CH2MHILL

PROJECT NUMBER:	BORING NUMBER:	
338884.FL	D-05	SHEET 1 OF 5

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723221.4 N, 457903.2 E (NAD83)

ELEVATION : 41.8 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: D. Buchler

DRILLING METHOD AND EQUIPMENT : CME 55 S/N 316625, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 04/04/07 START : 4/4/2007 END : 4/4/2007 LOGGER : A. Teal

DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)	RECOVERY (ft)	#TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION
41.8	0.0	0.8	SS-1	0-0-2 (2)	**Topsoil (OL)** 0.0-0.3' - black, (N1), organics		Water level: 2.0' below ground surface
	1.5				**Poorly Graded Sand With Organics (SP)** 0.3-0.8' - brownish gray, (5YR 4/1), moist, very loose, very fine to fine grained, no HCl reaction, silica sand, trace nonplastic fines, 20% organics as fines and roots		
5	5.0						
36.8		1.3	SS-2	1-0-0 (0)	**Sandy Lean Clay (CL)** 5.0-6.25' - greenish gray, (5G 6/1), moist to wet, very soft, low to medium plasticity, slow to rapid dilatancy, 35-40% very fine silica sand		Weight of hammer for last 12"
	6.5						
10	10.0						
31.8		1.4	SS-3	13-14-22 (36)	**Silty Sand (SM)** 10.0-11.4' - yellowish gray, (5Y 8/1), moist to wet, dense, very fine to coarse grained, low plasticity, very rapid dilatancy, strong HCl reaction, 20-25% low plastic trace fines gravel-sized		Appears to have fossil fragments Driller's Remark: Lost circulation at 12'
	11.5						
15	15.0						
26.8		1.0	SS-4	1-4-26 (30)	**Silt (ML)** 15.0-15.8' - moderate yellow, (5Y 7/6), wet, very stiff, nonplastic, rapid dilatancy, moderate to strong HCl reaction, 10-15% very fine sand-sized, carbonate materials		
	16.5				**Limestone Fragments** 15.8-16.0' - moderate olive brown, (5Y 4/4), strong HCl reaction, fine to coarse gravel-sized		Set 20' HW casing
20							

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21.8	20.0	0.1	SS-5	50/3 (50/3")	**Limestone Fragments** 20.0-20.3' - grayish yellow, (5Y 8/4), fine to coarse grained, mild HCl reaction, fine gravel-sized fragments		
25	25.0						
16.8	26.5	1.1	SS-6	17-26-31 (57)	**Sandy Silt With Limestone (ML)** 25.0-26.1' - grayish yellow, (5Y 8/4), wet, hard, nonplastic, rapid dilatancy, mild HCl reaction, 10% fine to coarse limestone fragments, 35-40% fine to coarse sand-sized, carbonate materials		
30	30.0						
11.8	31.5	1.5	SS-7	15-17-47 (64)	**Sandy Silt (ML)** 30.0-31.5' - Same as 25.0-26.1' except mild to moderate HCl reaction, 30% fine to coarse sand-sized, trace gravel-sized		
35	35.0						
6.8	36.2	1.1	SS-8	34-24-50/2.5 (74/8.5")	**Sandy Silt With Limestone (ML)** 35.0-36.1' - light olive gray, (5Y 5/2), wet, hard, nonplastic, rapid dilatancy, mild HCl reaction, 40% fine to coarse sand-sized, 10% fine to coarse gravel-sized limestone fragments, carbonate materials		
40							

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SOIL BORING LOG

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DRILLING METHOD AND EQUIPMENT : CME 55 S/N 316625, mud rotary, auto hammer, AWJ rods, 3-7/8" tri-cone bit ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 04/04/07 START : 4/4/2007 END : 4/4/2007 LOGGER : A. Teal

DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)	RECOVERY (ft)	#TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION
1.8	40.0	0.3	SS-9	50/4 (50/4")	**Limestone Fragments** 40.0-40.3' - light olive gray, (5Y 5/2), fine to coarse grained, mild HCl reaction Begin Rock Coring at 40.7 ft bgs See the next sheet for the rock core log		
45 -3.2							
50 -8.2							
55 -13.2							
60							

PROJECT NUMBER:	BORING NUMBER:
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ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723221.4 N, 457903.2 E (NAD83)

ELEVATION : 41.8 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: D. Buchler

CORING METHOD AND EQUIPMENT : CME 55 S/N 316625, mud rotary, NQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 2.0 ft bgs on 04/04/07 START : 4/4/2007 END : 4/4/2007 LOGGER : A. Teal

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	DISCONTINUITIES: R.Q.D (%)	DISCONTINUITIES: FRACTURES PER FOOT	DISCONTINUITIES: DESCRIPTION (DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS)	SYMBOLIC LOG	LITHOLOGY (ROCK TYPE, COLOR, MINERALOGY, TEXTURE, WEATHERING, HARDNESS, AND ROCK MASS CHARACTERISTICS)	COMMENTS (SIZE AND DEPTH OF CASING, FLUID LOSS, CORING RATE AND SMOOTHNESS, CAVING ROD DROPS, TEST RESULTS, ETC.)
	40.7 R1-NQ 1 ft 85% 41.7	50	3	40.9' - Fracture, 10 deg, smooth, undulating, tight 41.0' - Fracture, 50 deg, smooth, planar, tight		**Limestone** 40.7-41.7' - pale yellowish brown, (10YR 6/2), fine grained, moderate HCl reaction, weak (R2), 10-20% void space up to 1/8", trace cavities up to 1/4", moderately fossiliferous (casts/molds)	R1: 1 minute
	R2-NQ 5 ft 88%	35	0	41.05' - Fracture, 10 deg, smooth, undulating, loose		41.7-43.5' - pale yellowish brown, (10YR 6/2), fine grained, delayed moderate HCl reaction, weak to medium strong (R2 to R3), 15-20% voids up to 1/8", trace cavities up to 3/16", moderately fossiliferous (molds/casts)	
			5	43.2' - Mechanical break			
			>10	43.5-44.5' - Fracture zone (at least 7), tight but weathered fractures with fragmentation			
45 -3.2			>10	44.5-45.7' - Fracture zone, fragments from 1/8" to 1", subrounded			
			>10	45.7-46.1' - Fractures (at least 4), 10 deg, open, weathered, with vertical fractures and fragmentation		43.5-46.1' - pale yellowish brown, (10YR 6/2), fine grained, strong HCl reaction, extremely weak to very weak (R0 to R1), 10% void space up to 1/8", poorly fossiliferous	R2: 2 minutes
	46.7		NR	46.7-50.3' - Fracture zone, very soft material		**No Recovery 46.1-46.7'**	
			>10			**Limestone** 46.7-50.3' - pale yellowish brown, (10YR 6/2), fine grained, moderate HCl reaction, extremely weak to very weak (R0 to R1), 20-30% voids, trace up to 1/3" long fossil cavities and casts	
	R3-NQ 5 ft 70%	45	>10				
			>10				
50 -8.2			>10				
	51.7		NR			**No Recovery 50.5-51.7'**	R3: 1 minute
			>10	52.0' - Fracture, 10 deg, rough, undulating, tight		**Limestone** 51.7-53.8' - pale yellowish brown, (10YR 6/2), fine grained, moderate HCl reaction, very weak to weak (R1 to R2), 10-20% voids up to 1/16"	
			>10	52.3-53.0' - Fracture zone, limestone fragments from silt to cobble-sized fragments			
	R4-NQ 5 ft 86%	75	>10	53.8' - Fracture, 20 deg, rough, undulating, loose		53.8-56.0' - Same as 51.7-53.8' except moderate yellowish brown, (10YR 5/4)	
55 -13.2			0	54.1' - Fracture, 25 deg, rough, undulating, tight 54.2-54.7' - Fracture zone, 20 deg, same as 52.3-53.0'			
			0	55.5' - Mechanical break			R4: 2 minutes
	56.7		NR			**No Recovery 56.0-56.7'**	
			0			**Limestone** 56.7-61.3' - pale yellowish brown, (10YR 6/2), fine grained, moderate HCl reaction, very weak to weak (R1 to R2), 20-25% voids up to 1/8", some laminations	
			1	57.9' - Fracture, 30 deg, rough, undulating, tight			
	R5-NQ 5 ft 92%	68	>10	59.2' - Fracture, 70 deg, rough, undulating, tight			
60 -18.2			>10	59.5-60.3' - Fracture zone, gravel-sized fragments			

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DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	DISCONTINUITIES: R Q D (%)	DISCONTINUITIES: FRACTURES PER FOOT	DISCONTINUITIES: DESCRIPTION (DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS)	SYMBOLIC LOG	LITHOLOGY (ROCK TYPE, COLOR, MINERALOGY, TEXTURE, WEATHERING, HARDNESS, AND ROCK MASS CHARACTERISTICS)	COMMENTS (SIZE AND DEPTH OF CASING, FLUID LOSS, CORING RATE AND SMOOTHNESS, CAVING ROD DROPS, TEST RESULTS, ETC.)
			1	60.5' - Fracture, 45 deg, rough, undulating, tight		**Limestone**	R5: 3 minutes
61.7			NR	60.9' - Fracture, horizontal, smooth, planar, tight		60.0-60.3' - dark yellowish brown, (10YR 4/2), fine grained, mild HCl reaction, extremely weak (R0) 60.9-61.0' - Same as 60.0-60.3' 61.0-61.3' - Same as 56.7-61.3' **No Recovery 61.3-61.7'** Bottom of Boring at 61.7 ft bgs on 4/4/2007	End of boring