CH2MHILL

PROJECT NUMBER:	BORING NUMBER:	
338884.FL	A-03	SHEET 1 OF 12

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723884.4 N, 457671.8 E (NAD83)

ELEVATION : 42.1 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews, P. Buchler

DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, AWJ rods, 6 tri-cone bit ORIENTATION : Vertical

WATER LEVELS : 1.3 ft bgs on 3/11/07 START : 3/10/2007 END : 3/12/2007 LOGGER : R. Bitely, C. Wallestad, N. Jarzyniecki

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
42.1							C. Wallestad and N. Jarzyniecki also logged portions of boring A-03
	3.5						
	5.0	1.2	SS-1	3-4-6 (10)	**Poorly Graded Sand With Silt (SP-SM)** 3.5-4.7' - very pale orange and dark yellowish orange, (10YR 8/2 and 10YR 6/6), wet, loose, very fine to fine grained, silica sand, 6% nonplastic fines, trace root matter, trace iron cemented sand nodules <1/4" diameter		
5 37.1							Moderate to light chatter, slow advancement at 5.0-8.5'
	8.5						
	10.0	0.9	SS-2	3-8-4 (12)	**Silt (ML)** 8.5-9.4' - pale yellowish orange, (10YR 8/6), wet, stiff, nonplastic to low plasticity, rapid dilatancy, mild to moderate HCl reaction, 5-10% fine to medium grained sand, all carbonate		
10 32.1							Very slow drilling at 11.5-13.5'
	13.5 13.6	0.0	SS-3	50/1 (50/1")	**No Recovery 13.5-13.6'**		Rapid advancement
15 27.1							
	18.5						
	18.8	0.3	SS-4	50/4 (50/4")	**Silt With Sand (ML)** 18.5-18.8' - pale yellowish orange, (10YR 8/6), wet, hard, nonplastic, rapid dilatancy, mild HCl reaction, 15-20% fine to medium grained sand, all carbonate		Very dense layer at 18.75', very slow advancement
20							

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PROJECT NUMBER:	BORING NUMBER:	
338884.FL	A-03	SHEET 2 OF 12

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723884.4 N, 457671.8 E (NAD83)

ELEVATION : 42.1 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews, P. Buchler

DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, AWJ rods, 6 tri-cone bit ORIENTATION : Vertical

WATER LEVELS : 1.3 ft bgs on 3/11/07 START : 3/10/2007 END : 3/12/2007 LOGGER : R. Bitely, C. Wallestad, N. Jarzyniecki

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
22.1							
	23.5						Moderate to rapid advancement at 22.5'
	25.0	1.5	SS-5	23-36-46 (82)	**Silty Sand (SM)** 23.5-25.0' - grayish orange, (10YR 7/4), wet, very dense, fine to coarse grained, mild to moderate HCl reaction, 46% nonplastic fines, approximately 5 interbedded extremely weak (R0) limestone lenses <1/2" thick		Sample SS-5 may be weak limestone
25							
17.1							
	28.5						
	30.0	1.5	SS-6	8-9-27 (36)	**Silty Sand (SM)** 28.5-30.0' - Same as 23.5-25.0' except dark yellowish orange, (10YR 6/6), dense, 1/2" lense of medium plastic silt at 28.6', approximately 5 interbedded limestone lenses up to 1/2" thick		
30							
12.1							Moderate drilling rate with variable thin, dense zones.
	33.5						
	34.6	0.5	SS-7	4-10-50/1.5 (60/7.5")	**Silty Sand With Limestone (SM)** 33.5-34.0' - Same as 28.5-30.0' except 50% of sample is limestone lenses to 1/2" thick		
35							
7.1							
	38.5						
	39.4	0.9	SS-8	22-50/5 (72/11")			
40							

PROJECT NUMBER:	BORING NUMBER:
338884.FL	A-03 SHEET 3 OF 12

SOIL BORING LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723884.4 N, 457671.8 E (NAD83)

ELEVATION : 42.1 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews, P. Buchler

DRILLING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, cathead, AWJ rods, 6 tri-cone bit ORIENTATION : Vertical

WATER LEVELS : 1.3 ft bgs on 3/11/07 START : 3/10/2007 END : 3/12/2007 LOGGER : R. Bitely, C. Wallestad, N. Jarzyniecki

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
2.1					**Silty Sand With Limestone (SM)** 38.5-39.4' - olive gray, (5Y 4/1), wet, very dense, fine to coarse grained, moderate HCl reaction, 30% nonplastic fines, with interbedded limestone lenses to 1" thick, all carbonate		Slow drilling with intermittent light chatter at 40.0-43.5'
43.5 43.6	0.1	SS-9	50/1 (50/1")		**Limestone Fragments** 43.5-43.6' - olive gray, (5Y 4/1), mild to moderate HCl reaction, coarse sand to fine gravel-sized fragments (<1/2" in diameter), trace fossils and voids <1/16"		
45 -2.9					Begin Rock Coring at 43.5 ft bgs See the next sheet for the rock core log		
50 -7.9							
55 -12.9							
60							

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PROJECT NUMBER:	BORING NUMBER:	
338884.FL	A-03	SHEET 4 OF 12

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723884.4 N, 457671.8 E (NAD83)

ELEVATION : 42.1 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews, P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 1.3 ft bgs on 3/11/07 START : 3/10/2007 END : 3/12/2007 LOGGER : R. Bitely, C. Wallestad, N. Jarzyniecki

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.)
	43.5		0			**Limestone** 43.5-45.9' - moderate yellowish brown, (10YR 5/4), fine grained, weak to extremely weak (R2 to R0), voids (<1/6") over 60-70% of rock surface, hardness decreases with depth, highly to poorly fossiliferous decreasing with depth, trace laminations	HW casing installed to 43.5'; begin rock coring at 43.5'
	R1-NQ 2.5 ft 90%	88	0	44.65' - Mechanical break			
45 -2.9			1	45.4' - Bedding plane or fracture, <10 deg, rough, undulating, <1/4" open			R1: 5 minutes
	46.0		NR				
			3	46.15, 46.25, 46.4' - Bedding plane or mechanical break, 0-<10 deg, smooth, undulating, <1/4" open		**No Recovery 45.9-46.0'**	
			1	46.55, 47.2, 47.85' - Mechanical break 47.4-47.65' - Clay seam		**Limestone** 46.0-50.3' - moderate yellowish brown, (10YR 5/4), fine grained, very weak to extremely weak (R1 to R0), voids (<3/16") over 40-80% of rock surface increasing with depth, poorly fossiliferous, moderately to highly fossiliferous with fossil molds from 47.7-49.2'	
	R2-NQ 5 ft 86%	77	0	48.5' - Mechanical break			
			1	49.25-49.45' - Clay seam			
50 -7.9			1				R2: 4 minutes
	51.0		NR	50.25' - Bedding plane or mechanical break, <10 deg, smooth, undulating, tight		**No Recovery 50.3-51.0'**	
			0			**Limestone** 51.0-55.9' - moderate yellowish brown, (10YR 5/4), very fine to fine grained, moderate HCl reaction, very weak to weak (R1 to R2), voids (<1/16") over 80-90% of rock surface, moderately to highly fossiliferous with molds up to 1/2"x1/4", extremely weak at 52.0-52.5'	
			4	52.3, 52.5' - Bedding plane or mechanical break, <10 deg, rough, undulating, <1/8" open			
	R3-NQ 5 ft 98%	84	2	52.85' - Fracture or mechanical break, 50 deg, rough, undulating, tight			
			2	53.0' - Bedding plane or mechanical break, 35 deg, rough, undulating, tight			
55 -12.9			2	53.2' - Fracture or mechanical break, 20 deg, rough, undulating, tight 53.3' - Fracture or mechanical break, 50 deg, rough, undulating, tight			R3: 8 minutes
	56.0		NR	53.45, 53.6' - Mechanical break		**No Recovery 55.9-56.0'**	
			1	54.25' - Fracture or mechanical break, 60 deg, rough, undulating, tight		**Limestone** 56.0-60.5' - moderate yellowish brown, (10YR 5/4), very fine to fine grained, moderate to strong HCl reaction, weak to medium strong (R2 to R3), voids (<3/16") over 80-90% of rock surface, moderately to highly fossiliferous, with fossil molds 1/2"x1/4", extremely weak to very weak at 57.25-57.55' and 59.95-60.5'	
			5	55.4' - Fracture or mechanical break, <10 deg, rough, undulating, tight			
	R4-NQ 5 ft 90%	67	1	55.7' - Bedding plane or mechanical break, <10 deg, rough, undulating, 1/8" infilling, sand infilling, open			
			2	56.55' - Fracture or mechanical break, 30 deg, rough, undulating, tight 57.25, 57.35, 57.5, 57.55, 58.0, 58.4' - Bedding plane or mechanical break, <10 deg, rough, undulating, <1/4" open			
60 -17.9			2				R4: 10 minutes
	61.0		NR	59.25' - Bedding plane or mechanical break, <10 deg, smooth, undulating, <1/4" open		**No Recovery 60.5-61.0'**	
			1	59.95' - Bedding plane or mechanical break, horizontal, rough, undulating, <1/2" open			
			1	60.2, 60.45' - Bedding plane or mechanical break, <10 deg, rough to smooth, undulating, 1/4" open			
	R5-NQ			61.8' - Fracture or mechanical break, 30 deg, rough, undulating, sandy or fragmented infilling, 1/2" to 1/4" open			

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PROJECT NUMBER:	BORING NUMBER:	
338884.FL	A-03	SHEET 5 OF 12

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723884.4 N, 457671.8 E (NAD83)

ELEVATION : 42.1 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews, P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 1.3 ft bgs on 3/11/07 START : 3/10/2007 END : 3/12/2007 LOGGER : R. Bitely, C. Wallestad, N. Jarzyniecki

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.)
	5 ft 84%	74	1	62.5' - Bedding plane or mechanical break, horizontal, rough, undulating, 1/2" to 1/4" open		**Limestone** 61.0-65.2' - moderate yellowish brown, (10YR 5/4), very fine to fine grained, moderate HCl reaction, extremely weak to very weak (R0 to R1), voids to 1/16" over <15% of rock surface from 61.0-61.6', voids to 3/16" over 10% of rock surface in mottled patterns from 61.6-63.4', mottling decreasing with depth, voids to 1/16" covering <5% of rock surface from 64.0-65.2', poorly to moderately fossiliferous with molds to 1/2"x1/8", solution cavities/bioturbation at 63.45', weak to medium strong at 62.5-64.3'	
			1	63.45' - Mechanical break			
65 -22.9			1	63.7-64.0' - Fracture or mechanical break, <10 deg, rough, undulating, rock fragment infilling, 3-1/2" open			R5: 12 minutes
	66.0		NR	64.65' - Bedding plane or mechanical break, horizontal, smooth, undulating, 1/8" open			
			2	65.05' - Bedding plane or mechanical break, <10 deg, rough, undulating, 1/8" open			
			0	66.3' - Fracture or mechanical break, 60 deg, rough, undulating, tight			
	R6-NQ 5 ft 100%	98	1	66.8' - Bedding plane or mechanical break, horizontal, rough, undulating, tight			
			0	68.45' - Bedding plane, horizontal, smooth, undulating, tight		**No Recovery 65.2-66.0'**	
70 -27.9			1	70.0' - Bedding plane or mechanical break, horizontal, smooth, undulating, tight		**Limestone** 66.0-71.0' - pale yellowish brown, (10YR 6/2), mild to moderate HCl reaction, very weak to medium strong (R1 to R3), voids (1/6") over 30-70% of rock surface, poorly fossiliferous, trace molds, trace cavities to 3/4"x1/4" some cavities with secondary infilling, laminated bedding with organics from 67.3-67.7	R6: 9 minutes
	71.0			70.2, 71.0' - Mechanical break			
			1	71.55' - Fracture, 25 deg, rough, stepped, 1/4" open			
			3	72.4' - Fracture, 60 deg, smooth, undulating, tight			
	R7-NQ 5 ft 74%	53	NR	72.65' - Fracture or mechanical break, 20 deg, rough, undulating, tight		71.0-72.9' - yellowish gray to light olive gray, (5Y 7/2 to 5Y 5/2), very fine to fine grained, moderate HCl reaction, extremely weak to medium strong (R0 to R3), voids (3/16") over 20-80% of rock surface, moderately fossiliferous with fossil molds, trace secondary infilling of cavities, mottled	Driller's Remark: Silt seam from 72.9-73.9' based on drilling speed and circulation
			0	72.8' - Bedding plane or mechanical break, horizontal, smooth, undulating, tight			
			1	72.9-73.9' - Clay seam, driller reports soil horizon			Driller's Remark: 30% loss of circulation fluids at approximately 74'
75 -32.9			4	74.5' - Fracture, 40 deg, rough, undulating, tight		**No Recovery 72.9-73.9'**	R7: 9 minutes
	76.0		NR	75.15, 75.25' - Bedding plane, horizontal, smooth, undulating, tight		**Limestone** 73.9-75.7' - Same as 71.0-72.9'	
			1	75.5, 75.55' - Bedding plane or mechanical break, horizontal, smooth to rough, undulating, tight		**No Recovery 75.7-76.0'**	
			0	76.9' - Bedding plane or mechanical break, <10 deg, rough, undulating, open 1"		**Limestone** 76.0-76.9' - light olive gray, (5Y 5/2), very fine to fine grained, moderate HCl reaction, weak to medium strong (R2 to R3), voids (1/16") over 10-90% of rock surface, cavities to 2"x1/8"	
	R8-NQ 5 ft 49%	27	0	77.1' - Fracture, 70 deg, rough, undulating, 1/2" open		76.9-77.3' - yellowish gray, (5Y 7/2), very fine to fine grained, extremely weak (R0), voids (1/6") covering 75% of rock surface	
			NR	77.3-77.5' - Clay seam 77.75, 77.85, 77.9, 78.05' - Bedding plane, horizontal, smooth, undulating, tight		**Fat Clay To Highly Plastic Silt (CH)** 77.3-77.5' - moderate HCl reaction	
80 -37.9						**Limestone** 77.5-78.1' - Same as 76.9-77.3'	R8: 9 minutes
	81.0					78.1-78.45' - Same as 76.0-76.9'	
			2	81.35, 81.4' - Fracture or mechanical break, <10 deg, smooth to rough, undulating, organic staining over 50-80% of surface, <1/2" open		**No Recovery 78.45-81.0'**	SC-1 collected at 81.4-82.4'
			1	82.7, 83.25, 83.4' - Mechanical break			
	R9-NQ						

PROJECT NUMBER:	BORING NUMBER:	
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ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723884.4 N, 457671.8 E (NAD83)

ELEVATION : 42.1 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews, P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 1.3 ft bgs on 3/11/07 START : 3/10/2007 END : 3/12/2007 LOGGER : R. Bitely, C. Wallestad, N. Jarzyniecki

DEPTH BELOW SURFACE AND ELEVATION (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	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.)
	5 ft 98%	84	2	83.6, 83.7' - Bedding plane, rough, undulating		**Limestone** 81.0-85.35' - yellowish gray to very light gray, (5Y 7/2 to N8), very fine to fine grained, weak to medium strong (R2 to R3), extremely weak at 83.6-83.7', laminated from 81.0-81.4', voids (<1/16") over 30% of rock surface, organics rare from 81.35-81.4', secondary infilling of very fine grained matrix from 81.4-83.6', fossiliferous with molds up to 1/2"x1/4" with some secondary infilling, cavities up to 3" with secondary infilling, voids (3/16") over 80-90%, organics, fossiliferous, and cavities up to 1-1/2", possible bioturbation at 81.4-83.6' 85.35-85.9' - Same as 81.0-85.35' except extremely weak to very weak (R0 to R1), molds up to 1"x1/4" with some secondary infilling, cavities up to 1-1/2"x1/2", trace organics	
			0				
85 -42.9			>10				R9: 12 minutes
86.0			NR	85.55-85.9' - Fracture zone, rough, undulating to stepped			
			>10	86.0-86.3' - Fracture zone, rough, undulating to stepped, intersecting fractures			
			1	86.8-87.0' - Bedding plane, <10 deg, 1/2" clay infilling, 1/2" open			
	R10-NQ 5 ft 86%	64	0	87.6' - Bedding plane, <10 deg, smooth, undulating, 1/4" open 88.5' - Mechanical break			
			>10				
90 -47.9			>10	89.7-90.3' - Fracture zone, rough, undulating, intersecting fractures			R10: 7 minutes
91.0			NR			**No Recovery 85.9-86.0'**	
			0			**Limestone** 86.0-87.0' - Same as 85.35-85.9' except fat clay (CH) to elastic silt (MH) seams at 86.8' and 87.5', secondary infilling of cavities at 86.65-86.8', cavities up to 1-1/2"x1/2" 87.0-87.65' - yellowish gray, (5Y 7/2), very fine to fine grained, extremely weak (R0), fossil molds up to 1/2"x1/4", cavities few, some secondary infilling 87.65-90.3' - light olive gray to dark yellowish brown, (5Y 5/2 to 10YR 4/2), very fine to fine grained, very weak to medium strong (R1 to R3), voids (<3/16") over 60% of rock surface, cavities few (up to 1/2"), trace organics, possible bioturbation, very fossiliferous, molds and casts up to 1/4"x1/2"	End drilling for the day 3/10/07 at 91.0' Resume drilling on 3/11/07 at 91.0', water level is 1.3' below ground surface
			1	92.0, 94.3' - Mechanical break			
	R11-NQ 5 ft 100%	76	0	92.8' - Bedding plane or mechanical break, <10 deg, smooth, undulating 93.5' - Mechanical break			
			4	94.05, 94.5' - Bedding plane or mechanical break, <10 deg, rough, undulating			
95 -52.9			>10	94.65' - Fracture, smooth, undulating, 1/4" open 94.75' - Fracture, 50 deg, infilling, up to 1/2" open			R11: 24 minutes
96.0			0	95.1-96.0' - Fracture zone, intersecting fractures			SC-2 collected at 96.0-97.0'
			0	97.05, 99.5, 96.0-96.2' - Mechanical break			
	R12-NQ 5 ft 100%	87	1			**No Recovery 90.3-91.0'** **Limestone** 91.0-93.0' - dusky yellow, (5Y 6/4), very fine to fine grained, very weak to medium strong (R1 to R3), fossiliferous with casts up to 3/4"x1/2", voids (3/16") over 30% of rock surface, cavities up to 1/2"x1/4" over 15% of rock surface, yellowish gray (5Y 7/2) secondary infilling up to 2"x2" with trace voids (1/16"), trace organics	
			1	98.7' - Mechanical break, 50 deg, rough, stepped			
100 -57.9			5	99.9' - Bedding plane, <10 deg, smooth, undulating, up to 1/4" open 100.35, 100.4' - Fracture, <10 deg, rough, undulating, up to 1/4" open			R12: 10 minutes
101.0			1	100.55-101.0' - Fracture zone, 80-85 deg, rough, undulating, fracture interval separated by bedding plane fractures			
			1	100.7-100.9' - Fracture zone or bedding plane, rough, undulating			
	R13-NQ			101.2, 103.3, 103.5, 103.6, 104.4' - Mechanical break			

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PROJECT NUMBER:	BORING NUMBER:	
338884.FL	A-03	SHEET 7 OF 12

ROCK CORE LOG

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ELEVATION : 42.1 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews, P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 1.3 ft bgs on 3/11/07 START : 3/10/2007 END : 3/12/2007 LOGGER : R. Bitely, C. Wallestad, N. Jarzyniecki

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.)
	5 ft 100%	98	0	101.3' - Fracture, 50 deg, rough, undulating 102.5' - Mechanical break, <5 deg, rough, undulating		93.0-96.0' - yellowish gray, (5Y 7/2), weak to medium strong (R2 to R3), voids over <10% of rock surface increasing to 30% from 93.65-94.35', fossiliferous with molds/casts up to 1/2"x1/4", possibly bioturbated from 93.65-94.35'	
			1				
105 -62.9			0	104.95' - Bedding plane, rough, undulating			R13: 8 minutes
	106.0					**Limestone** 96.0-101.0' - yellowish gray, (5Y 7/2), very fine to fine grained, very weak to medium strong (R1 to R3), voids (3/16") over 35% of rock surface decreasing to 15-20% at 99.8', fossiliferous with casts/molds up to 1/2"x1/4", organics visible in solution cavities at 98.4-98.6', secondary infilling with voids over <10% of surface and with trace fossils 101.0-106.0' - yellowish gray, (5Y 7/2), very fine to fine grained, weak to very weak (R2 to R1), voids over 20-30% of rock surface, fossiliferous with casts up to 1"x1/2", fossils and voids increase from zone at 102-103.5', clay infilling over 5% of voids, secondary infilling of yellowish gray (5Y 8/1) limestone with <10% voids and fossils; sparsely fossiliferous from 101-102.5' with 15-25% voids on rock surface 106.0-106.9' - light olive gray to yellowish gray, (5Y 5/2 to 5Y 7/2), very fine to fine grained, very weak (R1), voids (1/16") over 20% of rock surface, fossiliferous with molds/casts up to 1"x1/2", laminar bedding planes 106.9-111.0' - yellowish gray, (5Y 5/2), very fine to fine grained, very weak to weak (R1 to R2), voids (3/16") over 25-30% of rock surface, fossiliferous with fossils up to 1/4"x1/4", possible dissolution cavities up to 1/2"x1/2" 111.0-119.0' - yellowish gray, (5Y 7/2), very fine to fine grained, very weak (R1), voids (<1/16") over 10-30% of rock surface, voids with secondary infilling over additional 25% of rock surface, secondary infilling is yellowish gray (5Y 8/1) 119.0-121.0' - yellowish gray, (5Y 7/2), very fine to fine grained, weak (R2), voids (3/16") over 30% of rock surface, highly fossiliferous, with fossils up to 1/2"x1/4", dissolution cavities up to 1/4" in diameter over 15% of rock surface	
			0	106.5, 108.3, 109.2' - Mechanical break			
			1	107.35' - Bedding plane, <15 deg, rough, undulating, 1/4" open			
	R14-NQ 5 ft 100%	87	3	108.1, 108.6, 108.8' - Bedding plane, 10 deg, smooth to rough, undulating, tight to up to 1/8" open at 108.8'			
			1				
110 -67.9			3	109.75' - Mechanical break, 10-15 deg, rough, undulating			SC-3 collected at 109.75-110.65'
	111.0			110.65, 110.85, 110.95' - Bedding plane, <10 deg, rough, undulating, up to 1/4" open			R14: 5 minutes
			3	111.05' - Fracture zone, rough, undulating, intersecting fractures			
			0	111.7, 112.1, 115.15-115.2, 115.85' - Mechanical break			
	R15-NQ 5 ft 100%	89	6	113.1, 113.35, 113.45, 113.55, 113.7, 113.8, 114.1, 144.3, 144.35, 114.75, 114.85' - Fracture zone or bedding plane, <10 deg, smooth to rough, undulating, up to 1/8" open, healed fracture at 119.6'			
			5				
115 -72.9			1	115.5' - Bedding plane, <10 deg, smooth to rough, undulating, up to 1/8" open			R15: 9 minutes
	116.0						
			3	116.1, 116.45, 116.55' - Bedding plane, <10 deg, smooth to rough, undulating, up to 1/4" open			
			0				
	R16-NQ 5 ft 100%	88	0	118.5, 118.45, 116.75, 119.8, 120.9' - Mechanical break			
			1	119.3' - Bedding plane, rough, undulating, ground rock infilling, up to 1/2" open			
120 -77.9			2				R16: 6 minutes
	121.0			120.6' - Bedding plane, rough, undulating			
			1	120.95' - Fracture or mechanical break, rough, undulating, high angle fracture			
				121.35' - Bedding plane, 15 deg, rough, undulating, 1/2" open			
			2	122.0' - Bedding plane, rough, undulating to stepped, tight			
	R17-NQ						

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PROJECT NUMBER:	BORING NUMBER:	
338884.FL	A-03	SHEET 8 OF 12

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723884.4 N, 457671.8 E (NAD83)

ELEVATION : 42.1 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews, P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 1.3 ft bgs on 3/11/07 START : 3/10/2007 END : 3/12/2007 LOGGER : R. Bitely, C. Wallestad, N. Jarzyniecki

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.)
	5 ft 100%	88	1	122.9' - Fracture, 55 deg, smooth to rough, undulating, up to 1/4" open		**Limestone** 121.0-126.0' - yellowish gray to light olive gray, (5Y 7/2 to 5Y 6/1), very fine to fine grained, voids (3/16") over 30% of rock surface, secondary infilling with yellowish gray (5Y 8/1) to medium gray (N5) limestone, voids increase to 40-50% at 123.8-124.0 and 125.2-126.0', fossiliferous with highly fossiliferous zones at 121.0-122.2', 123.8-124.2' and 125.2-126.0' (casts/molds), dissolution cavities at 121.8' and 122.1' up to 1"x1/2", smaller dissolution cavities throughout, laminar bedding at 122.9' 126.0-127.1' - Same as 121.0-126.0' except very weak to weak (R1 to R2), voids decreasing with depth 127.1-131.0' - yellowish gray, (5Y 7/2; 5Y 8/1), very fine to fine grained, very weak (R1), voids (1/16") over 10% of rock surface becoming infilled with depth, laminar bedding, fossiliferous with some fossils up to 1/4" in diameter, trace cavities 131.0-134.8' - yellowish gray to dusky yellow, (5Y 7/8 to 5Y 6/4), very fine to fine grained, very weak to weak (R1 to R2), voids (1/8") over 10-30% of rock surface increasing with depth, fossiliferous as casts/molds, fossils more abundant at 132.7-133.2', laminar bedding planes 134.8-136.0' - yellowish gray, (5Y 7/6), very fine to fine grained, weak (R2), voids (3/16"), fossiliferous (casts), dissolution cavities at 134.9-135.2' (1"x1/2") 136.0-141.5' - yellowish gray and light olive gray, (5Y 7/2 and 5Y 5/2), very fine to fine grained, very weak to weak (R1 to R2), voids (1/16") over 10% of rock surface increasing to 1/8" at 138.7' covering 25:% of rock surface, dissolution cavities up to 1/4" with some secondary calcite mineralization, poorly fossiliferous, laminar bedding	
			0	123.4' - Bedding plane, smooth to rough, undulating, up to 1/2" open			
125 -82.9			1	123.5, 123.7, 124.15, 125.7' - Mechanical break			R17: 11 minutes
	126.0			125.75' - Fracture, 55 deg, rough, undulating			
			>10				
			1	126.9-126.95' - Fracture zone, intersecting fractures, up to 1/4" open			
	R18-NQ 5 ft 100%	98		127.4' - Bedding plane, rough, undulating, up to 1/4" open			
			2	127.5, 130.15, 130.9' - Mechanical break			
			0	128.4, 128.7' - Bedding plane, tight to 1/4" open			
130 -87.9							R18: 7 minutes
	131.0		0				SC-4 collected at 130.15-131.1'
			0				
			2	131.95, 133.3, 134.35, 135.5' - Mechanical break			
	R19-NQ 5 ft 100%	94		132.4, 132.9' - Fracture, 40 deg, smooth to rough, undulating			
			4	133.45' - Bedding plane, <5 deg, smooth, undulating			
			0	133.55' - Fracture, 80 deg, rough to smooth, undulating, tight			
135 -92.9							R19: 8 minutes
	136.0		0	135.5, 133.6' - Fracture, 75 deg and 80 deg, rough to smooth, undulating, fractures intersect at 133.55'			
			4	136.05' - Bedding plane, 40 deg, rough to smooth, undulating			
			>10	136.35, 136.7, 136.85' - Bedding plane, 40 deg, rough to smooth, undulating, up to 1/4" open			
	R20-NQ 5 ft 100%	69	2	136.45, 137.1, 137.75, 139.0' - Mechanical break			
			1	137.3-137.75' - Fracture zone or bedding plane, multiple high angle intersecting fractures			
140 -97.9							R20: 8 minutes
	141.0		3	138.2, 138.5, 139.2' - Bedding plane, 40 deg, rough to smooth, undulating, up to 1/4" open 140.0, 140.3' - Fracture (2), 60 deg and 65 deg, rough, undulating, up to 1/4" open			Driller's Remark: 100% loss of circulation fluids at 140'
			1	140.7' - Bedding plane, <10 deg, smooth, undulating, up to 1/2" open			SC-5 collected at 141.85-142.9'
			0	141.3, 141.95, 145.9' - Mechanical break 141.45' - Bedding plane, <10 deg, smooth, undulating			
	R21-NQ						

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PROJECT NUMBER:	BORING NUMBER:	
338884.FL	A-03	SHEET 9 OF 12

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723884.4 N, 457671.8 E (NAD83)

ELEVATION : 42.1 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews, P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 1.3 ft bgs on 3/11/07 START : 3/10/2007 END : 3/12/2007 LOGGER : R. Bitely, C. Wallestad, N. Jarzyniecki

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.)
	5 ft 91%	53	>10	143.0' - Bedding plane, <10 deg, smooth to rough, undulating, up to 1" open		**Limestone** 141.5-143.1' - yellowish gray to light olive gray, (5Y 7/2 to 5Y 5/2), very fine to fine grained, very weak to weak (R1 to R2), voids over 20% of rock surface, cavities over 10% of rock surface up to 1-1/3"x3/4", most voids and cavities infilled with medium gray (N6) material, fossiliferous (as casts) 143.1-145.55' - yellowish gray to very light gray, with light olive grey mottling, (5Y 7/2 to N8, with 5Y 5/2), very fine to fine grained, weak to medium strong (R2 to R3), voids over 15% of rock surface, dissolution cavities up to 1/2" in diameter, fossiliferous (as casts)	
			>10	143.3' - Bedding plane, <10 deg, some recrystallization on 20% of surface			
145 -102.9			>10	143.5-144.6; 145.05-145.55' - Fracture zone, intersecting fractures			R21: 22 minutes
	146.0		NR				
			4	146.1-146.15' - Fracture zone, open			
				146.3' - Bedding plane, <10 deg, smooth to rough, undulating to planar, organic staining on fracture face, up to 1/2" open			
			3	146.9, 147.4' - Fracture, 50 deg			
	R22-NQ 5 ft 80%	71		147.55' - Bedding plane, <10 deg, 1/4" open			
			2	147.9' - Bedding plane, 10-15 deg, up to 1" open			
			1	148.4, 149.0' - Bedding plane, <10 deg, up to 1/2" open			
150 -107.9			NR			**No Recovery 145.55-146.0'** **Limestone** 146.0-147.2' - Same as 143.1-145.55' except laminar beds up to 4" thick, trace to 20% voids over rock surface, trace organics 147.2-150.0' - dusky yellow to very pale orange, (5Y 6/4 to 10YR 8/2), very fine to fine grained, very weak (R1), voids (<3/16") over 30% of rock surface, dissolution cavities up to 1/4" in diameter, fossiliferous (fossils 1/16"-1" in length), some voids and cavities with dusky yellow (5Y 6/4) to light olive gray (5Y 6/1) secondary infilling	R22: 25 minutes
	151.0						
			4	151.05' - Fracture, 20 deg, up to 1/2" open			
				151.65, 151.8, 151.9' - Bedding plane, <20 deg, up to 1/2" open			
			1	152.0' - Bedding plane, <5 deg, tight			
	R23-NQ 5 ft 89%	71	1				
				153.8' - Mechanical break, 50 deg			
			6	154.35-154.6' - Fracture zone or bedding plane, <10 deg, 1/2" open at 156.5			
155 -112.9			>10			**No Recovery 150.0-151.0'** **Limestone** 151.0-152.75' - dusky yellow to light gray, (5Y 6/4 to N7), very weak to weak (R1 to R2), voids (up to 1/16") over 40% of rock surface, dissolution cavities up to 1"x1/2", organic layer at 152.0' with very fine grained limestone layer with no voids (<1/4" thick) 152.75-155.45' - yellowish gray, (5Y 7/2), very fine to fine grained, weak (R2), very weak at 154.45-155.4', voids (up to 3/16") over 20% of rock surface, poorly fossiliferous, laminar beds	R23: 12 minutes
	156.0		NR	155.4-155.55' - Fracture zone, intersecting fractures			
			>10	156.0-156.1' - Fracture zone, open			
				156.35, 156.45' - Bedding plane, <10 deg, rough, undulating, up to 1/8" open			
			1	156.4' - Fracture, 85 deg, 1/8" open			
				157.6' - Bedding plane, <10 deg, rough, undulating, 1/4" open			
	R24-NQ 5 ft 92%	66	2	158.5-158.8' - Fracture zone, 50 deg, rough, undulating, organic staining over 10-20%			
			6	159.0-159.45' - Fracture zone, rough, undulating, intersecting fractures, up to 1/4" open			
160 -117.9			0	159.55, 159.75' - Bedding plane, 10 deg, rough, undulating, 1/8" open		**No Recovery 155.45-156.0'** **Limestone** 156.0-156.45' - Same as 152.75-155.45' except very weak (R1), laminar organics (<3/4") thick, moderately fossiliferous with casts up to 1/4"x1"	R24: 8 minutes
	161.0		NR	160.5' - Fracture, 50 deg, rough, undulating, 1/8" open			End drilling for the day 03/11/2007, 18:30 at 161.0' Resume drilling on 03/12/2007, water level is 1.0' below ground surface
			1	161.55' - Bedding plane, <5 deg, rough to smooth, undulating, up to 1/4" open			
			2	162.05' - Bedding plane, <5 deg, rough to smooth, undulating, up to 1/8" open			
	R25-NQ			162.75, 163.75, 164.55' - Mechanical break, rough, undulating			

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PROJECT NUMBER:	BORING NUMBER:	
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ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723884.4 N, 457671.8 E (NAD83)

ELEVATION : 42.1 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews, P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 1.3 ft bgs on 3/11/07 START : 3/10/2007 END : 3/12/2007 LOGGER : R. Bitely, C. Wallestad, N. Jarzyniecki

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.)
	5 ft 86%	85	1			**Limestone** 156.45-160.6' - very fine to fine grained, very weak to weak (R1 to R2), alternating laminar beds up to 8" thick defined by changes in voids, voids ranging from <10% up to 30% (up to 1/16"), dissolution cavities at 157.6', 158.45', 158.9', and 159.5' up to 1/2"x1/4" over 15% of rock surface, poorly to moderately fossiliferous	
			2				
165 -122.9			0	164.95' - Bedding plane, smooth to rough, undulating, up to 1/2" open			R25: 19 minutes
	166.0		NR				
			3	166.6, 166.75, 166.8, 167.1, 167.2, 167.4, 167.55, 167.65, 167.7, 167.8, 167.95, 168.10, 168.15, 168.2, 168.35, 168.45, 168.50, 169.9, 170.0' - Bedding plane or mechanical break, <5 deg, smooth, undulating to planar, open up to 1/4"		**No Recovery 160.6-161.0'**	
			8			**Limestone** 161.0-165.3' - light olive gray to yellowish gray, (5Y 5/2 to 5Y 7/2), very fine to fine grained, voids (up to 3/16") over <10% of rock surface, fossil casts over <10% of rock surface, laminar bedding characterized by color change and % voids, trace organics, highly fossiliferous from 162.05-163' with increase in voids (up to 1/4") over 35% of rock surface, some secondary infilling of voids with yellowish gray (5Y 7/2) to gray (N7) limestone	
	R26-NQ 5 ft 85%	38	6				SC-6 collected at 168.6-169.6'
			1				
170 -127.9			1				R26: 15 minutes
	171.0		NR				
			3	171.55' - Bedding plane or mechanical break, horizontal, rough, undulating, tight		**No Recovery 165.3-166.0'**	
			9	171.8' - Bedding plane, 20 deg, smooth, undulating, <1/8" open		**Limestone** 166.0-168.7' - yellowish gray to moderate olive brown, (5Y 7/2 to 5Y 4/4), very fine to fine grained, weak to medium strong (R2 to R3), extremely weak (R0) to very weak rock (R1) at discontinuities, voids (<3/16") over 60-80% of rock surface, several cavities (>5) from 1/4"-1/8" on bedding laminations, poorly fossiliferous	
	R27-NQ 5 ft 97%	34	3	171.95-172.25' - Fracture zone, <5 deg, rough to smooth, undulating, up to 1/4" open			
			4	172.4' - Fracture, 80 deg, rough to smooth, undulating, recrystallization on fracture surface			
175 -132.9			5	172.6' - Bedding plane, smooth to rough, undulating, silt-sized infilling, organic staining, up to 1/4" open			R27: 6 minutes
	176.0		NR	172.9, 172.95, 173.1, 173.5, 174.0, 174.35, 174.65' - Bedding plane or mechanical break, <5 deg, smooth, undulating			
			1	174.5' - Bedding plane or mechanical break, 35 deg, smooth, undulating		168.7-170.25' - Same as 166.0-168.7' except mild to moderate HCl reaction, moderately to highly fossiliferous (casts/molds), trace bedding plane laminations, trace secondary infilling of fossil molds at 169.8-169.9'	
			5	175.0, 175.25-175.35, 175.55, 175.65, 175.75' - Bedding plane or mechanical break, rough, undulating, <1/2" open, friable from 175.25-175.35'			
	R28-NQ 5 ft 91%	32	7	176.95' - Bedding plane or mechanical break, 20 deg, smooth to rough, undulating		**No Recovery 170.25-171.0'**	
			>10	177.25, 177.3' - Bedding plane or mechanical break, 10 deg, smooth, undulating		**Limestone** 171.0-175.85' - light olive gray to pale yellowish brown, (5Y 5/2 to 10YR 6/2), very fine to fine grained, extremely weak to weak (R0 to R2), weakest along bedding plane fractures, voids (<3/16") over 50-80% of rock surface, laminated bedding at 171.8', 172.9' and 174.8-175.05', several cavities (<1/2") over 20% of rock surface, poorly fossiliferous	
180 -137.9			3	178.7, 178.8' - Bedding plane, <10 deg, rough, undulating, up to 1/4" open			R28: 19 minutes
	181.0		NR	178.75' - Fracture, 60 deg and 65 deg			
			2	178.95' - Bedding plane, <10 deg, rough, undulating, up to 1" open			
			3	179.2-179.25' - Fracture zone, rough, undulating, 1/2" open			
	R29-NQ			179.3' - Bedding plane, <5 deg, smooth to rough, planar			
				179.45' - Bedding plane or mechanical break, smooth to rough, 1/2" to 1/4" open		**No Recovery 175.85-176.0'**	

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PROJECT NUMBER:	BORING NUMBER:	
338884.FL	A-03	SHEET 11 OF 12

ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723884.4 N, 457671.8 E (NAD83)

ELEVATION : 42.1 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews, P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 1.3 ft bgs on 3/11/07 START : 3/10/2007 END : 3/12/2007 LOGGER : R. Bitely, C. Wallestad, N. Jarzyniecki

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.)
	5 ft 88%	54	>5	179.5, 179.65, 179.8, 179.85, 179.95, 180.0, 180.1, 180.15' - Bedding plane, <10 deg, smooth to rough, undulating, up to 1/2" open		**Limestone** 176.0-178.5' - pale yellowish brown to very light gray, (10YR 6/2 to N8), very fine to fine grained, weak to medium strong (R2 to R3), voids (<3/16") over 60-80% of rock surface, dissolution cavity at 179.3' (1-1/2"x1"), few fossil molds	
			4	179.6-179.8' - Fracture zone, rough, undulating			
185 -142.9			0	181.3, 181.35' - Bedding plane or mechanical break, horizontal, rough, undulating, 1/4" open			R29: 15 minutes
			NR				
	186.0						
			1	181.45-181.6' - Fracture zone, 0-55 deg, rough, undulating, intersecting fractures		178.5-178.7' - Same as 176.0-178.5' except medium strong (R3), voids (<1/16") over 0-30% of rock surface, trace mottling	SC-7 collected at 186.0-186.75'
			5	182.75, 182.9, 183.0, 183.05, 183.35, 183.4, 183.45, 184.2, 184.3' - Bedding plane or mechanical break, smooth to rough, undulating, friable zones at 183.0-183.5'		178.7-179.0' - Same as 176.0-178.5' 179.0-179.5' - Same as 178.5-178.7' 179.5-180.55' - Same as 176.0-178.5'	
	R30-NQ 5 ft 100%	56	5	186.75, 187.05' - Bedding plane or mechanical break, <10 deg, rough, undulating, <1/4" open		**No Recovery 180.55-181.0'**	
			3	187.2, 187.35, 187.75, 187.9, 188.1, 188.45, 188.65, 188.75' - Bedding plane, <10 deg, rough to smooth, undulating, with some <1/4" open		**Limestone** 181.0-185.4' - pale yellowish brown, (10YR 6/2), very fine to fine grained, very weak to medium strong (R1 to R3), with extremely weak (R0) and friable silty lens, voids (<3/16") over 60% of rock surface, few cavities (3/4"x1/4") poorly fossiliferous with few casts/molds, bioturbated, friable lens at 184.55-184.6'	
190 -147.9			4	189.25' - Fracture, 50 deg, smooth, undulating			R30: 18 minutes
	191.0						
			3	189.65, 189.75, 190.4, 190.55, 190.75' - Bedding plane, <10 deg, rough to smooth, undulating, <1/8" open			
			2	191.1, 191.35, 191.7' - Fracture, <10 deg, rough, undulating		**No Recovery 185.4-186.0'**	
	R31-NQ 5 ft 99%	62		192.15' - Mechanical break		**Limestone** 186.0-191.0' - pale yellowish brown to moderate yellowish brown, (10YR 6/2 to 10YR 5/4), very fine to fine grained, weak to medium strong (R2 to R3), voids (<3/16") over 70-80% of rock surface, moderately to highly fossiliferous especially at 186.0-186.75' (molds/casts), laminated bedding over 50% of rock surface	
			3	192.85, 193.0-193.1' - Fracture zone, rough, undulating, <1/2" open			
				193.45, 193.6' - Mechanical break			
			3	193.75, 193.95, 194.1' - Bedding plane or mechanical break, <10 deg, rough, undulating to stepped			
195 -152.9			1	194.55' - Mechanical break, 40 deg			R31: 10 minutes
				194.75-194.9' - Fracture zone, rough, undulating			
	196.0		NR				
			3	195.6-195.8' - Fracture, rough, undulating, 2" fragment missing over 180 degrees of core section		191.0-193.0' - moderate yellowish brown to yellowish gray, (10YR 5/4 to 5Y 7/2), fine grained, very weak to weak (R1 to R2), voids (<3/16") over 80% of rock surface, dissolution cavities (<1-1/2" diameter), laminated over 30% of rock surface, highly fossiliferous	
			>10	196.45' - Bedding plane, horizontal, rough, undulating, silt and/or clay sized infilling, 1/2" open			
	R32-NQ 5 ft 84%	40	3	196.9-197.45' - Fracture zone, rough, undulating			
				198.55' - Bedding plane, horizontal, rough, undulating, 1/4" silt infilling			
			>10	198.8, 198.85, 199.15' - Bedding plane, <10 deg, rough, undulating, <1/4" open		193.0-194.0' - Same as 191.0-193.0' except very weak (R1), voids (<1/16") over 40% of rock surface, few dissolution cavities (<1/2"x1/8")	
200 -157.9			>10	199.4-199.65; 199.95-200.1' - Fracture zone, rough, undulating to stepped			R32: 11 minutes
			NR	199.65-199.95' - Fracture zone, smooth to rough, undulating, high angle fracture planes intersecting bedding plane at 199.8', tight		194.0-195.95' - Same as 191.0-193.0' except voids (<3/16") over 30-80% of rock surface, fossils decreasing with depth, highly fossiliferous with casts/molds and 2" diameter dissolution cavities at 195.6-195.8'	Total depth of boring is 201.0'
	201.0					**No Recovery 195.95-196.0'**	

PROJECT NUMBER:	BORING NUMBER:
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ROCK CORE LOG

PROJECT : Progress Energy Florida - COLA Investigation, Levy County Site LOCATION : 1723884.4 N, 457671.8 E (NAD83)

ELEVATION : 42.1 ft (NAVD88) DRILLING CONTRACTOR : Universal Engineering Sciences, Jacksonville, FL; Driller: B. Truitt; Cathead Operator: B. Crews, P. Buchler

CORING METHOD AND EQUIPMENT : Dietrich D-50 S/N 232, mud rotary, NQ tools, HW casing ORIENTATION : Vertical

WATER LEVELS : 1.3 ft bgs on 3/11/07 START : 3/10/2007 END : 3/12/2007 LOGGER : R. Bitely, C. Wallestad, N. Jarzyniecki

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.
						Limestone 196.0-197.45' - pale yellowish brown to very pale orange, (10YR 6/2 to 10YR 8/2), very fine to fine grained, extremely weak to weak (R0 to R2), voids (<3/16") over 50% of rock surface, mottled, bioturbated over 30% of rock surface, elastic silt (MH) from 196.0-196.5' 197.45-199.4' - Same as 196.0-197.45' except very weak to medium strong (R1 to R3), voids (<3/16") over 70-80% of rock surface, cavities (<3/4"x1/2"), highly fossiliferous, trace laminated bedding 199.4-200.2' - Same as 196.0-197.45' except voids (<1/16") over 30-50% of rock surface, poorly fossiliferous, organics from 199.5-200.1' **No Recovery 200.2-201.0'** Bottom of Boring at 201.0 ft bgs on 3/12/2007	