVERY Saturated brown medium dense coarse to fine sand w/ some gravel, trace silt 10" RECOVERY Pre	ess Sample - Shelby Tube.
12.45		6	12.0'	6 15 13 12	Moist medium dense brown gravelly coarse A-2-4(0)	
				12	sand w/ some fine sand, trace of silt.	

Remarks: Mud Rotary @ 34.0

Reviewed By: Kelly Maureen Soils Supervisor: Randy Ferguson

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

								T
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
	-	7	14.0' /	6	1:1:1:1:1:1:1:1 1:1:1:1:1:1:1:1:1	12" RECOVERY	A 2 4(0)	
\vdash		′	14.0'	10	1-1-1-1-1-1-1	Moist medium dense brown coarse to fine	A-2-4(0)	
14.94				12	1.1.1.1.1.1.1	sand w/ some gravel, trace of silt.		
					1:1:1:1:1:1:1:1	graves, trace of sin		
			16.0'		1217 J.L.	16" RECOVERY		
		8	16.0'	9	0111711C1 611111C1	Moist medium dense brown coarse to fine	A-2-5(0)	
				l a	1:0133.1;01 1:0133.1;01	sand w/ some silt, trace of gravel.	l , ,	
				9	126 1 2 3 3 1 6 6 126 1 7 7 1 1 6 1	_		
17.43					664)4166 66434166			
			40.0		110 1 1 1 1 1 1 1 1 10 1 1 1 1 1 1 1 1 10 1 1 1 1	10" DECOVEDY		
		9	18.0'	1	******	10 KLCOVLK1	4.7(0)	
		9	18.0'	4 5 6 7	1:1:1:1:1:1:1 1:1:1:1:1:1:1:1 1:1:1:1:1	Moist medium dense brown coarse to fine	A-5(0)	
						sand, trace of sift and gravel.		
					1:1:1:1:1:1:1 1:1:1:1:1:1:1:1 1:1:1:1:1			
					1:1:1:1:1:1:1:1			
19.92			20.0'			20" PECOVEDV		
):):):):):):) 			
					1:1:1:1:1:1:1:1			
					1:1:1:1:1:1:1 1:1:1:1:1:1:1:1 1:1:1:1:1			
					1-1-1-1-1-1-1			
					1: 1: 1: 1: 1: 1: 1 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1 1: 1: 1: 1: 1: 1: 1: 1			
22.41								
					1: 1: 1: 1: 1: 1: 1 1: 1: 1: 1: 1: 1: 1: 1			
					1:1:1:1:1:1:1 1:1:1:1:1:1:1:1			
					1-1-1-1-1-1-1			
		- 12		-				
		10	24.0'	5 5 7 5		Wet medium dense brown coarse to fine sand	A-2-4(0)	
24.9		\mathbf{V}		7 5	1:	w/ some silt, trace of gravel.		
24.5								
					961 (1)69 841 y 361			
			26.0			20" RECOVERY	4 —	
			20.0					
						4US 1 70		
						JUOL ZU		
27.39					198 JA 1989 198 J J J J J J J			
21.55								
					1111116			
					00113100 0011100			
\vdash					en i di i e i Di i di i e i Di i di i e i			
l		11	29.0'	2		Wet loose brown coarse to fine sand, trace of	A-2-4(0)	
20.00				2 3 5 7		silt and gravel.		
29.88				'		and grave.		
					1:1:1:1:1:1:1			
			0.4.5:		1:1:1:1:1:1:1:1 1:1:1:1:1:1:1:1			
			31.0'		11-1-1-1-1-1-1-1	1 20" DECAMEDY		
\vdash								
20.07								
32.37					1:1:1:1:1:1:1 1:1:1:1:1:1:1:1 1:1:1:1:1			
					1: 1: 1: 1: 1: 1: 1 1: 1: 1: 1: 1: 1: 1: 1			
					1:1:1:1:1:1:1:1 1:1:1:1:1:1:1:1			
					1:1:1:1:1:1:1			
		12	34.0'	7_		Saturated medium dense brown fine to coarse	A-2-4(0)	
0.55				7 7 7 7		sand w/ some silt, trace of gravel.	112 1(0)	
34.86				7		sand w/ some sitt, trace of graver.		
\vdash			36.0'			12" RECOVERY		
37.35								

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth	Daily		Sample					
(ft.)	Progress	No.	Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
		13	39.0'	5 4 5 7		Saturated loose brown fine sand w/ some silt	A-2-4(0)	
39.84				7		and coarse sand, trace of gravel.		
			41.0'			20" RECOVERY		
42.33								
		14	44.0'	17	-		A 2 4(0)	
44.82		14	44.0	17 23 23 21		Saturated dense brown fine sand w/ some coarse sand and silt.	A-2-4(0)	
44.02				21				
			46.0'			18" RECOVERY		
47.31								
						OR BIDI		
		V						
	_			•				
		15	49.0'_	11			A-2-4(0)	
49.8			Λ	11 18 25 30			15	
						JUOI ZU		
			51.0'			18" RECOVERY		
			5.1.5		(: 1 / 1 / 1 / 1 / 1 / 1 / 1 / 1 / 1 / 1	t U		
					15 (14 3 16 14 14 14 14 15 14 15 15	i l		
52.29								
					156 14 156 176 17 176 176 14 14 15	6		
					1:173.1;¢ 1:173.1;¢ 1:173.1;¢	u E		
F4 70		16	54.0'	16 20 25 27	**************************************		A-2-4(0)	
54.78				27		and coarse sand.		
			56.0'			16" RECOVERY		
57.27					(1) 13 (t 14 14 15 (t 17 17 17 (t)			
					11614116 11617116 11617116	81 8		
						и 6		
):::1":::: :::112::: :::12:::: :::12::::: :::12::::	Ģ r.		
		17	59.0'	8		Saturated medium dense brown fine sand w/	A-2-4(0)	
59.76				8 8 13 16		some silt and coarse sand.	11 2-¬(U)	
				1	m:1212121212121	15		I.

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Contra								
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
			61.0'			16" RECOVERY		
62.25								
-		18	64.0'	12 12 15 19		Saturated medium dense brown fine sand w/	A-4(0)	
64.74				15		some silt, trace of coarse sand.		
			66.0'			18" RECOVERY		
67.23								
01.20	1							
		19	69.0'	11		Saturated dense brown fine sand w/ some silt	A-2-4(0)	
69.72				11 19 25 29		and coarse sand.	112 (0)	
			71.0'			20" RECOVERY		
			7 1.0			20" RECOVERY		
		1						
72.21	-							
		20	73.0'	13 19 19 28	H	Saturated hard gray fine sandy silt w/ some	A-2-4(0)	
				28		clay, trace of coarse sand.		
74.7								
			75.0'			24" RECOVERY		
						Boring Terminated at 75.0'		
77.19								
-								
70.00								
79.68	1							
82.17]							

KEY TO SYMBOLS

Symbol Description

Strata symbols



Silty low plasticity clay



Low plasticity clay



Poorly graded sand with silt



Poorly graded sand



Well graded sand with silt



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

Notes:

- Exploratory borings were drilled on 2/27/2008 using a
 3 1/4-inch diameter continuous flight power auger. Rig is a truck mounted
 CME 55.
- No free water was encountered at the time of drilling or when re-checked the following day.
- 3. Boring locations and elevations were surveyed by Century Engineering using information contained in the project development scope.
- These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

43.5'

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to I-95 Boring No.: BR1-06-01

Contract: 25-113-01

Boring Location: Sta. 699+65.89, 292' Lt. C.L.

Boring Surface Elev.: 29.33 Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: IN. Lbs. 30 D-Sampler: S-Sampler: 2 IN. Type of: Split Barrel O.D. IN. IN. O.D. U-Sampler: 3 Ball Sampler

Core Bit: O.D.

To: To: **Casing Size:** 3 1/4 Inches From Depth of: Hollow Stem Auger: From Depth of: 0.0'

Water Level Readings

Depth of Casing Depth of Water Elev. of Water Time Depth of Hole Date 20.3 29.3 9.0' 2/6/08 10.0 8.0' 29.3 29.3 29.3

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Ft.; Dia. U-Sample Boring: U-Samples: 91.0 Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Danny Taylor

Helpers: A. Joseph

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
	•	1	1.0' 2.0'	3 6		Wet stiff brown clayey silt w/ some fine to coarse sand, trace of gravel. 12" RECOVERY	A-2-4(0)	10" Asphalt
2.49		2	2.0'	5 3 8 27		Wet stiff brown clayey fine sandy silt w/ some coarse sand and gravel.	A-2-4(0)	
			4.0'	Τ		12" RECOVERY		JG
	_	3	4.0'	7 12 6	1:3:3:3:3:3:3: 1:3:3:3:3:3:3:3: 1:3:3:3:3	Wet medium dense orange-brown coarse sand and gravel w/ some fine sand, trace of silt.	A-2-4(0)	
4.98			5.5			6" RECOVERY	15	
		ЗА	5.5' 6.0'	7		Wet stiff orange-brown clay w/ some fine	A-2-4(0)	
		4	6.0'	8 11 11 12		sand, trace of coarse sand and gravel. 6" RECOVERY	A-2-4(0)	
				12		Wet very stiff orange-brown fine sandy silt,		
7.47						trace of coarse sand.		
			8.0'	6		24" RECOVERY		
		5	8.0'	6 6 4 4	120 THE CONTROL OF TH	Saturated loose orange-brown fine to coarse sand w/ some gravel, trace of silt.	A-2-4(0)	
9.96			10.0'		9617466 6614366 8617466	15" RECOVERY		
		6	10.0'	2 4 5 2	Heffich Janusch Leinier Leinier Leinier Janusch	Saturated loose orange-brown fine to coarse sand w/ some silt, trace of gravel.	A-2-4(0)	
			12.0'		100 1 4 4 10 0 0 100 1 2 3 10 0 100 1 4 4 10 0 0	20" RECOVERY		
12.45		7	12.0'	3 3 2 4		Saturated loose orange-brown fine sand w/ some silt, trace of coarse sand and gravel.	A-2-5(0)	
			14.0'			19" RECOVERY		
		8	14.0'	1 2 4 5		Saturated loose orange-brown fine sand w/ some silt, trace of coarse sand and gravel.	A-2-4(0)	

Remarks: Mud Rotary @ 43.5

Reviewed By: Maureen Kelly Soils Supervisor: Randy Ferguson

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
		9	16.0' 16.0'	5 9 7 10		24" RECOVERY Saturated medium dense orange-brown fine	A-3	
17.43				10		sand w/ some silt, trace of coarse sand and gravel.		
17.43			18.0'			22" RECOVERY		
		10	18.0'	4 9 9 9		Saturated medium dense orange-brown fine sand w/ some coarse sand and silt.	A-7-5(9)	
					6111166 6111166 6111166			
19.92			20.0'		6333366 633366 633366 6333366	16" RECOVERY		
					2017326 201326 201326 2017326 2017326			
					00170160 60134160 60144161			
22.41								
						DRAFT		
		11	23.5'	5 4 6 6	miyint miyini miyini miyaliri miyaliri	Saturated loose orange-brown fine sand w/ some coarse sand, trace of silt and gravel.	A-1-b	
24.9				6	in in in in it.	some coarse sand, trace of sitt and graver.		
			25.5' 25.5'	4	i iiii ii iiiii ii iiiii	19" RECOVERY Visual description: Saturated loose orange-		Sample brought to GTA lab
	•		20.0	4 7 8 10	12 <mark>1</mark> 22762 161143166 171171161 161133166	brown fine sand w/ some coarse sand and silt.		for pH testing.
27.39					1217121 1217121 1217121	OC TOLIC	15	
27.00			27.5'			20" RECOVERY	CI	
		12	28.5'	3	etiantei. Gelinee Gelinee Gelinee	Saturated loose orange-brown fine sand w/	A-1-b	
				3 4 5 6		some silt, trace of coarse sand.		
29.88			30.5'			22" RECOVERY		
			30.5		(1) 13:00 (3) 13:00 (6) 13:00 (6) 13:00 (1) 13:00	22 RECOVERT		
					02112120 0211200 0213100 0213100 0213300			
32.37					/2117/20/ 66/13/06 66/13/06/ 66/14/66/			
					onivicio cerrico consider correcc			
		13	33.5'	3 5 9		Saturated medium dense orange-brown fine sand w/ some silt, trace of coarse sand.	A-1-b	
34.86				9		sand w/ some sin, trace of coarse sand.		
			35.5'			21" RECOVERY		
37.35								
37.33								

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	. 5 - 2 - 2	14	38.5'	7 9 10 11	Saturated medium dense green-brown silty fine sand w/ some coarse sand, trace of	A-2-4(0)	
39.84					gravel.		
			40.5'		23" RECOVERY		
42.33							
		15	43.5'	4	Saturated very stiff gray fine sandy silt, trace	A-2-4(0)	
				4 9 9 17	of coarse sand and gravel.	A-2-4(0)	
44.82							
			45.5'		24" RECOVERY		
					DRAFT		
47.31					DIVALI		
							-
					IND BIDI	$\supset IV$	
49.8		16	49.0'	6 9 10 14	Saturated medium dense gray fine sand w/ some silt, trace of coarse sand, gravel, and	A-2-4(0)	\mathbf{V}
49.0				14	organic matter.	4 —	
			51.0'		24" RECOVERY	15	
				10	7001 20	10	
52.29							
54.78		17	54.0'	3 5 5 8	Saturated loose gray clayey fine sand w/ some coarse sand, trace of organic matter.	A-2-4(0)	
			56.0'		24" RECOVERY		
57.27							
		18	59.0'	4	Saturated madium dance are: fine cond/	A-4(0)	
59.76			33.3	4 4 8 12	Saturated medium dense gray fine sand w/ some clay, trace of coarse sand and organic	A-4(U)	
					matter.		
			61.0'		23" RECOVERY		
		U-1	61.5'		No recovery.		Press Sample - Shelby Tube.

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

			1				
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
62.25			63.5'		0" RECOVERY		
64.74		19	64.0'	4 8 9 13	Saturated medium dense gray silty fine sand, trace of coarse sand, gravel, organic matter, and seashells.	A-3	
67.23			66.0'		24" RECOVERY		
69.72		20	69.0' 71.0'	6 12 11 14	Saturated very stiff gray fine sandy silt, trace of coarse sand, gravel, and organic matter. 24" RECOVERY	A-4(0)	
72.21				Τ	OR BIDI		IG
74.7		21	74.0'	9 11 14 27	Saturated very stiff gray clayey fine sandy silt, trace of organic matter and gravel.	A-4(0)	
77.19			76.0'		24" RECOVERY		
79.68		22	79.0' 81.0'	8 9 12 18	Saturated medium dense dark gray silty fine sand, trace of organic matter, coarse sand, gravel, and seashells. 24" RECOVERY	A-2-4(0)	
82.17							
84.66		23	84.0'	15 18 18 24	Saturated hard dark green fine sandy silt, trace of organic matter, coarse sand, and gravel.	A-4(0)	glauconitic.

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description C	Class./G.I.	Remarks
			86.0'		24" RECOVERY		
07.45							
87.15							
		24	89.0'	7 10	Saturated medium dense dark green fine sand A	A-2-4(0)	
89.64			90.0'		w/ some clay, trace of coarse sand, organic		
		24A	90.0'	12 16	matter, gravel, and seashells. 12" RECOVERY Saturated very stiff dark gray clayey silt, trace	A-6(15)	
			91.0		of fine to coarse sand, organic matter, and seashells.		
92.13					12" RECOVERY Boring terminated at 91.0 feet.		
					DRAFT		
94.62							
	R		<u> </u>				
					FOR BIDD		
97.11	•			_			
			Λ		IGUST 201	15	
				\U	GUSI ZU		
00.0							
99.6							
102.09							
104.58							
107.07							

KEY TO SYMBOLS

Symbol Description

Strata symbols



Silty low plasticity clay



Silt



Well graded sand with silt



Low plasticity clay



Poorly graded sand with silt



Silty sand



Poorly graded clayey silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

Notes:

- 1. Exploratory borings were drilled on 2/6/2008 using a 3 1/4-inch diameter continuous flight power auger. Rig is a Truck CME 55.
- 2. Groundwater levels recorded at time of drilling and rechecked the following day.
- 3. Surveyed boring locations and elevations were provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All SPT blow counts are uncorrected.

100.0'

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to I-95 **Boring No.:** BR1-06-02

Contract: 25-113-01

Boring Location: Sta. 671+81.87, 183' Lt. C.L.

Boring Surface Elev.: 32.34 Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: 2 Type of: Split Barrel O.D. IN. IN. O.D. U-Sampler: 3 Ball Sampler Core Bit: O.D.

To: To: **Casing Size:** 3 1/4 Inches From Depth of:

Hollow Stem Auger: From Depth of: 0.0'

Water Level Readings

Elev. of Water Time **Depth of Water Depth of Hole Depth of Casing** Date 6.8' 7.9' 25.5 24.4 2/8/08 8.0' 9.3' 6.0' 2/16/08

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 100.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Wayne Hurd

Helpers: A. Joseph

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks
		1	0.0'	4 2 5 4	No Sample Recovery 4" Topsoil
	<u>'</u>		2.0'		0" RECOVERY
2.49		2	2.0'	3 3 3 4	Wet loose tan fine to coarse sand w/ some silt and gravel. (Fill) A-4(0)
	<u> </u>		4.0'_		10" RECOVERY
4.98		3	4.0'	2 1 5 3	Wet loose tan fine to coarse sand, trace of silt A-1-a and gravel.
	∫ '	<u></u>	6.0'		16" RECOVERY
7.47		4	6.0'	2 1 3 3	Saturated very loose tan coarse to fine sand, trace of silt and gravel. A-2-4(0)
	'		8.0'		EEEEEEE 18" RECOVERY
		5	8.0'	5 4 4 5	Saturated loose tan coarse to fine seand, trace of silt and gravel. A-2-4(0)
9.96	 	6	10.0' 10.0'	3	20" RECOVERY
			12.0'	3 3 4 4	Saturated loose tan to orange-brown coarse to fine sand, trace of silt and gravel. 24" RECOVERY
40.45	'	7	12.0'	2	Saturated very loose orange-brown fine sand A-2-4(0)
12.45				2 1 1 1	w/ some coarse sand and silt, trace of gravel.

Remarks:

Reviewed By: Maureen Kelly Soils Supervisor: Randy Ferguson

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class	ss./G.I.	Remarks
(1.1.)	3. 555	8	\ 14.0' <i> </i>	1	20" RECOVERY	2-4(0)	
14.94		ŭ	14.0'	1 2 3	Saturated very loose light brown fine sand w/ some coarse sand and silt, trace of gravel.	2-4(0)	
			16.0'	2	22" RECOVERY		
		9	16.0'	2 1 3 5	Saturated very loose light brown fine to A-2	2-4(0)	
17.43					izidatiri Ber Aduci Ber adici		
		10	18.0' 18.0'	2 4 5 4	EHIEG 22 RECOVERT	2-5(0)	
19.92			20.0'		18" RECOVERY		
22.41					DRAFT		
		11	23.0' 23.5'	50/4"		2-4(0)	
24.9			O'	Τ	and gravel w/ some coarse sand, trace of silt. 4" RECOVERY		1G
27.39			A	l	BUST 201	5	
		12	28.0'	6 5 7 9	Saturated medium dense light brown fine sand w/ some coarse sand, trace of silt and gravel.	2-4(0)	
29.88			30.0'		20" RECOVERY		
					(9) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1		
					1613 3664 1611 7564 611 3866 611 3866		
32.37					761 3 2 2 2 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4		
		40	20.01	ο		2.472	
		13	33.0'	8 6 7 10	sand w/ some coarse sand, trace of silt.	2-4(0)	
				10	heijsjier Kritykei Grijang Heijsjier		
34.86			35.0'		terrative feitible feitible feitible feitible		
					Titi i diferi Met i Aude Total difere		
					120171201 6013900 10131001		
					Rei 13 sinct Nei 13 sinct Hei 13 since Hei 13 since Hei 13 since		
37.35					(1) (1)(1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1)		

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	-		-				
		14	38.0'	5 7 7 8	Saturated medium dense light brown silty fine	A-2-4(0)	
				8	sand w/ some coarse sand.		
39.84			40.0'		16" RECOVERY		
			40.0		10 RECOVER I		
42.33							
.2.00							
		15	43.0'	3 5 6 6	Saturated medium dense light brown fine	A-2-4(0)	
				6	sand w/ some coarse sand, trace of silt and gravel.		
44.82							
44.62			45.0'		22" RECOVERY		
					\mathbb{L}		
47.31							
		16	48.0'	4	Saturated stiff light gray fine sandy silt, trace	A-2-4(0)	
	_			4 5 8 10	of coarse sand.	12 (0)	
			_				
49.8			50.0'		24" RECOVERY	15	
				10	JUUI 20		
52.29							
		17	53.0'	6		A 2 4(0)	
		17	33.0	6 6 10 16	Saturated very stiff light gray fine sandy silt w/ some coarse sand, trace of organic matter.	A-2-4(0)	
54.78			55.0'		24" RECOVERY		
57.27							
		18	58.0'	6 6 8 13	Saturated medium dense light gray silty fine sand, trace of coarse sand and organic matter.	A-2-4(0)	
				13	sand, trace of coarse sand and organic matter.		
59.76			60.0'		24" RECOVERY		
			00.0		2 · 1230 · 244		

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth	Daily	No.	Sample	Blows/6"		Sample Description	Class./G.I.	Remarks
(ft.)	Progress	INU.	Depth	DIOM9/0		оатъре резоприон	Oid55./G.I.	IVEIIIAINS
62.25								
		19	63.0'	4 6 9 16		Saturated medium dense light gray silty fine sand, trace of coarse sand and organic matter.	A-2-4(0)	
				16		sand, trace of coarse sand and organic matter.		
64.74			65.0'			24" RECOVERY		
			00.0		-	24 RECOVERT		
67.23								
		20	68.0'	4 7 7 9		Saturated medium dense light gray silty fine	A-2-4(0)	
				9		sand, trace of coarse sand, gravel, and organic matter.		
69.72								
			70.0'			24" RECOVERY		
	R							
						FOR BIDI) \	
72.21		•		•				
		21	73.0'	5 7 8 12		Saturated stiff light gray fine sandy silt, trace	A-2-4(0)	
				8 12		of coarse sand, gravel, organic matter, and seashells.		
74.7						seasiens.		
			75.0'			24" RECOVERY		
77.19								
		22	78.0'	10 11		Saturated very stiff gray fine sandy silt w/	A-4(0)	
				12 15		some clay, trace of gravel, coarse sand,	, ,	
79.68						organic matter, and seashells.		
. 0.50			80.0'			24" RECOVERY		
82.17								
02.17								
		23	83.0'	8		Saturated very stiff dark gray fine sandy silt,	A-4(0)	
				8 12 16 25		trace of coarse sand, organic matter, and	A-4(0)	
						seashells.		

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
84.66			85.0'		-	22" RECOVERY		
87.15								
07.10								
		24	88.0'	12 20 30 38		Saturated dense dark gray silty fine sand, trace of coarse sand, organic matter, and	A-2-4(0)	
89.64				30		seashells.		
			90.0'		-	22" RECOVERY		
92.13								
	_					DRAFL		
		25	93.0'	6 7 9 9		Saturated medium dense dark gray silty fine sand, trace of coarse sand, gravel, organic	A-2-4(0)	
94.62	N	14	95.0'	Т		matter, and seashells.	\mathcal{I}	JG
		1	95.0		-	22" RECOVERY	711	NG
			_				4 -	
97.11						5UST 20	15	
		26	98.0'	8		Saturated very stiff dark gray clay w/ some	A-7-6(29)	
	_			8 11 13 16		organic matter, trace of fine sand.	11, 5(2),	
99.6			100.0'			24" RECOVERY		
						Boring terminated at 100.0 feet.		
102.09								
104.58								
104.58								
107.07								
157.07								

KEY TO SYMBOLS

Symbol Description

Strata symbols

Fill

Poorly graded sand

ite ite ite ite ite it ite ite ite ite ite ite it ite ite ite ite ite ite it

Well graded sand with silt



Silty sand



Poorly graded sand with silt



Poorly graded clayey silty sand



High plasticity clay

DRAFT NOT FOR BIDDING AUGUST 2015

Notes:

- 1. Exploratory borings were drilled on 2/8/2008 using a 3 1/4-inch diameter continuous flight power auger. Rig is a ATV CME 55.
- 2. Groundwater levels recorded at time of drilling and rechecked the following day.
- 3. Surveyed boring locations and elevations were provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All SPT blow counts are uncorrected.

F.A. Project: U.S. 301, Maryland State Line to I-95 **Boring No.:** BR1-06-03

Contract: 25-113-01

Boring Location: Sta. 670+28.94, 241' Lt. C.L.

Boring Surface Elev.: 28.54 Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: IN. Lbs. 30 D-Sampler: S-Sampler: 2 IN. Type of: Split Barrel O.D. IN. IN. O.D. U-Sampler: 3 Ball Sampler Core Bit: O.D.

To: To: **Casing Size:** 3 1/4 Inches From Depth of:

Hollow Stem Auger: From Depth of: 0.0' 81.0'

Water Level Readings

Elev. of Water **Depth of Casing** Time Depth of Hole **Depth of Water** Date 2/2/08 2/5/08 7.2' 6.0' 21.3 22.5 22.7 28.5 8.0' 8.5' 6.0' 2/6/08 8.5' 5.8'

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 91.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Bill Holden

Helpers: J. Hillebrand

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
		1	1.0' 2.0'	3 8	135 14 14 15 125 14 13 16 16 16 14 15 16 16 16 14 15 16 16 16 14 15 16 16	Moist loose brown coarse to fine sand w/ some gravel and silt. 10" RECOVERY	A-1-b	10" Asphalt
2.49		2	2.0'	16 14 8 8		Moist medium dense tan and gray fine to	A-2-4(0)	
			4.0'	8		coarse sand w/ some silt and gravel. 14" RECOVERY		JG
	_	3	4.0'	1 2 2		Wet soft gray silt, trace of fine to coarse sand and gravel.	A-4(0)	
4.98			6.0'	4		18" RECOVERY	15	
		4	6.0'	3 4 4		Saturated firm gray silt, trace of fine to coarse sand and clay.	A-4(2)	
7.47			0.01	6		·		
		5	8.0' 8.0'	2 3	(1) (1) (1) (2) (3) (2) (6)	18" RECOVERY Saturated loose gray gravel and fine sand w/	A-1-b	
			9.0'		0617300 0614300 06144160 06141300	some coarse sand, trace of gravel. 5" RECOVERY	71 1 0	
		5A	9.0'	11 10		Saturated stiff gray organic fine sandy silt w/	A-4(0)	
9.96		6	10.0' 10.0'	5		some coarse sand, trace of gravel. 10" RECOVERY	A-1-b	
			10.0	5 10 14		Saturated medium dense orange gravel and	A-1-0	
				16	(1111) 1217121 1417121	coarse to fine sand, trace of silt.		
					110 2 3 3 1 0 0 0 10 1 2 3 3 0 0 0 10 1 2 3 3 0 0 0	100 00000000000000000000000000000000000		
40.45		7	12.0' 12.0'	W/R	12.17.12.12 12.17.12.12 12.17.12.12.13	18" RECOVERY Saturated very loose orange fine to coarse	A-3	
12.45				W/R 1	erijaec Eriaec Eriaec	sand w/ some gravel, trace of silt.	N-3	
				"		, , , , , , , , , , , , , , , , , , ,		
			44.0'		15(13.1)01. 16(143.6) 16(13.1)06(O" DECOVERY		
		U-1	14.0' 14.0'			9" RECOVERY Wet orange fine to coarse sand, trace of silt	A-3	Press Sample - Shelby Tube.
						and gravel.		11000 bumple bheloy 1 doc.

Remarks: Mud Rotary @ 81.0'

Reviewed By: Maureen Kelly Soils Supervisor: Randy Ferguson

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth	Daily	No.	Sample	Blows/6"		Sample Description	Class./G.I.	Remarks
(ft.)	Progress		Depth		0: 6 3 1 3:00 t 1:6 1 4 3:16 6 1:6 1 7 3:16 0			
			16.0'		100 1 4 3 10 0 1 4 4 4 4 4 6 1 1 6 6 7 4 4 6 6 1 6 7 4 4 4 6 6	20" RECOVERY		
		8	16.0'	10 9 12 15	onivici Colleg Colleg	Saturated medium dense orange fine sand w/ some coarse sand, trace of silt and gravel.	A-3	
17.43				15	0013386 1701717171 4013386	some coarse sand, trace of sitt and graver.		
17.43			18.0'		1361 Y 1361 1361 Y 1364 1361 Y 1361	18" RECOVERY		
		9	18.0'	7 7 8 12	######################################	Saturated medium dense orange fine sand w/	A-3	
				12	121177720 12147720 12177720 12177720	some coarse sand, trace of silt and gravel.		
19.92			20.0'		198 JAA1966. 198 JAA1966 198 JAA1966 JAA197 JAA19	18" RECOVERY		
			20.0		100000000 100000000 100000000000000000	16 KLCOVEKT		
					1761 TELEC 664 13466 1867 TELEC 1867 TELEC 1			
					00123000 00170001 0013400 0014101			
22.41					06114306 10114306 101143066			
					10 14 16 16 16 16 16 16 16	DDAET		
					11.61431.61 64443.61 66443.61 66443.66	DRAFI		
		10	24.0'	7 6	00111100 0111100 0011100 0011100	Saturated medium dense orange fine sand w/	A-3	
24.9	R			7 8		some coarse sand, trace of silt.		
		M ($\cdot \cup R \; B H \; H$		
		,	26.0'			19" RECOVERY		
					100 1 3 3 1 0 0 100 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		4 =	
27.39						GUST 20	15	
				10	ierianer Bergree Bergree	JOO1 Z0		
					66113166 10111166 10111166			
		11	29.0'	11 5		Saturated 1999e orange into same we some sine	A-2-4(0)	
29.88				5 10		and coarse sand.		
			31.0'			22" RECOVERY		
			01.0			22 NECOVERT		
20.07								
32.37					0614366 0617060 0617060			
					nei / 1 ne 1614 1966 1717 1717 1717 644 1976			
		4.5	0.4.5:	E				
34.86		12	34.0'	5 7 9	98179969 8831996 8838396 8833996	Saturated medium dense brown fine sand w/ some coarse sand, trace of silt.	A-3	
04.00				11	neigrier Deirber Erziner Erziner Deigre			
			36.0'		1201 73102 1611 3366 1761 737617 1611 3366	21" RECOVERY		
					eciánici. Nel rance Delia dec Delia dec			
37.35					6613466 6614466 6614466			

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Clas	ıss./G.I.	Remarks
(11.)	Flogless		Берит		Fitte Titer Titer		
39.84		13	39.0'	10 8 14 10	Saturated medium dense brown-gray silty fine A-Z sand, trace of coarse sand and gravel.	2-4(0)	
33.04				10	5		
			41.0'		21" RECOVERY		
42.33							
		14	44.0'	7 10 16 20		2-4(0)	
44.82				20	w/ some coarse sand, trace of gravel and organic matter.		
			46.0'		21" RECOVERY		
			1010		DDAET		
47.31					UKAFI		
	N			Т	TOR RIDD	IN	IC
40.0		15	49.0'	10 9 10 11	Saturated medium dense gray silty fine sand, A-Z trace of coarse sand, gravel, and organic	2-4(0)	1 U
49.8			_	11	matter.		
			51.0'		24" RECOVERY	5	
		U-2	51.0'	10	Saturated medium dense gray clayey fine to A-2 coarse sand.	2-4(0)	Press Sample - Shelby Tube.
52.29							
			53.0'		15" RECOVERY		
		16	54.0'	5 6 8 9		2-4(0)	
54.78				9	w/ some coarse sand, trace of organic matter.		
			56.0'		24" RECOVERY		
57.27							
		17	59.0'	4 6		2-4(0)	
59.76				4 6 6 11	trace of coarse sand and organic matter.		
			64.0		24" RECOVERY		
			61.0'		24" RECOVERY		

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
62.25			-1					
64.74		18	64.0'	5 7 11 22	t	Saturated medium dense gray silty fine sand, trace of coarse sand, gravel, and organic matter.	A-2-4(0)	
			66.0'			20" RECOVERY		
67.23								
69.72		19	69.0' 71.0'	8 8 8 16		Saturated medium dense gray silty fine sand, trace of coarse sand, silt, and organic matter. 24" RECOVERY	A-2-4(0)	
72.21	N)	Т		OR BIDI		IG
74.7		20	74.0'	8 10 10 17		Saturated medium dense gray fine sandy silt w/some coarse sand and clay, trace of gravel and organic matter.	A-4(0)	
77.19			76.0'			19" RECOVERY		
79.68		21	79.0' 81.0'	8 12 15 19	t	Saturated medium dense gray silty fine sand, trace of coarse sand, gravel, and organic matter. 24" RECOVERY	A-2-4(0)	
82.17			01.0			24 RECOVERT		
84.66		22	84.0'	14 21 19 23		Saturated dense green-gray silty fine sand, trace of organic matter and coarse sand.	A-2-4(0)	glauconitic

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

	act. 25-113	-01			
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks
			86.0'		20" RECOVERY
87.15					
		23	89.0'	14	Saturated dense gray-green silty fine sand w/ A-2-4(0) glauconitic
89.64				14 14 18 20	some organic matter, trace of coarse sand and
					gravel.
			91.0'		Boring terminated at 91.0 feet.
92.13					
32.13					
					DRAFT
94.62					
					FOR BIDDING
		A .			
97.11			_		
					GUST 2015
				1	13031 Z013
99.6					
102.00					
102.09					
104.58					
107.07					
	1	I		1	

KEY TO SYMBOLS

Symbol Description

Strata symbols

Poorly graded sand with silt

Silty sand



silt



Poorly graded clayey silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

Notes:

- 1. Exploratory borings were drilled on 2/2/2008 using a 3 1/4-inch diameter continuous flight power auger. Rig is a Truck CME 55.
- 2. Groundwater levels recorded at time of drilling and rechecked the following day.
- 3. Surveyed boring locations and elevations were provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All SPT blow counts are uncorrected.

50.0'

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to I-95 Boring No.: BR1-06-04

Contract: 25-113-01

Boring Location: Sta. 671+25.11

Boring Surface Elev.: 28.78 Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: IN. Lbs. 30 D-Sampler: S-Sampler: 2 IN. Type of: Split Barrel O.D. IN. IN. O.D. U-Sampler: 3 Ball Sampler Core Bit: O.D.

To: To: **Casing Size:** 3 1/4 Inches From Depth of:

Hollow Stem Auger: From Depth of: 0.0'

Water Level Readings

Time Depth of Hole **Depth of Casing Depth of Water** Elev. of Water Date 20.8 22.8 22.8 28.8 2/4/08 10.0' 12.0'8.0' 2/6/08 6.0' 6.0' 2/7/08 6.0' 6.0'

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 101.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Danny Taylor

Helpers: A. Joseph

		1		1	_			1
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
		1	0.5'	7 12 11		Moist medium dense orange-brown fine to	A-2-4(0)	6" Asphalt
				11		coarse sand w/ some silt, trace of gravel. (Fill)		
			2.0'			16" RECOVERY		
0.40		2	2.0'	8		Moist medium dense orange-brown silty fine	A-2-4(0)	
2.49				8 6 7 7		to coarse sand, trace of gravel. (Fill)	1121(0)	
				/				
-		A .					—	
			4.0'	-	\bowtie	24" RECOVERY		
		3	4.0'	5 4		wet loose tall coarse to fille sailu, trace of	A-1-b	
4.98				5 3			15	
						711.31/1		
			6.0'	1	1.	15" RECOVERY		
		4	6.0'	4 4 10		Wet loose tan coarse to fine sand w/ some silt	A-1-b	
				10		and gravel.		
7.47			7.5'			18" RECOVERY		
7.47		4A	7.5	3		Wet stiff gray organic fine sandy clay w/	A-7-5(3)	
		5	8.0'	2		some coarse sand, trace of gravel.	A-4(2)	
		5A	8.0' \ 8.5' /			6" RECOVERY		
) JA	8.5'	8 14 13	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Saturated stiff gray clayey silt w/ some fine to	A-1-b	
						coarse sand and gravel, trace of organic		
9.96			10.0'			matter. 6" RECOVERY		
		6	10.0'	10 11		Saturated medium dense orange-brown gravel	A-1-b	
				10 10		\and fine to coarse sand, trace of silt.		
1						Seturated medium dense grange brown grayel		
			12.0'			Saturated medium dense orange-brown gravel w/ some fine to coarse sand and silt.		
12.45		7	12.0'	4		w/ some time to coarse said and sitt. 6" RECOVERY	A-2-4(0)	
12.73				4 2 3 4		Saturated loose orange-brown fine sand w/	(-)	
				_		some coarse sand and silt, trace of gravel.		
		0	14.0'	W/R		16" RECOVERY		
1		8	14.0'	3	rereini	Saturated loose orange-brown fine sand w/	A-3	

Remarks: Mud Rotary @ 50.0

Reviewed By: Maureen Kelly Soils Supervisor: Randy Ferguson

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth	Daily	Ī	Sample	DI (01)		0 1 5	01 (0.1	Б
(ft.)	Progréss	No.	Depth	Blows/6"	HOUSEHH.	Sample Description	Class./G.I.	Remarks
14.94				3	196133166 17617617617 66433466	some coarse sand, trace of silt and gravel.		
					130 33.31 6 1. 130 1 4 3 3 6 6 130 1 3 3 3 6 6			
			16.0'		1:61°C1:61: 6:11) 4:66 6:11341:61	14" RECOVERY		
		9	16.0'	W/H 2	121212121 66114126 12114126	Saturated loose orange-brown fine sand w/	A-3	
				4 4	1201 1210 C 1201 1210 C 1201 1210 C	some coarse sand, trace of silt.		
17.43					661)3166 6613166			
			18.0'			16" RECOVERY		
		10	18.0'	2 3 4 7	(11) 13:00 (11) 13:00 (11) 13:00	Saturated loose orange-brown fine sand w/	A-3	
				7	106143164 106141061 106113066	some coarse sand and silt.		
					15633.1166 1263333110 1263333166			
19.92			20.0'		preimpete assissed atsistiet	17" RECOVERY		
					nergane Gergree			
					0:01/33:06 0:01/33:06 0:01/33:06			
					0:1133:0:0 3:1133:0:0 4:1133:0:0			
					130 131 131 14 1 14 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
22.41					0.6133366 0.6133366 0.6134366			
					66111166 66111166	\square \bowtie \triangle \vdash \square		
					0114316 0114316 01113165			
		11	23.5'	W/H 1	156 13 3166 1761 7 1766 1761 7 1766 1761 7 1766	Saturated very loose orange-brown fine sand	A-3	
				3 5		w/ some coarse sand, trace of silt.		
24.9								
24.0		V	05 51		7416 F	24" RECOVERY		
	•	12	25.5' 25.5'	4 5	### 19### ##############################	Visual description: Saturated medium dense		Sample brought to GTA lab
				6	126 1 4 3 20 C 126 1 4 3 26 C 126 1 T 126 C	orange-brown fine sand, trace of silt and		for pH testing.
					11111111111111111111111111111111111111	coarse sand.		
27.39					## 1 # 1 # 1 # 1 # 1 # 1 # 1 # 1 # 1 #			
27.55			2 <mark>7</mark> .5'	1	1:023.1 00 0:01 (4:04 1:01 2 3:06	18" RECOVERY		
					12012-1201 12012-1201 12012-1201			
		13	28.5'	4		Saturated medium dense orange-brown fine	A-3	
		'	20.0	6 6 7	000 (400 p 000 (400 p 000 (400 p		A-3	
00.00				_ ′		sand, trace of sire and course sand.		
29.88								
			30.5'		63 14 12 6 10 6 7 1 7 10 6 10 6 1 7 7 9 10 10 10 6 1 7 7 7 10 10	19" RECOVERY		
					L: (1111:E)			
					196199961 126193200 126193200 126193200			
					00143166 001171001 00113100			
32.37					11111111111111111111111111111111111111			
					priviri. Grijare Grijare			
					11111111111111111111111111111111111111			
		14	33.5'	4 4 6 7	, 1147.61. 61713.66 11713.66	Saturated loose orange-brown fine sand, trace	A-3	
				7	0::173:00 0:1143:66 7::177::01	of coarse sand and silt.		
34.86					66113166 66113166 66113166			
			35.5'		06133366 176177761 4613386	20" RECOVERY		
					1:02:0:1:00 0:01:04:0:0 1:01:03:0:0			
					1.21°C1:61. 664) 4566 661) 4566			
					961 (436) 361 (436) 361 (436)			
37.35								

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
					ing same is nag sami da nag sami da			
		15	38.5'	1 1		Saturated very loose brown fine sand w/ some	A-2-4(0)	
						silt and coarse sand, trace of gravel.	11 2 .(0)	
39.84						, ,		
00.01								
			40.5'			22" RECOVERY		
		11.4	44.51			No magazzani		Press Sample - Shelby Tube.
		U-1	41.5'			No recovery.		Press Sample - Shelby Tube.
42.33								
			43.5'			0" RECOVERY		
		16	43.5'	3 4 7 8		Saturated medium dense gray clayey fine	A-2-4(0)	
				8		sand, trace of coarse sand.		
44.82								
			45.5'			17" RECOVERY		
						\square R Δ F \square		
47.31								
							\mathcal{I}	
		17	48.5'	6		Saturated medium dense gray silty fine sand,	A-2-4(0)	
	•			6 8 14 20		trace of coarse sand.	A-2-4(0)	
49.8				20				
10.0			Λ					
			50.5'			24" RECOVERY		
				10		J		
					ranara.			
50.00		U-2	51.5'			Saturated medium dense gray clayey fine to	A-2-4(0)	Press Sample - Shelby Tube.
52.29						coarse sand w/ some silt.		
			53.5'			24" RECOVERY		
54.78		18	54.5'	3 4 6 8		Saturated loose gray clayey fine sand w/ some	A-2-4(0)	
				6 8		coarse sand, trace of gravel.		
			56.5'			24" RECOVERY		
			00.0					
57.27								
		19	59.0'	4		Saturated loose gray silty fine sand, trace of	A-2-4(0)	
59.76				4 4 6 9		coarse sand and gravel.	- .(0)	
			61.0'			24" RECOVERY		

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I.	Remarks
62.25						
		20	64.0'	5	Saturated medium dense gray silty fine sand, A-2-4(0)	
64.74				5 9 11 21	trace of coarse sand, gravel, and organic matter.	
			66.0'		24" RECOVERY	
67.23						
07.20						
69.72		21	69.0'	6 7 10 10	Saturated medium dense gray silty fine sand, trace of coarse sand, organic matter, gravel,	
			71.0'		and seashells. 24" RECOVERY	
			71.0	T		
72.21		11			FOR BIDDII	NG
			Λ			
74.7		22	74.0'	7 9 12 15	Saturated very stiff gray clayey fine sandy A-4(0)	
7 - 1.7				15	silt, trace of gravel, organic matter, and seashells.	
			76.0'		24" RECOVERY	
77.19						
		23	79.0'	8 11	Saturated medium dense dark gray silty fine A-2-4(0)	
79.68			. 3.0	11 17 23	sand, trace of organic matter, coarse sand, and seashells.	
			81.0'		24" RECOVERY	
92.17						
82.17						
84.66		24	84.0'	13 23 34 35	Saturated very dense dark gray silty fine sand, trace of organic matter, gravel, and seashells.	

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
			86.0'		17" RECOVERY		
87.15							
89.64		25	89.0'	6 7 10 3	Saturated medium dense dark gray silty fine sand, trace of coarse sand, organic matter, gravel, and seashells.	A-2-4(0)	
92.13			91.0'		24" RECOVERY		
					DRAFT		
94.62	N	26	94.0'	7 10 11 19	Saturated very stiff dark gray clay w some organic matter, trace of fine sand, gravel, and seashells. 24" RECOVERY	A-7-6(32)	IG
97.11			A	l	GUST 20	15	
99.6		27	99.0'	12 22 30 36	 of organic matter and seashells.	A-4(0)	
			101.0'		24" RECOVERY Boring terminated at 101.0 feet		
102.09							
104.58							
107.07							

KEY TO SYMBOLS

Symbol Description

Strata symbols

Fill

Well graded sand with silt

Silty sand



Silt



Poorly graded sand with silt



Clayey sand



Poorly graded clayey silty sand



High plasticity organic clays

DRAFT NOT FOR BIDDING

Notes:

1. Exploratory borings were drilled on 1/31/2008 using a 3 1/4-inch diameter continuous flight power auger. Rig is a Truck CME 55.

AUGUST 2015

- Groundwater levels recorded at time of drilling and rechecked the following day.
- 3. Surveyed boring locations and elevations were provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All SPT blow counts are uncorrected.

F.A. Project: U.S. 301, Maryland State Line to I-95 Boring No.: BR1-06-05

Contract: 25-113-01

Boring Location: Sta. 671+97.00, 209' Lt. C.L.

Boring Surface Elev.: 31.12 Reference:

IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: 2 IN. Type of: Split Barrel O.D. IN. IN. O.D. U-Sampler: 3 Ball Sampler Core Bit: O.D.

To: To: **Casing Size:** 3 1/4 Inches From Depth of:

Hollow Stem Auger: From Depth of: 0.0' 76.0'

Water Level Readings

Elev. of Water Time **Depth of Hole Depth of Casing Depth of Water** Date 7.2' 9.3' 23.9 21.8 2/4/08 10.0 8.0' 2/6/08 14.0 2/7/08 9.0' 6.5' 24.6 31.1

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 76.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Jason Truver

Helpers: J. Hillebrand

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
		1	1.0'	6 6		Moist medium dense orange coarse sand w/ some clay, gravel, and fine sand.	A-2-4(0)	10" Asphalt
		2	2.0'	4		8" RECOVERY	A-1-b	
2.49				4 4 4 3		Moist loose light brown coarse to fine sand w/ some silt, trace of gravel.	71 1 0	
			4.0'			18" RECOVERY		JG
	_	3	4.0'	3 3 2 3		Wet loose light brown coarse to fine sand,	A-1-b	
4.98			_	3		trace of silt and gravel.		
			6.0'			12" RECOVERY	15	
		4	6.0'	5 3 3		Wet loose light brown coarse to fine sand,	A-1-b	
				3	: : : : : : : : : : : : : : : : :	trace of silt and gravel.		
7.47								
			8.0'		1:1:1:1:1:1:1:1 1:1:1:1:1:1:1:1:1	6" RECOVERY		
		5	8.0'	W/R W/H)::10::01. ::11::0::0	Saturated very loose light brown fine to	A-2-4(0)	
				1 2	eri raicu Gildiide	coarse sand w/ some silt, trace of gravel.		
					661)466 1111211111			
9.96			10.0'		1:1133:00 1:4171:61.	20" RECOVERY		
		6	10.0'	2)	Saturated very loose light brown fine to	A-3	
				1 2		coarse sand, trace of silt and gravel.		
					661)466 6114161			
			12.0'		1:11 13 3:0; ¢ 1:11 11 1:11 1:11 1:11 1:11 1:11 1:11	20" RECOVERY		
12.45		7	12.0'	2 2 3 4		Saturated loose orange fine to coarse sand w/	A-2-4(0)	
				3 4		some silt, trace of gravel.		
			14.0'			11" RECOVERY		
		8	14.0'	3 2 4 5		Saturated loose brown-orange fine to coarse	A-2-4(0)	
				4 5		sand w/ some silt, trace of gravel.		

Remarks:

Reviewed By: Maureen Kelly Soils Supervisor: Randy Ferguson

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description C	Class./G.I.	Remarks
		9	16.0' 16.0'	4 5 8 8	16" RECOVERY Saturated medium dense brown fine to coarse sand, trace of silt and gravel.	A-3	
17.43		10	18.0' 18.0'		11 THE STATE OF TH	1.2.4(0)	
		10		8 6 9 9	Saturated medium dense brown fine sand and gravel w/ some coarse sand and silt.	A-2-4(0)	
22.41			20.0'		RECOVERY Filling		
24.9		11	24.0'	10 10 13 15	Saturated medium dense brown fine sand w/ some silt and coarse sand, trace of gravel. 16" RECOVERY	A-2-4(0)	1G
27.39			A	\U	GUST 201	15	
29.88		12	31.0'	10 10 12 15	Saturated medium dense brown fine sand w/ some coarse sand and silt. 24" RECOVERY	A-2-4(0)	
32.37					** 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		
34.86		13	34.0'	8 6 9	Saturated medium dense brown silty fine sand w/ some coarse sand, trace of gravel. 20" RECOVERY	A-2-4(0)	
37.35							

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I.	Remarks
	-					
39.84		14	39.0'	8 5 6 8	Saturated medium dense brown fine sand, A-3 trace of coarse sand and silt.	
00.01				0	(† 1306) 10 Augustus 13 Augustus	
			41.0'		20" RECOVERY	
42.33					(1) (1) (1) (1) (1) (1) (1) (1) (1) (1)	
					7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
					1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
44.82		15	44.0'	3 2 1 2	Saturated very loose brown fine sand w/ some A-2-4(0) silt and coarse sand, trace of gravel.	
44.02				2	sitt and course said, trace of graver.	
			46.0'		24" RECOVERY	
					MDPAFT	
47.31						
	_					
40.0		16	49.0′	8 10 12 15	Saturated medium dense brown-gray silty fine A-2-4(0)	10
49.8			_	15	sand w/ some coarse sand, trace of gravel.	
			51 <u>.0</u> '		19" RECOVERY	
		U-1	51.0'	1	No recovery.	Press Sample - Shelby Tube.
52.29						
			52.7'		0" RECOVERY	
		17	54.0'	8 13 17 15	Saturated medium dense gray silty fine sand, A-2-4(0)	
54.78				15	trace of coarse sand.	
			56.0'		24" RECOVERY	
57.27						
		18	59.0'	6 13 15 20	Saturated medium dense gray clayey fine sand A-2-4(0)	
59.76				15 20	w/ some coarse sand, trace of gravel and organic matter.	
			61.0'		24" RECOVERY	
		U-2	61.0'		No recovery.	Press Sample - Shelby Tube.

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
62.25			62.3'		0" RECOVERY		
		19	64.0'	10 14	Saturated dense gray fine to coarse sand w/	A-2-4(0)	
64.74				10 14 17 24	some silt, trace of gravel and organic matter.		
		U-3	66.0' 66.0'		10" RECOVERY No recovery.		Press Sample - Shelby Tube.
	1				Military		
67.23			67.8'				
			07.0		HIME HIME		
					yearyean Kariisea Heisakea Heisakea		
		20	69.0'	9 15 35 50/5"	Saturated dense gray silty fine sand, trace of	A-2-4(0)	
69.72				50/5"	coarse sand, gravel, and organic matter.		
			74.01				
			71.0'		14" RECOVERY		
72.21				_		711	
12.21		M			FOR BIDI		
				•			
	<u> </u>		_			4	
74.7	-	21	74.0'	10 15 17 29	Saturated hard gray fine sandy silt, trace of coarse sand, organic matter, clay, and gravel.	A-4(0)	
				29	coarse sand, organic matter, cray, and graver.		
	-		76.0'		24" RECOVERY		
					Boring terminated at 76.0 feet.		
77.19	-						
79.68							
	1						
	-						
82.17							
84.66							

KEY TO SYMBOLS

Symbol Description

Strata symbols

Silty sand

10 Well graded sand with silt

1.03 00 00 1.03 00 00 1.03 00 00

Poorly graded sand with silt

Poorly graded clayey silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

Notes:

- 1. Exploratory borings were drilled on 2/4/2008 using a 3 1/4-inch diameter continuous flight power auger. Rig is a Truck CME 55.
- 2. Groundwater levels recorded at time of drilling and rechecked the following day.
- 3. Surveyed boring locations and elevations were provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All SPT blow counts are uncorrected.

F.A. Project: U.S. 301, Maryland State Line to I-95 **Boring No.:** BR1-06-06

Contract: 25-113-01

Boring Location: Sta. 669+57.61, 248' Lt. C.L.

Boring Surface Elev.: 29.20 Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: IN. Lbs. 30 D-Sampler: S-Sampler: 2 IN. Type of: Split Barrel O.D. IN. IN. O.D. 3 Ball Sampler

U-Sampler: Core Bit: O.D.

To: To: **Casing Size:** 3 1/4 Inches From Depth of: Hollow Stem Auger: From Depth of: 0.0' 75.0'

Water Level Readings

Elev. of Water Time Depth of Hole **Depth of Casing Depth of Water** Date 22.0 22.2 23.2 29.2 7.2' 7.0' 1/31/0810.0 8.0' 9.6' 2/1/08 2/4/08 8.5' 6.0'

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 75.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Jason Truver

Helpers: J. Hillebrand

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
		1	1.0' 2.0'	2 5		Moist firm gray silt w/ some fine to coarse sand and clay, trace of gravel. (Fill) 6" RECOVERY	A-4(1)	8" Asphalt - 8" Stone
2.49		2	2.0'	2 4 5		Moist stiff gray clayey coarse sandy silt w/	A-4(2)	
			4.0'	6		some fine sand and gravel. (Fill) 12" RECOVERY		JG
	_	3	4.0'	2 6 34 12		Moist dense brown gravel and coarse sand, trace of fine sand and silt. (Fill)	A-1-a	
4.98			6.0'			4" RECOVERY	15	
		4	6.0'	9 6 12 14		Wet medium dense brown fine to coarse sand	A-2-4(0)	
7.47			0.01	14		w/ some silt, trace of gravel.		
		5	8.0' 8.0'	5 5	1217 1111 1217 11111 1217 11111	12" RECOVERY Saturated loose brown fine to coarse sand w/	A-2-4(0)	
				5 5 5 5	iconici nei ranno lei da ile nei rancia lei da ile nei ranci	some silt, trace of gravel.		
9.96		6	10.0' 10.0'	1		18" RECOVERY		
		0	10.0	4 3 3 5	Die Trene in Geeffander Geeffander Geeffander Geeffander Geeffander Geeffander	Saturated loose brown fine to coarse sand, trace of silt and gravel.	A-3	
			12.0'	2	126 12 22 12 12 12 12 12 12 12 12 12 12 12	24" RECOVERY		
12.45		7	12.0'	2 3 2 3	000 1 100 0	Saturated loose brown fine sand w/ some coarse sand, trace of silt and gravel. 17" RECOVERY	A-3	
		8	14.0' 14.0'	4 3	**********	Saturated loose brown fine sand w/ some silt,	A-2-4(0)	
				4 3 3 4	00 14 10 0 f 00 14 10 0 f 00 14 10 0 f	trace of coarse sand and gravel.		

Remarks:

Reviewed By: Maureen Kelly Soils Supervisor: Randy Ferguson

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I.	Remarks
(11.)	1 Togrood		Ворин			
			16.0'	2	選話題 記書 20" RECOVERY	
		9	16.0'	2 4 6 7	Saturated loose brown fine sand w/ some silt, trace of coarse sand and gravel.	
17.43				,		
		4.0	18.0'	-	24" RECOVERY	
		10	18.0'	5 6 7 10	Saturated medium dense brown silty fine sand w/ some coarse sand.	
				10		
19.92			20.0'		24" RECOVERY	
22.41						
					MI)RAFI	
		44	0.4.01	6		
24.9		11	24.0'	6 8 13	Saturated medium dense brown fine sand w/ A-2-4(0) some silt and coarse sand.	
24.3						VG
		V '	26.0'	L	24" RECOVERY	
27.39					IGUST 2015	
				1	JUSI ZUIJ	
		12	29.0'	10 11	Saturated medium dense brown fine sand, A-3	_
29.88				12 13	trace of coarse sand and silt.	
			04.01		### 1 / 1 / 1 / 1 / 1 / 1 / 1 / 1 / 1 /	
			31.0'		20" RECOVERY	
					16.19.16.59 	
32.37					161 4 266 	
					1815-1966 1813-1966 1813-1866 1813-1866	
		4.0	0.4.01	7	10 3 A T	
34.86		13	34.0'	7 7 11 12	Saturated medium dense brown fine sand w/ A-2-4(0)	
5 1.50				"2	10 1 3 10 10 10 10 10 10 10 10 10 10 10 10 10	
			36.0'		ELITARE ELITARE	
					20 RECOVERY	
37.35					66 3 3 96 6 15 4 3 4 6 7 15 4 3 4 6 7 15 4 3 4 6 7 15 4 7 3 4 6 7	
					16 5 3 3 10 10 10 10 10 10 10 10 10 10 10 10 10	
					19 13 3105 64 13 34 5 64 13 4 5	

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I.	Remarks
(11.)	Flogless		Бери		HARRI 11 AME	
		14	39.0'	8 8 11 13	Saturated medium dense gray silty fine sand, A-2-4(0)	
39.84				13	trace of coarse sand and gravel.	
			41.0'		19" RECOVERY	
		U-1	41.0'		Saturated medium dense gray fine to coarse A-2-4(0)	Press Sample - Shelby Tube.
42.33					sand w/ some silt.	
42.55			43.0'		11" RECOVERY	
			40.0		TI KECOVERT	
		15	44.0'	8	Seturated and discondense area silts fire and A 2 4(0)	
44.82		13	44.0	8 10 11 11	Saturated medium dense gray silty fine sand, trace of coarse sand and gravel. A-2-4(0)	
			46.0'		24" RECOVERY	
47.31						
	_	_				
		16	49.0'	7 9 15 25	Saturated medium dense gray silty fine sand, A-2-4(0)	10
49.8				25	trace of coarse sand and gravel.	
			51,0'		24" RECOVERY	
				1	JUST ZUIS	
52.29						
		17	54.0'	7	Saturated medium dense gray silty fine sand, A-2-4(0)	
54.78				7 9 13 15	trace of coarse sand and gravel.	
			56.0'		24" RECOVERY	
57.27						
59.76		18	59.0'	6 10 10 9	Saturated medium dense gray silty fine sand, trace of coarse sand.	
55.76				9	trace of coarse said.	
			61.0'		24" RECOVERY	
	<u> </u>					

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

	25-115					
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I.	Remarks
62.25						
64.74		19	64.0'	9 14 20 32	Saturated dense gray silty fine sand, trace of coarse sand and gravel. A-2-4(0)	
67.23			66.0'		24" RECOVERY	
69.72		20	69.0'	10 11 14 16	Saturated medium dense gray fine sand w/ A-2-4(0) some silt and coarse sand.	
00.12			71.0'	16	24" RECOVERY	
72.21			0	Τ	FOR BIDDIN	IG
74.7		21	73.0'	8 8 15 20	Saturated very stiff gray clayey fine sandy silt, trace of organic matter and coarse sand. 20" RECOVERY	
					Boring terminated at 75.0 feet.	
77.19						
79.68						
82.17						
84.66						

KEY TO SYMBOLS

Symbol Description

Strata symbols

Fill



Silty sand



Poorly graded sand with silt



Clayey sand

DRAFT NOT FOR BIDDING AUGUST 2015

Notes:

- 1. Exploratory borings were drilled on 1/31/2008 using a 3 1/4-inch diameter continuous flight power auger. Rig is a Truck CME 55.
- 2. Groundwater levels recorded at time of drilling and rechecked the following day.
- 3. Surveyed boring locations and elevations were provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All SPT blow counts are uncorrected.

101.0

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to I-95 Boring No.: BR1-06-07

Contract: 25-113-01

Boring Location: Sta. 119+17, 26' Rt. C.L.

Boring Surface Elev.: + 28.45 Reference:

IN. IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Spoon O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Depth of Casing Time **Depth of Water** Depth of Hole Elev. of Water Date 2/12/09

10.0 12.0 8.5

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** G. Truver

Helpers: T. Kane

			1			T		1
Depth	Daily	No.	Sample	Blows/6"		Sample Description	Class./G.I.	Remarks
(ft.)	Progress		Depth		1	BBAET		
	2/11/09	1	0.0'			Augered to 2.0'.		Asphalt - 14". Subgrade -
<u> </u>								10".
		2	2.0'	2	עומעומ שומעומ	0" RECOVERY	A 4/1)	
l .			2.0	2 1 1 2		Wet soft gray silt w/ some fine sand and clay,	A-4(1)	
3				ż		trace of coarse sand and gravel.) 1	
		7 7	101				ノ ロ`	
\vdash	_	3	4.0' 4.0'	2		22" RECOVERY Wet soft gray silt w/ some fine sand and clay,	A 4(1)	
		3A	4.5'		ועוו	trace of coarse sand and gravel.	A-4(1)	
			4.5'	3 2 2		6" RECOVERY	A-4(0)	
6			6.0'			Wet soft gray coarse to fine sandy silt w/		
°		4	6.0'	2		some gravel, trace of clay.	A-4(0)	
				2 2 3 3		13" RECOVERY	A- 1 (0)	
				3		Wet firm gray fine sandy silt w/ some coarse		
			8.0'			sand, trace of gravel. 18" RECOVERY		
		5	8.0'	14 16		No Sample Recovery		
9				16 19 14		The sample recovery		
				14				
			10.0'			0" RECOVERY		
		6	10.0'	4 4		Saturated loose orange fine sand w/ some silt,	A-2-4(0)	
				4 4 3 3		trace of coarse sand and gravel.	` '	
12			12.0'			13" RECOVERY		
		7	12.0'	4 4		Saturated loose orange fine sand w/ some silt,	A-2-4(0)	
				4 4 3 4		trace of coarse sand.		
			14.0'			17" RECOVERY		
		8	14.0'	3 3 3 3		Saturated loose orange fine sand w/ some	A-3	
15				3 3		coarse sand, trace of silt.		
			16.0'			17" RECOVERY		
		9	16.0'	3 3 3	ini id iida Marenar Marenar	Saturated loose orange fine sand, trace of silt	A-3	
	ı	1	1	ı 3	L:) (5 (**)			

Remarks:

Reviewed By: Maureen Kelley Soils Supervisor: Randy Ferguson

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
	<u> </u>			3	00 0 1 2 1 2 1 0 00 0 1 2 1 2 1 0 00 0 1 2 2 1 0 10 0 1 2 2 1 0	and coarse sand.		
18			18.0'		(;;), (; (;);); (; (;); (;	17" DECOVEDV		
		10	18.0'	3 6			A-2-4(0)	
				9		some coarse sand and silt.		
			20.0'			10" RECOVERY		
21	-							
24								
		11	24.0'	10 9		Saturated medium dense brown fine sand w/	A-3	
				11 9		some coarse sand, trace of silt.		
			26.0'			19" RECOVERY		
27								
					100 2 1 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
					976 1 10 916 25 9 1 1 10 10 12 9 9 1 10 10 12 9 9 1 10 10 10 10 10 10 10 10 10 10 10 10 1			
		12	29.0'	7 6		Saturated medium dense brown fine sand,	A-3	
30		V١		6 10 13		trace of coarse sand and silt.		
			31.0'				4 -	
						31181 20	15	
				1		JUU1 ZU		
33					126 1 7 2 10 166 1 4 1 16 176 1 7 7 10 16 2 1 1 2 10			
		13	34.0'	6 8 9 10		Saturated integrand delise of own time said,	A-3	Mud Rotary @ 34.0'.
				10		trace of silt and coarse sand.		
36			36.0'		:	19" RECOVERY		
) 4 (4) (6) C			
)			
39		14	39.0'	8		Saturated medium dense light brown fine	A-2-4(0)	
				8 11 11 12		sand w/ some silt and coarse sand, trace of		
			44.01			gravel.		
			41.0'			19" RECOVERY		
42								
		15	44.0'	7 10 16 16		Saturated medium dense gray fine sand w/	A-2-4(0)	
45				16		some clay, trace of coarse sand and gravel.		

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
(11.)	Progress						
			46.0'		24" RECOVERY		
48							
		16	49.0'	11 10 18 20	Saturated medium dense gray clayey fine sand	A-2-4(0)	
				20	w/ some coarse sand, trace of gravel.		
51			51.0'		24" RECOVERY		
54							
54		17	54.0'	3 6 10 18	Saturated medium dense gray clayey fine	A-2-4(0)	
				18	sand, trace of coarse sand and organic matter.		
			56.0'		23" RECOVERY		
57							
					OR BIDI		J(j
		•		•			
		18	59.0'	4 7 16 19	Saturated medium dense gray silty fine sand,	A-2-4(0)	
60				19	trace of coarse sand, organic matter, and gravel.	15	
			61.0'	10	23"RECOVERY	10	
63							
		19	64.0'	5 6 16 45	Saturated medium dense gray silty fine sand,	A-2-4(0)	
				45	trace of coarse sand and organic matter.		
66			66.0'		24" RECOVERY		
69							
09		20	69.0'	7 11 19 22	Saturated medium dense gray clayey fine	A-2-4(0)	
				22	sand, trace of coarse sand and organic matter.		
			71.0'		24" RECOVERY		
72							

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

					ı		ı	
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
		21	74.0'	6 10 16 17		Saturated very stiff gray clayey fine sandy	A-4(0)	
75				16 17		silt, trace of organic matter.		
			76.0'			24" RECOVERY		
			76.0			24 RECOVERT		
78								
		22	79.0'	6 9 25 37		Saturated hard gray fine sandy silt, trace of	A-4(0)	
				25 37		organic matter and coarse sand.		
			04.0			2011 DECOVEDA		
81			81.0'		-	22" RECOVERY		
						DDAET		
84						IJRAFI		
07	2/12/09	23	84.0'	18 35		Saturated very dense green silty fine sand,	A-2-4(0)	Glauconitic
				18 35 34 27		trace of organic matter, coarse sand, and		
			2001			gravel.		
			86.0'			17" RECOVERY		
87	•			•				
			Λ			DIIOT OO	15	
						-11.51 /11		
		24	89.0'	4 7		Saturated medium dense green-gray clayey	A-2-4(0)	Glauconitic
90			90.0'			fine sand, trace of organic matter, coarse		
		24A	90.0'	12 15		\sand, and gravel. 12" RECOVERY	A-7-6(21)	
			91.0'			Saturated very stiff gray silty clay w/ some		
						fine sand, trace of organic matter. 8" RECOVERY		
						8 RECOVERY		
93								
		25	94.0'	4 8		Saturated very stiff gray clay w/ some fine	A-7-6(19)	
				4 8 12 13		sand and organic matter, trace of coarse sand.	\	
96			96.0'			24" RECOVERY		
000								
99		26	99.0'	8		Saturated dense gray fine sand w/ some silt,	A-2-4(0)	
				8 18 26 45		trace of organic matter and gravel.	(0)	
			101.0'			21" RECOVERY End of Roring		
						End of Boring		

KEY TO SYMBOLS

Symbol Description

Strata symbols

Silty low plasticity clay

Silty sand



silt



Poorly graded sand with silt



Poorly graded clayey silty sand



Clayey sand



Low plasticity clay

DRAFT NOT FOR BIDDING AUGUST 2015

Notes:

- 1. Exploratory borings were drilled on 2/11/2009 using a 3 1/4-inch diameter hollow stem auger. Rig is a Truck CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

18.0

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 Boring No.: BR1-6-08

Contract: 25-113-01

Boring Location: Sta. 116+48.6 21 RT C.L.

Boring Surface Elev.: + 35.52 Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: IN. IN. Wt. of Sample Hammer: Lbs. 30 Type of: Split Barrel O.D. 2 O.D.

Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: D-Sampler: S-Sampler: U-Sampler: IN. IN. Core Bit: O.D.

To: To: **Casing Size:** 3 1/4 Inches From Depth of: Hollow Stem Auger: From Depth of: 0.0

Water Level Readings

Depth of Casing Depth of Water Time Depth of Hole Elev. of Water Date 3/1/2010 10.0 8.0 7.7

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Ft.; Dia. U-Sample Boring: U-Samples: Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Gary Truver

Helpers: T. Kane

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	 Sample Description	Class./G.I.	Remarks
	3/1/10	1	0.0'	2 2 4 4	Moist loose brown fine gravelly coarse sand w/some fine sand, trace of silt.	A-1-b	Topsoil - 2".
			2.0'	-	12" RECOVERY		
2.5		2	2.0'	3332	Moist loose brown coarse to fine sand w/trace of silt and fine gravel.	A-1-b	
			4.0'		15" RECOVERY		
5		3	4.0'	4 6 7 7	No Sample Recovery		
			6.0'		0" RECOVERY		
		4	6.0'	8 9 7 6	No Sieve Analysis - Indication of moist tan medium dense silty sand.		
7.5					AUREGOVERN		
		5	8.0' 8.0'	1	2" RECOVERY Wet loose tan coarse to fine sand w/trace of fine gravel and silt.	A-1-b	
		J	S.C	3 3 4	wet loose tan coarse to fine saild w/trace of fine graver and sint.	A-1-0	
10			10.0'		16" RECOVERY		
12.5							
		6	13.0'	1 2 4	Wet loose tan fine to coarse sand w/trace of silt and fine gravel.	A-3	

Remarks: Switch to Mud Rotary @ 18.0 feet

Reviewed By: Hany Fekry Soils Supervisor: Randy Ferguson

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 **Contract:** 25-113-01

Depth Dept			_	1				T	
15. 15.0 16.	Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
To start and endium dense brown fine sand w/some coarse sand and silt. 20 20 20 20 20 20 20 20 20 2									
18.0° 3 4	15			15.0'		43.1066 1969 (1966 1961 (1966 1961 (1966	14" RECOVERY		
18.0° 3 4						::::::::::::::::::::::::::::::::::::::			
18.0° 3 4									
18.0° 3 4						/361-03-61; /26313:00 /2633:31:06			
18.0° 3 4									
20 19° RECOVERY 19° RECOVERY 19° RECOVERY 18.0° 18	17.5					66143666 96143666 96143666			
18.0. 18.0. 18.0. 18.0. 18.0. 18.0. 18.0. 18.0. 18.0. 18.0. 18.0. 18.0. 18.0. 18.0. 18.0. 18.0. 19° RECOVERY 18.0.			7	18.0'	3		Wet loose tan fine to coarse sand w/some silt_trace of fine gravel	A-2-4(0)	Mud
25. 8 23.0 \$ Saturated medium dense brown fine sand w/some coarse sand and silt.					4 4		Web 10000 can fine to compe same who same same of the grants.	112 .(0)	Rotary @
DRAFT Saturated medium dense brown fine sand w/some coarse sand and silt. A-2-4(0) AUGUST 2015 P 28.0'									18.0'.
DRAFT Saturated medium dense brown fine sand w/some coarse sand and silt. A-2-4(0) AUGUST 2015 P 28.0'	20			20.0'			19" RECOVERY		
8 23.0° 6 10 10 10 10 10 10 10									
8 23.0" 6 10 10 10 10 10 10 10									
8 23.0" 6 10 10 10 10 10 10 10									
8 23.0" 6 10 10 10 10 10 10 10							DDAET		
25 AUGUST 2015 27.5 9 28.0 10	22.5						IJRAFI		
25 AUGUST 2015 27.5 9 28.0 10			8	23.0'	6		Saturated medium dense brown fine sand w/some coarse sand and silt	A-2-4(0)	
25 AUST 2015 27.5 9 28.0			Ĭ.		8 10 13		trace of fine gravel.	A-2-4(0)	
Saturated medium dense brown fine sand w/some coarse sand and silt. A-2-4(0)									
Saturated medium dense brown fine sand w/some coarse sand and silt. A-2-4(0)	25		N	25.0'			20" RECOVERY		
27.5 9 28.0' 9 10 10 10 10 10 10 10 10 10 10 10 10 10	20			20.0					
27.5 9 28.0' 9 10 10 10 10 10 10 10 10 10 10 10 10 10									
27.5 9 28.0' 9 10 10 10 10 10 10 10 10 10 10 10 10 10							CHELON15		
27.5 9 28.0' 9 10 10 10 10 10 10 10 10 10 10 10 10 10					\neg		GUSI ZUIJ		
30 30.0° 21" RECOVERY 32.5 10 33.0° 7 21.55	27.5								
30 30.0° 21" RECOVERY 10 33.0° 7 21 31 32 33 33 35 35.0° Saturated medium dense brown fine sand w/some coarse sand, trace of silt. 17" RECOVERY			9	28.0'	9		Saturated medium dense brown fine sand w/some coarse sand and silt	A 2 4(0)	
30.0' 21" RECOVERY 32.5 10 33.0' 7 8 81382 11 12 12 12 12 12 12 12 12 12 12 12 12					10 12 14		Saturated median dense brown fine said w/some coarse said and sin.	A-2-4(0)	
32.5 10 33.0'									
32.5 10 33.0'	30			30.0'			21" RECOVERY		
35.0' Saturated medium dense brown fine sand w/some coarse sand, trace of silt. Saturated medium dense brown fine sand w/some coarse sand, trace of silt. 17" RECOVERY				33.0			22 1000 1211		
35.0' Saturated medium dense brown fine sand w/some coarse sand, trace of silt. Saturated medium dense brown fine sand w/some coarse sand, trace of silt. 17" RECOVERY									
35.0' Saturated medium dense brown fine sand w/some coarse sand, trace of silt. Saturated medium dense brown fine sand w/some coarse sand, trace of silt. 17" RECOVERY									
35.0' Saturated medium dense brown fine sand w/some coarse sand, trace of silt. Saturated medium dense brown fine sand w/some coarse sand, trace of silt. 17" RECOVERY									
35 35.0'	32.5								
35 35.0'			10	33.0'	7		Saturated madium dance brown fine and w/seme seems and tree	A 2	
35 35.0'			``	30.0	8 11 12			A-3	
\$\frac{1}{61.19 \text{int}} \\ \frac{1}{61.19 \text{int}} \\ \fr					12				
\$\frac{1}{61.19 \text{int}} \\ \frac{1}{61.19 \text{int}} \\ \fr	35			35.0'		miriki. Gradise Miniri	17" RECOVERY		
37.5	33			55.0		ne i dane Geldane Jerran	1/ RECOVERT		
37.5									
37.5						reiviei Hillione Hillione			
37.5									
[legistrate]	37.5								

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 **Contract:** 25-113-01

Depth	Daily	1	Sample				1	l
(ft.)	Progress	No.	Depth	Blows/6"	156 19 45661	Sample Description	Class./G.I.	Remarks
		11	38.0'	10 10 13 14		Saturated medium dense brown fine sand w/some silt and coarse sand.	A-2-4(0)	
40			40.0'			18" RECOVERY		
42.5								
		12	43.0'	5 8 11 12		Saturated medium dense brown fine sand w/some coarse sand, trace of silt.	A-3	
45			45.0'			16" RECOVERY		
						DRAFT		
47.5	N					OR RIDDING		
		13	48.0'	7 8 7 10	11011111111111111111111111111111111111	Saturated medium dense brown fine sand w/some coarse sand and silt.	A-2-4(0)	
50			50.0'	46		G S 21" RECOVERY 5		
52.5					00100000 0111000 0110100 0110100 0111000 0110100 0110100 0110100 0110100 0110100			
		14	53.0'	8 10 10 14		Saturated very stiff brown clayey fine snady silt w/trace of coarse sand.	A-4(0)	
55			55.0'			24" RECOVERY		
57.5								
		15	58.0'	16 16 22 26		Saturated dense brown silty fine sand w/some clay, trace of coarse sand.	A-2-4(0)	
				26				
60			60.0'			22" RECOVERY		

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
62.5							
62.5							
		16	63.0'	8 10 12 13	Saturated very stiff gray clayey fine sandy silt w/trace of coarse sand.	A-4(0)	
				13			
65			65.0'		23" RECOVERY		
67.5							
		17	68.0'	5	Saturated medium dense gray clayey fine sand w/trace of coarse sand and	A-2-4(0)	
				5 10 12 20	silt.	112 1(0)	
70			70.0'		23" RECOVERY		
		M			FOR BIDDING		
72.5		7					
		18	73.0'	9 10 16 21	Saturated very stiff gray fine sandy silt w/some clay, trace of coarse sand and fine gravel.	A-4(0)	
			<i> </i>	21			
75			75.0'		24" RECOVERY		
'3			70.0		24 KLCOVEKI		
-							
77.5							
		19	78.0'	9 14 17 17	Saturated hard gray clayey fine sandy silt w/trace of coarse sand.	A-4(0)	
				17 17			
80			80.0'		22" RECOVERY End of Boring		
					2.id of Doring		
82.5							
	I	i .		I		ĺ	I

KEY TO SYMBOLS

Symbol Description

Strata symbols

Poorly graded sand with silt

itititititi itiititititi itiitititi Well graded sand with silt

Silty sand



Clayey sand



Poorly graded clayey silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

Notes:

- 1. Exploratory borings were drilled on 3/1/2010 using a 3 1/4- inch diameter continues flight power auger. Rig is a CME 55 ATV.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blows are uncorrected.

38.0

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 Boring No.: BR1-6-09

Contract: 25-113-01

Boring Location: Sta. 116+48.12 21 LT C.L.

Boring Surface Elev.: + 48.75 Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: IN. Lbs. 30 D-Sampler: S-Sampler: U-Sampler: IN. Type of: Split Barrel O.D. 2 IN. IN. O.D. Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Depth of Casing Depth of Water Time Depth of Hole Elev. of Water Date 27.9

2/24/2010 30.0 28.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Gary Truver

Helpers: T. Kane

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	2/24/10	1	0.5'	4 9 8	Moist stiff brown fine gravelly clay w/some coarse sand and silt, trace of fine sand.	A-6(2)	Topsoil - 6".
			2.0'	7	6" RECOVERY		
2.5		2	2.0'	9 6 6	Moist medium dense brown clayey coarse sandy fine gravel w/some fine sand and silt. 15" RECOVERY	A-2-4(0)	
		3	4.0'	3 5 7	Moist medium dense brown fine gravelly coarse sand w/some silt and fine	A-1-b	
5			6.0	3 7 8	sand. UST 2015		
7.5		4	6.0'	7 8 6 5	Moist medium dense brown coarse sandy fine gravel w/some fine sand and silt.	A-1-b	
			8.0'	4	16" RECOVERY		
		5	8.0'	4 3 4 4	Moist loose brown fine to coarse sand w/some silt, trace of fine gravel.	A-2-4(0)	
12.5			10.0'		8" RECOVERY		
		6	13.0'	11 14 18 21	Moist dense brown fine gravel w/some coarse to fine sand and silt.	A-1-a	

Remarks: Switch to Mud Rotary @ 38.0 feet

Reviewed By: Hany Fekry Soils Supervisor: Randy Ferguson

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 **Contract:** 25-113-01

Depth	Daily	No.	Sample	Blows/6"	Comple Description	Class./G.I.	Remarks
(ft.)	Progress	INO.	Depth	DIOWS/6	Sample Description	Class./G.I.	Remarks
15			15.0'		10" RECOVERY		
	-						
17.5							
17.5	1						
		7	18.0'	4 6 6 8	Moist medium dense orange coarse to fine sand w/some silt, trace of fine gravel.	A-1-b	
				8	11111. graver. 11111. graver. 11111. graver.		
20			20.0'	1	16" RECOVERY		
				, i	11185 11780 11760		
					11722 11325 11326 11329		
) (4)			
22.5				i i	DDAET		
-		8	23.0'	4	Moist medium dense orange fine gravelly coarse to fine sand w/trace of	A-1-b	
				4 8 7 6	iffine in the said with the sa	A-1-0	
25		V	25.0'		17" RECOVERY		
					GUST 2015		
27.5							
		9	28.0'	1 3 4	Wet loose tan coarse sand w/some fine sand, trace of fine gravel and silt.	A-1-b	
				6			
30			30.0'		20" RECOVERY		
	-						
32.5							
		10	33.0'	3	Wet medium dense tan fine to coarse sand w/trace of silt and fine gravel.	A-3	
				3 6 11 11	imise wet incurum dense tan fine to coarse sand w/dace of sht and fine graver. ifficial ifficial ifficial ifficial	H-3	
					(14)16() 11 (16)2 11 (16)2		
35			35.0'	ļ	6" RECOVERY		
				 	HTTER HTTER HTTER UTTER		
				1	(14) (14) (14) (15) (14) (15) (15) (15)		
				1	11 1206 13 1207 17 1207		
37.5) 	avier Histo Distri		
				"			

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
		11	38.0'	8 10 9 7		Wet medium dense brown coarse to fine sand w/trace of silt and fine gravel.	A-1-b	Mud Rotary @ 38.0'.
40			40.0'			15" RECOVERY		
42.5								
		12	43.0'	11 13 12 15	6443466 1633.166. 1633.166. 1633.166. 1633.166. 1633.166.	Wet medium dense brown fine sand w/some coarse sand and silt, trace of fine gravel.	A-2-4(0)	
45			45.0'			18" RECOVERY		
47.5						DRAFT		
	3/1/10	13	48.0'	8 13 15 17		Wet medium dense brown fine sand w/some coarse sand and silt.	A-2-4(0)	
50			50.0'	4		GUST 2015		
		14	53.0'	9 10 15 20	icijalieri per randu icijalieri icijalieri per randu icijalieri icijalieri icijalieri icijalieri	Wet medium dense brown fine sand w/some coarse sand and silt.	A-2-4(0)	
			55.0'			15" RECOVERY		
55.5			33.0			13 RECOVERT		
		15	58.0'	7	1615.1661. 1611.1661 1611.1661	Wat madium dance brown fine and m/games accorded 21	A 2 4(0)	
		ເວ	JO.U	7 10 17 15		Wet medium dense brown fine sand w/some coarse sand and silt.	A-2-4(0)	
60			60.0'			15" RECOVERY		

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 **Contract:** 25-113-01

Contra	25-11	3 01					
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
62.5							
02.5							
		16	63.0'	9 10 13 14	Wet medium dense brown fine sand w/some coarse sand, trace of silt.	A-3	
				14	6613966 6113966 6113967		
65			65.0'		14" RECOVERY		
	-				1619-1661 1619-1661 1619-1661 1619-1661		
07.5							
67.5					(2) 1 (1) (2) (3) (3) (4) (4) (4) (4) (4) (4) (4) (4) (4) (4		
		17	68.0'	9 12 14 13	Wet medium dense brown fine sand w/some silt, trace of coarse sand and fine gravel.	A-2-4(0)	
				13	The graver		
70			70.0'		16" RECOVERY		
		١.					
					FOR BIDDING		
72.5		N					
		18	73.0'	13 17 20 30	wet dense brown silty fine sand w/trace of coarse sand and silt.	A-2-4(0)	
				30	ICHST 2015		
75			75.0'	76	24" RECOVERY		
77.5							
		19	78.0'	7 14 17 17	Wet dense gray silty fine sand w/trace of fine gravel and organic matter.	A-2-4(0)	
				17			
80			80.0'		24" RECOVERY		
82.5	-						
		20	83.0'	7 10 13 21	Wet medium dense gray silty fine sand w/trace of coarse sand and organic matter.	A-2-4(0)	
				21	matter.		
85			85.0'		24" RECOVERY		
						<u> </u>	

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 **Contract:** 25-113-01

Depth	Daily	No.	Sample	Blows/6"	Sample Description	Class./G.I.	Remarks
(ft.)	Progress	140.	Depth	Diows/o	Cample Description	01033.70.11.	Remarks
07.5							
87.5							
		21	88.0'	4 8 13 19	Wet medium dense gray silty fine sand w/trace of coarse sand, fine gravel	A-2-4(0)	
				19	and organic matter.		
00			90.0'		22" DECOVERY		
90			90.0		End of Boring		
00.5							
92.5							
					DRAFT		
					DIMI		
95							
95	R				FOR BIDDING		
					FUR BILLING		
	•			•			
97.5					LOLIOT COAF		
01.0				Δ	JGUST 2015		
				10	70001 2010		
100							
102.5							
105							
107.5							
107.0							

KEY TO SYMBOLS

Symbol Description

Strata symbols

Clayey sand



Silty sand



Poorly graded sand with silt



Well graded sand



Well graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

Notes:

- 1. Exploratory borings were drilled on 2/24/2010 using a 3 1/4- inch diameter continues flight power auger. Rig is a CME 55 ATV.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blows are uncorrected.

18.0

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to I-95 **Boring No.:** BR1-06-10

Contract: 25-113-01

Boring Location: Sta. 913+20 20' Lt C.L.

Boring Surface Elev.: + 45.0 Reference:

Wt. of Casing Hammer: Average Fall: IN. Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: IN. Lbs. 30 D-Sampler: S-Sampler: U-Sampler: IN. Type of: Split Barrel O.D. 2 IN. IN. O.D. O.D.

Core Bit: O.D. IN.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Depth of Casing Time **Depth of Hole Depth of Water** Elev. of Water Date 17.5 7/8/10 18.0 18.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 100.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Gary Truver

Helpers: T. Kane

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
	7/8/10	1	0.5' 2.0'	15 13 9		Moist very stiff brown silt w/some fine to coarse sand, fine gravel and clay. 15" RECOVERY	A-4(0)	Topsoil - 4".
		2	2.0'	6 5 6		No Sample Recovery		Gravel blocking spoon.
3			4.0	4		0" RECOVERY		JG
	•	3	4.0'	4 5 5 5		Moist loose brown clayey coarse to fine sand w/some fine gravel, trace silt.	A-2-4(0)	
6			6.0'			17" RECOVERY	15	
		4	6.0'	5 6 8 5		Moist medium dense brown coarse sandy fine gravel w/some fine sand and silt.	A-1-b	
			8.0'			15" RECOVERY		
9		5	8.0'	6 7 7 6		Moist medium dense brown fine gravelly coarse sand w/some fine sand and silt.	A-1-b	
			10.0'			10" RECOVERY		
		6	10.0'	4 5 5 5		Moist loose orange coarse to fine sand w/ some silt, trace fine gravel.	A-1-b	
12			12.0'			21" RECOVERY		
		7	12.0'	5 6 4 5		Moist loose orange coarse sand w/some fine sand, fine gravel and silt.	A-1-b	
			14.0'		6614166 8617768	17" RECOVERY		
15		8	14.0'	5 5 7 6		Moist medium dense orange coarse sand w/ some fine sand and fine gravel, trace silt.	A-1-b	
			16.0'		(#13.196) (#13.196)	17" RECOVERY		
		9	16.0'	5 7 5 5		Wet medium dense tan coarse sand w/some fine sand, trace silt and fine gravel.	A-1-b	

Remarks:

Reviewed By: Hany Fekry Soils Supervisor: Randy Ferguson

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
18			18.0'			16" RECOVERY		
		10	18.0'	4 5 6 6		Wet medium dense tan fine to coarse sand w/	A-1-b	Mud Rotary @ 18.0'
				6		some fine gravel, trace silt.		
			20.0'			18" RECOVERY		
21								
		44	00.01	4				
24		11	23.0'	4 5 6 5		wet inedian dense tan coarse to fine sand w	A-1-b	
				5		Ç		
			25.0'			10 KECOVEKT		
					1:1:1:1:1:1:1 1:1:1:1:1:1:1:1 1:1:1:1:1			
27								
						IJRAFI		
		12	28.0'	5		Wet loose brown fine to coarse sand w/some	A-2-4(0)	
				5 5 5 6		silt, trace fine gravel.	11 1 1(0)	
30			30.0'			15" RECOVERY		JG
00		1						
			Λ			DI ICT OA	15	
33						JUSI ZU		
		13	33.0'	6 8 10 13	126 1 2 1 2 1 1 6 6 126 1 2 2 2 2 2 2 6 6	Saturated medium dense reddish brown fine	A-2-4(0)	
				13				
			35.0'			20" RECOVERY		
36					0:03 13:00 1:01 13 1:00 1:01 73:00			
					100 1 5 3 10 10 100 1 5 3 5 6 6 5 7 8 1 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7			
		14	38.0'	8		Setupoted modium January J. J. J. J. J. C.	A 2 4/0)	
39		'*	30.0	8 10 7 7		Saturated medium dense reddish brown fine sand w/some coarse sand and silt, trace fine	A-2-4(0)	
						gravel.		
			40.0'			17" RECOVERY		
42								
		15	43.0'	6 6	131 J. 132 C 131 J. 132 C 132 C 132 C	Saturated medium dense brown fine sand w/	A-3	
				6 6 7 8	04143166 Januaria 6413466 Garanier	some coarse sand, trace silt.		
45			45.0'		126 1 7 4 16 6 126 1 7 7 1 6 1 126 1 7 7 1 6 1	19" RECOVERY		

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Saturated medium dense brown fine sand w/ some coarse sand, trace silt. 17 53.0" 5 7 7 7 7 7 7 7 7 7	Depth	Daily	1	Sample					
16 48.0° 7 17 17 17 17 17 18 18	(ft.)	Progress	No.	Depth	Blows/6"	10) 14 700-	Sample Description	Class./G.I.	Remarks
16		-				in lange			
16]				neryney Geryney			
16]				100 3 3 3 1 0 0 1 100 1 3 3 1 0 0 100 1 3 3 1 0 0			
50.0' Is RECOVERY	48	1	16	48.0'	7	line a regional d	Saturated medium dense brown fine sand w/	A-3	
50.0' 18" RECOVERY 17" 53.0' 5 2 2 2 2 2 2 2 2 2]			9 10 13			11.5	
51						100 1 1 1 1 1 1 1 1 1			
17 53.0° 5 12 13 14 15 16 17 18 18 58.0° 60 60.0° 63.0° 63.0° 63.0° 63.0° 65.0° 65.0° 65.0° 65.0° 65.0° 65.0° 65.0° 65.0° 65.0° 65.0° 65.0° 65.0° 65.0° 65.0° 60.0° 65.0° 65.0° 60.0° 65.0° 65.0° 60.0°		-		50.0'			18" RECOVERY		
17 53.0' 5 11	51					00 13 300 f 00 17 7 7 0 0 0			
17 53.0' 5 13.5 13.5									
17 53.0° 5 18 55.0°		_				1001111000			
55.0' 18 58.0' 60 6 58.0' 60 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6						ist i hat et a			
55.0' 18 58.0' 60 6 58.0' 60 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6			17	53.0'	9			A-2-4(0)	
55.0 17" RECOVERY 17" RECOVERY 18 58.0 6 20 20" RECOVERY 2 15 20" RECOVERY 2 15 20" RECOVERY 3 3 3 3 3 3 3 3 3	54	1			10	13013357	some sin and coarse sand.		
57 18 58.0 6 13.34 58.0 7 7 13.34 58.0 60.0 19 63.0 11 12 13.34 11 12 13.34 13				55.0'		######################################			
18 58.0 6 5 7 5 14 14 14 15 15 16 16 16 16 16 16 16 16 16 16 16 16 16							\square \bowtie \triangle \vdash \square		
18 58.0' 6 7 7 7 7 7 7 7 7 7		1				000 1 1 2 1 C C			
60 60.0' 60.	57					1873.191. 1873.191.0 1873.191.66			
Saturated medium dense brown fine sand w/ some coarse sand, trace silt and fine gravel. 60									
60 60.0' 60.0' 63 19 63.0' 11 8 Saturated medium dense tan fine sand w/some silt, trace coarse sand, fine gravel and clay. 20" RECOVERY 20" RECOVERY A-2-4(0) 21" RECOVERY			18	58.0'	6 7	in Angle	Saturated medium dense brown fine sand w/	A-3	
60 60.0' 60.0' 63 19 63.0' 11 11 11 11 11 11 11 11 11			•		7 7	PC 1 3 3 7 P P P	some coarse sand, trace silt and fine gravel.		
63 19 63.0' 11 8 11 12 Saturated medium dense tan fine sand w/some silt, trace coarse sand, fine gravel and clay. 21" RECOVERY	60			60.0'		100	20" DECOVEDY		
63 19 63.0' 11 Saturated medium dense tan fine sand w/some silt, trace coarse sand, fine gravel and clay. 65.0' 21" RECOVERY	60	†		00.0		100 1 4 2 4 5 12		15	
63 19 63.0' 18 Saturated medium dense tan fine sand w/some silt, trace coarse sand, fine gravel and clay. 65.0' 21" RECOVERY							3UOI /U		
19 63.0' 11 8 Saturated medium dense tan fine sand w/some silt, trace coarse sand, fine gravel and clay. 65.0' 21" RECOVERY						66331366 10334166 10334166	500 1 20		
Saturated medium dense tan fine sand w/some silt, trace coarse sand, fine gravel and clay. 65.0' Saturated medium dense tan fine sand w/some silt, trace coarse sand, fine gravel and clay.		1				06143166 076173760 064133166			
65.0' 21" RECOVERY	63	_	10	62.0'	11	************		A 2 4(0)	
65.0' 21" RECOVERY			19	63.0	8 11			A-2-4(0)	
		1			12		graver and endy.		
		-		65.0'			21" RECOVERY		
	66								
		1							
		-							
20 68.0' 5 Saturated medium dense gray silty fine sand A-2-4(0) 69 V/trace coarse sand.		1	20	68.0'	5 6			A-2-4(0)	
69 w/trace coarse sand.	69	-			10 12		w/trace coarse sand.		
70.0' 24" RECOVERY				70.0'			24" RECOVERY		
]							
		-							
	72								
]							
21 73.0' 6 Saturated very stiff gray fine sandy silt w/ A-4(0)		-	21	73.0'	6		Saturated very stiff gray fine condy silt w/	Δ-4(0)	
21 73.0' 6 8 Saturated very stiff gray fine sandy silt w/ A-4(0) trace coarse sand and clay.					8 12		trace coarse sand and clay.	A-4(0)	

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
			75.01	19	ANI DE GOVERN		
75			75.0'		22" RECOVERY		
78							
		22	78.0'	6 7 9 11	Saturated medium dense gray silty fine sand	A-2-4(0)	
				11	w/trace coarse sand.		
			80.0'		24" RECOVERY		
81							
		23	83.0'	8 8 9 13	Saturated very stiff gray fine sandy silt w/	A-4(0)	
84				9 13	trace coarse sand, fine gravel and clay.		
			85.0'		22" RECOVERY		
					FOR BIDI		
87		'					
		24	88.0	10	Saturated medium dense gray silty fine sand	A-2-4(0)	
				13 14	w/trace coarse sand.	15	
90			90.0'	1	24" RECOVERY		
93		25	93.0'	5		A 4(0)	
		20	93.0	5 8 10 10	Saturated very stiff greenish gray fine sandy silt w/trace fine gravel, coarse sand and clay.	A-4(0)	
			95.0'		20" RECOVERY		
			93.0		ZU RECOVERT		
96							
99		26	98.0'	7 13 16 24	Saturated medium dense green silty fine sand w/some organic matter, trace fine gravel and	A-2-4(0)	
99				24	coarse sand.		
			100.0'		24" RECOVERY End of Boring		
102							

KEY TO SYMBOLS

Symbol Description

Strata symbols



Silty low plasticity clay



Poorly graded clayey silty sand



Silty sand



Poorly graded sand with silt



Well graded sand with silt



Poorly graded sand

DRAFT NOT FOR BIDDING AUGUST 2015

Notes:

- Exploratory borings were drilled on July 8, 2010 using a 3 1/4-inch diameter continuous flight power auger. Rig is a CME 55 ATV.
- 2. Groundwater levels recorded at the time of drilling and re-checked to following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blows are uncorrected.

56.0'

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: US 301 Preferred Alternative Contract 1A Boring No.: BR1-07-01

Contract: 25-113-01

Boring Location: Sta. 668+62.39, 46' Rt. C.L.

Boring Surface Elev.: + 27.07 Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: IN. Lbs. 30 D-Sampler: S-Sampler: IN. Type of: Split-Barrel O.D. 2 IN. IN. O.D. 3

U-Sampler: Ball Sampler Core Bit: O.D.

To: To: 3 1/4" **Casing Size:** Inches From Depth of: Hollow Stem Auger: From Depth of: 0.0'

Water Level Readings

Depth of Casing Depth of Water Time **Depth of Hole** Elev. of Water Date 1/28/2008 12.0' 9.3 14.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 91.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corperation **Driller:** Dan Taylor

Helpers: Tom Kane

D	.	1				T		
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
	<u> </u>	1	0.0'	2 3		Moist brown loose silty coarse to fine sand w/	A-2-4(0)	FILL
				2 3 3 4		trace of gravel.		
<u> </u>		2	2.0'	4		13" RECOVERY	A Q 4(0)	THI I
3		 	2.0	3 3 4		Wet loose brown coarse sand w/some fine sand, gravel and clay.	A-2-4(0)	FILL
3				4		saild, graver and eray.		
			4.0'			14" RECOVERY		
		3	4.0'	3 3		Wet firm brown coarse sandy silt w/some fine	A-4(0)	FILL
				4		sand and gravel, trace of clay.	4 -	
			6.0'			10" RECOVERY	15	
6		4	6.0'	3		10" RECOVERY Wet very loose brown silty coarse to fine sand	A-1-b	FILL
				2 2 2		w/some gravel.	11 1 0	
			8.0'	_		14" RECOVERY		
		5	8.0'	2 W/H W/H		Saturated soft gray clay w/some fine sand,	A-7-6(22)	FILL
9				W/H		trace of coarse sand.		
			10.0'			3" RECOVERY		
		6	10.0'	1 1 2		Saturated soft gray silt w/some clay and	A-4(5)	FILL
				2		organic matter, trace of fine to coarse sand	` /	
			11.5'	4		and gravel. 12" RECOVERY		
12		6A 7	11.5' \ 12.0' /	7	WW.	→ No Sieve Analysis →	A 1 1	
		′	12.0'	7 20 19 13		6" RECOVERY	A-1-b	
				13		Saturated dense brown coarse sandy gravel w/ some fine sand, trace of silt.		
			14.0'			11" RECOVERY		
		8	14.0'	1 2 4 4		Saturated loose brown silty fine sand w/some	A-2-4(0)	
15				4 4		coarse sand, trace of gravel.		
		9	16.0' 16.0'	2 2		20" RECOVERY Saturated loose brown fine to coarse sand w/	A-3	
			10.0	2 4		Saturated loose brown line to coarse sand W/	A-3	

Remarks: Mud Rotary starting @ 56.0'

Reviewed By: Maureen Kelly Soils Supervisor: Randy Ferguson

F.A. Project: US 301 Preferred Alternative Contract 1A **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
	J			8		trace of silt and gravel.		
18			18.0'			15" RECOVERY		
10		10	18.0'	3 7	100 1 3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Saturated medium dense brown fine sand w/	A-3	
				3 7 7 8	1:6143166 1:6171:51 2:6113:50	some coarse sand, trace of silt.		
					120 / 2.120 r 220 / 2.220 r 261 / 2420 r			
			20.0'		preimine Certine Primiter	13 KECOVEKT		
21								
					66 1 3 4 1 6 6 120 3 3 1 1 6 6 120 1 3 3 1 6 6			
24		11	23.5'	4 7	######################################	Saturated medium dense brown fine sand w/	A-3	
				8 9		some coarse sand, trace of silt and gravel.		
					1.61 y 1.61 1.61 y 1.61 1.61 y 1.61 1.61 y 1.61 1.61 y 1.61			
			25.5'		0.6173361 0.613366 0.614366 0.613366	I I9" RECOVERY		
					00 1 1 1 1 1 0 0 00 1 1 1 1 1 0 0 00 1 1 1 1			
27								
					00111100			
					preimpre Centare Cinarie Contrare			
		12	28.5'	5	hitianide		A-3	
				6 9 9	120 20 20 20 20 20 20 20 20 20 20 20 20 2	some coarse sand, trace of silt.	, , ,	
30		N 1		9				
			30.5'					
			_		66 (44)66 66 (41)66 66 (41)66			
					rii i i i i	GUST 20	115	
					16 15 1 6 f	JUJI ZU		
33			_		15614356 17617167 166131666 1661731666			
		13	33.5'		100 100 100 100 100 100 100 100 100 100		A-3	
		10	00.0	5 8 12		1	A-3	
				12				
			35.5'		6617366 6617366	19" RECOVERY		
36					696 1943 1966 000 1990 1990 1 1961 1943 1966			
					1:11/13/11 1:11/13/11 1:11/13/11			
		14	38.5'	2		Caracada and the state of the s	A 2	
39		14	36.5	2 5 6 7	00010000	Saturated medium dense brown fine sand w/ some coarse sand, trace of silt.	A-3	
				7		some coarse sand, trace of sitt.		
			40.5'		(15	18" RECOVERY		
42					156 3 3 3 3 5 6 6 156 3 3 3 5 6 6 156 3 3 3 5 5 5 5			
					156143166 1761717171 166113186			
					130 3 3 3 1 1 6 7 12 6 1 7 3 2 1 1 12 1 1 1 3 1 6 1			
		15	43.5'	5 8 8 12		Saturated medium dense brownish gray fine	A-2-4(0)	
45				12		sand w/some silt and coarse sand, trace of		
45						gravel.		

F.A. Project: US 301 Preferred Alternative Contract 1A **Contract:** 25-113-01

Depth	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
(ft.)	Flogress		45.5'			20" RECOVERY		
48								
40								
		16	49.0'	3		Saturated medium dense gray silty fine sand	A-2-4(0)	
				3 5 8 10		w/some coarse sand, trace of gravel and	112 4(0)	
F1			51.0'			organic matter. 24" RECOVERY		
51			31.0			24 RECOVERT		
54		17	54.0'	6 7		Saturated very stiff gray fine sandy silt w/	A-4(0)	
				10 11		trace of coarse sand, gravel and organic		
			56.0'			matter. 23" RECOVERY		
57		1/						
		V				FOR BIDI		
	•			_				
		18	59.0'	3 4 5 6		Saturated loose gray silty fine sand w/some	A-2-4(0)	
60				6		coarse sand, trace of organic matter.	15	
			61.0'	10		22" RECOVERY	10	
63								
		40	0.4.01	4	иии	9		
		19	64.0'	4 7 9 15		Saturated dense gray fine sand w/some clay, trace of coarse sand and organic matter.	A-2-4(0)	
				10		-		
66			66.0'			20" RECOVERY		
69		20	69.0'	5		Saturated medium dense silty fine sand w/	A-2-4(0)	
				5 7 9 15		trace of coarse sand, gravel and organic	112 (0)	
			71.0'			matter. 22" RECOVERY		
			. 1.0			22 ADOVERT		
72								
			<u> </u>					

F.A. Project: US 301 Preferred Alternative Contract 1A **Contract:** 25-113-01

					1		T
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	<u> </u>						
75		21	74.0' 76.0'	6 9 11 12	Saturated medium dense gray fine sand w/ some clay, trace of coarse sand, gravel and organic matter. 22" RECOVERY	A-2-4(0)	
78							
		22	79.0'	5 9 11 13	Saturated very stiff grayish green silt w/some clay, trace of coarse sand, gravel and organic	A-4(0)	
81			81.0'		matter. 24" RECOVERY		
84					DRAFT		
		23	84.0'	7 13 20 37	Saturated dense grayish green silty fine sand w/trace of coarse sand and organic matter.	A-2-4(0)	
87	ľ	11	86.0'		24" RECOVERY	יווכ	IG
		24	89.0'	9	GUST 20	15	
90		24	91.0'	9 10 11 13	Saturated medium dense green silty fine sand w/trace of coarse sand, gravel and organic matter. 24" RECOVERY	A-2-4(0)	
					Boring Terminated at 91 feet		
93							
96							
99							

KEY TO SYMBOLS

Symbol Description

Strata symbols

Silty sand

Clayey sand

Low plasticity clay



Silty low plasticity clay



Poorly graded sand



Poorly graded sand with silt



Poorly graded clayey silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

Notes:

- Exploratory borings were drilled on 1/28/2008 using a
 1/4-inch diameter continuous flight power auger. Rig is a ATV CME 55
- No free water was encountered at the time of drilling or when re-checked the following day.
- 3. Boring locations were taped from existing features and elevations extrapolated from the final design schematic plan.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

39.0'

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

Boring No.: BR1-07-02 F.A. Project: US 301 Preferred Alternative Contract 1A

Contract: 25-113-01

Boring Location: Sta. 670+44.23, 37' Lt. C.L.

Boring Surface Elev.: + 33.0' Reference:

Wt. of Casing Hammer: Wt. of Sample Hammer: IN. IN. IN. Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: 30 Lbs. D-Sampler: S-Sampler: U-Sampler: 2 Type of: Split-Barrel O.D. IN. IN. O.D. 3 Ball Sampler O.D.

Core Bit: O.D. 3 1/4" **Casing Size:**

From Depth of: From Depth of: To: To: Inches **Hollow Stem Auger:** 0.0'

Water Level Readings

Depth of Water Time **Depth of Casing** Depth of Hole Elev. of Water Date 2/6/2008

10.0' 12.0 6.8

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 101.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corperation Driller: William Sharp

Helpers: Amber Joseph

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I.	Remarks
		1	0.0'	23333	No Sieve Analysis	
			2.0'		2" RECOVERY	
3		2	4.0'	4 6 7 7	No Sieve Analysis 2" RECOVERY	
		3	4.0'	3 3 2 3	Wet loose brown fine to coarse sand w/some A-2-4(0)	
6			6.0'	3	silt, trace of gravel.	
		4	6.0'	3 3 2 2	Wet loose brown fine to coarse sand w/trace of silt and gravel.	
			8.0'		20" RECOVERY	
9		5	8.0'	1 1 1 2	Wet very loose brown fine to coarse sand w/ A-2-4(0) some silt. 18" RECOVERY	
		6	10.0'	2 2 2 2 3	Wet very loose brown coarse to fine sand w/ A-1-b trace of silt and gravel.	
12		7	12.0'	2	20" RECOVERY	
		,	12.0'	2 2 2 3	Wet very loose brown coarse to fine sand w/ A-1-b trace of silt and gravel.	
			14.0'		16" RECOVERY	
15		8	14.0'	2333	Saturated loose brown coarse to fine sand w/ A-1-b trace of gravel and silt.	
		9	16.0' 16.0'	4	12" RECOVERY	
		9	10.0	4 5 5	Saturated loose brown coarse to fine sand w/ A-1-b	

Remarks: Mur Rotary starting @ 39.0'

Reviewed By:	Soil	s Supervisor:	

F.A. Project: US 301 Preferred Alternative Contract 1A **Contract:** 25-113-01

			T -	T	1	1		
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
	-			4		some gravel, trace of silt.		
18			18.0'			22" RECOVERY		
		10	18.0'	3 5 4		: Saturated 10050 010 Wil Time to course saile W	A-3	
				4		trace of shi and graver.		
			20.0'			20" RECOVERY		
21								
					10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
					::::::::::::::::::::::::::::::::::::::			
					rei 73k Gildig Julyon			
24					E			
	1	11	24.0'	5 6 7 8	121231	Saturated medium dense brown silty fine sand	A-2-4(0)	
				7 8		w/some coarse sand, trace of gravel.		
			26.0'			20" RECOVERY		
			20.0					
27						IJKAFI		
							$\Delta\Pi$	
		12	29.0'	6 8 7 8		Saturated medium dense brown fine sand w/	A-3	
30	•			8				
			31.0'			18" RECOVERY		TT 1 1
			31.0	4 5 7 12		PHOT ON	15	pH sample only.
				12		JUOI ZU		
33			33.0'			22" RECOVERY		
					PARTUR COLINIC COLINIC COLINIC			
		13	34.0'	4		Saturated medium dense brown fine sand w/	A-3	
				6 8 8		some coarse sand, trace of silt and gravel.		
			00.01		130 1441 16 15 1 1 1 1 1 1 1 15 1 1 4 1 1 1			
36	1		36.0'			22" RECOVERY		
					pairid Billio			
39					111 JAN 11 111 JAN 11 111 JAN 11			
		14	39.0'	4 7 9 11		Saturated medium dense brown fine sand w/	A-3	
				11		some coarse sand, trace of silt.		
			41.0'			24" RECOVERY		
42								
		15	44.0'	8		Saturated medium dense brown fine sand w/	A-2-4(0)	
45		. ັ		8 10 13 14		some silt and coarse sand, trace of gravel.	Λ-4-4(U)	
	1			1 7	10:1:1:1:1:1:1:1:	<u> </u>		l .

F.A. Project: US 301 Preferred Alternative Contract 1A **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
			46.0'			22" RECOVERY		
48								
		16	49.0'	7 9 11 11		Saturated medium dense grayish green silty fine sand w/trace of coarse sand and gravel.	A-2-4(0)	
51			51.0'	11		24" RECOVERY		
31			31.0			24 RECOVERT		
54		17	54.0'	5 9 12 14		Saturated medium dense grayish green silty	A-2-4(0)	
				14		fine sand w/some coarse sand.		
			56.0'			18" RECOVERY		
57				T		OR BIDI	JIV	JG
		V '				וטוט זוטו		
		18	59.0'	W/R		Saturated loose gray silty fine sand w/trace of	A-2-4(0)	
60				3 5		coarse sand.	15	
			61.0'			17" RECOVERY		
		U-1	62.0'			No Sample Recovery - Tube only pushed 14".		Press Sample - Shelby Tube.
63								
		19	64.0' 64.0'	3 3 8 17		0" RECOVERY Saturated medium dense gray silty fine sand	A-2-4(0)	
				8 17		w/trace of coarse sand and gravel.		
66			66.0'			20" RECOVERY		
69		20	69.0'	4		Saturated stiff gray fine sandy silt w/some	A-4(0)	
				4 5 8 10		clay, trace of coarse sand.	(0)	
			71.0'			24" RECOVERY		
72								
				I	MM M.M	и	I.	

F.A. Project: US 301 Preferred Alternative Contract 1A **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description (Class./G.I.	Remarks
75		21	74.0'	8 9 12 19	Saturated very stiff gray fine sandy silt w/ trace of coarse sand, gravel and organic matter. 24" RECOVERY	A-4(0)	
78							
		22	79.0'	10 11 15 19	Saturated medium dense gray fine sand w/ some clay, trace of coarse sand, gravel, organic matter and sea shells.	A-2-4(0)	
81			81.0'		24" RECOVERY		
84					DRAFT		
		23	84.0'	6 9 12 17	Saturated medium dense gray silty fine sand w/trace of coarse sand, gravel, organic matter and sea shells.	A-2-4(0)	
87			86.0		24" RECOVERY		IG
			Δ		GUST 201	15	
90		24	89.0' 91.0'	12 21 34 50/4"	Saturated very dense green silty fine sand w/ trace of coarse sand, organic matter and sea shells. 20" RECOVERY	A-2-4(0)	
93							
		25	94.0'	7 11 17 25	Saturated medium dense gray silty fine sand w/trace of coarse sand and organic matter.	A-2-4(0)	
96			96.0'		24" RECOVERY		
99							
		26	99.0'	7 11 17 22	Saturated very stiff gray clay w/some fine sand and organic matter, trace of sea shells.	A-6(13)	
			101.0'		24" RECOVERY Boring Terminated at 101 feet.		
	<u> </u>						

KEY TO SYMBOLS

Symbol Description

Strata symbols

Silty sand

1.000000

Poorly graded sand with silt

Well graded sand with silt

Poorly graded sand



Poorly graded clayey silty sand



Low plasticity clay

DRAFT NOT FOR BIDDING AUGUST 2015

Notes:

- Exploratory borings were drilled on 1/28/2008 using a
 1/4-inch diameter continuous flight power auger. Rig is a ATV CME 55
- No free water was encountered at the time of drilling or when re-checked the following day.
- 3. Boring locations were taped from existing features and elevations extrapolated from the final design schematic plan.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

51.0'

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: US 301 Preferred Alternative Contract 1A **Boring No.:** BR1-07-03

Contract: 25-113-01

Boring Location: Sta. 667+53.23, 30' Rt. C.L.

Boring Surface Elev.: + 29.60 Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: IN. Lbs. 30 D-Sampler: S-Sampler: U-Sampler: IN. Type of: Split-Barrel O.D. 2 O.D.

IN. IN. 3 Ball Sampler Core Bit: O.D.

From Depth of: From Depth of: To: To: 3 1/4" **Casing Size:** Inches Hollow Stem Auger: 0.0'

Water Level Readings

Depth of Water Time Depth of Hole **Depth of Casing** Elev. of Water Date 2/25/2008 14.0' 18.0 16.0'

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 100.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corperation Driller: Jason Truver

Helpers: Tom Kane

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I.	Remarks
		1	0.0'	1 4 4 4	Saturated firm brown silt w/trace of fine to coarse sand, gravel and clay. A-4(1)	
		2	2.0'	2	16" RECOVERY Saturated firm gray silt w/trace of fine to A-4(0)	
3			4.0'	2 3 4 5	coarse sand. 18" RECOVERY	j
		3	4.0'	3 4 5	Saturated loose gray gravel w/trace of coarse to fine sand and silt.	
6			6.0'	14	6" RECOVERY	
		4	6.0'	6 9 11 5	Saturated medium dense brown fine to coarse A-2-4(0) sand w/some silt, trace of gravel.	
				5	saild w/some sit, trace of graver.	
			8.0'	2	16" RECOVERY	
9		5	8.0'	3 5 8 8	Saturated medium dense brown fine to coarse sand w/some silt, trace of gravel. A-2-4(0)	
			10.0'		19" RECOVERY	
		6	10.0'	6 8 11 11	Saturated medium dense brown fine sand w/ A-2-4(0) some silt and coarse sand, trace of gravel.	
12			12.0'		14" RECOVERY	
		7	12.0'	4 7 7 9	Saturated medium dense brown fine sand w/ A-2-4(0) some silt and coarse sand.	
			14.0'		15" RECOVERY	
15		8	14.0'	W/R 3 5 8	Saturated loose brown fine sand w/some silt A-2-4(0) and coarse sand.	
			16.0'		15" RECOVERY	
		9	16.0'	5 10 11	Saturated medium dense brownish red silty A-2-4(0)	

Remarks: Mud Rotarty starting @ 51.0'

Reviewed By: Maureen Kelly Soils Supervisor: Randy Ferguson

F.A. Project: US 301 Preferred Alternative Contract 1A **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
	-			15		fine sand w/some coarse sand.		
18			18.0'			16" RECOVERY		
		10	18.0'	2 2 6 8		Saturated loose brown fine sand w/some silt	A-2-4(0)	
				8		and coarse sand.		
			20.0'			12" RECOVERY		
21								
24								
		11	24.0'	6		Saturated medium dense brown fine sand w/	A-2-4(0)	
				8 8		some coarse sand and silt.		
			26.0'			15" RECOVERY		
			26.0			15 RECOVERY		
27						DRAFI		
	R							
		12	29.0'	7 8 8 7		Saturated medium dense brown fine sand w/	A-2-4(0)	
30	•	,		7		some silt, trace of coarse sand.		
			31.0'			13" RECOVERY		
						GUST 20	15	
						7U31/U		
33								
		13	34.0'	3		Saturated loose brown fine sand w/some	A-3	
				3 3 4 6		coarse sand, trace of silt.		
36			36.0'			17" RECOVERY		
					1			
					1:01	다. 단 다리		
39								
		14	39.0'	2 3 3 3		Saturated loose brown silty fine sand w/some	A-2-4(0)	
				3		coarse sand, trace of gravel.		
			41.0'			23" RECOVERY		
42								
		15	44.0'	3		Cotymotod loogo burner fire and 1 / constitution	A 2 4(0)	
45		15 15A	\ 44.5' <i>/</i>	5 5		Saturated loose brown fine sand w/some silt, trace of coarse sand and gravel.	A-2-4(0) A-2-4(0)	
40			44.5'	5	HYDY	drace of course suite and graver.	11 2-7(U)	

F.A. Project: US 301 Preferred Alternative Contract 1A **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I.	Remarks
			46.0'	7	6" RECOVERY Saturated medium dense gray fine sand w/ some coarse sand and clay. 16" RECOVERY	
48						
		U-1	49.0'		No Sample Recovery	Press Sample - Shelby Tube.
51			51.0'		0" RECOVERY	
54		16	53.0'	3 6 6 10	Saturated medium dense gray fine sand w/ A-2-4(0) some coarse sand and clay.	
			55.0'		24" RECOVERY	
57		17	58.0'	3 3 6 6	Saturated stiff gray fine sandy silt w/trace of A-4(0)	IG
60			60.0'		coarse sand. 24" RÉCOVERY 25	
63		18	63.0'	6	Section 4 design and the site of the section of the	
		10		6 7 8 14	Saturated stiff gray fine sandy silt w/trace of coarse sand and gravel. A-4(0)	
66			65.0'		24" RECOVERY	
		19	68.0'	6		
69		19		6 8 10 13	Saturated very stiff grayish green fine sandy silt w/trace of coarse sand and gravel. A-4(0)	
			70.0'		23" RECOVERY	
72						
		20	73.0'	10		

F.A. Project: US 301 Preferred Alternative Contract 1A **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	J			12 12 13	Saturated very stiff grayish green fine sandy	A-4(0)	
				13	silt w/some clay, trace of coarse sand.		
75			75.0'		24" RECOVERY		
78		21	78.0'	9		A 2 4(0)	
		21	70.0	9 10 16 22	Saturated medium dense green fine sand w/ some clay, trace of gravel and coarse sand.	A-2-4(0)	
				22	graver and course said.		
			80.0'		24" RECOVERY		
81							
		22	00.01	15			
0.4		22	83.0'	15 23 50	Saturated very dense green silty fine sand w/ trace of coarse sand.	A-2-4(0)	
84			84.5'		17" RECOVERY		
					FOR BIDI		
87		"					10
<u> </u>							
			20.4	0		45	
		23	88.0′	8 10 15 13	Saturated very stiff green fine sandy silt w/ trace of coarse sand and gravel.	A-4(0)	
				13	trace of coarse saild and graver.		
90			90.0'		24" RECOVERY		
-							
93							
		24	93.0'	8 12 12 17	Saturated very stiff gray clay w/some organic	A-7-6(23)	
				17	matter, trace of fine to coarse sand.		
			95.0'		24" RECOVERY		
96							
		25	98.0'	16 30 40 50	Saturated hard grayish green fine sandy silt w/	A-4(0)	
99				50	trace of coarse sand.		
			100.0'		18" RECOVERY		
					Boring Terminated at 100 feet.		

KEY TO SYMBOLS

Symbol Description

Strata symbols

Silt



Poorly graded gravel



Silty sand



Poorly graded sand with silt



Poorly graded clayey silty sand



Silty low plasticity clay



Low plasticity clay

DRAFT NOT FOR BIDDING AUGUST 2015

Notes:

- Exploratory borings were drilled on 2/25/2008 using a
 1/4-inch diameter continuous flight power auger. Rig is a ATV CME 55
- 2. No free water was encountered at the time of drilling or when re-checked the following day.
- 3. Boring locations were taped from existing features and elevations extrapolated from the final design schematic plan.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

96.0'

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: US 301 Preferred Alternative Contract 1A Boring No.: BR1-07-04

Contract: 25-113-01

Boring Location: Sta. 668+75.28, 29' Lt. C.L.

Boring Surface Elev.: + 26.50' Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: IN. Lbs. 30 D-Sampler: S-Sampler: U-Sampler: 2 IN. Type of: Split-Barrel O.D. O.D.

IN. IN. 3 Ball Sampler Core Bit: O.D. IN.

From Depth of: From Depth of: To: To: 3 1/4" **Casing Size:** Inches Hollow Stem Auger: 0.0'

Water Level Readings

Depth of Casing Depth of Water Time Depth of Hole Elev. of Water Date 2/18/2008 2.8'

10.0' 8.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 96.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corperation Driller: William Sharp

Helpers: William Hurd

Danith	D-il.	ı	0					
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
(111)	riegiese	1	0.0'	1 2		Saturated soft brownish gray silt w/trace of	A-4(0)	
				1 2 2 3		fine sand.		
			2.0'	4		20" RECOVERY		
			2.0	3 3 4		Saturated firm brownish gray silt w/trace of fine to coarse sand and gravel.	A-4(0)	
3				4		The to coarse sand and graver.		
		W	4.0'			24" RECOVERY		
		3	4.0'	1 1		Saturated soft gray silt w/some fine sand and	A-4(0)	
				2 2		organic matter, trace of coarse sand and		
						gravel.	115	
6		4	6.0' 6.0'			14" RECOVERY	A-4(1)	
			7.0'	2		Saturated soft gray fine snady silt w/some clay and organic matter, trace of coarse sand.		
		4A	7.0'	6 12	nini	8" RECOVERY	A-1-a	
			8.0'	12		Saturated medium dense brown gravel w/	111	
		5	8.0'	3 3 7 6		some fine to coarse sand, trace of silt.	A-2-4(0)	
9				7 6		Saturated loose brown fine sand and gravel w	/	
						some coarse sand and silt.		
		6	10.0' 10.0'	3		12" RECOVERY Saturated loose brown fine sand w/some silt,	A-2-4(0)	
			10.0	3 3 4 6		trace of coarse sand and gravel.	A-2-4(0)	
				6		thee of course said and graver.		
12			12.0'			20" RECOVERY		
		7	12.0'	3 4 6 7		Saturated loose brown fine sandy silt w/some	A-4(0)	
				6 7		coarse sand, trace of gravel.		
			44.0			20" DECOVEDY		
		8	14.0' 14.0'	3		20" RECOVERY Saturated loose brown fine sand w/some	A-3	
15				3 3 5 7		coarse sand, trace of silt.	11.5	
.,				'				
			16.0'			20" RECOVERY		
		9	16.0'	5 6 7		Saturated medium dense brown silty fine san	d A-2-4(0)	

Remarks:

Reviewed By: Maureen Kelly Soils Supervisor: Randy Ferguson

F.A. Project: US 301 Preferred Alternative Contract 1A **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
(11.)	Flogless		Берит	9	w/some coarse sand.		
18			18.0'		22" RECOVERY		
		10	18.0'	3 6 5 7	Saturated medium dense brown fine sand w/	A-2-4(0)	
				7	some silt and coarse sand.		
			20.0'		22" RECOVERY		
21							
21							
24		11	24.0'	2	Saturated medium dense brown fine sand w/	A-2-4(0)	
				2 4 7 8	some silt and coarse sand.	112 1(0)	
			26.0'		20" PECOVEDV		
			26.0		20" RECOVERY		
27					IIIJKALI		
	N	12	29.0'	2	Saturated loose brown silty fine sand w/trace	A-2-4(0)	
30		V		2 4 6 8	of coarse sand and gravel.	112 (0)	NG
			04.01		100 PEGOVERN		
			31.0'		18" RECOVERY		
					GUST 20	115	
33				10			
35							
		13	34.0'	4	Saturated medium dense brown silty fine sand	l A-2-4(0)	
			0	4 4 8 11	w/trace of coarse sand and gravel.	A-2-4(0)	
36			36.0'		20" RECOVERY		
39		14	39.0'	5	Saturated medium dense grayish green fine	A-2-4(0)	
		'-	00.0	5 5 6 7	sand w/some silt, trace of coarse sand and	A-2-4(0)	
				,	gravel.		
			41.0'		24" RECOVERY		
42							
			44.01	4		1 2 1/2	
45		15	44.0'	4 5 9 14	Saturated medium dense grayish green silty fine sand w/some coarse sand, trace of gravel	A-2-4(0)	
45	<u> </u>	<u> </u>		14	I I I I I I I I I I I I I I I I I I I		1

F.A. Project: US 301 Preferred Alternative Contract 1A **Contract:** 25-113-01

			I	<u> </u>	1	1	
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description CI	lass./G.I.	Remarks
	-				and organic matter.		
			46.0'		24" RECOVERY		
48							
		16	49.0'	4 6 8 12		A-4(0)	
				12	trace of coarse sand, gravel and organic matter.		
51			51.0'		24" RECOVERY		
54		17	54.0'	3	Saturated medium dense grayish green silty A	A-2-4(0)	
				3 5 7 7	fine sand w/trace of coarse sand and organic	Σ τ(U)	
					matter.		
			56.0'		22" RECOVERY		
57							
					FOR BIDD		
		V					
		18	59.0'	3 4 6 6		A-4(0)	
60				6	trace of coarse sand and organic matter.	5	
			61.0'	10	24" RECOVERY		
63							
		19	64.0'	6	Saturated medium dense gray silty fine sand A	A-2-4(0)	
				6 9 11 15	w/trace of coarse sand, gravel, organic matter	\-'\	
			60.01		and sea shells.		
66			66.0'		24" RECOVERY		
69			_				
		20	69.0'	3 5 9 11	Saturated stiff gray fine sandy silt w/some clay, trace of coarse sand, gravel, organic	A-4(0)	
				11	matter and sea shells.		
			71.0'		24" RECOVERY		
]							
72							
					acted		

F.A. Project: US 301 Preferred Alternative Contract 1A **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
75		21	74.0'	10 15 19 23	c c	Saturated hard gray fine sandy silt w/some clay, trace of fine sand, gravel, organic matter and sea shells. 24" RECOVERY	A-4(0)	
78								
		22	79.0'	7 15 23 28		Saturated hard gray fine sandy silt w/trace of coarse sand, organic matter and sea shells.	A-4(0)	
81			81.0'			22" RECOVERY		
84		23	84.0'	7			A 4(0)	
		23	04.0	7 9 11		Saturated very stiff gray fine sandy silt w/ trace of coarse sand, gravel, organic matter	A-4(0)	
				17		and sea shells.		
0.7		11	86.0'		-	24" RECOVERY		IG
87			Δ			SUST 20	15	
90		24	89.0'	5 9 11 13		Saturated very stiff gray clay w/trace of fine to coarse sand and organic matter.	A-7-6(21)	
			91.0'			24" RECOVERY		
93								
		25	94.0'	10 11 13 16	//// r	Saturated very stiff gray clay w/some organic matter, trace of fine to coarse sand and sea shells.	A-7-6(27)	
96			96.0'		///// ^s	24" RECOVERY		
90			30.0		I	Boring Terminated at 96 feet.		
						Š		
99	-							
	1							
1								

KEY TO SYMBOLS

Symbol Description

Strata symbols

Silt



Silty low plasticity clay



Poorly graded gravel



Silty sand



Poorly graded sand



Poorly graded clayey silty sand



Low plasticity clay

DRAFT NOT FOR BIDDING AUGUST 2015

Notes:

- Exploratory borings were drilled on 2/18/2008 using a
 1/4-inch diameter continuous flight power auger. Rig is a ATV CME 55
- No free water was encountered at the time of drilling or when re-checked the following day.
- 3. Boring locations were taped from existing features and elevations extrapolated from the final design schematic plan.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

84.0'

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: US 301 Preferred Alternative Contract 1A **Boring No.:** BR1-07-05

Contract: 25-113-01

Boring Location: Sta. 667+59.36, 67' Lt. C.L.

Boring Surface Elev.: + 30.0' Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: IN. Lbs. 30 D-Sampler: S-Sampler: IN. Type of: Split-Barrel O.D. 2 O.D.

IN. IN. U-Sampler: 3 Ball Sampler Core Bit: O.D.

From Depth of: From Depth of: To: To: 3 1/4" **Casing Size:** Inches Hollow Stem Auger: 0.0'

Water Level Readings

Depth of Water Time **Depth of Hole Depth of Casing** Elev. of Water Date 2/20/2008 10.0' 5.8' 8.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 101.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corperation Driller: William Sharp

Helpers: William Hurd

Depth	Daily		Sample					Γ
(ft.)	Progress	No.	Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
		1	0.0'	W/H 4		Wet medium dense brown fine sandy gravel	A-1-b	
				W/H 4 7 13		w/some silt and coarse sand.		
			2.0'	7	Щ	16" RECOVERY		
	R	2	2.0	7 9 11		Wet medium dense brown coarse sandy	A-1-b	
3				11 12		gravel w/some fine sand, trace of silt.		
		4 '	4.0'			20" RECOVERY		
		3	4.0'	6 8 7		Wet medium dense brown coarse to fine	A-1-b	
				7		sandy gravel w/trace of silt.	4	
							16	
6			6.0'			16" RECOVERY		
		4	6.0'	4 5		Wet loose brown silty fine sand w/some	A-2-4(0)	
				5 6		coarse sand, trace of gravel.		
			0.01			20 RECOVERY		
		5	8.0' 8.0'	3		20" RECOVERY Saturated loose brown fine to coarse sand w/	A-2-4(0)	
9				3 4 4 4		some silt, trace of gravel.	11 2 4(0)	
- ŭ				4		2 - 1 - 2 - 1 - 1 - 1 - 1 - 2 - 2 - 1 - 1		
			10.0'			18" RECOVERY		
		6	10.0'	3 4 6 8		Saturated loose brown line to coarse saild w/	A-3	
				6 8		trace of silt and gravel.		
					(** (**):) (** (**):) (* (*):)			
12		7	12.0' 12.0'	6		22" RECOVERY	A 2 4(0)	
		′	12.0	6 5 5 8		NI I	A-2-4(0)	
				8		some silt, trace of gravel.		
			14.0'			18" RECOVERY		
		8	14.0'	6 5		Saturated medium dense brown fine sand w/	A-2-4(0)	
15				6 5 6 9		some coarse sand and silt, trace of gravel.	. ,	
			16.0'			18" RECOVERY		
		9	16.0'	9 8 8		Saturated medium dense brown fine sand w/	A-2-4(0)	

Remarks: Mud Rotary starting @ 84.0'

Reviewed By: Maureen Kellery Soils Supervisor: Randy Ferguson

F.A. Project: US 301 Preferred Alternative Contract 1A **Contract:** 25-113-01

		_						
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
	, j			9		some gravel, coarse sand and silt.		
18			18.0'			20" RECOVERY		
		10	18.0'	5 5 8 10		Saturated medium dense brown fine sand w/	A-3	
				10		some coarse sand, trace of silt and gravel.		
			20.0'			20" RECOVERY		
04								
21								
24		11	24.0'	6		Saturated medium dense brown fine sand w/	A-2-4(0)	
			24.0	6 6 10 12		some silt and coarse sand.	A-2-4(0)	
			26.0'			22" RECOVERY		
27						IJKAFI		
		10	00.01	7				
30		12	29.0'	7 6 8 7		Saturated medium dense brown fine sand w/ some silt and coarse sand.	A-2-4(0)	
30	•			7		some of and coarse said.		
			31.0'			20" RECOVERY	4 —	
						GUST 20	14	
				1		JUUI ZU		
33								
		13	34.0'	2 3 5 6		Saturated loose brown fine sand w/some silt and coarse sand.	A-2-4(0)	
				6		and Coarse Sand.		
36			36.0'		-	20" RECOVERY		
39								
		14	39.0'	4 8 12 15		Saturated medium dense brownish green fine	A-2-4(0)	
				15		sand w/some silt and coarse sand.		
			41.0'			24" RECOVERY		
42								
		15	44.0'	4 6		Saturated very stiff gray fine sandy silt w/	A-4(0)	
45				4 6 10 11		trace of coarse sand and gravel.		

F.A. Project: US 301 Preferred Alternative Contract 1A **Contract:** 25-113-01

Depth	Daily		Sample					
(ft.)	Progress	No.	Depth	Blows/6"	нанына	Sample Description	Class./G.I.	Remarks
			46.0'			24" RECOVERY		
			.0.0			2.1833.201		
48								
		16	49.0'	4		Saturated medium dense grayish green silty	A-2-4(0)	
				4 7 9 11		fine sand w/trace of coarse sand and gravel.	A-2-4(0)	
51			51.0'			22" RECOVERY		
54								
		17	54.0'	4 7 11 15		Saturated medium dense grayish green fine sand w/some clay, trace of coarse sand and	A-2-4(0)	
				15		gravel.		
			56.0'			24" RECOVERY		
57	_	_						
31						OR BIDI	$\supset IV$	
		V				UK DIDI		
	_			_				
		18	59.0'	4 6 8 14		Saturated medium dense grayish green silty	A-2-4(0)	
60				8 14		fine sand w/trace of coarse sand.	15	
			61.0'	1		24" RECOVERY		
63								
		19	64.0'	6		Saturated very stiff grayish green fine sand w/	A-4(0)	
				6 7 9 13		trace of coarse sand, gravel and clay.		
			66.0'			14" DECOVEDY		
66			00.0			24" RECOVERY		
69		20	69.0'	6		Saturated madium dance gravish areas silter	A-2-4(0)	
		20	55.0	6 9 13 18		Saturated medium dense grayish green silty fine sand w/trace of coarse sand.	A-2-4(U)	
			71.0'			24" RECOVERY		
72								
							•	•

F.A. Project: US 301 Preferred Alternative Contract 1A **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
75	Ü	21	74.0'	8 10 12 17	Saturated very stiff grayish green fine sandy silt w/some clay, trace of coarse sand, gravel and sea shells. 24" RECOVERY	A-4(0)	
78		22	79.0'	9 15 17 28	Saturated dense grayish green fine sand w/ some clay, trace of coarse sand, gravel and sea shells.	A-2-4(0)	
81			81.0'		22" RECOVERY		
87	N	23	84.0'	10 19 28 32	Saturated dense grayish green silty fine sand w/trace of gravel, coarse sand and sea shells. 24" RECOVERY	A-2-4(0)	IG
90		24	89.0'	7 12 13 21	Saturated very stiff grayish green fine sandy silt w/trace of coarse sand and sea shells.	A-4(0)	
93			91.0'		24" RECOVERY		
96		25	94.0'	7 9 13 15	Saturated very stiff gray fine sandy clay w/ some organic matter, trace of sea shells. 24" RECOVERY	A-7-6(13)	
99							
		26	99.0'	9 13 16 22	Saturated very stiff gray clay w/some organic matter, trace of fine sand and sea shells. 24" RECOVERY Boring Terminated at 101 feet.	A-7-6(25)	
					Doring Terminated at 101 feet.		

KEY TO SYMBOLS

Symbol Description

Strata symbols

Silty sand

1.0000

Poorly graded sand with silt

Poorly graded sand



Clayey sand



Poorly graded clayey silty sand



Silt



Low plasticity clay

DRAFT NOT FOR BIDDING AUGUST 2015

Notes:

- Exploratory borings were drilled on 2/20/2008 using a
 1/4-inch diameter continuous flight power auger. Rig is a ATV CME 55
- No free water was encountered at the time of drilling or when re-checked the following day.
- 3. Boring locations were taped from existing features and elevations extrapolated from the final design schematic plan.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

31.0'

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: US 301 Preferred Alternative Contract 1A Boring No.: BR1-07-06

Contract: 25-113-01

Boring Location: Sta. 669+61.56, 67' Rt. C.L.

Boring Surface Elev.: + 37.39' Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: IN. Lbs. 30 D-Sampler: S-Sampler: U-Sampler: IN. Type of: Split-Barrel O.D. 2 O.D.

IN. IN. 3 Ball Sampler Core Bit: O.D.

From Depth of: From Depth of: To: To: 3 1/4" **Casing Size:** Inches Hollow Stem Auger: 0.0'

Water Level Readings

Time Depth of Hole **Depth of Casing** Elev. of Water **Depth of Water** Date

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 100.5 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corperation **Driller:** Dan Taylor

Helpers: Tom Kane

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
		1	0.0'	1 3 4 9		Saturated firm brown coarse sandy silt w/some fine sand and clay, trace of gravel.	A-4(2)	
		2	2.0'	8 5		12" RECOVERY No Sample Recovery		
3			4.0'	8 5 3 1		0"RECOVERY		IG
		3	4.0'	2 2 2 2		Saturated very loose brown coarse to fine sand w/trace of silt and gravel.	A-1-b	
6			6.0'			15" RECOVERY	15	
		4	6.0'	2 3 2		Saturated loose brown coarse to fine sand w/ trace of silt and gravel.	A-1-b	
			8.0'			16" RECOVERY		
9		5	8.0'	1 2 2 2		Saturated very loose brown fine to coarse sand w/some silt, trace of gravel.	A-2-4(0)	
		6	10.0'	W/H 1 W/H 1		Saturated very loose brown fine to coarse sand w/some silt, trace of gravel.	A-2-4(0)	
12		7	12.0' 12.0'	2	00173700 0113766 0114186 0114186	Saturated very loose brown fine to coarse	A-3	
				1 1	00173366 00173366 00173366 00173366	sand w/trace of silt and gravel.		
		8	14.0' 14.0'	1		19" RECOVERY		
15		0	14.0	1 1 2 2		Saturated very loose brown fine to coarse sand w/trace of silt and gravel.	A-3	
			16.0'	4	00313000 0014306 0013300 0013300	16" RECOVERY		
		9	16.0'	1 1 2		Saturated very loose brown coarse sand w/	A-1-b	

Remarks: Mud Rotary starting @ 31.0'

Reviewed By: Maureen Kelly Soils Supervisor: Randy Ferguson

F.A. Project: US 301 Preferred Alternative Contract 1A **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
				3		some fine sand, trace of silt and gravel.		
18			18.0'			13" RECOVERY		
		10	18.0'	3 1 3 7		Saturated very loose brown fine to coarse	A-2-4(0)	
				7		sand w/some silt, trace of gravel.		
			20.0'			19" RECOVERY		
21								
24								
		11	24.0'	1 2 5 10		Saturated loose brown fine sand w/some	A-3	
				5 10		coarse sand and gravel, trace of silt.		
			26.0'			17" RECOVERY		
			20.0					
27					155 13.1165. 1251 223 124 1261 431 124	IJRAFI		
					06193166 076179760 076179760			
	A				ricabater. Nicarabit			
		12	29.0'	5 6 10 12		Saturated medium dense brown fine sand w/	A-3	
30	•	,		12		some coarse sand, trace of silt.		
			31.0'			18" RECOVERY		
						DI ICT ON	15	
						1001/0		
33				1	18 13.1861. 18 13.1861.	9001 Z0		
					onivier. Grinier			
		13	34.0'	5 9	12 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Cotymated medium dance brown fine and w/	A-3	
		10	04.0	9 10 13	1873.1966. 1861.73789 1861.73786 1861.73786	Saturated medium dense brown fine sand w/ some coarse sand, trace of silt.	A-3	
				13	66113166 18113166 18113166	,		
36			36.0'		onivici. Gridici Gridici	19" RECOVERY		
20		14	38.5'	3	(1996) (1997) (1997)	Saturated medium dense brown fine sand w/	A-3	
39				3 5 6 9		trace of coarse sand and silt.	71.5	
					0.000 000 000 0.000 000 000 000 000 000			
			40.5'			19" RECOVERY		
					00			
42								
					des labed District. District			
		15	43.5'	3 5	en 1430en En 1430en En 1430en	Saturated loose brown fine sand w/trace of	A-3	
				3 5 5 6	(c) 13 3:0; f	coarse sand and silt.		
45					6612466 6614466 6614466			

F.A. Project: US 301 Preferred Alternative Contract 1A **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
			45.5'		on or other on or other on other or other or other	17" RECOVERY		
					136 14 316 6 176 170 161 166 1 3 3 166 176 176 176 1			
					hrê 1 (4)0 k 100 14 300 c 100 17 300 c 100 17 300 c			
48					136 1 6 136 6 136 1 1 1 136 6 136 1 1 1 1 1 1 1 1 1			
		16	48.5'	3 3 5 6	######################################	Saturated loose brown fine sand w/some	A-3	
				6	4.61 y 2.61 4.61 2 4.66 4.62 2 4.66 1.63 1 2 5 6 5	coarse sand, trace of silt and gravel.		
51			50.5'			17" RECOVERY		
					114 14 11 6 4 114 1 7 7 7 11 1 114 1 7 7 7 11 11 11 11 11 11 11 11 11 11 1			
					00333300 10333300 10333300 10333360			
					DOETTURE. Gestare Gestaries Gestare			
54		17	53.5'	7 10 13 17		Saturated medium dense gray fine sand w/ some clay, trace of coarse sand and organic	A-2-4(0)	
				17		matter.		
		U-1	55.5' 55.5'			21" RECOVERY Saturated gray clayey fine sand w/some	A-2-4(0)	Press Sample - Shelby Tube
F-7						coarse sand, trace of gravel and organic matter.		
57			57.5			24" RECOVERY	\mathcal{I}	
		1					711	
		18	58.5'	6 8 12		Saturated medium dense gray silty fine sand w/some coarse sand, trace of organic matter.	A-2-4(0)	
60				15		PHICTION	15	
			60.5'	1		24" RECOVERY		
63								
		19	63.5'	6 9 12 15		Saturated medium dense gray silty fine sand w/trace of coarse sand and organic matter.	A-2-4(0)	
				15		_		
66			65.5'			20" RECOVERY		
69		20	68.5'	3 5 6 17		Saturated medium dense gray silty fine sand w/trace of coarse sand, gravel and organic	A-2-4(0)	
			70.51	''		matter.		
			70.5'			21" RECOVERY		
72								

F.A. Project: US 301 Preferred Alternative Contract 1A **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
75		21	73.5' 75.5'	5 7 10 12		Saturated medium dense gray fine sand w/ some clay, trace of coarse sand, gravel and organic matter. 24" RECOVERY	A-2-4(0)	
78								
04		22	78.5' 80.5'	1 7 11 15		Saturated medium dense gray silty fine sand w/trace of coarse sand, gravel and organic matter. 19" RECOVERY	A-2-4(0)	
81								
84		23	83.5' 85.5'	7 10 10 13		Saturated very stiff gray clayey fine sandy silt w/trace of coarse sand and organic matter.	A-4(0)	
87	l		00.0			C RECOVERY D		IG
		24	88.5'	10		211ST 20	15	
90		24		10 12 16 22		Saturated medium dense green silty fine sand w/trace of coarse sand, gravel and organic matter.	A-2-4(0)	
			90.5'		_	24" RECOVERY		
93								
		25	94.0'	18 25 37 45		Saturated very dense green silty fine sand w/ trace of coarse sand, gravel and organic matter.	A-2-4(0)	
96			96.0'			19" RECOVERY		
99		26	98.5'	5 6 10 14		Saturated medium dense green silty fine sand w/trace of coarse sand and organic matter.	A-2-4(0)	
			100.5'			22" RECOVERY Boring Terminated at 100.5 feet.		
I .		1			1			1

KEY TO SYMBOLS

Symbol Description

Strata symbols

Low plasticity clay

other than the other than other than the other than other than the other than the Well graded sand with silt

្រែក្រុមប្រជា ព្រះប្រជាព្រះ ព្រះប្រជាព្រះ Poorly graded sand with silt

.....

Well graded sand



Silty sand



Clayey sand



Poorly graded clayey silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

Notes:

- Exploratory borings were drilled on 1/29/2008 using a
 1/4-inch diameter continuous flight power auger. Rig is a ATV CME 55
- 2. No free water was encountered at the time of drilling or when re-checked the following day.
- 3. Boring locations were taped from existing features and elevations extrapolated from the final design schematic plan.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

101.0'

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: US 301 Preferred Alternative Contract 1A Boring No.: BR1-07-07

Contract: 25-113-01

Boring Location: Sta. 667+51.56 67' Lt. C.L.

Boring Surface Elev.: + 27.00' Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: IN. Lbs. 30 D-Sampler: S-Sampler: U-Sampler: 2 IN. Type of: Split-Barrel O.D. IN. IN. O.D. 3 Ball Sampler

Core Bit: O.D. IN.

From Depth of: From Depth of: To: To: 3 1/4" **Casing Size:** Inches Hollow Stem Auger: 0.0'

Water Level Readings

Depth of Casing Time Depth of Hole **Depth of Water** Elev. of Water Date 2/22/2008 8.0' 7.3' 10.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 101.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corperation Driller: Bill Holden

Helpers: Tom Kane

	1		Ι.		1			T
Depth	Daily	No.	Sample	Blows/6"		Sample Description	Class./G.I.	Remarks
(ft.)	Progress	<u> </u>	Depth					
		1	0.0'	3 3 2 2		No Sieve Analysis		
			1.0'	2				
			1.0'					
			2.0'			6" RECOVERY		
		2	2.0'	2 2 2 2 2		Saturated soft gray silt w/some clay, trace of	A-4(4)	
3				2		fine to coarse sand and gravel.		
	`	\sim					<i>,</i>	
		•	4.0'			3" RECOVERY		
		3	4.0'	1		Saturated soft grayish brown gravelly silt w/	A-4(0)	
				3		some fine to coarse sand, trace of clay.	11 .(0)	
			Λ	2			15	
6			6.0'			10" RECOVERY		
6		4	6.0'		440 112	Saturated medium dense brown coarse sandy	A-1-a	
			0.0	2 21 24			A-1-a	
				24		gravel w/some fine sand and silt.		
			8.0'	2		14" RECOVERY		
		5	8.0'	3 4 6 5		Saturated loose brown fine to coarse sand w/	A-2-4(0)	
9				5		some silt, trace of gravel.		
			10.0'			18" RECOVERY		
		6	10.0'	5 6		Saturated medium dense brown fine to coarse	A-2-4(0)	
				5 6 8 7		sand w/some gravel and silt.		
						, c		
12			12.0'			11" RECOVERY		
'-		7	12.0'	2		Saturated medium dense brown fine sand w/	A-2-4(0)	
				2 4 7 11		some silt, trace of coarse sand and gravel.	112 1(0)	
				11		some sitt, trace of course said and graver.		
			14.0'			20" RECOVERY		
		8	14.0'	8			A 2 4(0)	
			1-7.0	8 10 12 12		Saturated medium dense brown silty fine sand	A-2-4(0)	
15				12		w/some coarse sand, trace of gravel.		
			16.0'			16" RECOVERY		
		9	16.0'	8 12	0613306 37617376 4617476	Saturated medium dense brown fine sand w/	A-3	
1	1	ı	1	13	1.011.011	1		1

Remarks:

Reviewed By: Maureen Kelley Soils Supervisor: Randy Ferguson

F.A. Project: US 301 Preferred Alternative Contract 1A **Contract:** 25-113-01

Depth	Daily		Sample					
(ft.)	Progress	No.	Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
				15	00 14 200 00 14 200 00 17 7 7 10 00 14 20 0	some coarse sand, trace of silt.		
18			18.0'			15" RECOVERY		
		10	18.0'	10 12 17 17	1:03 A 1:00 1:03 A 1:01 1:03 A 1:01		A-3	
				17		some coarse sand, trace of silt.		
			20.0'			21" RECOVERY		
			20.0			21 ABGGVERT		
21					136 14 31 16 176 1 7 3 1 1 1 176 1 3 3 1 1 1			
					(1414):00 (0411):01 (0411):01			
					nii 143ii			
					111 / 111 6			
					onivici andraire			
24		11	24.0'	5		Setunded and it and because the country	A 2 4(0)	
		''	24.0	5 10 11	100 3 0.100 0 100 1 0 0 0 0 100 1 0 0 0 0 100 1 0 0 0 0	Saturated medium dense brown fine sand w/ some coarse sand and silt.	A-2-4(0)	
				11		Sand diameter		
			26.0'			18" RECOVERY		
					036 14-336 0 03 2 13:00 135 14-13:01			
27						DNAFI		
					otiviiti Esilise Esilise			
	N	12	29.0'	23	1111		1 2 1(0)	
30		12	29.0	23 19 9 10	13 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Saturated medium dense brown fine sand w/ some coarse sand and silt.	A-2-4(0)	
30	•			10		some course suite and site.		
			31.0'		116 13 116 6 14 1 7 1 1 1 1	22" RECOVERY		
					00 14-14-14-14-14-14-14-14-14-14-14-14-14-1	GUST 20	15	
						4UST 70		
33					100 13.100 i			
					otivici come			
		13	34.0'	8	111111111	Saturated medium dense brown fine sand w/	A 2 4(0)	
		'3	34.0	10 11 13		some silt, trace of coarse sand.	A-2-4(0)	
				13		and one, and or course surfa.		
36			36.0'			17" RECOVERY		
39		14	39.0'	4	201112	Saturated medium dense brownish red fine	A-3	
		'-	33.0	6 6 5		sand w/some coarse sand and silt, trace of	A-3	
				5		gravel.		
			41.0'			16" RECOVERY		
40								
42		U-1	42.0'			No Sample Recovery		Press Sample - Shelby Tube.
					pierriiti Lierriiti Lierriiti			
		15	44.0' 44.0'	6		0" RECOVERY Saturated very stiff gray fine sandy silt w/	A-4(0)	
45			1 1.0	6 7 11 15		some clay, trace of coarse sand and gravel.	A-4(U)	
<u>`</u> _	1	I	1	1 10	1////	x	I	

F.A. Project: US 301 Preferred Alternative Contract 1A **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
			46.0'		22" RECOVERY		
40							
48							
		16	49.0'	6 8 9 12	Saturated medium dense gray fine sand w/	A-2-4(0)	
				12	some clay, trace of coarse sand and gravel.		
51			51.0'		22" RECOVERY		
54							
					DRAFT		
57	N			Т			
		7		ı	OR BIDI	יווע)	NG
		17	59.0'	6 10 12 13	Saturated very stiff gray fine sandy silt w/	A-4(0)	
60				12 13	trace of coarse sand and gravel.	15	
			61.0'	10	23" RECOVERY	10	
63							
		18	64.0'	6	Saturated stiff gray fine sandy silt w/some	A-4(0)	
				6 7 8 12	coarse sand, trace of gravel.	(-)	
66			66.0'		22" RECOVERY		
69		19	69.0'	9	Saturated hard grayish green fine sandy silt w/	A-4(0)	
				9 13 18 18	trace of coarse sand and gravel.	11- 1 (U)	
			71.0'		21" RECOVERY		
72							
	l		<u> </u>				<u>l</u>

F.A. Project: US 301 Preferred Alternative Contract 1A **Contract:** 25-113-01

20 74.0 13 14 15 16 17 17 18 18 18 18 18 18	Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class	ss./G.I.	Remarks
21 79.0 8	75		20		12 13 16 18	silt w/some clay, trace of coarse sand and gravel.	-4(0)	
21 79.0" 9 10 10 10 10 10 10 10				76.0'		22" RECOVERY		
Saturated hard green fine sandy silt w/trace of coarse sand, gravel and organic matter. Saturated hard green silty fine sand w/	78							
Saturated very dense green sity fine sand w/ trace of coarse sand and organic matter. Saturated hard green fine sandy sit w/trace of coarse sand and organic matter. Saturated hard green fine sandy sit w/trace of coarse sand and organic matter. Saturated hard green sity fine sandy clay w/ trace of coarse sand, gravel and organic matter. Saturated hard green sity fine sandy clay w/ trace of coarse sand, gravel and organic matter. Saturated hard green sity fine sandy clay w/ trace of coarse sand, gravel and organic matter. Saturated hard green sity fine sandy clay w/ trace of coarse sand, gravel and organic matter. Saturated hard green sity fine sandy clay w/ trace of coarse sand, gravel and organic matter. Saturated hard green sity fine sandy clay w/ trace of coarse sand, gravel and organic matter. Saturated hard green sity fine sandy clay w/ trace of coarse sand, gravel and organic matter. Saturated hard green sity fine sandy clay w/ trace of coarse sand, gravel and organic matter. Saturated hard green sity fine sandy clay w/ trace of coarse sand, gravel and organic matter. Saturated hard green sity fine sandy clay w/ trace of coarse sand, gravel and organic matter. Saturated hard green sity fine sandy clay w/ trace of coarse sand, gravel and organic matter. Saturated hard green sity fine sandy clay w/ trace of coarse sand, gravel and organic matter. Saturated hard green sity fine sandy clay w/ trace of coarse sand, gravel and organic matter. Saturated hard green sity fine sandy clay w/ trace of coarse sand, gravel and organic matter. Saturated hard green sity fine sandy clay w/ trace of coarse sand, gravel and organic matter. Saturated hard green sity fine sandy clay w/ trace of coarse sand, gravel and organic matter. Saturated hard green sity fine sandy clay w/ trace of coarse sand, gravel and organic matter. Saturated hard green sity fine sandy clay w/ trace of coarse sand, gravel and organic matter. Saturated hard green sity fine sandy clay w/ trace of coarse sand,			21	79.0'	9 12 18 18		-4(0)	
22 84.0" 17 13 14 15 15 15 15 15 15 15	81			81.0'		24" RECOVERY		
22 84.0" 17 13 14 15 15 15 15 15 15 15	84					DRAFT		
Saturated hard green fine sandy silt w/trace of coarse sand and organic matter. Saturated hard green silty fine sandy clay w/ trace of coarse sand, gravel and organic matter. Saturated hard green silty fine sandy clay w/ trace of coarse sand, gravel and organic matter. Saturated hard green silty fine sandy clay w/ trace of coarse sand, gravel and organic matter. Saturated hard green silty fine sandy clay w/ trace of coarse sand, gravel and organic matter. Saturated hard green silty fine sandy clay w/ trace of coarse sand, gravel and organic matter. Saturated hard green silty fine sandy clay w/ trace of coarse sand, gravel and organic matter. Saturated hard green silty fine sandy clay w/ trace of coarse sand, gravel and organic matter. Saturated hard green silty fine sandy clay w/ trace of coarse sand, gravel and organic matter. Saturated hard green silty fine sandy clay w/ trace of coarse sand, gravel and organic matter. Saturated hard green silty fine sandy clay w/ trace of coarse sand, gravel and organic matter. Saturated hard green silty fine sandy clay w/ trace of coarse sand, gravel and organic matter. Saturated hard green silty fine sandy clay w/ trace of coarse sand, gravel and organic matter. Saturated hard green silty fine sandy clay w/ trace of coarse sand, gravel and organic matter. Saturated hard green silty fine sandy clay w/ trace of coarse sand, gravel and organic matter. Saturated hard green silty fine sandy clay w/ trace of coarse sand, gravel and organic matter. Saturated hard green silty fine sandy clay w/ trace of coarse sand, gravel and organic matter. Saturated hard green silty fine sandy clay w/ trace of coarse sand, gravel and organic matter. Saturated hard green silty fine sandy clay w/ trace of coarse sand, gravel and organic matter. Saturated hard green silty fine sandy clay w/ trace of coarse sand, gravel and organic matter. Saturated hard green silty fine sandy clay w/ trace of coarse sand, gravel and organic matter. Saturated hard green s	04		22	84.0'	17 25 43 50/4"	trace of coarse sand, gravel and organic	2-4(0)	
23 89.0' 75 24 24 24 24 24 25 25 2				86.0'	T.			lG
93 94.0' 9 Saturated hard green silty fine sandy clay w/ trace of coarse sand, gravel and organic matter. 18" RECOVERY A-6(8) 18" RECOVERY No Sample Recovery 101.0' 0" RECOVERY 101.0' 0" RECOVERY 101.0' 101.0' 10" RECOVERY	87	_						
93 94.0' 94.0' 92 23 503' 101.0' 98.0' 99.0' 5 16 16 16 16 16 16 16			- 00	90.01		IIJUS 1.201	5	
93 24 94.0' 912	90		23	69.0	15 24 30	Saturated hard green fine sandy silt w/trace of coarse sand and organic matter.	-4(0)	
24 94.0' 91/2 23 50/3' Saturated hard green silty fine sandy clay w/ trace of coarse sand, gravel and organic matter. 18" RECOVERY No Sample Recovery 101.0' No Sample Recovery 101.0' 0" RECOVERY No Sample Recovery 101.0' No Sample Recovery 101.				91.0'		21" RECOVERY		
96 96.0' 18" RECOVERY 99 25 99.0' 5 8 16 16 16 16 16 16 16 10 0" RECOVERY	93							
96 96.0' 18" RECOVERY 99 25 99.0' 5 8 16 16 16 16 16 16 16 10 0" RECOVERY			24	94.0'	9	Saturated hard green silty fine sandy clay w/	-6(8)	
99 25 99.0' 5 8 16 16 16 16 10 101.0' No Sample Recovery 101.0' 0" RECOVERY					12 23 50/3"	trace of coarse sand, gravel and organic matter.	0(0)	
25 99.0' 5 No Sample Recovery 101.0' 0" RECOVERY	96			96.0'		18" RECOVERY		
25 99.0' 5 No Sample Recovery 101.0' 0" RECOVERY								
101.0' 0" RECOVERY	99		25	99.0'	5	No Sample Recovery		
101.0' 0" RECOVERY Roring Terminated at 101 feet					16 16			
Doing formmated at 101 feet.				101.0'		0" RECOVERY Boring Terminated at 101 feet.		

KEY TO SYMBOLS

Symbol Description

Strata symbols



Silty low plasticity clay



Poorly graded clayey silty sand



Silty sand



Poorly graded sand with silt



Clayey sand



Silt



Low plasticity clay

DRAFT NOT FOR BIDDING AUGUST 2015

Notes:

- Exploratory borings were drilled on 2/19/2008 using a
 1/4-inch diameter continuous flight power auger. Rig is a ATV CME 55
- 2. No free water was encountered at the time of drilling or when re-checked the following day.
- 3. Boring locations were taped from existing features and elevations extrapolated from the final design schematic plan.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

33.0'

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: US 301 Preferred Alternative Contract 1A **Boring No.:** BR1-07-08

Contract: 25-113-01

Boring Location: Sta. 670+10.20, 28' Lt. C.L.

Reference: Boring Surface Elev.: + 36.83'

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: IN. Lbs. 30 D-Sampler: S-Sampler: U-Sampler: IN. Type of: Split-Barrel O.D. 2 O.D.

IN. IN. 3 Ball Sampler Core Bit: O.D.

From Depth of: From Depth of: To: To: 3 1/4" **Casing Size:** Inches Hollow Stem Auger: 0.0'

Water Level Readings

Time **Depth of Hole Depth of Casing Depth of Water** Elev. of Water Date 1/31/2008 12.0' 10.3' 14.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 100.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corperation **Driller:** Dan Taylor

Helpers: Tom Kane

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
		1	0.0'	2 2 2 2		Wet very loose brown silty fine to coarse sand w/some gravel.	A-2-4(0)	
			2.0'			11" RECOVERY		
3		2	4.0'	2 2 4 5		Wet loose brown coarse sandy gravel w/some silt and fine sand. 9" RECOVERY	A-1-b	1G
		3	4.0'	2 2 2 2	13 14 13 1: 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	wet very loose brown time to coarse sand w/	A-2-4(0)	
6			6.0'	2		some silt and gravel. 17" RECOVERY	15	
		4	6.0'	3 3 3		Wet loose brown coarse sand w/some fine	A-1-b	
				3		sand and silt, trace of gravel.		
			8.0'		(10 14 15) (10 14 15) (10 17 17)	17" RECOVERY		
9		5	8.0'	2 3 2 2		silt, trace of gravel.	A-1-b	
			10.0' 10.0'	1		21" RECOVERY	1.2.4(0)	
		6	10.0	1 1 1		Saturated very loose brown fine to coarse sand w/some silt, trace of gravel.	A-2-4(0)	
12		7	12.0' 12.0'	2		20" RECOVERY	A 2 4(0)	
		,	12.0	2 3 2 3		Saturated loose brown fine to coarse sand w/ some silt, trace of gravel.	A-2-4(0)	
1			14.0'			16" RECOVERY		
15		8	14.0'	1 1 1 1		sand w/trace of silt and gravel.	A-1-b	
			16.0'		(113.11) (113.11) (113.11)	e 10 RECOVERT		
		9	16.0'	1 1 1	(1113) (1113) (1113)	Saturated very loose brown fine to coarse	A-3	

Remarks: Mud Rotary starting @ 33.0'

Reviewed By: Maureen Kelley Soils Supervisor: Randy Ferguson

F.A. Project: US 301 Preferred Alternative Contract 1A **Contract:** 25-113-01

Depth	Daily		Sample			-		
(ft.)	Progress	No.	Depth	DIOW5/0		Sample Description	Class./G.I.	Remarks
				2	00 14 100 00 14 100 00 14 100 00 14 100 00 14 100	sand w/trace of silt and gravel.		
18			18.0'		(* 14) (* 11) (* 11)	14" RECOVERY		
		10	18.0'	4 2 2 2	00011100 000111000 0001111000	Saturated very loose brown fine to coarse	A-2-4(0)	
				2	13171361 13171361 13171361	sand w/some silt, trace of gravel.		
			20.0'			22" RECOVERY		
					66 144 167 (117 17 17 16 1 (117 14 16 1			
21								
					rici i i i i i i i Geranale G Litti i i i i i i i			
					000173000 00173000 00173000			
24								
		11	24.0'	3 3 4 8	100 13 400 0 100 13 14 16 6 100 13 10 10 6	Saturated loose brown fine sand w/trace of	A-3	
				8		coarse sand, gravel and silt.		
			26.0'			20" RECOVERY		
						DDAET		
27						IJKALI		
					0000 1300 0 000 1310 0 000 1320 0			
	_				0614366 0614366			_
		12	29.0'	1			1210	
30		12	29.0	4 4 6 10		Saturated loose brown fine sand w/some coarse sand and silt.	A-2-4(0)	
30	•			10		course said and sit.		
			31.0'			19" RECOVERY		
						PHOT ON	115	
						JUSI ZU		
33		40	20.01	1				
		13	33.0'	4 6 7 7	00 14 11 0 1 00 1 1 1 1 1 1 0 1 01 1 1 1 1 1	Saturated medium dense brown fine sand w/ some coarse sand, trace of gravel.	A-3	
				7		some coarse said, trace of graver.		
			35.0'			19" RECOVERY		
00					(34 1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-			
36					001111169 011111160			
):::::::::::::::::::::::::::::::::::::			
		14	38.0'	4 5		Saturated medium dense brown fine sand w/	A-3	
39				4 5 6 10		some coarse sand, trace of silt.		
			40.01		(14.15) (14.15) (14.15) (14.15)	ALL DECOVERY		
			40.0'		P:	21" RECOVERY		
42					pre 17300 6614366 9317730			
					130 33.1 E f 120 3 3 1 E f 120 3 3 3 4 4 6 6			
		15	43.0'	4 5 6 6	1:::139:::0 1:::13::1::0 1:::13::0 1:::13::0 1:::13::0	Saturated medium dense brown fine sand w/	A-3	
				6	1.6173.61 1.6133.66 1.6143.66	trace of silt and coarse sand.		
45			45.0'		000 1310 0 100 131 130 0 100 1 1 1 1 10 0	18" RECOVERY		

F.A. Project: US 301 Preferred Alternative Contract 1A **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
48		16 16A	48.0' 49.5' 49.5' 50.0'	9 10 12	Saturated medium dense brown fine sand w/some silt and coarse sand, trace of gravel. 14" RECOVERY Saturated medium dense gray fine sand w/some silt and coarse sand, trace of gravel. 6" RECOVERY	A-2-4(0)	
51		17	53.0'	4 5	6" RECOVERY Saturated medium dense gray silty fine sand	A-2-4(0)	
54			55.0'	4 5 7 10	w/trace of coarse sand. 24"RECOVERY	``	
57	l	18	58.0'	5 7 8 10	Saturated medium dense gray silty fine sand w/trace of coarse sand, gravel and organic matter.	A-2-4(0)	1G
63			60.0	\U	24" RECOVERY	15	
66		19	63.0' 65.0'	5 6 10 12	Saturated medium dense gray silty fine sand w/some coarse sand, trace of organic matter. 24" RECOVERY	A-2-4(0)	
		20	68.0'	5	Saturated stiff gray fine sandy silt w/some	A-4(0)	
69			70.0'	5 6 8 12	clay, trace of coarse sand, gravel and organic matter. 24" RECOVERY	11 T(U)	
72		21	73.0'	6			

F.A. Project: US 301 Preferred Alternative Contract 1A **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
				7 8 11		Saturated stiff gray fine sandy silt w/trace of coarse sand, gravel and organic matter.	A-4(0)	
7.5			75.0'			24" RECOVERY		
75		U-1	75.0'			No Sample Recovery		Press Sample - Shelby Tube
			77.0'			24" RECOVERY		
70								
78		22	78.0'	6 10 12 17		Saturated medium dense grayish green silty	A-2-4(0)	
				12 17		fine sand w/trace of coarse sand and organic matter.		
			80.0'			24" RECOVERY		
81								
						DDAET		
84		23	83.0'	9 15 15 21		Saturated very stiff green fine sandy silt w/ some clay, trace of gravel, silt and organic	A-4(0)	
04				21		matter.		
			85.0'			24" RECOVERY		
						OR BIDI		
87		A ,						
07								
		24	88.0'	6 11		Saturated medium dense green silty fine sand	A-2-4(0)	
				16 24		w/trace of coarse sand, gravel and organic		
90			90.0'			matter. 22" RECOVERY		
93								
		25	93.0'	16 22 30 28		Saturated very dense blackish green silty fine	A-2-4(0)	
				28		sand w/trace of coarse sand and organic matter.		
			95.0'			24" RECOVERY		
96								
		26	98.0'	9		Saturated medium dense green silty fine sand	A-2-4(0)	
99				9 12 16 24		w/trace of coarse sand and organic matter.	A-2-4(0)	
			100.0'			24" RECOVERY		
			100.0			Boring Terminated at 100 feet.		
	I	1	1	1	1		i e	1

KEY TO SYMBOLS

Symbol Description

Strata symbols

Silty sand

1.000000

Poorly graded sand with silt

Poorly graded clayey silty sand



Clayey sand

DRAFT NOT FOR BIDDING AUGUST 2015

Notes:

- Exploratory borings were drilled on 1/31/2008 using a
 1/4-inch diameter continuous flight power auger. Rig is a ATV CME 55
- No free water was encountered at the time of drilling or when re-checked the following day.
- 3. Boring locations were taped from existing features and elevations extrapolated from the final design schematic plan.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

101.0

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to I-95 **Boring No.:** BR1-07-09

Contract: 25-113-01

Boring Location: Sta. 665+76, 22' Rt. C.L.

Boring Surface Elev.: + 36.85 Reference:

IN. IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Spoon O.D. 2 O.D.

IN. IN. IN. Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Time **Depth of Casing** Depth of Hole **Depth of Water** Elev. of Water Date 2/10/09 10.5 14.0 12.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Ft.; Dia. U-Sample Boring: U-Samples: Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** B. Holden

Helpers: T. Kane

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
	2/10/09	1	0.0'	2 3 9 9		Moist stiff brown silt w/ some fine sand and clay, trace of coarse sand and gravel.	A-4(1)	Topsoil - 2".
			2.0'	0		20" RECOVERY		
3		1	4.0'	9 8 9 8		Moist very stiff brown fine sandy silt, trace of coarse sand and gravel. 17" RECOVERY	A-4(0)	IG
		3	4.0'	6 10 8		Moist medium dense orange coarse sand and	A-1-b	
6			6.0'	4		gravel w/ some fine sand, trace of silt. 10" RECOVERY	15	
		4	6.0' 8.0'	5 5 6		Wet loose orange fine sand w/ some silt and coarse sand. 21" RECOVERY	A-2-4(0)	
9		5	8.0'	3 4 4 4		Wet loose orange fine sand w/ some silt and coarse sand.	A-2-4(0)	
		6	10.0'	4 5 5 7		Saturated loose orange fine sand w/ some coarse sand, trace of silt and gravel.	A-3	
12		7	12.0' 12.0'	2		19" RECOVERY		
		,	12.0	2 6 7 9		Saturated medium dense red and brown fine to coarse sand, trace of silt and gravel.	A-3	
			14.0'	_	125 13.1266 . 126 177 226 C 126 177 226	20" RECOVERY		
15		8	14.0'	5 5 6 8	63 44 16 6 1 66 9 19 19 6 6 66 19 19 6 6 66 19 19 6 6 63 19 19 6 6	Saturated medium dense red-brown fine sand w/ some coarse sand, trace of silt. 17" RECOVERY	A-3	
		9	16.0'	4 7	6614366 6113366 6113366	Saturated medium dense red-brown fine sand	A-3	
				11	6113466	and the state of t		

Remarks:

Reviewed By: Maureen Kelley Soils Supervisor: Randy Ferguson

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth Daily (ft.) Progress No. Sample Depth 16 Depth 17 RECOVERY Depth 16 Depth 17 RECOVERY Depth 17 RECOVERY Depth 17 RECOVERY Depth 17 RECOVERY Depth 17 Dept
18
21 22 21 21 21 21 21 22 21 22 23 24 24 24 25 26.0' 26.0' 27 27 27 28 28 28 28 28 28 28
21 22 21 21 21 21 21 22 21 22 23 24 24 24 25 26.0' 26.0' 27 27 27 28 28 28 28 28 28 28
21
24 11 24.0'
24 11 24.0' 8
24 11 24.0' 8 9 Saturated medium dense red-brown coarse to fine sand, trace of silt. 26.0' 20" RECOVERY
24 11 24.0' 8 9 Saturated medium dense red-brown coarse to fine sand, trace of silt. 26.0' 20" RECOVERY
24 11 24.0' 8
24 11 24.0'
24 11 24.0' 8 9 Saturated medium dense red-brown coarse to fine sand, trace of silt. 26.0' 20" RECOVERY
26.0' 26.0' 27
26.0' 20" RECOVERY
Saturated medium dense red-brown coarse A-1-b Mud Rotary @ 29.0'.
30 7 CHERCH Sand w/ some fine sand, trace of silt and
The second secon
31.0' gravel. 20" RECOVERY
H AUSUST 2015
33 FEBRUARY FEBRUA
2/13/09 13 34.0' 3 Saturated loose brown coarse sand w/ some A-1-b fine sand, trace of silt.
8 distyret Time Sand, trace of Sitt.
36.0' 18" RECOVERY
39
14 39.0' 2 Saturated medium dense brown fine sand w/ A-3
7 some coarse sand, trace of silt.
41.0' 18" RECOVERY
131 (4.18) 61 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Priving fer land fer lan
• Constant
15 44.0' 2 Saturated medium dense brown fine sand w/ A-3

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
			46.0'		131 15.1127 124 15.1127 124 15.1127	19" RECOVERY		
			40.0			1) KECVEKI		
48								
					120 3 1 3 1 0 1 120 3 3 4 1 6 0 120 1 7 3 2 1 1			
		16	49.0'	5 8 13 15		Saturated medium dense gray and brown silty fine sand w/ some coarse sand, trace of	A-2-4(0)	
				15		gravel.		
51			51.0'			21" RECOVERY		
54		17	54.0'	4 9 14 17		Saturated medium dense gray clayey fine sand	A-2-4(0)	
				14 17		w/ some coarse sand.		
			56.0'			19" RECOVERY		
57								
						OR BIDI		
		N 1		ı				
		18	59.0'_	6		Saturated medium dense gray silty fine sand,	A-2-4(0)	
60				6 9 13 16		trace of coarse sand.	15	
			61.0'	1		22" RECOVERY		
63								
		40	04.01	4			1.2.1(0)	
		19	64.0'	4 7 11 14		Saturated medium dense gray silty fine sand, trace of coarse sand.	A-2-4(0)	
60			66.01			All DECOVERY		
66			66.0'			21" RECOVERY		
69								
		20	69.0'	4 6 9 9		Saturated stiff gray clayey fine sandy silt, trace of coarse sand.	A-4(0)	
				9		trace of coarse saird.		
-			71.0'			20" RECOVERY		
72								
	1			I				l

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
75		21	74.0'	4 11 22 22		Saturated dense gray silty fine sand, trace of coarse sand and organic matter.	A-2-4(0)	
			76.0'		-	24" RECOVERY		
78								
70								
		22	79.0'	6 11		Saturated very stiff gray clayey fine sandy	A-4(0)	
				6 11 18 22		silt, trace of organic matter, coarse sand, and gravel.	, ,	
81			81.0'			24" RECOVERY		
						DRAFT		
84	2/16/09	23	84.0'	5	MANN	Saturated very stiff gray clayey fine sandy	A-4(0)	
	_			5 12 17 19		silt, trace of organic matter and coarse sand.	71 4(0)	_
			86.0'	Т		24" RECOVERY	\mathcal{I}	JG
07		7						
87								
						GUST 20	15	
90		24	8 <mark>9</mark> .0'	6 12 23 33		Saturated dense gray silty fine sand, trace of organic matter and coarse sand.	A-2-4(0)	
			91.0'			23" RECOVERY		
93								
		25	94.0'	11		Saturated dense gray silty fine sand, trace of	A-2-4(0)	Glauconitic
				11 18 25 38		organic matter and coarse sand.	11 2 .(0)	
96			96.0'			24" RECOVERY		
99		26	99.0'	5		Saturated very stiff gray clay w/ some fine	A 7 6(20)	
			33.0	5 10 13 15		sand.	A-7-6(28)	
			101.0'			24" RECOVERY		
			.01.0			End of Boring		

KEY TO SYMBOLS

Symbol Description

Strata symbols



Silty low plasticity clay



Silt



Well graded sand with silt



Silty sand



Poorly graded sand with silt



Poorly graded clayey silty sand



Clayey sand



High plasticity clay

DRAFT NOT FOR BIDDING **AUGUST 2015**

Notes:

- 1. Exploratory borings were drilled on 2/10/2009 using a 3 1/4-inch diameter hollow stem auger. Rig is a ATV CME 55.
- Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

F.A. Project: U.S. 301, Maryland State Line to I-95 **Boring No.:** BR1-07-10

Contract: 25-113-01

Boring Location: Sta. 666+58, 60' Lt. C.L.

Boring Surface Elev.: 33.89' Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: Type of: Split Spoon O.D. 2 O.D.

IN. IN. **U-Sampler:** Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches

Hollow Stem Auger: 0.0

Water Level Readings

Elev. of Water **Depth of Water** Time Depth of Hole **Depth of Casing** Date 26.9 33.9 2/6/09 10.0 8.0 7.0

101

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Ft.; Dia. U-Sample Boring: U-Samples: Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** G. Truver/B. Holden

Helpers: T. Kane

Depth	Daily	No.	Sample	Blows/6"	Sample Description	Class./G.I.	Remarks
(ft.)	Progress		Depth				
	2/6/09	1	0.0'	7 8 7	Moist medium dense orange silty fi	ne to A-2-4(0)	Topsoil - 2".
				7	coarse sand w/ some gravel.		
			1.5'		12" RECOVERY	•	
		2	2.0'	3 2 3	Moist loose orange fine sand w/ so	me silt and A-2-4(0)	
3				2 3	coarse sand, trace of gravel.		
		V					
	•		4.0'	•	17" RECOVERY		
		3	4.0'	2 4 2	Wet loose orange fine sand w/ som	e coarse A-2-4(0)	
				4	sand and silt, trace of gravel.		
						11116	
6			6.0'		18" RECOVERY		
		4	6.0'	4	Wet loose orange fine to coarse sar	id w/ some A-2-4(0)	
				4 6	silt, trace of gravel.		
			8.0'		21" RECOVERY		
		5	8.0'	2 4 5 7	Saturated loose orange fine sand w		
9				7	coarse sand and silt, trace of gravel		
			10.0'	4	20" RECOVERY		
		6	10.0'	4 7 14	Saturated medium dense orange fin	e sand w/ A-3	
				14	some coarse sand, trace of silt.		
12	0/0/00	7	12.0'	2	17" RECOVERY		
	2/9/09	7	12.0'	3 4 5 8	Saturated loose brown fine sand w/		
				8	coarse sand, trace of silt and gravel		
			14.0' 14.0'	2	19" RECOVERY		
		8	14.0	2 5 6 8	Saturated medium dense brown fin	\ /	
15				8	some coarse sand and silt, trace of	gravei.	
					i i		
		9	16.0' 16.0'	6	18" RECOVERY	1 / 1 2	
		9	10.0	6 9 12	Saturated medium dense brown fine	e sand w/ A-3	

Remarks:

Reviewed By: Maureen Kelley Soils Supervisor: Randy Ferguson

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

10	Depth	Daily		Sample	D. (01)		0 1 2 1 2	01 (0.1	5 .
18	(ft.)	Progress	No.	Depth	Blows/6"	011971910001	Sample Description	Class./G.I.	Remarks
10 10 10 10 10 10 10 10					15	100173100	_		
20	18		10		5	######################################		A 2	
20.0 18° RECOVERY			10	16.0	9 9	100 10 3 10 C		A-3	
24 11 24.0 6 7 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8					12	100133000	some course suita, trace of site.		
24 11				20.0'			18" RECOVERY		
24	04								
24 11 24.0	21								
24 11 24.0									
24 11						CELLARIO ELIAREI			
24 11 24.0 2 3 5 5 5 5 5 5 5 5 5						06143166 20172260 6643466			
some coarse sand, trace of silt. 26.0	24					1211111111			
26.0' 20' RECOVERY 31.0' 31			11	24.0'	6 6 7	1000		A-3	
26.0°					9		some coarse sand, trace of sitt.		
27				26.0'			20" RECOVERY		
30						REPAREE.	DDAET		
12 29.0	27						DRAFI		
12 29.0									
12 29.0 3 5 5 5 5 5 5 5 5 5						Coanne C			
33 34.0°			12	29.0'	3		Saturated medium dense brown fine sand w/	Δ-3	1/2
33 34.0°	30		N١		5 8 9				
33 13 34.0' 36 36.0' 39 14 39.0' 41 41.0' Saturated medium dense brown fine sand w/ some coarse sand, trace of silt. Saturated medium dense brown fine sand w/ some coarse sand, trace of silt. 19" RECOVERY A-3 Mud Rotary @ 39.0'.									
33 34.0' 6 57 7 5 5 5 5 5 5 5				31.0'				4	
33 34.0' 6 57 7 5 5 5 5 5 5 5							2119170	115	
13 34.0' 6 5 7 7 1 1 20" RECOVERY					1				
36.0' 36.0' 36.0' 37 38 38 39 14 39.0'	33					120 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
36.0' 36.0' 36.0' 37 38 38 39 14 39.0'						in in in it.			
36 36.0' 20" RECOVERY 39.0' 4 39.0' 5 36.0' 39.0' 41.0' 39.0' 41.0' 19" RECOVERY 41.0'			13	34.0'	6 5	10 12 10 10 10 10 10 10 10 10 10 10 10 10 10		A-3	
36 36.0' 20" RECOVERY 39.0' 4 39.0' 5 7 8 39.0' 4 39.0' 4 39.0' 5 39.0' 4 39.0' 4 39.0' 5 39.0' 4 39.0' 4 39.0' 5 39.0'					7		some coarse sand, trace of silt.		
39 14 39.0' 4 Saturated medium dense brown fine sand w/ some coarse sand, trace of silt. 41.0' 19" RECOVERY A1.0' 19" RECOVERY	36			36.0'			20" RECOVERY		
39 14 39.0'						100 1 2 3 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			
39 14 39.0'									
39 14 39.0'						12111111111111111111111111111111111111			
14 39.0' 4 this is a some coarse sand, trace of silt. 41.0' 19" RECOVERY 19" RECOVERY						0:01:01:01:0 0:01:13:06			
41.0' 41.0' Some coarse sand, trace of silt. 19" RECOVERY	39		1/	30 0'	4	100	Cotunated madium days - bassar Garage 1	A 2	Mud Dotom: @ 20.0!
41.0' 19" RECOVERY 42			'*	39.0	5 7	100 13 3:100		A-3	wida Kotary @ 39.0°.
42 41.0' ####################################					8	61133166 6134166 6131366			
42				41.0'			19" RECOVERY		
	42								
Districts des land life land life land mit same fill same fill same fill same	44					h::133166 113166			
Girjand Historia Wilstoni Wilstoni Historia Hist									
						in laner.			
w/ some coarse sand, trace of organic matter.			15	44.0'	4 5		Saturated medium dense gray silty fine sand	A-2-4(0)	
[historial)	45				7 10		w/ some coarse sand, trace of organic matter.		

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Donth	Delle	ı	Commis		1			Γ
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
			46.0'			18" RECOVERY		
			40.0			18 RECOVER I		
48								
40								
		16	49.0'	1	mana		1.2.4(0)	
		16	49.0	4 6 7 11		Saturated medium dense gray clayey fine sand, trace of coarse sand, organic matter, and	A-2-4(0)	
				11		gravel.		
51			51.0'			22" RECOVERY		
54								
<u> </u>		17	54.0'	6 7 10 12		Saturated medium dense gray silty fine sand,	A-2-4(0)	
				10 12		trace of coarse sand, gravel, and organic		
			56.0'			matter. 21" RECOVERY		
57	R							
						OR BIDI) \	J(j
		A .						
		18	59.0'_	3	mmm	Control of Control of the	A 4(0)	
60		10	39.0	3 5 9		Saturated stiff gray clayey fine sandy silt, trace of coarse sand, organic matter, and	A-4(0)	
00				4		gravel.		
			61.0'	10		24" RECOVERY	10	
63								
		19	64.0'	4 5 10 10		Saturated stiff gray clayey fine sandy silt,	A-4(0)	
				10 10		trace of coarse sand, gravel, and organic matter.		
66			66.0'			matter. 23" RECOVERY		
			23.0					
69		20	69.0'	4		Cotumpted modium James and 111 Const.	A 2 4(0)	
		20	0.80	4 4 7 9		Saturated medium dense gray silty fine sand, trace of coarse sand, gravel, and organic	A-2-4(0)	
				9		matter.		
			71.0'			22" RECOVERY		
72								
'-								
	I	<u> </u>		<u> </u>		<u>:</u>		l

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Oontre	act. 25-113	-01						
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
75		21	74.0'	6 9 3 16		Saturated very stiff gray fine sandy silt, trace of gravel, coarse sand, and organic matter.	A-4(0)	
			76.0'		_	24" RECOVERY		
78								
		22	79.0'	5 11 15 21		Saturated very stiff gray fine sandy silt, trace of organic matter and clay.	A-4(0)	
81			81.0'			24" RECOVERY		
84						DRAFT		
	2/10/09	23	84.0'	7 13 18 28		Saturated dense gray silty fine sand, trace of organic matter, coarse sand, and gravel.	A-2-4(0)	
87	r		86.0'			24" RECOVERY		IG
			Δ			GUST 20	15	
90		24	8 <mark>9</mark> .0'	14 23 38 41		Saturated very dense green silty fine sand, trace of organic matter, gravel, and coarse sand.	A-2-4(0)	Glauconitic
			91.0		_	23" RECOVERY		
93								
		25	94.0' 95.5'	8 10 13		Saturated very stiff gray and green fine sandy silt, trace of organic matter, coarse sand, and gravel.	A-4(0)	Glauconitic
96		25A	95.5' \96.0'/	18		Saturated very stiff gray clay w/ some organic matter, trace of fine sand and gravel. 6" RECOVERY	A-7-6(20)	
99		26	99.0'	7 8 12 18		Saturated very stiff gray clay w/ some organic matter, trace of fine sand.	A-7-6(25)	
			101.0'			24" RECOVERY		
						End of Boring		

KEY TO SYMBOLS

Symbol Description

Strata symbols

Silty sand



Poorly graded sand with silt



Poorly graded clayey silty sand



Clayey sand



Low plasticity clay

DRAFT NOT FOR BIDDING AUGUST 2015

Notes:

- 1. Exploratory borings were drilled on 2/6/2009 using a 3 1/4-inch diameter hollow stem auger. Rig is a ATV CME 55.
- Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

F.A. Project: U.S. 301, Maryland State Line to I-95 Boring No.: BR1-07-11

Contract: 25-113-01

Boring Location: Sta. 668+50, 20' Lt. C.L.

Boring Surface Elev.: 28.0' Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Spoon O.D. 2 IN. IN. O.D. Core Bit: O.D. IN.

From Depth of: From Depth of: To: To: 101.0 **Casing Size:** 3 1/4 Inches 0.0 Hollow Stem Auger:

Water Level Readings

Depth of Casing Elev. of Water Time **Depth of Hole Depth of Water** Date 21.4 28.0 10.0 2/4/09 8.0 6.6

 $\frac{28.0}{28.0}$

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** G. Truver

Helpers:

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
	2/4/09	1	1.5'	2 4 4		Wet firm brown silt w/ some clay, trace of fine to coarse sand and gravel. 14" RECOVERY	A-4(4)	Topsoil - 3".
3		2	4.0'	6 5 5 5		Wet stiff brown silt, trace of fine to coarse sand and gravel. 16" RECOVERY	A-4(0)	IG
		3	4.0'	1 2 3		Wet firm brown silt w/ some fine sand, trace of coarse sand and gravel.	A-4(0)	
6			6.0	J		14" RECOVERY	15	
		4	6.0'	2 3 2 2		Wet firm gray silt w/ some fine sand, trace of coarse sand and gravel.	A-4(0)	
			8.0'			15" RECOVERY		
9		5	8.0'	14 18 9 9	61 44 16 6 61 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Wet medium dense orange gravel and coarse sand w/ some fine sand, trace of silt.	A-1-a	
		6	10.0'	5 3 4 4		Saturated loose orange fine sand w/ some silt, trace of coarse sand.	A-2-4(0)	
12			12.0'	W/P		15" RECOVERY		
		7	12.0'	W/R 2 5 6	136 14-1166 126 13 1206 126 13 1206 126 13 1206 126 14-1166 126 13 1200	Saturated loose orange fine sand w/ some silt, trace of coarse sand and gravel.	A-2-4(0)	
			14.0'		10111110 10111110 10111110	14" RECOVERY		
15		8	14.0'	1 3 7 9		Saturated loose orange fine sand w/ some coarse sand and silt.	A-2-4(0)	
			16.0'	Ω		15" RECOVERY	1.0.1(0)	
		9	16.0'	8 8 12		Saturated medium dense orange fine sand w/	A-2-4(0)	

Remarks:

Reviewed By: Maureen Kelley Soils Supervisor: Randy Ferguson

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

10 18.0 20 20 20 20 20 20 20	Depth	Daily	Ne	Sample	Dleves /0"		Comple Description	Class /C !	Damade
18.0	(ft.)	Progréss	No.	Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
10					23				
20.0 20.0	18		10	18.0'	4			A 2	
21 24 24 25 25 27 28 28 29 20 20 RECOVERY 24 25 26 27 27 27 28 27 27 28 28			10	18.0	8 10	100 1 2 3 3 10		A-3	
20					13	4.643.4	some course sume, trace of sine and graves.		
24 24 11 24.0 0 0 2 25.00 22 20.0 0 0 2 20.0 0 0 2 20.0 0 0 0				20.0'			20" RECOVERY		
24 24 11 24.0 0 0 2 25.00 22 20.0 0 0 2 20.0 0 0 2 20.0 0 0 0	21								
11	21								
11									
11									
11						6614316 1217126 1217136			
some coarse sand, trace of silt. 27.	24					erikire Scrane Sarabe			
26.0°			11	24.0'	6 6 7			A-3	
25/09 12 29.0 6 Saturated medium dense orange fine sand. 31.0 20 RECOVERY 31.0 31.0 20 RECOVERY 33.3 33.3 34.0 4 3 34.0 4 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5					8		some coarse sand, trace of silt.		
2/5/09 12 29.0 6 8 2 3 31.0 20" RECOVERY 33 34.0 4 4 31.0 34.0 4 3 31.0 34.0 3				26.0'			20" RECOVERY		
2/5/09 12 29.0 6 8 2 3 31.0 20" RECOVERY 33 34.0 4 4 31.0 34.0 4 3 31.0 34.0 3							DDAET		
2/509 12 29.0 6 5 6 5 6 6 5 6 6 6	27					1:01/1/1:0 1:01/1/1:0 1:01/1:01:0	DRAFI		
2/509 12 29.0 6 5 6 5 6 6 5 6 6 6									
2/509 12 29.0 6 5 6 5 6 6 5 6 6 6						,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			
30 31.0° 31.0° 20° RECOVERY 33 34.0° 4 3 34.0° 4 8 9 Saturated medium dense orange fine sand w/ some coarse sand, trace of silt. 36 36.0° 21° RECOVERY 39 41.0° 4 5 8 Saturated medium dense orange fine sand w/ some coarse sand, trace of silt. 21° RECOVERY A-3 Mud Rotary @ 39.0°. 22° RECOVERY		2/5/09	12	29.0'	6	li jii i	Soturated madium dange grange fine sand	Λ 2	
33 34.0°	30	2/0/00	\ ¹ \	20.0	6 9	14 (43) 12 3 3 2 2 14 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		A-3	
33 34.0 4 5 Saturated medium dense orange fine sand w/ some coarse sand, trace of silt. 36 36.0 2 1		_			9				
33 13 34.0' 4 34.0'				31.0'					
33 13 34.0' 4							21191 20	115	
36 36.0' Saturated medium dense orange fine sand w/ some coarse sand, trace of silt. 21" RECOVERY Saturated medium dense orange fine sand w/ some coarse sand, trace of silt. 21" RECOVERY Saturated medium dense orange fine sand w/ some coarse sand, trace of silt and gravel. 42 42 42 42 42 42 42 42 42 43 43 43 44 45 45 45 45 45 45 45 45 45 45 45 45					1		JUSI ZU		
some coarse sand, trace of silt. 21" RECOVERY 14 39.0' 5	33			_					
some coarse sand, trace of silt. 21" RECOVERY 14 39.0' 5						00 3 3 3 3 0 150 3 3 4 7 6 150 3 3 4 7 5 7 6			
36 36.0' 21" RECOVERY 39.0' 45 41.0' 22" RECOVERY A-3 Mud Rotary @ 39.0'.			13	34.0'			Saturated medium dense orange fine sand w/	A-3	
36 36.0' 21" RECOVERY 39.0' 4 39.0' 5 9 39.0'. Saturated medium dense orange fine sand w/ some coarse sand, trace of silt and gravel. A-3 Mud Rotary @ 39.0'. 41.0' 22" RECOVERY					8 9		some coarse sand, trace of silt.		
39 14 39.0' 4 Saturated medium dense orange fine sand w/ some coarse sand, trace of silt and gravel. 41.0' 22" RECOVERY 42	26			36 N'			21" RECOVERY		
39 14 39.0' Saturated medium dense orange fine sand w/ some coarse sand, trace of silt and gravel. 41.0' 22" RECOVERY	30			30.0			21 RECOVERT		
39 14 39.0' Saturated medium dense orange fine sand w/ some coarse sand, trace of silt and gravel. 41.0' 22" RECOVERY									
39 14 39.0'									
14 39.0' 14 39.0' 4						E 6 2 3 3 1 E 1			
41.0' Some coarse sand, trace of silt and gravel. 22" RECOVERY	39			00.51	4				
41.0' 22" RECOVERY			14	39.0'	5 6	00014300		A-3	Mud Rotary @ 39.0'.
42 41.0'					9		some coarse sand, nace of sitt and graver.		
				41.0'			22" RECOVERY		
(215,340) VI 1272V VI 1372V VI 1372V VI 1372V VI 1372V VI 1372V VI 1372V	42								
litianiei. Mitanie Mitanie									
						rit i initi			
45 5 5 6 6 6 6 6 6 6			15	44.0'	2		Saturated stiff gray fine sandy silt_trace of	A-4(0)	
	45				5 9 12			11 1(0)	

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
			46.0'			22" RECOVERY		
			10.0			22 RBSOVERT		
48								
			40.01	2				
		16	49.0'	3 8 10 13		Saturated medium dense gray silty fine sand, trace of coarse sand, organic matter, and	A-2-4(0)	
- F4			51.0'			gravel. 23" RECOVERY		
51	-		51.0			23 RECOVERY		
54								
		17	54.0'	3 4 8 10		Saturated stiff gray clayey fine sandy silt, trace of coarse sand, organic matter, and	A-4(0)	
				10		gravel.		
			56.0'			24" RECOVERY		
57	R			_				
		M				FOR BIDI		JG
				•				
60		18	59.0'	3 6 10		Saturated very stiff gray fine sandy silt, trace of coarse sand, organic matter, and gravel.	A-4(0)	
60	1			16		70.0	15	
			61.0'	10		24" RÉCOVERY		
	<u> </u> 							
63								
	-	19	64.0'	4 6 6 7		Saturated medium dense gray silty fine sand,	A-2-4(0)	
				7		trace of coarse sand, organic matter, and gravel.		
66			66.0'			24" RECOVERY		
60								
69	2/6/09	20	69.0'	2 5 9 12		Saturated stiff gray fine sandy silt w/ some	A-4(0)	
				12		clay, trace of coarse sand, organic matter, and gravel.		
			71.0'			21" RECOVERY		
72								
	1	I	1		ииии	PI CONTRACTOR OF THE CONTRACTO		l

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
		21	74.0'	4 8 10 11		Saturated very stiff gray clayey fine sandy	A-4(0)	
75				11	Si	ilt, trace of organic matter and coarse sand.		
			76.0'			23" RECOVERY		
78								
		22	79.0'	5 10	S	Saturated medium dense gray silty fine sand,	A-2-4(0)	
				5 10 19 23		race of organic matter and coarse sand.		
81			81.0'			22" RECOVERY		
01			01.0			22 RECOVERT		
						$)$ R Δ F \perp		
84		23	84.0'	9	C	Saturated dense green silty fine sand, trace of	A 2 4(0)	Glauconitic
		20	04.0	9 19 29 35		organic matter and coarse sand.	A-2-4(0)	Giauconitic
	R			33				
		\mathbf{H}	86.0'			20" RECOVERY		
87	•	•						
						110T00	15	
						1031 /0		
		24	89.0'	6 8 11 15		saturated medium dense gray and green silty	A-2-4(0)	Glauconitic
90				15		ine sand, trace of organic matter and coarse and.		
			91.0'			19" RECOVERY		
93								
		25	94.0'	4 7		Saturated very stiff gray silty clay w/ some	A-7-6(28)	
				4 7 11 13		organic matter, trace of fine sand.		
96			96.0'			24" RECOVERY		
30			30.0			2. RECOLEKT		
99		26	99.0'	4		aturated dance gray silty fine and trace of	A 2 4(0)	
			00.0	4 17 28 32		Saturated dense gray silty fine sand, trace of organic matter, coarse sand, and gravel.	A-2-4(0)	
				32				
			101.0'		Е	19" RECOVERY End of Boring		
						and or Dornig		

KEY TO SYMBOLS

Symbol Description

Strata symbols

Silty low plasticity clay

Silt

1.030.00 1.030.00 1.030.00

Poorly graded sand with silt



Silty sand



Poorly graded clayey silty sand



Low plasticity clay

DRAFT NOT FOR BIDDING AUGUST 2015

Notes:

- 1. Exploratory borings were drilled on 2/4/2009 using a 3 1/4-inch diameter hollow stem auger. Rig is a ATV CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

77.0'

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to I-95 Boring No.: BR1-08-01

Contract: 25-113-01

Boring Location: Sta. 629+57.39, 90' Rt. C.L.

Boring Surface Elev.: 76.67 Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: 2 Type of: Split Barrel O.D. IN. IN. O.D. U-Sampler: 3 Ball Sampler Core Bit: O.D.

To: To: **Casing Size:** 3 1/4 Inches From Depth of:

Hollow Stem Auger: From Depth of: 0.0'

Water Level Readings

Depth of Casing Depth of Water Time **Depth of Hole** Elev. of Water Date 45.7 76.7 1/25/08 34.0' 31.0' 36.0 76.7 76.7

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 77.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Jason Truver

Helpers: J. Hillebrand

Depth	Daily	T	Sample	,	
(ft.)	Progress	No.	Depth	Blows/6"	Sample Description Class./G.I. Remarks
		1	0.0'	5 3 4 4	Wet firm light brown clayey silt, trace of fine to coarse sand. 8" Cultivated Soils
2.49		2	2.0' 2.0'	3 3 2 3	Wet firm light brown fine sandy silt w/ some coarse sand and clay. 24" RECOVERY
4.98		3	4.0'	2 3 6 8	Wet firm light brown fine to coarse sandy silt. trace of gravel and clay. 14" RECOVERY
7.47		4	6.0'	4 7 7 7	Wet medium dense orange brown clayey fine to coarse sand, trace of gravel. 24" RECOVERY
9.96		5	8.0'	3 4 5 7	Wet loose orange brown fine sand w/ some coarse sand and silt, trace of gravel. 19" RECOVERY
		6	10.0'	6 6 13 11	Wet medium dense orange brown silty fine sand w/ some coarse sand. 10" RECOVERY
12.45		7	12.0'	4 4 8 9	Wet stiff reddish brown fine sandy clay w/ some coarse sand, trace of gravel. A-2-4(0)

Remarks:

Reviewed By: Maureen Kelly Soils Supervisor: Randy Ferguson

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
()	1.59.000	8	14.0' /	5	III	14" RECOVERY	A-2-7(0)	
14.94			14.0'	5 7 11 11	Ш	Wet very stiff reddish brown fine sandy clay	1127(0)	
14.94					Ш	w/ some coarse sand.		
					Ш			
		9	16.0' 16.0'	11		16" RECOVERY Wet medium dense reddish brown silty fine to	A-2-7(0)	
			10.0	11 11 14 15		coarse sand, trace of gravel.	A-2-7(0)	
<u> </u>				15		8-11-11		
17.43								
		10	18.0' 18.0'	7		17" RECOVERY	A 2 4(0)	
		10	10.0	7 14 14 8		Wet medium dense reddish brown silty fine to coarse sand w/ some gravel.	A-2-4(0)	
				8		coarse saile w/ some graver.		
19.92			20.0'		-	8" RECOVERY		
22.41						DRAFI		
		11	24.0'	7 7		Wet medium dense reddish brown silty coarse	A-2-4(0)	
24.9		V		7 7 8 15		to fine sand, trace of gravel.		
	_	_		_				
			00.0			24th DEGOVERN	_	
			26.0			24" RECOVERY	115	
						24" RECOVERY	15	
07.00				10	1			
27.39								
		12	29.0'	2 4 4 9		Wet loose light brown and reddish brown fine	A-2-4(0)	
29.88				9		to coarse sand w/ some silt, trace of gravel.		
			31.0'			24" RECOVERY		
		U-1	31.0'			Saturated medium dense light brown and	A-2-4(0)	Press Sample - Shelby Tube.
						reddish brown fine to coarse sand w/ some		
32.37						silt, trace of gravel.		
			32.8'		-	18" RECOVERY		
		13	34.0'	4		Saturated medium dense brown fine to coarse	A-2-4(0)	
34.86				4 6 7 9		sand w/ some silt, trace of gravel.		
			00.01			24# DECOVERY		
			36.0'		-	24" RECOVERY		
27.05								
37.35							<u> </u>	L

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
		14	39.0'	7		Saturated medium dense reddish brown fine	A-3	
39.84				7 7 9 10		to coarse sand w/ some silt.		
			41.0'			24" RECOVERY		
					126 1 7 3 16 1 10 6 1 4 3 16 1 10 6 1 16 1 16 1			
42.33					188 3 A. 188 1 188 1 7 3 3 6 1 188 1 7 3 3 6 1 188 1 7 3 3 6 1			
					100 2 1000 100 2 3 1000 100 1 2 2 3 10 100 1 2 3 3 3 6 1			
					preiopie Gerrani Gerrani Gerrani			
		15	44.0'	11 11		Saturated medium dense reddish brown fine	A-2-4(0)	
44.82				10 17		to coarse sand w/ some silt.		
						DDAET		
			46.0'			24" RECOVERY		
47.31	R	1/		T				
		M				·OR BIDI		
				•				
		16	49.0'	11 14 21 24		Saturated dense brown fine sand w/ some	A-3	
49.8				24		coarse sand and silt.	15	
			51.0'	10		14" RECOVERY	10	
			31.0		(: 6) () () () (: 6) () () () () (: 6) () () ()	14 RECOVERT		
50.00								
52.29								
					1967 3.1961 1967 3.3961 1967 3.3961 1967 3.3961			
54.78		17	54.0'	11 14 17 25	111 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Saturated delige ere wil lille to course saile w	A-2-4(0)	
				25				
			56.0'			16" RECOVERY		
57.27					(*************************************			
		18	59.0'	5	1:10		A 2	
59.76		10	39.0	15		some coarse sand and silt.	A-3	
					:			
					/#14// 	1		

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

	T		T =				T	
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
	<u> </u>		61.0'		00133066 370173707 86433086	24" RECOVERY		
					in dan er Den dan er Den dan er			
62.25								
					611)986 611,166			
		19	64.0'	8	######################################	Saturated medium dense brown fine sand w/	A-2-4(0)	
64.74				8 11 13 15	00111100 00111100 00111100 00111100	some coarse sand and silt.	(-)	
					18 14 19 6 1 18 14 14 16 1			
			66.0'		reirici Gerine Gerine	24" RECOVERY		
			00.0		neci cance neci cance per chen	24 RECOVERT		
					461133166 46133167. 14613366			
67.23								
		20	69.0'	10 12		Saturated dense brown fine sand w/ some	A-3	
69.72				10 12 21 20	10 6 1 4 3 10 C	coarse sand, trace of silt.		
					pikirpikir Karling Kirinitir Kiriniter			
			71.0'		000 1 2 3 10 0 01 1 3 3 3 6 6 0 1 4 3 3 6 6 0 1 4 3 3 6 6	19" RECOVERY		
					uit shijer. Na 1 sana Na 1 sana	19" RECOVERY		
		7 '			07 6 1 76 166 16 6			
72.21								
		21	73.0'	7 10 17		Visual Description: Saturated medium dense	115	Sample brought to GTA lab
				24		light brown clayey fine to coarse sand.		for pH testing.
74.7								
14.7			75.0'			18" RECOVERY		
		22	75.0'	8 13 18 20		Saturated dense brown fine sand w/ some	A-2-4(0)	
				20	1001 (41)04 1011 (41)04 1011 (41)	coarse sand and silt.		
					her than the fi			
77.19			77.0'		1:11	12" RECOVERY		
						Boring terminated at 77.0 feet.		
79.68								
82.17								
<u> </u>								

KEY TO SYMBOLS

Symbol Description

Strata symbols

Silty low plasticity clay

Clayey sand

1.633333 1.633333 Poorly graded sand with silt

Silty sand

Silt

Elastic silt

DRAFT NOT FOR BIDDING AUGUST 2015

Notes:

- 1. Exploratory borings were drilled on 1/25/2008 using a 3 1/4-inch diameter continuous flight power auger. Rig is a Truck CME 55.
- 2. Groundwater levels recorded at time of drilling and rechecked the following day.
- 3. Surveyed boring locations and elevations were provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All SPT blow counts are uncorrected.

F.A. Project: U.S. 301, Maryland State Line to I-95 **Boring No.:** BR1-08-02

Contract: 25-113-01

Boring Location: Sta. 629+22.39, 90' Lt. C.L.

Boring Surface Elev.: 77.13 Reference:

IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: 2 IN. Type of: Split Barrel O.D. IN. IN. O.D. U-Sampler: 3 Ball Sampler Core Bit: O.D.

To: To: **Casing Size:** 3 1/4 Inches From Depth of:

Hollow Stem Auger: From Depth of: 0.0' 77.0'

Water Level Readings

Depth of Casing Depth of Water Time **Depth of Hole** Elev. of Water Date 50.1 77.1 1/26/08 29.0' 27.0' 31.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 77.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Jason Truver

Helpers: J. Hillebrand

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remar	·ks
		1	0.0'	3333	Wet firm brown silt w/ some clay, trace of A-4(3) 10" Cultivated S fine to coarse sand.	Soils
2.49		2	2.0'	2 2 2 4	Wet soft brown silt w/ some clay, trace of fine to coarse sand. A-4(4)	
4.98		3	4.0'	3 4 6 6	Wet loose brown fine to coarse sand w/ some A-2-4(0) silt.	
7.47		4	6.0' 6.0'	4 6 8 8	10" RECOVERY Wet stiff orange brown fine sandy silt w/ some coarse sand, trace of gravel. 20" RECOVERY	
9.96		5	8.0'	4 5 6 9	Wet medium dense orange brown clayey gravel and coarse sand w/ some fine sand. 22" RECOVERY	
		6	10.0'	6 7 9 9	Wet medium dense light brown silty fine sand, trace of coarse sand. 24" RECOVERY	
12.45		7	12.0'	10 11 9 9	Wet very stiff reddish brown organic fine to coarse sandy silt w/ some gravel, trace of clay. A-7-6(1)	

Remarks:

Reviewed By: Maureen Kelly Soils Supervisor: Randy Ferguson

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

							I	
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
		8	14.0' /	9		13" RECOVERY	A-2-4(0)	
			14.0'	9 9 17 13		Wet medium dense reddish brown clayey fine	A-2-4(0)	
14.94				13		to coarse sand w/ some gravel and organic		
						matter.		
			16.0			10" RECOVERY		
		9	16.0' 16.0'	8		Wet medium dense reddish brown clayey fine	A-2-7(0)	
			10.0	8 11 11		to coarse sand w/ some organic matter, trace	A-2-7(0)	
				11 13		of gravel.		
17.43						or graver.		
			18.0'			24" RECOVERY		
		10	18.0'	9		Wet medium dense reddish brown clayey	A-2-7(0)	
				9 7 7 5		coarse to fine sand w/ some gravel.	1127(0)	
				5		coarse to fine said w/ some graver.		
19.92			20.0'			10" RECOVERY		
						10 11200 (2111		
22.41						DRAFT		
		11	24.0'	6 4		Wet loose light brown silty fine to coarse	A-2-4(0)	
24.9		\mathbf{V}		6 4 4 4		sand.		
24.0	-			•				
			26.0			8" RECOVERY		
		U-1	26.0'			Saturated loose light brown fine to coarse	A-2-4(0)	Press Sample - Shelby Tube
						sand w/ some silt.		
27.39								
			28.0'			22" RECOVERY		
		12	29.0'	3 4 6 7		Saturated loose light brown and reddish	A-2-4(0)	
29.88				6 7		brown fine to coarse sand w/ some silt, trace		
						of gravel.		
			31.0'			20" RECOVERY		
32.37								
					ЩЦ			
		13	34.0'	5 5 4		Saturated loose brown time to coarse sand w/	A-2-4(0)	
34.86				5 4		some silt.		
						6 6 6		
						5		
			36.0'			24" RECOVERY		
					/::i:i:i	(i.) [5]		
						14 U 15		
37.35						1.1 G		

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Danth	Delle	I	01-					<u> </u>
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
					1:032.1101 1:01 (4:01 1:01 (4:01			
		14	39.0'	4			1.2.1(0)	
39.84		14	39.0	4 5 10 13		Saturated medium dense orange brown fine sand w/ some coarse sand and silt.	A-2-4(0)	
33.04				13		Same wife some some since since		
			41.0'			24" RECOVERY		
			41.0			24 RECOVERT		
42.33								
		15	44.0'	9		Saturated medium dense orange brown fine	A-2-4(0)	
44.82				9 11 12 14		sand w/ some coarse sand and silt.		
			46.0'			24" RECOVERY		
47.31								
17.01	N					FOR BIDI	$\supset I \setminus I$	
		V				ION DIDI		V G
	_			_				
		16	49.0'	10 11 13 13		Saturated medium dense brown fine to coarse	A-3	
49.8				13		sand, trace of silt.	15	
				10		JUUI 20		
			51.0'		(4	24" RECOVERY		
52.29					1991A.1991 1991A.1991 1991A.1991			
					10			
		17	54.0'	11		Saturated medium dense brown fine to coarse	A 2 4(0)	
54.78		'′	04.0	11 14 15 21	130 131 150 150 150 150 150 150 150 150 150 150 150 150	sand w/ some silt.	A-2-4(0)	
			56.0'			17" RECOVERY		
					:			
E7 07								
57.27					pre 1 7 3 11 1 11 6 1 4 3 16 6 11 6 1 7 1 1 1 1 1 11 6 3 1 1 2 1 1			
					p.c.1703001 0062333001 1002333001 1002343001			
		18	59.0'	7 8		Saturated medium dense brown fine sand w/	A-3	
59.76				7 8 12 13		some coarse sand, trace of silt.		
	l	l	1		hi i i i i i i i i			1

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Б "	l 5 "							
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
			61.0'		0614166 01117930 0611396	24" RECOVERY		
					iit ii ii ter. Wet vancu Get i ii ii ee			
62.25					derrich 661)3966 66133966			
					110111121. 110111121			
64.74		19	64.0'	11 10 13 13		Saturated medium dense brown silty fine sand	A-2-4(0)	
04.74				13		w/ some coarse sand.		
			66.0'		-	18" RECOVERY		
67.23								
		20	69.0'	15	12 1 2 3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Saturated medium dense brown fine sand w/	A-3	
69.72				15 12 13 14	66134066 66134066 66134666	some coarse sand, trace of silt.		
			71.0'	_	erijiser Granas	24" RECOVERY		
						24" RECOVERY		
		A .			1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
72.21					essianes Essianes			
					66143166 66143166 6613466			
		21	73.0'	17 20 22 29		Visual Description: Saturated dense gray silty fine sand, trace of coarse sand	15	Sample brought to GTA lab
				29	4	The said, trace of coarse said		for pH testing.
74.7								
14.7			75.0'	16		12" RECOVERY		
		22	75.0'	19 23 25		Saturated dense gray silty fine sand, trace of coarse sand.	A-2-4(0)	
				25		coarse sand.		
77.19		-	77.0'			18" RECOVERY Boring terminated at 77.0 feet.		
						Bornig Criminated at 11.0 rect.		
79.68								
82.17								
02.17								
	1	I		1	1			

KEY TO SYMBOLS

Symbol Description

Strata symbols

Silty low plasticity clay



Silt



Silty sand



Poorly graded clayey silty sand



Poorly graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

Notes:

- 1. Exploratory borings were drilled on 1/26/2008 using a 3 1/4-inch diameter continuous flight power auger. Rig is a Truck CME 55.
- 2. Groundwater levels recorded at time of drilling and rechecked the following day.
- 3. Surveyed boring locations and elevations were provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All SPT blow counts are uncorrected.

F.A. Project: U.S. 301, Maryland State Line to I-95 **Boring No.:** BR1-08-03

Contract: 25-113-01

Boring Location: Sta. 629+30.71, at C.L.

Boring Surface Elev.: 75.88 Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: 2 Type of: Split Barrel O.D. IN. IN. O.D. U-Sampler: 3 Ball Sampler Core Bit: O.D.

To: To: **Casing Size:** 3 1/4 Inches From Depth of:

Hollow Stem Auger: From Depth of: 0.0' 75.0'

Water Level Readings

Depth of Casing Depth of Water Elev. of Water Time **Depth of Hole** Date 44.9 75.9 75.9 75.9 1/30/08 34.0' 31.0' 36.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 75.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Jason Truver

Helpers: J. Hillebrand

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks
		1	1.0' 2.0'	3 4	Wet firm brown clayey silt w/ some fine sand, A-4(6) 6" Asphalt trace of coarse sand. 8" RECOVERY
2.49		2	2.0'	7 7 7 6	Wet stiff brown clayey fine sandy silt w/ A-4(1)
			4.0'	6	some coarse sand, trace of gravel. 10" RECOVERY
	•	3	4.0'	7 6 7 7	Wet stiff brown clayey fine sandy silt w/ A-4(2)
4.98			6.0'	7	some coarse sand, trace of gravel. 18" RECOVERY
		4	6.0'	7 8 7	Wet medium dense brown clayey coarse to A-2-4(0)
7.47			8.0'	9	fine sand, trace of gravel. 24" RECOVERY
		5	8.0'	4 5 9	Wet medium dense brown silty fine sand, trace of coarse sand and gravel. A-2-4(0)
9.96			10.0'	9	20" RECOVERY
		6	10.0'	9 11 9 10	Wet medium dense light brown silty fine A-2-4(0) sand, trace of coarse sand.
			12.0'		20" RECOVERY
12.45		7	12.0'	6 6 7 9	Wet medium dense light brown silty fine sand w/ some gravel, trace of coarse sand. A-2-4(0)
		8	14.0' 14.0'	4	17" RECOVERY Wet medium dense reddish brown clayey fine A-2-6(0)
			14.0	4 6 12 14	Wet medium dense reddish brown clayey fine to coarse sand, trace of gravel. A-2-6(0)

Remarks:

Reviewed By: Maureen Kelly Soils Supervisor: Randy Ferguson

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
(11.)	i logiess		Берит					
			16.0'			14" RECOVERY		
		9	16.0'	7 5 6 7		Wet medium dense reddish brown silty coarse to fine sand, trace of gravel.	A-2-4(0)	
17.43				7		to fine said, trace of graver.		
17.10			18.0'			17" RECOVERY		
		10	18.0'	3 4 4 5		Wet loose reddish brown silty fine to coarse	A-2-4(0)	
				5		sand, trace of gravel.		
19.92			20.0'			12" RECOVERY		
		U-1	20.0'			Saturated reddish brown clayey fine to coarse	A-2-7(0)	Press Sample - Shelby Tube
						sand w/ some silt and gravel.		
			00.01			10% PEGOVEDV		
22.41			22.0'			19" RECOVERY		
						DDAET		
						DRAFI		
		11	24.0'	4 5 7		Wet medium dense brown silty fine to coarse	A-2-4(0)	
24.9	R			7		sand, trace of gravel.		
						() $($ $)$ $($ $)$ $($ $)$ $($		
			26.0'		-	14" RECOVERY		
							4	
27.39						GUST 20	15	
				1		JUS 1 20		
		12	29.0'	4 4		Wet loose brown fine to coarse sand w/ some	A-2-4(0)	
29.88				4 4		silt, trace of gravel.		
			31.0'		-	18" RECOVERY		
32.37								
		13	34.0'	5 8 9 10		Saturated medium dense brown fine to coarse	A-2-4(0)	
34.86				10		sand w/ some silt, trace of gravel.		
			26.01			24" RECOVERY		
			36.0'			24 RECUVERT		
37.35								
			1	<u> </u>	neretelelilili.	ш		1

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

14 39.0 7 12 13 14.0 14	Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
41.0 24" RECOVERY 42.33 15 44.0 10 10 10 10 10 10 10 10 10 10 10 10 10		-							
41.0 24" RECOVERY 42.33 15 44.0 10 10 10 10 10 10 10 10 10 10 10 10 10	30.84		14	39.0'	7 8 12			A-2-4(0)	
44.82 15 44.0' 10 24 Saturated dense brown fine sand w/ some coarse sand and silt. 46.0' 10 24 RECOVERY 15 Saturated medium dense brown fine sand w/ some coarse sand, trace of silt. 54.78 17 54.0' 10 10 10 10 10 10 10 10 10 10 10 10 10	39.04				12		some course same and sin, there or given		
15 44.0 19 24 24 24 RECOVERY A-3				41.0'			24" RECOVERY		
15 44.0 19 24 24 24 RECOVERY A-3									
46.0	42.33								
46.0									
46.0 47.31 47.31 47.31 49.8 49.8 51.6 51.6 51.6 52.29 52.29 54.78 55.6 17 54.0 18 59.0 7 84 85 84 85 84 85 84 85 84 85 85									
46.0 47.31 47.31 47.31 49.8 49.8 51.6 51.6 51.6 52.29 52.29 54.78 55.6 17 54.0 18 59.0 7 84 85 84 85 84 85 84 85 84 85 85			15	44.0'	10 14		Saturated dense brown fine sand w/ some	A-3	
16 490 15 24 24 RECOVERY A-2-4(0) Some coarse sand and silt. A-2-4(0) Some coarse sand and silt. A-2-4(0) A-	44.82				17 26		coarse sand and silt.		
16 490 15 575 58 58 58 58 58 58									
17 54.0° 18 22 15 24° RECOVERY 3 3 3 3 3 3 3 3 3				46.0'			24" RECOVERY		
17 54.0° 18 22 15 24° RECOVERY 3 3 3 3 3 3 3 3 3						11.0143160 0414160 0414160 0414160	DRAFI		
16 49.0 8 10 10 10 10 10 10 10	47.31					00111100 00111100 00111100			
16 49.0 5 10 10 10 10 10 10 10					_				
10 13 15 15 15 15 15 15 15							$\cdot () R R \Pi \Pi$		
52.29 17 54.0° 16 18 102 24° RECOVERY 55.0° 24° RECOVERY 18 59.0° 7 16 16 20 24° RECOVERY 18 59.0° 7 16 20 24° RECOVERY 19 59.76 61.0° 24° RECOVERY 10 50.0° 24° RECOVERY 11 50.0° 24° RECOVERY 12 50.0° 24° RECOVERY 13 50.0° 20 24° RECOVERY 14 50.0° 20 24° RECOVERY 15 50.0° 20 24° RECOVERY 16 20 24° RECOVERY	49.8		16	49.0	9 10	07 4 1 74 146 14 44 4 3 4 4 6 46 1 4 4 1 6 4 14 1 4 4 1 6 6		A-3	
52.29 17 54.0' 16 22 28 28 28 28 28 28 28 28 28 28 28 28								4 =	
52.29 17 54.0' 16 22 31				51.0'			24" RECOVERY	15	
17 54.0' 16 18 22 26 24" RECOVERY					10		J001 20		
17 54.0' 16 22 26 1111	52.29								
17 54.0' 16 22 26 1111						ing grade George			
Saturated dense brown fine sand w/ some coarse sand, trace of gravel. 54.78 56.0' 58.0' 24" RECOVERY 18 59.0' 7 24" RECOVERY Saturated medium dense brown fine sand w/ some coarse sand and silt. A-2-4(0) some coarse sand and silt.						neer raine Gergriee Gergriee			
56.0' 57.27 18 59.0' 7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			17	54.0'	16 18	had talahadi		A-3	
57.27 18 59.0' 18 59.0' 61.0' 24" RECOVERY A-2-4(0) Saturated medium dense brown fine sand w/ some coarse sand and silt.	54.78				22 26	0:01 4 3 3 0 0 C	coarse sand, trace of gravel.		
57.27 18 59.0' 7				56 O'			24" RECOVERY		
57.27 18 59.0' 7 13345 134				30.0			24 RECOVERT		
18 59.0' 7 13.11 13.	57.27					16613.3166 176173761 166173366			
18 59.0' 7	J					663 1300 6 663 1300 6 663 133 60			
18 59.0' 7						oritoru Cellonici Rijanici Rijanici			
61.0' 1613111 24" RECOVERY			10	50 0'	7	999) 999 6 170 170 170 170 170 170 170 170	Cotympted medium James have Constant to	A 2 4(0)	
61.0'	59.76		10	33.0	9 16 20	6017360 6017360 5017360 6017360		A-2-4(0)	
61.0'						110 3 A 110 1 120 1 4 3 10 6 120 1 7 3 10 6 120 1 7 120 12			
				61.0'		664) 9166 6673 1166 1267 14166 1267 14166	24" RECOVERY		
						HEE 139:E 6			

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

	act. 25-113	-01 -	I -	ı			T	
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
62.25					en 19 9:et partrimi, con 19:es partrimi			
					0001 7430 0 0013 3160 320 773 0 0013 773 0 0013 773 0			
					1:01:01:00 1:01:01:06 1:01:01:06 1:01:01:06 1:01:01:06			
	<u> </u>	19	64.0'	9 11 16 14		Saturated medium dense brown fine sand,	A-3	
64.74				16 14	00 13 300 C Darriot. 00 13 400 C C 13 400 C	trace of coarse sand and silt.		
	-							
			66.0'			24" RECOVERY		
	1							
67.23								
	-				66 1 1 1 1 1 6 6 66 1 1 1 1 1 6 6 66 1 1 1 1			
					00000000 00000000 00000000 00000000			
	-	20	69.0'	9 10 11 10		Saturated medium dense brown fine sand,	A-3	
69.72	-			11 10	60 14 16 1 60 14 16 6 60 17 16 6 60 17 16 16 16 16 16 16 16 16 16 16 16 16 16	trace of coarse sand, silt, and gravel.		
					00 1 2 2 3 6 6 00 1 2 1 2 1 6 7 00 1 2 1 2 1 6 7 1 6 1 2 2 3 3 6 6	DRAFI		
			71.0'			20" RECOVERY		
72.21		M			6) \	
		21	73.0'	10	rii (iii)	Saturated dense brown silty fine sand, trace of	A-2-4(0)	
				10 17 27 29		coarse sand and gravel.	A-2-4(0)	
74.7						21121 20	15	
14.1			7 <mark>5</mark> .0'	1		24" RECOVERY		
						Boring terminated at 75.0 feet.		
77.19								
77.15								
79.68								
82.17	-							
]							
84.66								

KEY TO SYMBOLS

Symbol Description

Strata symbols

SCIACA SYMBOLS

Low plasticity clay

Clayey sand



Silty sand



Poorly graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

Notes:

- 1. Exploratory borings were drilled on 1/30/2008 using a 3 1/4-inch diameter continuous flight power auger. Rig is a Truck CME 55.
- 2. Groundwater levels recorded at time of drilling and rechecked the following day.
- 3. Surveyed boring locations and elevations were provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All SPT blow counts are uncorrected.

F.A. Project: U.S. 301, Maryland State Line to I-95 Boring No.: BR1-08-04

Contract: 25-113-01

Boring Location: Sta. 629+05.87, 93' Rt. C.L.

Boring Surface Elev.: 76.00 Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: 2 Type of: Split Barrel O.D. IN. IN. O.D. U-Sampler: 3 Ball Sampler Core Bit: O.D.

To: To: **Casing Size:** 3 1/4 Inches From Depth of:

Hollow Stem Auger: From Depth of: 0.0' 46.0'

Water Level Readings

Depth of Casing Elev. of Water Time **Depth of Hole Depth of Water** Date 44.2 76.0 1/25/08 31.8' 36.0 34.0' 76.0 76.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 76.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dan Taylor

Helpers: J. Hillebrand

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks	
		1	0.0'	1 3 3 3	Wet firm orange clayey fine sandy silt w/ A-4(3) 5" Cultivated Soils some coarse sand.	
2.49		2	2.0'	2 2 2 3	Wet soft brown silt w/ some fine sand, trace of coarse sand and gravel. A-4(4)	
		3	4.0'	2	16" RECOVERY Wet stiff orange fine to coarse sandy clay, A-6(1)	
4.98				2 6 7 11	trace of gravel.	
			6.0'		15" RECOVERY	
7.47		4	6.0'	6 7 8 7	Wet medium dense orange silty fine to coarse sand, trace of gravel. A-2-4(0)	
		5	8.0' 8.0'	4 7 7 9	20" RECOVERY Wet medium dense orange silty fine to coarse sand. A-2-4(0)	
9.96			10.0'	F	19" RECOVERY	
		6	10.0'	5 7 8 10	Wet medium dense orange silty fine sand w/ some coarse sand. A-2-4(0)	
12.45		7	12.0'	8 12 13 10	Wet medium dense orange fine to coarse sand and gravel w/ some silt. A-2-4(0)	

Remarks: Mud Rotary @ 46.0

Reviewed By: Maureen Kelly Soils Supervisor: Randy Ferguson

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
(11)		8	14.0' /	4		17" RECOVERY	A-2-4(0)	
14.94			14.0'	4 8 11 14		Wet medium dense green and brown silty fine to coarse sand, trace of gravel.	A-2-4(0)	
			16.0'	0		15" RECOVERY		
		9	16.0'	8 10 12 17		Wet medium dense red and orange silty coarse to fine sand, trace of gravel.	A-2-4(0)	
17.43								
		10	18.0' 18.0'	4		18" RECOVERY Wet medium dense red and orange silty	A-2-4(0)	
				4 6 7 10		coarse to fine sand w/ some gravel.		
19.92			20.0'			16" RECOVERY		
22.41						DRAFI		
		11	24.0'	4 4		Wet loose brown silty coarse to fine sand,	A-2-4(0)	
24.9		V		4 4 5 6		trace of gravel.		
			26.0			19" RECOVERY		
		U-1	26.0'			Saturated loose reddish orange fine to coarse sand w/ some silt.	A-2-7(0)	Press Sample - Shelby Tube
27.39			20.01			All DECOVEDY		
		12	28.0' 28.0'	4 4		24" RECOVERY Wet loose orange fine to coarse sand w/ some	A-2-4(0)	
				4 5		silt, trace of gravel.		
29.88			30.0'			24" RECOVERY		
32.37								
		13	34.0'	4		Saturated medium dense brown fine to coarse	A-2-4(0)	
34.86			J 0	4 6 7 9	0617360 6613666 6634666 6631666	sand w/ some silt.	Λ-2- 1 (0)	
			36.0'		###	24" RECOVERY		
			30.0		666173966 6614366 6614366 6611366 6614366	27 RECOTERT		
37.35					1261 73761 1261 73761 1261 73261 1261 73261			

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
					1201 73201 1901 73300 1701 73301			
					120 Júlio 120 Júlio 120 Júlio			
		14	39.0'	8		Colored land; and land land Colored /	A 2 4(0)	
39.84		'4	39.0	8 10 15 18		Saturated medium dense brown fine sand w/ some coarse sand and silt.	A-2-4(0)	
				10				
			41.0'			22" RECOVERY		
42.33								
42.33								
		15	44.0'	9 12 13 19	00 1 3 4 3 6 1 00 1 3 4 3 6 6 12 1 3 3 6 6 12 1 3 3 6 6 12 1 3 4 3 6 1 12 1 3 4 3 6 1 12 1 3 4 3 6 1	Saturated medium dense brown fine sand w/	A-2-4(0)	
44.82				19		some coarse sand and silt.		
			40.01					
			46.0'		00 144 166 128 1 120 128 14 120 128 1 120	18" RECOVERY		
					:::::::::::::::::::::::::::::::::::::			
47.31	R							
		\mathbf{M}			10	OR BIDI		J(j
)		•	92 <mark>01</mark> (930) 60 (93) (93) 12(93) (120) 12(143) (143)			
		16	49.0'_	11		Saturated medium dense brown fine sand w/	A-3	
49.8				11 12 13 15		some coarse sand, trace of silt.	15	
				1		JUSI ZU		
			51.0'		11.00 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	18" RECOVERY		
					1:01/3/00 1:01/3/00 1:01/1:01			
52.29								
					piki riski Kan iniki Kan iniki Kan nam			
					1961 J 1966 J 2017 J 2016 G 5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
		17	54.0'	13	h: (Cotonicated and discondenses because fine and and	A 2	
54.78		'′	J-4.0	13 14 15 19	150 3 3.31 0 0 150 3 4 430 4 150 3 3 3 5 5 6 1 150 3 7 4 5 6 1	Saturated medium dense brown fine sand w/ some coarse sand, trace of silt.	A-3	
				.,	Prof. 1991 (1991) 120 1991 (1991) 120 1991 (1991)			
			56.0'			20" RECOVERY		
					10			
57.27					presidentisti 100 mai 100 m 100 mai 100 m 100 mai 100 m			
J. 121):::::::::::::::::::::::::::::::::::::			
					100 1 7 3 10 1 100 1 7 3 10 1 100 1 7 7 10 1			
					120 2 3 3 3 1 1 1 1 120 2 3 3 1 1 1 1 1 120 1 2 3 3 3 1 1 1			
50.76		18	59.0'	9 10 12	(CE) 1936 (CE) 1936 (CE) 7336 (CE) 7336	Saturated medium dense brown fine sand w/	A-3	
59.76				12 14	66 64 19 6 66 7 19 6 66 7 19 6 65 7 19 6	some coarse sand, trace of silt.		
					7.614316 7.614316 7.614316 7.6131316			

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
(11.)			61.0'		100 14 11 6 6 100 14 11 6 6 100 14 14 16 16	16" RECOVERY		
	1				11111111111111111111111111111111111111			
62.25	-				derricht. Graden Graden			
	-				1217116 12171161 16134166			
	-				130 130 130 1 100 13 100 1 100 13 100 1 100 13 100 1			
		19	64.0'	8	11111111	Saturated medium dense brown fine sand w/	A-3	
64.74	1			8 13 16 21	11111111111111111111111111111111111111	some coarse sand, trace of silt.	113	
	-				126 13 3105			
			66.0'		######################################	16" RECOVERY		
					00313300 0014300 0014300 0014300			
67.23					15 13 13 16 C 15 13 13 16 C 16 13 13 16 C			
					0614366 1217121 6613366 613366			
					nerrancu gerrancu gerrancu			
69.72	-	20	69.0'	7 10 11 12	1:032.1:01. 1:032.1:01. 1:032.1:05	Saturated medium dense brown fine sand w/ some coarse sand, trace of silt and gravel.	A-3	
]			12	61134366 61134366 61134366	some coarse said, trace of sitt and graver.		
			71.0'			17" RECOVERY		
			71.0		(17 RECOVERT		J(j
70.04		A .			11. 14.11.64 11. 11.11.66 11. 14.11.66		/ /	
72.21	1				100 1 7 3 10 0 100 1 4 1 1 6 9 3 2 1 1 7 3 2 0 10 3 3 3 3 2 0 6			
			Λ		100 / A. 110 A.		15	
					iildi 66 Jairinu 1631 166 1631 166. 1631 166.	3001 /0		
		21	74.0'	6 9 14 15		Saturated medium dense gray clayey fine	A-2-4(0)	
74.7				14 15		sand, trace of coarse sand and gravel.		
	-							
			76.0'			24" RECOVERY Boring terminated at 76.0 feet.		
						Boring terminated at 70.0 reet.		
77.19								
	-							
79.68								
	-							
	1							
82.17								
-								
<u> </u>	-							
	-							
	4	i	İ	1	1		i	

KEY TO SYMBOLS

Symbol Description

Strata symbols

Low plasticity clay



Clayey sand



Silty sand



Poorly graded sand with silt



Poorly graded clayey silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

Notes:

- 1. Exploratory borings were drilled on 1/25/2008 using a 3 1/4-inch diameter continuous flight power auger. Rig is a Truck CME 55.
- 2. Groundwater levels recorded at time of drilling and rechecked the following day.
- 3. Surveyed boring locations and elevations were provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All SPT blow counts are uncorrected.

46.0'

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to I-95 Boring No.: BR1-08-05

Contract: 25-113-01

Boring Location: Sta. 629+74.82, 86' Lt. C.L.

Boring Surface Elev.: 76.79 Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: IN. Lbs. 30 D-Sampler: S-Sampler: IN. Type of: Split Barrel O.D. 2 IN. IN. O.D. U-Sampler: 3 Ball Sampler

Core Bit: O.D.

To: To: **Casing Size:** 3 1/4 Inches From Depth of: Hollow Stem Auger: From Depth of: 0.0'

Water Level Readings

Depth of Casing Time **Depth of Hole Depth of Water** Elev. of Water Date 1/25/08 39.0' 33.7 41.0 43.1 76.8 76.8 76.8

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 76.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Gary Truver

Helpers: D. Zmijewski

		1	T -	1	1			T
Depth	Daily	No.	Sample	Blows/6"		Sample Description	Class./G.I.	Remarks
(ft.)	Progress		Depth					
		1	0.0'	6 5 4 5		Wet stiff brown silt w/ some clay, trace of	A-4(3)	6" Cultivated Soils
				5		fine to coarse sand.		
			2.0'			16" RECOVERY		
2.49		2	2.0'	5 8 10 8		Wet very stiff brown silt, trace of fine to	A-4(6)	
	1			10 8		coarse sand and clay.		
		4						
			4.0'			20" RECOVERY		
		3	4.0'	2		Wet firm brown silt w/ some clay, trace of	A-4(3)	
				2 3 4 5		fine to coarse sand and gravel.		
4.98				٥	HIN			
			6.0'			19" RECOVERY		
		4	6.0'	6 7		Wet stiff brown clay w/ some fine to coarse	A-6(3)	
				7 10		sand and gravel.	11 0(3)	
						sand and graver.		
7.47			7.5'			16" RECOVERY		
		4A	7.5'	12		Wet medium dense orange silty coarse sand	A-1-b	
		5	8.0'	6		\ w/ some fine sand, trace of gravel.		
		ľ	8.0'	6 7 7 8		6" RECOVERY	A-2-4(0)	
				8		Wet medium dense orange fine to coarse sand		
1						w/ some silt, trace of gravel.		
						<u> </u>		
9.96		<u> </u>	10.0' 10.0'	<u> </u>		24" RECOVERY	1 2 1/0	
		6	10.0	9 11		Wet medium dense orange silty fine sand,	A-2-4(0)	
				9		trace of coarse sand.		
			12.0'			24" RECOVERY		
12.45		7	12.0'	16 15		Wet hard orange fine sandy silt w/ some	A-4(0)	
			13.0'			coarse sand and gravel.		
		7A	13.0'	14 16		12" RECOVERY	A-1-b	
—		'^	15.0	16		Wet medium dense brown gravel and fine	A-1-0	
1						sand w/ some silt and coarse sand.		

Remarks: Mud Rotary @ 46.0

Reviewed By: Maureen Kelly Soils Supervisor: Randy Ferguson

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth	Daily		Sample		l			
(ft.)	Progress	No.	Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
14.94		8	14.0' /	6 12 23 10		12" RECOVERY Wet dense brown silty fine to coarse sand, trace of gravel.	A-2-4(0)	
			16.0'			18" RECOVERY		
17.43		9	16.0'	14 17 21 19		Wet dense brown silty fine to coarse sand, trace of gravel.	A-2-4(0)	
		10	18.0' 18.0'	9 8		22" RECOVERY Wet medium dense brown coarse to fine sand	A-1-b	
			19.0'			w/ some gravel and silt. 12" RECOVERY		
19.92		10A	19.0'	5 11		Wet medium dense brown gray silty coarse to fine sand trace of grayel	A-2-4(0)	
19.92		U-1	20.0'			fine sand, trace of gravel. 3" RECOVERY Saturated medium dense brown clayey fine to coarse sand w/ some silt, trace of gravel.	A-2-7(2)	Press Sample - Shelby Tube
22.41			22.0'			24" RECOVERY		
24.9		11	24.0'	8 6		Wet medium dense brown and light brown silty coarse to fine sand, trace of gravel. 11" RECOVERY	A-2-4(0)	lG
24.9	•	11A	25.0' 25.0'	8 9		Wet medium dense light brown silty fine to	A-2-4(0)	
27.39			26.0	\U		coarse sand, trace of gravel. 11" RECOVERY	15	
21.00								
29.88		12	29.0'	5 6 5 9		Wet medium dense light brown fine to coarse sand w/ some silt, trace of gravel.	A-2-4(0)	
			31.0'			17" RECOVERY		
32.37								
34.86		13	34.0'	6 10 12 15		Saturated medium dense brown fine sand w/ some coarse sand and silt, trace of gravel.	A-2-4(0)	
0 1.00				13		<u> </u>		
			36.0'			24" RECOVERY		
37.35								

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
		14	39.0'	7	Saturated dense brown fine sand w/ some	A-2-4(0)	
39.84				7 14 20 21	coarse sand and silt, trace of gravel.	11 2 .(0)	
			41.0'		24" RECOVERY		
42.33							
		15	44.0'	8	Saturated dense brown fine sand w/ some	A-2-4(0)	
44.82				8 16 17 22	coarse sand and silt.	A-2-4(0)	
					DDAET		
			46.0'		24" RECOVERY		
47.31							
					·OR BIDI		J(j
		7					V
		16	49.0'_	4	Saturated dense brown fine sand w/ some	A-2-4(0)	
49.8				4 10 27 50/5"	coarse sand and silt.	7-2-4(0)	
				$\setminus \bigcup$	JUSI ZU		
			51.0'		22" RECOVERY		
52.29							
		17	54.0'	18	Saturated dense brown fine sand w/ some	A-2-4(0)	
54.78				18 19 18 21	coarse sand and silt.	11 2 T(U)	
			56.0'		19" RECOVERY		
57.27							
		18	59.0'	17	Saturated dense brown silty fine sand w/ some	A-2-4(0)	
59.76				17 17 20 20	coarse sand.	112 1(0)	

F.A. Project: U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Contr	act: 25-113	-01				
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I.	Remarks
(***)	·		61.0'		19" RECOVERY	
	-					
62.25	1					
	1					
	-	19	64.0'	15 14 15 18	Saturated medium dense brown fine sand w/ A-2-4(0)	
64.74	_			15 18	Wight Some sht and coarse sand.	
	=				######################################	
			66.0'		23" RECOVERY	
	-				116500 Wilder Wilder	
67.23	-				######################################	
	-				11 Days 13 Avri 13 Avri	
	-	20	69.0'	11 12 15 20	Saturated medium dense brown fine sand w/ A-2-4(0)	
69.72	1			15 20	some silt and coarse sand.	
	-				H (100) 14 June 1 14 June 1	
		+	71.0'		24' RECOVERY	
		N١				NG
72.21	-				(1) (1) (1) (1) (1) (1) (1) (1) (1) (1)	
	-					
	-	21	74.0'	9	Saturated hard brown fine sandy silt, trace of A-4(0)	
74.7	-			9 20 26 37	coarse sand and clay.	
	-					
			76.0'		24" RECOVERY Boring terminated at 76.0 feet.	
	-				boring terminated at 76.0 feet.	
77.19	-					
	-					
	-					
79.68	-					
	=					
	-					
]					
82.17						
	-					
	-					
]					
	1	1	1	ı		Î.

Symbol Description

Strata symbols

Silty low plasticity clay

Low plasticity clay



silt



Silty sand



Poorly graded sand with silt



Poorly graded clayey silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 1/25/2008 using a 3 1/4-inch diameter continuous flight power auger. Rig is a Truck CME 55.
- Groundwater levels recorded at time of drilling and rechecked the following day.
- 3. Surveyed boring locations and elevations were provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All SPT blow counts are uncorrected.

F.A. Project: U.S. 301 maryland State Line to S.R. 1 Boring No.: BR1-4-9

Contract: 25-113-01

Boring Location: Sta. 830+12, 90' Lt. C.L.

Boring Surface Elev.: + 27.4 Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: IN. Lbs. 30 D-Sampler: S-Sampler: U-Sampler: IN. Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D. **Casing Size:** 3 1/4 Inches

From Depth of: From Depth of: To: To: Hollow Stem Auger: 0.0 38.0

Water Level Readings

Depth of Water Time **Depth of Hole Depth of Casing** Elev. of Water Date 9/25/2009 6.0 4.0 4.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Ft.; Dia. U-Sample Boring: U-Samples: 100 Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Jason Truver

Helpers: J. Lafferty

Depth	Daily		Sample						
(ft.)	Progress	No.	Depth	Blows/6"			Sample Description	Class./G.I.	Remarks
	9/25/09	1	0.0'	1 1 1			Moist soft gray silt w/some clay, trace of organic matter and fine to coarse sand.	A-4(4)	Forrest Duff - 3".
			2.0'		Ш	Щ	13" RECOVERY		
		2	2.0'	1 2		Ш	Wet soft gray silt w/trace of coarse to fine sand and gravel.	A-4(0)	
3.5			4.0'	4			16' RECOVERY		
	•	3	4.0'	1 7 18 13			Wet medium dense grayish orange gravel and coarse sand w/some fine sand and silt.	A-1-b	
		4	6.0' 6.0'	5	Щ		West and diversity to the second and any long of the second and any	A-1-b	
7		4		5 7 9 9			Wet medium dense tan coarse sand w/some fine sand, trace of gravel and silt.	A-1-0	
			8.0'	4			24" RECOVERY		
		5	8.0'	1 2 5	::();;;; ::();;; ::();;; ::();;;	66. 66. 66.	Wet very loose brown coarse to fine sand w/trace of silt and gravel.	A-1-b	
			10.0'				12" RECOVERY		
10.5		6	10.0'	5 5 7 9	::()5.1 ::()5.1 ::()5.1 ::()5.1 ::()5.1	6. 6. 6. 6. 6.	Wet medium dense orange fine to coarse sand w/some silt, trace of tgravel.	A-2-4(0)	
			12.0'			1.1	16" RECOVERY		
		7	12.0'	4 8 10 15			Wet medium dense orange fine sand w/some coarse sand and silt, trace of gravel.	A-2-4(0)	
14			14.0'				16" RECOVERY		
		8	14.0'	7 13 14 16			Wet medium dense orange fine sand w/some silt and coarse sand, trace of gravel.	A-2-4(0)	
			16.0'	_			16" RECOVERY		
17.5		9	16.0'	7 9 9 16			Wet medium dense orange fine sand w/some silt and coarse sand, trace of gravel.	A-2-4(0)	Cemented Sands
17.5			18.0'				14" RECOVERY		
		10	18.0'	6 9 10 10			Wet medium dense orange fine sand w/some coarse sand and silt, trace of gravel.	A-2-4(0)	Cemented Sands

Remarks: Mud Rotary @ 38.0 feet

Reviewed By: Maureen Kelley Soils Supervisor: Randy Ferguson

F.A. Project: U.S. 301 maryland State Line to S.R. 1 **Contract:** 25-113-01

	25-11						I	1
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
	-		20.0'			16" RECOVERY		
21								
		11	23.0'	8		Wet dense orange fine sand w/some coarse sand and silt, trace of gravel.	A-2-4(0)	Cemented
		' '	20.0	8 10 21 25		wet dense orange time sand w/some coarse sand and sint, trace of graver.	A-2-4(0)	Sands
24.5			25.0'	25		18" RECOVERY		
			20.0			10 KBSO EKI		
28								
		12	28.0'	9 16 15 21		Wet dense orange fine sand w/some coarse sand and silt, trace of gravel.	A-2-4(0)	Cemented
				15 21				Sands
			30.0'			18" RECOVERY		
31.5						D)RAFI		
	_	13	33.0'	9			4.2	C 1
		13	33.0	15 19 20		. Wet dense orange fine sand w/some coarse sand, trace of silt and gravel.	A-3	Cemented Sands
35		V	35.0'	20		18" RECOVERY		Surids
33	•		03.0	_		16 KICOVEKT		
					66 J 1500 g 66 J 3.400 g 66 J 7770 g	CHQT 2015		
			<i> </i>	4 U		JUSI ZUIJ		
38.5	9/28/09	14	38.0'	6 11 13 13		wet medium dense brown fine sand w/some coarse sand, trace of silt.	A-3	Mud
				13 13				Rotary @ 38.0'.
			40.0'			17" RECOVERY		38.0.
					:			
42					::			
		15	43.0'	8		Wet and it and have been Control to the Control of	A 2	
		13	43.0	8 7 10 12		Wet medium dense brown fine sand w/some coarse sand, trace of silt and gravel.	A-3	
			45.0'	12		20" RECOVERY		
45.5			70.0			20 RECOVERT		
					6111366 6111366 6111366			
		16	48.0'	10 20 18 23		Wet dense green silty fine sand w/some coarse sand, trace of gravel.	A-2-4(0)	Glauconit
49				18 23				
			50.0'			21" RECOVERY		
52.5								
52.5							I	

F.A. Project: U.S. 301 maryland State Line to S.R. 1 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
		17	53.0'	5 7 8 11		Wet medium dense gray clayey fine sand w/trace of coarse sand and gravel.	A-2-4(0)	Glauconit
			55.0'			22" RECOVERY		
56								
		40	50.01	0				
		18	58.0'	9 11 20 23		Wet dense gray clayey fine sand w/trace of coarse sand and gravel.	A-2-4(0)	Glauconit
59.5			60.0'	-		23" RECOVERY		
63								
		19	63.0'	4 7 9 11		Wet medium dense green clayey fine sand w/trace of coarse sand and gravel.	A-2-6(0)	Glauconit
			65.0'	11		23" RECOVERY		
66.5								
		V				OK BIDDING	J	
	_	20	68.0'	8 9 15 17		wet medium dense gray fine sand w/some clay, trace of coarse sand.	A-2-4(0)	Glauconit
70			70.0'	17		23" RECOVERY		
			F	H		G S 23" RECOVERY 5		
73.5		21	73.0'	5 8 11 17	(ANKA)	Wet medium dense gray silty fine sand w/trace of coarse sand and gravel.	A-2-4(0)	
			75.0'	17		23" RECOVERY		
			73.0			23 RECOVERT		
77								
77								
		22	78.0'	4 8 9 11		Wet medium dense gray clayey fine sand w/some gravel, trace of coarse	A-2-4(0)	
				11		sand.		
80.5			80.0'			22" RECOVERY		
		23	83.0'	9		Wet medium dense green clayey fine sand w/trace of organic matter,	A-2-4(0)	Glauconit
84				9 11 17 32		gravel and coarse sand.		
			85.0'			23" RECOVERY		

F.A. Project: U.S. 301 maryland State Line to S.R. 1 **Contract:** 25-113-01

91	24	93.0' 95.0'	9 17 50/5" 18 22 27 32	Wet very dense green silty fine sand w/trace of organic matter, coarse sand and gravel. 15" RECOVERY Wet dense green clayey fine sand w/trace of organic matter, gravel and coarse sand.	A-2-4(0)	Glauconit
	25		18 22 27 32	coarse sand.	A-2-4(0)	Glauconit
		95.0'		WWW AND DECOMED A		
98	26	98.0'	19 22 23 33	23" RECOVERY DRAF Wet dense green clayey fine sand w/trace of organic matter, gravel and	A-2-4(0)	
101.5	N	100.0'		coarse sand. 22" RECOVERY End of Boring	7	
105		F	40	JGUST 2015		
108.5						
112						
115.5						

Symbol Description

Strata symbols

Silt



Silty sand



Poorly graded sand



Poorly graded sand with silt



Poorly graded clayey silty sand



Clayey sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 9/25/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a Track CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

F.A. Project: U.S. 301 maryland State Line to S.R. 1 Boring No.: BR1-4-10

Contract: 25-113-01

Boring Location: Sta. 830+22, 90' Lt. C.L.

Reference: **Boring Surface Elev.: 26.0**

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: IN. Lbs. 30 D-Sampler: S-Sampler: IN. Type of: Split Barrel O.D. 2 IN. IN. O.D. **U-Sampler:** Core Bit: O.D.

To: To: **Casing Size:** 3 1/4 Inches From Depth of:

Hollow Stem Auger: From Depth of: 0.0 16.0

Water Level Readings

Elev. of Water **Depth of Water** Time **Depth of Hole Depth of Casing** Date 9/23/2009 22.0 26.0 6.0 4.0 4.0 $\frac{26.0}{26.0}$

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 100 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Jason Truver

Helpers: D. Zmijewski

3.5 2.0'								
2 2.0' do gravel. 14" RECOVERY Soii - 8".			No.		Blows/6"	Sample Description	Class./G.I.	Remarks
3.5 4.0' 4.0' 5		9/23/09	1	2.0'	3 2 3	of gravel.	A-4(1)	Cultivated Soil - 8".
1.5 RECOVERY Wet medium dense orangish gray mothed fine to coarse sand w/some silt, A-2-4(0)	0.5		2	2.0'	3 4 7 7		A-4(0)	
trace of gravel. 12" RECOVERY 12" RECOVERY 4 6.0" 6 6 6 6 6 6 6 6 6	3.5							
Wet medium dense brownish orange coarse to fine sand w/some silt, trace of gravel. 24" RECOVERY 5 8.0" 4			3		3 10 10 10	trace of gravel.	A-2-4(0)	
7								
10.5 10.0' 10.	7		4		10 6	of gravel.	A-2-4(0)	
12.0' 12.0' 7 12.0' 8 14.0' 14 14.0' 16 15 16.0' 17" RECOVERY Wet medium dense orange coarse tof ine sand w/trace of silt and gravel. Wet loose orange fine to coarse sand w/some silt, trace of gravel. 17" RECOVERY Wet loose orange fine to coarse sand w/some silt, trace of gravel. 17" RECOVERY Wet medium dense orange fine sand w/some coarse sand and silt, trace of A-2-4(0) Mud Rotary @ 16.0' 18.0' Wet medium dense orange fine sand w/some coarse sand and silt, trace of A-2-4(0) gravel. Wet medium dense orange fine sand w/some coarse sand and silt, trace of A-2-4(0) gravel.			5		6 6	CECENTER CENTERE CENTERE CENTERE CENTERE	A-1-b	
To the second solution of the second solution	10.5		6		4	THE STATE OF THE S	A-1-b	
14			7		3	45544		
8 14.0' 1	14		,		6	CERTIFICE RECORDER CREATERE CREATERE	A-1-b	
16.0' 16.0' 17" RECOVERY 9 16.0' 18.0' 18" RECOVERY 10 18.0' 18" Recovery Wet medium dense orange fine sand w/some coarse sand and silt, trace of A-2-4(0) gravel. gravel. A-2-4(0) Rotary @ 16.0.			8		1	4-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1	A 2 4(0)	
9 16.0' 5 Wet medium dense orange fine sand w/some coarse sand and silt, trace of A-2-4(0) Mud Rotary @ 16.0. 18" RECOVERY 10 18.0' 7 8 Wet medium dense orange fine sand w/some coarse sand and silt, trace of A-2-4(0) gravel. Wet medium dense orange fine sand w/some coarse sand and silt, trace of A-2-4(0) gravel.					1 4 6	619366 819366 81366	A-2-4(0)	
17.5 18.0' 18" RECOVERY 10 18.0' 7 8 Wet medium dense orange fine sand w/some coarse sand and silt, trace of gravel. Gravel.			_		_	15 d 30 b		
18.0' 18" RECOVERY 10 18.0' 7 8 7 9 Wet medium dense orange fine sand w/some coarse sand and silt, trace of A-2-4(0) gravel.	17.5		9	16.0'	5 5 7 7	4444444	A-2-4(0)	Rotary @
10 18.0' 7 8 Wet medium dense orange fine sand w/some coarse sand and silt, trace of A-2-4(0) gravel.	17.3			18.0'		18" RECOVERY		16.0.
20.0' 14" RECOVERY			10		7 8 7 9	Wet medium dense orange fine sand w/some coarse sand and silt, trace of	A-2-4(0)	
				20.0'		14" RECOVERY		

Remarks: Mud Rotary @ 16.0 feet

Reviewed By: Maureen Kelley Soils Supervisor: Randy Ferguson

F.A. Project: U.S. 301 maryland State Line to S.R. 1 **Contract:** 25-113-01

Depth	Daily	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
(ft.)	Progress	INU.	Depth	DIUWS/0		заприе резсприон	Ciass./G.I.	Remarks
21								
		11	23.0'	6 8 17 15		Wet medium dense orange fine sand w/some coarse sand and silt.	A-2-4(0)	
24.5				17 15				
			25.0'			20" RECOVERY		
					01.11010 01.11010 11.11110			
					1261436 1261436 1261737	5 5 14 4		
28		12	28.0'	9 10 15 11		Wet medium dense orange fine to coarse sand w/some silt.	A-2-4(0)	
				15 11		-		
			30.0'			17" RECOVERY		
31.5								
		13	33.0'	9		Wet dense orange fine sand w/some coarse sand, trace of silt.	A-3	
				9 15 17 21			113	
35		\mathbf{M}	35.0'			21" RECOVERY		
		7			(36.44) (38.713 (38.74.33)			
					11.011.111.11 11.011.111.1111.1111111111			
						OLICT 2015		
38.5		14	38.0'	7		Wet dense tan and orange fine sand w/some silt and coarse sand.	A-2-4(0)	
36.3		'-	30.0	7 17 17 20		wet dense tan and brange time sand w/some sur and coarse sand.	A-2-4(0)	
			40.0'	20		20" RECOVERY		
42								
		15	42.01	12			1.0.110	
		15	43.0'	12 19 26 26		Wet dense gray silty fine sand w/trace of coarse sand.	A-2-4(0)	
			45.0'	26		12" RECOVERY		
45.5			70.0			12 RECOVERT		
49		16	48.0'	10 20 20 20 23		Wet dense gray fine sand w/some silt and coarse sand, trace of gravel.	A-2-4(0)	
1	1		50.3 1	23		a # DD =		
			50.0'			24" RECOVERY		
52.5								

F.A. Project: U.S. 301 maryland State Line to S.R. 1 **Contract:** 25-113-01

	act: 25-11						
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	9/24/09	17	53.0'	8 18 21 18	Wet dense gray silty fine sand w/some coarse sand, trace of gravel.	A-2-4(0)	
	_		55.0'	16	17" RECOVERY		
56	_						
36	1						
		18	58.0'	14	Wet warm stiff around you fine sends silt w/seme coerse send, trace of	A-4(0)	
	_	'	00.0	14 12 12 12	Wet very stiff gray clayey fine sandy silt w/some coarse sand, trace of gravel.	A-4(0)	
59.5	-		60.0'		24" RECOVERY		
	-						
63	-	19	63.0'	8	Wet hard gray fine sandy silt w/some clay, trace of coarse sand.	A-4(0)	
	_	'	00.0	8 24 31 50	wet hard gray fine saidy sitt w/some cray, trace of coarse said.	A-4(0)	
	1		65.0'		24" RECOVERY		
66.5	1						
	-	20	68.0'	8	Wet very dense gray silty fine sand w/some coarse sand, trace of gravel.	A-2-4(0)	
	•			8 23 30 49	Wet very delise gray sinty fine sant wisome course sand, face of graver	11 2 4(0)	
70			70.0'		18" RECOVERY		
	_				GUST ^{18"} RECOVERY 15		
	=			7			
	_						
73.5	-	21	73.0'	6	Wet very stiff gray fine sandy silt w/some clay, trace of coarse sand and	A-4(0)	
				6 8 12 13	gravel.		
	-		75.0'		21" RECOVERY		
	-						
77	-						
]						
		22	78.0'	4 11 24 20	Wet dense gray silty fine sand w/trace of coarse sand and gravel.	A-2-4(0)	
	-			24 20			
00.5	-	<u> </u>	80.0'		19" RECOVERY		
80.5	-						
]						
		23	83.0'	10 11	Wet very stiff gray clayey fine sandy silt w/trace of coarse sand.	A-4(1)	
84	-			10 11 19 19			
	-		85.0'		24" RECOVERY		
	1	l	1			1	1

F.A. Project: U.S. 301 maryland State Line to S.R. 1 **Contract:** 25-113-01

101.5 NOT BIDDING AUGUST 2015 108.5 115.5 115.5 115.5 100.0	Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
24 88.0		-						
91. 91. 25 93.0 15 200 Wet very dense green sitty fine sand w/trace of organic matter, coarse sand and gravel. 92. 93.0 15 200 Sea Shells 93.0 16 200 Sea Shells 94.6 98.0 16 200 Sea Shells 95.0 Wet very dense green sitty fine sand w/trace of organic matter, coarse sand and gravel. 15° RECOVERY 15° RECOVERY A -4(0) Glauconi & sea Shells 100.07 Fend of Boring BIDDING AUGUST 2015 1015 1026 1036	87.5	1						
91. 91. 25 93.0 15 200 Wet very dense green sitty fine sand w/trace of organic matter, coarse sand and gravel. 92. 93.0 15 200 Sea Shells 93.0 16 200 Sea Shells 94.6 98.0 16 200 Sea Shells 95.0 Wet very dense green sitty fine sand w/trace of organic matter, coarse sand and gravel. 15° RECOVERY 15° RECOVERY A -4(0) Glauconi & sea Shells 100.07 Fend of Boring BIDDING AUGUST 2015 1015 1026 1036		1	24	88.0'	8 12 19		A-4(0)	
94.5. 98.0 98.0 98.0 98.0 98.0 99.0 100.00 Performed BIDDING AJUGUST 2015 AUGUST				00.0'	28			
98.0 98.0 98.0 98.0 98.0 98.0 98.0 98.0		1		90.0		24 RECOVERT		
98. 26 98.0° \$\frac{\delta}{\delta}\$ \text{Wot.very slift green fine sandy silt w/some organic matter and clay, trace A-4(0) & sea Shells \text{No.0} \text{Vot.very slift green fine sandy silt w/some organic matter and clay, trace & sea Shells \text{No.0} \text{Vot.very slift green fine sandy silt w/some organic matter and clay, trace & sea Shells \text{No.0} \text{Vot.very slift green fine sandy silt w/some organic matter and clay, trace & sea Shells \text{No.0} \text{Vot.very slift green fine sandy silt w/some organic matter and clay, trace & sea Shells \text{No.0} \text{Vot.very slift green fine sandy silt w/some organic matter and clay, trace & shells \text{Shells} \text{Shells} \text{Shells} \text{Shells} \text{Shells} \text{Shells} \text{Shells}	91	1						
98. 26 98.0° \$\frac{\delta}{\delta}\$ \text{Wot.very slift green fine sandy silt w/some organic matter and clay, trace A-4(0) & sea Shells \text{No.0} \text{Vot.very slift green fine sandy silt w/some organic matter and clay, trace & sea Shells \text{No.0} \text{Vot.very slift green fine sandy silt w/some organic matter and clay, trace & sea Shells \text{No.0} \text{Vot.very slift green fine sandy silt w/some organic matter and clay, trace & sea Shells \text{No.0} \text{Vot.very slift green fine sandy silt w/some organic matter and clay, trace & sea Shells \text{No.0} \text{Vot.very slift green fine sandy silt w/some organic matter and clay, trace & shells \text{Shells} \text{Shells} \text{Shells} \text{Shells} \text{Shells} \text{Shells} \text{Shells}								
98. 26 98.0° \$\frac{\delta}{\delta}\$ \text{Wot.very slift green fine sandy silt w/some organic matter and clay, trace A-4(0) & sea Shells \text{No.0} \text{Vot.very slift green fine sandy silt w/some organic matter and clay, trace & sea Shells \text{No.0} \text{Vot.very slift green fine sandy silt w/some organic matter and clay, trace & sea Shells \text{No.0} \text{Vot.very slift green fine sandy silt w/some organic matter and clay, trace & sea Shells \text{No.0} \text{Vot.very slift green fine sandy silt w/some organic matter and clay, trace & sea Shells \text{No.0} \text{Vot.very slift green fine sandy silt w/some organic matter and clay, trace & shells \text{Shells} \text{Shells} \text{Shells} \text{Shells} \text{Shells} \text{Shells} \text{Shells}		-	25	93.0'	12	Wat vary dance green silty fine sand w/trace of organic matter coarse	A-2-4(0)	Glauconit
98. 26 98.0° \$\frac{\delta}{\delta}\$ \text{Wot.very slift green fine sandy silt w/some organic matter and clay, trace A-4(0) & sea Shells \text{No.0} \text{Vot.very slift green fine sandy silt w/some organic matter and clay, trace & sea Shells \text{No.0} \text{Vot.very slift green fine sandy silt w/some organic matter and clay, trace & sea Shells \text{No.0} \text{Vot.very slift green fine sandy silt w/some organic matter and clay, trace & sea Shells \text{No.0} \text{Vot.very slift green fine sandy silt w/some organic matter and clay, trace & sea Shells \text{No.0} \text{Vot.very slift green fine sandy silt w/some organic matter and clay, trace & shells \text{Shells} \text{Shells} \text{Shells} \text{Shells} \text{Shells} \text{Shells} \text{Shells}	24.5	-		00.5	21 39 50/4"		Α-2-4(0)	& Sea
26 98.0° \$\frac{9}{39}\$ Wet very stiff great fine sauly silt w/some organic matter and clay, trace of coarse sand and gravel. 101.5 101.5 108.5 1115.5 1115.5	94.5	1		95.0'		15" RECOVERY		Shells
26 98.0° \$\frac{9}{39}\$ Wet very stiff great fine sauly silt w/some organic matter and clay, trace of coarse sand and gravel. 101.5 101.5 108.5 1115.5 1115.5]						
26 98.0° \$\frac{9}{39}\$ Wet very stiff great fine sauly silt w/some organic matter and clay, trace of coarse sand and gravel. 101.5 101.5 108.5 1115.5 1115.5		-						
26 98.0° \$\frac{9}{39}\$ Wet very stiff great fine sauly silt w/some organic matter and clay, trace of coarse sand and gravel. 101.5 101.5 108.5 1115.5 1115.5	98	-						
101.5 NOT Find of Boring BIDDING AUGUST 2015 105]	26	98.0'	8 9	Wet very stiff green fine sandy silt w/some organic matter and clay, trace	A-4(0)	Glauconit
101.5		-		100.01	38			
AUGUST 2015 108.5 115.5 115.5				100.0				
AUGUST 2015 108.5 112 115.5	101.5]	V			LOK DIDDIIN	J	
		_	_		_			
		-				IOLIOT OOAE		
		-		<i> </i>	ΔU	\mathcal{M}_{1}		
	105							
		-						
		_						
115.5	108.5	-						
115.5		_						
115.5		-						
115.5		_						
	112	_						
		_						
		-						
	115.5	-						
		-						
		_						
	119	_						

Symbol Description

Strata symbols



Silty low plasticity clay



Silty sand



Well graded sand with silt



Poorly graded sand with silt



Poorly graded clayey silty sand



Clayey sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 9/23/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a Track CME 55.
- Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

28

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 Boring No.: BR1-5-06

Contract: 25-113-01

Boring Location: Sta. 815+84.53 8 LT C.L.

Boring Surface Elev.: + 57.87 Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: IN. Lbs. 30 D-Sampler: S-Sampler: U-Sampler: IN. Type of: Split Spoon O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Depth of Water Time **Depth of Hole Depth of Casing** Elev. of Water Date 2/22/2010 30.0 28.0 28.3

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Gary Truver

Helpers: T. Kane

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	2/22/10	1	0.5' 2.0'	2 4 5	Wet firm brown clayey silt w/some coarse to fine sand and fine gravel. 12" RECOVERY	A-4(3)	Topsoil - 4".
		2	2.0'	5 7 9	Wet very stiff brown clayey coarse sandy fine gravelly silt w/some fine sand.	A-4(0)	
3.5			4.0'	6	salid.		
		3	4.0'	3 4 4 4	Wet loose brown clayey coarse sandy fine gravel w/some fine sand and silt.	A-2-4(0)	
			6.0'		6" RECOVERY		
7		4	6.0' 8.0'	4 3 3 3 3	Wet firm brown clayey coarse sandy silt w/some fine sand and fine gravel. 4" RECOVERY	A-4(1)	
		5	8.0'	3 3 3 3	Wet loose brown clayey coarse sandy fine gravel w/some fine sand, trace of silt.	A-2-4(0)	
10.5			10.0'		8" RECOVERY		
14		6	13.0'	2 2 4 4	Wet loose brown clayey coarse sandy silt w/some fine sand and fine gravel.	A-4(1)	
			15.0'		14" RECOVERY		
17.5							
		7	18.0'	3 3 3 3	Wet loose brown clayey coarse sandy fine gravel w/some fine sand, trace of silt.	A-2-4(0)	
			20.0'		16" RECOVERY		

Remarks: Mud Rotary at 28.0

Reviewed By: Hany Fekry Soils Supervisor: Randy Ferguson

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 **Contract:** 25-113-01

Contra	act: 25-11:	3-01					
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
24.5		8	23.0'	50/2"	No Sample Recovery 0" RECOVERY		Gravel blocking spoon.
31.5		9	28.0'	3 3 5 6	Wet loose tan fine to coarse sand w/trace of silt and fine gravel. 20" RECOVERY DRAFT	A-3	Mud Rotary @ 28.0'.
35	ľ	10	33.0'	6 8 9 9	Wet medium dense tan fine to coarse sand w/trace of silt and fine gravel. 15" RECOVERY	A-3	
38.5		11	38.0	34 5 5	Wet medium dense orange fine sand w/some silt and coarse sand. 20" RECOVERY	A-2-4(0)	
45.5	2/24/10	12	43.0'	5 6 8	Wet medium dense orange fine to coarse sand w/some silt, trace of fine gravel. 16" RECOVERY	A-2-4(0)	
52.5		13	48.0'	7 8 8 8 10	Wet medium dense brown fine sand w/some coarse sand and silt, trace of fine gravel. 22" RECOVERY	A-2-4(0)	

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
		14	53.0'	11 12 13 18	Wet medium dense brown fine sand w/some coarse sand, trace of silt and fine gravel.	A-3	
	-		55.0'	18	A THE GRAVET. FINAL THE GRAVET. 21" RECOVERY		
56	-				751 7555 61 71545 61 71545		
]				151 1355 151 1355 151 1355		
	-				1877-1881 1877-1881 1871-1881 1871-1881		
	-	15	58.0'	11 13 21 27	Wet dense brown fine sand w/some coarse sand, trace of silt and fine	A-3	
59.5]			21 27	翻譯 gravel. 翻譯		
	-		60.0'		19" RECOVERY		
	-				[6] [A 100] With 1970 With 1970 With 1970		
	_				66) jird 61) Albi Ni 13 Ru 161) 4360		
63	_	16	63.0'	8	Pairings Eilings Eilings Eilings Eilings	A 2	
	-	10	63.0	8 9 12 15	Wet medium dense brown fine sand w/some coarse sand, trace of silt.	A-3	
	1		65.0'		22" RECOVERY		
66.5	-	١.					
		17	68.0'	9 9 11 14	Wet medium dense brown fine sand w/some silt and coarse sand, trace of	A-2-4(0)	
70	-		70.0'	14	fine gravel.		
70	1		70.0'		GUST ^{20"} RECOVERY 15		
				71	JUJI ZUIJ		
	-				1843,1861 NG 143,00 G143,00 Patry 1855		
73.5	_	18	73.0'	13 17	Wet dense brown fine sand w/some silt and coarse sand, trace of fine	A-2-4(0)	
	-			13 17 27 34	gravel.		
	-		75.0'		18" RECOVERY		
]						
77	4						
	-	40	78.0'	14		1.2.4(0)	
	1	19	78.0	14 18 24 26	Wet dense gray silty fine sand w/trace of coarse sand and fine gravel.	A-2-4(0)	
			80.0'		24" RECOVERY		
80.5	-				End of Boring		
	_						
0.4	-						
84	1						
	1	I	1				1

Symbol Description

Strata symbols

bciaca symbols

Low plasticity clay

Clayey sand

Poorly graded sand

with silt

Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 2/22/2010 using a 3 1/4 inch continues flight power auger. Rig is a Track mounted CME 55
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

28.0

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 Boring No.: BR1-5-07

Contract: 25-113-01

Boring Location: Sta. 817+52 70 RT C.L.

Boring Surface Elev.: + 58.95 Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: IN. Lbs. 30 D-Sampler: S-Sampler: U-Sampler: IN. Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Depth of Water Time Depth of Hole **Depth of Casing** Elev. of Water Date 3/2/2010 30.0 28.0 27.6

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Ft.; Dia. U-Sample Boring: U-Samples: Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Gary Truver

Helpers: T. Kane

<u> </u>	Б ;;						1
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	3/2/10	1	0.0'		No Sampling		Asphalt - 4". Stone - 8".
			2.0'	-	0" RECOVERY		
3.5		2	2.0'	6 10 12	Wet very stiff orange clayey fine sandy silt w/some coarse sand, trace of fine gravel. 16" RECOVERY	A-4(1)	
	•	3	4.0' 6.0'	7 12 7 9	Wet medium dense brown clayey fine gravelly fine to coarse sand. 17" RECOVERY	A-2-4(0)	
7		4	6.0'	12 15 14 14	Wet medium dense brown coarse sandy fine gravel w/some fine sand and silt.	A-1-b	
		5	8.0' 8.0'	5	18" RECOVERY		
		5	8.0	5 6 6 6	No Sieve Analysis - Indication of wet medium dense brown silty sand.		
			10.0'		1" RECOVERY		
10.5							
14		6	13.0'	2 3 6 8	Wet stiff tan silty clay w/some fine sand.	A-6(9)	
-			15.0'		18" RECOVERY		
17.5							
		7	18.0'	17 19 17 19	Wet dense tan coarse sandy fine gravel w/trace of fine sand.	A-1-a	

Remarks: Switch to Mud Rotary @ 28.0 feet

Reviewed By: Hany Fekry Soils Supervisor: Randy Ferguson

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
(,	7 . 2 3 . 2 2 2		20.0'		IATE 14" RECOVERY		
21]						
					11500 19400 19500		
	<u> </u>				1/1659 1/1664 1/1665		
	-	8	23.0'	11	Wet dense tan fine gravelly coarse sand w/trace of fine sand.	A-1-b	
	-		20.0	11 14 17 18	wet dense tan fine graverry coarse sand witrace of fine sand.	A-1-0	
24.5	-		25.0'		15" RECOVERY		
	1				14177. 1437.		
	1				17966 17966 1797		
]				143007. 143000		
28					1976. 1136. 1136.		
		9	28.0'	5 7 9 7	No Sieve Analysis - Indication of wet medium dense brown coarse sandy fine gravel.		
	-			7	14466 13 and		
	-		30.0'		11" RECOVERY		
04.5	_						
31.5	-						
	1				1216c) 1416c) 1316c)		
	3/4/10	10	33.0'	20 8 5 5	Wet medium dense tan fine to coarse sand w/some silt, trace of fine	A-2-4(0)	
		M		5 5	gravel.		
35		N	35.0'		17" RECOVERY		
	-						
	1						
	_			Δ I			
38.5	-	11	38.0'	6	Wet medium dense tan fine to coarse sand w/trace of silt.	A-3	
00.0	1			6 4 7 8	ivitie in the definition of the course said wittace of sit.	A-3	
			40.0'		16" RECOVERY		
					13-1271 17-1265 13-1265		
	-				17360 17361 1737		
42	-				14 1267 17 3 1267 17 3 1267		
	-				1976. 1786. 1786.		
	1	12	43.0'	11 11 18 20	Wet medium dense brown fine sand w/some coarse sand, trace of silt and fine gravel.	A-3	
	1		45.01	20			
45.5]		45.0'		19" RECOVERY		
]				193661 17366		
	<u> </u> =				1770 119cc 149ci 149ci		
	-				1/36cf 1/36cf 1/36c6		
	-	13	48.0'	11 20 24 20	Wet dense brown fine sand w/some coarse sand and silt.	A-2-4(0)	
49	1			24 20			
	1		50.0'		22" RECOVERY		
	1						
]						
	1	I	1	1		1	

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
		14	53.0'	13 15 18 19	Wet dense brown fine sand w/some coarse sand and silt, trace of fine	A-2-4(0)	
				18 19	ilitii gravel.		
			55.0'		18" RECOVERY		
56					#1Anef. #17### #14###		
					5113165 113165 117309		
		15	58.0'	12 17	Wet dense brown fine sand w/some coarse sand, trace of silt.	A-3	
50.5			00.0	17 18 18	Wet dense brown the saild w/some coarse saild, trace of sitt.	A-3	
59.5			60.0'		21" RECOVERY		
					ii i i ii ii ii ii i i ii ii ii ii ii ii		
					Alfrigh 11 1805 11 1805		
63					11 5 1 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5		
		16	63.0'	10 14 30 36	Wet dense brown fine sand w/some coarse sand and silt.	A-2-4(0)	
			65.0'	30	18" RECOVERY		
					514-166- 11-1-166- 11-1-166- 11-1-166-		
66.5	N						
		M			TUR BIDDING	7	
	•	17	68.0' 69.0'	18 18	Wet dense tan silty fine sand w/trace of coarse sand. 12" RECOVERY	A-2-4(0)	
70	=	17A	69.0' 70.0'	25 26	Wet very dense gray silty fine sand w/trace of coarse sand and organic	A-2-4(0)	
70			70.0	H	matter. 8" RECOVERY		
73.5		18	73.0'	13 17 26 29	Wet dense gray fine sand w/some silt, trace of coarse sand and organic	A-2-4(0)	
				26 29	matter.		
			75.0'		18" RECOVERY		
77							
		19	78.0'	13	Wet dense gray fine sand w/some silt and coarse sand, trace of organic	A-2-4(0)	
				13 16 26 27	matter.		
80.5			80.0'		23" RECOVERY End of Boring		
55.5					Line of Boring		
84							
			1	1		1	

Symbol Description

Strata symbols

Clayey sand



Silty sand



Low plasticity clay



Poorly graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 3/2/2010 using a 3 1/4 inch diameter continues flight power auger. Rig is a ATV mounted CME 55.
- 2. Groundwater levels recorded at the time of drillign and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 Boring No.: BR1-7-12

Contract: 25-113-01

Boring Location: Sta. 806+53.04 18 LT C.L.

Boring Surface Elev.: + 33.02 Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: IN. Lbs. 30 D-Sampler: S-Sampler: U-Sampler: IN. Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0 10.0

Water Level Readings

Depth of Casing Depth of Water Time Depth of Hole Elev. of Water Date 2/22/2010 10.0 8.0 4.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Jason Truver

Helpers: J. Lafferty

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	2/22/10	1	0.5' 2.0'	3 3 3	Moist firm brown fine sandy silt w/some fine gravel, coarse sand and clay. 15" RECOVERY	A-4(0)	Topsoil - 3".
		2	2.0'	10 7	Saturated very stiff brown clayey fine sandy silt w/some coarse sand and	A-4(0)	
3			4.0'	11 13	fine gravel. 18" RECOVERY		
		3	4.0'	3 6 10 11	Saturated medium dense brown silty fine to coarse sandy fine gravel w/ some clay.	A-1-b	
6			6.0'		15" RECOVERY		
		4	6.0'	7 10 10 9	Saturated medium dense brown fine gravelly fine to coarse sand w/trace of silt.	A-1-b	
			0.01		MARKE HARKE		
		5	8.0' 8.0'	7 7	20" RECOVERY White Saturated medium dense brown fine gravelly fine to coarse sand w/trace	A-1-b	Mud
9				7 7 12 11	of silt.		Rotary @ 10.0'.
			10.0'		21" RECOVERY		10.0.
					13 13 15 1 13 13 15 1 13 13 15 1 13 13 15 1 13 13 15 1		
l					51-0561 1-1-1-1-1-1 1-1-1-1-1-1		
12							
		6	13.0'	5	Saturated medium dense brown fine sand w/some silt and coarse sand,	A-2-4(0)	
			10.0	5 6 10 8	trace of fine gravel.	A-2-4(0)	
15			15.0'		22" RECOVERY		
15			10.0		22 RECOVERT		

Remarks: Switch to Mud Rotary @ 10 feet

Reviewed By: Hany Fekry Soils Supervisor: Randy Ferguson

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 **Contract:** 25-113-01

	act: 25-11						
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
18							
		7	18.0'	5 6 12 15	Saturated medium dense brown fine sand w/some coarse sand, trace of silt.	A-3	
				15	111. 111. 111. 111. 111. 111. 111. 111		
			20.0'		21" RECOVERY		
21					\$11955 \$11965 \$11965		
					21 11 12 2 11 13 12 5 13 17 12 5		
		8	23.0'	5 6 9 12	Saturated medium dense brownish orange fine sand w/some coarse sand	A-2-4(0)	
24				9 12	and silt.		
			25.0'		20" RECOVERY		
27					IIII)RAFI		
		9	28.0'	7 7	Saturated medium dense brownish orange fine sand w/some coarse sand	A-3	
				7 9 10	saturated incurant dense brownish orange fine said w/some coarse said.	A-3	
30			30.0'		20" RECOVERY		
		A					
					## 17950 #14160 #14160		
				$\setminus \Box$			
33				71			
		10	33.0	7 9 11 10	Saturated medium dense brown fine sand w/some silt, trace of coarse sand.	A-2-4(0)	
				10	nti i ite Sidantei Sidantei		
			35.0'		19" RECOVERY		
36					## (A 1964) ## 17 / 1965 ## 17 / 1965		
					61/1965 H7A1867 E17/300		
					PATYERS BELLANES BELLANES		
		11	38.0'	5 7 8 8	Saturated medium dense brownish orange fine sand w/some silt, trace of	A-2-4(0)	
39				8	coarse sand.		
			40.0'		19" RECOVERY		
					6113166 6113166 6113166 6113166		
42					514-1614 5-1-1-1614 18-1-1-1614		
442					614 1664 161 17664 161 1866		
		12	43.0'	4 5	Hitel Hitel Saturated medium dense brown fine sand w/some coarse sand and silt,	A-3	
				4 5 7 7	trace of fine gravel.		
45			45.0'		20" RECOVERY		
					erren Histori		

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 **Contract:** 25-113-01

						I	
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
48		13	48.0'	4	Saturated medium dense gray clayey fine sand w/some silt, trace of fine	A-2-4(0)	
				4 6 6 8	gravel and coarse sand.	, ,	
			50.0'		22" RECOVERY		
			00.0		22 1000 1211		
51							
	2/24/10	14	53.0'	6 11 19 23	Saturated medium dense gray silty fine sand w/some clay, trace of coarse	A-2-4(0)	
54				19 23	sand and fine gravel.		
			55.0'		22" RECOVERY		
					DRAFI		
57							
	R						
		15	58.0'	5 7 11 23	Saturated medium dense gray silty fine sand w/some coarse sand, trace of	A-2-4(0)	
				23	organic matter.		
60			60.0'		22" RECOVERY		
					GUST 2015		
				16	0001 2010		
63							
		16	63.0'	6 6 10 11	Saturated medium dense gray clayey fine sand w/some silt, trace of coarse sand and fine gravel.	A-2-4(0)	
				11			
			65.0'		23" RECOVERY		
66							
		17	68.0'	5	Saturated medium dense gray silty fine sand w/some clay, trace of coarse	A-2-4(0)	
69		''	30.0	5 7 10 17	sand, fine gravel and organic matter.	/ 1-2-4(0)	
			70.0				
			70.0'		23" RECOVERY		
72							
		18	73.0'	10 15 23	Saturated hard gray fine sandy silt w/some clay, trace of coarse sand, fine	A-4(0)	
				23	gravel and organic matter.	(-)	

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
75			75.0'	50/4"	22" RECOVERY		
78		19	78.0'	10 19 23 31	Saturated hard gray clayey fine sandy silt w/trace of organic matter.	A-4(1)	
			80.0'		23" RECOVERY		
81							
84		20	83.0' 85.0'	11 14 19 22	Saturated dense green clayey fine sand w/some silt, trace of coarse sand, organic matter and shell fragments. 23" RECOVERY	A-2-4(0)	
87		V	O	T	FOR BIDDING		
90		21	88.0' 90.0'	23 33 50/5"	Saturated very dense green silty fine sand w/trace of coarse sand, fine gravel, organic matter and shell fragments. 21" RECOVERY	A-2-4(0)	
93							
		22	93.0'	7 10 13 20	Saturated medium dense green clayey fine sand w/some silt, trace of coarse sand and organic matter.	A-2-4(0)	
96			95.0'		22" RECOVERY		
99		23	98.0'	7 12 14 20	Saturated very stiff gray silty clay w/some organic matter, trace of fine sand and shell fragments.	A-7-6(33)	
			100.0'		23" RECOVERY End of Boring		
102	I						

Symbol Description

Strata symbols



Poorly graded clayey silty sand



Clayey sand



Poorly graded sand with silt



Silty sand



High plasticity clay

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 2/22/2010 using a 3 1/4 inch diameter continues flight power auger. Rig is a Track mounted CME 55.
- 2. Groundwater levels recorded at the time of drillign and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

23.0

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 Boring No.: BR1-7-13

Contract: 25-113-01

Boring Location: Sta. 805+75.8 66 RT C.L.

Boring Surface Elev.: + 32.49 Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: IN. Lbs. 30 D-Sampler: S-Sampler: U-Sampler: IN. Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Depth of Casing Depth of Water Time Depth of Hole Elev. of Water Date 3/5/2010 10.0 8.0 4.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Ft.; Dia. U-Sample Boring: U-Samples: Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Jason Truver

Helpers: J. Lafferty

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
	3/5/10	1	0.5' 2.0'	7 7 6		Wet stiff brown silty clay w/trace of fine to coarse sand and fine gravel.	A-6(13)	Topsoil - 6".
		2	2.0'	3		17" RECOVERY Wet stiff brown clayey silt w/some fine sand, trace of coarse sand and	A 4(7)	
	_	_	2.0	3 7 7		fine gravel.	A-4(7)	
3		V	4.0'	12		22" RECOVERY		
	_	3	4.0'	10 7 7		Saturated medium dense brown silty fine snady fine gravel w/some coarse sand and clay.	A-2-4(0)	
6			6.0'			16" RECOVERY		
		4	6.0'	13 17 15 15		Saturated dense brown coarse to fine sandy fine gravel w/some silt.	A-1-b	
			8.0'			23" RECOVERY		
9		5	8.0'	5 13 14 18		Saturated medium dense brown fine gravelly coarse to fine sand w/trace of silt.	A-1-b	
			10.0'			18" RECOVERY		
12								
		6	13.0'	5 8 11 13		Saturated medium dense orangish brown fine sand w/some coarse sand and silt, trace of fine gravel.	A-2-4(0)	
15			15.0'			22" RECOVERY		

Remarks: Switch to Mud Roatary @ 23.0 feet

Reviewed By: Hany Fekry Soils Supervisor: Randy Ferguson

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
18								
		7	18.0'	7 11 11 13		Saturated medium dense orangish brown fine sand w/some coarse sand, trace of silt and fine gravel.	A-3	
	-			13	eiiiiek 6114166 6111165	trace of she and thie grave.		
	-		20.0'			21" RECOVERY		
21					(::) 13:::: (::) 13:1:::: (::) 13::::: (::) 13:::::			
	-				MERTINE Diritui Gerrine Gerrine			
	_	8	23.0'	13		Saturated dense orangish brown fine sand w/some coarse sand, trace of	A-3	Mud
24]			13 17 17 19		silt.		Rotary @
			25.0'			23" RECOVERY		23.0'.
					11.01.01.01.01.01.01.01.01.01.01.01.01.0			
	_				100 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
27	_				66 13.156 f. 120 1 7 1 12 12 120 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	DDAET		
					6111366 6113161 6114366	DRAFI		
		9	28.0'	10 11 13 17	######################################	Saturated dense brown fine sand w/some coarse sand, trace of silt.	A-3	
				17				
30		V	30.0'			23" RECOVERY	7	
	•			•	(:::::::::::::::::::::::::::::::::::::			
					,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			
	-			Δ	Gillia Dirivito Liliai	GUST 2015		
33	-	10	33.0'	6 7		Saturated medium dense brown fine sand w/some coarse sand, trace of	A-3	
	-			6 7 10 15		silt.		
			35.0'			23" RECOVERY		
					11.01.11.11.11.11.11.11.11.11.11.11.11.1			
36	-				00111100 01111100 11111100 01111100			
					66 13.1966. 126 1 7 1 12.00 126 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
					663 13000 18733.1761. 1273 13000 1273 13760			
		11	38.0'	6 8 10 12	100 1 3 3 3 1 1 6 100 1 3 3 3 1 1 6 100 1 3 3 3 1 1 6 6	Saturated medium dense brown fine sand w/some coarse sand, trace of	A-3	
39	-			12	136 1 7 1 36 1 5 12 1 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	silt.		
	-		40.0'			22" RECOVERY		
					00111100 00111100 00111100 00111100			
40					9119949 6111966 6113196			
42	1							
	-	12	43.0'	8	100 / 100 /	Saturated medium dense brown fine sand w/some coarse sand, trace of silt	A-3	
		-	10.0	8 11 12 17	00111100 00111100 00111100 00111100	and fine gravel.	υ- 2	
45			45.0'		nii inii inii 1201 (anto 1201 (anto 1201 (anto	22" RECOVERY		
_ 4 ე	1		70.0		(SH) (SE	22 RECOVERT		1

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 **Contract:** 25-113-01

Donal	Dalle		Com:-!-					
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
					6113166 6113166			
48					1361 (1366) 1361 (1366) 1361 (1366)			
70		13	48.0'	8 13 14 33		Saturated medium dense gray clayey fine sand w/trace of silt, coarse sand	A-2-4(0)	
				14 33		and fine gravel.		
			50.0'			23" RECOVERY		
51								
J1								
				10				
54		14	53.0'	10 17 24 49		Saturated dense gray clayey fine sand w/trace of silt, coarse sand, fine gravel and organic matter.	A-2-4(0)	
J4				49				
			55.0'			23" RECOVERY		
						DRAFI		
57								
31				_				
		15	58.0'	10		Saturated dense gray clayey fine sand w/trace of silt, coarse sand, fine	A-2-4(0)	
		1		10 15 24 50/5"		gravel and organic matter.	2 .(0)	
60			60.0'	_		23" RECOVERY		
						GUST 2015		
				71		GUSI ZUIS		
63								
	3/8/10	16	63.0'	6 7 11 20		Saturated medium dense gray silty fine sand w/trace of coarse sand, fine	A-2-4(0)	
				20		gravel and organic matter.		
			65.0'			22" RECOVERY		
66								
		17	68.0'	8		Softworked years efficiency alones fine conducilt/	A 4(0)	
69		17	00.0	8 10 13 41		Saturated very stiff gray clayey fine sandy silt w/trace of coarse sand, fine gravel and organic matter.	A-4(0)	
			70.01					
			70.0'			23" RECOVERY		
72								
		18	73.0'	10 13 20		Saturated dense gray silty fine sand w/trace of coarse sand, fine gravel	A-2-4(0)	
				20		and organic matter.		

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
				24			
75			75.0'		22" RECOVERY		
78							
10		19	78.0'	13 20 21 50/3"	Saturated dense gray silty fine sand w/trace of coarse sand, fine gravel	A-4(0)	
				50/3"	and organic matter.		
			80.0'		23" RECOVERY		
81							
		20	83.0'	4	Saturated dense gray clayey fine sand w/trace of silt, fine gravel, coarse	A-2-4(0)	
84				4 15 17 27	sand and organic matter.		
			85.0'		23" RECOVERY		
		١.					
		M			FOR BIDDING		
87		M					
		21	88.0'	15_	Cabunated your days are with fine and with a of a constant fine	A 2 4(0)	
		- '	00.0	15 21 33 50/4"	Saturated very dense gray silty fine sand w/trace of coarse sand, fine gravel and organic matter.	A-2-4(0)	
90			90.0'	7	22" RECOVERY		
30			00.0		22 1000 1201		
93							
		22	93.0'	8 12 15 22	Saturated medium dense gray silty fine sand w/trace of fine gravel, organic matter and coarse sand.	A-2-4(0)	
				22			
			95.0'		23" RECOVERY		
96							
		23	98.0'	10 11 15 26	Saturated very stiff gray silty clay w/some organic matter, trace of fine	A-7-6(23)	
99				26	sand.		
			100.0'		22" RECOVERY End of Boring		
					2 0. 20g		
102							

Symbol Description

Strata symbols

Low plasticity clay



Poorly graded clayey silty sand



Silty sand



Well graded sand with silt



Poorly graded sand with silt



Clayey sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 3/5/2010 using a 3 1/4 inch diameter continues flight power auger. Rig is a Track mounted CME 55.
- 2. Groundwater levels recorded at the time of drillign and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 Boring No.: BR1-7-14

Contract: 25-113-01

Boring Location: Sta. 806+60.96 18 RT C.L.

Reference: **Boring Surface Elev.:** + 32.1

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: IN. IN. Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0 10.0

Water Level Readings

Depth of Casing Depth of Water Time **Depth of Hole** Elev. of Water Date 3/1/2010 10.0 8.0 4.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Ft.; Dia. U-Sample Boring: U-Samples: Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Jason Truver

Helpers: J. Lafferty

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
3	3/1/10	2	1.5' \ 2.0' / 2.0'	6 10 19 17 10	Moist firm brown clayey fine sandy silt w/some coarse sand, trace of fine gravel. 6" RECOVERY Moist dense brown coarse sandy fine gravel w/some fine sand and silt.	A-4(2) A-1-b	Topsoil - \18".
6		3	4.0' 4.0'	3 4 10 12	Wet medium dense brown coarse sandy fine gravel w/some fine sand, silt and clay. 11" RECOVERY	A-1-b	
		4	6.0' 8.0	8 8 11 16	Saturated medium dense brown fine gravelly coarse sand w/trace of fine sand and silt. 24" RECOVERY	A-1-b	
9		5	8.0'	7 7 8 9	Saturated medium dense brown fine gravelly coarse sand w/some fine sand, trace of silt. 24" RECOVERY	A-1-b	Mud Rotary @ 10.0'.
12							
		6	13.0'	5 8 9	Saturated medium dense orange fine sand w/some coarse sand and silt.	A-2-4(0)	
15			15.0'		20" RECOVERY		
18							

Remarks: Switch to Mud Rotary @ 10.0 feet.

Reviewed By: Hany Fekry Soils Supervisor: Randy Ferguson

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks	
		7	18.0'	7 11 14	Saturated medium dense orange fine sand w/some coarse sand and silt.	A-2-4(0)		
				14				
	-		20.0'		21" RECOVERY			
21								
	-							
	-	8	23.0'	6	Saturated medium dense brown fine sand w/some coarse sand and silt.	A-2-4(0)		
24				6 7 10 11	114th 114th 114th			
			25.0'		1966 1966 1966 1967 1968 24" RECOVERY			
	-		20.0		2. KECOVEKT 1387 1387			
					17320 17320 17321			
27					14(87) 1738 1718			
	1	9	28.0'	6 7 8 10	Saturated medium dense brown fine sand w/some coarse sand, trace of	A-3		
	-			10				
30			30.0'		1315) 17745 17855			
					FOR BIDDING			
		V						
	-				1/3/00 1/3/6/ 1/1/6/			
33					OHOT OO4E			
		10	33.0'	5 7 8 8	Saturated medium dense brown fine sand w/some coarse sand, trace of silt.	A-3		
	1			8	1.4357. 1.4357.			
	-		35.0'		22" RECOVERY			
36					14597 17399 1839			
					17125 14361 1738			
]				11.1561 11760: 1.1366			
		11	38.0'	4	Saturated medium dense brown fine sand w/some coarse sand and silt.	A-2-4(0)		
39				4 5 6 7	13375 11365 11365			
			40.0'		1967 1967 1967 1978 1978 24" RECOVERY			
			12.0		1430F 1130F 1130F			
					17780 17167 17167			
42					15367 17367			
					11162 13161 14161			
		12	43.0'	4 5 6	Saturated medium dense brown fine sand w/some fine gravel and coarse	A-3		
				6	sand, trace of silt.			
45			45.0'		24" RECOVERY			
	1				HARRI Tareri			

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 **Contract:** 25-113-01

Depth	Daily	No.	Sample	Blows/6"		Sample Description	Class./G.I.	Domorko
(ft.)	Progress	INO.	Depth	DIUWS/0	381433221 	Sample Description	Ciass./G.I.	Remarks
48		13	48.0'	5			A 2 4(0)	
		13	40.0	5 7 10 13		Saturated medium dense gray clayey fine sand w/some coarse sand and silt, trace of organic matter.	A-2-4(0)	
				13		,		
			50.0'			24" RECOVERY		
51								
		44	50.01	7				
54		14	53.0'	7 10 13 14		Saturated medium dense gray clayey fine sand w/some silt, trace of coarse sand and organic matter.	A-2-4(0)	
J-4				14		sand and organic matter.		
			55.0'			24" RECOVERY		
						D)RAFI		
57								
				_				
	R	15	58.0'	5 7 9		Saturated medium dense gray clayey fine sand w/some silt, trace of coarse sand and organic matter.	A-2-4(0)	
		M		10		said and organic matter.		
60	•		60.0'	•		24" RECOVERY		
						GUST 2015		
				7		JUSI 2013		
63		40	00.01	E				
		16	63.0'	5 11 20		Saturated dense gray clayey fine sand w/some silt, trace of coarse sand, fine gravel and organic matter.	A-2-4(0)	
				22		The graver and organic matter.		
			65.0'			12" RECOVERY		
66								
		4-	00.01	7	MAN MAN			
69		17	68.0'	7 9 11 12		Saturated medium dense gray silty fine sand w/some clay, trace of coarse sand and organic matter.	A-2-4(0)	
03				12				
			70.0'			24" RECOVERY		
72								
	0/0/40	40	70.01	40			:	
	3/2/10	18	73.0'	12 12 16 17		Saturated medium dense gray clayey fine sand w/some silt, trace of coarse sand and organic matter.	A-4(0)	
				17		and organic matter.		

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
			75.0'		12" RECOVERY		
	-						
78							
70	1	19	78.0'	7 11	Saturated very stiff gray fine sandy clay w/some silt, trace of organic	A-6(2)	
				7 11 14 17	matter and coarse sand.		
	-		80.0'		24" RECOVERY		
81							
<u> </u>							
	-	20	83.0'	20	Saturated dense dark gray silty fine sand w/trace of coarse sand, fine	A-2-4(0)	
84		-	00.0	20 22 18 22	gravel and organic matter.	A-2-4(0)	
- 04	1			22			
			85.0'		17" RECOVERY		
	-						
87							
01						•	
		V					
	_	21	88.0'	16 20 26 30	Saturated dense dark gray silty fine sand w/trace of coarse sand and	A-2-4(0)	
	-			30	organic matter.		
90			90.0'		24" RECOVERY		
- 50	1		-	\rightarrow t	24" RECOVERY		
	-						
93							
- 00		22	93.0'	12 9 13 17	Saturated very stiff dark gray silty fine sandy clay w/trace of organic	A-6(12)	Hole had
				13 17	matter and coarse sand.		caving
			05.01				issues could not
			95.0'		End of Boring		get
96					End of Borning		farther
							than
							95.0'.
	1						
99							
	-						
	1						
102							

Symbol Description

Strata symbols

Low plasticity clay



Silty sand



Poorly graded clayey silty sand



Poorly graded sand



Well graded sand



Poorly graded sand with silt



Clayey sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 3/1/2010 using a 3 1/4 inch diameter continues flight power auger. Rig is a Track mounted CME 55.
- 2. Groundwater levels recorded at the time of drillign and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

Boring No.: IT1-21 F.A. Project: U.S. 301 Maryland State Line to S.R. 1

Contract: 28-113-01

Boring Location: Sta. 568+00, 93.00' Rt. C.L.

Boring Surface Elev.: + 66.0 Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D. Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches

Hollow Stem Auger: 0.0 14.0

Water Level Readings

Depth of Water Time **Depth of Hole Depth of Casing** Elev. of Water Date 7/10/2009 9.7 12.0 10.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 16.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dave Burt

Helpers: D. Zmijewski

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	7/10/09	1	0.5' 2.0'	8 9 10	Moist very stiff gray clay w/some fine to coarse sand, trace of gravel. 17" RECOVERY	A-6(8)	Cultivated Soil - 6".
		2	2.0'	18 13 16	Moist very stiff gray clay w/trace of fine to coarse sand and gravel.	A-6(11)	
3		3	4.0'	18	19" RECOVERY Moist very stiff grayish orange mottled fine sandy silt w/some clay, trace	A-4(0)	USDA
6			6.0'	7 12 15 10	of coarse sand and gravel.	A-4(0)	Classifica - Sandy Loam.
		4	6.0'	9 12 10 9	Moist medium dense orange silty fine sand w/trace of coarse sand.	A-2-4(0)	20mm
			8.0'		18" RECOVERY		
9		5	8.0' 10.0'	4 5 6 7	Wet medium dense orange fine sand w/some silt and coarse sand, trace of gravel. 19" RECOVERY	A-2-4(0)	
		6	10.0'	13 14 15 14	Wet medium dense orange coarse to fine sand w/trace of silt and gravel.	A-1-b	
12			12.0'		PERCOVERY		
		7	12.0'	5 5 6 6	Wet medium dense orange coarse sand w/some gravel and fine sand, trace of silt. 21" RECOVERY	A-1-b	
15		8	14.0'	13 15 11 8	Wet medium dense orange coarse sand and gravel w/some fine sand, trace of silt.	A-1-b	
			16.0'		End of Boring		

Remarks:

Symbol Description

Strata symbols

Low plasticity clay



Silty sand



Well graded sand with silt



Poorly graded sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 7/10/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a ATV CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 Boring No.: IT1-22

Contract: 28-113-01

Boring Location: Sta. 573+00, 101.00' Lt. C.L.

Boring Surface Elev.: + 64.2 Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Depth of Water Time **Depth of Hole Depth of Casing** Elev. of Water Date 7/13/2009 12.0 8.0 7.5

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 16.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dave Burt

Helpers: D. Zmijewski

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	7/13/09	1	0.5' 2.0'	8 9 6	Moist very stiff gray clayey silt w/trace of fine to coarse sand. 16" RECOVERY	A-4(8)	Cultivated Soil - 8".
	1	2	2.0'	5 7	Moist stiff gray silt w/some clay, trace of fine to coarse sand.	A-4(2)	
3		3	4.0'	8 10	R 16' RECOVERY		
6	-		6.0'	5 6 7 5	Wet medium dense orange silty fine to coarse sand w/trace of gravel. 18" RECOVERY	A-2-4(0)	
		4	6.0'	4 4 6 13	Wet loose orange silty coarse sand w/some fine sand and gravel.	A-1-b	
<u> </u>	1	5	8.0' 8.0'	4	16" RECOVERY	<u> </u>	
9		5	10.0'	8 7 8	Wet medium dense orange gravel and coarse sand w/some fine sand, trac of silt. 11" RECOVERY	e A-1-a	
<u> </u>	1	6	10.0'	15	wet medium dense orange coarse sand and gravel w/some fine sand, trace	e A-1-b	
				15 9 5 4	of silt.	; A-1-0	
12	1		12.0'	<u> </u>	10" RECOVERY		
		7	12.0'	3 4 4 6	Wet stiff orange gravelly clay w/some fine to coarse sand.	A-7-6(5)	
<u> </u>	1	8	14.0' 14.0'	7	16" RECOVERY	A 2.5(0)	Companie
15			14.0	7 8 10 5	Wet medium dense orange clayey fine to coarse sand w/some gravel.	A-2-5(0)	Cemented sands.
	1		16.0'		12" RECOVERY		
					End of Boring		

Remarks:

Symbol Description

Strata symbols



Low plasticity clay



Silty low plasticity clay



Silty sand



Well graded sand with silt



Clayey sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 7/13/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a ATV CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

Boring No.: IT1-23 F.A. Project: U.S. 301 Maryland State Line to S.R. 1

Contract: 28-113-01

Boring Location: Sta. 578+00, 91.00' Rt. C.L.

Boring Surface Elev.: + 65.4 Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: IN. IN. Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches **Hollow Stem Auger:** 0.0

Water Level Readings

Depth of Casing Depth of Water Time **Depth of Hole** Elev. of Water Date 7/10/2009 11.5 14.0 12.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 16.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dave Burt

Helpers: D. Zmijewski

	Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
F	\·/	7/10/09	1	0.5'	4 3 3	Moist firm grayish orange mottled clay w/trace of fine to coarse sand. 14" RECOVERY	A-6(14)	Cultivated Soil - 6".
T			2	2.0'	6 7	Moist stiff gray clayey silt w/trace of fine to coarse sand and gravel.	A-4(5)	
ŀ	3		V	4.0'	5	FOR PIT RECOVERY		
		ľ	3	4.0'	3 6 6 8	Moist medium dense orangish gray fine to coarse sand and gravel w/some silt, trace of clay.	A-2-4(0)	USDA Classifica - Loamy Sand.
F	6		4	6.0' 6.0'	8 7 8 8	16" RECOVERY Moist medium dense orange fine to coarse sand and gravel w/some silt.	A-1-b	Saliu.
l				8.0'		9" RECOVERY		
L	9		5	8.0'	6 7 5 6	wet stiff orange fine sandy clay w/some coarse sand, trace of gravel.	A-7-5(2)	
l				10.0'		18" RECOVERY		
			6	10.0'	7 7 8 8	Wet stiff greenish orange fine sandy clay w/some coarse sand, trace of gravel.	A-7-5(11)	
L	12			12.0'		12" RECOVERY		
			7	12.0'	9 9 7 6	Wet medium dense greenish brown silty fine to coarse sand w/trace of gravel.	A-2-4(0)	
ŀ			8	14.0' 14.0'	3	16" RECOVERY	A 2.7(2)	
ŀ	15		0	14.0	3 4 7 4	Wet medium dense greenish brown clayey fine sand w/some coarse sand and gravel.	A-2-7(2)	
L				16.0'		18" RECOVERY		
						End of Boring		
Н			l				1	

Remarks:

Symbol Description

Strata symbols



Low plasticity clay



Silty low plasticity clay



Silty sand



Elastic silt

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 7/10/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a ATV CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 Boring No.: IT1-24

Contract: 28-113-01

Boring Location: Sta. 583+00, 108.00' Lt. C.L.

Boring Surface Elev.: + 68.0 Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 O.D.

IN. IN. Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Depth of Water Depth of Casing Time **Depth of Hole** Elev. of Water Date 7/13/2009 16.0 14.0

10.4

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 16.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dave Burt

Helpers: D. Zmijewski

		_					_
Depth	Daily	No.	Sample	Blows/6"	Sample Description	Class./G.I.	Remarks
(ft.)	Progress	4	Depth	2			~
	7/13/09	1	0.5'	3 5 6	Moist stiff orange clayey fine sandy silt w/some coarse sand.	A-4(3)	Cultivated
							Soil - 6".
			2.0'	0	12" RECOVERY		
		2	2.0'	9 12	Moist medium dense orange fine to coarse sand w/some silt.	A-2-4(0)	
3			3.0'		11" RECOVERY		
		2A	3.0'	14 7	Moist medium dense orange fine to coarse sand w/some silt.	A-2-4(0)	
		V	4.0'		4" RECOVERY		
	•	3	4.0'	8 14	Moist very stiff orange silt w/some fine sand, trace of coarse sand and	A-4(0)	
			5.0'		gravel.		
		3A	5.0'	12 6	7" RECOVERY	A-2-4(0)	USDA
6			6.0'		Moist medium dense orange fine to coarse sand w/some silt, trace of clay.		Classifica
		4	6.0'	9 12	Moist medium dense orangish yellow mottled silty fine sand w/some	A-2-4(0)	- Sand.
				11 14	coarse sand, trace of gravel.		
					osumu, vines of granter		
			8.0'		16" RECOVERY		
		5	8.0'	9	Moist medium dense orange coarse to fine sand and gravel w/some silt.	A-1-b	
9				16 11			
			10.0'		17" RECOVERY		
		6	10.0'	9	No Sieve Analysis - Indication of wet medium dense orange coarse to fine		
			11.0'		sand and gravel w/some silt.		
		6A	11.0'	4 5	6" RECOVERY		
12			12.0'		No Sieve Analysis - Indication of wet very stiff green sandy clay.		
		7	12.0'	4 5	Wet stiff green fine to coarse sandy clay w/trace of gravel.	A-6(0)	
				6			
			14.0'		18" RECOVERY		
		8	14.0'	3 4	Wet medium dense orangish green mottled clayey fine to coarse sand w/	A-2-7(0)	
15				9	some gravel.	` '	
				1			
			16.0'		14" RECOVERY		
					End of Boring		
					č		

Remarks:

Symbol Description

Strata symbols

Low plasticity clay

Silty sand

|||||||||| silt

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 7/13/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a ATV CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 Boring No.: IT1-25

Contract: 28-113-01

Boring Location: Sta. 587+00, 95.00' Rt. C.L.

Boring Surface Elev.: + 68.0 Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 O.D.

IN. IN. Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Depth of Water Depth of Casing Time **Depth of Hole** Elev. of Water Date 7/13/2009 10.4 14.0 12.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 16.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dave Burt

Helpers: D. Zmijewski

_	_		T _			ī	, i
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
(11.)	7/13/09	1	0.5'	4 4 4	Moist firm gray clayey silt w/some fine sand, trace of coarse sand.	A-4(4)	Cultivated Soil - 8".
		2	2.0' 2.0'	3 5	12" RECOVERY Moist stiff orange fine sandy silt w/some clay, trace of coarse sand.	A-4(1)	
3	N			5 7 7	Worst still orange thie sailty silt w/some clay, trace of coarse sailt.	A-4(1)	
		M	4.0'		18" RECOVERY		
	•	3	4.0'	4 5 9 7	Moist stiff orange fine sandy silt w/trace of coarse sand.	A-4(0)	
6			6.0'		24" RECOVERY		
		4	6.0'	8 12 17 13	Moist very stiff brownish gray mottled fine sandy silt and clay w/some coarse sand and gravel.	A-6(3)	USDA Classifica
				15			- Sandy
			8.0'		24" RECOVERY		Clay
9		5	8.0'	3 4 5 5	Moist stiff brown fine sandy clay w/some coarse sand, trace of gravel.	A-7-6(2)	Loam.
			10.0'		15" RECOVERY		
		6	10.0'	3 8 7 9	Wet stiff brown fine sandy clay w/some coarse sand, trace of gravel.	A-7-5(18)	
l			40.01		2011 777 770 7777		
12		7	12.0' 12.0'	4	20" RECOVERY Wet loose orange silty coarse to fine sand w/trace of gravel.	A 2 4(0)	
		,	12.0	4 5 7	wet loose orange stity coarse to line sand w/trace of graver.	A-2-4(0)	
			14.0'		18" RECOVERY		
15		8	14.0'	5 6 7 9	Wet medium dense orangish brown mottled silty coarse to fine sand w/ trace of gravel.	A-2-4(0)	
			16.0'		18" RECOVERY		
			10.0		End of Boring		

Remarks:

Symbol Description

Strata symbols



Silty low plasticity clay



Silty sand



Clayey sand



High plasticity clay

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 7/13/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a ATV CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 Boring No.: IT1-26

Contract: 28-113-01

Boring Location: Sta. 593+00, 108.00' Lt. C.L.

Boring Surface Elev.: + 69.2' Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D. Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches

Hollow Stem Auger: 0.0 14.0

Water Level Readings

Depth of Casing Depth of Water Time **Depth of Hole** Elev. of Water Date 7/14/2009 16.0 14.0 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 16.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dave Burt

Helpers: J. Williams

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	7/14/09	1	0.5' 2.0'	4 5 4	Moist stiff brown clayey silt w/trace of fine to coarse sand. 17" RECOVERY	A-4(8)	Cultivated Soil - 5".
	1	2	2.0'	3	Moist stiff brown silt w/some clay, trace of fine to coarse sand.	A-4(2)	
3			4.0'	6 10	RECOVERY		
6	•	3	4.0' 6.0'	3 5 8 7	Moist medium dense tan silty fine to coarse sand w/trace of clay and gravel. 18" RECOVERY	Á-2-4(0)	USDA Classifica - Loamy Sand.
		4	6.0'	8 10 11 13	Moist medium dense brownish orange silty fine sand w/some gravel and coarse sand.	A-2-4(0)	Sura.
			8.0'		18" RECOVERY		
9		5	8.0'	5 10 17 8	Wet very stiff brown coarse to fine sandy clay w/trace of gravel.	A-7-5(3)	
			10.0'		15" RECOVERY		
		6	10.0'	8 10 11 12	Wet very stiff brown fine sandy clay w/some coarse sand, trace of gravel.	A-7-5(6)	
12			12.0'		17" RECOVERY		
		7	12.0'	3 4 3 3	Wet loose brown clayey coarse to fine sand w/trace of gravel.	A-2-7(1)	
			14.0'	3	19" RECOVERY	/4	
15		8	14.0'	3 4 5 7	Wet loose brown clayey coarse to fine sand w/trace of gravel.	A-2-7(1)	
			16.0'		22" RECOVERY		
					End of Boring		
	1	i					

Remarks:

Symbol Description

Strata symbols



Low plasticity clay



Silty low plasticity clay



Silty sand



Silt

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 7/14/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a ATV CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

Boring No.: IT1-27 F.A. Project: U.S. 301 Maryland State Line to S.R. 1

Contract: 28-113-01

Boring Location: Sta. 598+00, 96.00' Rt. C.L.

Boring Surface Elev.: + 72.1 Reference:

Wt. of Casing Hammer: Average Fall: IN. Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: IN. IN. Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Depth of Casing Depth of Water Time Depth of Hole Elev. of Water Date 7/14/2009 16.0 14.0 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 16.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Jason Truver

Helpers: J. Lafferty

						1	
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
()	7/14/09	1	0.5'	7 8 8	Moist very stiff brown clayey silt w/trace of fine to coarse sand.	A-4(3)	Topsoil - 5".
	-	2	2.0'	11 11	15" RECOVERY Moist very stiff brown silt w/some fine sand, trace of clay and coarse	A-4(1)	
3		_		11 14	sand.	A-4(1)	
			3.5'		18" RECOVERY		
		2A	3.5'	14	Moist medium dense brown silty fine sand w/some coarse sand.	A-2-4(0)	
	•	3	4.0'	2 3 6 10	6 RECOVERY Wet stiff grayish orange mottled clay w/some fine sand, trace of coarse	A-6(6)	
	-			10	sand and gravel.		
6			6.0'		22" RECOVERY		
	1	4	6.0'	14 14 16 16	Moist very stiff grayish orange mottled fine sandy clay w/some coarse	A-6(6)	
				16 16	sand, trace of gravel.		
			0.01		ANII DEGOVEDV		
		5	8.0' 8.0'	10	20" RECOVERY Moist medium dense white silty fine sand w/trace of clay and coarse sand.	A-2-4(0)	USDA
9				10 11 12 12	Worst median dense write sitey line saile wittee of elay and coarse saile.	11 2 4(0)	Classificate - Sandy
			10.0'		20" RECOVERY		Loam.
		6	10.0'	4 8 8 8	Moist medium dense orangish gray coarse sand w/some silt and fine sand, trace of gravel.	A-1-b	
			40.01		A ALI DE GOLUPPA		
12	1	7	12.0' 12.0'	14	Moist dense orangish tan coarse sand and gravel w/some silt and fine	A-1-b	
		,	12.0	14 22 26 11	sand.	A-1-0	
			14.0'		16" RECOVERY		
	1	8	14.0'	18 20 14 16	Wet dense brownish red clayey coarse sand w/some fine sand and gravel.	A-2-5(0)	
15				14 16			
			16.0'		19" RECOVERY		
					End of Boring		

Remarks:

Symbol Description

Strata symbols



Silty low plasticity clay



Silt



Silty sand



Low plasticity clay

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 7/14/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a ATV CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 Boring No.: IT1-28

Contract: 28-113-01

Boring Location: Sta. 603+00, 119.00' Lt. C.L.

Boring Surface Elev.: + 75.4 Reference:

IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: IN. Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0 14.0

Water Level Readings

Depth of Casing Depth of Water Time **Depth of Hole** Elev. of Water Date 7/13/2009 16.0 14.0 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 16.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Jason Truver

Helpers: J. Lafferty

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	7/13/09	1	0.5' 2.0'	6 4 5	Moist stiff brown clayey silt w/trace of fine sand and gravel. 14" RECOVERY	A-4(6)	Topsoil - 5".
		2	2.0'	7 6	Moist stiff brown clayey silt w/trace of fine sand.	A-4(9)	
3			4.0'	9	P P 19' RECOVERY		
_		3	4.0'	4 5 5 9	Moist stiff brown clayey silt w/some fine sand, trace of coarse sand.	A-4(6)	
6	1		6.0'		17" RECOVERY	1	
		4	6.0'	5 7 8 8	Moist stiff orangish gray mottled clay w/some fine to coarse sand, trace of gravel.	of A-6(6)	
			8.0'		22" RECOVERY		
9		5	8.0'	5 7 8 12	Moist stiff orangish gray mottled fine to coarse sandy clay w/trace of gravel.	A-6(6)	
			10.0'		22" RECOVERY		
	-	6	10.0'	13 11 13 19	Moist very stiff orangish gray mottled fine to coarse sandy clay w/trace of gravel.	of A-6(4)	
10			12.0'	ľ	20" RECOVERY		
12	1	7	12.0'	6 10	Moist very stiff brownish green fine sandy clay w/some coarse sand and	A-7-5(4)	
<u> </u>				10 10 11	gravel.	A-1-3(1)	
			14.0'		15" RECOVERY		
		8	14.0'	11 11	Moist very stiff brownish green fine sandy clay w/some coarse sand, trac	e A-7-5(4)	
15				13 16	of gravel.		
	l		16.0'	<u> </u>	23" RECOVERY		
					End of Boring		
	4						

Remarks:

Symbol Description

Strata symbols

Silt

Low plasticity clay

Clayey sand

Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 7/13/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a ATV CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 Boring No.: IT1-29

Contract: 28-113-01

Boring Location: Sta. 608+00, 89.00' Rt. C.L.

Boring Surface Elev.: + 76.97 Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: IN. IN. Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 O.D.

IN. IN. Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Depth of Casing Depth of Water Time **Depth of Hole** Elev. of Water Date 7/14/2009 16.0 14.0 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 16.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Jason Truver

Helpers: J. Lafferty

						1	1
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	7/14/09	1	0.5'	8 8 7	Moist stiff brown clayey silt w/some fine sand, trace of coarse sand.	A-4(6)	Topsoil - 6".
		2	2.0'	7 8	Moist medium dense brown fine to coarse sand w/some silt.	A-2-4(0)	
3			4.0'	8 10	E P 21' RECOVERY		
		3	4.0'	2 2 3 3	Moist firm tan and gray clayey silt w/some fine sand, trace of coarse sand. 20" RECOVERY	A-4(6)	
6	1	4	6.0' 6.0'	4	Moist stiff tan and orange slightly mottled clay w/some fine sand, trace of	A-6(14)	
				4 6 6 8	coarse sand.	Α-0(17)	
	1	<u> </u>	8.0'		22" RECOVERY		
9	 	5	8.0'	4 6 4 6	Moist stiff orange fine sandy silt w/some coarse sand, trace of gravel.	A-4(0)	
	1	<u> </u>	10.0'		20" RECOVERY		
		6	10.0'	5 5 7 6	Moist medium dense orange silty fine sand w/trace of coarse sand and gravel.	A-2-4(0)	
12	1	'	12.0'		19" RECOVERY		
· · -		7	12.0'	5	No Sieve Analysis - Indication of moist medium dense orangish gray		
		7A	12.5' <i>f</i> 12.5'	8 8 9	mottled sand w/some clay. 3" RECOVERY	A-2-4(0)	
		'	14.0'		Moist medium dense brown silty fine sand w/some coarse sand, trace of		
	'	8	14.0'	11 14	gravel. 16" RECOVERY	A-1-b	
15	1	'		16 16	Moist medium dense brown coarse sand and gravel w/some fine sand,		
			16.0'		trace of silt. 19" RECOVERY		
	'				End of Boring		
	1 '	1 '	1				

Remarks:

Symbol Description

Strata symbols

Low plasticity clay



Silty sand



Well graded sand with silt

DRAFT NOT FOR BIDDING **AUGUST 2015**

- 1. Exploratory borings were drilled on 7/14/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a ATV CME 55.
- Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

Boring No.: IT1-30 F.A. Project: U.S. 301 Maryland State Line to S.R. 1

Contract: 28-113-01

Boring Location: Sta. 613+00, 129.00' Lt. C.L.

Boring Surface Elev.: + 71.1 Reference:

Wt. of Casing Hammer: Average Fall: IN. Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: IN. IN. Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches **Hollow Stem Auger:** 0.0

Water Level Readings

Depth of Casing Depth of Water Time Depth of Hole Elev. of Water Date 7/13/2009 16.0

14.0 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 16.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Jason Truver

Helpers: J. Lafferty

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	7/13/09	1	0.5' 2.0'	3 3 4	Moist firm brown clayey fine sandy silt w/some coarse sand, trace of gravel. 13" RECOVERY	A-4(1)	Topsoil - 6".
		2	2.0'	3 3	Moist firm brown clayey silt w/some fine to coarse sand, trace of gravel.	A-4(6)	
3			4.0'	3	16' RECOVERY		
	•	3	4.0' 6.0'	2 3 4 7	Moist firm brown silt w/some fine to coarse sand and clay, trace of gravel. 20" RECOVERY	A-4(4)	USDA Classifica - Loam.
6		4	6.0'	5 6 7 8	Moist medium dense brownish red silty coarse to fine sand w/trace of gravel.	A-2-4(0)	
			8.0'		20" RECOVERY		
9		5	8.0'	4 5 6 7	Wet medium dense brownish red silty coarse to fine sand w/trace of gravel.	A-2-4(0)	
			10.0'		14" RECOVERY		
		6	10.0'	7 9 9 10	Wet medium dense brownish red silty fine to coarse sand.	A-2-4(0)	
12			12.0'		21" RECOVERY		
		7	12.0'	3 2 3 2	Wet loose brownish gray mottled silty coarse to fine sand w/trace of gravel.	A-2-4(0)	
			14.0'		16" RECOVERY		
15		8	14.0'	4 6 6 5	Wet medium dense brownish gray mottled fine to coarse sand w/some silt, trace of gravel.	A-2-4(0)	
			16.0'		20" RECOVERY		
					End of Boring		

Remarks:

Symbol Description

Strata symbols



Silty low plasticity clay



Low plasticity clay



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 7/13/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a ATV CME 55.
- Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

Boring No.: IT1-31 F.A. Project: U.S. 301 Maryland State Line to S.R. 1

Contract: 28-113-01

Boring Location: Sta. 618+00, 210.00' Lt. C.L.

Boring Surface Elev.: + 87.8 Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D. 3 1/4 Inches

From Depth of: From Depth of: To: To: **Casing Size: Hollow Stem Auger:** 0.0

Water Level Readings

Depth of Casing Depth of Water Time Depth of Hole Elev. of Water Date 7/13/2009 16.0 14.0 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 16.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Jason Truver

Helpers: J. Lafferty

Donth	Daily		Comple				
Depth (ft.)	Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	7/13/09	1	0.5' 2.0'	4 4 4	Moist firm brown clayey silt w/trace of fine to coarse sand and gravel. 14" RECOVERY	A-4(8)	Topsoil - 5".
		2	2.0'	7 5 5	Moist stiff brown clayey silt w/trace of fine to coarse sand.	A-4(8)	
3		J	4.0'	6	18' RECOVERY		
	•	3	4.0'	5 5 7 8	Moist stiff brownish gray silt w/some clay and fine sand, trace of coarse sand and gravel.	A-4(3)	
6			6.0'	-	19" RECOVERY		
		4	6.0'	5 5 7 8	Moist stiff brown silt w/some clay and fine sand, trace of coarse sand.	A-4(4)	
			8.0'	7	21" RECOVERY		
9		5	8.0'	7 5 7 7	Moist stiff brown clayey fine sandy silt w/some coarse sand and gravel.	A-4(1)	
		6	10.0' 10.0'	7	17" RECOVERY	A 4(0)	USDA
				7 9 9 11	Moist very stiff orange fine sandy silt w/some coarse sand and clay.	A-4(0)	Classificate - Sandy
12		7	12.0' 12.0'	5	19" RECOVERY	1 2 4(0)	Loam.
		,	14.0'	5 7 8 9	Moist medium dense orange silty fine sand w/some coarse sand, trace of gravel. 18" RECOVERY	A-2-4(0)	
15		8	14.0'	8 11 13 13	Moist medium dense orange coarse to fine sand w/some silt, trace of gravel.	A-1-b	
			16.0'		18" RECOVERY		
					End of Boring		

Remarks:

Symbol Description

Strata symbols

Low plasticity clay



Silty low plasticity clay



Clayey sand



Poorly graded clayey silty sand



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 7/13/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a ATV CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 Boring No.: IT1-32

Contract: 28-113-01

Boring Location: Sta. 619+00, 70.00' Rt. C.L.

Boring Surface Elev.: + 76.25 Reference:

IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: IN. Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Depth of Water Depth of Casing Time **Depth of Hole** Elev. of Water Date 7/13/2009 16.0 14.0 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 16.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Jason Truver

Helpers: J. Lafferty

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
(***)	7/13/09	1	0.5'	4 2 2	Moist soft brown clayey fine sandy silt w/some coarse sand, trace of gravel. 12" RECOVERY	A-4(2)	Topsoil - 5".
		2	2.0'	5	Moist stiff brown clayey silt w/some coarse to fine sand, trace of gravel.	A-4(3)	
3			4.0'	56	18" RECOVERY		
	•	3	4.0'	5000	Moist medium dense brown clayey fine to coarse sand w/some gravel.	A-2-4(0)	
6			6.0'		19" RECOVERY		
		4	6.0'	5 6 6 7	Moist medium dense brown coarse to fine sand w/some silt, trace of clay and gravel.	A-2-4(0)	
			8.0'		20" RECOVERY		
9		5	8.0'	5 4 7 6	Moist medium dense brown silty fine sand w/some coarse sand, trace of gravel.	A-2-4(0)	
			10.0'		19" RECOVERY		
		6	10.0'	4 6 9 10	Moist medium dense brown fine to coarse sand w/some silt, trace of gravel.	A-2-4(0)	
12			12.0'		17" RECOVERY		
12		7	12.0'	9 11 13 16	Moist medium dense brown silty gravel and fine sand w/some coarse sand.	A-1-b	
			14.0'		17" RECOVERY		
15		8	14.0'	13 10 17 18	Wet medium dense orangish black silty coarse to fine sand w/trace of gravel.	A-2-4(0)	
			16.0'		18" RECOVERY		
					End of Boring		

Remarks:

Symbol Description

Strata symbols



Silty low plasticity clay



Poorly graded clayey silty sand



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 7/13/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a ATV CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 Boring No.: IT1-33

Contract: 28-113-01

Boring Location: Sta. 623+00, 90.00' Lt. C.L.

Boring Surface Elev.: + 76.4 Reference:

Wt. of Casing Hammer: Average Fall: IN. Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: IN. Lbs. 30 D-Sampler: S-Sampler: U-Sampler: IN. Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches

Hollow Stem Auger: 0.0

Water Level Readings

Depth of Water Depth of Casing Time **Depth of Hole** Elev. of Water Date 7/13/2009 16.0 14.0 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 16.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Jason Truver

Helpers: J. Lafferty

		_				_	_
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	7/13/09	1	0.5' 2.0'	4 3 3	Moist firm brown clay w/trace of fine to coarse sand.	A-6(11)	Topsoil - 5".
		2	2.0'	4 5	Moist stiff brown fine sandy silt w/some clay and coarse sand, trace of	A-4(2)	
3		J	4.0'	6	POR BIDDING		
	•	3	4.0'	5 6	Moist stiff tan clay w/some fine sand, trace of coarse sand and gravel.	A-6(13)	
6			6.0'		CLICT 2015		
		4	6.0'	8 11 14 16	Moist very stiff orange fine sandy clay w/some coarse sand and gravel.	A-6(4)	
			0.01	10			
9		5	8.0' 8.0'	5 6 6 8	Moist medium dense orange silty fine to coarse sand w/trace of clay and gravel.	A-2-4(0)	USDA Classifica
			10.0'				- Sandy Loam
		6	10.0'	12 7 9 7	Moist medium dense tan coarse to fine sand w/some silt and gravel.	A-1-b	
12			12.0'				
14	1	7	12.0'	10 9 11 14	Moist medium dense tan coarse to fine sand w/some silt and gravel.	A-2-4(0)	
				14			
		8	14.0' 14.0'	17	Moist dense brown clayey coarse sand and gravel w/some fine sand.	A-2-6(0)	
15				17 19 21 26	and graves who me dand	-1 2 3(0)	
			16.0'				
					End of Boring		
	-						

Remarks:

Symbol Description

Strata symbols

Low plasticity clay



Silty low plasticity clay



Clayey sand



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 7/13/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a ATV CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 Boring No.: IT1-34

Contract: 28-113-01

Boring Location: Sta. 623+00, 283.00' Rt. C.L.

Boring Surface Elev.: + 76.1 Reference:

IN. IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches **Hollow Stem Auger:** 0.0

Water Level Readings

Depth of Casing Depth of Water Time **Depth of Hole** Elev. of Water Date 7/14/2009 16.0 14.0 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 16.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Jason Truver

Helpers: J. Lafferty

		_				_	
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	7/14/09	1	0.5'	3 4	Moist frim brown clayey silt w/trace of fine to coarse sand.	A-4(4)	Topsoil -
				4			5".
			2.0'	_	14" RECOVERY		
		2	2.0'	5 7 9	Moist very stiff brown clayey silt w/trace of fine to coarse sand.	A-4(7)	
3			4.0'	9	P P 20" RECOVERY		
		3	4.0'	4	Moist medium dense orange clayey fine to coarse sand w/trace of gravel.	A-2-6(0)	
				7 8			
6			6.0'	\ I	19" RECOVERY		
		4	6.0'	3 6	Moist stiff orange fine to coarse sandy clay w/trace of gravel.	A-6(5)	
				8			
			0.01				
		5	8.0' 8.0'	3	18" RECOVERY	1.2.4(0)	110D 1
		3	0.0	3 5 5 7	Moist loose orange silty fine sand w/trace of clay, coarse sand and gravel	A-2-4(0)	USDA Classifica
9				7			- Sandy
			10.0'		16" RECOVERY		Loam
		6	10.0'	3 4	Moist loose orange silty fine sand.	A-2-4(0)	
				4 5	S ,		
12			12.0'		18" RECOVERY		
		7	12.0'	6 7 7 8	Moist stiff orange fine sandy silt.	A-4(0)	
				7 8			
			4.5		400 7		
<u> </u>	-	8	14.0' 14.0'	16	19" RECOVERY		
l		°	14.0	16 13 11	Moist medium dense brownish red coarse to fine sand w/some silt and	A-1-b	
15	1			6	gravel.		
			16.0'		13" RECOVERY		
					End of Boring		
1					· · · ·0		
	1	I	1				

Remarks:

Symbol Description

Strata symbols

Silty low plasticity clay

Low plasticity clay

Clayey sand



Silty sand

DRAFT NOT FOR BIDDING **AUGUST 2015**

- 1. Exploratory borings were drilled on 7/13/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a ATV CME 55.
- Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 Boring No.: IT1-35

Contract: 28-113-01

Boring Location: Sta. 628+00, 85.00' Rt. C.L.

Boring Surface Elev.: + 75.3 Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: IN. IN. Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches

Hollow Stem Auger: 0.0

Water Level Readings

Depth of Casing Depth of Water Time Depth of Hole Elev. of Water Date 7/14/2009 0.0 16.0 14.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 16.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Jason Truver

Helpers: J. Lafferty

		Ι			T I		ı
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
(-11)	7/14/09	1	0.5'	3 3 4	Moist firm brown clayey silt w/trace of fine sand.	A-4(7)	Topsoil - 5".
			2.0'		13" RECOVERY		
		2	2.0'	7 9 8	Moist very stiff brown clayey silt w/some fine sand, trace of coarse sand	A-4(4)	
3		V	4.0'	10	and gravel. 18" RECOVERY		
	ľ	3	4.0'	3 5 7 8	Moist medium dense orange clayey coarse to fine sand w/trace of gravel.	A-2-6(0)	
6			6.0'		19" RECOVERY		
		4	6.0'	9 11 9 10	Moist medium dense orange coarse sand w/some silt and fine sand, trace of gravel and clay.	A-1-b	USDA Classifica - Sand
			8.0'		21" RECOVERY		
9		5	8.0'	4 6 5 5	Moist medium dense orange silty fine to coarse sand w/trace of gravel.	A-2-4(0)	
			10.0'		20" RECOVERY		
		6	10.0'	6 9 11 13	Moist medium dense orange silty fine sand w/some coarse sand, trace of gravel.	A-2-4(0)	
12			12.0'		16" RECOVERY		
		7	12.0'	14 14 18 14	Moist hard brownish red fine sandy clay w/some coarse sand, trace of gravel.	A-7-5(6)	
		8	14.0' 14.0'	11	19" RECOVERY	A 0 4(0)	
15		ď	14.0	11 13 11 10	Moist medium dense greenish red silty fine to coarse sand w/trace of gravel.	A-2-4(0)	
			16.0'		18" RECOVERY		
					End of Boring		

Remarks:

Symbol Description

Strata symbols

7/// **T** ---

Low plasticity clay

Clayey sand

Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 7/14/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a ATV CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 Boring No.: IT1-36

Contract: 28-113-01

Boring Location: Sta. 628+00, 458.00' Lt. C.L.

Boring Surface Elev.: + 77.3 Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Depth of Casing Depth of Water Time Depth of Hole Elev. of Water Date 7/15/2009 16.0 14.0

Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dave Burt

Helpers: J. Lafferty

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	7/15/09	1	0.5'	3 4 4	Moist firm brown clayey silt w/trace of fine to coarse sand.	A-4(9)	Topsoil - 7".
\vdash		2	2.0'	4	12" RECOVERY Moist stiff brown clayey silt w/trace of fine to coarse sand.	A-4(9)	
3		-		6 9	Moist still brown clayey sht w/trace of fine to coarse said.	A-4(3)	
<u> </u>			4.0'	8	16' RECOVERY		
		3	4.0'	8 10 8	Moist very stiff brown coarse to fine snady clay w/trace of gravel.	A-6(1)	
6			6.0'	Λ	20" RECOVERY		
		4	6.0'	9 10 7 7	MOist medium dense brown clayey fine to coarse sand w/some silt, trace of gravel.	A-2-4(0)	USDA Classifica - Sandy
			8.0'		21" RECOVERY		Loam
9		5	8.0'	4 5 6 6	Moist medium dense brown silty fine sand w/trace of coarse sand.	A-2-4(0)	
			10.0'		20" RECOVERY		
		6	10.0'	9 6 9 15	Moist medium dense brown silty fine sand w/trace of coarse sand.	A-2-4(0)	
1 12			12.0'		22" RECOVERY		
12	•	7	12.0'	7 9 11 13	Moist medium dense brownish red clayey coarse to fine sand w/trace of gravel.	A-2-5(0)	
			14.0'	13	17" RECOVERY		
15		8	14.0'	7 8 6 8	Wet medium dense brownish red clayey coarse to fine sand w/trace of gravel.	A-2-7(0)	
			16.0'		20" RECOVERY		
					End of Boring		
]						

Remarks:

Symbol Description

Strata symbols

Low plasticity clay



Clayey sand



Poorly graded clayey silty sand



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 7/15/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a ATV CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 Boring No.: IT1-37

Contract: 28-113-01

Boring Location: Sta. 633+00, 89.00' Lt. C.L.

Boring Surface Elev.: + 70.6 Reference:

Wt. of Casing Hammer: Average Fall: IN. Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: IN. IN. Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Depth of Casing Depth of Water Time Depth of Hole Elev. of Water Date 7/15/2009 16.0 14.0

Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 16.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dave Burt

Helpers: J. Lafferty

	•		ı				
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	7/15/09	1	0.5' 2.0'	5 4 4	Moist firm brown clayey silt w/trace of fine sand and gravel. 13" RECOVERY	A-4(8)	Topsoil - 5".
		2	2.0'	4	Moist stiff brown clayey silt w/trace of fine to coarse sand.	A-4(9)	
3			4.0'	6 10	20' RECOVERY		
	•	3	4.0' 6.0'	4 8 7 8	Moist stiff brownish green clay w/some gravel and fine to coarse sand. 18" RECOVERY	A-7-6(8)	
6		4	6.0'	6 10 10 10	Moist very stiff brownish green silty fine sandy clay w/trace of coarse sand.	A-7-6(10)	USDA Classifica - Clay
			8.0'		21" RECOVERY		
9		5	8.0'	6 7 7 8	Moist medium dense greenish orange clayey fine to coarse sand w/trace of gravel. 16" RECOVERY	A-2-7(0)	
		6	10.0'	7 8 14 11	Moist very stiff greenish orange clayey coarse sandy silt w/some fine sand and gravel.	A-5(1)	
12			12.0'		22" RECOVERY		
		7	12.0'	3 5 4 8	Wet loose orange coarse to fine sand w/some silt, trace of gravel.	A-1-b	
			14.0'		20" RECOVERY		
15		8	14.0'	7 9 10 11	Wet medium dense orange clayey coarse to fine sand w/trace of gravel.	A-2-7(0)	
			16.0'		End of Boring		
					Eliu oi doillig		

Remarks:

Symbol Description

Strata symbols

Low plasticity clay



Silt



Silty sand



Poorly graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 7/15/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a ATV CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 Boring No.: IT1-38

Contract: 28-113-01

Boring Location: Sta. 633+00, 436.00' Rt. C.L.

Boring Surface Elev.: + 74.5 Reference:

IN. IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D. Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches

Hollow Stem Auger: 0.0

Water Level Readings

Depth of Casing Depth of Water Time Depth of Hole Elev. of Water Date 7/17/2009 16.0 14.0

Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 16.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dave Burt

Helpers: J. Lafferty

Donth	Daily		Comple				
Depth (ft.)	Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	7/17/09	1	0.5' 2.0'	5 5 5	Moist stiff brown clayey silt w/trace of fine sand. 13" RECOVERY	A-4(10)	Topsoil - 7".
		2	2.0'	5 7	Moist stiff brown clayey silt w/trace of fine to coarse sand.	A-4(7)	
3		3	4.0'	7 8	14' RECOVERY		
		3		3 3 6 9	Moist stiff brown clayey fine andy silt w/some coarse sand, trace of gravel.	A-4(2)	
6		4	6.0' 6.0'	6	17" RECOVERY Moist medium dense orange coarse sand w/some silt and fine sand, trace	A-1-b	
			8.0'	6 5 6	of gravel. 18" RECOVERY	A-1-0	
9		5	8.0'	3 6 8 15	Moist medium dense orange gravel and coarse to fine sand w/some silt, trace of clay.	A-1-b	USDA Classificate - Loamy Sand
		6	10.0'	15 20 25 20	Moist dense brown gravel and coarse sand w/some silt and fine sand.	A-1-b	Pulverized gravel in tip of
12		7	12.0' 12.0'	5	12" RECOVERY Wet stiff green coarse to fine sandy clay w/trace of gravel.	A 7 5(4)	spoon.
		,	14.0'	5 4 5 5	wet stiff green coarse to fine sandy clay w/trace of gravel. 16" RECOVERY	A-7-5(4)	
15		8	14.0'	3 7 5 4	Wet medium dense brown coarse to fine sand w/some silt, trace of gravel.	A-1-b	
			16.0'		13" RECOVERY		
					End of Boring		

Remarks:

Symbol Description

Strata symbols

//// T.

Low plasticity clay

Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 7/17/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a ATV CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 Boring No.: IT1-39

Contract: 28-113-01

Boring Location: Sta. 638+00, 104.00' Rt. C.L.

Boring Surface Elev.: + 66.9 Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: IN. IN. Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches **Hollow Stem Auger:** 0.0

Water Level Readings

Depth of Casing Depth of Water Time **Depth of Hole** Elev. of Water Date 7/16/2009 16.0 14.0 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 16.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dave Burt

Helpers: J. Lafferty

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	7/16/09	1	0.5' 2.0'	6 6 6	Moist stiff clayey silt w/some gravel, trace of fine to coarse sand.	A-4(7)	Topsoil - 6".
		2	2.0'	6 8	Moist very stiff brown clayey silt w/trace of fine to coarse sand.	A-4(9)	
3			4.0'	11	18' RECOVERY		
	•	3	4.0' 6.0'	4 5 5 8	Moist stiff brownish orange mottled clayey silt w/trace of fine to coarse sand. 20" RECOVERY	A-4(7)	USDA Classifica - Silt
6		4	6.0'	7 21 12 14	Moist dense brown clayey gravel w/some coarse sand, trace of fine sand.	A-1-b	Pulverized gravel in tip of
		5	8.0' 8.0'	3	8" RECOVERY	A 2 ((0)	spoon.
9		5	0.0	3 5 7 10	Moist medium dense greenish orange clayey gravel and fine sand w/some silt and coarse sand.	A-2-6(0)	
			10.0'		17" RECOVERY		
		6	10.0'	6 8 12 8	Moist medium dense orange coarse to fine sand and gravel w/some silt.	A-1-b	
12			12.0'		17" RECOVERY		
		7	12.0'	3 3 3 4	Wet loose orange silty coarse to fine sand w/some gravel.	A-2-4(0)	
			14.0'		21" RECOVERY		
15		8	14.0'	12 9 6 21	Wet medium dense brown coarse sand and gravel w/some coarse sand and silt.	A-1-b	
			16.0'		20" RECOVERY		
					End of Boring		
<u> </u>							

Remarks:

Symbol Description

Strata symbols

Low plasticity clay



Silt



Silty clayey gravel



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 7/16/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a ATV CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 Boring No.: IT1-40

Contract: 28-113-01

Boring Location: Sta. 638+00, 164.00' Lt. C.L.

Boring Surface Elev.: + 70.5 Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Depth of Casing Depth of Water Time **Depth of Hole** Elev. of Water Date 7/16/2009 16.0 14.0 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 16.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dave Burt

Helpers: J. Lafferty

					, , , , , , , , , , , , , , , , , , ,		
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	7/16/09	1	0.5'	7 5 7	Moist stiff brown clayey silt w/trace of fine sand.	A-4(10)	Topsoil - 7".
<u> </u>	· '	2	2.0'	7	11" RECOVERY		
	1	^	2.0	4	Moist firm brown silt w/some clay, trace of fine sand.	A-4(4)	
3		V	4.0'	5	19" RECOVERY		
_	 	3	4.0'	7 7 7 13	Moist medium dense brown clayey gravel w/some coarse to fine sand.	A-2-4(0)	
6	1 '	<u></u>	6.0'		16" RECOVERY		
_		4	6.0'	11 12 13 18	Moist medium dense tan gravel and coarse to fine sand w/some silt, trace of clay.	A-1-b	USDA Classifica - Sandy
	l '		8.0'		14" RECOVERY		Loam
9		5	8.0'	4 10 8 9	Moist medium dense orangish green clayey fine sand w/some coarse sand and gravel.	A-2-7(1)	
	l '		10.0'		13" RECOVERY		
		6	10.0'	8 7 8 10	Moist medium dense orangish green clayey gravel and fine sand w/some coarse sand.	A-2-7(1)	
	l '						
12	l '	<u> </u>	12.0'		20" RECOVERY		
		7	12.0'	3 5 7 5	Wet medium dene orange silty coarse to fine sand and gravel.	A-1-b	
	1 '		14.0'		16" RECOVERY		
15		8	14.0'	4 13 9 8	Wet medium dense orange silty coarse to fine sand and gravel.	A-1-b	
	'		16.0'		13" RECOVERY		
			16.0		End of Boring		
	'				End of Boring		

Remarks:

Symbol Description

Strata symbols

Low plasticity clay



Silty low plasticity clay



Poorly graded clayey silty sand



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 7/16/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a ATV CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 Boring No.: IT1-41

Contract: 28-113-01

Boring Location: Sta. 643+00, 126.00' Lt. C.L.

Boring Surface Elev.: + 66.8 Reference:

IN. IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Depth of Casing Depth of Water Time **Depth of Hole** Elev. of Water Date 7/16/2009 Dry 16.0 14.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 16.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dave Burt

Helpers: J. Lafferty

- ·	- ·	_				1	1
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	7/16/09	1	0.5'	5 6 6	Moist stiff brown clayey silt w/trace of fine to coarse sand.	A-4(7)	Topsoil -
				6			5".
			2.0'	,	15" RECOVERY		
		2	2.0'	4 8 10	Moist very stiff brown clayey coarse sandy silt w/some fine sand and	A-4(2)	USDA
3				15	gravel.		Classifica
		M	4.0'		17" RECOVERY	+	- Loam
		3	4.0'	8	No Sieve Analysis - Indication of moist dense brown silty sand w/trace o		Piece of
				23 13 12	gravel.		gravel in
							tip of
6			6.0'		3" RECOVERY		spoon.
		4	6.0'	13 10 13 12	No Sieve Analysis - Indication of moist medium dense brown silty sand		Piece of
				13 12	w/trace of gravel.		gravel in
							tip of
		5	8.0' 8.0'	2	2" RECOVERY		spoon.
		٦	8.0	3 5 6	Wet medium dense orange fine to coarse sand w/some silt, trace of grave	l. A-2-4(0)	
9	-			6	eft F49te 164 916te 184 916te		
			10.0'		15" RECOVERY		
		6	10.0'	6 5 6	Wet medium dense orange clayey coarse to fine sand w/some gravel.	A-2-7(1)	
				6	g, .,		
12			12.0'		17" RECOVERY		
		7	12.0'	3 5 7 7	Wet medium dense orange silty coarse to fine sand w/some gravel.	A-1-b	
				7			
		8	14.0' 14.0'	3	20" RECOVERY	A 2 4(0)	
1 45			14.0	3 5 8	Wet medium dense orange silty coarse to fine sand w/some gravel.	A-2-4(0)	
15	1			7			
			16.0'		22" RECOVERY		
			. 5.0		End of Boring		
	1		1			1	

Remarks:

Symbol Description

Strata symbols

Low plasticity clay

Poorly graded sand with silt



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 7/16/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a ATV CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 Boring No.: IT1-42

Contract: 28-113-01

Boring Location: Sta. 648+00, 111.00' Rt. C.L.

Boring Surface Elev.: + 62.79 Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D. Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches

Hollow Stem Auger: 0.0 14.0

Water Level Readings

Depth of Casing Depth of Water Time **Depth of Hole** Elev. of Water Date 7/16/2009 16.0 14.0 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 16.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dave Burt

Helpers: J. Lafferty

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	7/16/09	1	0.5'	17 18 22	Moist hard brown clayey gravelly silt w/trace of fine to coarse sand.	A-4(1)	Topsoil - 6".
		2	2.0'	23 21 15	Moist dense brown clayey gravel w/some fine to coarse sand.	A-2-4(0)	
3		V	4.0'	16	13' RECOVERY		
	•	3	4.0'	13 15 14 14	Moist medium dense orangish brown clayey gravel and fine sand w/some coarse sand.	A-2-7(1)	
6]		6.0'		16" RECOVERY		
		4	6.0'	14 8 11 13	Wet medium dense orange clayey gravel and fine sand w/some coarse sand.	A-2-7(0)	
l			8.0'	'	15" RECOVERY		
9		5	8.0'	16 15 13 5	Wet very stiff orange coarse to fine sandy clay w/trace of gravel.	A-7-5(2)	
			10.0'	'	4" RECOVERY		
		6	10.0'	4 4 7 8	Wet medium dense orange silty coarse to fine sand w/trace of gravel.	A-2-4(0)	
12			12.0'	'	17" RECOVERY		
12		7	12.0'	4 5 7 7	Wet mediumd ense orange silty coarse sand and gravel w/some fine sand.	A-1-b	
			14.0'	'	10" RECOVERY		
15		8	14.0'	6 5 7 7	Wet medium dense orange silty coarse to fine snad w/some gravel.	A-2-4(0)	
			16.0'		18" RECOVERY		
			10.0		End of Boring		
]			!			

Remarks:

Symbol Description

Strata symbols

Clayey sand



Poorly graded clayey silty sand



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 7/16/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a ATV CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 Boring No.: IT1-43

Contract: 28-113-01

Boring Location: Sta. 653+00, 100.00' Lt. C.L.

Boring Surface Elev.: + 64.8 Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: IN. IN. Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches

Hollow Stem Auger: 0.0

Water Level Readings

Depth of Casing Depth of Water Time Depth of Hole Elev. of Water Date 7/17/2009 16.0 14.0 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 16.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dave Burt

Helpers: J. Lafferty

		1					
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
(10.)	7/17/09	1	0.5'	5 5 5	Moist stiff brown clayey silt w/trace of fine to coarse sand.	A-4(8)	Topsoil - 7".
		2	2.0'	5 6 7	Moist stiff brown clayey silt w/some fine sand, trace of coarse sand and	A-4(6)	
3			4.0'	6	gravel. 20" RECOVERY		
	ľ	3	4.0'	3 4 5 7	Moist stiff brown silty clay w/some fine sand, trace of coarse sand and gravel.	A-6(9)	USDA Classifica - Clay Loam
6	}	4	6.0' 6.0'	5	18" RECOVERY Wet stiff brown fine sandy clay w/some coarse sand, trace of gravel.	A-7-5(7)	Loam
			8.0'	5655	wet stiff brown the saidy clay w/some coarse said, trace of graver.	A-1-3(1)	
9		5	8.0'	3 4 5 5	Wet stiff orangish green coarse sandy clay w/some fine sand, trace of gravel.	A-7-5(5)	
		6	10.0' 10.0'	5	12" RECOVERY	A 2 4(0)	
				5 6 7 9	Wet medium dense orangish brown silty coarse sand w/some fine sand and gravel.	A-2-4(0)	
12	}	7	12.0' 12.0'	3	18" RECOVERY Wet loose orangish brown silty coarse to fine sand w/trace of gravel.	A-2-4(0)	
		,	14.0'	3 5 5 8	wet loose orangish brown stity coarse to line sand w/trace of graver. 19" RECOVERY	A-2-4(0)	
15		8	14.0'	8 4 7 13	Wet medium dense brownish orange silty coarse to fine sand w/trace of gravel.	A-2-4(0)	
			16.0'		18" RECOVERY		
					End of Boring		
]	I					

Remarks:

Symbol Description

Strata symbols

Low plasticity clay

Silt

Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 7/17/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a ATV CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 Boring No.: IT1-44

Contract: 28-113-01

Boring Location: Sta. 658+00, 98.00' Rt. C.L.

Boring Surface Elev.: + 56.2 Reference:

Wt. of Casing Hammer: Average Fall: IN. Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: IN. IN. Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D. Core Bit: O.D.

Casing Size: 3 1/4 Inches

From Depth of: From Depth of: To: To: Hollow Stem Auger: 0.0 14.0

Water Level Readings

Depth of Casing Depth of Water Time Depth of Hole Elev. of Water Date 7/17/2009 16.0 14.0 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 16.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dave Burt

Helpers: J. Laffertty

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	7/17/09	1	0.5' 2.0'	6 6 8	Moist stiff brown clayey silt w/trace of fine to coarse sand and gravel. 13" RECOVERY	A-4(7)	Topsoil - 5".
		2	2.0'	5 7	Moist very stiff brown clayey silt w/some fine to coarse sand, trace of	A-4(4)	
3		2A	3.0' 3.0' 4.0' 4.0'	18 10	gravel. 10" RECOVERY Moist medium dense brown coarse to fine sand w/some gravel and silt. 12" RECOVERY	A-1-b A-1-b	
6		0	6.0'	7 8 7 9	Moist medium dense brown coarse to fine sand and gravel w/some silt. 18" RECOVERY	A-1-0	
		4	6.0'	6 7 5 6	Moist medium dense brown fine to coarse sand w/some silt, trace of gravel and clay.	A-2-4(0)	USDA Classifica - Sand
9		5	8.0' 8.0'	5 7 10 7	18" RECOVERY Moist medium dense brownish orange silty coarse to fine sand w/trace of gravel.	A-2-4(0)	
		6	10.0' 10.0'	6	15" RECOVERY	1.0.1(0)	
		ь	10.0	6 6 5 6	Wet medium dense brownish orange silty coarse to fine sand w/trace of gravel.	A-2-4(0)	
12			12.0'		18" RECOVERY		
		7	12.0'	5 3 4 4	Wet loose orangish brown silty fine to coarse sand w/trace of gravel. 15" RECOVERY	A-2-4(0)	
		8	14.0'	3	Wet loose orangish brown silty fine to coarse sand w/trace of gravel.	A-2-4(0)	
15				3 4 5 6		112 (0)	
			16.0'		20" RECOVERY		
					End of Boring		

Remarks:

Symbol Description

Strata symbols

//// T.

Low plasticity clay

Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 7/17/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a ATV CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 Boring No.: IT1-45

Contract: 28-113-01

Boring Location: Sta. 663+00, 105.00' Lt. C.L.

Boring Surface Elev.: + 50.5 Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: IN. IN. Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Depth of Casing Depth of Water Time Depth of Hole Elev. of Water Date 7/17/2009 Dry

16.0 14.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 16.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dave Burt

Helpers: J. Lafferty

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
	7/17/09	1	0.5' 2.0'	11 12 12	112211122111	Moist very stiff brown clayey silt w/trace of fine to coarse sand and gravel. 13" RECOVERY	A-4(5)	Topsoil - 5".
		2	2.0'	8 8 9	//// N	Moist very stiff orange fine sandy clay w/trace of coarse sand and gravel.	A-6(8)	
3		3	4.0'	6 10 16 10	N	17' RECOVERY Moist medium dense brown coarse to fine sand w/some gravel and silt.	A-1-b	
6			6.0'			18" RECOVERY		
		4	6.0'	5 7 8 15		Moist medium dense orange fine to coarse sand w/some silt and gravel, trace of clay.	A-2-4(0)	USDA Classifica - Sand
			8.0'			16" RECOVERY		
9		5	8.0'	3 5 5 5	7	Wet loose brownish orange silty fine to coarse sand w/trace of gravel.	A-2-4(0)	
			10.0'			19" RECOVERY		
		6	10.0'	4 5 4 5	,	Wet loose brown fine to coarse sand w/some silt, trace of gravel.	A-2-4(0)	
12			12.0'			19" RECOVERY		
		7	12.0'	4 6 7 8	,	Wet medium dense brown fine to coarse sand w/some silt, trace of gravel.	A-2-4(0)	
		8	14.0' 14.0'	8		23" RECOVERY	1 2 1(0)	
15		ð	14.0	8 10 8 10		Wet medium dense brownish orange fine to coarse sand w/some silt, trace of gravel.	A-2-4(0)	
			16.0'			22" RECOVERY		
					E	End of Boring		

Remarks:

Symbol Description

Strata symbols



Silty low plasticity clay



Low plasticity clay



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 7/17/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a ATV CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 Boring No.: IT1-46

Contract: 28-113-01

Boring Location: Sta. 673+00, 98.00' Rt. C.L.

Boring Surface Elev.: + 61.6 Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Depth of Casing Depth of Water Time **Depth of Hole** Elev. of Water Date 7/21/2009 16.0 14.0 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 16.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Bill Holden

Helpers: D. Zmijewski

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
	7/21/09	1	1.0'	7 7		Moist stiff orange clayey silt w/trace of gravel and fine to coarse sand.	A-4(7)	Cultivated
	1 '		2.0'			12" RECOVERY		Soil -
	'	2	2.0'	8 9 12 14		Moist very stiff orange gravelly clay w/some coarse sand, trace of fine	A-6(3)	12".
3	1 '	'		12 14		sand.		
			4.0'			16° RECOVERY		
	1 '	3	4.0'	3 5 9		Moist medium dense orange clayey gravel and coarse sand w/trace of fine	A-2-6(1)	
	"	🔻 '				sand.	= -(.,	
	'	'						
6] '		6.0'			16" RECOVERY		
	'	4	6.0'	8 11		Moist medium dense orange clayey gravel w/some coarse sand, trace of	A-2-6(0)	
	!	'		14 20		fine sand.		
	'	'						
 	1	5	8.0' 8.0'	9		12" RECOVERY	A-1-b	
9	'		0.0	9 9 8		MOist medium dense orange coarse to fine sand and gravel w/some silt.	A-1-0	
9	1 '	'		9				
	'	'	10.0'			17" RECOVERY		
	'	6	10.0'	10 4		Moist loose orange silty fine sand w/some coarse sand, trace of gravel.	A-2-4(0)	
 	'	'		4 4		, ,		
	'	'		'				
12] '	<u> </u>	12.0'			24" RECOVERY		
	'	7	12.0'	5 6 9 10		Moist medium dense orange coarse to fine sand and gravel w/some silt.	A-1-b	
	! '	'		9 10				
	'	'						
	!	8	14.0' 14.0'	9		20" RECOVERY	A 1 1	
	'	$ $ $ $	14.0	9 7 6		Moist medium dense orange coarse to fine snad w/some gravel, trace of silt.	A-1-b	
15	1 '	'		7		SIII.		
	'	'	16.0'		000 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	22" RECOVERY		
	 	$\vdash \vdash$	10.0	+	eli i i i e e L	End of Boring		
	'	'				End of Boring		
	'	'						

Remarks:

Symbol Description

Strata symbols

Silt

Clayey sand



Silty sand



Poorly graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 7/21/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a Track CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 Boring No.: IT1-47

Contract: 28-113-01

Boring Location: Sta. 678+00, 110.00' Lt. C.L.

Boring Surface Elev.: + 62.7 Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Depth of Water Depth of Casing Time **Depth of Hole** Elev. of Water Date 7/7/2009 16.0 14.0 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 16.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Bill Holden

Helpers: T. Kane

	ı		_			Ī	_
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
(,	7/6/09	1	0.5'	4 4 7	Moist stiff brown clay w/trace of fine to coarse sand and gravel.	A-6(12)	Topsoil - 7".
			2.0'		12" RECOVERY		
		2	2.0'	8 9	Moist very stiff brown clayey silt w/trace of fine to coarse sand.	A-4(8)	
3		V	4.0'	10	FOR PIGERECOVERY		
	•	3	4.0'	7 6 7 6	Moist stiff brown clay w/some fine to coarse sand, trace of gravel.	A-6(7)	
6	ļ	4	6.0'	9	18" RECOVERY		
		4	6.0'	9 8 6 8	Moist stiff brown clay w/some fine to coarse sand and gravel.	A-6(8)	
			8.0'		17" RECOVERY		
9		5	8.0'	6 5 6 12	Moist medium dense brown silty coarse sand w/some fine sand, trace of gravel.	A-1-b	
			10.0'	7	19" RECOVERY		
		6	10.0'	7 10 9 9	Moist medium dense brown coarse to fine sand w/some gravel and silt.	A-1-b	
12			12.0'		21" RECOVERY		
12		7	12.0'	8 10 9 10	Moist medium dense brown fine to coarse sand w/some silt, trace of gravel.	A-2-4(0)	
			14.0'		18" RECOVERY		
15		8	14.0'	8 9 9 7	Moist medium dense brown fine to coarse sand w/some gravel and silt.	A-2-4(0)	
			16.0'		10" RECOVERY		
			10.0		End of Boring		
					2.10 01 2 01.11g		

Remarks:

Symbol Description

Chasha grabala

Strata symbols

Low plasticity clay



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 7/6/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a Truck CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 Boring No.: IT1-48

Contract: 28-113-01

Boring Location: Sta. 683+00, 91.00' Rt. C.L.

Boring Surface Elev.: + 44.7 Reference:

IN. IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Depth of Casing Depth of Water Time Depth of Hole Elev. of Water Date 7/6/2009 16.0 14.0 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 16.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Bill Holden

Helpers: T. Kane

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
	7/6/09	1	0.5' 2.0'	10 14 17		Moist medium dense gravel w/some fine to coarse sand and silt. 14" RECOVERY	A-1-b	Cultivated Soil - 6".
		2	2.0'	6 9		Moist medium dense orange fine to coarse sand w/some silt, trace of	A-2-4(0)	
3			4.0'	7 12		gravel. 16" RECOVERY		
	_	3	6.0'	6 5 7 6		Moist medium dense orange silty coarse to fine sand w/trace of gravel. 18" RECOVERY	A-2-4(0)	
6		4	6.0'	6		Moist medium dense orange fine to coarse sand w/some silt, trace of	A-2-4(0)	
				66555		gravel.	112 1(0)	
		5	8.0'	6		14" RECOVERY		1105 1
9		5	8.0'	6 6 7 5		Moist medium dense orange coarse sand w/some fine sand, trace of silt, gravel and clay.	A-1-b	USDA Classificate - Sand
		6	10.0' 10.0'	7		16" RECOVERY	A-1-b	
		Ü	10.0	7 8 10 9		Moist medium dense orange coarse sand w/some fine sand and silt, trace of gravel.	A-1-0	
12			12.0'		# 1111 F E	15" RECOVERY		
		7	12.0'	9 10 14 10		Moist medium dense brown coarse sand and gravel w/some fine sand, trace of silt.	A-1-b	
			14.0'		(0.03 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	14" RECOVERY		
15		8	14.0'	15 19 21 17	100 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	No Sample Recovery		Gravel blocking spoon.
			16.0'		115 13.1361. 1261 13.264 1661 13.666	0" RECOVERY		
						End of Boring		

Remarks:

Symbol Description

Strata symbols



Silty sand



Poorly graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 7/6/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a Truck CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 Boring No.: IT1-49

Contract: 28-113-01

Boring Location: Sta. 688+00, 91.00' Lt. C.L.

Boring Surface Elev.: + 33.9 Reference:

Wt. of Casing Hammer: Average Fall: IN. Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: IN. IN. Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D. **Casing Size:**

From Depth of: From Depth of: To: To: 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Depth of Casing Depth of Water Time Depth of Hole Elev. of Water Date 7.8

7/6/2009 16.0 14.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 16.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Bill Holden

Helpers: T. Kane

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
	7/6/09	1	0.5' 2.0'	5 4 4	Moist loose br	own coarse sand w/some clay, gravel and fine sand. 12" RECOVERY	A-2-4(0)	Topsoil - 4".
		2	2.0'	6	·γ.,	own clayey coarse sandy silt w/some gravel, trace of fine	A-4(1)	
3		3	4.0'	6 6	sand.	15" RECOVERY own clayey coarse sand w/some gravel and fine sand.	A-2-4(0)	
6		J	6.0'	4 4 7	Worst loose bi	18" RECOVERY	A-2-4(0)	
		4	6.0'	16 19 22 14	Moist dense b	rown coarse sand w/some fine sand and silt, trace of gravel.	A-1-b	
			8.0'		iec 186 189	16" RECOVERY		
9		5	8.0'	11 9 12 14	Wet medium of	dense brown silty coarse sand and gravel w/some fine sand.	A-1-b	
			10.0'			14" RECOVERY		
		6	10.0'	12 11 14 9	Wet medium of silt.	dense brown coarse sand and gravel w/some fine sand and	A-1-b	
12			12.0'		1661 1661 1661	19" RECOVERY		
		7	12.0'	6 6 3 4	Wet loose bro	wn fine to coarse sand w/trace of silt and gravel. 15" RECOVERY	A-3	
15		8	14.0'	6 5 14 12	Wet medium o	dense brown fine to coarse sand w/some gravel, trace of silt.	A-3	
			16.0'		End of Boring	14" RECOVERY		
					End of Boring			

Remarks:

Symbol Description

Strata symbols

Poorly graded clayey silty sand



Clayey sand



Poorly graded sand with silt



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 7/6/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a Track CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 Boring No.: IT1-50

Contract: 28-113-01

Boring Location: Sta. 693+00, 88.00' Rt. C.L.

Boring Surface Elev.: + 40.1 Reference:

IN. IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches **Hollow Stem Auger:** 0.0

Water Level Readings

Depth of Casing Depth of Water Time Depth of Hole Elev. of Water Date 7/6/2009 14.0 16.0 14.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 16.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Bill Holden

Helpers: T. Kane

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	7/6/09	1	0.5' 2.0'	4 3 2	Moist firm brown clayey coarse sandy silt w/trace of fine sand. 15" RECOVERY	A-4(4)	Cultivated Soil - 6"
		2	2.0'	4 5	Moist stiff brown coarse to fine sandy silt w/trace of gravel.	A-4(0)	
3			4.0'	5 5	14' RECOVERY		
	ľ	3	4.0'	7 5 5 3	Moist stiff brown fine sandy silt w/some coarse sand, trace of gravel.	A-4(0)	
6		4	6.0' 6.0'	8	16" RECOVERY Moist medium dense brown coarse sand and gravel w/some fine sand,	A-1-b	
		·	0.0	8 12 13 9	trace of silt.	A-1-0	
			8.0'		18" RECOVERY		
9		5	8.0'	15 11 10 13	Moist medium dense brown coarse sand w/some fine sand and clay, trace of silt.	A-1-b	USDA classificat - Loamy
			10.0'		5" RECOVERY		Sand
		6	10.0'	16 13 10 10	Moist medium dense brown coarse sand w/some gravel, silt and fine sand.	A-1-b	
12			12.0'		20" RECOVERY		
		7	12.0'	9 9 7 8	Moist medium dense brown coarse sand w/some fine sand, trace of silt and gravel.	A-1-b	
			14.0'		15" RECOVERY		
15		8	14.0'	6 6 6 6	Wet medium dense brown coarse to fine sand w/trace of silt and gravel.	A-1-b	
			16.0'		17" RECOVERY		
					End of Boring		

Remarks:

Symbol Description

Strata symbols



Low plasticity clay



Silty sand



Well graded sand with silt



Poorly graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 7/6/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a Track CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

Boring No.: IT1-51 F.A. Project: U.S. 301 Maryland State Line to S.R. 1

Contract: 28-113-01

Boring Location: Sta. 698+00, 110.00' Lt. C.L.

Boring Surface Elev.: + 36.9 Reference:

Wt. of Casing Hammer: Average Fall: IN. Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: IN. IN. Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Depth of Casing Depth of Water Time Depth of Hole Elev. of Water Date 7/6/2009 11.5 16.0 14.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 16.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Bill Holden

Helpers: T. Kane

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	7/6/09	1	0.5' 2.0'	3 4 3	Moist firm brown clayey silt w/some fine to coarse sand, 13" RECOVERY	trace of gravel. A-4(2)	Cultivated Soil - 4".
		2	2.0'	3 5	Moist stiff brown fine sandy silt w/some clay, coarse san	d and gravel. A-4(0)	
3		3	4.0'	7 9 9	16' RECOVERY Moist medium dense brown fine sand w/some silt, coarse	e sand and gravel. A-2-4(0)	
6		4	6.0'	11	16" RECOVERY	5	Hab 4
		4	6.0' 8.0'	11 14 17 19	Moist dense brown fine to coarse sand w/some clay and s gravel. 21" RECOVERY	silt, trace of A-2-4(0)	USDA Classificat - Sandy Loam
9		5	8.0'	20 14 10 11	Moist medium dense brown gravel and fine sand w/some sand.	silt and coarse A-1-b	Loam
			10.0'		15" RECOVERY		
		6	10.0'	12 11 10 5	Wet medium dense brown coarse to fine sand w/some gr	avel, trace of silt. A-1-b	
12			12.0'		14" RECOVERY		
		7	12.0'	10 6 5 4	Wet medium dense tan fine to coarse sand w/trace of silt	and gravel. A-3	
		8	14.0'	3	Wet loose tan coarse to fine sand w/trace of silt and grave	el. A-1-b	
15				3 4 6 6			
			16.0'		17" RECOVERY		+
					End of Boring		

Remarks:

Symbol Description

Strata symbols



Silty low plasticity clay



Poorly graded clayey silty sand



Silty sand



Well graded sand with silt



Poorly graded sand with silt



Poorly graded sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 7/6/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a Track CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 Boring No.: IT1-52

Contract: 28-113-01

Boring Location: Sta. 703+00, 53.00' Rt. C.L.

Boring Surface Elev.: + 47.0 Reference:

IN. IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Depth of Water Depth of Casing Time **Depth of Hole** Elev. of Water Date 7/6/2009 Dry 16.0 14.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 16.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Bill Holden

Helpers: T. Kane

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	7/6/09	1	0.5' 2.0'	3 3 3	Moist firm brown clay w/some fine to coarse sand, trace of gravel. 10" RECOVERY	A-6(4)	Cultivated Soil - 7".
		2	2.0'	2 2	Moist soft brown coarse to fine sandy silt w/trace of gravel.	A-4(0)	
3			4.0'	2 2	E D D 15" RECOVERY		
	•	3	4.0	7 6 7 6	Moist medium dense brown silty fine to coarse sand w/trace of gravel.	A-2-4(0)	
6		4	6.0' 6.0'	5	13" RECOVERY Moist medium dense brown fine to coarse sand w/some silt, trace of clay	A-2-4(0)	USDA
		·	0.0	5 6 7 6	and gravel.	A-2-4(0)	Classifica - Loamy
			8.0'		16" RECOVERY		Sand
9		5	8.0'	8 7 6 7	Moist medium dense brown coarse sand w/some fine sand and silt.	A-1-b	
			10.0'		15" RECOVERY		
		6	10.0'	8 8 7 9	Moist medium dense brown coarse sand w/trace of silt, fine sand and gravel.	A-1-b	
12			12.0'		20" RECOVERY		
12		7	12.0'	5 4 4 7	Moist loose brown coarse sand w/trace of fine sand, gravel and silt.	A-1-b	
			14.0'		16" RECOVERY		
15		8	14.0'	9 13 20 29	Moist dense brown gravel and coarse sand w/trace of fine sand and silt.	A-1-b	
			16.0'		HEREIGE HEREIGE HEREIGE HEREIGE HEREIGE HEREIGE 14" RECOVERY		
			10.0		End of Boring		

Remarks:

Symbol Description

Strata symbols

Low plasticity clay



Silty sand



Poorly graded sand with silt



Well graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 7/6/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a Track CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

Boring No.: IT1-58 F.A. Project: U.S. 301 Maryland State Line to S.R. 1

Contract: 25-113-01

Boring Location: Sta.110+09, Lt. C.L.

Boring Surface Elev.: Reference:

Wt. of Casing Hammer: Wt. of Sample Hammer: IN. IN. IN. Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Lbs. D-Sampler: S-Sampler: U-Sampler: Core Bit: Type of: O.D. IN. IN. O.D. O.D.

From Depth of: From Depth of: To: To: **Casing Size:** Inches **Hollow Stem Auger:**

Water Level Readings

Elev. of Water Time Depth of Hole **Depth of Casing Depth of Water** Date

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:**

Helpers:

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
()	9/30/09	1	0.0'		No Sample Taken		Hand Auger - Topsoil
			1.0'		0" RECOVERY		
1.5		2	2.0'	T	Wet brown clay w/trace of fine to coarse sand. 12" RECOVERY	A-6(11)	Hand Auger
3		3	3.0'		Wet greenish brown clay w/trace of coarse to fine sand and gravel. 12" RECOVERY	A-6(8)	Hand Auger
		4	3.0'		Wet brownish gray clay w/some fine to coarse sand, trace of gravel. 12" RECOVERY	A-6(8)	Hand Auger
4.5		5	4.0' 5.0'		Wet brownish gray clay w/some gravel and fine sand, trace of coarse sand. 12" RECOVERY	A-6(12)	Hand Auger
		6	5.0'		Wet brownish gray silty clay w/some gravel and fine sand, trace of coarse sand.	A-6(10)	Hand Auger USDA Classifica
6		7	6.0' 6.0'		12" RECOVERY Wet brownish gray clayey gravel w/some fine to coarse sand.	A-2-6(2)	- Clay Loam
			7.0'		12" RECOVERY		Hand Auger
					End of Boring		
7.5							

Remarks:

Symbol Description

Strata symbols

Low plasticity clay



Clayey sand

DRAFT NOT FOR BIDDING **AUGUST 2015**

- 1. Exploratory borings were drilled on 9/30/2009 using a hand auger.
- 2. Surveyed boring location and elevation was provided by Century Engineering.
- 3. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 4. Results of tests conducted on samples recovered are reported on the logs.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 Boring No.: IT1-59

Contract: 25-113-01

Boring Location: Sta. 717+96, Lt. C.L.

Boring Surface Elev.: Reference:

Wt. of Casing Hammer: Wt. of Sample Hammer: IN. IN. IN. Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Lbs. D-Sampler: S-Sampler: U-Sampler: Core Bit: Type of: O.D. IN. IN. O.D. O.D.

From Depth of: From Depth of: To: To: **Casing Size:** Inches **Hollow Stem Auger:**

Water Level Readings

Elev. of Water Time Depth of Hole **Depth of Casing Depth of Water** Date

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:**

Helpers:

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
1.5		1	2.0'		Wet gray silt w/some fine sand and clay, trace of coarse sand.	A-4(2)	Hand Auger
3		2	3.0'	T	12" RECOVERY Wet gray clayey silt w/some fine sand, trace of coarse sand. 12" RECOVERY	A-4(2)	Hand Auger
		3	3.0' 4.0'		Wet brown silty fine to coarse sand w/some gravel. 12" RECOVERY	A-2-4(0)	Hand Auger
4.5		4	4.0 5.0'		Wet orange coarse to fine sand w/some silt, trace of gravel. 12" RECOVERY	A-1-b	Hand Auger
6		5	5.0' 6.0'		Wet orange silt w/some fine sand, trace of coarse sand. 12" RECOVERY	A-4(0)	Hand Auger USDA CLassific
		6	6.0' 7.0'		Wet orange coarse to fine sand w/some silt. 12" RECOVERY	A-2-4(0)	- Sandy Loam Hand Auger
7.5		7	7.0' 8.0'		Wet orange coarse sand w/some fine sand and silt, trace of gravel.	A-1-b	Hand Auger
9					End of Boring		

Remarks:

Symbol Description

Strata symbols



Silty low plasticity clay



Silty sand



silt



Poorly graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 9/29/2009 using a hand auger.
- 2. Surveyed boring location and elevation was provided by Century Engineering.
- 3. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 4. Results of tests conducted on samples recovered are reported on the logs.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

Boring No.: IT1-60 F.A. Project: U.S. 301 Maryland State Line to S.R. 1

Contract: 25-113-01

Boring Location: Sta. 719+55, Rt C.L.

Boring Surface Elev.: Reference:

Wt. of Casing Hammer: Wt. of Sample Hammer: IN. IN. IN. Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Lbs. D-Sampler: S-Sampler: U-Sampler: Core Bit: Type of: O.D. IN. IN. O.D. O.D.

From Depth of: From Depth of: To: To: **Casing Size:** Inches **Hollow Stem Auger:**

Water Level Readings

Elev. of Water Time Depth of Hole **Depth of Casing Depth of Water** Date

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:**

Helpers:

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	9/29/09	1	0.0'		No Sample Taken		Hand Auger Topsoil -
			1.0'		0" RECOVERY		6".
1.5		2	2.0'		Moist gray gravel and coarse sand w/some fine sand and silt. 12" RECOVERY	A-1-b	Hand Auger
3		3	3.0'	41	Wet gray clay w/some fine sand, trace of coarse sand. 12" RECOVERY	A-6(12)	Hand Auger
		4	4.0'		Wet gray clayey fine sandy silt w/trace of coarse sand. 12" RECOVERY	A-4(0)	Hand Auger
4.5		5	4.0' 5.0'		Wet gray silty fine sand w/trace of coarse sand. 12" RECOVERY	A-2-4(0)	Hand Auger USDA Classifica
6		6	5.0' 6.0'		Wet gray silty fine sand w/trace of coarse sand. 12" RECOVERY	A-2-4(0)	- Loamy Sand. Hand Auger
<u> </u>		7	6.0'		Wet gray silty fine sand w/some coarse sand.	A-2-4(0)	Hand Auger
			7.0'		End of Boring		
7.5					End of Boring		

Remarks:

Symbol Description

Strata symbols



Silty sand



Low plasticity clay



Silty low plasticity clay

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 9/29/2009 using a hand auger.
- 2. Surveyed boring location and elevation was provided by Century Engineering.
- 3. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 4. Results of tests conducted on samples recovered are reported on the logs.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

Boring No.: IT1-61 F.A. Project: U.S. 301 Maryland State Line to S.R. 1

Contract: 25-113-01

Boring Location: 730+20, Lt. C.L.

Boring Surface Elev.: Reference:

Wt. of Casing Hammer: Wt. of Sample Hammer: IN. IN. IN. Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Lbs. D-Sampler: S-Sampler: U-Sampler: Core Bit: Type of: O.D. IN. IN. O.D. O.D.

From Depth of: From Depth of: To: To: **Casing Size:** Inches **Hollow Stem Auger:**

Water Level Readings

Elev. of Water Time Depth of Hole **Depth of Casing Depth of Water** Date

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:**

Helpers:

Depth	Daily		Sample				
(ft.)	Progress	No.	Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	9/25/09	1	0.5'		Moist brown clayey silt w/trace of fine sand.	A-4(10)	Hand
							Auger
		2	1.0'		Moist gray clayey silt w/trace of fine to coarse sand.	A-4(8)	Topsoil -
1.5			1.5'		6" RECOVERY		6".
							Hand
		3	2.0'		12" RECOVERY Moist orange fine sandy silt w/some coarse sand and clay.	A-4(0)	Auger Hand
			2.0		Worst orange tine sandy shi w/some coarse sand and cray.	A-4(0)	Auger
							Augei
3			3.0'		12" RECOVERY		
		4	3.0'		Wet orange clayey silt w/some fine sand, trace of coarse sand.	A-4(3)	Hand
			<i> </i>	\dashv			Auger
		_	4.0'		12" RECOVERY		
		5	4.0'		Wet orange clayey fine to coarse sand.	A-2-4(0)	Hand
4.5							Auger USDA
			5.0'		12" RECOVERY		CLassifica
		6	5.0'		Wet orange clayey gravel w/some fine to coarse sand.	A-2-4(0)	- Sandy
					The stange clayey graver wisome time to coarse said.	11 2-7(0)	Loam.
							Hand
6			6.0'		12" RECOVERY		Auger
		7	6.0'		Saturated green fine sandy clay w/some gravel, trace of coarse sand.	A-7-6(8)	Hand
							Auger
			7.0'		12" RECOVERY		
7.5					End of Boring		
7.5							
						1	

Remarks:

Symbol Description

Strata symbols

Low plasticity clay



Silty low plasticity clay



Poorly graded clayey silty sand



Clayey sand



Silt

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 9/25/2009 using a hand auger.
- 2. Surveyed boring location and elevation was provided by Century Engineering.
- 3. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 4. Results of tests conducted on samples recovered are reported on the logs.

Boring No.: IT1-62 F.A. Project: U.S. 301 Maryland State Line to S.R. 1

Contract: 25-113-01

Boring Location: Sta. 728+728+84, Rt. C.L.

Boring Surface Elev.: Reference:

Wt. of Casing Hammer: Wt. of Sample Hammer: IN. IN. IN. Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Lbs. D-Sampler: S-Sampler: U-Sampler: Core Bit: Type of: O.D. IN. IN. O.D. O.D.

From Depth of: From Depth of: To: To: **Casing Size:** Inches **Hollow Stem Auger:**

Water Level Readings

Elev. of Water Time Depth of Hole **Depth of Casing Depth of Water** Date

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:**

Helpers:

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	9/25/09		0.0'		No Sample Taken		Hand Auger Topsoil - 6".
		1_	1.0'		0" RECOVERY	A 4(C)	Hand
1.5			2.0'		Wet brown clayey silt w/trace of fine to coarse sand. 12" RECOVERY	A-4(6)	Auger
		2	2.0'		Wet gray clayey silt w/trace of fine to coarse sand.	A-4(8)	Hand
3			3.0'		12" RECOVERY		Auger
		3	3.0'		Wet gray clayey silt w/trace of fine to coarse sand.	A-4(7)	Hand
			4.0'		12" RECOVERY		Auger
		4	4.0'		Wet orange clayey silt w/some fine sand, trace of coarse sand.	A-4(4)	Hand
4.5							Auger
		5	5.0' 5.0'		12" RECOVERY	1 (0)	** 1
		5			Wet orange clayey fine sandy silt w/some coarse sand.	A-4(2)	Hand Auger USDA
6		6	6.0' 6.0'		12" RECOVERY	A 2 4(0)	Classificat
		U	0.0		Wet green silty fine sand w/some coarse sand, trace of gravel.	A-2-4(0)	- Loam. Hand
							Auger
			7.0'		12" RECOVERY		10501
		7	7.0'		Wet green silty fine to coarse sand w/some gravel.	A-2-4(0)	
7.5							
			8.0'		12" RECOVERY		
					End of Boring		

Remarks:

Symbol Description

Strata symbols

Silty low plasticity clay



Low plasticity clay



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 9/29/2009 using a hand auger.
- 2. Surveyed boring location and elevation was provided by Century Engineering.
- 3. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 4. Results of tests conducted on samples recovered are reported on the logs.

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 Boring No.: IT1-64

Contract: 25-113-01

Boring Location: Sta. 731+03, Rt. C.L.

Boring Surface Elev.: Reference:

Wt. of Casing Hammer: Wt. of Sample Hammer: IN. IN. IN. Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Lbs. D-Sampler: S-Sampler: U-Sampler: Core Bit: Type of: O.D. IN. IN. O.D. O.D.

From Depth of: From Depth of: To: To: **Casing Size:** Inches **Hollow Stem Auger:**

Water Level Readings

Elev. of Water Time Depth of Hole **Depth of Casing Depth of Water** Date

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:**

Helpers:

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	9/29/09	1	0.0'		No Sample Taken		Hand Auger
	'		1.0'	<u> </u> '	0" RECOVERY		
1.5		2	2.0'	T	Wet brown clay w/trace of fine to coarse sand and gravel. 12" RECOVERY	A-6(9)	Hand Auger
3		3	3.0'	4	Wet brown clay w/some fine sand, trace of coarse sand and gravel. 12" RECOVERY	A-6(8)	Hand Auger
		4	3.0'		Wet brownish green clayey fine sandy silt w/some coarse sand and gravel.	A-4(1)	Hand Auger
	'	5	4.0' 4.0'	 	12" RECOVERY Wet brownish green silty fine sand w/some coarse sand and gravel.	A-2-4(0)	Hand
4.5			5.0'		wet brownish green siity fine sand w/some coarse sand and graver. 12" RECOVERY	A-2-4(0)	Auger USDA Classifica
		6	5.0'		Wet brown clayey silt w/trace of fine to coarse sand and gravel.	A-4(9)	- Sandy Loam. Hand
6	1 '		6.0'	'	12" RECOVERY		Auger
					End of Boring		
7.5							

Remarks:

Symbol Description

Strata symbols

Low plasticity clay



Clayey sand



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 9/29/2009 using a hand auger.
- 2. Surveyed boring location and elevation was provided by Century Engineering.
- 3. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 4. Results of tests conducted on samples recovered are reported on the logs.

F.A. Project: U.S. 301 Maryland State Line to S.R. 1

Boring No.: IT1-65

Contract: 25-113-01

Boring Location: Sta. 738+71, Lt. C.L.

Boring Surface Elev.: Reference:

 Wt. of Casing Hammer:
 Lbs.
 Average Fall:
 IN.

 Wt. of Sample Hammer:
 Lbs.
 Average Fall:
 IN.

 Type of:
 D-Sampler:
 O.D.
 O.D. of Sampler:
 IN.

 S-Sampler:
 O.D.
 O.D. of Samp. Tube:
 IN.

 U-Sampler:
 O.D.
 O.D. of Samp. Tube:
 IN.

 Core Bit:
 O.D.
 O.D. of Rock Core:
 IN.

Casing Size: Inches From Depth of: To: Hollow Stem Auger: From Depth of: To: To:

Water Level Readings

Date Time Depth of Hole Depth of Casing Depth of Water Elev. of Water

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: Ft.; Dia. U-Sample Boring: Ft. No. of 2 in. Dia. Shelby Tubes: ; No. of: U-Samples: 2 1/2 in. Dia. Contin. Sample Boring: Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:**

Driller: Helpers:

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	9/22/09	1	0.0'		No Sample Taken		Hand Auger
			1.0'		12" RECOVERY		
1.5		2	2.0'		Wet brown silt w/some fine sand and clay, trace of coarse sand. 12" RECOVERY	A-4(3)	Hand Auger
		3	2.0'		Wet brown fine to coarse sand w/some silt.	A-2-4(0)	Hand
3			3.0'	11	12" RECOVERY		Auger
		4	3.0		Wet brown coarse to fine sand w/some silt.	A-2-4(0)	Hand Auger
-			4.0'		12" RECOVERY		
4.5		5	4.0'		Wet brown fine sandy silt w/some coarse sand and clay.	A-4(0)	Hand Auger USDA Classifica
		_	5.0' 5.0'		12" RECOVERY		
		6	5.0		Wet brown clayey silt w/some fine sand, trace of coarse sand.	A-4(6)	- Loam. Hand Auger
6			6.0'		12" RECOVERY		
					End of Boring		
7.5							
	1			1		1	1

Remarks:

Reviewed By:	Soils Supervisor:	

Symbol Description

Strata symbols

Silty low plasticity clay



Silty sand



Low plasticity clay

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 9/22/2009 using a hand auger.
- 2. Surveyed boring location and elevation was provided by Century Engineering.
- 3. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 4. Results of tests conducted on samples recovered are reported on the logs.

Boring No.: IT1-66 F.A. Project: U.S. 301 Maryland State Line to S.R. 1

Contract: 25-113-01

Boring Location: Sta. 739+70, Lt. C.L.

Boring Surface Elev.: Reference:

Wt. of Casing Hammer: Wt. of Sample Hammer: IN. IN. IN. Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Lbs. D-Sampler: S-Sampler: U-Sampler: Core Bit: Type of: O.D. IN. IN. O.D. O.D.

From Depth of: From Depth of: To: To: **Casing Size:** Inches **Hollow Stem Auger:**

Water Level Readings

Elev. of Water Time Depth of Hole **Depth of Casing Depth of Water** Date

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:**

Helpers:

					_		
Depth	Daily	No.	Sample	Blows/6"	Sample Description	Class./G.I.	Remarks
(ft.)	Progress		Depth	, 5			
	9/22/09	1	1.0'		Wet brown silt w/some fine sand and clay, trace of coarse sand.	A-4(1)	Hand
1.5							Auger
							Topsoil -
			2.0'		12" RECOVERY		6".
		2	2.0		Wet brown clay w/some fine sand, trace of coarse sand and gravel.	A-6(8)	Hand
					///-()H/ H		Auger
		V					
3		3	3.0' 3.0'		12" RECOVERY	A 4/0)	TT 1
			3.0		Wet gray clayey silt w/trace of fine to coarse sand and gravel.	A-4(8)	Hand
							Auger
			4.01		TOTAL PROCESSION AND A STATE OF THE		
	1	4	4.0' 4.0'	7-	12" RECOVERY Wet gray fine sandy silt w/some coarse sand.	A-4(0)	Hand
4.5			7.02		wet gray time sailedy stit w/solfie coarse saile.	A-4(0)	Auger
4.5	1						Augei
			5.0'		12" RECOVERY		
<u> </u>		5	5.0'		Wet gray fine sandy silt w/some coarse sand and clay, trace of gravel.	A-4(0)	Hand
					in the gray the saidy sit wisome coarse said and eray, trace of graver.	71- 1 (U)	Auger
							USDA
6			6.0'		12" RECOVERY		Classifica
	1	6	6.0'		Wet gray fine sandy silt w/some coarse sand and clay, trace of gravel.	A-4(0)	- Sandy
						(-)	Loam.
			7.0'		12" RECOVERY		
					End of Boring		
7.5							
	1						
9							
	i	l					

Remarks:

Symbol Description

Strata symbols



Silty low plasticity clay



Low plasticity clay



Silty sand



Poorly graded clayey silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 9/22/2009 using a hand auger.
- 2. Surveyed boring location and elevation was provided by Century Engineering.
- 3. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 4. Results of tests conducted on samples recovered are reported on the logs.

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 Boring No.: IT1-67

Contract: 25-113-01

Boring Location: Sta. 739+11, Rt. C.L.

Boring Surface Elev.: Reference:

Wt. of Casing Hammer: Wt. of Sample Hammer: IN. IN. IN. Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Lbs. D-Sampler: S-Sampler: U-Sampler: Core Bit: Type of: O.D. IN. IN. O.D. O.D.

From Depth of: From Depth of: To: To: **Casing Size:** Inches **Hollow Stem Auger:**

Water Level Readings

Elev. of Water Time Depth of Hole **Depth of Casing Depth of Water** Date

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:**

Helpers:

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
1.5		1	1.0'		Wet brown clayey silt w/trace of fine to co		Hand Auger
3		2	2.0' 2.0' 3.0'		Wet brown clay w/trace of fine to coarse s	A-6(11)	Hand Auger
		3	3.0' 4.0'	1	Wet brown clay w/some fine sand, trace of	015	Hand Auger
4.5		4	4.0 ¹ 5.0'		Wet brown clayey silt w/some fine sand, to		Hand Auger
6		5	5.0' 6.0'		Wet brown fine sandy silt w/some coarse a		Hand Auger USDA Classifica
					End of Boring		- Sandy Loam.
7.5							
9							

Remarks:

Symbol Description

Strata symbols

Silty low plasticity clay



Low plasticity clay



Poorly graded clayey silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 9/22/2009 using a hand auger.
- 2. Surveyed boring location and elevation was provided by Century Engineering.
- 3. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 4. Results of tests conducted on samples recovered are reported on the logs.

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 Boring No.: IT1-69

Contract: 25-113-01

Boring Location: Sta. 745+44, Rt. C.L.

Boring Surface Elev.: Reference:

Wt. of Casing Hammer: Wt. of Sample Hammer: IN. IN. IN. Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Lbs. D-Sampler: S-Sampler: U-Sampler: Core Bit: Type of: O.D. IN. IN. O.D. O.D.

From Depth of: From Depth of: To: To: **Casing Size:** Inches **Hollow Stem Auger:**

Water Level Readings

Elev. of Water Time Depth of Hole **Depth of Casing Depth of Water** Date

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:**

Helpers:

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
1.5	9/22/09	1	1.0'		Wet gray clayey silt w/trace of fine to coarse sand and gravel.	A-4(7)	Hand Auger Topsoil -
			2.0'		12" RECOVERY		6".
3		2	3.0'	T	Wet gray clay w/trace of fine to coarse and and gravel. 12" RECOVERY	A-6(11)	Hand Auger
		3	3.0'	1	Wet gray clayey silt w/some fine sand, trace of coarse sand. 12" RECOVERY	A-4(4)	Hand Auger
4.5		4	4.0 5.0'		Wet gray clayey fine sandy silt w/some coarse sand, trace of gravel. 12" RECOVERY	A-4(2)	Hand Auger
		5	5.0'		Wet gray silty clay w/some fine sand, trace of coarse sand.	A-6(6)	Hand Auger USDA Classifica
6		6	6.0' 6.0'		12" RECOVERY	1.6(0)	-h
		О	7.0'		Wet gray clay w/some fine sand, trace of coarse sand and gravel. 12" RECOVERY	A-6(9)	- Loam. Hand Auger
7.5		7	7.0'		Wet gray fine sandy clay w/trace of coarse sand and gravel.	A-6(10)	Hand Auger
			8.0'		12" RECOVERY		
					End of Boring		
9							

Remarks:

Symbol Description

Strata symbols

Low plasticity clay



Silty low plasticity clay

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 9/22/2009 using a hand auger.
- 2. Surveyed boring location and elevation was provided by Century Engineering.
- 3. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 4. Results of tests conducted on samples recovered are reported on the logs.

Boring No.: IT1-71 F.A. Project: U.S. 301 Maryland State Line to S.R. 1

Contract: 25-113-01

Boring Location: Sta. 750+73, Lt. C.L.

Boring Surface Elev.: Reference:

Wt. of Casing Hammer: Wt. of Sample Hammer: IN. IN. IN. Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Lbs. D-Sampler: S-Sampler: U-Sampler: Core Bit: Type of: O.D. IN. IN. O.D. O.D.

From Depth of: From Depth of: To: To: **Casing Size:** Inches **Hollow Stem Auger:**

Water Level Readings

Elev. of Water Time Depth of Hole **Depth of Casing Depth of Water** Date

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:**

Helpers:

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
1.5	9/24/09	1	2.0'		Wet brown clayey silt w/some fine sand, trace of coarse sand. 12" RECOVERY	A-4(4)	Hand Auger Topsoil - 6".
3		2	3.0	T	Wet brown silty fine sand w/some coarse sand, trace of gravel. 12" RECOVERY	A-2-4(0)	Hand Auger
		3	3.0' 4.0'	11	Wet brown clayey fine to coarse sand w/trace of gravel. 12" RECOVERY	A-2-4(0)	Hand Auger
4.5		4	4.0 ¹ /		Wet orange fine sandy silt w/trace of coarse sand and gravel. 12" RECOVERY	A-4(0)	Hand Auger
6		5	5.0' 6.0'		Wet orange silty fine sand w/some clay, trace of coarse sand. 12" RECOVERY	A-2-4(0)	Hand Auger USDA Classifica
		6	6.0' 7.0'		Wet orange gravel and coarse sand w/some fine sand, trace of silt.	A-1-a	- Sandy Loam. Hand Auger
7.5		7	7.0' 8.0'		Wet orange gravel w/some coarse to fine sand and clay. 12" RECOVERY	A-1-b	Hand Auger
9					End of Boring		

Remarks:

Symbol Description

Strata symbols

Low plasticity clay



Silty sand



Clayey sand



Well graded sand with silt



Poorly graded clayey silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 9/24/2009 using a hand auger.
- 2. Surveyed boring location and elevation was provided by Century Engineering.
- 3. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 4. Results of tests conducted on samples recovered are reported on the logs.

Boring No.: IT1-72 F.A. Project: U.S. 301 Maryland State Line to S.R. 1

Contract: 25-113-01

Boring Location: 751+30, Rt. C.L.

Boring Surface Elev.: Reference:

Wt. of Casing Hammer: Wt. of Sample Hammer: IN. IN. IN. Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Lbs. D-Sampler: S-Sampler: U-Sampler: Core Bit: Type of: O.D. IN. IN. O.D. O.D.

From Depth of: From Depth of: To: To: **Casing Size:** Inches **Hollow Stem Auger:**

Water Level Readings

Elev. of Water Time Depth of Hole **Depth of Casing Depth of Water** Date

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:**

Helpers:

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	9/23/09	1	0.0'		No Sample Taken		Hand Auger
			1.0'		12" RECOVERY		
1.5		2	2.0'		Wet brown silt w/some fine to coarse sand and clay. 12" RECOVERY	A-4(1)	Hand Auger
		3	2.0'		Wet brown clayey fine sandy silt w/some coarse sand.	A-4(2)	Hand
3			3.0'	11	C S T _{12" RECOVERY} 15		Auger
		4	3.0		Wet brown clay w/some fine sand, trace of coarse sand and gravel.	A-6(11)	Hand
			4.0'		12" RECOVERY		Auger
		5	4.0'		Wet brown fine sandy clay w/some coarse sand and silt, trace of gravel.	A-6(5)	Hand
4.5							Auger USDA
		6	5.0' 5.0'		12" RECOVERY	1.2.6(0)	Classifica
		0			Wet brownish orange clayey fine to coarse sand w/some gravel.	A-2-6(0)	Loam. Hand Auger
6		7	6.0' 6.0'		12" RECOVERY Wet brownish orange silty fine sand w/some coarse sand, trace of gravel.	A-2-4(0)	Hand
					The crowning offing the said wisome course said, trace of gravel.	112 1(0)	Auger
			7.0'		12" RECOVERY		
					End of Boring		
7.5							

Remarks:

Symbol Description

Strata symbols



Silty low plasticity clay



Low plasticity clay



Clayey sand



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 9/23/2009 using a hand auger.
- 2. Surveyed boring location and elevation was provided by Century Engineering.
- 3. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 4. Results of tests conducted on samples recovered are reported on the logs.

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 Boring No.: IT1-73

Contract: 25-113-01

Boring Location: Sta. 752+95, Rt. C.L.

Boring Surface Elev.: Reference:

Wt. of Casing Hammer: Wt. of Sample Hammer: IN. IN. IN. Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Lbs. D-Sampler: S-Sampler: U-Sampler: Core Bit: Type of: O.D. IN. IN. O.D. O.D.

From Depth of: From Depth of: To: To: **Casing Size:** Inches **Hollow Stem Auger:**

Water Level Readings

Elev. of Water Time Depth of Hole **Depth of Casing Depth of Water** Date

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:**

Helpers:

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
1.5	9/23/09	1	2.0'		Wet brown clayey silt w/trace of fine to coarse sand and gravel. 12" RECOVERY	A-4(8)	Hand Auger Topsoil - 8".
3		2	3.0'	T	Wet brown clay w/trace of fine to coarse sand. 12" RECOVERY	A-6(11)	Hand Auger
		3	3.0' 4.0'		Wet brown clay silt w/trace of fine to coarse and gravel. 12" RECOVERY	A-4(9)	Hand Auger
4.5		4	4.0 ¹ 5.0 ¹		Wet brown clayey silt w/trace of fine to coarse sand. 12" RECOVERY	A-4(5)	Hand Auger
6	-	5	5.0' 6.0'		Wet brown fine sandy silt w/some coarse sand and clay. 12" RECOVERY	A-4(0)	Hand Auger USDA CLassific
0		6	6.0' 6.0'		Wet brown silty fine to coarse sand w/trace of gravel. 12" RECOVERY	A-2-4(0)	Loam. Hand Auger
7.5	-	7	7.0'		Wet brown silty fine sand w/trace of coarse sand. 12" RECOVERY	A-2-4(0)	Hand Auger
9			0.0		End of Boring		
	′		'	'			1

Remarks:

Symbol Description

Strata symbols

Low plasticity clay

Silt

Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 9/23/2009 using a hand auger.
- 2. Surveyed boring location and elevation was provided by Century Engineering.
- 3. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 4. Results of tests conducted on samples recovered are reported on the logs.

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 Boring No.: IT1-74

Contract: 25-113-01

Boring Location: Sta. 762+00, Lt. C.L.

Boring Surface Elev.: Reference:

Wt. of Casing Hammer: Wt. of Sample Hammer: IN. IN. IN. Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Lbs. D-Sampler: S-Sampler: U-Sampler: Core Bit: Type of: O.D. IN. IN. O.D. O.D.

From Depth of: From Depth of: To: To: **Casing Size:** Inches **Hollow Stem Auger:**

Water Level Readings

Elev. of Water Time Depth of Hole **Depth of Casing Depth of Water** Date

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:**

Helpers:

						_	
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
1.5	9/24/09	1	1.0'		Moist brown clayey gravel w/some fine to coarse sand.	A-2-6(0)	Hand Auger Topsoil -
			2.0'		12" RECOVERY		6".
3		2	3.0'	T	Wet brown clayey gravelly silt w/some fine sand, trace of coarse sand. 12" RECOVERY	A-4(2)	Hand Auger
		3	3.0'	1/	Wet brown clayey fine sand w/some coarse sand, trace of gravel. 12" RECOVERY	A-2-6(0)	Hand Auger
4.5		4	4.0' 5.0'		Wet orange silty fine to coarse sand w/trace of gravel. 12" RECOVERY	A-2-4(0)	Hand Auger
		5	5.0'		Wet orange silty fine to coarse sand w/some clay, trace of gravel.	A-2-4(0)	Hand Auger USDA Classifica
6		6	6.0' 6.0' 7.0'		12" RECOVERY Wet orange fine to coarse sand w/some silt. 12" RECOVERY	A-2-4(0)	- Loamy Sand. Hand Auger
7.5		7	7.0'		Wet orange fine to coarse sand w/some silt.	A-2-4(0)	Hand Auger
			8.0'		End of Boring		
9							

Remarks:

Symbol Description

Strata symbols

Clayey sand



Silty low plasticity clay



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 9/24/2009 using a hand auger.
- 2. Surveyed boring location and elevation was provided by Century Engineering.
- 3. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 4. Results of tests conducted on samples recovered are reported on the logs.

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 Boring No.: IT1-75

Contract: 25-113-01

Boring Location: Sta. 764+53, Rt. C.L.

Boring Surface Elev.: Reference:

Wt. of Casing Hammer: Wt. of Sample Hammer: IN. IN. IN. Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Lbs. D-Sampler: S-Sampler: U-Sampler: Core Bit: Type of: O.D. IN. IN. O.D. O.D.

From Depth of: From Depth of: To: To: **Casing Size:** Inches **Hollow Stem Auger:**

Water Level Readings

Elev. of Water Time Depth of Hole **Depth of Casing Depth of Water** Date

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:**

Helpers:

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
1.5	9/23/09	1	1.0'		Wet brown clayey silt w/trace of fine to coarse sand.	A-4(4)	Hand Auger
3		2	2.0' 2.0' 3.0'	T	Wet brown clayey silt w/trace of fine to coarse sand and gravel. 12" RECOVERY	A-4(8)	Hand Auger
		3	3.0' 4.0'	14	Wet brown clay w/some fine sand, trace of coarse sand and gravel. 12" RECOVERY	A-6(8)	Hand Auger
4.5		4	4.0 ¹ 5.0'		Wet orange clayey fine to coarse and w/trace of gravel. 12" RECOVERY	A-2-4(0)	Hand Auger
6		5	5.0'		Wet orange silty fine and w/some clay, trace of coarse sand. 12" RECOVERY	A-2-4(0)	Hand Auger USDA Classifica
		6	6.0' 7.0'		Wet orange silty fine asand w/trace of coarse sand. 12" RECOVERY	A-2-4(0)	- Sandy Loam. Hand Auger
7.5					End of Boring		

Remarks:

Symbol Description

Strata symbols



Silty low plasticity clay



Low plasticity clay



Clayey sand



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 9/23/2009 using a hand auger.
- 2. Surveyed boring location and elevation was provided by Century Engineering.
- 3. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 4. Results of tests conducted on samples recovered are reported on the logs.

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 Boring No.: IT1-76

Contract: 25-113-01

Boring Location: Sta. 765+72, Lt. C.L.

Boring Surface Elev.: Reference:

Wt. of Casing Hammer: Wt. of Sample Hammer: IN. IN. IN. Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Lbs. D-Sampler: S-Sampler: U-Sampler: Core Bit: Type of: O.D. IN. IN. O.D. O.D.

From Depth of: From Depth of: To: To: **Casing Size:** Inches **Hollow Stem Auger:**

Water Level Readings

Elev. of Water Time Depth of Hole **Depth of Casing Depth of Water** Date

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:**

Helpers:

			,				
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	9/23/09	1	0.0'		No Sample Taken		Hand Auger
			1.0'		12" RECOVERY		
1.5		2	2.0'		Wet brownish gray clayey silt w/trace of fine to coarse sand. 12" RECOVERY	A-4(10)	Hand Auger
3		3	3.0'	11	Wet brownish gray clayey silt w/trace of fine sand. 12" RECOVERY	A-4(8)	Hand Auger
		4	3.0'		Wet brown clay w/trace of fine to coarse sand. 12" RECOVERY	A-6(11)	Hand Auger
4.5		5	4.0' 5.0'		Wet brown clayey coarse to fine sandy silt w/some gravel. 12" RECOVERY	A-4(0)	Hand Auger USDA Classifica
6		6	5.0' 6.0'		Wet brown silty coarse to fine sand w/some gravel. 12" RECOVERY	A-1-b	- Sandy Loam. Hand Auger
					End of Boring		
7.5							

Remarks:

Symbol Description

Strata symbols

Low plasticity clay

Silt



Poorly graded clayey silty sand



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 9/23/2009 using a hand auger.
- 2. Surveyed boring location and elevation was provided by Century Engineering.
- 3. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 4. Results of tests conducted on samples recovered are reported on the logs.

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 Boring No.: IT1-78

Contract: 25-113-01

Boring Location: Sta. 788+46, Lt. C.L.

Boring Surface Elev.: Reference:

Wt. of Casing Hammer: Wt. of Sample Hammer: IN. IN. IN. Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Lbs. D-Sampler: S-Sampler: U-Sampler: Core Bit: Type of: O.D. IN. IN. O.D. O.D.

From Depth of: From Depth of: To: To: **Casing Size:** Inches **Hollow Stem Auger:**

Water Level Readings

Elev. of Water Time Depth of Hole **Depth of Casing Depth of Water** Date

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:**

Helpers:

	-						
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
1.5	9/28/09	1	2.0'		Wet brown clay w/trace of fine to coarse and. 12" RECOVERY	A-6(10)	Hand Auger Topsoil - 6".
3		2	3.0'	T	Wet brown clay w/trace of fine to coarse sand and gravel. 12" RECOVERY	A-6(14)	Hand Auger
		3	3.0' 4.0'	14	Wet brown silty gravel and fine asand w/some coarse sand. 12" RECOVERY	A-2-4(0)	Hand Auger
4.5		4	4.0 ¹ 5.0'		Wet brown clayey fine sand and gravel w/trace of coarse sand. 12" RECOVERY	A-2-4(0)	Hand Auger
6		5	5.0'		Wet brown fine sandy silt w/some clay, trace of coarse sand. 12" RECOVERY	A-4(0)	Hand Auger USDA Classifica
7.5					End of Boring		- Sandy Loam.
9							

Remarks:

Symbol Description

Strata symbols

Low plasticity clay

Clayey sand



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 9/28/2009 using a hand auger.
- 2. Surveyed boring location and elevation was provided by Century Engineering.
- 3. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 4. Results of tests conducted on samples recovered are reported on the logs.

F.A. Project: U.S. 301 Maryland State Line to S.R. 1

Boring No.: IT1-79

Contract: 25-113-01

Boring Location: Sta. 787+00, Rt. C.L.

Boring Surface Elev.: Reference:

 Wt. of Casing Hammer:
 Lbs.
 Average Fall:
 IN.

 Wt. of Sample Hammer:
 Lbs.
 Average Fall:
 IN.

 Type of:
 D-Sampler:
 O.D.
 O.D. of Sampler:
 IN.

 S-Sampler:
 O.D.
 O.D. of Samp. Tube:
 IN.

 U-Sampler:
 O.D.
 O.D. of Samp. Tube:
 IN.

 Core Bit:
 O.D.
 O.D. of Rock Core:
 IN.

Casing Size: Inches From Depth of: To: Hollow Stem Auger: From Depth of: To: To:

Water Level Readings

Date Time Depth of Hole Depth of Casing Depth of Water Elev. of Water

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: Ft.; Dia. U-Sample Boring: Ft. No. of 2 in. Dia. Shelby Tubes: ; No. of: U-Samples: 2 1/2 in. Dia. Contin. Sample Boring: Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Driller:

Driller: Helpers:

Depth (ft.)	Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	9/28/09	1	0.0'		No Sample Taken		Hand Auger - Topsoil
	1 '		1.0'	<u> </u>	0" RECOVERY	L	<u> </u>
1.5		2	2.0'	T	Wet brown clay w/trace of fine to coarse sand. 12" RECOVERY	A-6(12)	Hand Auger
	1 '	3	2.0'	'	Wet brown clay w/trace of fine to coarse sand.	A-6(11)	Hand
3			3.0'	AL'	ST _{12" RECOVERY}		Auger
		4	3.0 ¹		Wet brown clayey silt w/trace fine to coarse and gravel. 12" RECOVERY	A-4(7)	Hand Auger
	1 '	5	4.0'	+	Wet brown clayey gravel and coarse sand w/trace of silt and fine sand.	A-2-6(0)	Hand
4.5	'				Wet blown clayey graver and coarse saild wittace of sint and time sailed.	A-2-0(0)	Auger
	1 '		5.0'		12" RECOVERY		
		6	5.0'		Wet brown gravel w/some coarse sand, trace of fine sand and silt.	A-1-a	Hand Auger
6		<u> </u>	6.0'	 '	12" RECOVERY	 	
] '				End of Boring		
	'						
7.5	1 '			'			
	1						
	1 '	1	1	1			

Remarks:

Reviewed By:	Soils Supervisor:

Symbol Description

Strata symbols



Low plasticity clay



Poorly graded gravel with clay



Well graded gravel with silt

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 9/28/2009 using a hand auger.
- 2. Surveyed boring location and elevation was provided by Century Engineering.
- 3. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 4. Results of tests conducted on samples recovered are reported on the logs.

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 Boring No.: IT1-80

Contract: 25-113-01

Boring Location: Sta. 789+04, Rt. C.L.

Boring Surface Elev.: Reference:

Wt. of Casing Hammer: Wt. of Sample Hammer: IN. IN. IN. Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Lbs. D-Sampler: S-Sampler: U-Sampler: Core Bit: Type of: O.D. IN. IN. O.D. O.D.

From Depth of: From Depth of: To: To: **Casing Size:** Inches **Hollow Stem Auger:**

Water Level Readings

Elev. of Water Time Depth of Hole **Depth of Casing Depth of Water** Date

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:**

Helpers:

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
1.5	9/28/09	1	2.0'		Wet brown clayey silt w/trace of gravel and fine to coarse sand. 12" RECOVERY	A-4(5)	Hand Auger Topsoil - 6".
3		2	3.0'	T	Wet brown clayey silt w/trace of gravel and fine to coarse sand. 12" RECOVERY	A-4(9)	Hand Auger
		3	3.0' 4.0'		Wet brown clayey silt w/trace of fine sand. 12" RECOVERY	A-4(8)	Hand Auger
4.5		4	4.0 ¹ 5.0'		Wet brown fine to coarse sandy silt w/some clay, trace of gravel. 12" RECOVERY	A-4(0)	Hand Auger
6		5	5.0' 6.0'		Wet brown coarse sand w/some silt and fine sand, trace of clay and gravel. 12" RECOVERY	A-1-b	Hand Auger USDA Classifica
					End of Boring		- Loamy Sand.
7.5							
9							

Remarks:

Symbol Description

Strata symbols



Silty low plasticity clay



Low plasticity clay



Poorly graded clayey silty sand



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 9/28/2009 using a hand auger.
- 2. Surveyed boring location and elevation was provided by Century Engineering.
- 3. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 4. Results of tests conducted on samples recovered are reported on the logs.

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 Boring No.: IT1-83

Contract: 25-113-01

Boring Location: Sta. 836+24, Rt. C.L.

Boring Surface Elev.: Reference:

Wt. of Casing Hammer: Wt. of Sample Hammer: IN. IN. IN. Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Lbs. D-Sampler: S-Sampler: U-Sampler: Core Bit: Type of: O.D. IN. IN. O.D. O.D.

From Depth of: From Depth of: To: To: **Casing Size:** Inches **Hollow Stem Auger:**

Water Level Readings

Elev. of Water Time Depth of Hole **Depth of Casing Depth of Water** Date

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:**

Helpers:

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
1.5	9/30/09	1	1.0'		Moist brown silty coarse to fine sand w/trace of gravel.	A-2-4(0)	Hand Auger Topsoil - 8".
	1 _ '	2	2.0'		12" RECOVERY	A 1 1.	
3		V	3.0'	T	Moist brown coarse to fine sand and gravel w/some silt.	A-1-b	Hand Auger
[/	1	3	3.0'	ין ו	Moist brown fine to coarse sand and gravel w/some silt.	A-1-b	Hand
			4.0'		12" RECOVERY		Auger
ļ!	1	4	4.0		Moist orange coarse to fine sand w/some silt, trace of gravel.	A-2-4(0)	Hand
4.5			5.0'		12" RECOVERY		Auger
<u> </u>	1 '	5	5.0'	<u> </u>	MOist orange fine to coarse sand w/trace of silt, clay and gravel.	A-3	Hand
]		!		1/1 linet 1/1 linet 1/1/tet 1/1/tet 1/1/tet 1/1/tet		Auger USDA
6	1		6.0'	l!	iditief iditief 12" RECOVERY	ĺ	Classifica
	1	6	6.0'		Moist orange fine to coarse sand w/some silt, trace of gravel.	A-2-4(0)	- Sand.
	1		1		19 (4 1966) 19 (7 1966) 19 (8 1966)		Hand
	1		1	1	######################################		Auger
\vdash	1		7.0'	ļ!	12" RECOVERY		
\vdash	1	7	7.0'	"	Moist orange fine to coarse sand w/trace of silt and gravel.	A-3	Hand
7.5	1		1	, j	######################################		Auger
<u> </u> !	4		2.0	r	HINEL HINEL		
<u> </u>	 '		8.0'	+	End of Boring	 	
	1		1		Ellu of Borling		
	1		1				
9	1		'				
5	1		'				
1 '	1	1	1	,		1	1

Remarks:

Symbol Description

Strata symbols



Silty sand



Poorly graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 9/30/2009 using a hand auger.
- 2. Surveyed boring location and elevation was provided by Century Engineering.
- 3. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 4. Results of tests conducted on samples recovered are reported on the logs.

Boring No.: IT1-84 F.A. Project: U.S. 301 Maryland State Line to S.R. 1

Contract: 25-113-01 **Boring Location:**

Boring Surface Elev.: Reference:

Wt. of Casing Hammer: Wt. of Sample Hammer: IN. IN. IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Lbs. D-Sampler: S-Sampler: U-Sampler: Core Bit: Type of: O.D. IN. IN. O.D. O.D.

From Depth of: From Depth of: To: To: **Casing Size:** Inches **Hollow Stem Auger:**

Water Level Readings

Elev. of Water Time Depth of Hole **Depth of Casing Depth of Water** Date

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:**

Helpers:

Danti	Dailu		Commit-				
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	9/29/09	1	0.0'		No Sample Taken		Hand Auger - Topsoil
			1.0'		0" RECOVERY		
1.5		2	2.0'		Wet brownish gray clayey silt w/trace of fine to coarse sand. 12" RECOVERY	A-4(7)	Hand Auger
3		3	3.0'		Wet brownish gray clayey silt w/trace of fine to coarse sand and gravel. 12" RECOVERY	A-4(7)	Hand Auger
		4	3.0 ¹		Wet brownish gray clayey fine sandy silt w/trace of coarse sand and gravel. 12" RECOVERY	A-4(2)	Hand Auger
4.5		5	4.0'		Wet brownish gray silty fine sand w/some clay, trace of coarse sand and gravel. 12" RECOVERY	A-2-4(0)	Hand Auger USDA Classificat
6		6	5.0'		Wet brownish orange coarse to fine sand w/some silt, trace of gravel. 12" RECOVERY	A-1-b	- Sandy Loam. Hand Auger
		7	6.0'		Wet brownish orange coarse sand w/some fine sand, trace of silt and gravel.	A-1-b	Hand Auger
			7.0'		開始網 開放製 12" RECOVERY		
					End of Boring		
7.5							
1							1

Remarks:

Symbol Description

Strata symbols

Low plasticity clay



Silty sand



Poorly graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 9/29/2009 using a hand auger.
- 2. Surveyed boring location and elevation was provided by Century Engineering.
- 3. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 4. Results of tests conducted on samples recovered are reported on the logs.

F.A. Project: US 301 Maryland State Line to SR-1 Boring No.: IT1-85

Contract: 25-113-01

Boring Location: STA. 723+00 103' Rt. C.L.

Boring Surface Elev.: + 68.28 Reference:

IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. D-Sampler: S-Sampler: U-Sampler: IN. Type of: O.D. IN. IN. O.D. Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** Inches **Hollow Stem Auger:**

Water Level Readings

Time **Depth of Hole Depth of Casing Depth of Water** Elev. of Water Date 2/24/11 8.5

8.2

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 8.5 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dave Burt

Helpers: T. Kane

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks	
2.52	2/24/11	1	1.5' 2.5'		Wet tan clayey silt w/trace of fine to coarse A-4(6) Topsoil - 8". Hand Auger	
2.53		2	2.5'		Wet grayish brown silty clay w/trace of fine to coarse sand. A-6(14) Hand Auger	
		3	3.5'	Τ	Wet brown fine sandy silt w/trace of coarse sand and clay. A-4(0) Hand Auger	
5.06			6.5'		36" RECOVERY	
7.59		4	6.5' 7.5'	10	Wet orange silty coarse to fine sand w/trace A-2-4(0) Hand Auger of fine gravel. 12" RECOVERY	
7.59		5	7.5' 8.5'		Saturated orange coarse sandy fine gravel w/ A-1-a Hand Auger some fine sand, trace of silt.	
					End of Boring	
10.12						
12.65						
15.18						

Remarks: Hand Auger

Reviewed By: Hany Fekry Soils Supervisor: Randy Ferguson

Symbol Description

Strata symbols



Silty low plasticity clay



Low plasticity clay



silt



Silty sand



Poorly graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

- Exploratory borings were drilled on February 24, 2011 using a hand auger.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.

10.0

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: US 301 Maryland State Line to SR-1 Boring No.: IT1-86

Contract: 25-113-01

Boring Location: STA. 804+00 122' Rt. C.L.

Boring Surface Elev.: +41.11 Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Depth of Casing Depth of Water Time **Depth of Hole** Elev. of Water Date 2/17/11 9.5 10.0 10.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 10.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Gary Truver

Helpers: T. Kane

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks
	2/17/11	1	1.0' 2.0'	2 2	Wet soft brown clayey silt w/some fine sand, trace of coarse sand and fine gravel. 10" RECOVERY Topsoil - 12".
2.53		2	2.0'	2 5 5 5	Wet loose brown silty coarse to fine sand w/ A-1-b some fine gravel.
		3	4.0' 4.0'	5 5 4	14" RECOVERY Wet loose brown fine to coarse sand w/some A-2-4(0)
5.06			6.0'	3 4 4	silt, trace of fine gravel.
		4	6,0'	4 5 5 5 5	Wet loose brown fine to coarse sand w/some silt, trace of clay. A-2-4(0) USDA Classification: Loamy Sand
7.59		5	8.0' 8.0'	1	18" RECOVERY
		5		4 4 4	Wet loose brown fine to coarse sand w/some silt.
10.12			10.0'		End of Boring
12.65					

Remarks:

Reviewed By: Hany Fekry Soils Supervisor: Randy Ferguson

Symbol Description

Strata symbols

Low plasticity clay



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on February 17, 2011 using 3 1/4 inch diameter continuous flight power auger. Rig is CME 55 ATV
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blows are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to I-95 Boring No.: R1-014

Contract: 25-113-01

Boring Location: Sta. 525+00.00, 45' Lt. C.L.

Boring Surface Elev.: + 60.0' Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: 2 Type of: Split Barrel O.D. O.D.

IN. IN. U-Sampler: 3 Ball Sampler Core Bit: O.D.

To: To: **Casing Size:** 3 1/4 Inches From Depth of: Hollow Stem Auger: From Depth of: 0.0' 10.0'

Water Level Readings

Depth of Water Time **Depth of Hole Depth of Casing** Elev. of Water Date 2/20/08 10.0 8.0' 4.1'

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 10.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dan Taylor

Helpers: D. Zmijewski

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks
		1	1.0' 2.0'	6 12	Wet very stiff gray clayey silt w/ some fine to A-4(4) Cultivated Soil - 12".
		2	2.0'	9 14 20 25	coarse sand, trace of gravel. 11" RECOVERY A-2-4(0)
3	R			25	silt, trace of gravel.
		3	4.0'	10 12 16 15	12" RECOVERY Saturated medium dense brown fine to coarse A-3
	•			16 15	sand, trace of silt and graver.
6		4	6.0' 6.0'	16	COLUMN 15" RECOVERY
		4	6.0	16 17 18 16	Saturated dense brown and light brown gravel A-1-b and coarse to fine sand w/ some silt.
			8.0'	1	20" RECOVERY
		5	8.0'	8 9 10 10	Saturated medium dense orange coarse to fine A-2-4(0)
9				10	sand w/ some silt, trace of gravel.
			10.0'		18" RECOVERY
					Boring terminated at 10.0 feet
12					
15					

Remarks:

Symbol Description

Strata symbols

Low plasticity clay



Silty sand



Poorly graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 2/20/2008 using a 3 1/4-inch diameter continuous flight power auger. Rig is a ATV CME 45.
- 2. Groundwater levels recorded at the time of drilling. Boring backfilled upon completion.
- 3. Surveyed boring locations and elevations were provided by Century engineering.
- These logs are subject to the limitations, conclusions, and recomendations in this report
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to I-95 Boring No.: R1-015

Contract: 25-113-01

Boring Location: Sta. 530+00.00, 45' Rt. C.L.

Boring Surface Elev.: + 64.0' Reference:

IN. IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: 2 Type of: Split Barrel O.D. IN. IN. O.D.

U-Sampler: 3 Ball Sampler Core Bit: O.D.

To: To: **Casing Size:** 3 1/4 Inches From Depth of: Hollow Stem Auger: From Depth of: 0.0' 10.0'

Water Level Readings

Time **Depth of Water Depth of Hole Depth of Casing** Elev. of Water Date 2/20/08 7.5' 10.0 8.0'

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 10.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dan Taylor

Helpers: D. Zmijewski

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks
		1	0.5'	1 2 3	Moist soft brown coarse sandy silt w/ some A-4(1) Topsoil - 5". clay and fine sand, trace of gravel.
			2.0' 2.0'	-	10" RECOVERY
	_	2	2.0	5 10 11 15	Moist medium dense orange coarse to fine sand w/ some silt and gravel.
3			4.0'		20" RECOVERY
	•	3	4.0'	10 16 15 15	Moist dense orange fine to coarse sand w/ A-2-4(0) some silt, trace of gravel.
6			6.0'		19" RECOVERY
		4	6.0'	14 19 29 22	Wet hard orange and brown gravelly silt w/ A-4(0) some coarse to fine sand.
			8.0'		17" RECOVERY
9		5	8.0'	2 2 6 8	Saturated loose brown silty fine to coarse A-2-4(0) sand.
			10.0'		16" RECOVERY
					Boring terminated at 10.0 feet
12					
15					

Remarks:

Symbol Description

Strata symbols



Silty low plasticity clay



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 2/20/2008 using a 3 1/4-inch diameter continuous flight power auger. Rig is a ATV CME 45.
- 2. Groundwater levels recorded at the time of drilling. Boring backfilled upon completion.
- 3. Surveyed boring locations and elevations were provided by Century engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to I-95 Boring No.: R1-016

Contract: 25-113-01

Boring Location: Sta. 535+00.00, 130' Lt. C.L.

Boring Surface Elev.: + 63.0' Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: IN. Lbs. 30 D-Sampler: S-Sampler: 2 IN. Type of: Split Barrel O.D. IN. IN. O.D. U-Sampler: 3 Ball Sampler

Core Bit: O.D.

To: To: **Casing Size:** 3 1/4 Inches From Depth of: Hollow Stem Auger: From Depth of: 0.0'

Water Level Readings

Depth of Casing Depth of Water Time **Depth of Hole** Elev. of Water Date 2/20/08 5.8'

12.0' 14.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 16.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dan Taylor

Helpers: D. Zmijewski

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks
	· ·	1	0.5' 2.0'	1 2 2	Wet soft light brown silt w/ some gravel and fine to coarse sand, trace of clay. 12" RECOVERY Topsoil - 4".
3		2	2.0'	3 5	Wet loose light brown coarse sand w/ some A-1-b silt, fine sand, and gravel.
J		2A	3.0' 4.0'	11 22	7" RECOVERY Wet dense brown silty fine sand w/ some A-2-4(0)
		3	4.0'	11 14 13 13	coarse sand, trace of gravel. 11" RECOVERY Wet medium dense brown coarse sand w/
6			6.0'		some fine sand, silt, and gravel. 18" RECOVERY
		4	6.0'	10 10 10 11	Saturated medium dense brown coarse to fine sand w/ some silt, trace of gravel. A-1-b
			8.0'		19" RECOVERY
9		5	8.0'	5 6 5 4	Saturated medium dense brown coarse to fine sand w/ some silt and gravel. A-1-b
			10.0'		16" RECOVERY
		6	10.0'	2 4 6 10	Saturated loose brown fine to coarse sand, trace of silt and gravel. A-3
12			12.0'		18" RECOVERY
		7	12.0'	W/R 2 3 6	Saturated loose brown fine to coarse sand w/ A-2-4(0) some silt, trace of gravel.
			14.0'		20" RECOVERY
15		8	14.0'	6 11 19 22	Saturated medium dense brown fine sand and gravel w/ some coarse sand, trace of silt.
			16.0'		17" RECOVERY
					Boring terminated at 16.0 feet

Remarks:

Symbol Description

Strata symbols

Silt

Silty sand



Poorly graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 2/20/2008 using a 3 1/4-inch diameter continuous flight power auger. Rig is a ATV CME 45.
- 2. Groundwater levels recorded at the time of drilling and rechecked the following day.
- 3. Surveyed boring locations and elevations were provided by Century engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to I-95 Boring No.: R1-017

Contract: 25-113-01

Boring Location: Sta. 540+00.00, 139' Rt. C.L.

Boring Surface Elev.: + 71.0' Reference:

Wt. of Casing Hammer: Average Fall: IN. Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: IN. Lbs. 30 D-Sampler: S-Sampler: U-Sampler: 2 IN. Type of: Split Barrel O.D. IN. IN. O.D.

3 Ball Sampler Core Bit: O.D.

To: To: **Casing Size:** 3 1/4 Inches From Depth of: Hollow Stem Auger: From Depth of: 0.0'

Water Level Readings

Depth of Casing Depth of Water Time **Depth of Hole** Elev. of Water Date 3/12/08 12.0' 10.1 14.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 16.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dan Taylor

Helpers: D. Zmijewski

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
	•	1	0.8' 2.0'	3 6		oist stiff brown clayey fine sandy silt w/ me coarse sand, trace of gravel. 13" RECOVERY	A-4(1)	Topsoil - 10".
3		2	2.0'	6 12 16 16		oist very stiff brown fine sandy silt w/ some arse sand and gravel.	A-4(0)	. (
			4.0'			22" RECOVERY		
		3	4.0'	9 16 17 13		oist hard brown fine sandy silt w/ some arse sand, trace of gravel.	A-4(0)	
6			6.0'			22" RECOVERY		
		4	6.0'	12 15 12 6		oist medium dense brown silty coarse to e sand w/ some gravel.	A-1-b	
			8.0'			19" RECOVERY		
9		5	8.0'	4 5 5 4		oist loose light brown coarse sand w/ some evel, fine sand, and silt.	A-1-b	
			10.0'			14" RECOVERY		
		6	10.0'	5 5 6 4		et medium dense light brown coarse to fine and w/ some gravel and silt.	A-1-b	
12			12.0'			13" RECOVERY		
		7	12.0'	4 4 4 14		turated loose light brown coarse to fine and w/ some silt, trace of gravel.	A-1-b	
			14.0'	7		24" RECOVERY		
15		8	14.0'	7 5 6 5	san	turated medium dense light brown coarse and and gravel w/ some fine sand, trace of	A-1-b	
			16.0'		SIIL	 5" RECOVERY		
						ring terminated at 16.0 feet		

Remarks:

Symbol Description

Strata symbols



Silty low plasticity clay



Silty sand



Well graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 3/12/2008 using a 3 1/4-inch diameter continuous flight power auger. Rig is a ATV CME 45.
- 2. Groundwater levels recorded at the time of drilling and rechecked the following day.
- 3. Surveyed boring locations and elevations were provided by Century engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

0.0'

F.A. Project: U.S. 301, Maryland State Line to I-95 Boring No.: R1-018

Contract: 25-113-01

Boring Location: Sta. 550+00.00, 46' Lt. C.L.

Hollow Stem Auger:

Boring Surface Elev.: + 64.0' Reference:

IN. IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: 2 Type of: Split Barrel O.D. IN. IN. O.D. U-Sampler: 3 Ball Sampler Core Bit: O.D.

To: To: **Casing Size:** 3 1/4 Inches From Depth of:

Water Level Readings

Time **Depth of Water Depth of Hole Depth of Casing** Elev. of Water Date 3/5/08 10.0 8.0' 5.4'

From Depth of:

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 10.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dan Taylor

Helpers: D. Zmijewski

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks
		1	0.7'	4 8	Wet stiff gray clay, trace of fine to coarse A-6(14) Forest Duff - 8".
3		2	2.0' 2.0'	14 16 22 14	Wet hard gray clayey fine sandy silt w/ some coarse sand, trace of gravel. 12" RECOVERY 18" RECOVERY
6	ľ	3	4.0' 6.0'	4 4 12 15	Wet medium dense orange and gray mottled silty fine sand w/ some gravel, trace of coarse sand. 12" RECOVERY
		4	6.0' 8.0'	10 12 10 9	Saturated medium dense brown coarse to fine sand w/ some silt and gravel. 18" RECOVERY
9		5	8.0'	3 7 8 9	Saturated medium dense brown coarse to fine sand, trace of silt and gravel. 24" RECOVERY
					Boring terminated at 10.0 feet
12					
15					

Remarks:

Symbol Description

Strata symbols

Low plasticity clay



Poorly graded clayey silty sand



Silty sand



Well graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory boring was drilled on 3/5/2008 using a 3 1/4-inch diameter continuous flight power auger. Rig is a ATV CME 45.
- Groundwater levels recorded at time of drilling. Boring backfilled upon completion.
- 3. Surveyed boring locations and elevations were provided by Century Engineering.
- These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All SPT blow counts are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to I-95 Boring No.: R1-019

Contract: 25-113-01

Boring Location: Sta. 555+00.00, 45' Rt. C.L.

Boring Surface Elev.: + 62.0' Reference:

IN. IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: 2 Type of: Split Barrel O.D. O.D.

IN. IN. U-Sampler: 3 Ball Sampler Core Bit: O.D.

To: To: **Casing Size:** 3 1/4 Inches From Depth of: Hollow Stem Auger: From Depth of: 0.0'

Water Level Readings

Time **Depth of Water Depth of Hole Depth of Casing** Elev. of Water Date 3/5/08 10.0 8.0' 4.4'

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 10.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dan Taylor

Helpers: D. Zmijewski

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks
	-	1	0.7'	1 4	Wet firm gray clay w/ some gravel and organic matter, trace of fine to coarse sand. A-6(5) Forest Duff - 8".
3		2	2.0' 2.0' 4.0' 4.0'	4 11 14 19 3 6 9 9	Wet very stiff gray and brown mottled clayey gravelly silt w/ some coarse to fine sand, trace of organic matter. 16" RECOVERY 16" RECOVERY Saturated medium dense gray coarse sand w/ some silt and fine sand, trace of gravel.
6		4	6.0' 6.0'		17" RECOVERY
		4	8.0'	10 9 8 9	Saturated medium dense brown coarse to fine sand w/ some silt, trace of gravel. 17" RECOVERY
9		5	8.0'	5 9 10 13	Saturated medium dense brown coarse to fine sand w/ some silt and gravel. 14" RECOVERY
			10.0		Boring terminated at 10.0 feet
12					
15					

Remarks:

Symbol Description

Strata symbols

Low plasticity clay



Poorly graded clayey silty sand



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory boring was drilled on 3/5/2008 using a 3 1/4-inch diameter continuous flight power auger. Rig is a ATV CME 45.
- Groundwater levels recorded at time of drilling. Boring backfilled upon completion.
- 3. Surveyed boring locations and elevations were provided by Century Engineering.
- These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All SPT blow counts are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to I-95 Boring No.: R1-020

Contract: 25-113-01

Boring Location: Sta. 560+00.00, 45' Lt. C.L.

Boring Surface Elev.: + 66.0' Reference:

IN. IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: 2 Type of: Split Barrel O.D. IN. IN. O.D. U-Sampler: 3 Ball Sampler

Core Bit: O.D.

To: To: **Casing Size:** 3 1/4 Inches From Depth of: Hollow Stem Auger: From Depth of: 0.0' 10.0'

Water Level Readings

Time **Depth of Water Depth of Hole Depth of Casing** Elev. of Water Date 3/5/08 10.0 8.0' 8.0'

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 10.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dan Taylor

Helpers: D. Zmijewski

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks
		1	0.8'	3 5	Wet firm brown clayey silt w/ some fine sand, trace of coarse sand and gravel. Cultivated Soil - 10".
3	N	2	2.0' 2.1'	4 5 6 6	Wet medium dense brown clayey coarse to fine sand, trace of gravel. 14" RECOVERY 23" RECOVERY
6	•	3	6.0'	6 9 12 12	Wet medium dense brown silty coarse to fine A-2-4(0) sand w/ some gravel.
		4	6.0' 8.0'	11 14 16 14	Wet medium dense brown coarse to fine sand w/ some silt and gravel. 11" RECOVERY
9		5	8.0'	13 14 12 6	Saturated very stiff brown clayey fine to coarse sandy silt, trace of gravel. 4" RECOVERY
			10.0		Boring terminated at 10.0 feet
12					
15					

Remarks:

Symbol Description

Strata symbols

Low plasticity clay



Poorly graded clayey silty sand



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory boring was drilled on 3/5/2008 using a 3 1/4-inch diameter continuous flight power auger. Rig is a ATV CME 45.
- Groundwater levels recorded at time of drilling. Boring backfilled upon completion.
- 3. Surveyed boring locations and elevations were provided by Century Engineering.
- These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All SPT blow counts are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to I-95 Boring No.: R1-021

Contract: 25-113-01

Boring Location: Sta. 565+00.00, 118' Rt. C.L.

Boring Surface Elev.: + 69.0' Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: 2 Type of: Split Barrel O.D. O.D.

IN. IN. U-Sampler: 3 Ball Sampler Core Bit: O.D.

To: To: **Casing Size:** 3 1/4 Inches From Depth of: Hollow Stem Auger: From Depth of: 0.0'

Water Level Readings

Time **Depth of Casing Depth of Water Depth of Hole** Elev. of Water Date 12.0' 10.0' 3/5/08 14.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 16.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dan Taylor

Helpers: D. Zmijewski

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks
		1	1.0' 2.0'	2 4	Moist firm brown clayey silt w/ some fine sand, trace of coarse sand and gravel. 11" RECOVERY A 4(0)
3		2	2.0'	4 5 10 10	Moist stiff brown clayey gravelly coarse sandy silt w/ some fine sand. A-4(0)
			4.0'		22" RECOVERY
		3	4.0'	4 5 10 10	Moist medium dense brown and light brown silty fine to coarse sand, trace of gravel.
6] '		6.0'		18" RECOVERY
		4	6.0	9 9 9 8	Moist medium dense orange silty fine to coarse sand, trace of gravel. A-2-4(0)
	'		8.0'		21" RECOVERY
9		5	8.0'	3 5 4 3	Wet loose brown fine to coarse sand w/ some silt, trace of gravel. A-2-4(0)
			10.0'	<u> </u>	18" RECOVERY
		6	10.0'	3 5 6 5	Wet medium dense brown fine to coarse sand A-1-b and gravel w/ some silt.
12] '		12.0'		12" RECOVERY
		7	12.0'	4 5 19 10	Saturated medium dense brown coarse to fine sand w/ some silt, trace of gravel. A-1-b
	·	<u> </u>	14.0'	- 6	20" RECOVERY
15		8	14.0'	6 10 11 12	Saturated medium dense brown gravel and coarse sand w/ some fine sand and silt. 19" RECOVERY
	 		10.0		Boring terminated at 16.0 feet
					Boring terminated at 10.0 feet

Remarks:

Symbol Description

Strata symbols

Low plasticity clay

Poorly graded clayey silty sand

Silty sand

Poorly graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory boring was drilled on 3/5/2008 using a 3 1/4-inch diameter continuous flight power auger. Rig is a ATV CME 45.
- 2. Groundwater levels recorded at time of drilling and rechecked the following day.
- 3. Surveyed boring locations and elevations were provided by Century Engineering.
- These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All SPT blow counts are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to I-95 Boring No.: R1-022

Contract: 25-113-01

Boring Location: Sta. 570+00.00, 108' Lt. C.L.

Boring Surface Elev.: + 69.0' Reference:

Wt. of Casing Hammer: Average Fall: IN. Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: IN. Lbs. 30 D-Sampler: S-Sampler: U-Sampler: 2 IN. Type of: Split Barrel O.D. IN. IN. O.D. 3 Ball Sampler

Core Bit: O.D. **Casing Size:** 3 1/4 Inches

From Depth of: From Depth of: To: To: Hollow Stem Auger: 0.0'

Water Level Readings

Time **Depth of Casing Depth of Water Depth of Hole** Elev. of Water Date 12.0' 10.7 3/6/08 14.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 16.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dan Taylor

Helpers: D. Zmijewski

Depth	Daily		Sample		
(ft.)	Progress	No.	Depth	Blows/6"	Sample Description Class./G.I. Remarks
		1	0.5'	2 1 3	Moist soft brown and light brown silt w/ some A-4(2) Forest Duff - 3".
				3	fine to coarse sand and clay.
			2.0'		18" RECOVERY
		2	2.0'	3 6	Moist medium dense light brown silty coarse A-2-4(0)
3	R			8 12	to fine sand w/ some gravel.
			4.0		18" RECOVERY
		3	4.0'	11 16	Moist hard light brown coarse sand w/ some A-1-b
				18 17	silt and fine sand, trace of gravel.
					19" RECOVERY
6		4	6.0' 6.0'	11	Wet medium dense brown silty coarse to fine A-1-b
				11 13 13 12	sand w/ some gravel.
				12	Sand Wy Some graven
			8.0'		20" RECOVERY
		5	8.0'	6 9 5 6	Wet medium dense brown coarse to fine sand A-1-b
9				5 6	w/ some silt and gravel.
		6	10.0' 10.0'	3	20" RECOVERY Wet medium dense orange coarse to fine sand A-1-b
			10.0	3 5 12	and gravel w/ some silt.
				9	Hitti
12			12.0'		17" RECOVERY
		7	12.0'	17 9	Wet medium dense orange coarse sand and A-1-b
			13.0'		gravel w/ some fine sand, trace of silt.
		7A	13.0'	7 8	Saturated medium dense brown clayey gravel A-2-7(1)
		8	14.0' 14.0'	10	and fine to coarse sand.
15			14.0	10 4 6 5	12" RECOVERY / A-7-3(2)
15				5	Saturated stiff brown and green fine sandy
			16.0'		clay w/ some coarse sand, trace of gravel. 15" RECOVERY
					Boring terminated at 16.0 feet

Remarks:

Symbol Description

Strata symbols

Silt

Silty sand

Poorly graded sand with silt

10:10:10:10:10:10:10 10:10:10:10:10:10:10 10:10:10:10:10:10:10:10 Well graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 3/6/2008 using a 3 1/4-inch diameter continuous flight power auger. Rig is a ATV CME 45.
- Groundwater levels recorded at the time of drilling and rechecked the following day.
- 3. Surveyed boring locations and elevations were provided by Century engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to I-95 Boring No.: R1-023

Contract: 25-113-01

Boring Location: Sta. 575+00.00, 45' Rt. C.L.

Boring Surface Elev.: + 65.0' Reference:

IN. IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: 2 Type of: Split Barrel O.D. O.D.

IN. IN. U-Sampler: 3 Ball Sampler Core Bit: O.D.

To: To: **Casing Size:** 3 1/4 Inches From Depth of: Hollow Stem Auger: From Depth of: 0.0'

Water Level Readings

Time **Depth of Water Depth of Hole Depth of Casing** Elev. of Water Date 3/5/08 10.0 8.0' 6.3'

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 10.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dan Taylor

Helpers: D. Zmijewski

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks
		1	0.3'	3 7 9	Moist very stiff brown and orange coarse to fine sandy clay, trace of gravel. A-6(1) Forest Duff - 3".
			2.0'		20" RECOVERY
		2	2.0'	12 12 11 14	Moist medium dense brown coarse to fine A-1-b sand w/ some silt and gravel.
3			4.0'		21' RECOVERY
		3	4.0'	7 7 8	Wet medium dense brown fine to coarse sand, trace of silt and gravel.
6			6.0′	7	24" RECOVERY
		4	6.0'	6 7 10 14	Saturated medium dense brown fine sand w/ A-2-4(0) some coarse sand, silt, and gravel.
			8.0'	14	18" RECOVERY
		5	8.0'	4 7 7 9	Saturated stiff brown fine sandy clay w/ some A-7-5(9) coarse sand, trace of gravel.
9			40.0	9	
			10.0'		Boring terminated at 10.0 feet
12					
15					
10					
1					

Remarks:

Symbol Description

Strata symbols

Clayey sand

Silty sand

Poorly graded sand

Elastic silt

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory boring was drilled on 3/5/2008 using a 3 1/4-inch diameter continuous flight power auger. Rig is a ATV CME 45.
- 2. Groundwater levels recorded at time of drilling. Boring backfilled upon completion.
- 3. Surveyed boring locations and elevations were provided by Century Engineering.
- These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All SPT blow counts are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to I-95 Boring No.: R1-024

Contract: 25-113-01

Boring Location: Sta. 580+00.00, 127' Lt. C.L.

Boring Surface Elev.: + 67.0' Reference:

IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: 2 IN. Type of: Split Barrel O.D. IN. IN. O.D. 3 Ball Sampler

Core Bit: O.D.

To: To: **Casing Size:** 3 1/4 Inches From Depth of: Hollow Stem Auger: From Depth of: 0.0'

Water Level Readings

Time **Depth of Casing Depth of Water Depth of Hole** Elev. of Water Date 12.0' 10.0' 3/6/08 14.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 16.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dan Taylor

Helpers: D. Zmijewski

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks
		1	0.9' 2.0'	6 10	Moist very stiff gray and brown mottled A-4(6) Cultivated Soil - 11".
3		2	2.0'	8 10 13 13	12" RECOVERY Moist medium dense brown fine sand w/ some clay and coarse sand, trace of gravel. A-2-4(0)
			4.0		20" RECOVERY
		3	4.0	6 8 9 15	Moist medium dense light brown silty fine A-2-4(0) sand, trace of coarse sand and gravel.
6			6.0'		16" RECOVERY
		4	6.0'	12 18 26 13	Moist dense light brown coarse to fine sand and gravel w/ some silt. A-1-b
			8.0'		10" RECOVERY
9		5	8.0'	8 23 17 9	No Sample Recovery
		6	10.0' 10.0'	4	0" RECOVERY
		0	10.0	4 8 14 11	Saturated very stiff brown and green fine to coarse sandy clay, trace of gravel. A-7-5(2)
12			12.0'		19" RECOVERY
		7	12.0'	7 9 12 13	Saturated very stiff green-gray fine to coarse sandy clay, trace of gravel. A-7-5(1)
			14.0'	Ω	21" RECOVERY
15		8	14.0'	8 11 4 3	Saturated medium dense green silty fine to coarse sand, trace of gravel. 24" RECOVERY
			10.0		Boring terminated at 16.0 feet

Remarks:

Symbol Description

Strata symbols

Low plasticity clay



Poorly graded clayey silty sand



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 3/5/2008 using a 3 1/4-inch diameter continuous flight power auger. Rig is a ATV CME 45.
- 2. Groundwater levels recorded at the time of drilling and rechecked the following day.
- 3. Surveyed boring locations and elevations were provided by Century engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to I-95 Boring No.: R1-025

Contract: 25-113-01

Boring Location: Sta. 585+00.00, 45' Rt. C.L.

Boring Surface Elev.: + 70.0' Reference:

IN. IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: 2 Type of: Split Barrel O.D. O.D.

IN. IN. 3 Ball Sampler Core Bit: O.D.

To: To: **Casing Size:** 3 1/4 Inches From Depth of: Hollow Stem Auger: From Depth of: 0.0' 10.0'

Water Level Readings

Depth of Water Time **Depth of Hole Depth of Casing** Elev. of Water Date 3/6/08 10.0 8.0' Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 10.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dan Taylor

Helpers: D. Zmijewski

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks	
		1	0.8' 2.0'	3 3	Moist firm brown clayey silt w/ some fine sand, trace of coarse sand and gravel. 15" RECOVERY A-4(5) Cultivated Soils - 9	9".
3	N	2	2.0'	3 5 6 9	Moist stiff brown fine sandy silt w/ some A-4(0) coarse sand and clay.	
		3	4.0	4 4 9 8	Moist stiff brown and gray mottled fine sandy A-4(0) silt w/ some coarse sand.	
6		4	6.0' 6.0'	7 9 7 6	Moist very stiff light brown and gray fine to coarse sandy silt, trace of gravel. A-4(0)	
		5	8.0' 8.0'	9	15" RECOVERY Moist medium dense light brown and gray A-2-4(0)	
9			10.0'	9 14 14 14	silty fine to coarse sand, trace of gravel. 17" RECOVERY	
					Boring terminated at 10.0 feet	
12						
15						
				ļ		

Remarks:

Symbol Description

Strata symbols

Low plasticity clay

Poorly graded clayey silty sand

Silt

Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 3/6/2008 using a 3 1/4-inch diameter continuous flight power auger. Rig is a ATV CME 45.
- Groundwater levels recorded at the time of drilling. Boring backfilled upon completion.
- 3. Surveyed boring locations and elevations were provided by Century engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to I-95 Boring No.: R1-026

Contract: 25-113-01

Boring Location: Sta. 590+00.00, 45' Lt. C.L.

Boring Surface Elev.: +68.11' Reference:

IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: 2 IN. Type of: Split Barrel O.D. IN. IN. O.D.

U-Sampler: 3 Ball Sampler Core Bit: O.D.

To: To: **Casing Size:** 3 1/4 Inches From Depth of: Hollow Stem Auger: From Depth of: 0.0'

Water Level Readings

Depth of Water Time **Depth of Hole Depth of Casing** Elev. of Water Date 3/6/08 10.0 8.0' Dry

68.1 68.1 68.1

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 10.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dan Taylor

Helpers: D. Zmijewski

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks
	3/6/08	1 2	1.0' 2.0' 2.0'	7 7 5	Wet stiff brown silt w/ some clay and fine sand, trace of coarse sand, 11" RECOVERY A-4(0)
3			2.0	5 11 11 13	Wet very stiff brown fine sandy silt, trace of coarse sand.
		3	4.0'	6 5 8 10	21" RECOVERY Wet stiff brown and gray clayey gravelly silt A-4(1) w/ some fine to coarse sand.
6	_		6.0'		W/ some tine to coarse sand.
		4	6.0'	7 9 13 19	Wet very stiff brown fine sandy clay w/ some A-6(2) coarse sand, trace of gravel.
			8.0' 8.0'	4	22" RECOVERY
9		5	8.0	4 8 11 14	Wet very stiff brown fine sandy clay w/ some coarse sand, trace of gravel. A-7-5(2)
			10.0'		19" RECOVERY
					Boring terminated at 10.0 feet
12					
15					

Remarks:

Symbol Description

Strata symbols

Silty low plasticity clay

Silt

Clayey sand



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory boring was drilled on 3/6/2008 using a 3 1/4-inch diameter continuous flight power auger. Rig is a ATV CME 45.
- 2. Groundwater levels recorded at time of drilling. Boring backfilled upon completion.
- 3. Surveyed boring locations and elevations were provided by Century Engineering.
- These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All SPT blow counts are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to I-95 Boring No.: R1-027

Contract: 25-113-01

Boring Location: Sta. 595+00.00, 131' Rt. C.L.

Boring Surface Elev.: + 72.0' Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: IN. IN. Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: 2 Type of: Split Barrel O.D. IN. IN. O.D.

U-Sampler: 3 Ball Sampler Core Bit: O.D.

To: To: **Casing Size:** 3 1/4 Inches From Depth of: Hollow Stem Auger: From Depth of: 0.0'

Water Level Readings

Depth of Water Time **Depth of Hole Depth of Casing** Elev. of Water Date 2/21/08 14.0' 16.0 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 16.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dan Taylor

Helpers: D. Zmijewski

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
	2/21/08	1	0.0'	1 3 7 8		Wet stiff tan silt w/ some clay and fine sand, trace of coarse sand.	A-4(1)	Cultivated Soil - 11".
			2.0'			12" RECOVERY		
3		2	4.0'	6 5 9 9		Wet stiff brown fine sandy silt w/ some clay and coarse sand. 18" RECOVERY	A-4(0)	IG
		3	4.0'	6 8		Wet very stiff orange and gray clayey silt w/	A-4(2)	
6			6.0'	9		some fine to coarse sand, trace of gravel. 16" RECOVERY	15	
		4	6.0'	10		Wet very stiff gray clay w/ some fine sand,	A-6(10)	
			7.0'	45		trace of coarse sand and gravel. 12" RECOVERY		
		4A	7.0' 8.0'	15 16		Wet dense gray clayey fine to coarse sand,	A-2-4(0)	
		5	8.0'	5 9 9		trace of gravel. 6" RECOVERY	A-2-4(0)	
9			10.0'	8		Wet medium dense gray silty fine sand w/ some coarse sand.		
		6	10.0'	3 11		Wet stiff gray clayey fine sandy silt, trace of	A-4(3)	
			11.0'	''		coarse sand and gravel.		
		6A	11.0'	15 14		5" RECOVERY	A-1-a	
12			12.0'			Wet medium dense gray gravel w/ some		
		7	12.0'	16 49 27 19		coarse and fine sand and silt. 9" RECOVERY	A-1-b	Chattering in auger drilling to 14 ft.
			44.0	19		Wet very dense brown gravel w/ some coarse sand and silt, trace of fine sand and rock		2
		8	14.0' 14.0'	4 9		fragments. 8" RECOVERY	A-4(0)	
15				7		Wet medium dense brown silty fine to coarse	A-4(0)	
13				10		sand w/ some gravel, trace of cemented sands.		
			16.0'			12" RECOVERY		
						Boring terminated at 16.0 feet		
			I	1	1		l	

Remarks:

Symbol Description

Strata symbols

Silty low plasticity clay

Low plasticity clay

Clayey sand



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory boring was drilled on 2/21/2008 using a 3 1/4-inch diameter continuous flight power auger. Rig is a ATV CME 45.
- 2. Groundwater levels recorded at time of drilling and rechecked the following day.
- 3. Surveyed boring locations and elevations were provided by Century Engineering.
- These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All SPT blow counts are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to I-95 Boring No.: R1-028

Contract: 25-113-01

Boring Location: Sta. 600+00.00, 45' Lt. C.L.

Boring Surface Elev.: +75.0' Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: 2 Type of: Split Barrel O.D. O.D.

IN. IN. U-Sampler: 3 Ball Sampler Core Bit: O.D.

To: To: **Casing Size:** 3 1/4 Inches From Depth of: Hollow Stem Auger: From Depth of: 0.0'

Water Level Readings

Depth of Water Time **Depth of Hole Depth of Casing** Elev. of Water Date 2/21/08 10.0 8.0' Dry

75.0 75.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 10.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dan Taylor

Helpers: D. Zmijewski

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks
	2/21/08	1	0.0'	1 3 6 6	Wet stiff brown clayey silt w/ some fine sand, trace of coarse sand. A-4(4) Cultivated Soil - 11".
		2	2.0'	8	14" RECOVERY Wet stiff brown fine sandy silt, trace of coarse A-4(0)
3			4.0'	8 7 8 8	sand and clay. 18" RECOVERY
		3	4.0'	2 3 6	Wet stiff gray clayey silt w/ some fine sand, trace of coarse sand and gravel.
6			6.0'	6	20" RECOVERY
		4	6.0'	6 9 13 14	Wet very stiff gray clay w/ some fine to coarse sand, trace of gravel. A-6(5)
			8.0'		22" RECOVERY
9		5	8.0'	6 9 11 12	Wet medium dense gray silty coarse to fine sand, trace of gravel. 19" RECOVERY
			10.0		Boring terminated at 10.0 feet
12					
15					

Remarks:

Symbol Description

Strata symbols

Low plasticity clay

Silt

Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory boring was drilled on 2/21/2008 using a 3 1/4-inch diameter continuous flight power auger. Rig is a ATV CME 45.
- 2. Groundwater levels recorded at time of drilling. Boring backfilled upon completion.
- 3. Surveyed boring locations and elevations were provided by Century Engineering.
- These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All SPT blow counts are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to I-95 Boring No.: R1-029

Contract: 25-113-01

Boring Location: Sta. 605.00.00, 122' Rt. C.L.

Boring Surface Elev.: + 77.0' Reference:

Wt. of Casing Hammer: Average Fall: IN. Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: IN. Lbs. 30 D-Sampler: S-Sampler: U-Sampler: 2 IN. Type of: Split Barrel O.D. IN. IN. O.D.

3 Ball Sampler Core Bit: O.D.

To: To: **Casing Size:** 3 1/4 Inches From Depth of: Hollow Stem Auger: From Depth of: 0.0'

Water Level Readings

Depth of Water Depth of Casing Time **Depth of Hole** Elev. of Water Date 2/21/08 14.0' 16.0 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 16.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dan Taylor

Helpers: D. Zmijewski

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. R	emarks
	2/21/08	1	0.0'	2 3 6 9	Wet stiff brown clayey silt, trace of fine to coarse sand. Cultivated	Soil - 11".
			2.0'	40	14" RECOVERY	
3		2	4.0'	10 15 17 20	Wet hard gray and brown silt w/ some clay, trace of fine to coarse sand. 24" RECOVERY	
		3	4.0'	4 7 11	Wet very stiff gray and brown clayey silt w/ A-4(3)	
6			6.0'	11	some fine sand, trace of coarse sand. 24" RECOVERY	
		4	6.0'	10	Wet very stiff brown fine sandy clay w/ some A-6(4)	
		4A	7.0' 7.0'	11 14	coarse sand. 10" RECOVERY A-2-4(0)	
			8.0'	14	Wet medium dense brown silty fine to coarse	
9		5	8.0'	5 8 7 11	sand, trace of gravel. 10" RECOVERY Wet medium dense orange clayey fine to coarse sand, trace of gravel. 19" RECOVERY	
		6	10.0'	8 13 14 11	Wet medium dense brown silty gravel and coarse sand w/ some fine sand. A-1-b	
12			12.0'		14" RECOVERY	
		7	12.0'	9 16 16 12	Wet dense brown silty fine sand w/ some A-2-4(0) coarse sand and gravel.	
			14.0'		16" RECOVERY	
15		8	14.0'	4 6 7 13	Wet medium dense brown silty fine to coarse A-2-4(0) sand, trace of gravel.	
			16.0'		20" RECOVERY	
					Boring terminated at 16.0	

Remarks:

Symbol Description

Strata symbols

Low plasticity clay



Silty low plasticity clay



Poorly graded clayey silty sand



Clayey sand



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory boring was drilled on 2/21/2008 using a 3 1/4-inch diameter continuous flight power auger. Rig is a ATV CME 45.
- Groundwater levels recorded at time of drilling and rechecked the following day.
- 3. Surveyed boring locations and elevations were provided by Century Engineering.
- These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All SPT blow counts are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to I-95 Boring No.: R1-030

Contract: 25-113-01

Boring Location: Sta. 610+00.00, 148' Lt. C.L.

Boring Surface Elev.: + 73.0' Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: 2 Type of: Split Barrel O.D. O.D.

IN. IN. U-Sampler: 3 Ball Sampler Core Bit: O.D.

To: To: **Casing Size:** 3 1/4 Inches From Depth of: Hollow Stem Auger: From Depth of: 0.0'

Water Level Readings

Depth of Water Depth of Casing Time **Depth of Hole** Elev. of Water Date 2/21/08 14.0' 16.0 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 16.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dan Taylor

Helpers: D. Zmijewski

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks	
	2/21/08	1	1.0' 2.0'	3 3	Wet firm brown clayey silt w/ some fine sand, A-4(6) Cultivated Soil - 12". trace of coarse sand.	
3		2	2.0'	3 5 4 6	Wet stiff brown clayey fine to coarse sandy silt, trace of gravel. A-4(1)	
		3	4.0	3 2 3 5	Wet firm orange fine sandy silt, trace of coarse sand. A-4(0)	
6			6.0'		21" RECOVERY	
		4	6.0	5 7 7 8	Wet medium dense orange and light brown fine sand w/ some silt, trace of coarse sand. A-2-4(0)	
			8.0'		18" RECOVERY	
9		5	8.0'	5 7 6	Wet medium dense orange and light brown silty fine sand w/ some coarse sand, trace of gravel. A-2-4(0) 22" RECOVERY	
		6	10.0'	7 10 8 9	Wet medium dense brown clayey fine to coarse sand, trace of gravel. A-2-5(0)	
12		<u> </u>	12.0'	7	11" RECOVERY	
		7	12.0'	7 8 10 9	Wet medium dense brown clayey fine to coarse sand, trace of gravel. 20" RECOVERY	
15		8	14.0'	11 9 10 11	Wet medium dense brown coarse to fine sand w/ some silt and gravel. 18" RECOVERY	
					Boring terminated at 16.0 feet	

Remarks:

Symbol Description

Strata symbols

Low plasticity clay

Clayey sand

silt

Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory boring was drilled on 2/21/2008 using a 3 1/4-inch diameter continuous flight power auger. Rig is a ATV CME 45.
- 2. Groundwater levels recorded at time of drilling and rechecked the following day.
- 3. Surveyed boring locations and elevations were provided by Century Engineering.
- These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All SPT blow counts are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to I-95 Boring No.: R1-031

Contract: 25-113-01

Boring Location: Sta. 615.00.00, 120' Rt. C.L.

Boring Surface Elev.: + 79.0' Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: 2 Type of: Split Barrel O.D. IN. IN. O.D. U-Sampler: 3 Ball Sampler

Core Bit: O.D.

To: To: **Casing Size:** 3 1/4 Inches From Depth of: Hollow Stem Auger: From Depth of: 0.0' 10.0'

Water Level Readings

Depth of Water Time **Depth of Hole Depth of Casing** Elev. of Water Date 2/21/2008 10.0 8.0' Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 10.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dan Taylor

Helpers: D. Zmijewski

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks	
	2/21/08	1	1.0' 2.0'	1 2 4	Saturated medium stiff brown clay with a trace of fine to coarse sand and gravel. 8" RECOVERY A 4(8) Cultivated Soil - 12".	
3		2	2.0'	1 2 4 5 3 5 5 4	8" RECOVERY Saturated stiff brown clay with some fine to coarse sand and a trace of gravel A-4(8)	
		3	4.0'	2 3 4 3	19" RECOVERY No Sieve Analysis: Indication of Saturated medium stiff brown clay with a trace of fine to coarse sand.	
6			6.0'		22" RECOVERY	
		4	6.0	4 5 6 6	Saturated stiff brown clayey fine to coarse sand with some gravel. A-6(2)	
			8.0'		21" RECOVERY	
9		5	10.0'	3 5 5 6	Wet medium dense orange silty fine to coarse sand with a trace of gravel. 20" RECOVERY	
					Boring terminated at 10.0 feet	
12						
12						
15						

Remarks:

Symbol Description

Strata symbols

Strata Symbols

Low plasticity clay

Clayey sand

Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory boring was drilled on 2/21/2008 using a 3 1/4-inch diameter continuous flight power auger. Rig is a ATV CME 45.
- 2. Groundwater levels recorded at time of drilling. Boring backfilled upon completion.
- 3. Surveyed boring locations and elevations were provided by Century Engineering.
- These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All SPT blow counts are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to I-95 Boring No.: R1-032

Contract: 25-113-01

Boring Location: Sta. 620+00.00, 45' Lt. C.L.

Boring Surface Elev.: +81.0' Reference:

IN. IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: 2 Type of: Split Barrel O.D. IN. IN. O.D. U-Sampler: 3 Ball Sampler

Core Bit: O.D.

To: To: **Casing Size:** 3 1/4 Inches From Depth of: Hollow Stem Auger: From Depth of: 0.0'

Water Level Readings

Depth of Water Time **Depth of Hole Depth of Casing** Elev. of Water Date 2/20/08 10.0 8.0' Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 10.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dan Taylor

Helpers: D. Zmijewski

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks
	2/20/08	1	0.8' 2.0'	3 3 4	Wet firm brown clay, trace of fine to coarse sand. 15" RECOVERY Cultivated Soil - 9".
3		2	2.0'	5 4 6 9	Wet stiff brown clayey silt, trace of fine to coarse sand and gravel. A-4(6)
			4.0'		24" RECOVERY
		3	4.0' 5.0'	5 5	Wet stiff brown clayey silt w/ some fine sand, A-4(3) trace of coarse sand and gravel.
6		3A	5.0' 6.0'	6	9" RECOVERY A-4(0) Wet stiff brown fine sandy silt w/ some
		4	6.0'	2 4 6	coarse sand, trace of gravel. 10" RECOVERY A-4(6)
			8.0'		Wet stiff brown clayey silt w/ some fine sand, trace of coarse sand. 24" RECOVERY
9		5	8.0'	3 5 7 7	Wet medium dense brown clayey coarse sand A-2-4(0) and gravel w/ some fine sand.
			10.0'	·	18" RECOVERY
					Boring terminated at 10.0 feet
12					
15					

Remarks:

Symbol Description

Strata symbols

Low plasticity clay



Silty low plasticity clay



Silty sand



Clayey sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory boring was drilled on 2/20/2008 using a 3 1/4-inch diameter continuous flight power auger. Rig is a ATV CME 45.
- 2. Groundwater levels recorded at time of drilling. Boring backfilled upon completion.
- 3. Surveyed boring locations and elevations were provided by Century Engineering.
- These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All SPT blow counts are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to I-95 Boring No.: R1-033

Contract: 25-113-01

Boring Location: Sta. 625+00.00, 45' Rt. C.L.

Boring Surface Elev.: + 74.0' Reference:

IN. IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: 2 Type of: Split Barrel O.D. O.D.

IN. IN. U-Sampler: 3 Ball Sampler Core Bit: O.D.

To: To: **Casing Size:** 3 1/4 Inches From Depth of: Hollow Stem Auger: From Depth of: 0.0'

Water Level Readings

Depth of Water Time **Depth of Hole Depth of Casing** Elev. of Water Date 2/20/08 10.0 8.0' Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 10.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dan Taylor

Helpers: D. Zmijewski

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks
	2/20/08	1	0.0'	1 3 3 4	Wet firm brown clayey silt, trace of fine to coarse sand. Cultivated Soil - 10".
			2.0'	2	14" RECOVERY
3		2	4.0'	2 4 5 4	Wet stiff brown clayey silt, trace of fine to coarse sand and gravel. 19" RECOVERY
		3	4.0'	6 7	Wet very stiff orange fine sandy silt, trace of A-4(0)
6			6.0'	9 9	gravel and coarse sand. 18" RECOVERY
		4	6.0'	7 9 10 9	Wet very stiff orange fine sandy silt. A-4(0)
			8.0'		20" RECOVERY
9		5	8.0'	4 8 8 20	Wet very stiff orange fine sandy silt, trace of gravel and coarse sand. A-4(0)
			10.0'		Boring terminated at 10.0 feet
12					
15					

Remarks:

Symbol Description

Strata symbols

Low plasticity clay

Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory boring was drilled on 2/20/2008 using a 3 1/4-inch diameter continuous flight power auger. Rig is a ATV CME 45.
- 2. Groundwater levels recorded at time of drilling. Boring backfilled upon completion.
- 3. Surveyed boring locations and elevations were provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All SPT blow counts are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to I-95 Boring No.: R1-034

Contract: 25-113-01

Boring Location: Sta. 635+00.00, 45' Lt. C.L.

Boring Surface Elev.: + 71.0' Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: 2 Type of: Split Barrel O.D. IN. IN. O.D. U-Sampler: 3 Ball Sampler

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0' 10.0'

Water Level Readings

Depth of Water Time **Depth of Hole Depth of Casing** Elev. of Water Date 3/4/08 10.0 8.0' Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Ft.; Dia. U-Sample Boring: U-Samples: 10.0 Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dan Taylor

Helpers: D. Zmijewski

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	3/4/08	1	1.0' 2.0'	3 4	Moist firm brown clayey silt, trace of fine to coarse sand.	A-4(7)	Cultivated Soil - 10".
3		2	2.0'	4 5 6 7	Moist stiff brown silt w/ some clay and fine to coarse sand, trace of gravel.	A-4(1)	
			4.0		18' RECOVERY		
		3	4.0	4 9 9 8	Moist medium dense light brown silty coarse sand w/ some fine sand, trace of gravel.	A-1-b	
6		4	6.0' 6.0'	7	19" RECOVERY Moist medium dense brown coarse sand w/	A-1-b	
		·		7 8 10 9	some silt, fine sand, and gravel.	A-1-0	
		5	8.0' 8.0'	8 11 12 12	20" RECOVERY Moist medium dense brown gravel and coarse	A-1-b	Sample contains rock
9				12	to fine sand w/ some silt.		fragments (gravel).
			10.0'		Boring terminated at 10.0 feet		
					Boring terminated at 10.0 feet		
12							
15							

Remarks:

Symbol Description

Strata symbols



Low plasticity clay



Silty low plasticity clay



Silty sand



Poorly graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory boring was drilled on 3/4/2008 using a 3 1/4-inch diameter continuous flight power auger. Rig is a ATV CME 45.
- 2. Groundwater levels recorded at time of drilling. Boring backfilled upon completion.
- 3. Surveyed boring locations and elevations were provided by Century Engineering.
- These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All SPT blow counts are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to I-95 Boring No.: R1-035

Contract: 25-113-01

Boring Location: Sta. 639+99.11, 45' Rt. C.L.

Boring Surface Elev.: + 65.0' Reference:

IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: 2 IN. Type of: Split Barrel O.D. IN. IN. O.D. 3 Ball Sampler

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0'

Water Level Readings

Depth of Water Time **Depth of Casing Depth of Hole** Elev. of Water Date 14.0' 3/4/08 16.0 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 16.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dan Taylor

Helpers: D. Zmijewski

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I.	Remarks
	3/4/08	1	1.0' 2.0'	4 4	Moist firm brown clayey silt, trace of fine A-4(7) sand.	Cultivated Soil - 11".
		2	2.0'	3 7	10" RECOVERY $A-4(0)$	
3			3.0'	/	Moist stiff brown silt w/ some gravel, coarse	
	N	2A	3.0' 4.0'	14	to fine sand, and clay. 7" RECOVERY Moist medium dense brown gravel and coarse	
		3	4.0	7 9 14 15	sand w/ some silt and fine sand. 7" RECOVERY	NG
6			6.0'	15	Wet very stiff brown fine sandy clay w/ some	
		4	6.0	8 6 9 14	coarse sand, trace of gravel. 11" RECOVERY Wet stiff brown fine sandy clay w/ some coarse sand and gravel. A-7-5(6)	
			8.0'		18" RECOVERY	
		5	8.0'	4 7 5 6	Wet stiff brown fine sandy clay w/ some coarse sand, trace of gravel.	
9				6		
			10.0'	2	12" RECOVERY	
		6	10.0'	3 3 5 7	Wet loose brown clayey coarse to fine sand w/ some gravel. A-2-5(0)	
12			12.0'		19" RECOVERY	
		7	12.0'	6 5 11 10	Wet medium dense brown clayey coarse to fine sand w/ some gravel. A-2-5(0)	
			14.0'		18" RECOVERY	
15		8	14.0'	2 13 7 5	Wet medium dense brown silty coarse to fine sand w/ some gravel.	
			16.0'		18" RECOVERY	
					Boring terminated at 16.0 feet	

Remarks:

Symbol Description

Strata symbols



Silty low plasticity clay



Poorly graded clayey silty sand



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory boring was drilled on 3/4/2008 using a 3 1/4-inch diameter continuous flight power auger. Rig is a ATV CME 45.
- 2. Groundwater levels recorded at time of drilling and rechecked the following day.
- 3. Surveyed boring locations and elevations were provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All SPT blow counts are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to I-95 Boring No.: R1-036

Contract: 25-113-01

Boring Location: Sta. 645+00.00, 99' Lt. C.L.

Boring Surface Elev.: + 68.0' Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: 2 Type of: Split Barrel O.D. IN. IN. O.D. U-Sampler: 3 Ball Sampler

Core Bit: O.D.

To: To: **Casing Size:** 3 1/4 Inches From Depth of: Hollow Stem Auger: From Depth of: 0.0'

Water Level Readings

Depth of Water Time **Depth of Casing Depth of Hole** Elev. of Water Date 14.0' 3/4/08 16.0 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 16.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dan Taylor

Helpers: D. Zmijewski

Б	5 "			1		
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks	
	3/4/08	1	1.0'	3 3	Wet firm brown clay, trace of fine sand and A-6(12) Cultivated Soil - 12".	
			2.0'		gravel.	
		2	2.0'	3 4 5 4	Wet stiff brown clayey silt, trace of fine to A-4(8)	
3				5 4	coarse sand.	
	N.	14	4.0		18' RECOVERY	
		3	4.0	2	Wet medium dense brown clayey gravel w/ A-2-6(0) Sample contains rock	
		A .		2 4 12 12	some fine to coarse sand.	
				12	The some time to course suite.	
6			6.0'		23" RECOVERY	
		4	6.0	15 15 22 21	Wet dense brown clayey gravel and coarse A-2-6(0) Sample contains rock	
				22 21	sand w/ some fine sand. fragments.	
				1		
			8.0'		21" RECOVERY	
		5	8.0'	14 17 19 12	Wet dense brown clayey gravel and coarse A-2-7(0) Sample contains rock	
9				19 12	sand w/ some fine sand. fragments.	
			10.0'	0	17" RECOVERY	
		6	10.0'	9 11 12 16	Wet medium dense brown clayey gravel and A-2-6(0)	
				16	fine to coarse sand.	
12		7	12.0'	4	23" RECOVERY	
		7	12.0'	4 6 8 10	Wet medium dense orange and brown clayey A-2-7(1)	
				10	coarse sand and gravel w/ some fine sand.	
			14.0' 14.0'	3	19" RECOVERY	
		8	14.0	3 9 7 9	Wet medium dense orange and brown clayey A-2-7(0)	
15				9	coarse to fine sand w/ some gravel.	
			40.01			
			16.0'		19" RECOVERY	
					Boring terminated at 16.0 feet	
	l			1		

Remarks:

Symbol Description

Strata symbols

DOLUCE DYNAGE.

Low plasticity clay

Clayey sand

Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory boring was drilled on 3/4/2008 using a 3 1/4-inch diameter continuous flight power auger. Rig is a ATV CME 45.
- 2. Groundwater levels recorded at time of drilling and rechecked the following day.
- 3. Surveyed boring locations and elevations were provided by Century Engineering.
- These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All SPT blow counts are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to I-95 Boring No.: R1-037

Contract: 25-113-01

Boring Location: Sta. 650+00.00, 57' Rt. C.L.

Boring Surface Elev.: + 65.0' Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: 2 Type of: Split Barrel O.D. IN. IN. O.D. 3 Ball Sampler

U-Sampler: Core Bit: O.D.

To: To: **Casing Size:** 3 1/4 Inches From Depth of: Hollow Stem Auger: From Depth of: 0.0'

Water Level Readings

Depth of Casing Depth of Water Time **Depth of Hole** Elev. of Water Date 13.0' 3/4/08 15.0 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 15.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dan Taylor

Helpers: D. Zmijewski

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks
	3/4/08	Bulk 1	1.0' 2.0'	3 4	Wet brown fine to coarse sandy lean clay. Wet firm brown clay, trace of fine sand. 9" RECOVERY A-6(10) Cultivated Soil - 11". A-6(11) A-4(7)
3		2	2.0'	5 5 6 8	Wet stiff brown clayey silt, trace of fine to coarse sand. A-4(7)
			4.0'		18" RECOVERY
		3	4.0' 5.0'	2 4	Wet loose brown clayey fine to coarse sand, A-2-4(0) trace of gravel.
6		ЗА	5.0' 6.0'	6 11	10" RECOVERY Wet very stiff brown silt w/ some clay, fine to A-4(1)
		4	6.0	26 38 44 22	coarse sand, and gravel. 10" RECOVERY Wet very dense light brown gravel w/ some
			8.0'	10	silt and coarse to fine sand. 8" RECOVERY
9		5	8.0'	15 24 28 27	No recovery.
J			10.0'	21	0" RECOVERY
			10.0		O RECOVERT
12					
		6	13.0'	12 8 5 8	Wet medium dense brown silty coarse sand A-2-4(0) w/ some fine sand and gravel.
15			15.0'		17" RECOVERY
10					Boring terminated at 15.0 feet

Remarks:

Symbol Description

Strata symbols

Low plasticity clay

Silt

Clayey sand



Silty low plasticity clay



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory boring was drilled on 3/4/2008 using a 3 1/4-inch diameter continuous flight power auger. Rig is a ATV CME 45.
- 2. Groundwater levels recorded at time of drilling. Boring backfilled upon completion.
- 3. Surveyed boring locations and elevations were provided by Century Engineering.
- These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All SPT blow counts are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to I-95 Boring No.: R1-038

Contract: 25-113-01

Boring Location: Sta. 655+00.00, 45' Lt. C.L.

Boring Surface Elev.: + 63.0' Reference:

IN. IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: 2 Type of: Split Barrel O.D. IN. IN. O.D. U-Sampler: 3 Ball Sampler

Core Bit: O.D.

To: To: **Casing Size:** 3 1/4 Inches From Depth of: Hollow Stem Auger: From Depth of: 0.0'

Water Level Readings

Depth of Casing Depth of Water Time **Depth of Hole** Elev. of Water Date 13.0' 3/3/08 15.0 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 15.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dan Taylor

Helpers: D. Zmijewski

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks
	3/3/08	1	1.0' 2.0'	3 5	Wet firm brown clayey silt, trace of fine to coarse sand. Cultivated Soil - 10".
3		2	2.0'	3 4 5 5	Wet stiff brown silt w/ some clay, trace of fine to coarse sand and gravel. A-4(4)
			4.0'		20" RECOVERY
		3	4.0	4 4 4 9	Wet loose brown clayey fine to coarse sand, A-2-4(0) trace of gravel.
6			6.0'		18" RECOVERY
		4	6.0'	8 9 11 11	Wet medium dense orange and brown gravel A-2-4(0) w/ some fine to coarse sand and silt.
			8.0'		20" RECOVERY
9		5	8.0'	7 8 9 10	Wet medium dense orange and brown gravel and fine sand w/ some coarse sand and silt.
			10.0'		20" RECOVERY
12					
		6	13.0'	2 7 8 4	Wet medium dense orange and brown gravel and coarse sand w/ some silt and fine sand. A-1-b
15			15.0'		16" RECOVERY
					Boring terminated at 15.0 feet
1					

Remarks:

Symbol Description

Strata symbols

Low plasticity clay

Silt

Clayey sand

Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory boring was drilled on 3/3/2008 using a 3 1/4-inch diameter continuous flight power auger. Rig is a ATV CME 45.
- 2. Groundwater levels recorded at time of drilling. Boring backfilled upon completion.
- 3. Surveyed boring locations and elevations were provided by Century Engineering.
- These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All SPT blow counts are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to I-95 Boring No.: R1-039

Contract: 25-113-01

Boring Location: Sta. 660+00.00, 127' Rt. C.L.

Boring Surface Elev.: + 52.0' Reference:

Wt. of Casing Hammer: Average Fall: IN. Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: IN. Lbs. 30 D-Sampler: S-Sampler: U-Sampler: 2 IN. Type of: Split Barrel O.D. O.D.

IN. IN. 3 Ball Sampler Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0'

Water Level Readings

Depth of Water Time **Depth of Casing Depth of Hole** Elev. of Water Date 14.0' 3/3/08 16.0 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 16.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dan Taylor

Helpers: D. Zmijewski

Donth	Doily	I	Comple			
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks	
	3/3/08	1	0.8'	3 6 7	Moist medium dense brown gravel w/ some A-1-b Cultivated Soil - 9".	
			2.0'		12" RECOVERY	
		2	2.0'	2 3 4	Moist loose brown fine to coarse sand w/ A-2-4(0)	
3				5	some silt, trace of gravel.	
			4.0'		16" RECOVERY	
		3	4.0'	5 7 6 8	Moist medium dense light brown coarse to A-2-4(0)	
				6 8	fine sand w/ some silt, trace of gravel.	
6			6.0		18" RECOVERY	
		4	6.0'	5 5 5 18	Moist loose light brown coarse to fine sand w/ A-1-b	
				5 18	some silt and gravel.	
					(5) (4) (5) (4) (4) (4) (4) (4) (4) (4) (4) (4) (4	
		5	8.0' 8.0'	5	19" RECOVERY	
			0.0	5 7 8 10	Wet medium dense brown silty fine to coarse A-2-4(0) sand, trace of gravel.	
9				10	Saild, trace of graver.	
			10.0'		21" RECOVERY	
		6	10.0'	5 10 11	Wet very stiff brown fine to coarse sandy silt, A-5(0)	
				11 15	trace of gravel.	
12		7	12.0' 12.0'	11	24" RECOVERY	
		′	12.0	11 12 14 13	Wet very stiff brown fine to coarse sandy silt A-4(0) w/ some gravel.	
				13	w/ Some graver.	
			14.0'		19" RECOVERY	
		8	14.0'	5 7	Wet medium dense brown fine to coarse sand, A-3	
15				11 10	trace of silt and gravel.	
					68 (64) (6) (63) (7) (6) (64) (7) (6)	
			16.0'		20" RECOVERY	
					Boring terminated at 16.0 feet	
1	I					

Remarks:

Symbol Description

Strata symbols

Silty gravel



Silty sand



Poorly graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory boring was drilled on 3/3/2008 using a 3 1/4-inch diameter continuous flight power auger. Rig is a ATV CME 45.
- 2. Groundwater levels recorded at time of drilling and rechecked the following day.
- 3. Surveyed boring locations and elevations were provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All SPT blow counts are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to I-95 Boring No.: R1-040

Contract: 25-113-01

Boring Location: Sta. 680+00.00, 45' Rt. C.L.

Boring Surface Elev.: + 56.0' Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: 2 Type of: Split Barrel O.D. IN. IN. O.D. U-Sampler: 3 Ball Sampler

Core Bit: O.D.

To: To: **Casing Size:** 3 1/4 Inches From Depth of: Hollow Stem Auger: From Depth of: 0.0'

Water Level Readings

Depth of Casing Depth of Water Time **Depth of Hole** Elev. of Water Date 13.0' 3/3/08 15.0 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 15.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dan Taylor

Helpers: D. Zmijewski

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks
3	3/3/08	Bulk 1 2	1.0' 2.0' 2.0'	3 4 3 4 5 5	Moist brown fine to coarse sandy lean clay. Wet firm brown clayey silt, trace of fine sand. 12" RECOVERY Wet stiff brown clayey silt, trace of fine to coarse sand. A-6(5) A-4(6) A-4(6)
			4.0'		coarse sand. 23' RECOVERY
	l '	3	4.0	3 5 5 8	Wet stiff brown silt w/ some fine to coarse sand, trace of gravel.
6			6.0'		24" RECOVERY
		4	6.0'	7 8 10 11	Wet very stiff brown fine sandy gravelly silt w/some clay and coarse sand.
			8.0'	'	20" RECOVERY
9		5	8.0'	3 5 9 9	Wet very stiff brown clay w/ some fine sand, trace of coarse sand. A-6(9)
			10.0'		24" RECOVERY
			1		
12					
		6	13.0'	4 4 6 10	Wet stiff brown clayey fine sandy silt, trace of coarse sand and gravel. A-4(4)
15			15.0'		24" RECOVERY
15			15.0		Boring terminated at 15.0 feet

Remarks:

Symbol Description

Strata symbols

Silt

Low plasticity clay

Poorly graded clayey silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory boring was drilled on 3/3/2008 using a 3 1/4-inch diameter continuous flight power auger. Rig is a ATV CME 45.
- 2. Groundwater levels recorded at time of drilling. Boring backfilled upon completion.
- 3. Surveyed boring locations and elevations were provided by Century Engineering.
- These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All SPT blow counts are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to I-95 Boring No.: R1-041

Contract: 25-113-01

Boring Location: Sta. 685+00.00, 120' Lt. C.L.

Boring Surface Elev.: + 44.0' Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: 2 Type of: Split Barrel O.D. IN. IN. O.D. U-Sampler: 3 Ball Sampler

Core Bit: O.D. **Casing Size:** 3 1/4 Inches From Depth of:

To: To: Hollow Stem Auger: From Depth of: 0.0'

Water Level Readings

Depth of Water Time **Depth of Casing Depth of Hole** Elev. of Water Date 14.0' 3/3/08 16.0 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 16.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dan Taylor

Helpers: D. Zmijewski

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
	3/3/08	1	1.0' 2.0'	3 3		Wet firm brown clayey silt, trace of fine to coarse sand.	A-4(7)	Cultivated Soil - 11".
		2	2.0'	3 4		11" RECOVERY	A-4(3)	
3				3 4 5 4		Wet stiff brown silt w/ some clay, trace of fine to coarse sand.		
		1	4.0'			21" RECOVERY		
		3	4.0	4 4 6 10		Wet stiff brown silt w/ some clay and coarse	A-4(1)	
	•			10		to fine sand, trace of gravel.		
6			6.0'			23" RECOVERY		
		4	6.0'	9 11 10		Wet very stiff brown clayey silt, trace of fine	A-1-b	
				10 8		to coarse sand.		
			8.0'			18" RECOVERY		
		5	8.0'	4 5 6 7		Wet medium dense brown coarse sand w/	A-1-b	3" clay lens at 8.5'
9				7		some silt and fine sand, trace of gravel.		
			10.0'	_		18" RECOVERY		
		6	10.0'	5 8 8 7		Wet medium dense brown coarse sand w/ some silt, trace of fine sand and gravel.	A-1-b	
				7		some sin, trace of time sailt and graver.		
12			12.0'	-		24" RECOVERY		
		7	12.0'	5 6 6 5	6644-1664 86919-864 8619-864	Wet medium dense brown coarse sand, trace of silt, fine sand, and gravel.	A-1-b	
				5	11.00 10.00 11.00 10.00 11.00 10.00	or sirt, time sailed, and graver.		
			14.0'	6	100 13.300 f. 100 1 7 2 2 2 2 100 1 3 2 2 2 2 2	22" RECOVERY		
15		8	14.0'	6 6 11 9		Wet medium dense brown coarse sand and gravel w/ some silt and fine sand.	A-1-b	
13				9		graver we some our and time said.		
			16.0'			21" RECOVERY		
						Boring terminated at 16.0 feet		

Remarks:

Symbol Description

Strata symbols

Low plasticity clay



Silt



Silty low plasticity clay



Silty sand



Poorly graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory boring was drilled on 3/3/2008 using a 3 1/4-inch diameter continuous flight power auger. Rig is a ATV CME 45.
- 2. Groundwater levels recorded at time of drilling and rechecked the following day.
- 3. Surveyed boring locations and elevations were provided by Century Engineering.
- These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All SPT blow counts are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to I-95 Boring No.: R1-042

Contract: 25-113-01

Boring Location: Sta. 695+00.00, 128' Rt. C.L.

Boring Surface Elev.: + 39.0' Reference:

IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: 2 IN. Type of: Split Barrel O.D. IN. IN. O.D. 3 Ball Sampler

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0'

Water Level Readings

Depth of Water Time **Depth of Casing Depth of Hole** Elev. of Water Date 14.0' 3/3/08 16.0 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 16.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dan Taylor

Helpers: D. Zmijewski

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Ren	narks
	3/3/08	1	0.8' 2.0'	1 1 4	Moist firm brown clayey coarse sandy silt w/ A-4(0) Cultivated So some fine sand and gravel. 9" RECOVERY	il - 9".
		2	2.0'	3	Moist very loose coarse sand w/ some fine A-1-b	
3		2A	2.5' / 2.5' 4.0'	4 4 6	sand, silt, and gravel. 5" RECOVERY Moist stiff brown clay w/ some coarse sand,	
		3	4.0'	3 6 9 12	trace of fine sand. 15" RECOVERY Moist stiff brown clay w/ some fine sand,	
6			6.0		trace of gravel and coarse sand. 12" RECOVERY	
		4	6.0'	10 9 6 5	Moist medium dense light brown coarse sand w/ some fine sand and silt, trace of grayel.	
			8.0'		20" RECOVERY	
9		5	8.0'	5 5 7 7	Moist medium dense light brown coarse to fine sand w/ some silt, trace of gravel.	
			10.0'		18" RECOVERY	
		6	10.0'	7 6 7 12	Moist medium dense light brown coarse to fine sand w/ some silt, trace of gravel.	
12			12.0'		20" RECOVERY	
		7	12.0'	8 5 6 5	Wet medium dense light brown coarse to fine sand, trace of silt and gravel.	
		8	14.0' 14.0'	5	18" RECOVERY	
15		0	14.0	5 3 3 2	Wet loose light brown coarse to fine sand w/ A-2-4(0) some silt, trace of gravel.	
			16.0'		21" RECOVERY	
					Boring terminated at 16.0 feet	

Remarks:

Symbol Description

Strata symbols

Poorly graded clayey silty sand



Silty sand



Low plasticity clay



Poorly graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory boring was drilled on 3/3/2008 using a 3 1/4-inch diameter continuous flight power auger. Rig is a ATV CME 45.
- 2. Groundwater levels recorded at time of drilling and rechecked the following day.
- 3. Surveyed boring locations and elevations were provided by Century Engineering.
- These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All SPT blow counts are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to I-95 Boring No.: R1-043

Contract: 25-113-01

Boring Location: Sta. 700+00.00, 45' Lt. C.L.

Boring Surface Elev.: + 41.0' Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: IN. Lbs. 30 D-Sampler: S-Sampler: U-Sampler: 2 IN. Type of: Split Barrel O.D. O.D.

IN. IN. 3 Ball Sampler Core Bit: O.D.

To: To: **Casing Size:** 3 1/4 Inches From Depth of: Hollow Stem Auger: From Depth of: 0.0' 10.0'

Water Level Readings

Depth of Water Time **Depth of Hole Depth of Casing** Elev. of Water Date 3/3/08 10.0 8.0' Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Ft.; Dia. U-Sample Boring: U-Samples: 10.0 Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dan Taylor

Helpers: D. Zmijewski

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	3/3/08	1	1.0' 2.0'	3 4	Moist firm brown clay w/ some coarse to fine sand, trace of gravel.	A-6(6)	Cultivated Soil - 10".
3		2	2.0'	3 6 9 12	Moist stiff brown clayey fine to coarse sandy	A-4(0)	
3	N	1/	4.0'	12	silt, trace of gravel. 18" RECOVERY		
		3	4.0'	9 12 17 7	Moist medium dense brown gravel and coarse sand w/ some silt and fine sand.	A-1-b	\mathbf{U}
6			6.0'		15" RECOVERY		
		4	6.0	5 6 7 12	Moist medium dense light brown and brown silty fine sand w/ some coarse sand and gravel.	A-2-4(0)	
			8.0'		15" RECOVERY		
9		5	8.0'	6 11 11 12	Moist medium dense light brown coarse sand w/ some fine sand and silt, trace of gravel.	A-1-b	4" clay lens at 9.8 ft.
			10.0'				
					Boring terminated at 10.0 feet		
12							
15							

Remarks:

Symbol Description

Strata symbols

Low plasticity clay



Poorly graded clayey silty sand



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory boring was drilled on 3/3/2008 using a 3 1/4-inch diameter continuous flight power auger. Rig is a ATV CME 45.
- Groundwater levels recorded at time of drilling. Boring backfilled upon completion.
- 3. Surveyed boring locations and elevations were provided by Century Engineering.
- These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All SPT blow counts are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to I-95 Boring No.: R1-044

Contract: 25-113-01

Boring Location: Sta. 705+00.00, 16' Rt. C.L.

Boring Surface Elev.: + 48.0' Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: IN. Lbs. 30 D-Sampler: S-Sampler: U-Sampler: 2 IN. Type of: Split Barrel O.D. IN. IN. O.D.

3 Ball Sampler Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0' 10.0'

Water Level Readings

Depth of Water Time **Depth of Hole Depth of Casing** Elev. of Water Date 3/3/08 10.0 8.0' Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 10.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dan Taylor

Helpers: D. Zmijewski

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	3/3/08	1	0.0'	1 3 4 4	Moist loose brown clayey coarse sand w/ some fine sand and gravel.	A-2-4(0)	Cultivated Soil - 10".
	_	2	2.0'	6_	12" RECOVERY Moist medium dense brown silty coarse to	A-1-b	_
3			4.0'	6 10 10 12	fine sand w/ some gravel. 21" RECOVERY		IG
		3	4.0'	6 7 8 9	Wet medium dense brown silty coarse to fine sand, trace of gravel.	A-2-4(0)	
6			6.0'		22" RECOVERY		
		4	6.0'	6 5 4	Wet medium dense brown fine to coarse sand w/ some silt and gravel.	A-2-4(0)	
			8.0'	4	20" RECOVERY		
9		5	8.0'	4 5 4 6	Wet loose brown fine to coarse sand w/ some silt, trace of gravel. 24" RECOVERY	A-2-4(0)	
			10.0		Boring terminated at 10.0 feet		
					-		
12							
15							

Remarks:

Symbol Description

Strata symbols



Poorly graded clayey silty sand



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory boring was drilled on 3/3/2008 using a 3 1/4-inch diameter continuous flight power auger. Rig is a ATV CME 45.
- 2. Groundwater levels recorded at time of drilling. Boring backfilled upon completion.
- 3. Surveyed boring locations and elevations were provided by Century Engineering.
- These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All SPT blow counts are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to I-95 Boring No.: R1-045

Contract: 25-113-01

Boring Location: Sta. 719+00.00, 65' Lt. C.L.

Boring Surface Elev.: + 53.0' Reference:

IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: 2 IN. Type of: Split Barrel O.D. IN. IN. O.D. 3 Ball Sampler

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0'

Water Level Readings

Depth of Water Time **Depth of Casing Depth of Hole** Elev. of Water Date 14.0' 3/3/08 16.0 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 16.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dan Taylor

Helpers: D. Zmijewski

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks	
	3/3/08	1	1.0'	2 3	Moist firm brown clayey silt w/ some fine to A-4(5) Cultivated Soil - 10	' .
		2	2.0'	4	coarse sand, trace of gravel. 10" RECOVERY A-1-b	
		_	2.0	4 7 9 12	Moist medium dense brown silty coarse sand	
3				12	w/ some fine sand, trace of gravel.	
	l N		4.0'		14" RECOVERY	
		3	4.0'	11 10	Moist medium dense brown and light brown A-1-b	
	•	,		11 10 9 8	silty coarse sand, trace of gravel.	
6			6.0'		18" RECOVERY	
		4	6.0	6 6 4 2	Moist loose brown and light brown fine to A-2-4(0)	
				2	coarse sand w/ some silt, trace of gravel.	
			8.0'		20" RECOVERY	
		5	8.0'	6	Moist loose brown and light brown silty fine A-2-4(0)	
9				6 2 3 3	to coarse sand, trace of gravel.	
				3	To Course suits, trace of graver	
			10.0'		19" RECOVERY	
		6	10.0'	3 6	Moist medium dense brown and light brown A-1-b	
				3 6 7 5	gravel and fine sand w/ some coarse sand and	
					silt.	
12			12.0'		18" RECOVERY	
		7	12.0'	5 7 8 9	Moist medium dense brown gravel and coarse A-1-b	
				9	sand w/ some silt and fine sand.	
			14.0'		17" RECOVERY	
		8	14.0'	7	Moist medium dense brown coarse to fine A-1-b	
15				7 7 6 7	sand and gravel w/ some silt.	
.,				'		
			16.0'		18" RECOVERY	
					Boring terminated at 16.0 feet	

Remarks:

Symbol Description

Strata symbols

Low plasticity clay



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory boring was drilled on 3/3/2008 using a 3 1/4-inch diameter continuous flight power auger. Rig is a ATV CME 45.
- 2. Groundwater levels recorded at time of drilling and rechecked the following day.
- 3. Surveyed boring locations and elevations were provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All SPT blow counts are uncorrected.

39.0

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: R1-046

Contract: 25-113-01

Boring Location: Sta. 460+00, 100.00' Lt. C.L.

Boring Surface Elev.: + 65.80' Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: IN. Lbs. 30 D-Sampler: S-Sampler: U-Sampler: IN. Type of: Split Spoon O.D. 2 IN. IN. O.D. Core Bit: O.D. IN.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches

Hollow Stem Auger: 0.0

Water Level Readings

Depth of Casing Time Depth of Hole **Depth of Water** Elev. of Water Date 2/27/09 11.2 12.0 12.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 40.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** J. Truver

Helpers: J. Lafferty

Depth	Daily	l	Sample		T			
(ft.)	Progress	No.	Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
	2/27/09	1	0.5'	3 3 3		Moist firm brown silt w/ some clay, trace of	A-4(3)	Topsoil - 5".
				3		fine to coarse sand.		
	_		2.0'	2	MM	17" RECOVERY		
		2	2.0'	3 4 8		Moist medium dense brown coarse to fine	A-1-b	
3				8 9		sand w/ some silt, trace of gravel.		
		M	4.0			22" RECOVERY		
		3	4.0'	2 2		Moist soft brown clayey gravelly silt w/ some	A-4(1)	
				2 2 2 3		fine sand, trace of coarse sand.	. ,	
						DI LOT OO		
6			6.0'	0		18" RECOVERY	16	
		4	6.0'	6 6 6		Moist medium dense tan coarse sand w/ some	A-1-b	
			_	8		silt and fine sand, trace of gravel.		
			8.0'			20" RECOVERY		
	-	5	8.0'	1		Moist medium dense tan coarse to fine sand	A-1-b	
9				1 5 7 7		w/ some silt, trace of gravel.	11 1 0	
	1			,				
			10.0'			21" RECOVERY		
		6	10.0'	7 9	100 (100 f.) 100 (100 f.)	Moist medium dense brown gravel and coarse	A-1-b	
				10 11	1217121 1217121	sand w/ some silt, trace of fine sand.		
l			40.0		(1131) (1131) (1131) (1131)	2011 DE GOLVEDA		
12	-	7	12.0' 12.0'	9		20" RECOVERY Indication of moist medium dense brown		No sieve analysis.
		′	12.0	9 14 13 13		gravel and coarse sand, trace of clay and fine		Two sieve unarysis.
	1			13		sand.		
			14.0'			17" RECOVERY		
	1	8	14.0'	11 9	-061143166 201143166 061133166	Indication of moist medium dense orange silty		No sieve analysis.
15				11 9 7 7	1:::::::::::::::::::::::::::::::::::::	sand w/ some gravel.		
					privide Granace Granace			
			16.0'			3" RECOVERY		
		9	16.0'	6 6 8 9		Wet medium dense orange, green, and brown	A-2-6(0)	
				9		clayey gravel and fine sand w/ some coarse		

Remarks:

STATE OF DELAWARE DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 **Contract:** 25-113-01

Boring No.: R1-046

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
18			18.0'		sand. 16" RECOVERY		
		10	18.0' 20.0'	3 4 5 6	Saturated stiff green and brown fine sandy clay, trace of gravel and coarse sand. 15" RECOVERY	A-7-6(3)	
21							
24							
		11	24.0'	3 6 8 10	Saturated stiff green and brown clayey fine sandy silt, trace of coarse sand.	A-4(0)	
			26.0'		22" RECOVERY		
27					DRAFT		
30		12	29.0'	4 7 8 10	Saturated medium dense green fine sand w/some silt and coarse sand, trace of organic matter and gravel. 21" RECOVERY	A-2-4(0)	Glauconitic.
33			A	l	GUST 20	15	
200		13	34.0'	W/H 6 9 11	Saturated medium dense green fine to coarse sand w/ some silt, trace of organic matter and gravel.	A-2-4(0)	Glauconitic.
36			30.0		21" RECOVERY		
39							
		14	39.0'	5 7 9 10	Saturated medium dense green clayey fine to coarse sand w/ some organic matter and gravel.	A-2-4(0)	Glauconitic.
			41.0'		End of Boring		
42					<u>-</u>		
45							

Symbol Description

Strata symbols



Silty low plasticity clay



Silty sand



Poorly graded sand with silt



Clayey sand



Poorly graded clayey silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 2/27/2009 using a 3 1/4-inch diameter hollow stem auger. Rig is a ATV CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

14.0

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: R1-047

Contract: 25-113-01

Boring Location: Sta. 465+00, 100.00' Rt. C.L.

Boring Surface Elev.: + 60.5' Reference:

IN. IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Spoon O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches **Hollow Stem Auger:** 0.0

Water Level Readings

Depth of Casing Time **Depth of Water Depth of Hole** Elev. of Water Date 10.0 3/6/09 10.0 8.6

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 58.9 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** J. Truver

Helpers: D. Zmijewski

Danti	Deily	I	Coment-			
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I.	Remarks
	3/6/09	1	0.5'	2 3 2	Moist loose tan silty fine to coarse sand w/ A-2-4(0)	Forrest Duff - 4".
]			2	some gravel.	
			2.0'		7" RECOVERY	
		2	2.0'	5 11 11 6	Moist medium dense orange gravel w/ some A-1-b	
3				6	fine to coarse sand and silt.	
			4.0			
		3	4.0' 4.0'	5	13" RECOVERY Wet stiff brown fine sandy clay w/ some A-7-6(3)	N U
				5 6 6	coarse sand.	
	1			ь		
6			6.0'		13" RECOVERY	
		4	6.0'	4 4 6	Wet stiff brown fine sandy clay w/ some A-7-6(3)	
				5	coarse sand.	
		5	8.0' 8.0'	3	17" RECOVERY	
			0.0	3 4 4 5	Saturated firm brown fine sandy clay w/ some coarse sand, trace of organic matter. A-6(2)	
9				5	coarse saile, trace or organic matter.	
			10.0'		15" RECOVERY	
	1	6	10.0'	3 4	Saturated loose brown clayey fine sand w/ A-2-4(0)	
				3 4 6 7	some coarse sand.	
12			12.0'	2	13" RECOVERY	
		7	12.0'	3 4 5 5	Saturated stiff brown fine sandy clay, trace of A-7-6(3)	
				5	coarse sand.	
			14.0'		17" RECOVERY	
		8	14.0'	3	Saturated firm brown-orange fine sandy clay, A-7-6(4)	Started mud rotary at 14.0'.
15				3 3 5 7	trace of coarse sand.	Surrou mad rouny at 14.0.
10	1			'		
			16.0'		16" RECOVERY	
		9	16.0'	2 3 5 6	Saturated firm brown-orange fine sandy clay, A-7-6(3)	
				5 6	trace of coarse sand.	

Remarks:

STATE OF DELAWARE DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 **Contract:** 25-113-01

Boring No.: R1-047

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
18			18.0'			12" RECOVERY		
10		10	18.0'	3 5 7 10		Saturated stiff brown-orange fine sandy clay, trace of coarse sand.	A-6(4)	
				10				
			20.0'			24" RECOVERY		
21								
24								
		11	24.0'	3 4 5 7		Saturated loose dark green silty fine to coarse	A-2-4(0)	
				7		sand, trace of organic matter and gravel.		
			26.0'			24" RECOVERY		
27						$\square \square \square \wedge \square \square$		
		12	29.0'	4		Saturated medium dense dark green fine to	A-2-4(0)	
30			25.0	4 6 7 10		coarse sand w/ some silt, trace of organic	A-2-4(0)	
00		V 1		10		matter and gravel.		
			31.0'		-	23" RECOVERY		
			_					
						4UST 20	15	
33				1		JUUI 20		
		13	34.0'	7 7		Saturated medium dense dark green organic	A-2-4(0)	
				16 15		silty fine to coarse sand, trace of gravel.	. ,	
			00.01			AND DESCRIPTIVE		
36			36.0'			20" RECOVERY		
39								
		14	39.0'	5 4 7 11		Saturated medium dense dark green coarse to	A-2-4(0)	
				11		fine sand w/ some silt and gravel, trace of organic matter.		
			41.0'			14" RECOVERY		
42								
		15	44.0'	6			A 0 4/0	
45		15	44.0	6 13 25 29		Saturated dense dark gray silty fine to coarse sand, trace of organic matter and gravel.	A-2-4(0)	
45				29		sand, trace of organic matter and gravel.		
			1		Nete191919191	1		ı

STATE OF DELAWARE DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 **Contract:** 25-113-01

Boring No.: R1-047

	act: 25-113	-01				
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./	G.I. Remarks
48			46.0'		24" RECOVERY	
51		16	49.0'	18 23 50/4"	Saturated very dense dark gray fine to coarse sand w/ some silt, trace of gravel. 12" RECOVERY	0)
54		17	54.0' 55.0'	45 50/3"	Saturated very dense dark gray fine sand w/ some silt and coarse sand, trace of gravel. 9" RECOVERY A-2-4	0)
57		18	59.0' 60.0'	39 50/5"	Saturated very dense dark gray fine sand w/ some coarse sand and silt, trace of gravel. 8" RECOVERY	NG
63			A	\U	End of Boring	5
66						
69						
72						

Symbol Description

Strata symbols

Silty sand



Clayey sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 3/6/2009 using a 3 1/4-inch diameter hollow stem auger. Rig is a Track CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: R1-048

Contract: 25-113-01

Boring Location: Sta. 540+00, 70.00' Lt. C.L.

Boring Surface Elev.: + 69.92' Reference:

IN. IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Spoon O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Depth of Water Time **Depth of Casing Depth of Hole** Elev. of Water Date 3/23/09 13.0 14.0 14.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 40.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** D. Burt

Helpers:

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class.	/G.I. Remarks
	3/23/09	1	0.0'	2 3 4 6	Moist firm light brown fine sandy silt w/ A-4 some coarse sand and clay, trace of gravel.	(0) Topsoil - 2".
			2.0'	6	22" RECOVERY	
3			4.0'	6 8 8 10	Moist medium dense light brown and orange silty fine to coarse sand, trace of mica. 18" RECOVERY	NG
		3	4.0'	5 12 13	Moist medium dense dark brown coarse to fine sand w/ some silt, trace of gravel.	-b
6			6.0'	14	20" RECOVERY	5
		4	6.0'	15 13 13 12	Moist medium dense dark brown silty coarse A-1 to fine sand w/ some gravel.	-b
				12	to fine sand w/ some graver.	
			8.0'	7	16" RECOVERY	
9		5	8.0'	7 9 10 13	Moist medium dense light gray coarse to fine sand w/ some silt, trace of gravel.	-b
			10.0' 10.0'	10	23" RECOVERY	
		6	10.0	10 11 10 12	Moist medium dense light gray coarse sand w/ some fine sand and silt, trace of gravel.	-b
12			12.0'		24" RECOVERY	
		7	12.0'	4 4 6 7	Wet loose brown and black mottled coarse to fine sand w/ some silt and gravel.	-b
			14.0'		23" RECOVERY	
15		8	14.0'	5 5 3 3	Wet loose light brown gravel and fine sand w/ A-1 some silt and coarse sand.	-b
			16.0'		14" RECOVERY	
		9	16.0'	8 10 9	Indication of wet very stiff dark black clayey	No sieve analysis.

Remarks:

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 **Contract:** 25-113-01

Depth	Daily	No.	Sample	Blows/6"		Sample Description	Class./G.I.	Remarks
(ft.)	Progress	1,40.	Depth	9		·	01000./0.1.	Glauconitic.
						sandy silt.		Giauconiuc.
18			18.0'		Щ	6" RECOVERY		
		10	18.0'	8 9 11 9		Saturated very stiff dark black fine sandy	A-6(3)	Glauconitic.
				9		clay, trace of coarse sand and gravel.		
			20.0'			21" RECOVERY		
		11	20.0'	3 5		Saturated stiff dark black fine sandy clay,	A-6(2)	Glauconitic.
21				3 5 8 9		trace of coarse sand and gravel.	· /	
		40	22.0'			21" RECOVERY		
		12	22.0'	8 12 13 16		Saturated very stiff dark black fine sandy	A-6(5)	Glauconitic.
				16		clay, trace of coarse sand and gravel.		
24			24.0'			23" RECOVERY		
24		13	24.0'	5 7		Saturated stiff dark black fine sandy silt, trace	A-4(0)	Glauconitic.
				5 7 8 9		of coarse sand and gravel.	(-)	
						_		
			26.0'	40		23" RECOVERY		
		14	26.0'	12 13 18 22		Saturated hard dark black fine sandy clay,	A-6(3)	Glauconitic.
27				22		trace of coarse sand.		
			20.01			14 PECOVERY		
		15	28.0' 28.0'	3		14" RECOVERY Saturated stiff dark black fine sandy clay,	A-6(5)	
				3 4 6 10		trace of coarse sand and gravel.	11 0(3)	
				10)	
30		V '	30.0'			10" RECOVERY		
		16	30.0'	13 9		Saturated very stiff dark black fine sandy	A-7-6(4)	Glauconitic.
				14 17		clay, trace of coarse sand and gravel.		
			20.01			OLD ECONEDA	15	
		17	32.0' 32.0'	3 5		9" RECOVERY Saturated stiff dark black fine sandy clay,	A-7-6(5)	Glauconitic.
33				8 8	1	trace of coarse sand and gravel.	11-7-0(3)	Gladeonnie.
- 55				8		gravers		
			34.0'			12" RECOVERY		
		18	34.0'	2 3 6 7		Saturated loose black clayey fine to coarse	A-2-6(1)	
				6 7		sand w/ some organic matter, trace of gravel.		
			00.51			221 27 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5		
36		19	36.0' 36.0'	14		22" RECOVERY Saturated hard black organic fine sandy silt w/	A-4(0)	
				14 18 27 24		some coarse sand, trace of gravel.	A- 4 (0)	
				24		grand, made of grand.		
			38.0'			19" RECOVERY		
		20	38.0'	5 11		Saturated medium dense black organic silty	A-2-5(0)	
39				18 24		fine to coarse sand w/ some gravel.		
			40.5					
			40.0'			8" RECOVERY End of Boring		
						Lind of Dofflig		
42								
45								
4 0		ı	Ì	1		I		

Symbol Description

Strata symbols

Silty low plasticity clay



Silty sand



Clayey sand



Low plasticity clay

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 3/23/2009 using a 3 1/4-inch diameter hollow stem auger. Rig is a Track CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: R1-049

Contract: 25-113-01

Boring Location: Sta. 545+00, 30.00' Lt. C.L.

Boring Surface Elev.: + 68.23' Reference:

IN. IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Spoon O.D. 2 IN. IN. O.D. Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches

Hollow Stem Auger: 0.0 38.0

Water Level Readings

Depth of Casing Time **Depth of Water Depth of Hole** Elev. of Water Date 3/27/09 18.0 16.0 15.7

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 40.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** D. Burt

Helpers:

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
	3/27/09	1	0.0'	2 3 3 5		Moist firm brown clay w/ some fine to coarse sand.	A-6(6)	
			2.0'	_		21" RECOVERY		
3		2	4.0'	5 10 8 5		Moist medium dense brown to orange silty fine to coarse sand, trace of gravel. 22" RECOVERY	A-2-4(0)	IG
		3	4.0'	3 3 5	1314126. 1111166 1111166	Moist loose brown fine to coarse sand w/ some silt and gravel.	A-2-4(0)	
6			6.0'	Ů		20" RECOVERY	<u>15</u>	
		4	6.0' 8.0'	7 7 7 5		Moist medium dense brown coarse sand w/some silt and fine sand, trace of gravel. 22" RECOVERY	A-1-b	
9		5	8.0'	5 7 6 6		Moist medium dense brown coarse sand w/ some fine sand, gravel, and silt. 17" RECOVERY	A-1-b	
		6	10.0'	6 10 7 6		Moist medium dense brown coarse to fine sand w/ some gravel, trace of silt.	A-1-b	
12			12.0'	2	10000000000000000000000000000000000000	18" RECOVERY		
		7	12.0'	2 4 6 8	6644-166 66919:00 66939:06 66939:06 66139:06 66139:06	Wet loose brown coarse to fine sand w/ some gravel, trace of silt.	A-1-b	
			14.0'		6613.1166 6613.3166 6613.3166	18" RECOVERY		
15		8	14.0'	7 5 4 7		Wet loose brown coarse to fine sand w/ some gravel, trace of silt. 23" RECOVERY	A-1-b	
		9	16.0'	9 11 15		Wet medium dense coarse sand w/ some fine	A-1-b	

Remarks:

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 **Contract:** 25-113-01

Depth	Daily	No.	Sample	Blows/6"		Sample Description	Class./G.I.	Remarks
(ft.)	Progress		Depth	16	sand and g	ravel, trace of silt.		
18			18.0'			23" RECOVERY		
10	1	10	18.0'	17 6	Wet mediu	m dense brown coarse to fine sand	A-1-b	
	-			17 6 7 5	w/ some gr	avel and silt.		
			20.01		19 19 19 19 19 19 19 19 19 19 19 19 19 1	10" DECOVEDY		
	-	11	20.0'	10	Wet mediu	m dense brown coarse to fine sand	A-1-b	
21				10 10 8 8		ravel and silt.		
			00.01			1011 777 777		
	-	12	22.0' 22.0'	4	Saturated s	19" RECOVERY tiff brown to gray fine sandy clay,	A-7-6(5)	
				4 6 7 9		arse sand and gravel.	(- /	
24		13	24.0' 24.0'	4	Saturated v	18" RECOVERY very stiff gray fine sandy clay w/	A-7-5(2)	
				4 11 14 17	1111111111	se sand, trace of gravel.	11 / 3(2)	
	-	14	26.0' 26.0'	14	Saturated b	23" RECOVERY nard gray fine sandy clay w/ some	A-7-5(6)	
27				14 18 20 22		I, trace of gravel.	11 / 5(0)	
						\ / \		
	-	15	28.0' 28.0'	7	Saturated r	24" RECOVERY medium dense black silty fine sand	A-2-4(0)	
				7 8 10 11		parse sand, trace of gravel.	A-2-4(0)	
						RBIIJI		
30		16	30.0' 30.0'	8	Seturated r	18" RECOVERY medium dense black fine sand w/	A-2-4(0)	
		"	00.0	8 8 10 12		se sand, silt, and organic matter,	A-2-4(0)	
			Λ	12	trace of gra		1	
	-	17	32.0' 32.0'	8	C	20" RECOVERY	A-2-4(0)	
33		''	32.0	8 10 12 13		nedium dense black silty fine sand parse sand, trace of gravel.	A-2-4(0)	
	1			15		, 2		
	-	18	34.0' 34.0'	4	C. d. a.d. 1	23" RECOVERY	A 2 4(0)	
		10	34.0	5 8 14		nedium dense black silty coarse to race of gravel.	A-2-4(0)	
]			14	53333,	- 6		
36	-	19	36.0' 36.0'	5	G. t 1	21" RECOVERY	A 2 4(0)	
		19	30.0	5 7 11 15		medium dense black silty coarse to v/ some gravel.	A-2-4(0)	
	1			15	Time said v			
		20	38.0' 38.0'	42	G	24" RECOVERY	A 0.5(0)	
39		20	39.0'	42 50/3"	Saturated v	very dense black silty fine to coarse me gravel.	A-2-5(0)	
39	1		33.0		Sand W/ So	me gravel. 10" RECOVERY		
					End of Bor	ring		
	-							
42								
	1							
45								

Symbol Description

Strata symbols

Low plasticity clay



Silty sand



Poorly graded sand with silt



Well graded sand with silt



Silt

DRAFT NOT FOR BIDDING **AUGUST 2015**

- 1. Exploratory borings were drilled on 3/27/2009 using a 3 1/4-inch diameter hollow stem auger. Rig is a Track CME 55.
- Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: R1-050

Contract: 25-113-01

Boring Location: Sta. 550+00, 100.00' Rt. C.L.

Boring Surface Elev.: + 63.87 Reference:

IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: IN. Type of: Split Spoon O.D. 2 IN. IN. O.D.

Core Bit: O.D. IN.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Depth of Casing Time **Depth of Water Depth of Hole** Elev. of Water Date 3/30/09 10.0 12.0 8.1

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 40.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** D. Burt

Helpers:

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
	3/30/09	1	0.0'	2 4 4 6		Moist stiff brown clayey fine sandy silt, trace of coarse sand.	A-4(2)	
			2.0'			20" RECOVERY		
3		2	4.0'	3 4 8 8 8		Moist stiff brown clayey fine sandy silt w/ some coarse sand and gravel. 18" RECOVERY	A-4(1)	IG
		3	4.0'	5 4		Moist loose brown silty fine sand, trace of	A-2-4(0)	
6			6.0'	3		coarse sand and gravel. 18" RECOVERY	15	
		4	6.0'	3 2 2 5		Moist very loose brown and orange fine to	A-2-4(0)	
				5		coarse sand w/ some silt, trace of gravel.		
			8.0'			17" RECOVERY		
9		5	8.0'	3 4 8 6		Moist medium dense brown-orange coarse to fine sand and gravel w/ some silt.	A-1-b	
			10.0'	0	122 / 1.12 ft. 122 / 1.12 ft. 122 / 1.12 ft.	18" RECOVERY		
		6	10.0'	8 9 7 5		Moist medium dense brown-orange coarse sand and gravel w/ some fine sand and silt.	A-1-b	
12			12.0'	_		18" RECOVERY		
		7	12.0'	2 2 5 6		Moist medium dense brown and orange fine to coarse sand w/ some silt and gravel.	A-2-4(0)	
			14.0'			19" RECOVERY		
15		8	14.0'	3 4 4 8		Moist loose orange coarse sand w/ some silt and fine sand, trace of gravel.	A-1-b	
			16.0'			20" RECOVERY		
		9	16.0'	8 5 8		Wet medium dense green clayey coarse to	A-2-6(1)	

Remarks:

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	3			10	fine sand, trace of gravel.		
18			18.0'		19" RECOVERY		
		10	18.0'	5 5 10 11	Wet medium dense green silty fine to coarse	A-2-4(0)	
				11	sand, trace of organic matter and gravel.		
			20.0'		18" RECOVERY		
		11	20.0'	8 10 7 10	Saturated medium dense green silty fine to	A-2-4(0)	
21				10	coarse sand w/ some gravel and organic matter.		
			22.0'		18" RECOVERY		
		12	22.0'	2 3 6 8	Saturated stiff green fine sandy clay w/ some	A-6(0)	
				8	coarse sand, trace of organic matter and gravel.		
24			24.0'		21" RECOVERY		
		13	24.0'	4 18 12 12	Saturated very stiff green organic fine sandy	A-4(0)	
				12	silt w/ some clay and coarse sand, trace of gravel.		
			26.0'		graver 20" RECOVERY		
		14	26.0'	4 7 14 20	Saturated medium dense green silty fine sand	A-2-4(0)	
27				14 20	w/ some coarse sand, trace of gravel.		
			28.0'		19" RECOVERY		
		15	28.0'	5 8	Saturated very stiff green fine to coarse sandy	A-7-5(2)	
				14 31	clay, trace of gravel.	$\mathcal{J} I I V$	
30	· ·	M	30.0'		17" RECOVERY		
- 00	•	16	30.0'	30 50/4"	Saturated very dense green clayey fine sand	A-2-5(0)	
			31.0'		w/ some coarse sand and gravel.	4 —	
						15	
		17	32.0'	10 28 34 50/5"	Saturated very dense green silty fine to coarse	A-2-4(0)	
33			_	34 50/5"	sand, trace of gravel.		
			34.0'		19" RECOVERY		
		18	34.0'	30 20 23 28	Saturated dense green silty fine to coarse	A-2-5(0)	
				23 28	sand, trace of gravel.		
36			36.0'		18" RECOVERY		
		19	36.0'	13 15 17 18	Saturated dense green fine to coarse sand w/	A-2-4(0)	
				17 18	some gravel and silt.		
			38.0'		18" RECOVERY		
		20	38.0'	20 32	Saturated very dense green clayey fine to	A-2-4(0)	
39				20 32 38 50/3"	coarse sand, trace of gravel.		
			40.0'		10" DECOVEDY		
			40.0		18" RECOVERY End of Boring		
40							
42							
45							

Symbol Description

Strata symbols



Silty low plasticity clay



Poorly graded clayey silty sand



Silty sand



Poorly graded sand with silt



Clayey sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 3/30/2009 using a 3 1/4-inch diameter hollow stem auger. Rig is a Track CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: R1-051

Contract: 25-113-01

Boring Location: Sta. 555+00, 100.00' Lt. C.L.

Boring Surface Elev.: + 62.0' Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: IN. Lbs. 30 D-Sampler: S-Sampler: U-Sampler: IN. Type of: Split Spoon O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Time **Depth of Water Depth of Hole Depth of Casing** Elev. of Water Date 4/1/09 6.0 4.0 3.1

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 60.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** D. Burt

Helpers:

D #	Б 11				т —			
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
(11.)	4/1/09	1	0.5'	1	///	Wet firm gray clayey silt, trace of fine sand	A-4(8)	Topsoil - 3".
				1 3 4		and gravel.	A-4(0)	Topson - 3.
			2.0'			18" RECOVERY		
		2	2.0'	9		Wet very stiff gray clayey silt, trace of fine to	A-4(6)	
3				9 8 9		coarse sand and gravel.	A-4(0)	
°				13		coarse saile and graver.		
		M	4.0			19" RECOVERY		
		3	4.0'	9 18 14 14		Wet hard gray-brown gravelly silt w/ some	A-4(0)	
				14 14		coarse to fine sand, trace of clay.	. ,	
6			6.0'			15" RECOVERY	15	
		4	6.0'	9 9 13 15		Wet medium dense brown and orange coarse	A-1-b	
				13 15				
					(4 (4) (3 ()))			
			8.0'		12777	19" RECOVERY		
		5	8.0'	6 10 9 12	1:1:1:1:1:	wet medium dense brown coarse to fine sand	A-1-b	
9				9 12	11111111	w/ some gravel, trace of silt.		
					1:			
			10.0'			15 RECOVERT		
		6	10.0'	11 2		Wet medium dense brown coarse sand w/	A-1-b	
				6 6		some gravel and fine sand, trace of silt.		
12			12.0'			20" RECOVERY		
		7	12.0'	5 4 3 3		Wet loose tan fine to coarse sand w/ some silt,	A-2-4(0)	
				3 3		trace of gravel.		
			14.0'			20" RECOVERY		
		8	14.0'	2 3 5 6		Wet loose tan fine to coarse sand w/ some silt,	A-2-4(0)	
15				5 6		trace of gravel.		
			16.0'			17" RECOVERY		
		9	16.0'	7 6 9 10		Wet medium dense tan-brown coarse sand w/	A-1-b	
				10		some silt, fine sand, and gravel.		
	I		1	1	10:1:1:1:1:1	in in the second of the second		

Remarks: Mud Rotary @ 34.0 Feet.

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 **Contract:** 25-113-01

<u> </u>	l 5 "			1				
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
18			18.0'			19" RECOVERY		
		10	18.0'	12 10 8 8		Wet medium dense tan-brown coarse sand w/	A-1-b	
				8				
			20.0'			18" RECOVERY		
21								
					onivie Compres			
					nee 1 3 3 200 156 1 3 3 3 6 1 1 2 2 1 7 2 3 2 1			
24								
		11	24.0'	3 4 6 7		Saturated loose brown coarse sand w/ some	A-1-b	
				7		fine sand, silt, and gravel.		
			26.0'			18" RECOVERY		
l								
27						I)RAFI		
	R	12	29.0'	6 5		Saturated medium dense green coarse to fine	A-2-4(0)	Glauconitic.
30				6 5 11 10		sand w/silt and gravel.		
		4	31.0'			18" RECOVERY		Y •
			31.0			16 RECOVERT		
						DIICT ON	1 [
33						GUST 20	15	
33				1		7001 		
		13	34.0'	8			A 2 4(0)	M 1D 4 6 24 0
		13	34.0	8 9 12 14		Saturated medium dense green-brown silty fine to coarse sand, trace of gravel.	A-2-4(0)	Mud Rotary @ 34.0'.
				14		and to course suite, trace or graver.		
36			36.0'			20" RECOVERY		
39								
		14	39.0'	1 2 4 6		Saturated loose green-brown fine to coarse	A-3	
-				6		sand, trace of silt.		
			41.0'			20" RECOVERY		
42								
					priviri 1911-1910 1911-1911			
		15	44.0'	9		Saturated medium dense green-brown fine	A-2-4(0)	
45				9 9 13 16		sand w/ some coarse sand and silt.	2 1(0)	

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
	_		46.0'			21" RECOVERY		
48								
		16	49.0'	18 28 38 50/4"		Saturated very dense brown fine sand w/ some silt and coarse sand.	A-2-4(0)	
51			51.0'			19" RECOVERY		
54		17	54.0'	14 26 33 50/4"		g Battarated very dense green time sand, trace or	A-3	
				50/4"		silt and coarse sand.		
			56.0'			17" RECOVERY		
57		١.						
		18	58.0'	28 50/3"	15 /3.416 10 / 4210 14 / 4210	Saturated very dense green fine sand w/ some	A-2-4(0)	
		N '	59.0'	50/3"		coarse sand and silt.		1
60			_			End of Boring ST 20	4 -	
						4US 1 70	15	
				1				
63								
66								
69								
72								

Symbol Description

Strata symbols

Low plasticity clay



Silty sand



Poorly graded sand with silt



Well graded sand with silt



Well graded sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 4/1/2009 using a 3 1/4-inch diameter hollow stem auger. Rig is a Track CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: R1-052

Contract: 25-113-01

Boring Location: Sta. 682+00, 40.00' Lt. C.L.

Boring Surface Elev.: + 50.61' Reference:

IN. IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Spoon O.D. 2 IN. IN. O.D. Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches

Hollow Stem Auger: 0.0

Water Level Readings

Depth of Casing Depth of Water Time **Depth of Hole** Elev. of Water Date 2/10/09 Dry 20.0 18.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 20.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** D. Burt

Helpers: D. Zmijewski

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	2/10/09	1	1.0'	3 4 4	Moist firm brown clayey silt, trace of coarse to fine sand.	A-4(9)	Cultivated Soil - 8".
3		2	2.0'	4 4 3 4	Moist firm brown clayey silt, trace of fine to coarse sand.	A-4(7)	
			4.0		14" RECOVERY 18" RECOVERY		
		3	4.0	2 9 9 6	Moist medium dense orange gravel and fine sand w/ some clay, trace of coarse sand.	A-2-4(0)	
6			6.0'		10" RECOVERY		
		4	6.0	7 8 8 9	Moist medium dense orange silty fine sand and gravel w/ some coarse sand.	A-2-4(0)	
			8.0'		18" RECOVERY		
9		5	8.0'	3 3 7 3	Moist loose orange silty fine sand, trace of coarse sand and gravel.	A-2-4(0)	
			10.0'		19" RECOVERY		
		6	10.0'	3 4 5 5	Moist stiff orange fine sandy silt, trace of coarse sand.	A-4(0)	
12			12.0'		19" RECOVERY		
		7	12.0'	3 4 5 5	Moist loose orange fine to coarse sand w/ some silt, trace of gravel.	A-2-4(0)	
			14.0'		21" RECOVERY		
15		8	14.0'	3 4 3 3	Moist loose orange fine to coarse sand w/ some silt, trace of gravel.	A-2-4(0)	
			16.0'	2	15" RECOVERY		
		9	16.0'	3 18 17 16	Moist dense orange gravel and coarse sand w/ some fine sand, trace of silt.	A-1-a	

Remarks:

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
		10	18.0' 18.0'	20 20 20 20 17	Moist dense orange gravel and coarse sand w/ some silt, trace of fine sand.	A-1-a	
			20.0'		18" RECOVERY End of Boring		
21							
24							
24							
27							
21					DRAFT		
					DIVALI		
30				_		511	
30					FOR BIDI		IG
	•			•			
33			Λ		GUST 20	15	
33				\U	GU31 ZU		
36							
30							
39							
00							
42							
-72							
45							
45							

Symbol Description

Strata symbols

Low plasticity clay



Silt



Poorly graded clayey silty sand



Silty sand



Poorly graded gravel with silt

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 2/10/2009 using a 3 1/4-inch diameter hollow stem auger. Rig is a Track CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: R1-053

Contract: 25-113-01

Boring Location: Sta. 622+00, 190.00' Rt. C.L.

Boring Surface Elev.: + 78.42' Reference:

IN. IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Spoon O.D. 2 IN. IN. O.D. Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches

Hollow Stem Auger: 0.0

Water Level Readings

Depth of Casing Time **Depth of Hole Depth of Water** Elev. of Water Date 2/25/09 39.0 39.0 35.2

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 50.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** D. Burt

Helpers: D. Zmijewski

Donth	Doily		Comple		$\overline{}$			
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
	2/24/09	1	1.0'	4 5		Moist stiff tan clayey silt, trace of fine to	A-4(6)	Cultivated soil - 9"; 4" frozen
	 		2.0'			coarse sand.		soil.
	 	2	2.0'	6 7 6 5		10" RECOVERY	A-4(0)	
3	 			6 5		Moist stiff tan silt, trace of fine to coarse sand		
						and gravel.		
			4.0			16" RECOVERY	\rightarrow	
		3	4.0	3 5 5 6		Moist stiff tan clayey fine sandy silt w/ some	A-4(1)	
				6		coarse sand, trace of gravel.		
	 					1		
6	!		6.0'	7		14" RECOVERY		
	 	4	6.0	7 6 6 7		Moist stiff tan clay w/ some fine sand, trace of	A-6(9)	
	!			Ž		coarse sand and gravel.		
	 							
		5	8.0' 8.0'	2	HALL	24" RECOVERY	A 4(0)	
	 		0.0	2 3 6 7		Moist stiff tan fine sandy silt w/ some gravel,	A-4(0)	
9	!			7		clay, and coarse sand.		
	 		10.0'			14" RECOVERY		
	1	6	10.0'	9	HIND I	Moist medium dense orange silty fine to	A-2-4(0)	
	 	-		9 8 11		coarse sand w/ some gravel.	17-2-4(0)	
	1 1			11		Course suite w/ some graver.		
12	 		12.0'			24" RECOVERY		
12	1 1	7	12.0'	6		Moist medium dense orange coarse to fine	A-1-b	
	 			6 13 13 16		sand and gravel w/ some silt.	11 1 0	
	1			10		8		
	 		14.0'			14" RECOVERY		
	1 1	8	14.0'	8 10		Moist medium dense orange coarse sand w/	A-1-b	
15	 			8 10 10 9		some fine sand and silt, trace of gravel.		
]							
	 		16.0'			19" RECOVERY		
	 	9	16.0'	15 14 12 12		Moist medium dense orange coarse to fine	A-1-b	
	 			12 12		sand w/ some silt and gravel.		
	 							
L	l i	Į.				1		į l

Remarks:

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 **Contract:** 25-113-01

Depth	Daily		Sample		1			
(ft.)	Progress	No.	Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
		10	18.0' 18.0' 20.0'	10 18 10 9		17" RECOVERY Wet medium dense orange coarse to fine sand and gravel w/ some silt. 17" RECOVERY	A-1-b	Cemented sands.
21			20.0					
		11	24.0'	8 9 6 5		Wet medium dense orange-brown silty coarse to fine sand, trace of gravel. 14" RECOVERY	A-2-4(0)	
27						DRAFT		
30		12	31.0'	5 4 6 5		Saturated loose orange-brown silty fine to coarse sand, trace of gravel. 24' RECOVERY	A-2-4(0)	IG
33			A	\U		GUST 20	15	
	2/25/09	13	34.0'	2 4 5 7		Saturated loose orange and gray mottled fine to coarse sand w/ some silt, trace of gravel.	A-2-4(0)	
36			36.0'			24" RECOVERY		
39		14	39.0' 41.0'	5 6 7 8		Saturated medium dense orange and gray mottled fine sand w/ some coarse sand and silt. 24" RECOVERY	A-2-4(0)	
42								
45		15	44.0'	8 10 14 11		Saturated medium dense orange fine sand w/ some coarse sand and silt.	A-2-4(0)	

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 **Contract:** 25-113-01

Depth (ft.)	Daily	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
(11.)	Progress		Depth				
48		16	48.0'	7 9	Saturated medium dense orange fine sand w/	A-3	
				9 14 14	some coarse sand, trace of silt.	113	
			50.0'		ratified fridatel fri		
51					End of Boring		
<u> </u>							
54							
					DRAFT		
57					DIALI		
<u> </u>							
					FOR BIDI	\mathcal{I}	JG
		11				711	
60							
					ICHIST 20	15	
				1	GUST 20		
63							
66							
69							
72							

Symbol Description

Strata symbols

Silty low plasticity clay

Silt



Low plasticity clay



Poorly graded clayey silty sand



Silty sand



Poorly graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 2/24/2009 using a 3 1/4-inch diameter hollow stem auger. Rig is a Track CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: R1-054

Contract: 25-113-01

Boring Location: Sta. 622+00, 250.00' Lt. C.L.

Boring Surface Elev.: + 76.07' Reference:

IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: IN. Type of: Split Spoon O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Depth of Casing Time **Depth of Water Depth of Hole** Elev. of Water Date 2/23/09 32.5 34.0 34.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 50.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** D. Burt

Helpers: D. Zmijewski

Depth	Daily	I	Sample				
(ft.)	Progress	No.	Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	2/23/09	1	1.0'	3 4	Moist firm brown clay, trace of fine sand.	A-6(11)	Cultivated Soil - 9".
			2.0'		11" RECOVERY		
		2	2.0'	3 7 6 6	Moist stiff brown clayey silt w/ some fine to	A-4(4)	
3				6 6	coarse sand.		
			4.0'		16" RECOVERY		
	· ·	3	4.0	3 4 5	Moist loose orange silty fine to coarse sand,	A-2-4(0)	
				5 6	trace of gravel.		
6			6.0'		14" RECOVERY		
		4	6.0	6 7 9 8	Moist medium dense orange silty fine to	A-2-4(0)	
				8	coarse sand, trace of gravel.		
		5	8.0' 8.0'	2	24" RECOVERY	A 2 4(0)	
			0.0	2 6 7 7	Moist medium dense yellow silty fine to coarse sand.	A-2-4(0)	
9				7	Coarse sand.		
			10.0'		15" RECOVERY		
		6	10.0'	6	Moist medium dense yellow fine to coarse	A-2-4(0)	
				6 7 7 8	sand and gravel w/ some silt.	11 2 1(0)	
				0	6		
12			12.0'		20" RECOVERY		
]	7			Wet medium dense brown, green, and orange	A-2-4(0)	Cemented sands.
					silty coarse to fine sand w/ some gravel.		
				_			
		8	14.0'	5 8 9 9	Wet medium dense brown, green, and orange	A-2-4(0)	Cemented sands.
15				9	silty fine to coarse sand w/ some gravel.		
		9	16.0' 16.0'	5	14" RECOVERY	1.2.4(0)	
		9	16.0	5 5 6 8	Wet medium dense brown, green, and orange	A-2-4(0)	Cemented sands.
-				, š	coarse to fine sand w/ some silt, trace of		
					gravel.		

Remarks:

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 **Contract:** 25-113-01

Depth	Daily	N	Sample	Blows/6"		Cample Description	Class /O.I	Damende
(ft.)	Progréss	No.	Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
	1	10	18.0' 18.0'	7		12" RECOVERY Wat madium dansa brown graan, and grange	A-1-b	Cemented sands.
			10.0	7 7 11 9		Wet medium dense brown, green, and orange coarse to fine sand w/ some silt and gravel.		3
	[3		coarse to fine saile w/ some sitt and graver.		
			20.0'			9" RECOVERY		
21								
	-							
24								
		11	24.0'	4 5 6 9		Wet medium dense brown, green, and orange	A-2-4(0)	Cemented sands.
				6 9		fine to coarse sand w/ some silt and gravel.		
			26.0'			20" RECOVERY		
27								
27								
						III		
	1							
		12	29.0'	3 5 7		Wet medium dense brown fine to coarse sand	A-2-4(0)	Cemented sands.
30				6		w/ some silt.		
		\mathbf{M}	04.01					
	•		31.0'			24 th RECOVERY		•
						6		
33								
						JUUI ZU		
		40	24.0	2	1:01/2	υ Ε	1.2.1(0)	
		13	34.0'	2 6 11		Wet medium dense brown fine sand w/ some	A-2-4(0)	Cemented sands.
				8		coarse sand and silt, trace of gravel.		
36			36.0'			20" RECOVERY		
	1		30.0			ZU RECUTERT		
39		14	39.0'	6	11123 11123 11123	Wet medium dense brown fine sand w/ some	A-3	Cemented sands.
		''	30.0	6 10 11 14		5	Δ-3	Comenica sanas.
				14	1. (1) j 1. (14) 1. (14)	i.		
			41.0'					
42						V Y		
						- U.S.		
<u> </u>						प्र स		
					0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Ģ.		
		15	44.0'	13	111111	<u>[</u>	A-3	Cemented sands.
45				13 18 33 45		sand, trace of silt and gravel.		
				.5				
			46.0'			f.i		

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
					613366 613367 617361		
					NET SALVEY. NET 1 42664 NET 2 3 3 16 16 16 16 16 16 16 16 16 16 16 16 16		
48		16	48.0'	7 7 10 12	Wet medium dense brown fine sand w/ some	A-3	Cemented sands.
				10 12	coarse sand, trace of silt and gravel.		
			50.0'		20" RECOVERY End of Boring		
51					End of Bornig		
54							
54							
					DRAFT		
57							
	R			_			
					FOR BIDI		
60				•			
			Λ		CLICT OF	15	
					IGUST 20	15	
63							
66							
69							
72							

Symbol Description

Strata symbols

Low plasticity clay



Silty sand



Poorly graded sand with silt

DRAFT NOT FOR BIDDING **AUGUST 2015**

- 1. Exploratory borings were drilled on 2/23/2009 using a 3 1/4-inch diameter hollow stem auger. Rig is a Track CME 55.
- Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: R1-055

Contract: 25-113-01

Boring Location: Sta. 627+00, 360.00' Rt. C.L.

Boring Surface Elev.: + 72.15' Reference:

IN. IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Spoon O.D. 2 O.D.

IN. IN. Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Depth of Casing Depth of Water Time **Depth of Hole** Elev. of Water Date 2/26/09 29.0 29.0 26.9

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 50.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** D. Burt

Helpers: D. Zmijewski

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	2/25/09	1	1.0' 2.0'	4 5	Moist stiff tan clayey silt, trace of fine to coarse sand.	A-4(10)	Cultivated Soil - 10".
3		2	2.0'	4 5	Moist stiff tan clayey silt, trace of fine to	A-4(10)	
	N	2A	3.0' 4.0'	6 5	coarse sand. 10" RECOVERY Moist medium dense tan-orange clayey coarse	A-2-4(0)	
	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	3	4.0	4 9 8 9	to fine sand w/ some gravel. 10" RECOVERY	A-2-6(0)	U
6			6.0'		Moist medium dense yellow-orange clayey coarse to fine sand, trace of gravel.	4	
		4	6.0	10 10 11 10	Moist medium dense orange gravel and fine sand w/ some coarse sand and silt.	A-1-b	
			8.0'		18" RECOVERY		
9		5	8.0'	12 13 14 10	Moist medium dense orange coarse sand and gravel w/ some fine sand and silt.	A-1-b	
			10.0'		14" RECOVERY		
		6	10.0'	9 11 15 9	Moist medium dense orange coarse sand and gravel w/ some fine sand, trace of silt.	A-1-b	
12			12.0'		EFFARET FILENCE 17" RECOVERY		
		7	12.0'	6 11 11 9	Moist medium dense brown silty gravel and coarse sand w/ some fine sand.	A-1-b	Cemented sands.
			14.0'		8" RECOVERY		
15		8	14.0'	6 8 9 6	Wet very stiff brown fine to coarse sandy silt, trace of gravel.	A-4(0)	Cemented sands.
			16.0'		11" RECOVERY		
		9	16.0'	6 10 9 6	Wet medium dense brown clayey coarse to fine sand w/ some gravel.	A-2-5(0)	Cemented sands.

Remarks:

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 **Contract:** 25-113-01

	act. 25-113	01						
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
	·	10	18.0'	6 2 2 3		9" RECOVERY Wet very loose orange silty coarse to fine sand w/ some gravel.	A-2-4(0)	Cemented sands.
			20.0'			12" RECOVERY		
21								
24	2/26/09	11	24.0'	5 10 9 4		Wet medium dense green-orange coarse to fine sand and gravel w/ some silt.	A-1-b	Cemented sands.
			26.0'		_	17" RECOVERY		
27						DRAFT		
30		12	31.0'	8 7 7 8		Saturated medium dense orange fine to coarse sand w/ some silt, trace of gravel. 21" RECOVERY	A-2-4(0)	1G
33			A	\U		GUST 20	15	
		13	34.0'	4 6 10 12		Saturated medium dense orange fine sand w/ some coarse sand and silt, trace of gravel.	A-2-4(0)	
36			36.0'		_	20" RECOVERY		
39		14	39.0'	6 7 8 8		Saturated medium dense orange fine sand w/ some coarse sand and silt.	A-2-4(0)	
42			41.0'		_	22" RECOVERY		
45		15	44.0' 46.0'	9 10 17 20		some coarse sand, trace of silt.	A-3	
	!		1.0.0	<u> </u>	1111	eter) 10 12200 12101	L	I

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
48					GISTORY		
		16	48.0' 50.0'	15 15 18 20	Saturated dense orange fine sand w/ some coarse sand and silt. 16" RECOVERY	A-3	
			50.0		End of Boring		
51							
54							
					DRAFT		
57							
				Τ	FOR BID	DIN	1G
60							
			Λ		GUST 20	15	
				1	GUS1 20		
63							
-							
66							
69							
72							

Symbol Description

Strata symbols

SCIACA SYMDOIS

Low plasticity clay

Clayey sand



Silty sand



Poorly graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 2/25/2009 using a 3 1/4-inch diameter hollow stem auger. Rig is a Track CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: R1-056

Contract: 25-113-01

Boring Location: Sta. 627+00, 360.00' Lt. C.L.

Boring Surface Elev.: + 80.38' Reference:

IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: IN. Type of: Split Spoon O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0 48

Water Level Readings

Depth of Casing Depth of Water Time **Depth of Hole** Elev. of Water Date 2/23/09 38.0 39.0 39.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 50.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** D. Burt

Helpers: D. Zmijewski

Depth	Daily	I	Sample			
(ft.)	Progress	No.	Depth	Blows/6"	Sample Description Class./G.I. Remar	ks
	2/20/09	1	1.0'	4 5	Moist stiff tan clayey silt, trace of fine to A-4(8) Cultivated Soil -	- 8".
			2.0'		coarse sand.	
		2	2.0'	5 6 8 6	Moist stiff to a group fire and weith w/ same A-4(0)	
3				8 6	Moist stiff tan-orange fine sandy silt w/ some coarse sand, trace of clay.	
			4.0' 4.0'	1	16' RECOVERY	
		3	4.0	4 4 4	Moist firm tan-orange fine sandy silt w/ some A-4(0)	
	-			4	coarse sand.	
			6.0'		15" RECOVERY	
6	1	4	6.0	2	Moist stiff orange clayey fine sandy silt w/ A-4(0)	
				2 5 10 12	some coarse sand, trace of gravel.	
			8.0'		22" RECOVERY	
		5	8.0'	5 6	Moist medium dense orange silty fine to A-2-4(0)	
9				5 6 6 7	coarse sand, trace of gravel.	
			10.0'	_	19" RECOVERY	
		6	10.0'	7 6 8 10	Moist medium dense orange silty fine to A-2-4(0)	
				10	coarse sand, trace of gravel.	
12		7	12.0' 12.0'	4	24" RECOVERY	
		′	12.0	4 6 7	Moist medium dense yellow coarse sand and A-1-b gravel w/ some fine sand and silt.	
				12	inster graver w/ some rine sand and sint.	
			14.0'		15" RECOVERY	
		8	14.0'	25	Moist medium dense yellow fine to coarse A-1-b	
15				25 17 12 11	sand and gravel w/ some silt.	
'`	1			''		
			16.0'		6" RECOVERY	
		9	16.0'	27 10	Moist medium dense yellow silty coarse sand A-1-b	
				10 10	and gravel w/ some fine sand.	
		9	10.0	27 10 10 10		

Remarks:

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 **Contract:** 25-113-01

Depth	Daily		Sample					Τ
(ft.)	Progress	No.	Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
		10	18.0'	6 10 8 9		Wet very stiff brown-orange fine sandy clay w/ some coarse sand and gravel.	A-7-5(1)	
			20.0'	-		18" RECOVERY		
21								
24		11	24.0'	7		Wet loose brown-orange silty fine to coarse	A-2-4(0)	
				7 4 4 4		sand, trace of gravel.	(*)	
			26.0'			14" RECOVERY		
27						BBAET		
						DRAFI		
		12	29.0'	2 5 7 6		Wet medium dense brown-orange fine to coarse sand w/some silt, trace of gravel.	A-2-4(0)	
30				6		·()R KII)I)	
		Y '	31.0'			24' RECOVERY		
33			A	\U		GUST 20	15	
		13	34.0'	2 4 7 7		Wet medium dense orange-white mottled fine to coarse sand w/ some silt, trace of gravel.	A-2-4(0)	
				7		to coarse said w/ some sit, trace or graver.		
36			36.0'			23" RECOVERY		
39								
	2/23/09	14	39.0'	3 4 6 8		Wet loose orange-white mottled fine to coarse sand, trace of silt.	A-3	
				8		Sand, trace of sitt.		
-			41.0'			22" RECOVERY		
42								
					92.179.6 8.53.338 18.53.338 18.53.338 18.53.338			
		15	44.0'	5 0		Wet medium dense orange-white mottled fine	A-2-4(0)	
45				5 8 12 20				
			46.0'			24" RECOVERY		
							<u> </u>	

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
					ME JANCE GE JANGE GE JANGE GE JANGE		
48					MC(14MC) Mc(14MC) MC(14MC) MC(14MC) MC(14MC)		
		16	48.0'	10 16 17 15	Wet dense orange-white mottled fine to coarse sand, trace of silt and gravel.	A-3	
			50.0'		1917 1918 1917 1918 1918 1918		
51					End of Boring		
54							
					DRAFT		
57					DIVALI		
					FOR BIDI		IG
60	•						
			Λ		IGUST 20	15	
				10	GU31 ZU	10	
63							
66							
69							
72							
_							

Symbol Description

Strata symbols

Silt

Silty sand



Poorly graded clayey silty sand



Poorly graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 2/20/2009 using a 3 1/4-inch diameter hollow stem auger. Rig is a Track CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: R1-057

Contract: 25-113-01

Boring Location: Sta. 632+00, 380.00' Rt. C.L.

Boring Surface Elev.: + 70.58' Reference:

IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: IN. Type of: Split-Spoon O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Depth of Casing Depth of Water Time **Depth of Hole** Elev. of Water Date 2/17/09 29.0 29.0 27.1

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 50.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** D. Burt

Helpers: D. Zmijewski

Danith	Daile	ı	0	1	1	1		
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
	2/17/09	1	1.0'	3 4		Moist firm gray clay, trace of fine to coarse	A-6(11)	Cultivated Soil - 9".
		2	2.0'	5		sand.	1 (0)	
		2	2.0	5 6 8 9		Moist stiff gray clay, trace of gravel and fine	A-6(9)	
3				9		to coarse sand.		
			4.0'			20" RECOVERY		
	· ·	3	4.0'	3 5 7		Moist medium dense orange coarse to fine	A-1-b	
	•	, T		7 8		sand w/ some silt, trace of gravel.		
6			6.0'			15" RECOVERY		
		4	6.0	7 50/5"		Moist very dense orange coarse to fine sand	A-1-b	
			7.0'			w/ some gravel and silt.		
				1		8" RECOVERY		
		5	8.0'	4 5 7 8		Wet stiff orange-brown fine sandy clay w/	A-7-5(5)	Cemented sands.
9				8		some gravel and coarse sand.		
			10.0'	_		12" RECOVERY		
		6	10.0'	6 7 13 14		Wet very stiff orange-brown fine sandy clay	A-7-5(8)	Cemented sands.
				13 14		w/ some gravel and coarse sand.		
12			12.0'			20" RECOVERY		
		7	12.0'	4 7		Wet medium dense orange-brown clayey fine	A-2-6(0)	Cemented sands.
				8 11		sand w/ some gravel and coarse sand.		
			14.0'			18" RECOVERY		
		8	14.0'	8 8 9		Wet medium dense orange-brown and green	A-2-4(0)	
15				9		silty fine to coarse sand w/ some gravel.		
<u> </u>			16.0'			17" RECOVERY		
		9	16.0'	8 10 7 8		Wet medium dense orange-brown and green	A-2-4(0)	Cemented sands.
				8		silty coarse to fine sand w/ some gravel.		

Remarks:

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
		10	18.0' 18.0' 20.0'	8 3 7 8		20" RECOVERY Wet loose orange-brown and green silty coarse to fine sand w/ some gravel. 15" RECOVERY	A-2-4(0)	Cemented sands.
21								
27		11	24.0'	6353		Wet loose orange fine to coarse sand w/ some silt, trace of gravel. 24" RECOVERY	A-2-4(0)	Cemented sands.
27						DRAFT		
30		12	31.0'	3 4 5 6		coarse sand, trace of silt and gravel. 24' RECOVERY	A-3	IG
33			A	\U	100 1 4 1 10 10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	GUST 20	15	
		13	34.0'	6 9 11 12		Wet medium dense orange fine sand w/ some coarse sand and silt.	A-2-4(0)	
36			36.0'			24" RECOVERY		
39		14	39.0'	7 9 11 12		Wet medium dense orange fine sand w/ some coarse sand, trace of silt and gravel.	A-3	
42			41.0'			24" RECOVERY		
45		15	44.0'	6 6 10 12		Wet medium dense orange fine sand w/ some coarse sand, trace of silt. 17" RECOVERY	A-3	
	1		.5.0		hilita	1. ILLOO, ERT		<u>l</u>

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
48	Š		·		11 3 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4		
		16	48.0'	10 12 22 30	Wet dense orange fine sand w/ some fine sand, trace of silt.	A-3	
			50.0'				
51					End of Boring		
54							
					DRAFT		
57							
	N			Т	FOR BIDI		
					LOK DIDI	711	U
60							
					IGUST 20	15	
					000120		
63							
66							
69							
72							

Symbol Description

Strata symbols

Low plasticity clay



Silty sand



Elastic silt



Poorly graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 2/17/2009 using a 3 1/4-inch diameter hollow stem auger. Rig is a Track CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: R1-059

Contract: 25-113-01

Boring Location: Sta. 637+00, 220.00' Rt. C.L.

Boring Surface Elev.: + 63.68' Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Spoon O.D. 2 IN. IN. O.D.

Core Bit: O.D. **Casing Size:** 3 1/4 Inches

From Depth of: From Depth of: To: To: Hollow Stem Auger: 0.0

Water Level Readings

Depth of Casing Depth of Water Time **Depth of Hole** Elev. of Water Date 2/16/09 29.0 29.0 25.8

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 50.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** D. Burt

Helpers: D. Zmijewski

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
	2/13/09	1	1.0'	4 4		Moist firm brown clayey silt, trace of fine to	A-4(9)	Cultivated Soil - 9".
			2.0'			coarse sand and gravel.		
		2	2.0'	6 7		10" RECOVERY	A-4(7)	
3			3.0'			Moist very stiff brown clayey silt, trace of fine to coarse sand and gravel.		
	N	2A	3.0' 4.0'	11 7		8" RECOVERY	A-1-b	
		3	4.0	4	A TANKA	Moist medium dense brown clayey gravel and coarse sand w/ some silt and fine sand.	A-7-5(11)	
		•		4 6 7 10		4" RECOVERY		
				10		Moist stiff brown fine sandy clay w/ some		
6			6.0'			coarse sand, trace of gravel.		
		4	6.0	8 7 10 13			A-7-5(4)	Cemented sands.
				10 13		Moist very stiff brown-orange fine to coarse sandy clay, trace of gravel.		
		5	8.0' 8.0'	3		16" RECOVERY		
		5	8.0	3 5 6 8		Wet medium dense brown-orange clayey	A-2-7(1)	Cemented sands.
9				8		coarse to fine sand w/ some gravel.		
			10.0'			15" RECOVERY		
		6	10.0'	4		Wet medium dense brown-orange clayey	A-2-7(0)	Cemented sands.
				4 7 9 10		coarse to fine sand, trace of gravel.	A-2-7(0)	Cemented sands.
				10		course to time sund, trace of graver.		
12			12.0'			21" RECOVERY		
		7	12.0'	5		Wet loose brown-orange silty coarse to fine	A-1-b	Cemented sands.
				5 3 7 7		sand and gravel.		
			14.0'			14" RECOVERY		
		8	14.0'	3 8 5 5		Wet medium dense brown-orange silty coarse	A-1-b	Cemented sands.
15				5 5		to fine sand w/ some gravel.		
		9	16.0' 16.0'	5		15" RECOVERY		
		9	16.0	5 7 7		Wet medium dense brown-orange silty coarse	A-2-4(0)	Cemented sands.
				5		to fine sand w/ some gravel.		
-			-	•				

Remarks:

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 **Contract:** 25-113-01

Depth	Daily	T	Sample					
(ft.)	Progress	No.	Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
		10	18.0' 18.0' 20.0'	3 3 5 5		21" RECOVERY Wet loose orange fine to coarse sand w/ some silt, trace of gravel. 21" RECOVERY	A-2-4(0)	
21								
		11	24.0'	3 5 6 7		Wet medium dense tan and yellow fine to coarse sand w/ some silt, trace of gravel. 24" RECOVERY	A-2-4(0)	
27						DRAFT		
30		12	31.0'	5 5 6 9		coarse sand, trace of silt and gravel.	A-3	IG
33			A	\U		GUST 20	15	
		13	34.0'	3 7 9 21		and the self-tilt	A-3	
36			36.0'			24" RECOVERY		
		14	39.0' 41.0'	2 6 9 12		Wet medium dense orange fine to coarse sand, trace of silt. 24" RECOVERY	A-3	
42								
45		15	44.0' 46.0'	6 13 14 19	111 1 3 3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Wet medium dense brown fine to coarse sand, trace of silt and gravel. 20" RECOVERY	A-3	

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	3						
					23.5 (V) 93.1 (30.7) 93.1 (30.7)		
48		16	48.0'	4	Wet medium dense brown fine sand w/ some	A-2-4(0)	
				4 4 7 13	silt and coarse sand.		
			50.0'		19" RECOVERY		
51					End of Boring		
54							
					DRAFT		
57					DIALI		
				Т	FOR BIDI	\cup	
		N 1			וטוט זוט ו	711	
60						_	
					IGUST 20	15	
				10	GU31 ZU		
63							
66							
69							
72							

Symbol Description

Strata symbols

Low plasticity clay



Silt



Poorly graded clayey silty sand



Elastic silt



Silty sand



Poorly graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 2/13/2009 using a 3 1/4-inch diameter hollow stem auger. Rig is a Track CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: R1-060

Contract: 25-113-01

Boring Location: Sta. 637+00, 150.00' Lt. C.L.

Boring Surface Elev.: + 70.91' Reference:

IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: IN. Type of: Split Spoon O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Depth of Casing Depth of Water Time **Depth of Hole** Elev. of Water Date 2/13/09 30.0 34.0 34.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 50.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** D. Burt

Helpers: D. Zmijewski

Danth	Dailu		Commis		I			
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
	2/12/09	1	1.0'	2 3 4		Moist firm brown clay, trace of fine sand.	A-6(13)	Cultivated Soil - 8".
		2	2.0'	7		Moist stiff brown clayey silt, trace of fine to	A-4(8)	
3			2.5'	7 6 6 7		coarse sand and gravel.	· /	
						14" RECOVERY		
			4.0		W W W W	18" RECOVERY	\rightarrow	-
		3	4.0	2 4 5		Moist loose tan and orange mottled clayey	A-2-4(0)	
	_			6		coarse to fine sand w/ some gravel.		
6			6.0'			10" RECOVERY		
		4	6.0	3	HANA	Moist medium dense tan and orange gravel	A-1-b	
				3 10 11 12		and coarse to fine sand w/ some silt.		
				10		3001 20		
			8.0'	_		12" RECOVERY		
	2/13/09	5	8.0'	7 11 8 7		Moist medium dense tan and orange clayey	A-2-7(0)	
9				7		coarse sand and gravel w/ some fine sand.		
			10.0'			13" RECOVERY		
		6	10.0'	7		Moist hard brown and green coarse to fine	A-7-5(3)	Cemented sands.
				7 16 15 17		sandy clay w/ some gravel.	11 / 3(3)	Comenica sanas.
				.,		, , ,		
12			12.0'			18" RECOVERY		
		7	12.0'	7 9 8		Wet medium dense orange clayey coarse to	A-2-5(0)	
				10		fine sand w/ some gravel.		
			44.0			101 DEGGVEDV		
		8	14.0' 14.0'	6		12" RECOVERY Wet medium dense orange silty coarse to fine	A-2-4(0)	Cemented sands.
15				6 8 3 4		sand, trace of gravel.	A-2-4(0)	Comenica sanas.
'3				4		Sand, Made of Brailer		
			16.0'			20" RECOVERY		
		9	16.0'	14 8 4 7		Wet medium dense orange silty coarse to fine	A-1-b	Cemented sands.
				4 7		sand w/ some gravel.		

Remarks:

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 **Contract:** 25-113-01

Б. //	l 5 "			1			
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
		10	18.0' 18.0'	15	23" RECOVERY Wat madium dance groups silty goorse to fine	A-1-b	Cemented sands.
			10.0	15 10 8 4	Wet medium dense orange silty coarse to fine sand, trace of gravel.		Jeniemos sumus.
			20.0'		10" RECOVERY		
21							
	1						
24		11	24.0'	5	XXI (1 C')	A 2 4(0)	
		''	24.0	5 5 5 6	Wet loose orange fine to coarse sand w/ some silt, trace of gravel.	A-2-4(0)	
				6	sin, nace of graven		
			26.0'		20" RECOVERY		
27							
21							
					I)RAFI		
		12	29.0'	3 4	Wet loose gray and orange mottled fine to	A-2-4(0)	
30				3 4 5 6	coarse sand w/ some silt, trace of gravel.		
		M	31.0'		23" RECOVERY	////	
	•		31.0	-	23 RECOVERY		
			_				
					PHOT ON	15	
33					GUST 20		
			_	•			
		13	34.0'	7 7 10 10	Wet medium dense orange fine to coarse sand	A-2-4(0)	
				10	w/ some silt, trace of gravel.		
36			36.0'		21" RECOVERY		
1							
39		14	39.0'	6 7	Wet medium dense orange fine to coarse	A-3	
				6 7 10 12	sand, trace of silt.		
			44.01		II.		
			41.0'		20" RECOVERY		
42							
					S) 81 10		
					;; ;; ;;		
		15	44.0'	8 10 13 15	Wet medium dense orange fine to coarse	A-3	
45				15	sand, trace of silt.		
			46.0'		23" RECOVERY		
					 <u>···</u>	l .	1

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 **Contract:** 25-113-01

Depth	Daily	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
(ft.)	Progress		Беріп				
					611386 181387 181388		
48		16	48.0'	6	Wet medium dense orange fine to coarse	A-3	
		10	40.0	6 10 12 13	Wet medium dense orange fine to coarse sand, trace of silt.	A-3	
			50.0'		Militif Militi		
			00.0		End of Boring		
51							
54							
					DRAFT		
57							
	R						
					FOR BIDI		IG
60	•						
00					OLIOT OO	4 -	
					GUST 20	15	
				1	000120		
63							
66							
69							
72							

Symbol Description

Strata symbols

Low plasticity clay



Poorly graded clayey silty sand



Silty sand



Poorly graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 2/12/2009 using a 3 1/4-inch diameter hollow stem auger. Rig is a Track CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: R1-061

Contract: 25-113-01

Boring Location: Sta. 629+50, 200.00' Lt. C.L.

Boring Surface Elev.: + 76.68' Reference:

IN. IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Spoon O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Depth of Water Time **Depth of Hole Depth of Casing** Elev. of Water Date 2/19/09 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 16.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** J. Truver

Helpers: D. Zmijewski

		1	T			
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I.	Remarks
(11.)	2/19/09	1	1.0'	4 4	Moist firm tan silt w/ some clay, trace of fine A-4(3) As	phalt - 6".
	_,	•	2.0'	4	to coarse sand.	phan - 0.
		2	2.0'	4	10" RECOVERY A-4(5)	
3				4 5 5 4	Moist stiff tan clayey silt, trace of fine to	
				4	coarse sand and gravel.	
			4.0'		16" RECOVERY	
		3	4.0	2		fset 2' south to obtain
		,		2 3 4 5		elby tube.
						•
6			6.0'		18" RECOVERY	
		4	6.0	6 10 11	Moist very stiff orange clayey fine sandy silt A-4(2)	
				11	w/ some coarse sand, trace of gravel.	
			8.0'	4	19" RECOVERY	
		5	8.0'	4 7 7 7	Moist stiff orange silty fine to coarse sand w/ A-2-4(0)	
9				7	some gravel.	
		6	10.0' 10.0'	7	16" RECOVERY	
		0	10.0	7 9 10 11		emented sands.
				11	sandy silt w/ some coarse sand, trace of gravel.	
			40.01			
12		7	12.0' 12.0'	2	22" RECOVERY Moist medium dense orange-gray mottled A-2-4(0) Co	ontains mica.
		'	12.0	2 6 6 8	silty fine sand.	ontains inica.
				8	Sifty fine said.	
			14.0'		18" RECOVERY	
		8	14.0'	10 14	Moist hard orange-gray mottled fine sandy A-4(0)	
15			15.0'	14	silt, trace of coarse sand.	
'		8A	15.0'	17 20	12" RECOVERY A-2-4(0) Ce	emented sands.
			16.0'	∠∪	Moist dense orange-brown silty coarse to fine	
					sand w/ some gravel. 12" RECOVERY	
					End of Boring	
					Lift of Dorling	
1		I		1		

Remarks:

Symbol Description

Strata symbols

Silty low plasticity clay

Silt

Clayey sand



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 2/19/2009 using a 3 1/4-inch diameter hollow stem auger. Rig is a Track CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: R1-062

Contract: 25-113-01

Boring Location: Sta. 629+40, 200.00' Rt. C.L.

Boring Surface Elev.: + 73.50' Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Spoon O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Depth of Water Time **Depth of Casing Depth of Hole** Elev. of Water Date 2/19/09 Dry 16.0 14.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 16.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** J. Truver

Helpers: D. Zmijewski

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks
	2/19/09	1	1.0' 2.0'	3 4	Moist firm brown silt w/ some clay and fine to coarse sand, trace of gravel. 8" RECOVERY A 2 4(0)
3		2	2.0'	3 4 5 5	Moist loose orange clayey gravel and fine to coarse sand. A-2-4(0)
			4.0'		15" RECOVERY
		3	4.0'	3 4 5 6	Moist loose orange clayey fine to coarse sand, A-2-4(0) trace of gravel.
6] '		6.0'		15" RECOVERY
	_	4	6.0	8 9 10 17	Moist medium dense orange fine to coarse sand w/ some silt and gravel. A-2-4(0)
			8.0'		9" RECOVERY
9		5	8.0'	5 9 9 12	Moist very stiff brown and green gravelly clay w/ some fine to coarse sand. A-7-6(5)
			10.0'		11" RECOVERY
	 -	6	10.0'	12 14 16 18	Wet very stiff brown and green fine sandy clay w/ some coarse sand, trace of gravel. A-7-5(6)
12			12.0'		19" RECOVERY
		7	12.0'	4 7 10 11	Wet very stiff brown clayey fine to coarse sandy silt, trace of gravel. A-5(0) Cemented sands.
]	<u></u>	14.0'		21" RECOVERY
15		8	14.0'	8 10 12 14	Wet medium dense brown silty fine to coarse sand, trace of gravel. Cemented sands.
	 '		16.0'		21" RECOVERY
					End of Boring

Remarks:

Symbol Description

Strata symbols



Silty low plasticity clay



Clayey sand



Poorly graded clayey silty sand



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 2/19/2009 using a 3 1/4-inch diameter hollow stem auger. Rig is a Track CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: R1-063

Contract: 25-113-01

Boring Location: Sta. 667+00, C.L.

Boring Surface Elev.: + 31.44' Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: IN. Lbs. 30 D-Sampler: S-Sampler: U-Sampler: IN. Type of: Split Spoon O.D. 2 IN. IN. O.D. O.D.

Core Bit: O.D. IN.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Time **Depth of Water Depth of Hole Depth of Casing** Elev. of Water Date 2/11/09 6.0 6.0 5.6

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 20.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** D. Burt

Helpers: D. Zmijewski

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
	2/11/09	1	0.0'	2 17 13 8		Moist very stiff brown fine sandy silt w/ some coarse sand, trace of gravel.	A-4(0)	
			2.0'	1		6" RECOVERY		
3			4.0'	1 3 8 8		Moist medium dense brown silty fine sand and gravel w/ some coarse sand. 7" RECOVERY	A-2-4(0)	IG
		3	4.0'	1 3 4		Moist loose brown gravel and coarse sand w/	A-1-a	
6			6.0'	4 5	1	some fine sand, trace of silt. 4" RECOVERY	15	
		4	6.0'	3 5 7 8		Moist medium dense brown coarse sand and	A-1-b	
				7 8		gravel w/ some fine sand, trace of silt.		
			8.0'			20" RECOVERY		
9		5	8.0'	4 5 8 8	66 444166 66 9 19 10 10 66 19 19 10 10 70 14 21 10 70 14 21 10 66 14 19 10 66 14 19 10 70 14 21 10	Wet medium dense brown fine to coarse sand, trace of silt and gravel. 24" RECOVERY	A-3	
		6	10.0'	10 12		Wet medium dense brown fine to coarse sand.	A-3	
				12 16 16	126 1 9 1 9 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	trace of silt and gravel.	A-3	
12			12.0'		00111100 001111100	19" RECOVERY		
		7	12.0'	6 9 11 14		Wet medium dense brown fine to coarse sand w/ some silt, trace of gravel.	A-2-4(0)	
			14.0'			10" RECOVERY		
15		8	14.0'	4 7 12 9		Wet medium dense brown fine sand w/ some coarse sand and silt, trace of gravel.	A-2-4(0)	Cemented sands.
			16.0'			14" RECOVERY		
		9	16.0'	9 10 12		Wet medium dense brown fine sand w/ some	A-2-4(0)	

Remarks:

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
				16	coarse sand and silt.		
18		10	18.0'		18" RECOVERY		
		10	18.0'	6 7 9 9	Wet medium dense brown fine to coarse sand w/ some silt.	A-2-4(0)	
	=			9	, , , , , , , , , , , , , , , , , , ,		
			20.0'		21" RECOVERY End of Boring		
21					2 0. 2 0		
	-						
	-						
24							
	-						
	-						
27					DRAFT		
		١.					
	· N				EUD BIDI		
30		1			FOR BIDI		
	1		Λ		GUST 20	15	
	-				しいしろ レ とし		
33	_				000.20		
	1						
	-						
36	_						
	1						
	-						
39]						
	1						
	-						
42							
	1						
	-						
45							

Symbol Description

Strata symbols



Silty sand



Poorly graded gravel



Poorly graded sand



Poorly graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 2/11/2009 using a 3 1/4-inch diameter hollow stem auger. Rig is a Track CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: R1-064

Contract: 25-113-01

Boring Location: Sta. 670+00, C.L.

Boring Surface Elev.: + 39.8' Reference:

Wt. of Casing Hammer: Average Fall: IN. Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: IN. Lbs. 30 D-Sampler: S-Sampler: U-Sampler: IN. Type of: Split Spoon O.D. 2 IN. IN. O.D.

Core Bit: O.D. IN.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Depth of Casing Depth of Water Time **Depth of Hole** Elev. of Water Date 2/11/09 14.0 16.0 16.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 20.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** D. Burt

Helpers: D. Zmijewski

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
	2/11/09	1	0.5'	4 4 5		Moist loose orange-yellow clayey gravel and	A-2-4(0)	Forest Duff - 3".
				5		coarse sand w/ some fine sand.	,	
			2.0'			16" RECOVERY		
		2	2.0'	7 5 3		Moist loose orange-yellow coarse sand and	A-1-b	
3				3 2		gravel w/ some fine sand and silt.		
			4.0			12" RECOVERY		
		3	4.0'	3		Moist very loose orange coarse to fine sand	A-1-b	Y • • • • • • • • • • • • • • • • • • •
				3 2 2 2 2		w/ some silt, trace of gravel.	A-1-0	
				2			4 —	
6			6.0'			13" RECOVERY	15	
		4	6.0'	4 2 3 3		Wholst loose orange coarse to fine sand, trace	A-1-b	
				3		or sint and States		
					1:1:1:1:1:1:1:1 1:1:1:1:1:1:1:1 1:1:1:1:1:1:1:1:1 1:1:1:1:1:1:1:1:1	:		
		5	8.0' 8.0'	3	 	20 KLEOVEK I		
		٥	0.0	3 2 3 3	1313333333	Wioist roose orange coarse sand w/ some fine	A-1-b	
9				3				
			10.0'		100000000000000000000000000000000000000	:		
		6	10.0'	2	1:111111111111111111111111111111111111	Moist loose orange coarse to fine sand trace	A-1-b	
				2 2 3 4		of silt and gravel.		
					(4 14 14 14 14 14 14 14 14 14 14 14 14 14	-		
12			12.0'		::::::::::::::::::::::::::::::::::::	19" RECOVERY		
1		7	12.0'	1 2 2 4	(14.14.14.14.14.14.14.14.14.14.14.14.14.1		A-3	
				4		trace of silt and gravel.		
1			44.01			i		
—		8	14.0' 14.0'	1		19" RECOVERY Wet very loose orange coarse to fine sand,	A-1-b	
15				1 2 1	(CE) () (CE)	trace of silt and gravel.	A-1-U	
10	1			2		tuce of sht and graver.		
			16.0'			21" RECOVERY		
	1	9	16.0'	1		Wet very loose orange fine sand w/ some	A-2-4(0)	
				3 4		coarse sand and silt, trace of gravel.		

Remarks:

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
18		10	18.0' 18.0'	6	24" RECOVERY Wet loose orange coarse to fine sand, trace of silt and gravel.	A-1-b	
			20.0'		End of Boring End of Boring		
21					End of Bornig		
24							
27					DRAFT		
				_			
30				ı	FOR BIDI		IG
33			A	\U	IGUST 20	15	
36							
39							
42							
.=							
45							

Symbol Description

Strata symbols

Clayey sand



Silty sand



Well graded sand with silt



Poorly graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 2/11/2009 using a 3 1/4-inch diameter hollow stem auger. Rig is a Track CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: R1-065

Contract: 25-113-01

Boring Location: Sta. 741+00, C.L.

Boring Surface Elev.: + 16.7' Reference:

IN. IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Spoon O.D. 2 IN. IN. O.D. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Depth of Casing Time **Depth of Water Depth of Hole** Elev. of Water Date 1/20/09 10.0 9.9 10.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 26.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** G. Truver

Helpers: T. Kane

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
	1/20/09	1	1.0' 2.0'	10 9		Moist dense orange fine to coarse sand w/ some gravel and silt.	A-2-4(0)	Topsoil - 9"; fill material.
3		2	2.0'	7 8 11 17		Moist medium dense orange coarse to fine	A-1-b	Fill material.
	N		4.0	11		20 RECOVERT	ALC	
		3	4.0	11 11 20 29		Moist d <mark>ense</mark> orange fine to coarse sand and gravel w/ some silt.	A-1-b	Fill material.
6			6.0'			11" RECOVERY		
		4	6.0'	38 31 40 30		Moist very dense brown coarse sand w/ some fine sand, silt, and gravel.	A-1-b	Fill material.
			8.0'			18" RECOVERY		
9		5	8.0'	7 9 6 7		Wet medium dense orange coarse to fine sand w/ some gravel and silt.	A-1-b	
			10.0'			16" RECOVERY		
		6	10.0' 11.0'	3 4	66 14 15 0 12 1 1 1 1 1 1 1 1 12 1 1 1 1 1 1 1 1 1	Wet loose light brown coarse sand w/ some	A-1-b	
40		6A	11.0'	4 5	64 44 14 6 62 7 1 7 1 6 7 63 7 1 4 1 6 6	10" RECOVERY Wet loose orange fine sand w/ some silt,	A-2-4(0)	
12		7	12.0' 12.0'	1 2 2 2	100 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	trace of coarse sand. 10" RECOVERY	A-3	
			14.0'	2	496 1 7 3 9 6 6 11 6 1 4 3 1 6 6 13 6 4 4 9 6 6 16 7 4 4 9 6 16 7 4 4 9 6 6	Saturated very loose orange fine sand w/ some coarse sand, trace of silt.		
15		8	14.0'	1 2 2 3	11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Saturated very loose orange fine sand w/ some coarse sand, trace of silt.	A-3	
			16.0'		64 (4) 6 (64 (4) 6 (64 (4) 6 (75 (4) 6 (75 (4) 6 (75 (4) 6 (19" RECOVERY		
		9	16.0'	3 3 3 4	0613366 0613466 0613466 0613466 0613466 0613566	and course suma, trace of graven	A-2-4(0)	

Remarks:

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks	
		10	18.0' 18.0'	4 2 3 4	18" RECOVERY Saturated loose orange fine sand w/ some A-2-4(0)	
				4	coarse sand and silt.	
		11	20.0'	1 1	17" RECOVERY Saturated very loose orange fine sand w/ A-2-4(0)	
21				1 1 2 2	some silt and coarse sand.	
		12	22.0' 22.0'	1	13" RECOVERY Seturated very loose grange fine sand w/ A 2 4(0)	
		12	22.0	1 1 2 3	Saturated very loose orange fine sand w/ A-2-4(0) some coarse sand and silt, trace of gravel.	
24			24.0'		19" RECOVERY	
		13	24.0'	10 15 17 19	Saturated dense brown silty fine sand w/ some coarse sand, trace of gravel.	
			00.01	19		
			26.0'		End of Boring	
27						
					DRAFI	
30	N	14		Т		
		V			FOR BIDDING	
00			Λ		IGUST 2015	
33				1	1GUS 1 ZU 13	
36						
39						
42						
45						

Symbol Description

Strata symbols



Silty sand



Poorly graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 1/20/2009 using a 3 1/4-inch diameter hollow stem auger. Rig is a Track CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: R1-066

Contract: 25-113-01

Boring Location: Sta. 744+50, C.L.

Boring Surface Elev.: + 16.0' Reference:

IN. IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Spoon O.D. 2 IN. IN. O.D. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches

Hollow Stem Auger: 0.0

Water Level Readings

Time **Depth of Casing Depth of Water Depth of Hole** Elev. of Water Date 1/23/09 14.0 14.0 12.1

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 26.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** G. Truver

Helpers: T. Kane

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I.	Remarks
	1/23/09	1	1.0' 2.0'	8 8	Moist medium dense orange coarse to fine A-1-b sand w/ some silt, trace of gravel.	Topsoil - 10", fill material.
3		2	2.0'	18 19 16 15	8" RECOVERY Moist dense orange fine to coarse sand w/ some silt and gravel. A-2-4(0)	Fill material.
			4.0'		18" RECOVERY	
		3	4.0'	5 13 15 18	Moist medium dense orange fine sand w/ A-2-4(0) some coarse sand and silt, trace of gravel.	Fill material.
6			6.0'		17" RECOVERY	1
		4	6.0	22 18 19 20	Wet dense orange fine sand w/ some coarse sand and silt, trace of gravel. A-2-4(0)	Fill material.
			8.0'	44	20" RECOVERY	
9		5	8.0'	11 23 24 27	Wet dense orange fine sand w/ some coarse sand and silt, trace of gravel. A-2-4(0)	Fill material.
			10.0'		20" RECOVERY	
		6	10.0'	31 34 31 39	Wet very dense orange fine to coarse sand w/ A-2-4(0) some silt, trace of gravel.	Fill material.
12			12.0'		21" RECOVERY	
		7	12.0'	15 20 25 27	Wet dense light brown coarse sand w/ some fine sand, gravel, and silt. 21" RECOVERY	
		8	14.0'	9	Wet dense light brown coarse to fine sand w/ A-1-b	
15			16.0'	9 15 21 27	some silt, trace of gravel. 20" RECOVERY	
		9	16.0'	11 24 23 18	Wet dense orange fine to coarse sand w/ some silt, trace of gravel. A-2-4(0)	

Remarks:

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	· · ·	emarks
		10	18.0' 18.0'	W/H 2 5 4	12" RECOVERY Wet loose light brown fine to coarse sand w/ some silt, trace of gravel. A-2-4(0)	
		11	20.0'	1 3 8 8	12" RECOVERY Wet medium dense light brown fine to coarse A-1-b	
21			22.0'	8	sand w/ some silt and gravel. 16" RECOVERY	
		12	22.0'	1 2 3 3	No Sample Recovery	
24		13	24.0' 24.0'	6 15 25 17	0" RECOVERY Saturated dense dark gray fine sand and A-3 gravel w/ some coarse sand, trace of silt.	
			26.0'		End of Boring	
27					DRAFT	
30	N	1/	<u> </u>	_		
	ì	V '		I	FOR BIDDING	
33					IGUST 2015	
36						
39						
42						
45						

Symbol Description

Strata symbols



Silty sand



Poorly graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 1/23/2009 using a 3 1/4-inch diameter hollow stem auger. Rig is a Track CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blow counts are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: US 301 Maryland State Line to SR-1 Boring No.: R1-075

Contract: 28-113-01

Boring Location: Sta. 907+00 20' Rt. C.L.

Boring Surface Elev.: + 33.92 Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: IN. Lbs. 30 D-Sampler: S-Sampler: U-Sampler: IN. Type of: Split Barrel O.D. 2 O.D.

IN. IN. Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Depth of Water Time **Depth of Hole Depth of Casing** Elev. of Water Date

7/9/10 20.0 18.0 7.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 20.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Bill Holden

Helpers: T. Kane

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks	
	7/9/10	1	0.5' 2.0'	13 14 13	Moist very stiff brown clayey silt w/some fine sand, trace coarse sand and fine gravel. 10" RECOVERY Topsoil - 4".	
		2	2.0' 3.0'	11 9	Moist very stiff brown clayey silt w/some fine A-4(2)	
3.6	A	2A	3.0' 4.0'	9	sand, trace coarse sand and fine gravel. 8" RECOVERY A-2-4(0)	
		3	4.0' 6.0'	7 8 8 6	Moist medium dense brown silty fine sand w/some coarse sand, trace fine gravel. 10" RECOVERY Wet medium dense brown fine to coarse sand	
7.2		4	6.0' 8.0'	4 5 6 7	w/some silt, trace fine gravel. 16" RECOVERY Wet medium dense orange fine sand w/some silt and coarse sand, trace fine gravel.	
		5	8.0' 10.0'	3 3 4 4	Wet loose orange fine sand w/some coarse sand and silt, trace fine gravel. 18" RECOVERY A-2-4(0)	
10.8		6	10.0' 12.0'	4 5 8 7	Wet medium dense orange fine to coarse sand w/some silt, trace fine gravel. 18" RECOVERY	
		7	12.0'	3 3 3 3	Wet loose orange fine to coarse sand w/some A-2-4(0) silt, trace fine gravel. 14" RECOVERY	
14.4		8	14.0'	4 12 11 13	Wet medium dense orange fine sand w/some fine gravel, coarse sand and silt. 16" RECOVERY	
		9	16.0'	5 10 15 16	Wet medium dense brown fine sand w/some A-2-4(0) silt, trace fine gravel and coarse sand.	
18		10	18.0'	11 26 24 25	18" RECOVERY Wet very dense brown fine to coarse sand w/ some fine gravel, trace silt.	
			20.0'		图[辞] 19" RECOVERY End of Boring	

Remarks:

Reviewed By: Hany Fekry Soils Supervisor: Randy Ferguson

Symbol Description

Strata symbols



Low plasticity clay



Silty low plasticity clay



Silty sand



Poorly graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

- Exploratory borings were drilled on July 9, 2010 using a 3 1/4-inch diameter continuous flight power auger. Rig is a CME 55 ATV.
- 2. Groundwater levels recorded at the time of drilling and re-checked to following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blows are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: US 301 Maryland State Line to SR-1 Boring No.: R1-076

Contract: 28-113-01

Boring Location: Sta 923+00 20' Lt. C.L.

Boring Surface Elev.: + 53.55 Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Depth of Casing Depth of Water Time **Depth of Hole** Elev. of Water Date 7/12/10 Dry 20.0 18.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 20.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Bill Holden

Helpers: T. Kane

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Re	marks
	7/12/10	1	1.0' 2.0'	7 10		. Stone - 8".
		2	2.0'	7	coarse to fine sand and fine gravel. 8" RECOVERY A-6(13)	
				7 5 5 6	Wet stiff brown silty clay w/trace fine to	
3.6			4.0'	ŭ	coarse sand and fine gravel.	
	l N	3	4.0'	13 5	Wet stiff brown fine sandy silt w/some coarse A-4(0)	
	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	\mathbf{V}		13 5 6 7	sand and clay, trace fine gravel.	
	•		6.0'	•	13" RECOVERY	
		4	6.0'	9 8	Wet stiff gray fine sandy silt w/some coarse A-4(0)	
7.2				7 8	sand and clay.	
			8.0'		15" RECOVERY	
		5	8.0'	9 11 7	Wet medium dense orange silty fine sand w/ A-2-4(0)	
				8	trace coarse sand.	
		6	10.0' 10.0'	6	14" RECOVERY	
10.8		0	10.0	6 5 5 7	Wet stiff tan fine sandy silt w/trace coarse A-4(0) sand.	
				7		
		7	12.0' 12.0'	5	19" RECOVERY Wet medium dense tan silty fine sand w/trace A-2-4(0)	
		'	12.0	5 6 8 7	coarse sand and fine gravel.	
			44.0	7	6" RECOVERY	
14.4		8	14.0' 14.0'	4	Wet medium dense tan fine to coarse sand w/ A-2-4(0)	
				4 5 6 5	some silt, trace fine gravel.	
			16.0'		19" RECOVERY	
		9	16.0'	4 6	Wet medium dense orange coarse to fine sand A-2-4(0)	
				10 11	w/some silt, trace fine gravel.	
18			18.0'		20" RECOVERY	
.,		10	18.0'	9	Wet medium dense brown fine gravelly A-1-b	
				11 15	coarse sand w/trace silt and fine sand.	
			20.0'		Higher 14" RECOVERY	
					End of Boring	
	I	i e	1	1	1	

Remarks:

Reviewed By: Hany Fekry Soils Supervisor: Randy Ferguson

Symbol Description

Strata symbols

Low plasticity clay



Poorly graded clayey silty sand



Silty low plasticity clay



Silty sand



Silt



Poorly graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

- Exploratory borings were drilled on July 12, 2010 using a 3 1/4-inch diameter continuous flight power auger. Rig is a CME 55 ATV.
- 2. Groundwater levels recorded at the time of drilling and re-checked to following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blows are uncorrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: SWM1-10-1

Contract: 25-113-01

Boring Location: Sta. 514+00, 250.00' Rt. C.L.

Boring Surface Elev.: + 53.0' Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Spoon O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Time **Depth of Water** Depth of Hole **Depth of Casing** Elev. of Water Date 2/25/09 4.9

16.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Ft.; Dia. U-Sample Boring: U-Samples: Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** J. Truver

Helpers:

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	2/25/09	1	0.5' 2.0'	6 4 4	Moist firm brown fine sandy silt w/ some clay and coarse sand, trace of gravel. 15" RECOVERY	A-4(0)	Topsoil - 5".
	_	2	2.0'	4 8 13 8	Moist medium dense brown gravel and coarse sand w/ some fine sand, trace of silt.	A-1-a	
3.5			4.0'		19"RECOVERY		
	"	3	4.0'	4 5 5 8	Moist loose brown coarse sand and gravel w/ some silt and fine sand.	A-1-b	
	['		6.0'	!	6" RECOVERY		
7		4	6.0' 8.0'	4 4 4 5	Wet loose brown coarse sand w/ some fine sand, silt, and gravel. 22" RECOVERY	A-1-b	
		5	8.0'	6 7 6 7	Wet medium dense brown coarse sand w/ some gravel, silt, and fine sand	l. A-1-b	
 	1 '		10.0'	ļ!	21" RECOVERY	+	
10.5		6	10.0'	4 8 8 13	Wet medium dense green and brown gravel w/ some coarse to fine sand and silt.	A-1-a	
<u> </u>			12.0'		16" RECOVERY		
		7	12.0'	6 6 7 6	Saturated medium dense green and brown clayey fine to coarse sand, trace of gravel.	A-2-4(0)	
14	'		14.0'	!	21" RECOVERY		
		8	14.0'	6 6 7 8	Saturated medium dense green and brown clayey fine to coarse sand w/ some gravel.	A-2-4(0)	
Г	'		16.0'	!	20" RECOVERY		
					End of Boring		
	{						
17.5	4						
	1						
	1						

Remarks:

Symbol Description

Strata symbols

Poorly graded clayey silty sand

Poorly graded sand



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 2/25/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a ATV CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: SWM1-1-1

Contract: 25-113-01

Boring Location: Sta. 462+00, 330' Rt. C.L.

Boring Surface Elev.: + 58.0 Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 O.D.

IN. IN. Core Bit: O.D.

From Depth of: From Depth of: To: To: 3 1/4 **Casing Size:** Inches

Hollow Stem Auger: 0.0

Water Level Readings

Depth of Water Time **Depth of Hole Depth of Casing** Elev. of Water Date 7/28/2009 7.2

10.0 8.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 16.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dave Burt

Helpers: J. Lafferty

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	7/28/09	1	0.0'	4 5 6	Moist stiff brown silt w/some clay and fine to coarse sand.	A-4(2)	
] '			6 4			
	'		2.0'		22" RECOVERY		
	_ '	2	2.0'	4 5	Moist medium dense brown gravel w/some clay and coarse to fine sand.	A-1-b	
3.5				10			
0.5	'		4.0'		15" RECOVERY		
	"	3	4.0'	8	Moist to wet loose brown silty fine to coarse sand w/some gravel.	A-2-4(0)	
	'			3			
-	'		6.0'		16" RECOVERY		
<u> </u>	 	4	6.0'	4 3 4	Wet firm brown fine sandy clay w/some coarse sand.	A-7-6(4)	
7	'			4 6	JUJI ZUIJ		
<u> </u>	! '		8.0'		18" RECOVERY		
<u> </u>	 	5	8.0'	2 3	Wet firm green fine sandy clay w/some coarse sand, trace of gravel.	A-7-6(4)	
<u> </u>	'			4 5			
<u> </u>	'		10.0'		14" RECOVERY		
10.5	. '	6	10.0'	4 4	Wet stiff green fine sandy clay w/some coarse sand.	A-7-6(4)	
<u> </u>	! '			6 9			
	<u> </u>	<u> </u>	12.0'		18" RECOVERY		
		7	12.0'	3 5 7	Wet stiff green fine sandy clay w/trace of coarse sand.	A-6(3)	
] '			7 8	· ·		
14] '	<u></u>	14.0'		17" RECOVERY		
	'	8	14.0'	6 7	Wet very stiff green fine sandy clay w/trace of coarse sand.	A-6(4)	
	'			9 12			
	'		16.0'	<u> </u>	18" RECOVERY		
					End of Boring		
17.5	'			'			
17.5	'						
	'						
<u> </u>	1 '			'			

Remarks:

Symbol Description

Strata symbols



Silty low plasticity clay



Poorly graded clayey silty sand



Silty sand



Clayey sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 2/27/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a ATV CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: SWM1-11-1

Contract: 25-113-01

Boring Location: Sta. 516+60, 270.00' Rt. C.L.

Boring Surface Elev.: + 53.0 Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Spoon O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Time **Depth of Water** Depth of Hole **Depth of Casing** Elev. of Water Date 2/26/09 5.6

16.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Ft.; Dia. U-Sample Boring: U-Samples: Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** J. Truver

Helpers:

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	2/26/09	1	0.5' 2.0'	2 2 3	Moist firm brown silt w/some clay, fine to coarse sand, and gravel.	A-4(1)	Topsoil - 5".
	'	2	2.0'	4 4 4	Moist loose brown gravel and coarse sand w/ some silt and fine sand.	A-1-b	
3.5			4.0'	6 1	20" RECOVERY		
		3	4.0'	2 2 2 2	Wet very loose brown coarse to fine sand w/ some silt, trace of gravel.	A-2-4(0)	
<u> </u>			6.0'		12" RECOVERY		
7		4	6.0'	2 7 5 7	Wet medium dense brown fine to coarse sand w/ some silt, trace of gravel.	A-2-4(0)	
		5	8.0'	5 5 7 7	Wet medium dense brown fine to coarse sand w/ some silt and gravel.	A-2-4(0)	
<u> </u>			10.0'	<u> </u>	21" RECOVERY		
10.5		6	10.0'	4 5 7 7	Saturated medium dense brown and green silty fine sand w/ some coarse sand and gravel.	A-2-4(0)	
<u> </u>		<u> </u>	12.0'		20" RECOVERY		
		7	12.0'	8 11 13 16	Saturated medium dense brown and green clayey fine sand w/ some coarse sand and gravel.	A-2-4(0)	
14	<u> </u>		14.0'		15" RECOVERY		
		8	14.0'	9 11 14 18	Saturated medium dense brown and green fine to coarse sand w/ some gravel and silt.	A-2-4(0)	
			16.0'		17" RECOVERY		
					End of Boring		
17.5					_ 		
17.5	1						
<u> </u>				!			
				!			
	'	1					

Remarks:

Symbol Description

Strata symbols

Silty low plasticity clay



Silty sand



Clayey sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 2/26/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a ATV CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: SWM1-12-1

Contract: 25-113-01

Boring Location: Sta. 543+50, 280.00' Rt. C.L.

Boring Surface Elev.: + 65.0 Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Spoon O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Time **Depth of Water** Depth of Hole **Depth of Casing** Elev. of Water Date 3/30/09 Dry

16.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Ft.; Dia. U-Sample Boring: U-Samples: Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** D. Burt

Helpers:

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	3/30/09	1	0.5' 2.0'	2 1 2	Moist soft brown clayey fine sandy silt, trace of coarse sand and gravel. 17" RECOVERY	A-4(1)	Topsoil - 6".
		2	2.0'	7 21 30 24	Moist very dense brown coarse sand and gravel w/ some fine sand and silt.	A-1-b	
3.5			4.0'		20" RECOVERY		
		3	4.0'	9 12 13 12	Moist medium dense brown coarse sand and gravel w/some fine sand, trace of silt.	A-1-b	
	1		6.0'		18" RECOVERY		
7		4	6.0' 8.0'	22 20 17 17	Moist dense brown gravel and coarse sand w/ some fine sand, trace of silt. 18" RECOVERY	A-1-b	
		5	8.0'	6 6 7 4	Wet medium dense brown and orange coarse to fine sand w/ some silt,	A-1-b	
10.5		6	10.0'	8 8 11 12	Wet medium dense brown and orange coarse to fine sand w/ some silt, trace of gravel. 15" RECOVERY	A-1-b	
		7	12.0'	4 8 12 11	Wet medium dense brown and orange coarse sand w/ some fine sand, trace of gravel and silt.	A-1-b	
14		<u> </u>	14.0'	E	19" RECOVERY		
		8	14.0'	5 7 9 13	Wet medium dense brown and orange coarse to fine sand, trace of gravel and silt. 17" RECOVERY	A-1-b	
			16.0'				
					End of Boring		
1							
17.5	1						

Remarks:

Symbol Description

Strata symbols



Silty low plasticity clay



Silty sand



Well graded sand with silt



Poorly graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 3/30/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a ATV CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: SWM1-13-1

Contract: 25-113-01

Boring Location: Sta. 547+00, 240.00' Lt. C.L.

Boring Surface Elev.: + 66.0 Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Spoon O.D. 2 IN. IN. O.D.

Core Bit: O.D. **Casing Size:**

From Depth of: From Depth of: To: To: 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Time **Depth of Water** Depth of Hole **Depth of Casing** Elev. of Water Date 3/23/09 16.0 7.3

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Ft.; Dia. U-Sample Boring: U-Samples: Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** D. Burt

Helpers:

Depth	Daily	No.	Sample	Blows/6"	Sample Description	Class./G.I.	Remarks
(ft.)	Progress		Depth				
	3/23/09	1	0.5'	4 5 5	Moist stiff brown silt w/some coarse to fine sand and clay, trace of	A-4(1)	Topsoil -
			2.0'	5	gravel.		6".
		2	2.0'	8 8	Moist medium dense brown and gray clayey fine sandy silt, trace of	A-4(1)	
		_		8 9	coarse sand and gravel.	A-4(1)	
3.5				11	Coarse saild and graver.		
			4.0'		13" RECOVERY		
		3	4.0'	4 6 8 11	Moist medium dense brown and black mottled clayey fine to coarse sand,	A-2-4(0)	
	-			11	trace of gravel.		
			6.0'		10" RECOVERY		
		4	6.0'	7 9 8	Wet medium dense brown and black mottled coarse to fine sand w/ some	A-2-4(0)	
7				8 6	silt, trace of gravel.		
		5	8.0' 8.0'	5	Wet loose brown and black mottled fine to coarse sand w/ some silt and	A 2 4(0)	
		3	0.0	5 4 5 6		A-2-4(0)	
				6	gravel.		
			10.0'		16" RECOVERY		
10.5		6	10.0'	5 7	Wet medium dense brown and black mottled fine to coarse sand w/ some	A-2-4(0)	
				6 7	silt, trace of gravel.		
			12.0'		12" RECOVERY		
		7	12.0'	11	Wet medium dense brown coarse to fine sand w/ some gravel trace of	A-1-b	
				11 6 7 8	silt.		
				8			
14		8	14.0'	2	21" RECOVERY		
		8	14.0'	3 5 8 10	Wet medium dense brown coarse to fine sand and gravel, trace of silt.	A-1-b	
			16.0'		20" RECOVERY		
					End of Boring		
H					-		
17.5							
L							

Remarks:

Symbol Description

Strata symbols



Silty low plasticity clay



Clayey sand



Silty sand



Poorly graded sand with silt



Well graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 3/23/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a ATV CME 55.
- Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: SWM1-14-1

Contract: 25-113-01

Boring Location: Sta. 558+60, 210.00' Lt. C.L.

Boring Surface Elev.: + 65.0 Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Spoon O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Time **Depth of Water** Depth of Hole **Depth of Casing** Elev. of Water Date 4/8/09 16.0 6.3

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Ft.; Dia. U-Sample Boring: U-Samples: Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** D. Burt

Helpers:

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	4/8/09	1	0.5' 2.0'	2 5 6	Moist stiff gray and brown fine sandy silt, trace of coarse sand and clay. 18" RECOVERY	A-4(0)	Topsoil - 6".
		2	2.0'	10 17 22 16	Moist dense orange silty fine to coarse sand, trace of gravel.	A-2-4(0)	Iron staining.
3.5	N		4.0'		24" RECOVERY		
		3	4.0'	10 7 12 14	Wet medium dense brown and orange coarse to fine sand w/ some clay, trace of gravel.	A-2-4(0)	
			6.0'		21" RECOVERY		
7		4	6.0' 8.0'	20 18 20 15	Wet dense gray coarse sand w/ some gravel, fine sand, and silt. 20" RECOVERY	A-1-b	
		5	8.0'	6 7 6 7	Wet medium dense gray coarse to fine sand w/ some gravel and silt.	A-1-b	
10.5		6	10.0' 10.0'	14 8	12" RECOVERY Wet medium dense gray coarse sand and gravel w/ some fine sand, trace	A-1-b	
			12.0'	9 7	of silt.		
		7	12.0'	2	2115b2	A-1-b	
		,	12.0	2 5 5 9	Wet loose gray coarse to fine sand w/ some silt, trace of gravel.	A-1-0	
14			14.0'		18" RECOVERY		
		8	14.0'	20 25 18 19	Wet dense gray coarse to fine sand w/ some gravel and silt.	A-1-b	
			16.0'		reformer Petit field Reformer Reformer		
					End of Boring		
17.5							

Remarks:

Symbol Description

Strata symbols

Silt



Silty sand



Poorly graded clayey silty sand



Poorly graded sand with silt



Well graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 4/8/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a ATV CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: SWM1-15-1

Contract: 25-113-01

Boring Location: Sta. 563+52, 218.00' Rt. C.L.

3 1/4

Boring Surface Elev.: + 67.0 Reference:

Inches

Wt. of Casing Hammer: Wt. of Sample Hammer: IN. IN. IN. Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: 30 Lbs. D-Sampler: S-Sampler: U-Sampler: Core Bit: 2 Type of: Split Barrel O.D. IN. IN. IN. O.D. Ö.D.

O.D.

From Depth of: From Depth of: To: To: **Casing Size: Hollow Stem Auger:** 0.0

Water Level Readings

Depth of Casing Depth of Water Time Elev. of Water Depth of Hole Date 7/10/2009 10.0 12.0 6.5

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dave Burt

Helpers:

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	7/10/09	1	0.5' 2.0'	6 6 7	Moist stiff orange clayey fine sandy silt w/some coarse sand and gravel 7" RECOVERY	A-4(1)	Cultivated Soil - 8".
		2	2.0'	14 18 14	Moist dense orange coarse to fine sand w/some silt and gravel.	A-1-b	
3.5			4.0'	12	18" RECOVERY		
		3	4.0'	10 10 10 10	Moist medium dense silty coarse to fine sand w/trace of gravel.	A-2-4(0)	
			6.0'		21" RECOVERY		
7		4	6.0' 8.0'	10 16 7 12	Moist medium dense orange gravel and coarse sand w/some fine sand a silt. 15" RECOVERY	nd A-1-b	
		5	8.0'	4 9 9 8	Wet medium dense orange gravel and coarse sand w/some fine sand and silt.	l A-1-b	
			10.0'		12" RECOVERY		
10.5		6	10.0'	9 8 13 20	Wet medium dense orange gravel and coarse sand w/some fine sand, tra of silt. 23" RECOVERY	ce A-1-b	
		7	12.0' 12.0'	8	6 1 pt 4 pt 6 b	A-7-5(4)	
		,	12.0	8 7 16 12	Wet very stiff green fine sandy clay w/some coarse sand and gravel.	A-7-3(4)	
14			14.0'		14" RECOVERY		
		8	14.0'	10 13 14 17	Wet very stiff green fine sandy clay w/trace of coarse sand and gravel.	A-7-5(14)	
			16.0'		9" RECOVERY		
					End of Boring		
17.5							
17.5							

Remarks:

Reviewed By:	Soils Supervisor:

Symbol Description

Strata symbols

Clayey sand



Silty sand



Poorly graded sand with silt



Elastic silt

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 7/10/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a ATV CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: SWM1-16-1

Contract: 25-113-01

Boring Location: Sta. 570+13, 187.00' Rt. C.L.

Boring Surface Elev.: + 65.0' Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Depth of Water Time Depth of Hole **Depth of Casing** Elev. of Water Date 7/10/2009 10.0 8.0 6.8

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dave Burt

Helpers:

			1				, ,
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	7/10/09	1	0.5' 2.0'	5 8 12	Moist very stiff gray silt w/some clay, trace of fine to coarse sand and gravel. 15" RECOVERY	A-4(3)	Cultivated Soil - 8".
		2	2.0'	8 12 12 14	Moist very stiff orangish gray mottled fine sandy silt w/some clay and coarse sand, trace of gravel.	A-4(0)	
3.5			4.0'		18" RECOVERY		
		3	4.0'	10 5 4 2	Moist loose orange fine to coarse sand w/some silt, trace of gravel.	A-2-4(0)	
			6.0'		19" RECOVERY		
7		4	6.0' 8.0'	6 4 3 1	Moist loose orangish gray mottled coarse to fine sand w/some silt, trace gravel. 14" RECOVERY	of A-1-b	
		5	8.0'	2 3 4 5	Wet loose orange silty fine sand w/some coarse sand, trace of gravel. 16" RECOVERY	A-2-4(0)	
10.5		6	10.0'	7 8 12 11	Wet medium dense orange coarse sand and gravel w/some fine sand, trac of silt. 24" RECOVERY	ee A-1-b	
		7	12.0'	7 8 11 20	Wet very stiff greenish brown mottled fine sandy clay w/some coarse sand and gravel.	A-7-5(1)	
14			14.0'		17" RECOVERY		
		8	14.0'	10 12 11 12	Wet medium dense green clayey fine to coarse sand w/some gravel.	A-2-6(0)	Glauconit
			16.0'		10" RECOVERY		
					End of Boring		
17.5					-		
17.5							

Remarks:

Symbol Description

Strata symbols



Silty low plasticity clay



Poorly graded clayey silty sand



Silty sand



Well graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 7/10/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a ATV CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: SWM1-17-1

Contract: 25-113-01

Boring Location: Sta. 570+34, 190.00' Lt. C.L.

Boring Surface Elev.: + 67.0 Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D.

IN. Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Depth of Casing Depth of Water Time Depth of Hole Elev. of Water Date 7/13/2009 14.0 12.0

11.9

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dave Burt

Helpers:

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	7/13/09	1	0.5' 2.0'	3 4 3	Moist firm tan clayey silt w/trace of fine to coarse sand.	A-4(5)	Forrest Duff - 3".
		2	2.0'	5 5 6	Moist stiff tan clayey coarse sandy silt w/some fine sand, trace of gravel.	A-4(3)	
3.5			4.0'	8	20" RECOVERY		
		3	4.0'	8 10 5 8	Moist medium dense orange silty fine sand w/some coarse sand.	A-2-4(0)	
			6.0'		18" RECOVERY		
7		4	6.0' 8.0'	6 7 5 6	Moist medium dense orange silty fine sand w/some coarse sand. 21" RECOVERY	A-2-4(0)	
		5	8.0'	4 5 6 4	Wet medium dense orange fine sand and gravel w/some silt and coarse sand.	A-2-4(0)	
10.5		6	10.0'	3 6 7 7	14" RECOVERY Wet medium dense orange coarse to fine sand w/some silt, trace of gravel.	A-2-4(0)	
		L	12.0'		19" RECOVERY		
		7	12.0'	7 5 5 8	Wet stiff brown fine sandy clay w/some coarse sand, trace of gravel.	A-7-5(7)	
14			14.0'	_	14" RECOVERY		
		8	14.0'	7 14 12 17	Wet very stiff greenish brown fine sandy clay w/some coarse sand.	A-7-6(9)	
			16.0'		24" RECOVERY		
					End of Boring		
17.5							
		l					

Remarks:

Symbol Description

Strata symbols



Silty low plasticity clay



Low plasticity clay



Silty sand



Poorly graded sand with silt



Elastic silt

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 7/13/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a ATV CME 55.
- Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: SWM1-18-1

Contract: 25-113-01

Boring Location: Sta. 573+15, 237.00' Rt. C.L.

Boring Surface Elev.: + 67.0 Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0 14.0

Water Level Readings

Depth of Water Time Depth of Hole **Depth of Casing** Elev. of Water Date 7/10/2009 10.0 9.0 12.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dave Burt

Helpers:

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	7/10/09	1	0.5' 2.0'	2 2 4	Moist firm gray clayey silt w/trace of fine to coarse sand and gravel. 16" RECOVERY	A-4(5)	Cultivated Soil - 6".
3.5		2	2.0'	6 6 7 9	Wet stiff greenish brown and gray mottled silty fine sandy clay w/trace o gravel and coarse sand.	A-6(8)	USDA Classifica
3.5		2	4.0'	7	19" RECOVERY	7.7(10)	- Clay Loam
		3	4.0'	7 9 9 7	Wet very stiff greenish brown fine sandy clay w/some coarse sand.	A-7-5(12)	
			6.0'		16" RECOVERY		
7		4	6.0' 8.0'	8 9 10 10	Wet very stiff green fine sandy clay w/some coarse sand, trace of gravel. 19" RECOVERY	A-7-5(2)	Glauconit
		5	8.0'	3 7 10 8	Wet medium dense green silty fine to coarse sand.	A-2-4(0)	Glauconit
10.5		_	10.0'	8	18" RECOVERY	1 1/0	G1 .
10.5		6	10.0'	8 9 9 10	Wet very stiff green fine sandy silt w/some clay, organic matter and coarse sand. 21" RECOVERY	A-4(0)	Glauconit
		7	12.0'	1	Wet soft green clayey fine sandy silt w/some organic matter, trace of	A-4(1)	Glauconit
		•	12.0	1 2 1 1	coarse sand and silt.	A-4(1)	Giaucollit
14			14.0'		21" RECOVERY		
		8	14.0'	1 1 1 1	Wet soft green organic fine to coarse sandy clay w/trace of gravel.	A-7-5(4)	Glauconit
			16.0'		21" RECOVERY	<u> </u>	
					End of Boring		
17.5							

Remarks:

Symbol Description

Strata symbols



Silty low plasticity clay



Low plasticity clay



Elastic silt



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 7/10/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a ATV CME 55.
- Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: SWM1-19-1

Contract: 25-113-01

Boring Location: Sta. 574+68, 209.00' Lt. C.L.

Boring Surface Elev.: + 66.0 Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0 14.0

Water Level Readings

Depth of Water Time Depth of Hole **Depth of Casing** Elev. of Water Date 7/13/2009 10.0 9.2 12.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** Dave Burt

Helpers:

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	7/13/09	1	0.5' 2.0'	4 3 4	Moist firm gray silt w/some clay and fine sand, trace of coarse sand. 16" RECOVERY	A-4(2)	Cultivated Soil - 6".
3.5		2	2.0'	8 12 14 13	Moist medium dense orangish gray coarse sand w/some clay and fine sand, trace of gravel and silt.	A-1-b	USDA Classifica
3.0		3	4.0'	6	20" RECOVERY	2.4(0)	- Sandy Clay
			4.0	6 7 6 6	Moist medium dense orange silty coarse to fine sand w/trace of gravel.	A-2-4(0)	Loam
		<u></u>	6.0'	<u></u> !	18" RECOVERY		
7		4	6.0' 8.0'	5 7 7 6	Moist to wet medium dense orange fine to coarse sand w/some silt. 16" RECOVERY	A-2-4(0)	
		5	8.0'	4 4 3 10	Wet loose orange silty fine sand w/some coarse sand, trace of gravel.	A-2-4(0)	
10.5		6	10.0' 10.0'	14	16" RECOVERY	4 1 1	
10.5		р	10.0'	14 15 9 9	Wet medium dense orange gravel and fine to coarse sand w/some silt. 24" RECOVERY	A-1-b	
	-	7	12.0'	4 6 7	Wet loose green clayey fine to coarse sand w/trace of gravel.	A-2-7(1)	Glauconit
14			14.0'	<u> </u>	223" RECOVERY		
		8	14.0'	5 8 13 20	Wet medium dense green clayey fine to coarse sand w/trace of gravel.	A-2-7(2)	Glauconit
		<u> </u>	16.0'	<u> </u>	14" RECOVERY		
					End of Boring		
H				'			
17.5	1			'			
	1			'			
				'			
				!			
	1			,			

Remarks:

Symbol Description

Strata symbols



Silty low plasticity clay



Poorly graded clayey silty sand



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 7/13/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a ATV CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: SWM1-20-1

Contract: 25-113-01

Boring Location: Sta. 586+86, 192.00' Rt. C.L.

Boring Surface Elev.: + 67.0 Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Depth of Water Time Depth of Hole **Depth of Casing** Elev. of Water Date 6/26/2009 10.0 12.0 8.9

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Gary Truver

Helpers:

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	6/26/09	1	0.5' 2.0'	2 3 5	Moist firm tan clayey silt w/trace of fine to coarse sand.	A-4(4)	Cultivated Soil - 8".
		2	2.0'	4 5 8	Moist stiff tan fine sandy silt w/some clay, trace of coarse sand.	A-4(0)	
3.5			4.0'	9	12" RECOVERY		
		3	4.0'	3 6 7 8	Moist stiff brown fine sandy silt w/some coarse sand, trace of clay.	A-4(0)	USDA Classifica - Sandy
		<u> </u>	6.0'	12	17" RECOVERY		Loam
7		4	6.0' 8.0'	12 13 15 8	Moist medium dense tan silty fine to coarse sand w/some gravel. 17" RECOVERY	A-2-4(0)	
		5	8.0'	3 5 6 7	Wet stiff brownish green fine sandy clay w/some coarse sand, trace of gravel.	A-7-6(9)	
			10.0'		17" RECOVERY		
10.5		6	10.0'	7 8 10 10	Wet very stiff brownish green fine sandy clay w/trace of coarse sand and gravel.	A-7-5(19)	
		l	12.0'		20" RECOVERY		l
		7	12.0'	3 4 6 5	Wet stiff brown fine to coarse sandy clay w/trace of gravel.	A-7-5(3)	
14		L	14.0'		16" RECOVERY		
		8	14.0'	2 2 4 6	Wet firm gray fine sandy clay w/some coarse sand, trace of gravel.	A-7-5(2)	
		l	16.0'		19" RECOVERY		
					End of Boring		
17.5							

Remarks:

Symbol Description

Strata symbols

Silty low plasticity clay



Silty sand



Elastic silt

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 6/26//2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a ATV CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: SWM1-2-1

Contract: 25-113-01

Boring Location: Sta. 465+50, 250.00' Rt. C.L.

Boring Surface Elev.: + 60.0 Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Spoon O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Time **Depth of Water Depth of Hole Depth of Casing** Elev. of Water Date 3/6/09

16.0 8.5

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 16 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** J. Truver

Helpers:

	ı		Τ_	1			Г	
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
	3/6/09	1	0.5' 2.0'	2 2 2		Moist soft light brown silt w/ some fine to coarse sand, trace of clay and gravel. 17" RECOVERY	A-4(0)	Cultivated Soil - 6".
		2	2.0'	4 4 6		Moist loose orange silty fine sand w/ some gravel and coarse sand.	A-2-4(0)	
3.5			4.0'	14		16" RECOVERY		
		3	4.0'	9 10 9 11		Moist medium dense orange silty gravel and fine sand w/ some coarse sand.	A-2-4(0)	
			6.0'			13" RECOVERY		
7		4	6.0' 8.0'	9 9 10 11	:1:1:1:1:1:1:1:1	Wet medium dense brown fine to coarse sand w/ some clay, trace of gravel. 20" RECOVERY	A-2-4(0)	
		5	8.0'	3566		Wet medium dense brown clayey fine sand w/ some coarse sand.	A-2-6(0)	
			10.0'	4		15" RECOVERY		
10.5		6	10.0'	4 6 8 9		Wet stiff brown fine sandy clay w/ some coarse sand. 17" RECOVERY	A-7-6(2)	
	1	7	12.0'	3			A 2 6(1)	
		,		3 4 8 8		Saturated medium dense brown clayey fine sand w/ some coarse sand.	A-2-6(1)	
14			14.0'			18" RECOVERY		
		8	14.0'	3 6 8 10		Saturated medium dense brown silty fine sand w/ some coarse sand.	A-2-4(0)	
			16.0'			15" RECOVERY		
						End of Boring		
						-		
17.5								
	1							
—	ł	l	1					

Remarks:

Symbol Description

Strata symbols

Silt

Silty sand

Clayey sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 3/6/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a Track CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: SWM1-21-1

Contract: 25-113-01

Boring Location: Sta. 590+93, 226.00' Rt. C.L.

Boring Surface Elev.: + 67.0 Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Spoon O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Time **Depth of Water** Depth of Hole **Depth of Casing** Elev. of Water Date

2/27/09 16.0 8.6

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Ft.; Dia. U-Sample Boring: U-Samples: Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** D. Burt

Helpers:

D ::	Б.:		٠ .			1	,
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	2/27/09	1	1.0' 2.0'	3 2	Moist firm light brown silt, trace of fine to coarse sand and clay.	A-4(1)	Cultivated
		2	2.0'	4 5 5 6	Moist stiff orange silt w/ some fine sand and clay, trace of coarse sand and gravel.	A-4(1)	12".
3.5			4.0'	0	20" RECOVERY		
		3	4.0'	7 11 13 9	Moist medium dense yellow clayey coarse to fine sand and gravel.	A-2-4(0)	
			6.0'		17" RECOVERY		
7		4	6.0'	16 13 14	Moist medium dense white coarse sand w/ some fine sand, trace of clay and gravel.	A-1-b	
			8.0'	15	18" RECOVERY		
		5	8.0'	4 9 8 8	Wet medium dense yellow coarse sand w/ some gravel, trace of silt and fine sand.	A-1-b	
			10.0'		tracert (1986) 17" RECOVERY		
10.5		6	10.0'	3 5 10 9	Saturated stiff orange clayey coarse sandy silt w/ some fine sand and gravel.	A-5(1)	Cemented sands.
			12.0'		24" RECOVERY		
		7	12.0'	2 2 4 5	Saturated firm orange coarse to fine sandy clay, trace of gravel.	A-7-5(8)	Cemented sands.
14			14.0'		18" RECOVERY		
		8	14.0'	9 10 10 11	Saturated medium dense orange coarse to fine sand w/ some silt and gravel.	A-1-b	Cemented sands.
			16.0'		18" RECOVERY		
					End of Boring		
17.5							
17.5	1						
	l						
L	l						

Remarks:

Symbol Description

Strata symbols

Silt



Silty low plasticity clay



Poorly graded clayey silty sand



Silty sand



Poorly graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 2/27/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a Track CME 55.
- Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: SWM1-22-1

Contract: 25-113-01

Boring Location: Sta. 595+65, 199.00' Rt. C.L.

Boring Surface Elev.: + 71.0' Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Spoon O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Time **Depth of Water Depth of Hole Depth of Casing** Elev. of Water Date 2/27/09 16.0 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Ft.; Dia. U-Sample Boring: U-Samples: Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** D. Burt

Helpers:

		_				_	
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	2/27/09	1	1.0' 2.0'	7 7	Moist stiff brown clayey silt, trace of fine to coarse sand.	A-4(8)	Cultivated
		2	2.0'	8 7 7	Moist stiff brown and gray clay w/ some fine sand, trace of coarse sand.	A-6(8)	Soil - 11".
3.5				6			
		3	4.0'	3	12" RECOVERY Moist very stiff gray fine sandy clay, trace of coarse sand and gravel.	A-6(6)	
		N		3 7 10 12	inost very start gray rate stand carry, trace of coarse stand and graver.	1 0(0)	
	_		6.0'	_	24" RECOVERY		
7		4	6.0'	5 8 13 20	Moist very stiff brown and gray mottled fine sandy clay, trace of coarse sand and gravel.	A-6(8)	
			8.0'	20	24" RECOVERY		
		5	8.0'	3 6	Moist medium dense white silty fine sand and gravel, trace of coarse	A-2-4(0)	
				14 15	sand.		
			10.0'		15" RECOVERY		
10.5		6	10.0'	19 25 14 11	Moist dense gray to orange clayey gravel and coarse sand w/ some fine sand.	A-2-4(0)	Cemented sands.
			12.0'		17" RECOVERY		
		7	12.0'	7 11 12 16	Wet very stiff brown fine sandy clay w/ some coarse sand, trace of grave	el. A-7-5(4)	
14			14.0'	16	12" RECOVERY		
'-		8	14.0'	23 17 12 13	Wet medium dense orange clayey fine to coarse sand w/ some gravel.	A-2-7(0)	
				12 13			
			16.0'		24" RECOVERY		
					End of Boring		
17.5							

Remarks:

Symbol Description

Strata symbols

Low plasticity clay

Silty sand

Silt

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 2/27/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a Track CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: SWM1-23-1

Contract: 25-113-01

Boring Location: Sta. 600+00, 190.00' Rt. C.L.

Boring Surface Elev.: + 76.0 Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Spoon O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Time **Depth of Water** Depth of Hole **Depth of Casing** Elev. of Water Date 2/27/09 Dry 16.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Ft.; Dia. U-Sample Boring: U-Samples: Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** D. Burt

Helpers:

Donth	Daily	Ι	Cample				Г
Depth (ft.)	Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	2/27/09	1	1.0'	7 6	Moist stiff brown clayey silt, trace of fine to coarse sand.	A-4(8)	Cultivated
			2.0'		12" RECO <mark>V</mark> ERY		Soil - 9".
		2	2.0'	6 8 9 11	Moist very stiff brown clayey fine sandy silt w/ some coarse sand.	A-4(3)	
3.5				11			
			4.0'		16" RECOVERY		
		3	4.0'	3 7	Moist medium dense orange silty fine sand w/ some coarse sand.	A-2-4(0)	
		N		6			
			6.0'		17" RECOVERY		
		4	6.0'	4 4	Moist stiff orange to gray clay w/ some fine sand, trace of coarse sand.	A-6(7)	
7				6 4			
			8.0'	41	24" RECOVERY		
		5	8.0'	1 4 7	Moist stiff orange and gray mottled fine sandy clay w/ some coarse sand,	A-6(4)	
				7 8	trace of gravel.		
			10.0'		18" RECOVERY		
10.5		6	10.0'	7 7 14 16	Moist very stiff gray fine sandy clay w/ some coarse sand, trace of gravel.	A-6(4)	
				14 16			
			12.0'		20" RECOVERY		
		7	12.0'	3	Moist medium dense gray and orange mottled coarse to fine sand w/ some	A-1-b	
				3 9 10 11	silt, trace of gravel.		
14			14.0'		17" RECOVERY		
		8	14.0'	12 15	Moist dense gray and grange mottled coarse sand and grayel w/ some fine	A-1-b	
				12 15 19 27	sand, trace of silt.		
			16.0'		20" RECOVERY		
			10.0		End of Boring		
17.5							

Remarks:

Symbol Description

Strata symbols

Low plasticity clay



Silty sand



Clayey sand



Well graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 2/27/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a Track CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: SWM1-23-2

Contract: 25-113-01

Boring Location: Sta. 605+00, 205.00' Rt. C.L.

Boring Surface Elev.: + 74.0 Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Spoon O.D. 2 IN. IN. O.D.

Core Bit: O.D. **Casing Size:** 3 1/4 Inches

From Depth of: From Depth of: To: To: Hollow Stem Auger: 0.0

Water Level Readings

Time **Depth of Water Depth of Hole Depth of Casing** Elev. of Water Date 2/27/09 Dry 16.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Ft.; Dia. U-Sample Boring: U-Samples: Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** D. Burt

Helpers:

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	2/27/09	1	1.0' 2.0'	7 8	Moist stiff brown silt, trace of fine to coarse sand.	A-4(0)	Cultivated Soil -
	-	2	2.0'	6 6 8	Moist stiff brown clayey silt w/ some fine sand, trace of coarse sand.	A-4(3)	3011 - 11".
3.5			4.0'	5	19" RECOVERY		
		3	4.0'	3 4 7 7	Moist stiff gray clayey silt w/ some fine sand, trace of coarse sand.	A-4(6)	
	1	<u> </u>	6.0'	<u> </u>	20" RECOVERY		l
7		4	6.0'	3 5 7 8	Moist stiff gray clay w/ some fine sand, trace of coarse sand.	A-6(11)	
	-	5	8.0' 8.0'	3 5 8 8	24" RECOVERY Moist medium dense yellow fine to coarse sand w/ some silt, trace of gravel.	A-2-4(0)	
	 -		10.0'		17" RECOVERY		
10.5		6	10.0'	12 9 7 8	Moist medium dense yellow silty fine sand w/ some coarse sand, trace of gravel.	A-2-4(0)	
			12.0'	!	17" RECOVERY		
		7	12.0'	8 7 6 9	Moist medium dense orange fine to coarse sand w/ some silt, trace of gravel.	A-2-4(0)	
14	1		14.0'	'	18" RECOVERY		
		8	14.0' 16.0'	8 13 11 11	Moist medium dense orange fine sand and gravel w/ some silt and coarse sand. Moist medium dense orange fine sand and gravel w/ some silt and coarse sand.	A-2-4(0)	
<u> </u>	 	+	10.0	+	16" RECOVERY		
<u> </u>	1			'	End of Boring		
17.5				'			
<u> </u>	1			'			
	1			'			
	1			'			
	1			'			
	4	1		,			

Remarks:

Symbol Description

Strata symbols

Silt



Silty low plasticity clay



Low plasticity clay



Silty sand

DRAFT NOT FOR BIDDING **AUGUST 2015**

- 1. Exploratory borings were drilled on 2/27/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a Track CME 55.
- Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: SWM1-24-1

Contract: 25-113-01

Boring Location: Sta. 605+49, 196.00' Lt. C.L.

Boring Surface Elev.: + 76.0 Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Spoon O.D. 2 IN. IN. O.D. Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches

Hollow Stem Auger: 0.0 14.0

Water Level Readings

Time **Depth of Water Depth of Hole Depth of Casing** Elev. of Water Date 2/27/09 Dry 16.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Ft.; Dia. U-Sample Boring: U-Samples: Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** D. Burt

Helpers:

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	2/27/09	1	1.0' 2.0'	5 6	Moist stiff tan fine sandy silt w/ some clay and coarse sand. 12" RECOVERY	A-4(1)	Topsoil - 8".
		2	2.0'	6 7 9	Moist very stiff tan silt w/ some fine sand, trace of clay and coarse sand.	A-4(0)	· .
3.5				9			
		3	4.0' 4.0'	3	18" RECOVERY Moist stiff orange clay w/ some fine sand, trace of coarse sand and gravel.	A-6(11)	
		V		3 6 5 6	Worst sum of ange day w/ some time sand, trace of coarse sand and graver.	7-0(11)	
			6.0'		15" RECOVERY		
7		4	6.0' 7.0'	6 8	Moist very stiff orange gray mottled fine sandy clay, trace of coarse sand and gravel.	A-6(7)	
		4A	7.0'	10 15	12" RECOVERY	A-2-4(0)	
		5	8.0' 8.0'	5 7	Moist medium dense orange-gray mottled silty fine to coarse sand, trace	A-2-4(0)	
				7 7 6	of gravel. 12" RECOVERY	11 2 4(0)	
			10.0'		Moist medium dense orange-gray mottled fine to coarse sand w/ some silt,		
10.5		6	10.0'	5 7 9 10	trace of gravel. 15" RECOVERY	A-2-4(0)	
				9 10	Moist medium dense orange-gray mottled silty fine to coarse sand, trace		
			12.0'		of gravel.		
		7	12.0'	5 6 11 11	Moist medium dense orange fine sand and gravel w/ some coarse sand and silt.	A-2-4(0)	
14			14.0'		15" RECOVERY		
		8	14.0'	22 12 12 12	Wet very stiff orange and brown coarse sandy clay w/ some fine sand and	A-7-5(3)	Cemented
				12	gravel.		sands.
			16.0'		14" RECOVERY		
					End of Boring		
17.5							

Remarks:

Symbol Description

Strata symbols

Silty low plasticity clay

Silt



Low plasticity clay



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 2/27/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a Track CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: SWM1-25-1

Contract: 25-113-01

Boring Location: Sta. 605+80, 174.00' Rt. C.L.

Boring Surface Elev.: + 74.0' Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Spoon O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Depth of Water Time **Depth of Hole Depth of Casing** Elev. of Water Date 2/27/09 Dry 16.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Ft.; Dia. U-Sample Boring: U-Samples: Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** D. Burt

Helpers:

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	2/27/09	1	1.0' 2.0'	4 6	Moist stiff tan clayey silt, trace of fine to coarse sand. 12" RECOVERY	A-4(8)	Topsoil - 8".
		2	2.0'	12 13 11	Moist very stiff tan clayey silt w/ some fine sand, trace of coarse sand.	A-4(3)	<u>o</u> .
3.5			4.01	8			
		3	4.0'	3 4	21" RECOVERY Moist stiff tan and gray mottled clayey silt w/ some fine sand, trace of	A-4(5)	
		V		3 4 5 5	coarse sand.		
			6.0'	5	18" RECOVERY	1 (5)	
7		4	6.0' 7.0'	5 14	Moist very stiff tan and gray mottled clayey silt w/ some fine sand, trace of coarse sand and gravel.	A-4(5)	
		4A	7.0'	13 12	12" RECOVERY	A-2-4(0)	
		5	8.0' 8.0'	4 6	Moist medium dense orange and gray mottled silty fine sand w/ some coarse sand.	A-2-4(0)	
				6 8 7	coarse sand.	11 2 1(0)	
			10.0'	, ,	Moist medium dense orange and yellow mottled silty fine sand, trace of		
10.5		6	10.0'	8 15	coarse sand.	A-2-4(0)	
				8 15 11 10	Moist medium dense orange fine to coarse sand w/ some silt.		
			12.0'		20" RECOVERY		
		7	12.0'	4 10 24 24	Moist dense brown gravel and coarse to fine sand w/ some silt.	A-1-b	
				24	ACTIVITY OF THE PROPERTY OF TH		
14		8	14.0' 14.0'	17	#### 11" RECOVERY Wet dense brown clayey fine to coarse sand w/ some gravel.	A-2-7(1)	
			1112	17 14 17 13	wet dense brown crayey fine to coarse sand w/ some graver.	A-2-7(1)	
			16.0'		16" RECOVERY		
					End of Boring		
17.5							
17.0							

Remarks:

Symbol Description

Strata symbols

Silt



Silty low plasticity clay



Low plasticity clay



Silty sand



Poorly graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 2/27/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a Track CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: SWM1-26-1

Contract: 25-113-01

Boring Location: Sta. 610+87, 210.00' Lt. C.L.

Boring Surface Elev.: + 66.0 Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Spoon O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Time **Depth of Water Depth of Hole Depth of Casing** Elev. of Water Date 2/26/09 16.0 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Ft.; Dia. U-Sample Boring: U-Samples: Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** D. Burt

Helpers:

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
3.5	2/26/09	2	1.0' 2.0' 2.0'	3 4 4 4 4 6	Moist firm orange fine sandy silt w/ some clay, trace of coarse sand and gravel. 9" RECOVERY Moist loose orange silty fine to coarse sand, trace of gravel.	A-4(0) A-2-4(0)	Cultivated Soil - 10".
		3	4.0' 4.0'	3 3 6 3	T2" RECOVERY Wet loose orange silty coarse to fine sand, trace of gravel. 8" RECOVERY	A-2-5(0)	Cemented sands.
7		4	6.0'	4 8 4 5	Wet medium dense orange coarse sand w/ some fine sand, silt, and gravel. 10" RECOVERY	A-1-b	Cemented sands.
		5	8.0 ¹	3 3 4 5	Wet loose orange silty coarse to fine sand, trace of gravel. 12" RECOVERY	A-2-4(0)	Cemented sands.
10.5		6	10.0'	6 6 7 4	Wet medium dense orange silty fine to coarse sand, trace of gravel. 18" RECOVERY	A-2-4(0)	Cemented sands.
14		7	12.0'	3 4 4 6	Wet loose brown and gray fine to coarse sand w/ some silt, trace of gravel. 17" RECOVERY	A-2-4(0)	
17		8	14.0'	7 7 6 7	Wet medium dense orange fine to coarse sand w/ some silt, trace of gravel. 21" RECOVERY	A-2-4(0)	Cemented sands.
17.5			16.0		End of Boring		

Remarks:

Symbol Description

Strata symbols

Poorly graded clayey silty sand



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 2/26/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a ATV CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: SWM1-27-1

Contract: 25-113-01

Boring Location: Sta. 613+27, 225.00' Lt. C.L.

Boring Surface Elev.: + 71.0' Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split-Spoon O.D. 2 IN. IN. O.D. Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches

Hollow Stem Auger: 0.0 14.0

Water Level Readings

Depth of Water Time **Depth of Hole Depth of Casing** Elev. of Water Date 2/26/09 16.0 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Ft.; Dia. U-Sample Boring: U-Samples: Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** D. Burt

Helpers:

			Τ_			1	
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	2/26/09	1	1.0'	4 3	Moist firm brown clayey fine sandy silt w/ some coarse sand, trace of	A-4(1)	Cultivated
		2	2.0' 2.0'	3 4	gravel. 12" RECOVERY	A-2-4(0)	Soil -
		-	2.0	4	Moist loose orange silty coarse to fine sand, trace of gravel.	A-2-4(0)	10".
3.5	_	_		3			
		3	4.0'	4	Moist loose orange silty fine to coarse sand, trace of gravel.	A-2-4(0)	
	ì	Ň	4.0	4 3 4	Worst loose drange sirty fine to coarse saild, trace of graver.	A-2-4(0)	
			6.0'		20" RECOVERY		
7		4	6.0'	6 24 10	Moist dense orange coarse to fine sand and gravel w/ some silt.	A-1-b	Cemented
			8.0'	7	14" RECOVERY		sands.
		5	8.0	3 3 8 5	Wet medium dense orange silty coarse sand and gravel w/ some fine sand	A-2-4(0)	Cemented sands.
			10.0'		9" RECOVERY		
10.5		6	10.0'	5 9 9 6	Wet medium dense orange silty coarse to fine sand, trace of gravel.	A-2-4(0)	Cemented sands.
			12.0'		19" RECOVERY		
		7	12.0'	2 6 8 10	Wet medium dense orange silty coarse to fine sand, trace of gravel.	A-2-5(0)	Cemented sands.
			44.01	10	12# DECOVEDY		
14		8	14.0' 14.0'	7	13" RECOVERY Wet medium dense orange silty coarse to fine sand, trace of gravel.	A-1-b	Cemented
				7 9 8 10	The medium dense stange strip course to time stand, trace or grants.		sands.
			16.0'		19" RECOVERY		
			10.0		End of Boring		
l							
17.5							
-							

Remarks:

Symbol Description

Strata symbols

Clayey sand



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 2/26/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a ATV CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: SWM1-28-1

Contract: 25-113-01

Boring Location: Sta. 624+80, 168.00' Lt. C.L.

Boring Surface Elev.: + 75.0' Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Spoon O.D. 2 IN. IN. O.D.

Core Bit: O.D. **Casing Size:**

From Depth of: From Depth of: To: To: 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Time **Depth of Water** Depth of Hole **Depth of Casing** Elev. of Water Date 2/23/09 16.0 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Ft.; Dia. U-Sample Boring: U-Samples: Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** D. Burt

Helpers:

	<u> </u>						
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	2/23/09	1	1.0' 2.0'	3 3	Moist firm brown and tan silt w/ some clay, trace of fine to coarse sand and gravel.	A-4(3)	Cultivated Soil - 9".
	1	2	2.0'	5 6 7 7	12" RECOVERY Moist stiff brown and tan clayey silt, trace of fine to coarse sand and	A-4(5)	
3.5	l N		4.0'	<u> </u>	gravel. 16" RECOVERY	100	
		3	4.0'	6 7 7	Moist medium dense tan clayey fine sand w/ some coarse sand, trace of gravel.	A-2-4(0)	
	1 '		6.0'	<u> </u>	14" RECOVERY		
7		4	6.0' 8.0'	6 8 9 9	Moist medium dense tan silty fine sand, trace of coarse sand. 16" RECOVERY	A-2-4(0)	Contains trace of mica.
		5	8.0'	4 5 7 7	Moist medium dense orange-brown mottled silty fine sand, trace of grav and coarse sand.	el A-2-4(0)	Contains mica.
10.5	1 '	6	10.0' 10.0'	10	17" RECOVERY	1 4(0)	
10.5	1			10 10 12 13	Moist very stiff orange-brown, yellow, and white mottled fine sandy silt trace of coarse sand.	, A-4(0)	Contains mica.
\vdash	1 '	<u> </u>	12.0'	<u> </u>	24" RECOVERY		<u> </u>
	!	7	12.0'	7 12 22 8	Moist dense orange-brown fine to coarse sand w/ some gravel, trace of silt.	A-3	Cemented sands.
14	1 '	1 '	14.0'	'	16" RECOVERY		
		8	14.0'	7 6 6 8	Wet medium dense orange and brown silty coarse to fine sand w/ some gravel/	A-2-5(0)	Cemented sands.
	1 '		16.0'		15" RECOVERY		
	ſ <u>'</u>		,	'	End of Boring		
17.5	1 '	1	['	'			
17.5	1 '	1	1	'			
\vdash	1 '	1	['	'			
	1 '	1	['	'			
	1 '		'	'			

Remarks:

Symbol Description

Strata symbols



Silty low plasticity clay



Clayey sand



Silty sand



Poorly graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 2/23/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a Track CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: SWM1-29-1

Contract: 25-113-01

Boring Location: Sta. 625+05, 173.00' Rt. C.L.

Boring Surface Elev.: + 74.0' Reference:

IN. IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Spoon O.D. 2 IN. IN. O.D.

Core Bit: O.D. **Casing Size:** 3 1/4 Inches

From Depth of: From Depth of: To: To: Hollow Stem Auger: 0.0

Water Level Readings

Time **Depth of Water Depth of Hole Depth of Casing** Elev. of Water Date 2/25/09 Dry 16.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Ft.; Dia. U-Sample Boring: U-Samples: Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** D. Burt

Helpers:

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
(ft.)	2/25/09	1	1.0'	3 4	Moist firm tan clayey silt, trace of fine to coarse sand.	A-4(7)	Cultivated
		2	2.0' 2.0'		6" RECOVERY Moist stiff tan silt w/ some fine to coarse sand and clay, trace of gravel.	A-4(0)	Soil - 8".
		-	2.0	3 4 6 7	worst surr-tail site w/ some thie to coarse saild and clay, trace of graver.	A-4(0)	
3.5			4.0'	_	14" RECOVERY		
		3	4.0'	3 5 6 7	Moist stiff orange fine sandy silt, trace of coarse sand and gravel.	A-4(0)	
	•		6.0'	-	15" RECOVERY		
		4	6.0'	4 7	Moist stiff orange fine sandy silt.	A-4(0)	
7			8.0'	7 4	19" RECOVERY		
		5	8.0	2 4 6 6	Moist stiff orange fine sandy silt, trace of coarse sand and gravel.	A-4(0)	
				6 6			
			10.0'	00	18" RECOVERY		
10.5		6	10.0'	20 17 18 30	Moist dense orange, tan, white mottled gravel and coarse sand w/ some fine sand and silt.	A-1-b	Auger refusal at
			12.0'		16" RECOVERY		10.5'. Boring
		7	12.0'	19 20 12 7	Moist dense orange clayey coarse sand and gravel w/ some fine sand.	A-2-6(0)	offset 3.0'
14			14.0'		12" RECOVERY		completio
		8	14.0'	8 15 15 16	Wet medium dense orange silty fine to coarse sand w/ some gravel.	A-2-5(0)	of boring.
				16			Cemented sands.
			16.0'		16" RECOVERY		Cemented
					End of Boring		sands.
17.5							Cemented
							sands.

Remarks:

Symbol Description

Strata symbols

Low plasticity clay



Silty low plasticity clay



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 2/25/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a Track CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: SWM1-30-1

Contract: 25-113-01

Boring Location: Sta. 625+84, 485.00' Rt. C.L.

Boring Surface Elev.: + 74.0' Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Spoon O.D. 2 IN. IN. O.D. Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches

Hollow Stem Auger: 0.0

Water Level Readings

Time **Depth of Water** Depth of Hole **Depth of Casing** Elev. of Water Date 2/26/09 16.0 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Ft.; Dia. U-Sample Boring: U-Samples: Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** D. Burt

Helpers:

			T _			1	_
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	2/26/09	1	1.0' 2.0'	5 5	Moist stiff tan clay, trace of fine sand. 12" RECOVERY	A-6(13)	Cultivated Soil - 8".
		2	2.0'	6 7 8 7	Moist stiff tan clayey silt, trace of fine to coarse sand.	A-4(9)	5011 - 0 .
3.5		_	4.01	7			
	N	3	4.0' 4.0'	4	19" RECOVERY Moist stiff tan silt w/ some fine to coarse sand, trace of clay and gravel.	A-4(1)	
		V	Ü	4 5 7 9	violst stiff tall site w/ solile line to coarse salid, trace of clay and graver.	A-4(1)	
			6.0'		11" RECOVERY		
_		4	6.0'	5 5 6	Moist stiff orange fine sandy silt w/ some clay and coarse sand, trace of	A-4(0)	
7			8.0'	6 7	gravel. 17" RECOVERY		
		5	8.0'	3 4 6 8	Moist loose yellow silty fine sand, trace of coarse sand.	A-2-4(0)	
			10.0'		15" RECOVERY		
10.5		6	10.0'	10 9 9 8	Moist medium dense yellow silty fine sand, trace of coarse sand.	A-2-4(0)	
			12.0'		20" RECOVERY		
		7	12.0'	6 12 9 11	Moist medium dense yellow fine to coarse sand w/ some gravel and silt.	A-2-4(0)	Cemented
				11			sands.
14			14.0'	40	16" RECOVERY		
		8	14.0'	16 29 22 31	Moist very dense yellow gravel and coarse sand w/ some fine sand and	A-1-b	Cemented
				31	silt.		sands.
			16.0'		17" RECOVERY		
					End of Boring		
17.5							

Remarks:

Symbol Description

Strata symbols

Low plasticity clay



Silty low plasticity clay



Poorly graded clayey silty sand



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 2/25/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a Track CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: SWM1-31-1

Contract: 25-113-01

Boring Location: Sta. 627+59, 178.00' Rt. C.L.

Boring Surface Elev.: + 73.0' Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Spoon O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Time **Depth of Water Depth of Hole Depth of Casing** Elev. of Water Date 2/25/09 16.0 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Ft.; Dia. U-Sample Boring: U-Samples: Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** D. Burt

Helpers:

		г –					
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	2/25/09	1	1.0' 2.0'	4 4	Moist firm tan clayey silt, trace of fine to coarse sand and gravel. 12" RECOVERY	A-4(5)	Cultivated Soil - 8".
3.5		2	2.0'	5 7 5 6	Moist stiff tan clayey silt w/some fine to coarse sand, trace of gravel.	A-4(2)	5011 - 6 .
0.0			4.0'		18" RECOVERY		
		3	4.0'	3 4 7 8	Moist stiff orange fine sandy silt, trace of coarse sand and gravel.	A-4(0)	Contains mica.
			6.0'		16" RECOVERY		
7		4	6.0'	9 9 9	Moist medium dense orange silty fine sand, trace of coarse sand and gravel.	A-2-4(0)	
·			8.0'	9	17" RECOVERY		
		5	8.0	3 8 7 12	Wet stiff orange fine sandy clay w/ some coarse sand and gravel.	A-7-5(4)	Cemented sands.
			10.0'		12" RECOVERY		
10.5		6	10.0'	10 15 15 18	Wet very stiff green fine sandy clay w/ some coarse sand, trace of gravel.	A-7-5(2)	Cemented sands.
			12.0'		17" RECOVERY		
		7	12.0'	4 6 8 10	Wet stiff green clayey fine to coarse sandy silt, trace of gravel.	A-4(0)	Cemented sands.
14			14.0'		15" RECOVERY		
		8	14.0'	8 9 9	Wet medium dense orange silty coarse to fine sand w/ some gravel.	A-2-4(0)	Cemented sands.
			16.0'		24" RECOVERY		
					End of Boring		
17.5							
17.5							

Remarks:

Symbol Description

Strata symbols

Silty low plasticity clay



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 2/25/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a Track CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: SWM1-32-1

Contract: 25-113-01

Boring Location: Sta. 631+28, 196.00' Rt. C.L.

Boring Surface Elev.: + 73.0' Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Spoon O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Time **Depth of Water** Depth of Hole **Depth of Casing** Elev. of Water Date 2/18/09 Dry 16.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Ft.; Dia. U-Sample Boring: U-Samples: Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** D. Burt

Helpers:

		_	Τ_				1
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	2/18/09	1	1.0' 2.0'	3 4	Moist firm brown and tan clayey silt, trace of fine to coarse sand.	A-4(9)	Cultivated Soil - 8";
3.5		2	2.0'	5 5 8 9	Moist stiff orange clayey fine sandy silt w/ some coarse sand and gravel.	A-4(1)	boring offset 12'
	R		4.0'		15" RECOVERY		weset due
		3	4.0'	3 4 5 5	Moist loose orange clayey fine to coarse sand, trace of gravel.	A-2-4(0)	to over head wires.
l		4	6.0' 6.0'	9	14" RECOVERY Meiet modium dance brown silve fine to george and w/ some group!	A 2 4(0)	Companied
7			7.0'	9 10	Moist medium dense brown silty fine to coarse sand w/ some gravel.	A-2-4(0)	Cemented sands.
		4A	7.0' 8.0'	7 11	Wet very stiff orange fine sandy silt w/ some clay, trace of coarse sand and gravel.	A-4(0)	sands.
		5	8.0'	7 10 12 14	10" RECOVERY Wet medium dense brown and green clayey fine sand and gravel w/ some	A-2-7(0)	Cemented sands.
			10.0'		coarse sand. 16" RECOVERY		Sures.
10.5		6	10.0'	8 21 33 13	Wet hard brown and green fine sandy clay w/ some coarse sand, trace of gravel.	A-7-5(2)	Cemented sands.
		7	12.0' 12.0'	4	16" RECOVERY	A 2 4(0)	
		′	12.0	4 5 7 12	Wet medium dense brown, green, and gray mottled silty fine to coarse sand, trace of gravel.	A-2-4(0)	
14			14.0'		18" RECOVERY		
		8	14.0'	8 10 7 7	Wet medium dense orange and red clayey fine to coarse sand w/ some gravel.	A-2-5(0)	Cemented sands.
			16.0'		15" RECOVERY		
					End of Boring		
L					Č		
17.5							
	1						

Remarks:

Symbol Description

Strata symbols

Low plasticity clay

Poorly graded clayey silty sand

Clayey sand



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 2/18/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a Track CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: SWM1-33-1

Contract: 25-113-01

Boring Location: Sta. 637+31, 390.00' Rt. C.L.

Boring Surface Elev.: + 66.0' Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Spoon O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Time **Depth of Water Depth of Hole Depth of Casing** Elev. of Water Date 2/12/09 Dry 16.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Ft.; Dia. U-Sample Boring: U-Samples: Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** D. Burt

Helpers:

		_	1			1	
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	2/12/09	1	1.0'	2 4 8	Moist stiff brown and orange clayey gravelly silt w/ some fine sand, trac of coarse sand.	e A-4(1)	Cultivated Soil - 8".
		2	2.0' \ 2.5'	13 13 13 13	Moist medium dense yellow-tan gravel w/ some coarse sand, trace of sile	A-1-a	3011 - 8 .
3.5		_	1.01	18	and fine sand. 16" RECOVERY		
		3	4.0'	4 8 10 9	8" RECOVERY No sample recovery.	5	
			6.0'	40	0" RECOVERY		
7		4	6.0'	12 15 19 13	Wet hard brown fine sandy clay w/ some gravel, trace of coarse sand.	A-7-5(10)	
			8.0'	-	8" RECOVERY		
		5	8.0'	2 4 5 7	Wet loose orange and brown clayey fine to coarse sand w/ some gravel.	A-2-7(1)	Cemented sands.
			10.0'		12" RECOVERY		
10.5		6	10.0'	2 3 3 2	Wet loose orange and brown clayey coarse to fine sand, trace of gravel.	A-2-5(0)	Cemented sands.
			12.0'		20" RECOVERY		
		7	12.0'	3 4 6 6	Wet stiff orange and brown coarse to fine sandy clay, trace of gravel.	A-7-5(2)	Cemented sands.
14			14.0'		19" RECOVERY		
		8	14.0'	4 6 7 8	Wet medium dense orange and brown silty coarse to fine sand, trace of gravel.	A-1-b	Cemented sands.
			16.0'		20" RECOVERY		
			1 212		End of Boring		
					G		
17.5							

Remarks:

Symbol Description

Strata symbols

Clayey sand



Poorly graded gravel with silt



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 2/12/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a Track CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: SWM1-34-1

Contract: 25-113-01

Boring Location: Sta. 638+75, 311.00' Lt. C.L.

Boring Surface Elev.: + 69.0' Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Spoon O.D. 2 IN. IN. O.D.

Core Bit: O.D. **Casing Size:** 3 1/4 Inches

From Depth of: From Depth of: To: To: Hollow Stem Auger: 0.0

Water Level Readings

Time **Depth of Water Depth of Hole Depth of Casing** Elev. of Water Date 2/12/09 16.0 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Ft.; Dia. U-Sample Boring: U-Samples: Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** D. Burt

Helpers:

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	2/12/09	1	1.0' 2.0'	2 3	Moist firm orange clayey silt, trace of fine to coarse sand. 12" RECOVERY	A-4(8)	Cultivated Soil - 9".
		2	2.0'	4 7 7 6	Moist stiff orange clayey fine sandy silt w/ some coarse sand and gravel.	A-4(1)	2011 7.
3.5	N		4.0'		10" RECOVERY		
		3	4.0'	5 11 19 14	Moist medium dense gray clay gravel w/ some coarse to fine sand.	A-2-4(0)	
	_		6.0'	- 10	16" RECOVERY		
7		4	6.0' 8.0'	10 10 10 11	Moist medium dense brown and orange silty coarse sand w/ some gravel and fine sand. 8" RECOVERY	A-1-b	Cemented sands.
		5	8.0'	3 6 8 7	Wet medium dense brown and green silty coarse sand w/ some fine sand trace of gravel.	, A-2-4(0)	Cemented sands.
			10.0'	40	8" RECOVERY		
10.5		6	10.0'	12 13 11 10	Wet medium dense orange clayey coarse to fine sand, trace of gravel.	A-2-7(1)	Cemented sands.
		7	12.0' 12.0'	3	18" RECOVERY	A 2 4(0)	Cemented
		,	12.0	3 6 5 14	Wet medium dense orange silty coarse to fine sand, trace of gravel.	A-2-4(0)	sands.
14			14.0'	20	15" RECOVERY		
		8	14.0'	20 10 12 14	Wet medium dense orange silty coarse to fine sand w/ some gravel.	A-2-4(0)	Cemented sands.
			16.0'		13" RECOVERY		
					End of Boring		
17.5							

Remarks:

Symbol Description

Strata symbols

Low plasticity clay

Clayey sand



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 2/12/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a Track CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: SWM1-35-1

Contract: 25-113-01

Boring Location: Sta. 642+97, 236.00' Rt. C.L.

Boring Surface Elev.: + 56.0' Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Spoon O.D. 2 IN. IN. O.D.

Core Bit: O.D. **Casing Size:** 3 1/4 Inches

From Depth of: From Depth of: To: To: Hollow Stem Auger: 0.0

Water Level Readings

Time **Depth of Water Depth of Hole Depth of Casing** Elev. of Water Date 2/12/09 Dry 16.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Ft.; Dia. U-Sample Boring: U-Samples: Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** D. Burt

Helpers:

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	2/12/09	1	1.0' 2.0'	6 6	Wet medium dense brown clayey coarse to fine sand, trace of gravel.	A-2-7(0)	Cultivated Soil - 9".
		2	2.0'	6 7 7 8	Wet medium dense brown clayey coarse to fine sand, trace of gravel.	A-2-7(0)	Cemented sands.
3.5			4.0'		16" RECOVERY		Surios.
		3	4.0'	2 10 5 5	Wet medium dense orange-brown silty coarse to fine sand w/ some gravel.	A-1-b	Cemented sands.
			6.0'		12" RECOVERY		
7		4	6.0'	6 8 10	Wet medium dense orange-brown coarse sand and gravel w/ some fine sand and silt.	A-1-b	
			8.0'	5	19" RECOVERY		
		5	8.0'	2 4 6 7	Wet loose orange fine to coarse sand w/ some silt, trace of gravel.	A-2-4(0)	Cemented sands.
			10.0'		8" RECOVERY		
10.5		6	10.0'	10 10 9 10	Wet medium dense orange fine to coarse sand w/ some silt, trace of gravel.	A-2-4(0)	Cemented sands.
			12.0'		20" RECOVERY		
		7	12.0'	2 3 4 5	Wet firm orange silt w/ some fine sand, trace of coarse sand and gravel.	A-4(0)	
14			14.0'		18" RECOVERY		
		8	14.0'	4 6 6 7	Wet medium dense orange-gray fine to coarse sand w/ some silt, trace of gravel.	A-2-4(0)	
			16.0'		24" RECOVERY		
					End of Boring		
17.5							
11.13							

Remarks:

Symbol Description

Strata symbols

Silty sand

Silt

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 2/12/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a Track CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: SWM1-36-1

Contract: 25-113-01

Boring Location: Sta. 648+20, 209.00' Rt. C.L.

Boring Surface Elev.: + 59.0' Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Spoon O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Time **Depth of Water** Depth of Hole **Depth of Casing** Elev. of Water Date 2/12/09 Dry 16.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Ft.; Dia. U-Sample Boring: U-Samples: Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** D. Burt

Helpers:

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	2/12/09	1	1.0'	2 4	Wet firm brown clayey silt w/ some fine sand, trace of coarse sand and	A-4(6)	Cultivated
	1 '	2	2.0' 2.0'	2	gravel. 12" RECOVERY	A-7-6(13)	Soil - 9";
	! '			2 3 3	Wet firm brown fine sandy clay, trace of gravel and coarse sand.	A-7-0(13)	cemented sands.
3.5	1 _'	_ '	1.01	4			sanus.
<u> </u>	1 P	3	4.0' 4.0'	2	13" RECOVERY Wet stiff orange fine sandy clay w/ some coarse sand and gravel.	A-7-5(5)	Cemented
		V		5 10	The said of the said, each was said and said said.	7 3(3)	sands.
	1		6.0'	<u> </u>	14" RECOVERY	<u> </u>	
7	1	4	6.0'	5 5 8	Wet medium dense orange clayey coarse sand w/ some fine sand and	A-2-7(1)	Cemented
	'		8.0'	ا ۲	gravel. 19" RECOVERY		sands.
	'	5	8.01	2 4 6 14	Wet stiff orange-gray mottled coarse to fine sandy clay, trace of gravel.	A-7-5(3)	Cemented sands.
	1		10.01	14			Builds.
10.5	1	6	10.0' 10.0'	4	16" RECOVERY Wet medium dense orange-gray mottled clayey coarse to fine sand, trace	A-2-5(0)	Cemented
10.5	'		10.0	4 6 6 19	wet medium dense orange-gray mottled clayey coarse to fine sand, trace of gravel.	A-2-3(0)	sands.
<u> </u>	4		12.0'		19" RECOVERY		
<u> </u>	- 4 '	7	12.0'	2 10 12 14	Wet medium dense orange-brown coarse sand w/ some fine sand, gravel,	A-1-b	Cemented
<u> </u>	∫ '		'	12 14	in the second se		sands.
14			14.0'		istanter 13" RECOVERY		
		8	14.0'	13 12 9 10	Wet medium dense orange-brown coarse to fine sand w/ some gravel and	A-1-b	Cemented
	1		'	10	silt.		sands.
	Ĺ'		16.0'		23" RECOVERY		
	[· ['	End of Boring		
17.5	1	1	'	'			
<u> </u>	1		'	'			
	1		'	'			
	1			'			
	1			'			
	1	1		1 '			1

Remarks:

Symbol Description

Strata symbols

Low plasticity clay



Silty sand



Poorly graded sand with silt

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 2/12/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a Track CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: SWM1-37-1

Contract: 25-113-01

Boring Location: Sta. 664+13, 224.00' Lt. C.L.

Boring Surface Elev.: + 45.0' Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Spoon O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches **Hollow Stem Auger:** 0.0 14.0

Water Level Readings

Depth of Water Time **Depth of Hole Depth of Casing** Elev. of Water Date 2/11/2009

Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** D. Burt

Helpers:

						_	
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	2/11/09	1	0.0'	4 4 4 6	Moist firm brown clayey fine sandy silt, trace of gravel and coarse sand	A-4(1)	No topsoil.
		<u> </u>	2.0'		18" RECOVERY		
3.5	N	2	2.0'	9 7 14 16	Moist medium dense orange coarse to fine sand and gravel, trace of silt. 20' RECOVERY	A-1-b	Cemented sands.
		3	4.0'	2 14 12 12	Moist medium dense brown coarse sand and gravel w/ some fine sand ar	d A-1-b	Cemented sands.
7		4	6.0' 6.0' 8.0'	6 7 7 8	Wet medium dense dark orange silty fine to coarse sand, trace of gravel. 23" RECOVERY	A-2-4(0)	
		5	8.0'	3 4 5 5	Wet loose dark orange fine to coarse sand w/ some silt, trace of gravel.	A-2-4(0)	Cemented sands.
10.5		6	10.0'	7 7 7 7	20" RECOVERY Wet medium dense orange-gray mottled fine to coarse sand w/ some silt trace of gravel.	A-2-4(0)	
			12.0'		24" RECOVERY		
		7	12.0'	2 6 5 6	Wet medium dense orange-gray mottled fine to coarse sand w/ some silt trace of gravel.	A-2-4(0)	
14			14.0'		23" RECOVERY		
		8	14.0'	8 7 8 9	Wet medium dense orange-gray mottled fine to coarse sand w/ some silt.	A-2-4(0)	
			16.0'		24" RECOVERY		
					End of Boring		
17.5							

Remarks:

Symbol Description

Strata symbols

Clayey sand

10:10:10:10:10:10 10:10:10:10:10:10:10 10:10:10:10:10:10:10 Well graded sand with silt

1.03000 1.03000 1.03000

Poorly graded sand with silt



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 2/12/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a Track CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: SWM1-7-1

Contract: 25-113-01

Boring Location: Sta. 495+50, 300.00' Rt. C.L.

Boring Surface Elev.: + 50.0 Reference:

IN. IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Spoon O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches **Hollow Stem Auger:** 0.0 16.0

Water Level Readings

Time **Depth of Water** Depth of Hole **Depth of Casing** Elev. of Water Date 2/27/09 10.1 16.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** J. Truver

Helpers:

Depth	Daily		Sample	DI (C"		0 10 17	01 (0.1	
(ft.)	Progress	No.	Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
	2/27/09	1	0.5' 2.0'	5 3 4	Moist firm brown	clayey coarse to fine sandy silt, trace of gravel.	A-4(0)	Topsoil - 5".
		2	2.0'	1 5 8 6	Wet stiff gray and to coarse sand.	l orange mottled clayey silt w/ some gravel, trace of fine	A-4(6)	
3.5			4.0'			20" RECOVERY		
		3	4.0'	6 6 6 7	Wet stiff gray and	orange mottled clay, trace of fine to coarse sand.	A-6(12)	
			6.0'			19" RECOVERY		
7		4	6.0' 8.0'	1 5 5 6	Wet stiff brown a	nd green fine sandy clay, trace of coarse sand. 19" RECOVERY	A-6(2)	
		5	8.0'	2 2 4 4	Saturated firm brogravel.	own and green fine sandy clay, trace of coarse sand and	A-6(2)	
10.5		6	10.0' 10.0'	3	Z Cotomoto d otiff has	15" RECOVERY	A 4(2)	
10.5		O	10.0	3 6 5 5	sand.	own and green clayey fine sandy silt, trace of coarse	A-4(2)	
			12.0'		2	20" RECOVERY		
		7	12.0'	4 7 7 9	Saturated stiff gre trace of gravel.	en and brown fine sandy clay w/ some coarse sand,	A-6(2)	
14			14.0'			18" RECOVERY		
		8	14.0'	4 6 6 7	Saturated stiff gre trace of gravel.	en and brown fine sandy clay w/ some coarse sand,	A-6(4)	Glauconit
			16.0'			19" RECOVERY		
					End of Boring			
17.5								

Remarks:

Symbol Description

Strata symbols

Poorly graded clayey silty sand



Low plasticity clay



Clayey sand



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 2/27/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a ATV CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.

STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to S.R. 1 Boring No.: SWM1-9-1

Contract: 25-113-01

Boring Location: Sta. 506+14, 199.00' Rt. C.L.

Boring Surface Elev.: + 55.0' Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Spoon O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Time Depth of Water Depth of Hole **Depth of Casing** Elev. of Water Date 2/25/09 7.2

16.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Ft.; Dia. U-Sample Boring: U-Samples: Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation **Driller:** J. Truver

Helpers:

		ı				1	
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	2/25/09	1	0.5' 2.0'	2 2 2	Moist soft brown clayey silt w/some gravel and fine sand, trace of coarse sand. 16" RECOVERY	A-4(2)	Topsoil - 6".
		2	2.0'	11 11 8	Moist medium dense brown coarse sand and gravel w/ some fine sand, trace of silt.	A-1-b	
3.5			4.0'	14	18" RECOVERY		
		3	4.0'	11 18 19 30	Moist dense brown coarse sand and gravel w/ some fine sand and silt.	A-1-b	
			6.0'		19" RECOVERY		
7		4	6.0' 8.0	11 11 13 14	Wet medium dense brown coarse sand and gravel w/ some fine sand and silt. 22" RECOVERY	A-1-b	
		5	8.0'	7 8 11 14	Wet medium dense brown coarse to fine sand and gravel w/ some silt.	A-1-b	
10.5			10.0'	4	11" RECOVERY		
10.5		6	10.0'	4 4 13 18	Wet medium dense brown coarse to fine sand w/ some silt, trace of gravel.	A-1-b	
			12.0'		17" RECOVERY		
		7	12.0'	7 10 11 13	Saturated very stiff brown and green fine sandy clay w/ some coarse sand trace of gravel.	A-6(1)	
14			14.0'		20" RECOVERY		
		8	14.0'	8 9 11 11	Saturated very stiff brown and green fine sandy clay w/ some coarse sand trace of gravel.	A-7-6(2)	
			16.0'		20" RECOVERY		
					End of Boring		
17.5							

Remarks:

Symbol Description

Strata symbols



Silty low plasticity clay



Well graded sand with silt



Poorly graded sand with silt



Silty sand

DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on 2/25/2009 using a 3 1/4- inch diameter hollow stem auger. Rig is a ATV CME 55.
- Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recomendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All Blows are un corrected.