



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-10
SHEET 1 OF 12	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724149.3 N, 457766.2 E (NAD83)
 ELEVATION : 42.2 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: M. Griffin
 DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, AWJ rods, 2-7/8 tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 1.0 ft bgs on 03/10/07 START : 2/25/2007 END : 3/11/2007 LOGGER : C. LeBlanc, T. Stewart, C. Wallestad

WATER LEVELS : 1.0 ft bgs on 03/10/07		START : 2/23/2007		END : 3/11/2007		LOGGERS : G. LeBlanc, T. Stewart, C. Wailestad	
DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION		SYMBOLIC LOG	COMMENTS
	RECOVERY (ft)	#TYPE		6"-6"-6" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY		DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION
42.2							C. Sump and T. Stewart also logged part of boring A-10
5	5.0						
37.2		0.8	SS-1	3-36-50/2 (86/8")	Poorly Graded Sand With Silt (SP-SM) 5.0-5.5' - dusky yellow, (5Y 6/4), moist, very dense, very fine to fine grained, no HCl reaction, 10% nonplastic fines		Driller's Remark: Hard 5-13.5'
	6.5				Limestone Fragments 5.5-5.8' - very light gray, (N8), moist, very fine grained, mild HCl reaction, some orange staining		
10	10.0						Driller's Remark: Softened at 13.5-15'
32.2		1.4	SS-2	8-18-50/5 (68/11")	Silt (ML) 10.0-11.4' - grayish yellow, (5Y 8/4), wet, very dense, very fine grained, nonplastic, very rapid dilatancy, moderate to strong HCl reaction, 10-15% sand material, slightly indurated 1" layers throughout		
	11.4						
15	15.0						
27.2		1.5	SS-3	18-29-35 (64)	Silt With Sand And Limestone Fragments (ML) 15.0-16.5' - grayish yellow, (5Y 8/4), wet, fine to coarse grained, nonplastic, very rapid dilatancy, moderate HCl reaction, 20-25% fine to coarse sand-sized, 10% fine gravel-sized carbonate material		
	16.5						
20							



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-10
SHEET 2 OF 12	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724149.3 N, 457766.2 E (NAD83)
 ELEVATION : 42.2 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: M. Griffin
 DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, AWJ rods, 2-7/8 tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 1.0 ft bgs on 03/10/07 START : 2/25/2007 END : 3/11/2007 LOGGER : C. LeBlanc, T. Stewart, C. Wallestad

WATER LEVELS : 1.0 (lbs) on 03/10/07			START : 2/23/2007			END : 3/11/2007			LOGGERS : G. LeBlanc, T. Stewart, G. Wailestad		
DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION		SYMBOLIC LOG	COMMENTS			
	RECOVERY (ft)	#TYPE	6"-6"-6" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY		DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION					
22.2	20.0	0.2	SS-4	18-29-50/5 (79/11")	Silt With Sand (ML) 20.0-20.2' - Same as 15.0-16.5' except except one 1/2" gravel-sized carbonate fragment.						
	21.5										
25	25.0	0.1	SS-5	50/3 (50/3")	Silty Sand (SM) 25.0-25.1' - dusky yellow, (5Y 6/4), wet, very dense, fine to coarse grained, mild to moderate HCl reaction, sand-sized carbonate material, 30% fines						
17.2	25.3										
30	30.0	0.3	SS-6	50/4 (50/4")	Silty Sand (SM) 30.0-30.3' - dark yellowish orange, (10YR 6/6), moist, very dense, fine to coarse grained, moderate HCl reaction, 25% silt-sized grains, carbonate material			Sample SS-6 has the appearance of extremely weak limestone.			
12.2	30.3										
35	35.0	0.2	SS-7	50/2 (50/2")	Limestone Fragments 35.0-35.2' - moderate yellowish brown, (10YR 5/4), fine to coarse grained, mild to moderate HCl reaction, gravel fine to coarse to 1", fossiliferous						
7.2	35.2										



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-10
SHEET 3 OF 12	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724149.3 N, 457766.2 E (NAD83)
 ELEVATION : 42.2 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: M. Griffin
 DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, AWJ rods, 2-7/8 tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 1.0 ft bgs on 03/10/07 START : 2/25/2007 END : 3/11/2007 LOGGER : C. LeBlanc, T. Stewart, C. Wallestad

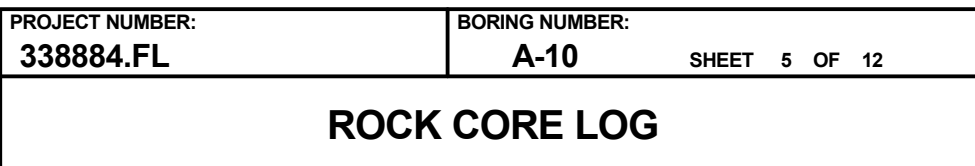
WATER LEVELS : 1.0 (RDS) ON 03/0/07			START : 2/23/2007		END : 3/11/2007		LOGGERS : G. LeBlanc, T. Stewart, C. Wailestad	
DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION	SYMBOLIC LOG	COMMENTS	
	RECOVERY (ft)	#TYPE	6"-6"-6" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION			
2.2	40.0	1.3	SS-8	31-47-45 (92)	Sandy Silt (SM) 40.0-41.3' - moderate yellowish brown, (10YR 5/4), moist to wet, hard, mild to moderate HCl reaction, 49% sand and gravel, 10-15% fines, carbonate materials			
	41.5							
45	45.0							
-2.8	45.8	0.8	SS-9	40-50/3 (90/9")	Silty Sand (SM) 45.0-45.75' - Same as 40.0-41.3' except trace gravel-sized rock fragments			
50	50.0							
-7.8	50.4	0.1	SS-10	50/4.5 (50/4.5")	Limestone Fragments With Silty Sand 50.0-50.1' - pale yellowish brown, (10YR 6/2), mild to moderate HCl reaction, silty sand (SM) cuttings, silty sand is same as 45.0-45.75', fossiliferous			
55	55.0							
-12.8	55.3	0.1	SS-11	50/3 (50/3")	Limestone Fragments 55.0-55.1' - Same as 50.0-50.1'			
60								



PROJECT NUMBER: 338884.FL	BORING NUMBER: A-10
SHEET 4 OF 12	
SOIL BORING LOG	

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724149.3 N, 457766.2 E (NAD83)
 ELEVATION : 42.2 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: M. Griffin
 DRILLING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, cathead, AWJ rods, 2-7/8 tri-cone bit ORIENTATION : Vertical
 WATER LEVELS : 1.0 ft bgs on 03/10/07 START : 2/25/2007 END : 3/11/2007 LOGGER : C. LeBlanc, T. Stewart, C. Wallestad

WATER LEVELS : 1.01 RDS ON 03/10/07			START : 2/29/2007		END : 3/11/2007		LOGGERS : C. LeBlanc, T. Stewart, C. Wailestad		
DEPTH BELOW SURFACE AND ELEVATION (ft)	SAMPLE INTERVAL (ft)		STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION		SYMBOLIC LOG	COMMENTS	
	RECOVERY (ft)	#TYPE	6"-6"-6" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY		DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION			
-17.8	60.0	0.1	SS-12	50/1 (50/1")	Limestone Fragments 60.0-60.1' - light olive gray, (5Y 5/2), mild to moderate HCl reaction			61.5-62.0' Heavy chatter, drill time increases, cuttings show weak limestone fragments, light olive gray, (5Y 5/2), finish soil drilling at 62', switch to rock coring, see rock core log	
62.0									
62.1	0.0	SS-13	50/1 (50/1")	Limestone Fragments 62.0-62.1' - light olive gray, (5Y 5/2), moderate HCl reaction, weak (R2) Begin Rock Coring at 62.0 ft bgs See the next sheet for the rock core log					
65									
-22.8									
70									
-27.8									
75									
-32.8									
80									





PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-10

SHEET 6 OF 12

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724149.3 N, 457766.2 E (NAD83)

ELEVATION : 42.2 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: M. Griffin

CORING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, NQ tools, NW casing

ORIENTATION : Vertical

WATER LEVELS : 1.0 ft bgs on 03/10/07

START : 2/25/2007

END : 3/11/2007

LOGGER : C. LeBlanc, T. Stewart, C. Wallestad

DEPTH BELOW SURFACE AND ELEVATION (ft)		CORE RUN, LENGTH, AND RECOVERY (%)	DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY	COMMENTS	
			R Q D (%)	FRACTURES PER FOOT		DESCRIPTION	ROCK TYPE, COLOR, MINERALOGY, TEXTURE, WEATHERING, HARDNESS, AND ROCK MASS CHARACTERISTICS	SIZE AND DEPTH OF CASING, FLUID LOSS, CORING RATE AND SMOOTHNESS, CAVING ROD DROPS, TEST RESULTS, ETC.
						DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS		
85 -42.8	R5-NQ 5 ft 60%	58	2	81.1-81.3' - Clay seam, poorly to moderately indurated laminated silt (ML)		Sand (SW) 77.0-77.5' - strong HCl reaction, well graded fine sand sized carbonate derived grains, loose, friable, 10-15% fine clear crystals, (secondary calcite), possible fine silica grains (<5%) Limestone 77.5-81.1' - yellowish gray, (5Y 7/2), fine grained, moderate to strong HCl reaction, medium strong (R3), few larger voids irregular shaped up to 3/4" in size with dark olive gray staining, Silt (ML) 81.1-81.4' - consolidated carbonate silt Limestone 81.4-81.7' - Same as 77.5-81.1' No Recovery 81.7-82.0' Limestone 82.0-85.0' - grayish orange, (10YR 7/4), moderate to strong HCl reaction, weak (R2), color changes with depth to yellowish gray (5Y 7/2), 15-25% voids (1/8") over surface, 1-2% larger voids/cavities (fossil molds) up to 3/8" length, iron staining, few fossil molds infilled with very pale orange (10YR 8/2) soft material No Recovery 85.0-87.0' Limestone 87.0-87.7' - yellowish gray, (5Y 7/2), moderate to strong HCl reaction, medium strong (R3), fossiliferous molds and casts 1/16"-3/16" over 5-20% of surface, larger cavities up to 3/4" (fossil molds) 87.7-88.2' - white to yellowish gray, (N9 to 5Y 8/1), strong HCl reaction, very weak (R1), fossiliferous (molds & casts) 88.2-89.6' - pale yellowish brown, (10YR 6/2), moderate to strong HCl reaction, 15-20% voids (1/16"-1/8"), 2% larger voids/cavities, laminated black organic infilling at 89.4' 89.6-91.1' - pale yellow gray, (5Y 8/1), strong HCl reaction, weak to medium strong (R2 to R3), silt sized material (inclusions) and thin layers (1"-2") No Recovery 91.1-92.0'	SC-2 collected at 85.06-86.06' R5: 4 minutes	
			1	81.3' - Fracture, horizontal, rough, undulating				
			3	82.2' - Fracture, rough, stepped 82.6' - Fracture, rough, stepped, fine sand sized particles on surface 83.7' - Fracture, horizontal, rough, undulating				
			NR	84.0' - Fracture, 45 deg, rough, undulating to planar, tight, dark black/gray fine grained coating 84.6' - Fracture, horizontal, rough, undulating 84.7' - Fracture, 45 deg, rough, planar, some fine grained pyrite coating				
90 -47.8	R6-NQ 5 ft 82%	60	2	87.0' - Mechanical break, horizontal, rough, undulating		R6: run time not recorded		
			1	87.7-88.2' - Fracture zone, discontinuity with weak limestone interbedded				
			4	88.8' - Fracture, 10 deg, rough, undulating, iron staining 89.3, 89.5' - Fractures (2), rough, black to dark brown staining, irregular fractures associated with larger voids/solution cavities				
			1	89.6' - Fracture, horizontal, contact with silty material				
92.0	R7-NQ 5 ft 80%	48	NR	89.8' - Fracture, 30-45 deg, rough, multiple tight healed fractures 90.3' - Mechanical break, horizontal 91.0' - Fracture, rough, break associated with large cavity		R7: run time not recorded		
			4	92.0' - Mechanical break, horizontal, planar				
			2	92.2' - Fracture, 45 deg, rough, planar				
			NA	92.21' - Fracture, horizontal, black coating on fracture edge, (pyrite-organics) 92.8, 93.2, 93.8' - Fractures (3), horizontal, rough, stepped, loose, silty sand material on faces				
95 -52.8	R8-NQ 5 ft 60%	22	>10	94.5' - Fracture, horizontal, smooth, undulating, parting along fine lamination, dark brown color, friable zone		R8: run time not recorded		
			NR	95.1' - Fracture, 60 deg, planar, loose sand material, fine grained pyrite on surface 95.1-96.0' - Fracture zone, limestone fragments				
			2	97.0' - Fracture or mechanical break, 60 deg, rough, undulating				
			2	97.6' - Fracture or mechanical break, horizontal, rough, planar				
100 -57.8	R8-NQ 5 ft 60%	22	3	98.3' - Fracture, 45 deg, rough, undulating, irregular 98.6' - Mechanical break, rough, undulating, near vertical		R8: run time not recorded		
			NR	99.2' - Fracture, 60 deg, planar 99.4' - Fracture, 15 deg, rough, undulating 99.8' - Fracture, 50-60 deg, rough, planar				
			NR					
			NR					
102.0								



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-10

SHEET 7 OF 12

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724149.3 N, 457766.2 E (NAD83)

ELEVATION : 42.2 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: M. Griffin

CORING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, NQ tools, NW casing

ORIENTATION : Vertical

WATER LEVELS : 1.0 ft bgs on 03/10/07

START : 2/25/2007

END : 3/11/2007

LOGGER : C. LeBlanc, T. Stewart, C. Wallestad

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES			SYMBOLIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	FRACTURES PER FOOT	DESCRIPTION			
				DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS			
105 -62.8	R9-NQ 5 ft 65%	38	>10	102.1, 102.7' - Fractures or mechanical break (2), horizontal, rough, undulating		Limestone 92.0-93.2' - yellowish gray, (5Y 8/1), strong HCl reaction, weak (R2), black organic/pyrite mottling and castings on fracture/void surfaces, voids (1/16") over 10-15% of surface, fossiliferous (molds/casts)	R9: 4 minutes
			>10	102.3' - Fracture, 60-70 deg, smooth, thin coating of loose silt sized material on fracture surface			
			0	102.7-103.3' - Fracture zone, limestone fragments			
			0				
107.0			NR			Silt (ML) 93.2-95.2' - moderate HCl reaction, medium strong (R3), carbonate silt material with gravel-sized limestone fragments with 10-15%, voids (1/16-1/8"), large solution cavity (3/4"x3/4")	
			1	107.1' - Fracture, 45-60 deg		Limestone 95.2-96.0' - yellow gray, (5Y 8/1), strong HCl reaction, weak (R2), pyrite on surfaces	SC-3 collected at 107.3-108.35'
			1			No Recovery 96.0-97.0'	
110 -67.8	R10-NQ 5 ft 100%	54	2	108.5' - Fracture, 60 deg, rough, undulating, <1% fine black trace secondary pyrite crystals on surface		Limestone 97.0-100.0' - yellowish gray, (5Y 8/1), strong HCl reaction, weak (R2), 10-15% voids (1/16-1/8") over surface, fossil molds/casts, cavities and molds up to 3/8" over 1-2% of surface.	R10: 4 minutes
			2	109.4' - Fracture or mechanical break, horizontal		No Recovery 100.0-102.0'	
			2	109.5' - Fracture, 45 deg, rough, stepped, trace very fine black pyrite crystals		Limestone 102.0-105.25' - yellowish gray, (5Y 8/1), strong HCl reaction, weak (R2), percent voids vary from 5-15%, large fossil molds/cavities up to 3/8" (mollusks)	
			6	110.8' - Fracture or mechanical break, horizontal, rough		No Recovery 105.25-107.0'	
			1	110.9, 111.0, 111.2, 111.5, 111.6, 111.8, 112.0' - Fractures (7), horizontal, rough, planar to undulating, open, fine "chalky" material on surface		Limestone 107.0-114.6' - yellowish gray, (5Y 8/1), fine grained, strong HCl reaction, weak (R2), small voids (1/16"-1/8") over <5% of surface, very few larger (>3/16") cavities/fossil molds on surface chalky appearance and texture	R11: 5 minutes
			3	112.0' - Fracture or mechanical break, horizontal, smooth, planar		Limestone 114.6-116.8' - yellowish gray, (5Y 8/1), strong HCl reaction, weak (R2), highly fossiliferous(molds and casts) up to 30-40%, somewhat friable	
115 -72.8	R11-NQ 5 ft 96%	86	1	113.7' - Fracture, horizontal, iron oxide staining		No Recovery 116.8-117.0'	
			2	113.71-113.8' - Mechanical break or fracture zone, horizontal, (drill pin)		Sand (SP) 117.0-117.3' - strong HCl reaction, well sorted carbonate sand, 5% fine clear subhedral calcite crystals, possible trace silica grains, possibly slough	
			2	114.4, 115.2, 115.7, 116.1, 116.3, 116.8' - Fractures or mechanical break (6), horizontal, undulating			R12: run time not recorded
			5	117.0-117.3' - Fracture zone, loose carbonate fine sand			
			3	117.3, 117.5, 117.9' - Fractures (3), horizontal, rough, undulating, fine carbonate sand on surface			
			3	118.5' - Fracture, 45 deg, rough, undulating to planar			
			3	118.8, 118.7, 119.1, 120.1' - Bedding plane (4), horizontal, smooth to rough, planar			
120 -77.8	R12-NQ 5 ft 100%	70	>10	120.1, 120.6, 121.1' - Fractures or mechanical break (3), 0-10 deg, rough, undulating			
			>10	121.1-122.0' - Fracture zone, irregular fracture surfaces, limestone fragments			
122.0							



PROJECT NUMBER:

338884.FL

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A-10

SHEET 8 OF 12

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724149.3 N, 457766.2 E (NAD83)

ELEVATION : 42.2 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: M. Griffin

CORING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, NQ tools, NW casing

ORIENTATION : Vertical

WATER LEVELS : 1.0 ft bgs on 03/10/07

START : 2/25/2007

END : 3/11/2007

LOGGER : C. LeBlanc, T. Stewart, C. Wallestad

WATER LEVEL - 10' DEGS ON 10' LOG		DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY		COMMENTS	
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	R Q D (%)	FRACTURES PER FOOT		DESCRIPTION	ROCK TYPE, COLOR, MINERALOGY, TEXTURE, WEATHERING, HARDNESS, AND ROCK MASS CHARACTERISTICS	SIZE AND DEPTH OF CASING, FLUID LOSS, CORING RATE AND SMOOTHNESS, CAVING ROD DROPS, TEST RESULTS, ETC.	
					DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS			
125 -82.8	R13-NQ 5 ft 78%	15	3	122.1, 122.5, 123.25, 123.5, 123.8, 124.1, 124.3, 124.35, 124.55, 124.75, 124.95, 125.1, 125.25, 125.4, 125.5, 125.6, 125.7, 125.8, 122.8' - Mechanical break (19), horizontal, smooth, planar		NQ rod stuck at 117.0' after completing R-12, hole abandoned and replacement hole drilled to obtain information below 122' T. Stewart begins logging at 122' NW casing at 120' below ground surface, water level 1.0' below ground surface R13: 19 minutes		
			3					
			6	122.95' - Fracture, 40 deg, smooth, undulating, open, black particles (1/5"-1/3") in matrix on surface				
			7					
			NR					
	127.0			>10		127.8' - Fracture, vertical, smooth, undulating, tight, black staining		R14: 24 minutes Driller's Remark: 50% circulation loss near top of R14-NQ
	R14-NQ 5 ft 64%	0	5	128.1, 128.2, 128.4, 128.75' - Mechanical break (4), horizontal, smooth, planar				
			>10					
			0					
			NR					
132.0								
135 -92.8	R15-NQ 5 ft 88%	23	7	132.35' - Fracture, 50 deg, smooth, stepped, tight		R15: 13 minutes Driller's Remark: Return of circulation at approximately 135.0' below ground surface		
			>10	132.4, 132.55, 132.65, 132.75, 132.9, 133.1, 133.23, 133.35, 133.55, 133.65, 133.75, 134.55' - Mechanical break (12), horizontal, smooth, planar				
			>10					
			4	134.85' - Fracture, 5 deg, rough, undulating, open 2/5"				
			0	135.05, 135.15' - Mechanical break (2)				
	R16-NQ 5 ft 56%	7	NR	135.53' - Fracture, horizontal, smooth, undulating, tight to open 1/10"		R16: 22 minutes		
			>10	135.77' - Fracture, 5 deg, rough, undulating, open 3/4", 2/5" thick infilling				
			>10					
			2	138.05' - Fracture, vertical, tight, healed				
			NR	138.1-138.3' - Fracture zone				
140 -97.8	R16-NQ 5 ft 56%	7		138.7' - Fracture, 70 deg, tight, healed, 1/16" thick infilling		R16: 22 minutes		
				138.95, 139.15' - Fractures (2), 50 deg, rough, undulating, tight				
				139.55' - Fracture, vertical, tight, vertical, black staining, 1/16" thick infilling				
	R16-NQ 5 ft 56%	7					R16: 22 minutes	
142.0								



PROJECT NUMBER:
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BORING NUMBER:
A-10

SHEET 9 OF 12

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724149.3 N, 457766.2 E (NAD83)

ELEVATION : 42.2 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: M. Griffin

CORING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, NQ tools, NW casing

ORIENTATION : Vertical

WATER LEVELS : 1.0 ft bgs on 03/10/07

START : 2/25/2007

END : 3/11/2007

LOGGER : C. LeBlanc, T. Stewart, C. Wallestad

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES			SYMBOLIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	FRACTURES PER FOOT	DESCRIPTION			
				DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS		ROCK TYPE, COLOR, MINERALOGY, TEXTURE, WEATHERING, HARDNESS, AND ROCK MASS CHARACTERISTICS	SIZE AND DEPTH OF CASING, FLUID LOSS, CORING RATE AND SMOOTHNESS, CAVING ROD DROPS, TEST RESULTS, ETC.
145 -102.8	R17-NQ 5 ft 80%	37	>10	142.0-143.8' - Fracture zone		135.8-136.4' - light olive gray, (5Y 6/1), strong HCl reaction, weak to medium strong (R2 to R3), trace voids up to 1/16", many irregularly shaped cavities up to 2-2/5" long x 2/5" wide, infilled with moderate olive brown (5Y 4/4) medium to coarse grained material	SC-4 collected at 144.1-145.05'
			1	143.8' - Fracture, horizontal, rough, planar, open		No Recovery 136.4-137.0' Limestone	
			1	144.1, 145.0' - Fractures (2), horizontal, rough, planar, tight		137.0-139.8' - light olive gray, (5Y 6/1), very fine grained, strong HCl reaction, medium strong (R3), 75% voids up to 1/8"x3/16", cavities over 15-20% of surface (near top of run), infilled with coarse grained material, brownish black laminations <1/16" containing sub rounded clasts up to 3/16" in size at 138.4-138.6', series of 70-90 degree fractures (healed tight) over 138.6 to 139.8' interval with black mottled appearance	
			0			No Recovery 139.8-142.0' Limestone	
			NR			142.0-143.8' - yellowish gray, (5Y 7/2), medium to coarse grained, strong HCl reaction, very weak to weak (R1 to R2), matrix grain colors are white (N9) (33%), yellowish gray (5Y 8/1) (33%), and gray (33%)	
150 -107.8	R18-NQ 5 ft 75%	58	0	148.1, 148.2, 148.3, 148.32' - Bedding plane (4), horizontal, rough, planar, tight to open 1/10"		143.8-144.1' - Same as 142.0-143.8' except brown and white laminations with trace cavities infilled with white material	R17: 17 minutes Last core run on 3/10/07 Resume drilling 07:55 on 3/11/07 SC-5 collected at 147.0-148.1'
			5	148.93' - Bedding plane, horizontal, rough, planar, silty infilling		144.1-145.05' - Same as 143.8-144.1' except light olive gray (5Y 5/2), 15-20% coarse grained gray particles	
			2	149.4, 150.0, 152.05, 152.1' - Mechanical break (4)		145.05-146.0' - Same as 143.8-144.1' except fine grained, no gray particles	
			0			No Recovery 146.0-147.0' Limestone	
			NR			147.0-148.37' - dark yellowish orange, (10YR 6/6), fine to medium grained, moderate HCl reaction, weak (R2), 3/16"x1/8" voids over 15% of surface, fossiliferous (trace molds), bedding plane at 147.9' at 40 degrees	
155 -112.8	R19-NQ 5 ft 86%	39	2	153.3' - Bedding plane, horizontal, smooth, undulating, open 1/8"-1/4"		148.37-148.93' - yellowish gray, (5Y 8/1), medium grained, strong HCl reaction, extremely weak (R0)	R18: 22 minutes Driller's Remark: Continued loss of circulation R19: 14 minutes
			5	153.43' - Bedding plane, horizontal, smooth, undulating, tight		148.93-150.74' - dark yellowish orange, (10YR 6/6), fine to coarse grained, strong HCl reaction, weak (R2), trace voids to 1/16" over <5% surface, some infill of white material, trace fine to medium grained black particles	
			>10	153.48, 153.55, 153.63' - Bedding plane (3), horizontal, smooth, planar, tight		No Recovery 150.74-152.0	
			6	153.6' - Fracture, vertical, rough, undulating, tight, black particles in matrix			
			NR	153.8' - Bedding plane or mechanical break, horizontal, smooth, planar, tight			
160 -117.8	R20-NQ 5 ft 92%	42	4	154.05' - Bedding plane or mechanical break, <10 deg, smooth, undulating, open 1/4"			R20: 19 minutes
			4	154.05-155.5' - Fracture zone			
			1	157.25, 157.4' - Bedding plane or mechanical break (2), <10 deg, smooth, undulating, open 1/4"			
			>10	157.45' - Bedding plane or mechanical break, <10 deg, smooth, undulating, open 1/2"			
			NR	157.8' - Bedding plane or mechanical break, horizontal, smooth, undulating, open 1/8"			
162.0				158.05' - Bedding plane or mechanical break, smooth, undulating, open 1/8"-1/4"			
				158.47, 158.95' - Bedding plane or mechanical break (2), horizontal, open 1/8"-1/2"			



PROJECT NUMBER:

338884.FL

BORING NUMBER:

A-10

SHEET 10 OF 12

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1724149.3 N, 457766.2 E (NAD83)

ELEVATION : 42.2 ft (NAVD88)

DRILLING CONTRACTOR : Universal Engineering Sciences, Gainesville, FL; Driller: M. Boatright; Cathead Operator: M. Griffin

CORING METHOD AND EQUIPMENT : CME 550 S/N 186073, mud rotary, NQ tools, NW casing

ORIENTATION : Vertical

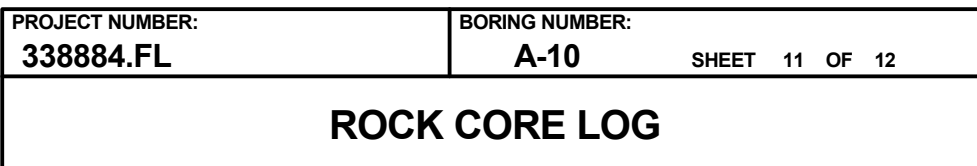
WATER LEVELS : 1.0 ft bgs on 03/10/07

START : 2/25/2007

END : 3/11/2007

LOGGER : C. LeBlanc, T. Stewart, C. Wallestad

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN LENGTH AND RECOVERY (%)	DISCONTINUITIES			SYMBOLIC LOG	LITHOLOGY	COMMENTS
		RQD (%)	FRACTURES PER FOOT	DESCRIPTION			
				DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS		ROCK TYPE, COLOR, MINERALOGY, TEXTURE, WEATHERING, HARDNESS, AND ROCK MASS CHARACTERISTICS	SIZE AND DEPTH OF CASING, FLUID LOSS, CORING RATE AND SMOOTHNESS, CAVING ROD DROPS, TEST RESULTS, ETC.
165 -122.8	R21-NQ 5 ft 88%	18	9	159.1' - Bedding plane or mechanical break, horizontal, smooth, planar, open 1/4"-1/2"		Limestone 152.0-156.3' - very pale orange, (10YR 8/2), strong HCl reaction, weak (R2), voids to 1/8" covering 25-30% of surface, moderately fossiliferous, (mold and casts) 5-10% white inclusions up to 1-1/4" (irregular shape), fine brownish black laminations (<1/16") at 153.48-153.63', contains vertical fracture across interval, up to 20% fine black particles No Recovery 156.3-157.0' Limestone 157.0-161.6' - yellowish gray to dusky yellow, (5Y 7/2 to 5Y 6/4), fine to medium grained, strong HCl reaction, very weak to weak (R1 to R2), trace voids up to 1/8" elliptical, poorly fossiliferous (few molds, casts), 3/8"x3/16", bedding plane laminations <1/16" from 160.2-161.6' No Recovery 161.6-162.0' Limestone 162.0-166.4' - yellowish gray to moderate olive brown, (5Y 7/2 to 5Y 5/4), fine grained, strong HCl reaction, weak to medium strong (R2 to R3), voids up to 1/16" over 40% of surface, 163.0-163.09' interval has voids to 3/16" covering 90% of surface, moderately fossiliferous from 163.0-163.9' (some molds), 2"x1/4" inclusions up to 5%, from 163.0-163.1', irregular shaped inclusions, medium gray in color. No Recovery 166.4-167.0' Limestone 167.0-171.2' - moderate olive brown, (5Y 4/4), fine grained, strong HCl reaction, weak to medium strong (R2 to R3), voids up to 1/8" over 15-20% of surface, cavities (1/4"x1") from 168.05-168.04' poorly fossiliferous (trace molds), horizontal wavy laminations (<1/16") at 170.5 No Recovery 171.2-172.0' Limestone 172.0-176.2' - yellowish gray to moderate olive brown, (5Y 7/2 to 5Y 4/4), strong HCl reaction, weak to medium strong (R2 to R3), voids up to 1/8"x3/16" over 10-15% of surface, cavities up to 1"x1/2" over 5% of surface, poorly fossiliferous (few casts), mottling of slightly darker hue up to 20% No Recovery 176.2-177.0'	R21: 19 minutes
			2	160.05-161.3' - Fracture zone or mechanical break, horizontal, smooth, planar			
			6	162.27, 162.3, 162.4, 162.6, 162.7, 162.75, 162.82, 162.9, 162.98' - Bedding plane or mechanical break (9), smooth, planar, tight to open 1/8"			
			>10	163.9' - Bedding plane, horizontal, smooth, undulating, open 1/8"-1/4", dark staining			
			NR	163.98' - Bedding plane or mechanical break, <10 deg, rough, undulating, black staining			
170 -127.8	R22-NQ 5 ft 84%	31	2	164.1, 169.25, 164.4, 164.5, 164.85, 164.95' - Bedding plane or mechanical break (6), horizontal, smooth, planar to undulating, tight to open 1/8"-1/4"		SC-6 collected at 168.4-169.3'	R22: 23 minutes
			3	166.0' - Mechanical break			
			3	166.1' - Bedding plane or mechanical break, horizontal, smooth, planar, tight to open 1/8"			
			4	166.25-166.3' - Fracture (2), 80 deg, rough, undulating, tight, reddish brown staining			
			NR	167.05' - Mechanical break or bedding plane, horizontal, smooth, planar, tight			
175 -132.8	R23-NQ 5 ft 84%	35	3	167.75-167.9' - Fracture zone		R23: 22 minutes	R23: 22 minutes
			6	168.1' - Bedding plane or mechanical break, horizontal, smooth, planar, open 1/8"-1/4"			
			4	168.2' - Bedding plane or mechanical break, <10 deg, rough, undulating, tight to open 1/4"-3/4"			
			6	168.4' - Bedding plane, smooth, undulating, open 1/4"			
			NR	169.3' - Bedding plane, horizontal, smooth, undulating, open 1/8"-1/4"			
180 -137.8	R24-NQ 5 ft 78%	40	6	169.55-169.7' - Fracture zone		R24: 20 minutes	R24: 20 minutes
			4	169.8' - Bedding plane, horizontal, smooth, undulating, 1/8"-1/4" open			
			6	170.1' - Bedding plane or mechanical break, <10 deg, smooth, undulating, 1/8"-1/4" open			
			NR	170.3-170.5' - Fracture zone			
			NR	170.7-170.8' - Bedding plane (2), <10 deg, tight, dark staining			
182.0			1	172.05' - Bedding plane, horizontal, smooth, undulating, crystal traces on surface, open 1/4"			
			NR	172.15' - Bedding plane, horizontal, smooth, planar, open 1/8"-1/4"			
			6	172.3-172.55' - Fracture zone			
			0	173.2' - Bedding plane, horizontal, smooth, undulating, crystals on surface of fracture, open 1/8"			
			2	173.3' - Bedding plane, <10 deg, smooth, undulating, crystals covering 30% of surface, open 1/4" to 1/2"			
182.0			>10	173.45, 173.75, 173.87, 173.9, 174.0, 174.03' - Bedding plane (6), horizontal, smooth, planar, crystals covering surface, tight to open 1/8"			
			NR	174.1' - Bedding plane, horizontal, smooth, undulating, crystals, open 1/8"-1/4"			
			NR	174.2-174.35' - Fracture zone, 3/4" fragments			
			NR				
			NR				



ORIENTATION : Vertical

LOGGER : C. LeBlanc, T. Stewart, C. Wallestad

WATER LEVEL: 10.0 ft (3.05 m)		DISCONTINUITIES		SYMBOLIC LOG	LITHOLOGY		COMMENTS
DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	R Q D (%)	FRACTURES PER FOOT		DESCRIPTION	ROCK TYPE, COLOR, MINERALOGY, TEXTURE, WEATHERING, HARDNESS, AND ROCK MASS CHARACTERISTICS	
					DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS		
185 -142.8	R25-NQ 5 ft 92%	40	4	175.45, 175.6, 175.8, 175.85, 175.95, 175.98, 176.05' - Bedding plane (7), horizontal, smooth, undulating, crystals on surface, tight to open 1/4"		Limestone 177.0-177.95' - yellowish gray to moderate olive brown, (5Y 7/2 to 5Y 4/4), fine grained, strong HCl reaction, weak to medium strong (R2 to R3), voids up to 1/8" covering 15-20% of surface, wavy dark brown laminations at 177.8' to sharp contact (bedding plane) at 177.95', 25 degree bedding plane 177.95-180.9' - yellowish gray, (5Y 7/2), very fine to medium grained, strong HCl reaction, weak to medium strong (R2 to R3), voids up to 3/16" covering 30-40% of surface, cavities (fossil molds) up to 1"x2" covering <5% of surface, moderate fossiliferous (casts, molds), very fine grained, very pale orange (10YR 8/2) wavy beds up to 1"1/2" from 179.65-180.35' and 180.5-180.68' No Recovery 180.9-182.0' Limestone 182.0-186.6' - yellowish gray to moderate olive brown, (5Y 7/2 to 5Y 4/4), strong HCl reaction, weak to medium strong (R2 to R3), voids up to 1/16" on 40-60% of surface, cavities (irregular shaped) up to 3/8"x3/16" over 10-20% of surface, moderately fossiliferous (molds and casts) No Recovery 186.6-187.0' Limestone 187.0-188.15' - Same as 182.0-186.6' 188.15-191.8' - yellowish gray, (5Y 7/2), fine grained, moderate to strong HCl reaction, weak to medium strong (R2 to R3), weaker at bottom of interval, medium strong (R3) at base, voids up to 3/16" covering 5-15% of surface, trace cavities 3/4"-1/8" with no infill, poorly fossiliferous, (mostly casts, molds), trace organics No Recovery 191.8-192.0' Limestone 192.0-193.25' - Same as 182.0-186.6' 193.25-194.2' - yellowish gray, (5Y 7/2), fine grained, strong HCl reaction, medium strong (R3), trace black color laminations, trace very fine to fine black particles No Recovery 194.2-197.0' Limestone 197.0-197.15' - Same as 193.25-194.2' No Recovery 197.15-202.5'	Driller's Remark: 183.0-184.5' was hard drilling, had to increase pump pressure R25: 28 minutes <

