

Geotechnical Boring Logs

KEY TO SYMBOLS AND DESCRIPTIONS-SOIL/ROCK

TURKEY POINT COL., 5-30-08, 6468-07-1950

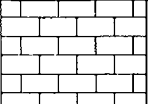
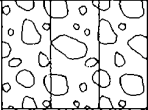
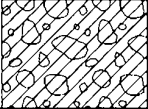
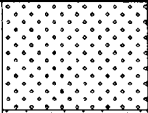
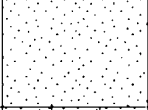
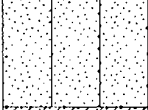
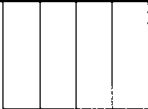
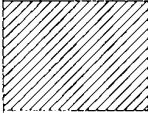
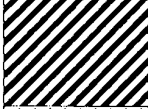
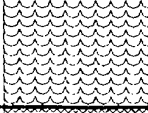
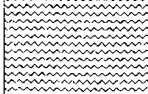
Soils classified under the Unified Soil Classification System (USCS) and in accordance with ASTM D 2488-06

CORRELATION OF SPT RESISTANCE WITH RELATIVE DENSITY-CONSISTENCY				MOISTURE CONTENT	MODIFIERS	
GRANULAR MATERIAL		SILTS AND CLAYS		DRY-Absence of moisture	Approximate %	Modifiers
RELATIVE DENSITY	SPT N Value (blows/ft)	CONSISTENCY	SPT N Value (blows/ft)	MOIST-Damp/no visible H2O	<5%	TRACE
VERY LOOSE	0 - 4	VERY SOFT	0 - 2	WET-Visible free water	5 to 10%	FEW
LOOSE	5 - 10	SOFT	3 - 4		15 to 25%	LITTLE
MEDIUM DENSE	11 - 30	FIRM	5 - 8	HCl Reaction	30 to 45%	SOME
DENSE	31 - 50	STIFF	9 - 15	NONE - No visible reaction	50 to 100%	MOSTLY
VERY DENSE	> 50	VERY STIFF	16 - 30	WEAK - Some reaction/slow	Modifiers provide an estimate of the percentages of gravel, sand, and fines (silt or clay size particles) or other material such as organics, shells, etc.	
		HARD	> 30	STRONG - Violent reaction		
COLOR of Soil/Rock: Based on Munsell Soil Color Charts				SPT Sample Numbering: Boring # - Sample # (602-1, 602-2, 602-3, etc.)		
Particle Size Range for Sand (Fine, Medium, Coarse) and Gravel (Fine or Coarse)				Undisturbed Sample Numbering: Boring # -UD-sample # (602-UD-1)		
GROUND WATER: Ground water level observations were recorded at every boring location at the start and end of each work day, when possible. In general, observed water levels were within +/- 2 feet of the existing ground surface. Due to the use of drilling fluid additives, these values may not represent the ground water conditions at the site. See observation wells for measured ground water levels.				Core Sample Numbering: Boring # -CS-Sample # (602-CS-01)		
				Field Measurements: Horizontal measurements rounded to nearest foot. Vertical measurements, such as SPT sample recovery or penetration, sample depths, core run depth, core run length, core recovery, core RQD, etc. rounded to nearest tenth of a foot (0.1 ft).		
				Datum Reference Information	Horizontal - NAD83, Florida State Plane (Florida East) US ft	
					Elevation - NAVD88, US ft	

ROCK

Classification of Carbonate Rocks (Dunham, 1962) Mud<0.06 mm		MUDSTONE <10% Grains	WACKESTONE >10% Grains, mud supported	PACKSTONE >5% Mud, grain supported	GRAINSTONE <5% Mud	BOUNDSTONE Original components bound together
ROCK HARDNESS DESCRIPTIONS ⁽¹⁾			INDURATION			
VERY SOFT	Core Samples: Rock core crumbles when handled. SPT Samples: N<20		For sedimentary rocks, induration is the hardening of the material by cementing, heat, pressure, etc.			
SOFT	Core Samples: Can break core easily with hands. SPT Samples: N=21-30		FRIABLE	Rubbing with finger frees numerous grains; gentle blow by hammer disintegrates sample.		
MEDIUM HARD	Core Samples:Can break core with hands. SPT Samples: N=31-45		MODERATELY INDURATED	Grains can be separated from sample with steel probe/knife; breaks easily when hit with hammer.		
MODERATELY HARD	Core Samples: Thin edges of rock can be broken with fingers. SPT Samples: N=46-60		INDURATED	Grains are difficult to separate with steel probe/knife; difficult to break with hammer.		
HARD	Core Samples: Thin edges of rock cannot be broken with fingers. SPT Samples: N=61-100		EXTREMELY INDURATED	Sharp hammer blows required to break sample; sample breaks across grains.		
VERY HARD	Core Samples: Rock core rings when struck with a hammer (cherts). SPT Samples: N>50/0.1'		(1) Core sample hardness description based on manual methods in general accordance with Engineering Geology Field Manual (US Bureau of Reclamation, 2001), Army TM 5-818-1 (1983) and Characteristics of Geologic Materials and Formations (Hunt, 2006). SPT sample hardness description based on N-values after McMahan, Jr., "Drilled Shaft Design and Construction in Florida", University of Florida, 1988.			
Core Terms-Abbreviations		EXPLANATION				
DRILL RATE		Time in minutes it takes to core one foot, for each foot or partial foot of a core run. (1:32; 0:54/0.7 ft)				
CORE RUN; RUN LENGTH		Cored Interval; Total distance of core run measured to nearest 0.1 ft. Core runs are not to exceed 5 feet.				
CORE RECOVERY (REC.)		Total length of recovered core, measured to nearest 0.1 ft, divided by the core run length, and expressed as a percentage.				
CORE RQD (RQD)		Rock Quality Designation. Sum of intact core pieces greater than 4 inches in length, measured to the nearest 0.1 ft, divided by the core run length, and expressed as a percentage.				

SOIL AND ROCK SYMBOLS AND DESCRIPTIONS

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
ROCK				LS	CARBONATE ROCKS-LIMESTONE, DOLOSTONE
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
	SAND AND SANDY SOILS	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		CLEAN SANDS (LITTLE OR NO FINES)		SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	MUCK, PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS



GEOTECHNICAL BORING LOG

Prepared By OPF Date 8-14-08Checked By SSC Date 8-17-08

SHEET 1 OF 6

BECHTEL PROJECT NO.: 25409					MACTEC PROJECT NO.: 6468-07-1950					COUNTY: Miami-Dade			GEOLOGIST: S. Lehman				
SITE DESCRIPTION: Turkey Point COL					DRILL MACHINE: CME-75 (CLT)					DRILLER: T.Warren/J.Warren/Guy/Harvey					GROUND WATER (ft)		
BORING NO.: B-601(DH)					DRILL METHOD: Mud Rotary/ Core					SAMPLE METHODS: SPT/Core					0 HR. NA		
GROUND ELEV.: -1.4 ft (NAVD88)					NORTHING: 396,968 US ft (NAD83/90)					EASTING: 876,643 US ft (NAD83/90)					24 HR. NA		
TOTAL DEPTH: 419.2 ft					BORING DIAMETER: 6" to 25.5', 4" to 419.2'					CASING DEPTH: 6" to 25.5', 4" to 153.3'					HAMMER (ID):140 lb. Auto (MEC-09)		
DATE STARTED: 2/24/08					COMPLETED: 3/25/08					CORE SIZE: PQ3					BITS USED: 3 7/8" & 6" Roller Cone		
ELEV.	DEPTH	BLOW COUNT			BLOWS PER FOOT					SAMP.	LOG	SOIL AND ROCK DESCRIPTION					
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20	40	60	80	100					NO.		
-1.4					Ground Surface												
-1.4	0.0	WOR	WOR	WOR							601(DH)-1		-1.4	0.0			
-3.7	2.3										601(DH)-2		-3.9	2.5			
		1	1	10													
-6.7	5.3										601(DH)-3						
		7	7	6													
-9.0	7.6										601(DH)-4						
		3	6	10													
-11.1	9.7										601(DH)-5						
		4	7	8													
-13.9	12.5										601(DH)-6						
		25	20	31													
-16.2	14.8										601(DH)-7						
		50/0.2															
-22.8	21.4										601(DH)-8						
		5	7	10													
-27.8	26.4												-26.4	25.0			
-28.2	26.8										601(DH)-9						
		50/0.4									RUN-1						
-32.9	31.5																
											RUN-2						
-37.8	36.4																
											RUN-3						
-42.8	41.4										601(DH)-CS-01						
											RUN-4						
-47.8	46.4										601(DH)-CS-02						
											RUN-5		-48.8	47.4			
-52.8	51.4										601(DH)-CS-03						
											RUN-6						
											601(DH)-CS-04						
-57.8	56.4										RUN-7						
-62.8	61.4										RUN-8						
-67.8	66.4										RUN-9						
											601(DH)-CS-05						
-72.8	71.4										RUN-10						

TURKEY POINT COL BORE TURKEY POINT COL GDI 8/14/08



SHEET 2 OF 6

BECHTEL PROJECT NO.: 25409					MACTEC PROJECT NO.: 6468-07-1950					COUNTY: Miami-Dade			GEOLOGIST: S. Lehman				
SITE DESCRIPTION: Turkey Point COL					DRILL MACHINE: CME-75 (CLT)					DRILLER: T.Warren/J.Warren/Guy/Harvey					GROUND WATER (ft)		
BORING NO.: B-601(DH)					DRILL METHOD: Mud Rotary/ Core					SAMPLE METHODS: SPT/Core					0 HR. NA		
GROUND ELEV.: -1.4 ft (NAVD88)					NORTHING: 396,968 US ft (NAD83/90)					EASTING: 876,643 US ft (NAD83/90)					24 HR. NA		
TOTAL DEPTH: 419.2 ft			BORING DIAMETER: 6" to 25.5', 4" to 419.2'					CASING DEPTH: 6" to 25.5', 4" to 153.3'					HAMMER (ID):140 lb. Auto (MEC-09)				
DATE STARTED: 2/24/08			COMPLETED: 3/25/08			CORE SIZE: PQ3			BITS USED: 3 7/8" & 6" Roller Cone								
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT						SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION			
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100							
-76.2					Continued from previous page												
-77.6	76.2										RUN-11			LIMESTONE, boundstone, white (2.5Y8/1), hard, indurated, fossiliferous, few vugs, few gastropod shell molds and casts (Lower Fort Thompson Formation) (continued)			
-82.6	81.2										RUN-12			81.2ft: very soft to hard, friable to indurated, trace shell molds and casts			
-87.6	86.2										RUN-13						
-92.6	91.2										RUN-14						
-97.6	96.2										601(DH)-CS-06 601(DH)-CS-07			97.5ft: 0.7'-thick friable zone, little shell molds and casts, trace sand			
-102.6	101.2										RUN-15						
-107.6	106.2										601(DH)-CS-08 RUN-16						
-112.6	111.2										RUN-17			111.2ft: soft to moderately hard, friable to moderately indurated, sandy, few shell fragments			
-117.6	116.2										RUN-18						
-122.6	121.2										RUN-19						
-129.7	128.3	9	7	11							601(DH)-10A&B			-116.4 115.0 -123.4 122.0 Silty SAND (SM), gray (5Y5/1), to light gray (5Y7/2), medium dense, wet, strong to weak HCl reaction, and lenses of LIMESTONE, boundstone, white (2.5Y8/1), moderately hard, moderately indurated, sandy, trace shell fragments (Tamiami Formation) 121.2ft. Switch sampling method to SPT Silty SAND (SM), gray (5Y5/1), to light gray (5Y7/2), medium dense, wet, strong to weak HCl reaction, fine to coarse grained sand, fine gravel, little fines			
-139.7	138.3	WOR	3	5							601(DH)-11			128.3ft: greenish gray (10Y6/1), loose, strong HCl reaction, fine to coarse grained sand, little fines			
-149.8	148.4	9	10	16							601(DH)-12			138.3ft: medium dense, weak HCl reaction, trace shells, fine grained sand			
		WOR	WOR	WOR							601(DH)-13						

TURKEY POINT COL BORE TURKEY POINT GP TURKEY POINT COL GDT 8/14/08



SHEET 3 OF 6

BECHTEL PROJECT NO.: 25409					MACTEC PROJECT NO.: 6468-07-1950					COUNTY: Miami-Dade		GEOLOGIST: S. Lehman		
SITE DESCRIPTION: Turkey Point COL					DRILL MACHINE: CME-75 (CLT)					DRILLER: T.Warren/J.Warren/Guy/Harvey			GROUND WATER (ft)	
BORING NO.: B-601(DH)					DRILL METHOD: Mud Rotary/ Core					SAMPLE METHODS: SPT/Core			0 HR. NA	
GROUND ELEV.: -1.4 ft (NAVD88)					NORTHING: 396,968 US ft (NAD83/90)					EASTING: 876,643 US ft (NAD83/90)			24 HR. NA	
TOTAL DEPTH: 419.2 ft			BORING DIAMETER: 6" to 25.5', 4" to 419.2'					CASING DEPTH: 6" to 25.5', 4" to 153.3'			HAMMER (ID):140 lb. Auto (MEC-09)			
DATE STARTED: 2/24/08			COMPLETED: 3/25/08			CORE SIZE: PQ3			BITS USED: 3 7/8" & 6" Roller Cone					
ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT						SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100	MOI	G		
-151.0					Continued from previous page									
-159.8	158.4	3	8	10									148.4ft. greenish gray (10Y5/1), very loose Silty SAND (SM), gray (5Y5/1), to light gray (5Y7/2), medium dense, wet, strong to weak HCl reaction, fine to coarse grained sand, fine gravel, little fines (continued)	
-169.8	168.4	5	7	12									Sandy SILT (ML), greenish gray (10Y5/1), very stiff, wet, medium dense, fine grained sand, strong HCl reaction	
-179.8	178.4	3	8	17									178.4ft: fine to medium grained sand, weak HCl reaction	
-189.8	188.4	WOR	7	11									194.0ft: stiff, fine grained sand	
-199.8	198.4	2	5	10										
-209.8	208.4	2	4	6									SILT with sand (ML), dark greenish gray (10Y4/1), stiff, moist, fine grained sand, weak HCl reaction	
-219.8	218.4	4	11	23									Silty SAND (SM), olive gray (5Y5/2), dense, moist, fine grained sand, strong HCl reaction (Hawthorn Group)	

TURKEY POINT COL BORE - TURKEY POINT COL GDI 8-14-08



BECHTEL PROJECT NO.: 25409				MACTEC PROJECT NO.: 6468-07-1950				COUNTY: Miami-Dade				GEOLOGIST: S. Lehman			
SITE DESCRIPTION: Turkey Point COL				DRILL MACHINE: CME-75 (CLT)				DRILLER: T.Warren/J.Warren/Guy/Harvey				GROUND WATER (ft)			
BORING NO.: B-601(DH)				DRILL METHOD: Mud Rotary/ Core				SAMPLE METHODS: SPT/Core				0 HR. NA			
GROUND ELEV.: -1.4 ft (NAVD88)				NORTHING: 396,968 US ft (NAD83/90)				EASTING: 876,643 US ft (NAD83/90)				24 HR. NA			
TOTAL DEPTH: 419.2 ft				BORING DIAMETER: 6" to 25.5', 4" to 419.2'				CASING DEPTH: 6" to 25.5', 4" to 153.3'				HAMMER (ID): 140 lb. Auto (MEC-09)			
DATE STARTED: 2/24/08				COMPLETED: 3/25/08				CORE SIZE: PQ3				BITS USED: 3 7/8" & 6" Roller Cone			
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	▼ MOI	LOG	SOIL AND ROCK DESCRIPTION		
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100					
-225.8					Continued from previous page										
-229.8	228.4	9	39	50/0.5						601(DH)-21				Silty SAND (SM), olive gray (5Y5/2), dense, moist, fine grained sand, strong HCl reaction (Hawthorn Group) (continued)	
														228.4ft: dark greenish gray (10Y4/1), very dense, moist, friable cemented sand fragments	
-239.8	238.4	4	8	11						601(DH)-22				238.4ft: medium dense, wet	
-249.8	248.4	2	11	18						601(DH)-23				248.4ft: greenish gray (10Y5/1), no HCl reaction, fine grained sand, friable cemented sand fragments	
-259.8	258.4	3	8	13						601(DH)-24				258.4ft: dark greenish gray (10Y4/1), wet	
-269.8	268.4	4	12	20						601(DH)-25				268.4ft: dense	
-279.8	278.4	WOR	7	16						601(DH)-26				278.4ft: medium dense	
-289.8	288.4	4	13	23						601(DH)-27				288.4ft: dense	
-299.8	298.4									601(DH)-28					



SHEET 5 OF 6

BECHTEL PROJECT NO.: 25409					MACTEC PROJECT NO.: 6468-07-1950					COUNTY: Miami-Dade		GEOLOGIST: S. Lehman			
SITE DESCRIPTION: Turkey Point COL					DRILL MACHINE: CME-75 (CLT)					DRILLER: T.Warren/J.Warren/Guy/Harvey				GROUND WATER (ft)	
BORING NO.: B-601(DH)					DRILL METHOD: Mud Rotary/ Core					SAMPLE METHODS: SPT/Core				0 HR. NA	
GROUND ELEV.: -1.4 ft (NAVD88)					NORTHING: 396,968 US ft (NAD83/90)					EASTING: 876,643 US ft (NAD83/90)				24 HR. NA	
TOTAL DEPTH: 419.2 ft			BORING DIAMETER: 6" to 25.5', 4" to 419.2'					CASING DEPTH: 6" to 25.5', 4" to 153.3'				HAMMER (ID):140 lb. Auto (MEC-09)			
DATE STARTED: 2/24/08			COMPLETED: 3/25/08			CORE SIZE: PQ3				BITS USED: 3 7/8" & 6" Roller Cone					
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT						SAMP. NO.	▼ MOI	L O G	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100					
-300.6					Continued from previous page										
		5	20	30										POORLY GRADED SAND with silt (SP-SM), olive gray (5Y4/2), dense, wet, fine to medium grained sand, no HCl reaction (continued)	
-309.8	308.4	6	21	30							601(DH)-29			-306.4 305.0 Silty SAND (SM), greenish gray (10Y5/1), very dense, wet, fine to medium grained sand, no HCl reaction	
-319.8	318.4	20	50/0.4								601(DH)-30			-317.4 316.0 POORLY GRADED SAND (SP-SM), greenish gray (10Y5/1), very dense, wet, fine to medium grained sand, weak HCl reaction	
-329.8	328.4	50/0.3									601(DH)-31				
-339.8	338.4	43	50/0.3								601(DH)-32			338.4ft. no HCl reaction, organic odor	
-349.8	348.4	50/0.4									601(DH)-33			348.4ft: fine grained sand	
-359.8	358.4	50/0.5									601(DH)-34				
-369.8	368.4	50/0.4									601(DH)-35				

TURKEY POINT COL BORE TURKEY POINT COL GDT 8 14 08

BECHTEL PROJECT NO.: 25409			MACTEC PROJECT NO.: 6468-07-1950			COUNTY: Miami-Dade			GEOLOGIST: S. Lehman			
SITE DESCRIPTION: Turkey Point COL			DRILL MACHINE: CME-75 (CLT)			DRILLER: T.Warren/J.Warren/Guy/Harvey			GROUND WATER (ft)			
BORING NO.: B-601(DH)			DRILL METHOD: Mud Rotary/ Core			SAMPLE METHODS: SPT/Core			0 HR. NA			
GROUND ELEV.: -1.4 ft (NAVD88)			NORTHING: 396,968 US ft (NAD83/90)			EASTING: 876,643 US ft (NAD83/90)			24 HR. NA			
TOTAL DEPTH: 419.2 ft			BORING DIAMETER: 6" to 25.5', 4" to 419.2'			CASING DEPTH: 6" to 25.5', 4" to 153.3'			HAMMER (ID):140 lb. Auto (MEC-09)			
DATE STARTED: 2/24/08			COMPLETED: 3/25/08			CORE SIZE: PQ3			BITS USED: 3 7/8" & 6" Roller Cone			
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100	MOI	
-375.4					Continued from previous page							
-379.8	378.4	48	50/0.2							98/0.7	601(DH)-35	-376.4 Silty SAND (SM), greenish gray (10Y5/1), very dense, wet, no HCl reaction, and interlaminated clayey SAND (SC), very dark greenish gray (10Y3/1), wet, weak HCl reaction, fine to medium grained sand 375.0
-389.8	388.4	37	50/0.5							87/1.0	601(DH)-37	
-399.8	398.4	48	50/0.3							98/0.8	601(DH)-38	398.4ft: fine grained sand
-419.8	418.4	28	50/0.3							78/0.8	601(DH)-39	-406.4 POORLY GRADED SAND with silt (SP-SM), greenish gray (10Y5/1), very dense, wet, fine grained sand, weak HCl reaction 405.0
												-420.6 Boring Terminated at Elevation -420.6 ft 419.2

TURKEY POINT COL BORE TURKEY POINT GPJ TURKEY POINT COL GDT 8:14:08



SHEET 1 OF 2

BECHTEL PROJECT NO.: 25409	MACTEC PROJECT NO.: 6468-07-1950	COUNTY: Miami-Dade	GEOLOGIST: S. Lehman
SITE DESCRIPTION: Turkey Point COL	DRILL MACHINE: CME-75 (CLT)	DRILLER: T.Warren/J.Warren/Guy/Harvey	GROUND WATER (ft)
BORING NO.: B-601(DH)	DRILL METHOD: Mud Rotary/ Core	SAMPLE METHODS: SPT/Core	0 HR. NA
GROUND ELEV.: -1.4 ft (NAVD88)	NORTHING: 396,968 US ft (NAD83/90)	EASTING: 876,643 US ft (NAD83/90)	24 HR. NA
TOTAL DEPTH: 419.2 ft	CASING DEPTH: 6" to 25.5', 4" to 153.3'	HAMMER (ID): 140 lb. Auto (MEC-09)	
DATE STARTED: 2/24/08	COMPLETED: 3/25/08	CORE SIZE: PQ3	CORE BARREL TYPE: Triple Tube Wireline (Split inner liners)

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		L O G	DESCRIPTION AND REMARKS
				REC. (ft) %	RQD (ft) %		REC. (ft) %	RQD (ft) %		
										Begin Coring @ 26.8 ft
-28.2	26.8	4.7	1:01/0.7 1:43 2:40 3:11 3:44	(4.2) 89%	(3.2) 68%	RUN-1	(20.1) 98%	(18.0) 87%		LIMESTONE, boundstone, white (2.5Y8/1), medium hard to moderately hard, moderately indurated, fossiliferous, recrystallized calcite, coralline (Upper Fort Thompson Formation) (continued)
-32.9	31.5	4.9	2:12 2:42 1:23 1:17 1:24/0.9	(4.9) 100%	(4.0) 82%	RUN-2				31.5ft: hard, indurated, few vugs and shell molds 33.0ft: loss of circulation
-37.8	36.4	5.0	1:34 1:36 1:27 2:02 3:01	(5.0) 100%	(4.8) 96%	RUN-3				
-42.8	41.4	5.0	4:18 2:46 2:09 2:13 2:14	(5.0) 100%	(5.0) 100%	601(DH)-CS-01 RUN-4 601(DH)-CS-02				41.4ft: white (2.5Y8/1) to light gray (2.5Y7/1) at 46.1 ft
-47.8	46.4	5.0	2:08 2:28 1:49 1:51 1:28	(4.9) 98%	(4.9) 98%	RUN-5	(59.0) 87%	(47.8) 71%	-48.8	46.4ft: light gray (2.5Y7/1) to 47.4 ft LIMESTONE, boundstone, white (2.5Y8/1), hard, indurated, fossiliferous, few vugs, few gastropod shell molds and casts (Lower Fort Thompson Formation)
-52.8	51.4	5.0	1:55 0:31 0:29 0:32 0:35	(5.0) 100%	(5.0) 100%	601(DH)-CS-03 RUN-6 601(DH)-CS-04				51.4ft: moderately hard, moderately indurated
-57.8	56.4	5.0	0:20 0:13 0:22 0:59 0:52	(4.0) 80%	(4.0) 80%	RUN-7				56.4ft: white (2.5Y8/1) and light gray (2.5Y7/1), hard, indurated
-62.8	61.4	5.0	1:01 0:45 0:41 0:35 0:34	(4.2) 84%	(3.2) 64%	RUN-8				61.4ft: white (2.5Y8/1), moderately hard to hard, moderately indurated to indurated
-67.8	66.4	5.0	1:32 0:28 0:27 0:30 0:53	(3.7) 74%	(2.9) 58%	RUN-9 601(DH)-CS-05				
-72.8	71.4	4.8	0:49 0:30 1:26 0:23 1:23/0.8	(2.4) 50%	(0.9) 19%	RUN-10				71.4ft: sandy, trace to few shell fragments
-77.6	76.2	5.0	1:47 1:24 1:03 1:06 0:52	(4.6) 92%	(2.7) 54%	RUN-11				
-82.6	81.2	5.0	0:34 1:22 0:11 0:09 0:33	(3.6) 72%	(2.0) 40%	RUN-12				81.2ft: very soft to hard, friable to indurated, trace shell molds and casts
-87.6	86.2	5.0	1:23 1:11 1:09 1:36 2:01	(5.0) 100%	(4.5) 90%	RUN-13				
-92.6	91.2	5.0	1:17 1:10 0:38 0:41 0:51	(4.9) 98%	(4.9) 98%	601(DH)-CS-06 601(DH)-CS-07 RUN-14				
-97.6	96.2	5.0	0:34 0:18 0:26 1:03 0:58	(4.9) 98%	(4.4) 88%	601(DH)-CS-08 RUN-15				97.5ft: 0.7'-thick friable zone, little shell molds and casts, trace sand
-102.6	101.2									

TURKEY POINT COL CORE TURKEY POINT GPJ TURKEY POINT COL.GDT 8-14-08



SHEET 2 OF 2

BECHTEL PROJECT NO.: 25409	MACTEC PROJECT NO.: 6468-07-1950	COUNTY: Miami-Dade	GEOLOGIST: S. Lehman
SITE DESCRIPTION: Turkey Point COL	DRILL MACHINE: CME-75 (CLT)	DRILLER: T.Warren/J.Warren/Guy/Harvey	GROUND WATER (ft)
BORING NO.: B-601(DH)	DRILL METHOD: Mud Rotary/ Core	SAMPLE METHODS: SPT/Core	0 HR. NA
GROUND ELEV.: -1.4 ft (NAVD88)	NORTHING: 396,968 US ft (NAD83/90)	EASTING: 876,643 US ft (NAD83/90)	24 HR. NA
TOTAL DEPTH: 419.2 ft	CASING DEPTH: 6" to 25.5', 4" to 153.3'	HAMMER (ID): 140 lb. Auto (MEC-09)	
DATE STARTED: 2/24/08	COMPLETED: 3/25/08	CORE SIZE: PQ3	CORE BARREL TYPE: Triple Tube Wireline (Split inner liners)

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		L O G	DESCRIPTION AND REMARKS
				REC (ft) %	RQD (ft) %		REC (ft) %	RQD (ft) %		
										Continued from previous page
-107.6	106.2	5.0	0:59 0:41 0:30 0:31 0:34	(5.0) 100%	(5.0) 100%	RUN-16				LIMESTONE, boundstone, white (2.5Y8/1), hard, indurated, fossiliferous, few vugs, few gastropod shell molds and casts (Lower Fort Thompson Formation) (continued)
-112.6	111.2	5.0	0:34 0:48 0:40 1:22 1:08	(4.8) 96%	(4.4) 88%	RUN-17				
-117.6	116.2	5.0	0:41 0:10 0:33 0:31 0:18	(3.0) 60%	(0.0) 0%	RUN-18				111.2ft: soft to moderately hard, friable to moderately indurated, sandy, few shell fragments
-122.6	121.2	5.0	0:07 0:21 0:07 0:15 0:10	(0.6) 12%	(0.0) 0%	RUN-19	(0.6) 10%	(NA)		Silty SAND (SM), gray (5Y5/1), to light gray (5Y7/2), medium dense, wet, strong to weak HCl reaction, and lenses of LIMESTONE, boundstone, white (2.5Y8/1), moderately hard, moderately indurated, sandy, trace shell fragments (Tamiami Formation)

Coring Terminated at Elevation -122.6

TURKEY POINT COL CORE TURKEY POINT GPI TURKEY POINT COL GDT 8/14/08



B-601 (DH) - Box 1



B-601 (DH) - Box 2

B-601 (DH) - Box 3



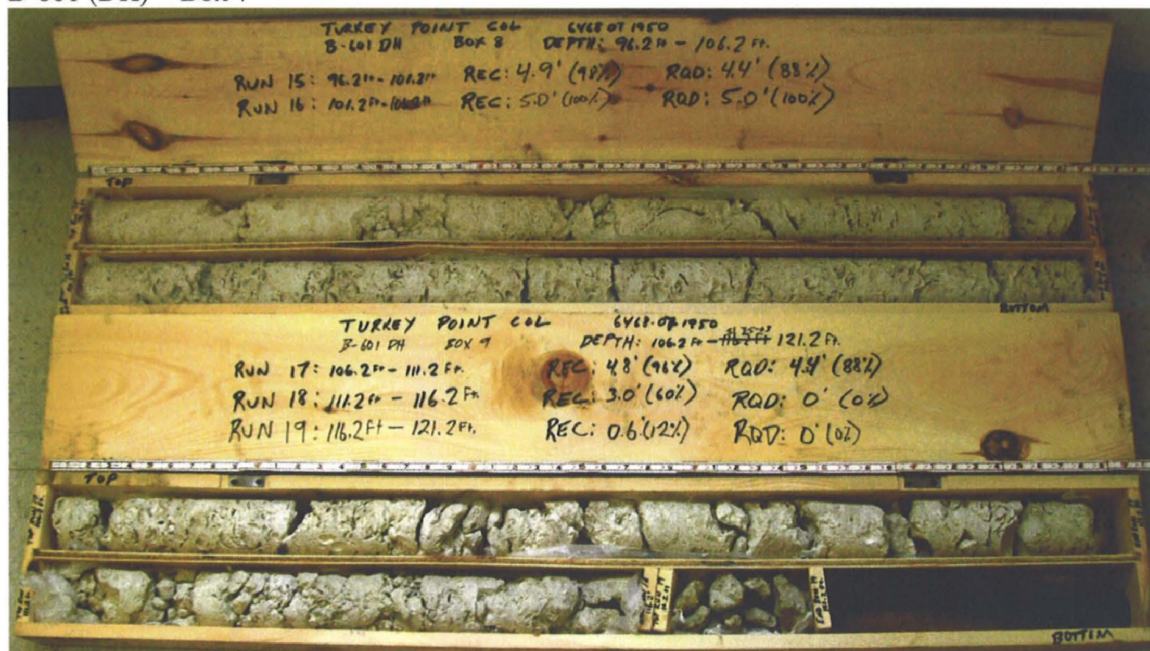
B-601 (DH) - Box 4

B-601 (DH) - Box 5



B-601 (DH) – Box 6

B-601 (DH) – Box 7



B-601 (DH) – Box 8

B-601 (DH) – Box 9



GEOTECHNICAL BORING LOG

Prepared By 7/10/08 Date 7-10-08Checked By 7/10/08 Date 7-10-08

SHEET 1 OF 3

BECHTEL PROJECT NO.: 25409				MACTEC PROJECT NO.: 6468-07-1950				COUNTY: Miami-Dade				GEOLOGIST: O. Rodriguez				
SITE DESCRIPTION: Turkey Point COL				DRILL MACHINE: CME-45C (RAL)				DRILLER: D. Rhodes/ K. Guy				GROUND WATER (ft)				
BORING NO.: B-602				DRILL METHOD: Mud Rotary/ Core				SAMPLE METHODS: SPT/Core				0 HR. NA				
GROUND ELEV.: -1.4 ft (NAVD88)				NORTHING: 397,020 US ft (NAD83/90)				EASTING: 876,594 US ft (NAD83/90)				24 HR. NA				
TOTAL DEPTH: 204.1 ft				BORING DIAMETER: 4" to 14.0', 3" to 204.1'				CASING DEPTH: 4" to 14.0', 3" to 119.0'				HAMMER (ID): 140 lb. Auto (MEC-12)				
DATE STARTED: 3/10/08				COMPLETED: 3/18/08				CORE SIZE: HQ3				BITS USED: 2 15/16" Roller Cone				
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT						SAMP. NO.	▼ MOI	L O G	SOIL AND ROCK DESCRIPTION		
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100						
-1.4					Ground Surface											
-1.4	0.0	WOH	WOH	WOH	●0						602-1			-1.4	0.0	MUCK, dark gray (5YR4/1), very soft, wet, roots, mostly organic
-3.9	2.5	3	3	11	WOH						602-2A&B			-4.5	3.1	2.5ft: firm
-6.2	4.8	7	5	6	●14						602-3					LIMESTONE, boundstone, white (2.5Y8/1), very soft, wet, trace to few fine grained sand, oolitic (Miami Formation)
-8.7	7.3	50/0.2			●11						602-4					7.3ft: no recovery, hard
-11.3	9.9	3	4	8						50/0.2	602-5					9.9ft: white (2.5Y8/1), to light gray (10Y6/1), very soft
-13.7	12.3	9	10	13	●12						602-6					14.8ft: hard
-16.2	14.8	13	17	50/0.4	●23						602-7					16.3ft: Switch sampling method to coring
-17.7	16.3									67/0.9	RUN-1					16.3ft: medium hard, moderately indurated, fossiliferous, few fine grained sand and clay, oolitic, locally interconnected vugs
-22.5	21.1										RUN-2					
-27.5	26.1										RUN-3			-25.4	24.0	LIMESTONE, boundstone, white (2.5Y8/1), medium hard, moderately indurated to indurated, fossiliferous, coralline, few to little vugs (Upper Fort Thompson Formation)
-32.5	31.1										RUN-4					26.1ft: medium hard to hard, indurated
-37.5	36.1										RUN-5					27.0ft: loss of circulation
-39.8	38.4										RUN-6					36.1ft: indurated to extremely indurated
-42.5	41.1										RUN-7					38.4ft: indurated
-47.5	46.1										RUN-8					
-49.5	48.1										RUN-9			-49.5	48.1	46.1ft: light greenish gray (10Y7/1) to light gray (7/N)
-52.5	51.1										RUN-10					LIMESTONE, boundstone, white (2.5Y8/1) hard, indurated, fossiliferous, trace vugs (Lower Fort Thompson Formation)
-57.5	56.1										602-CS-01					
-62.5	61.1										602-CS-02					
-67.5	66.1										RUN-11					
-72.5	71.1										RUN-12					61.1ft: few vugs
											RUN-13					66.1ft: little vugs
											RUN-14					71.1ft: few vugs

TURKEY POINT COL BORE TURKEY POINT COL.GDT 7/10/08



SHEET 2 OF 3

BECHTEL PROJECT NO.: 25409		MACTEC PROJECT NO.: 6468-07-1950		COUNTY: Miami-Dade		GEOLOGIST: O. Rodriguez							
SITE DESCRIPTION: Turkey Point COL		DRILL MACHINE: CME-45C (RAL)		DRILLER: D. Rhodes/ K. Guy		GROUND WATER (ft)							
BORING NO.: B-602		DRILL METHOD: Mud Rotary/ Core		SAMPLE METHODS: SPT/Core		0 HR. NA							
GROUND ELEV.: -1.4 ft (NAVD88)		NORTHING: 397,020 US ft (NAD83/90)		EASTING: 876,594 US ft (NAD83/90)		24 HR. NA							
TOTAL DEPTH: 204.1 ft		BORING DIAMETER: 4" to 14.0', 3" to 204.1'		CASING DEPTH: 4" to 14.0', 3" to 119.0'		HAMMER (ID): 140 lb. Auto (MEC-12)							
DATE STARTED: 3/10/08		COMPLETED: 3/18/08		CORE SIZE: HQ3		BITS USED: 2 15/16" Roller Cone							
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT						SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			
-76.2					Continued from previous page								
-77.5	76.1										RUN-15		LIMESTONE, boundstone, white (2.5Y8/1) hard, indurated, fossiliferous, trace vugs (Lower Fort Thompson Formation) (continued)
-80.8	79.4										RUN-16		79.4ft: trace vugs
-82.5	81.1										602-CS-03 RUN-17		81.1ft: few vugs
-87.5	86.1										RUN-18		
-92.5	91.1										RUN-19		91.1ft: moderately indurated, little vugs
-97.5	96.1										RUN-20		96.1: few vugs
-102.5	101.1										RUN-21		
-107.5	106.1										RUN-22		
-112.5	111.1										RUN-23		111.1ft: moderately hard, little vugs, few cemented sand fragments
-117.5	116.1	11	13	25							602-8		POORLY GRADED SAND (SP), white (2.5Y8/1), wet, dense, trace coarse grained sand (Tamiami Formation) 116.1ft: Switch sampling method to SPT
-124.0	122.6	8	4	2							602-9		Silty SAND (SM), white (5Y8/1), loose, wet, fine to coarse grained sand, fine gravel, strong HCl reaction, trace fine grained friable cemented sand olive gray (5Y5/2), loose
-134.0	132.6	6	3	5							602-10		
-143.9	142.5	6	5	5							602-11		

TURKEY POINT COL BORE TURKEY POINT GPJ TURKEY POINT COL.GDT 7/10/08



SHEET 3 OF 3

BECHTEL PROJECT NO.: 25409			MACTEC PROJECT NO.: 6468-07-1950			COUNTY: Miami-Dade			GEOLOGIST: O. Rodriguez				
SITE DESCRIPTION: Turkey Point COL			DRILL MACHINE: CME-45C (RAL)			DRILLER: D. Rhodes/ K. Guy			GROUND WATER (ft)				
BORING NO.: B-602			DRILL METHOD: Mud Rotary/ Core			SAMPLE METHODS: SPT/Core			0 HR. NA				
GROUND ELEV.: -1.4 ft (NAVD88)			NORTHING: 397,020 US ft (NAD83/90)			EASTING: 876,594 US ft (NAD83/90)			24 HR. NA				
TOTAL DEPTH: 204.1 ft			BORING DIAMETER: 4" to 14.0', 3" to 204.1'			CASING DEPTH: 4" to 14.0', 3" to 119.0'			HAMMER (ID): 140 lb. Auto (MEC-12)				
DATE STARTED: 3/10/08			COMPLETED: 3/18/08			CORE SIZE: HQ3			BITS USED: 2 15/16" Roller Cone				
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100	MOI		
-151.0					Continued from previous page								
-154.0	152.6	11	11	19						602-12			Silty SAND (SM), white (5Y8/1), loose, wet, fine to coarse grained sand, fine gravel, strong HCl reaction, trace fine grained friable cemented sand (continued) 152.6ft: medium dense, trace limestone fragments
-164.0	162.6	3	4	11						602-13			Sandy SILT (ML), olive gray (5Y5/2), stiff, moist, trace shell fragments, fine to medium grained sand, strong HCl reaction
-174.0	172.6	2	3	10						602-14			
-184.0	182.6	2	3	6						602-15			182.6ft: firm
-194.0	192.6	2	2	17						602-16			very stiff, wet, fine grained sand
-204.0	202.6	2	4	10						602-17			
													Boring Terminated at Elevation -205.5 ft

TURKEY POINT COL BORE TURKEY POINT COL.GDT 7/10/08



SHEET 1 OF 2

BECHTEL PROJECT NO.: 25409				MACTEC PROJECT NO.: 6468-07-1950				COUNTY: Miami-Dade		GEOLOGIST: O. Rodriguez			
SITE DESCRIPTION: Turkey Point COL				DRILL MACHINE: CME-45C (RAL)				DRILLER: D. Rhodes/ K. Guy			GROUND WATER (ft)		
BORING NO.: B-602				DRILL METHOD: Mud Rotary/ Core				SAMPLE METHODS: SPT/Core			0 HR. NA		
GROUND ELEV.: -1.4 ft (NAVD88)				NORTHING: 397,020 US ft (NAD83/90)				EASTING: 876,594 US ft (NAD83/90)			24 HR. NA		
TOTAL DEPTH: 204.1 ft				CASING DEPTH: 4" to 14.0', 3" to 119.0'						HAMMER (ID): 140 lb. Auto (MEC-12)			
DATE STARTED: 3/10/08		COMPLETED: 3/18/08		CORE SIZE: HQ3		CORE BARREL TYPE: Triple Tube Wireline (Split inner liners)							
ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC (ft) %RQD (ft) %		SAMP. NO.	STRATA REC (ft) %RQD (ft) %		L O G	DESCRIPTION AND REMARKS			
										Begin Coring @ 16.3 ft			
-17.7	16.3	4.8	5:35 1:23 0:43 0:23 0:15/0.8	(1.6) 33%	(0.5) 10%	RUN-1	(1.6) 21%	(0.5) 6%		LIMESTONE, boundstone, white (2.5Y8/1), very soft, wet, trace to few fine grained sand, oolitic (Miami Formation) (continued) 16.3ft: medium hard, moderately indurated, fossiliferous, few fine grained sand and clay, oolitic, locally interconnected vugs			
-22.5	21.1	5.0	1:06 0:35 0:45 1:22 2:34	(1.2) 24%	(0.6) 12%	RUN-2				24.0			
-27.5	26.1	5.0	2:20 1:32 1:12 0:57 0:57	(3.1) 62%	(1.3) 26%	RUN-3	(17.4) 75%	(10.0) 43%		LIMESTONE, boundstone, white (2.5Y8/1), medium hard, moderately indurated to indurated, fossiliferous, coralline, few to little vugs (Upper Fort Thompson Formation) 26.1ft: medium hard to hard, indurated 27.0ft: loss of circulation			
-32.5	31.1	5.0	1:21 1:14 0:55 1:22 1:27	(3.3) 66%	(2.0) 40%	RUN-4							
-37.5	36.1	2.3	1:16 6:04	(1.4) 61%	(0.0) 0%	RUN-5				36.1ft: indurated to extremely indurated			
-39.8	38.4	2.7	6:43/0.3 0:33/0.7 2:10 2:08	(2.1) 78%	(1.2) 44%	RUN-6				38.4ft: indurated			
-42.5	41.1	5.0	2:04 2:03 0:39 1:44 2:10	(4.2) 84%	(4.0) 80%	RUN-7							
-47.5	46.1	2.0	1:53 5:10	(2.0) 100%	(0.9) 45%	RUN-8				46.1ft: light greenish gray (10Y7/1) to light gray (7/N)			
-49.5	48.1	3.0	1:25 1:36 1:40	(3.0) 100%	(3.0) 100%	RUN-9	(37.0) 57%	(20.9) 32%		48.1			
-52.5	51.1	5.0	4:41 1:42 1:27 0:43 0:37	(4.9) 98%	(3.9) 78%	RUN-10 602-CS-01 602-CS-02							
-57.5	56.1	5.0	2:03 4:08 0:45 0:42 0:53	(3.4) 68%	(1.0) 20%	RUN-11							
-62.5	61.1	5.0	1:10 0:55 0:27 0:33 0:26	(1.3) 26%	(0.0) 0%	RUN-12				61.1ft: few vugs			
-67.5	66.1	5.0	0:40 0:17 0:34 1:08 0:41	(1.0) 20%	(0.0) 0%	RUN-13				66.1ft: little vugs			
-72.5	71.1	5.0	1:24 1:26 0:53 0:45 2:08	(1.5) 30%	(0.8) 16%	RUN-14				71.1ft: few vugs			
-77.5	76.1	3.3	2:03 1:19 1:24	(3.1) 94%	(2.4) 73%	RUN-15							
-80.8	79.4	1.7	3:02/0.3 1:28/0.7 1:29	(1.7) 100%	(1.7) 100%	RUN-16 602-CS-03				79.4ft: trace vugs			
-82.5	81.1	5.0	2:02 0:50 0:20 0:17 0:06	(1.7) 34%	(0.5) 10%	RUN-17				81.1ft: few vugs			
-87.5	86.1	5.0	1:06 1:19 0:42 0:40	(1.6) 32%	(0.4) 8%	RUN-18							
-92.5	91.1												

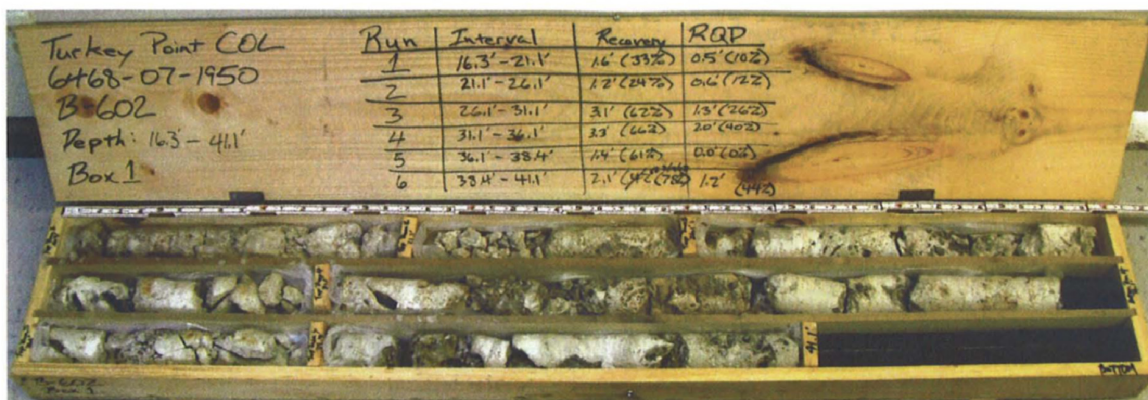
TURKEY POINT COL CORE TURKEY POINT GP TURKEY POINT COL GDI 7/10/08



SHEET 2 OF 2

BECHTEL PROJECT NO.: 25409				MACTEC PROJECT NO.: 6468-07-1950				COUNTY: Miami-Dade		GEOLOGIST: O. Rodriguez			
SITE DESCRIPTION: Turkey Point COL				DRILL MACHINE: CME-45C (RAL)				DRILLER: D. Rhodes/ K. Guy				GROUND WATER (ft)	
BORING NO.: B-602				DRILL METHOD: Mud Rotary/ Core				SAMPLE METHODS: SPT/Core				0 HR. NA	
GROUND ELEV.: -1.4 ft (NAVD88)				NORTHING: 397,020 US ft (NAD83/90)				EASTING: 876,594 US ft (NAD83/90)				24 HR. NA	
TOTAL DEPTH: 204.1 ft				CASING DEPTH: 4" to 14.0', 3" to 119.0'						HAMMER (ID): 140 lb. Auto (MEC-12)			
DATE STARTED: 3/10/08		COMPLETED: 3/18/08		CORE SIZE: HQ3		CORE BARREL TYPE: Triple Tube Wireline (Split inner liners)							
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC (ft) %		RQD (ft) %	SAMP. NO.	STRATA REC (ft) %		RQD (ft) %	L O G	DESCRIPTION AND REMARKS	
Continued from previous page													
-97.5	96.1	5.0	0.34 0.59 1:17 1:38 1:42 1.08	(1.2) 24%	(0.0) 0%	RUN-19							91.1ft: moderately indurated, little vugs LIMESTONE, boundstone, white (2.5Y8/1) hard, indurated, fossiliferous, trace vugs (Lower Fort Thompson Formation) (continued)
-102.5	101.1	5.0	0.32 0.34 0.34 0.54 0.54	(4.2) 84%	(1.7) 34%	RUN-20							96.1: few vugs
-107.5	106.1	5.0	0.44 0.34 0.41 0.40 0.43	(4.9) 98%	(4.7) 94%	RUN-21							
-112.5	111.1	5.0	0.45 0.35 0.56 0.24 0.46	(2.6) 52%	(0.4) 8%	RUN-22							
-117.5	116.1	5.0	0.21 0.38 1:13 0:50 0:36	(0.9) 18%	(0.4) 8%	RUN-23	(0.0) 0%	(NA)				-114.4	111.1ft: moderately hard, little vugs, few cemented sand fragments POORLY GRADED SAND (SP), white (2.5Y8/1), wet, dense, trace coarse grained sand (Tamiami Formation)
Coring Terminated at Elevation -117.5													

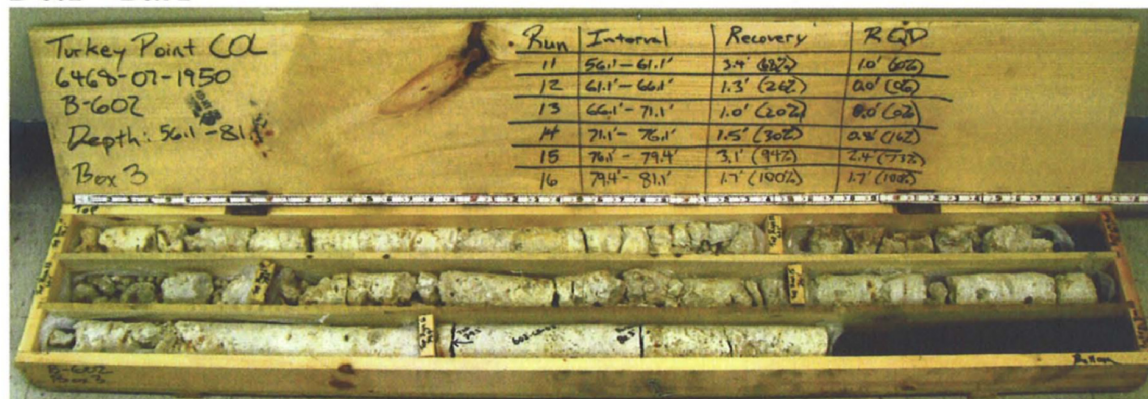
TURKEY POINT COL CORE TURKEY POINT GPJ TURKEY POINT COL GDT 7/10/08



B-602 - Box 1



B-602 - Box 2



B-602 - Box 3



B-602 - Box 4



B-602 - Box 5