

APPENDIX 2AA

LEE NUCLEAR STATION FIELD EXPLORATION DATA

WLS COL 2.5-1 This Appendix contains geotechnical boring logs, test pit logs, SPT energy measurements, and Packer Test results that are the basis for discussion in relevant sections of 2.5. The logs and tests represent a record of subsurface conditions at the William States Lee III Nuclear Station site. Attachment 1 contains geotechnical boring logs (124 borings in total) and monitoring well construction logs (24 in total) resulting from the COL investigation as well as a key to symbols and descriptions. Attachment 2 contains the results of SPT energy measurement testing performed on the Lee Nuclear Station site. Attachment 3 contains test pit logs resulting from the COL investigation, 14 logs in total. Attachment 4 contains Packer Test results from four locations on the Lee site. Attachment 5 contains the Cone Penetrometer Test, Seismic Cone Penetrometer Test, and Pore Pressure Dissipation Test results performed on the Lee Nuclear Station site.
















APPENDIX 2AA
ATTACHMENT 1 – LEE NUCLEAR STATION GEOTECHNICAL
BORING LOGS AND GROUNDWATER MONITORING WELL
CONSTRUCTION LOGS





WLS COL 2.5-1 This Attachment contains geotechnical boring logs resulting from the COL investigation, a list of the included borings, and keys to the symbols and descriptions used in the soil and rock boring logs. 124 borings are represented within this attachment. Monitoring well construction logs are also included in this attachment, separate from the geotechnical monitoring well logs.

Lee Nuclear Station Boring Logs Included in Appendix 2AA, Attachment 1

WLS COL 2.5-1

Geotechnical Boring Logs				Construction Logs
B-1000	B-1029	B-1060	MW-1200	MW-1200
B-1000-UD	B-1030	B-1061	MW-1200A	MW-1201
B-1000-UDA	B-1031	B-1062	MW-1201	MW-1201A
B-1000-UDB	B-1031-UD	B-1063	MW-1202	MW-1202
B-1001	B-1031-UDA	B-1064	MW-1202A	MW-1203
B-1001A	B-1032	B-1065	MW-1203	MW-1204
B-1002	B-1033	B-1066	MW-1204	MW-1204A
B-1003	B-1033-UD	B-1067	MW-1204A	MW-1205
B-1004	B-1034	B-1068	MW-1205	MW-1206
B-1004A	B-1035	B-1068-UD	MW-1206	MW-1206A
B-1005	B-1036	B-1069	MW-1207	MW-1207
B-1006	B-1037	B-1070	MW-1207A	MW-1207A
B-1006A	B-1037A	B-1070-UD	MW-1208	MW-1208
B-1007	B-1037-UD	B-1071	MW-1209	MW-1209
B-1008	B-1038	B-1072	MW-1210	MW-1209A
B-1009	B-1044	B-1073	MW-1210A	MW-1210
B-1009A	B-1045	B-1074	MW-1211	MW-1210A
B-1010	B-1045-UD	B-1074A	MW-1212	MW-1211
B-1011	B-1046	B-1075	MW-1212A	MW-1212
B-1012	B-1046-UD	B-1075A	MW-1213	
B-1013	B-1047		MW-1214	MW-1214
B-1014	B-1047-UD		MW-1214A	MW-1215
B-1015	B-1048		MW-1215	MW-1216
B-1016	B-1048-UD		MW-1216	MW-1217
B-1017	B-1049		MW-1217	MW-1218
B-1018	B-1050		MW-1218	
B-1019	B-1051			
B-1020	B-1052			
B-1021	B-1053			
B-1022	B-1053A			
B-1023	B-1053B			
B-1024	B-1053C			
B-1025	B-1053-UD			
B-1025-UD	B-1054			
B-1026	B-1055			
B-1026-UD	B-1056			
B-1027	B-1057			
B-1028	B-1058			
B-1028-UD	B-1059			

MAJOR DIVISIONS			GROUP SYMBOLS		TYPICAL NAMES																						
COARSE GRAINED SOILS (More than 50% of material is LARGER than No. 200 sieve size)	GRAVELS (More than 50% of coarse fraction is LARGER than the No. 4 sieve size)	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 or grave - sand mixtures, little or no fines.																						
				GM	Silty gravels, gravel - sand - silt mixtures.																						
				GC	Clayey gravels, gravel - sand - clay mixtures.																						
	SANDS (More than 50% of coarse fraction is SMALLER than the No. 4 Sieve Size)	CLEAN SANDS (Little or no fines)		SW	Well graded sands, gravelly sands, little or no fines.																						
		SANDS WITH FINES (Appreciable amount of fines)		SP	Poorly graded sands or gravelly sands, little or no fines.																						
				SM	Silty sands, sand - silt mixtures																						
				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 of clayey fine sands or clayey silts and 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 sandy or silty soils, elastic silts.																							
			CH	Inorganic clays of high plasticity, fat clays																							
			OH	Organic clays of medium to high plasticity, organic silts.																							
HIGHLY ORGANIC SOILS			PT	Peat and other highly organic soils.																							
BOUNDARY CLASSIFICATIONS: Soils possessing characteristics of two groups are designated by combinations of group symbols.																											
<table><tr><td rowspan="2">SILT OR CLAY</td><td colspan="3">SAND</td><td colspan="2">GRAVEL</td><td rowspan="2">Cobbles</td><td rowspan="2">Boulders</td></tr><tr><td>Fine</td><td>Medium</td><td>Coarse</td><td>Fine</td><td>Coarse</td></tr><tr><td></td><td>No.200</td><td>No.40</td><td>No.10</td><td>No.4</td><td>3/4"</td><td>3"</td><td>12"</td></tr></table> <p>U.S. STANDARD SIEVE SIZE</p>							SILT OR CLAY	SAND			GRAVEL		Cobbles	Boulders	Fine	Medium	Coarse	Fine	Coarse		No.200	No.40	No.10	No.4	3/4"	3"	12"
SILT OR CLAY	SAND			GRAVEL		Cobbles		Boulders																			
	Fine	Medium	Coarse	Fine	Coarse																						
	No.200	No.40	No.10	No.4	3/4"	3"	12"																				
References: ASTM D 2487-00, Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Soil Classification System) ASTM D 2488-00, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)																											

SAMPLE TYPE	GROUP SYMBOLS		TYPICAL NAMES	
		SPT	Split Spoon Sample	
		CME	Continuous Soil Sample	
		UD	Undisturbed Sample	
ABBREVIATIONS				
SAA - Same As Above NA - Not Applicable ND - Not Determined WOH - Weight Of Hammer				
Correlation of Penetration Resistance with Relative Density and Consistency				
SAND & GRAVEL		SILT & CLAY		
No. of Blows	Relative Density	No. of Blows	Consistency	
< 4	Very Loose	< 2	Very Soft	
4 - 10	Loose	2 - 4	Soft	
10 - 30	Medium Dense	4 - 8	Medium Stiff	
30 - 50	Dense	8 - 15	Stiff	
> 50	Very Dense	15 - 30	Very Stiff	
		> 30	Hard	
Datum Reference Information		Horizontal - SC State Plane NAD 83 Elevation - NAVD 88		
KEY TO SYMBOLS AND DESCRIPTIONS FOR SOIL LOGS				
 William States Lee III Nuclear Station				

- 1) Note A - Water Level Data. The ground water level posted on the first page of each boring log represents the last reading taken either during drilling or directly following completion of drilling activities.
- 2) Suffix- Certain borings designations end in with a -A, -B, -C, -UD
 - A, B, C, offset hole due to obstruction or abandonment at original location, each subsequent offset is given a new suffix, ascending in alphabetical order
 - UD, Boring to obtain undisturbed samples
 - A, angle boring (B-1001A, B-1004A)
- 3) Color descriptors in Lithology Section - Color code for soil and rock (e.g. 5YR 5/8) is based on Munsell Soil Color Chart (1994) designations

GENERAL NOTES FOR SOIL AND ROCK LOGS

References: Brown, E. T. (1981) Rock characterization testing and monitoring ISRM suggested methods
 Hoek, E. and Brown, E. T. (1997) Practical estimates of rock mass strength
 ASTM 6032-02, Standard Test Method for Determining Rock Quality Designation (RQD) of Rock Core

WEATHERING (abbreviation)

FRESH (F) - No visible sign of rock material weathering; perhaps slight discoloration on major discontinuity surfaces.
 SLIGHTLY WEATHERED (SW) - Rock mass is generally fresh with slight discoloration in rock fabric. Discontinuities are stained and may contain clay. Decomposition extends up to 1" into rock.
 MODERATELY WEATHERED (MW) - Less than 50% of rock is decomposed. Significant portion of rock shows discoloration and weathering effects.
 HIGHLY WEATHERED (HW) - Rock mass is more than 50% decomposed. Rock can be broken by hand or scraped with knife or pick.
 COMPLETELY WEATHERED (CW) - Rock mass is completely decomposed but rock fabric and structure may still be evident. Specimen is easily crumbled or penetrated with knife or pick.







Modified from Brown (1981)

ROCK STRENGTH (abbreviation)

EXTREMELY WEAK (R0) - Can be indented with difficulty by thumbnail. May be friable or moldable with finger pressure.
 VERY WEAK (R1) - Crumbles under firm blows with point of hammer. Can be peeled by a knife.
 WEAK (R2) - Can be peeled or scraped by a knife with difficulty. Cannot be scratched by fingernail. Shallow indentation made by firm blow of hammer.
 MEDIUM STRONG (R3) - Cannot be scraped or picked with a knife.
 STRONG (R4) - More than one blow of geologic hammer required to fracture specimen.
 VERY STRONG (R5) - Specimen requires many hard blows of hammer to fracture or chip.

Modified from Brown (1981), Hoek (1997)

ROCK SYMBOLS AND NAMES

ROCK		META-DIORITE		AMPHIBOLITE
		META-GRANODIORITE		QUARTZITE
		META-QUARTZ DIORITE		
		SCHIST		

DEFINITIONS

RQD = The sum of the length of intact and sound rock pieces over 100 mm in length divided by the total length of the core run, multiplied by 100%
 (ASTM D 6032-02)



Datum Reference
Information

Horizontal - SC State Plane NAD 83
 Elevation - NAVD 88

KEY TO SYMBOLS AND DESCRIPTIONS FOR ROCK LOGS



William States Lee III Nuclear Station

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1000	
Type and Diameter of Boring Hollow stem auger / HQ core / 6 inch		Boring Location Unit 1 N 1166072 E 1846189		Total Depth 151 feet	
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X		Elevation and Datum 581.5 feet MSL		Ground Water Depth 29 feet	
Sampling Method SPT		Sample Driving Hammer/Drop 140 lbs / 30 inches		No. of Samples 12	
		Borehole Inclination -90		Logged by R. Ortiz	
				Date Started 3/30/06	
				Date Completed 4/1/06	



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT sandy (ML), strong brown (7.5YR 5/6), medium stiff, dry ~15% sand, some road base crushed stone gravel in upper part, asphalt pieces within sample. FILL	Begin day 3/30/06	581
1												580
2												579
3												578
4		SPT 1	6 4 3	7 18								577
5												576
6												575
7												574
8												573
9		SPT 2	2 2 2	12 18						SAA, soft, dry, 15-20% fine sand, minor gravel. FILL		572
10												571
11												570
12												569
13												568
14		SPT 3	2 5 5	18 18						SILT sandy, gravelly (ML), strong brown (7.5YR 5/8), dry, stiff, ~20% sand mixed in road gravel FILL		567
15												566
16												565
17												564
18											Hard rocky drilling believed to be in shot rock	563
19		SPT 4	36 40 18	14 18					SM	SAND silty, gravelly (SM), light gray (2.5Y 7/2), dry, very dense, some lithic and quartzite fragments within sample, RESIDUUM		562
20												561
21												560
22												559
23												558
24		SPT 5	7 8 8	14 18					SM	SAND silty (SM), light brownish gray (2.5Y 6/2) to greenish gray (10Y 5/1), damp, medium dense. SAPROLITE		557
25												556
26												555
27												554
28												553
29		SPT 6	9 12 10	18 18					∇	SAA, light gray (2.5Y 7/2), 41 % fines, 12% gravel, SAPROLITE	Classification based on B-1000 UDA UD-2 at 28 to 29.2 ft	552
30												551
31												550
32												549
33												548
34		SPT 7	5 11 17	18 18						SAA, strong brown (7.5YR 4/6), damp, medium dense, relict veins some root casts; SAPROLITE		547
35												546
36												545
37												544
38												543
39		SPT 8	4 12 17	18 18						SAA, light olive brown (2.5Y 5/4) to olive yellow (2.5Y 6/8), damp, medium dense SAPROLITE		542
40												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389



SOIL LOG - Boring No. B-1000

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40												541
41												540
42												539
43												538
44	SPT 9	15 37	50/2	16 13.5					SM	SAND silty, clayey (SM), brown (10YR 4/3), damp to moist, SAPROLITE		537
45									SM	SAND silty (SM) yellow (10YR 7/8), PARTIALLY WEATHERED ROCK		536
46												535
47											Hard drilling	534
48												533
49	SPT 10	50/5	5	5						SAND silty; light olive brown (2.5Y 5/6), damp, hard, >12% silts and clays. PARTIALLY WEATHERED ROCK		532
50												531
51												530
52												529
53												528
54	SPT 11	50/1	2	1						SAA, brownish yellow (10YR 6/8) PARTIALLY WEATHERED ROCK		527
55												526
56												525
57												524
58											At 60 ft, end of hollow stem auger, begin rock coring. Refer to rock log for continuation of boring log	523
59	SPT 12	40 50/5	11 11							SAA; light olive brown (2.5Y 5/6 to 2.5Y 5/4) PARTIALLY WEATHERED ROCK		522
60												521
61												520
62												519
63												518
64												517
65												516
66												515
67												514
68												513
69												512
70												511
71												510
72												509
73												508
74												507
75												506
76												505
77												504
78												503
79												502
80												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. B-1000	
Type and Diameter of Boring Hollow stem auger / HQ core / 6 inch		Boring Location Unit 1 N 1166072 E 1846189		Total Depth 151 feet	
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X		Elevation and Datum 581.5 feet MSL	Ground Water Depth 29 feet	Depth to Bedrock 63.5 feet	
Casing Size and Depth 4 inch / 60 feet		Length of Core Barrel and Bit 13 feet / 13 feet	No. of Core Boxes 6	Date Started 3/30/06	
		Borehole Inclination -90	Logged by R. Ortiz	Date Completed 4/1/06	

Reviewed by / Date F. Syms 5/24/06

Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
60								No recovery; PARTIALLY WEATHERED ROCK	End of day 3/30/06 Begin day 3/31/06, begin HQ core	521
61		13	0.0 3.5	0	CW	R0				520
62										519
63										518
64								META-DIORITE, dark olive gray (5Y 3/2), fine grained, numerous oxidized veins, dissolution features along veins.		517
65										516
66		14	3.8 5.0	20	MW to HW	R2 to R3		META-QUARTZ DIORITE, pale brown (10YR 6/3), fine to medium grained, numerous with veins of altered material and high amounts of iron oxide along dissolution features.		515
67										514
68										513
69								META-DIORITE; massive, manganese and pyrite mineralization along majority of fracture planes		512
70										511
71		15	3.3 5.0	0	MW to HW	R2				510
72										509
73										508
74								SAA		507
75										506
76		16	1.5 5.0	0	HW	R1 to R2				505
77										504
78										503
79										502
80								META-DIORITE yellowish brown (10YR 5/6), plagioclase phenocrysts throughout, foliation (~50°) expressed as re-mineralized veins (manganese oxide) and alignment of plagioclase crystals.		501
81		17	5.0 5.0	60	MW	R0 to R1				500
82										499
83										498
84										497
85										496
86		18	4.8 5.0	36	MW	R0 to R2				495
87										494
88										493
89							R1 to R2			492
90										491
91		19	5.0 5.0	34	MW	R2		SAA; yellowish brown (10YR 5/6), massive, fine grained, manganese oxide, iron oxide mineralization along majority of joint surfaces At 90.5 ft quartz diorite-granodiorite xenolith is partially exposed with epidote mineralization		490
92										489
93										488
94								SAA; apparent foliation between 45 to 80°, Partially Weathered Rock.		487
95										486
96		20	5.0 5.0	40	MW	R2 to R3				485
97										484
98										483
99										482
100										

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389



ROCK LOG - Boring No. B-1000



Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
100		21	$\frac{3.3}{4.0}$	20	MW	R2 to R3		META-DIORITE, dark olive brown with oxidized zones of yellowish brown (10YR 5/6), plagioclase phenocrysts throughout, foliation (~50°) expressed as re-mineralized veins (manganese oxide) and alignment of plagioclase crystals.		481
101										480
102										479
103		22	$\frac{1.0}{1.0}$	11	MW	R2 to R3				478
104										477
105					HW	R2 to R3				476
106		23	$\frac{5.0}{5.0}$	88	MW	R3				475
107					SW	R4				474
108										473
109										472
110		24	$\frac{5.0}{5.0}$	44	SW	R3 to R4		Joints and healed joints are apparent foliation joints that have similar orientation and dips (40 to 70°). Calcite, and epidote (minor) mineralization along joint surfaces and within healed joints, some pitting of infilled minerals along joint surface.		471
111										470
112										469
113										468
114										467
115		25	$\frac{5.0}{5.0}$	78	F to MW	R3 to R4		SAA; bluish black (10B 2.5/1), massive, fine to very fine grained, calcite mineralization along wavy healed veins (probable foliation) CONTINUOUS ROCK	End of day 3/31/06 Begin day 4/1/06; water level at 29 ft prior to start of drilling	467
116										466
117										465
118										464
119										463
120		26	$\frac{5.0}{5.0}$	100	SW to F	R3 to R4		SAA; fine grained with plagioclase phenocrysts, plagioclase crystals appear to be elongated along a foliation oriented approximately with the calcite healed joints and veins.		462
121										461
122										460
123										459
124								SAA; very fine grained plagioclase phenocrysts.		458
125										457
126		27	$\frac{5.0}{5.0}$	100	SW to F	R4				456
127										455
128										454
129										453
130		28	$\frac{5.0}{5.0}$	100	SW to F	R4		SAA; fine grained, weakly foliated, fewer plagioclase phenocrysts than above, foliation joints are primarily healed with calcite with minor quartz and plagioclase (altered) mineralization.		452
131										451
132										450
133										449
134										448
135										447
136		29	$\frac{5.0}{5.0}$	100	SW to F	R4		SAA; some to many chalcopyrite phenocrysts, healed joints are mineralized with calcite, some quartz, minor altered plagioclase, and traces of pyrite.		446
137										445
138										444
139										443
140										442

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389





ROCK LOG - Boring No. B-1000



Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
140		30	5.0 5.5	100	F	R4		SAA; some to many chalcopryrite phenocrysts, healed joints are mineralized with calcite, some quartz, minor altered plagioclase, and traces of pyrite.		441
141										440
142								SAA		439
143										438
144										437
145										436
146										435
147										434
148		31	7.0 7.0	100	F	R4				433
149										432
150									Boring terminated at 151 ft on 4/1/06	431
151										430
152								Total Depth 151 ft. Groundwater encountered at 29 feet Borehole Grouted On 4/27/06		429
153										428
154										427
155										426
156										425
157										424
158										423
159										422
160										421
161										420
162										419
163										418
164										417
165										416
166										415
167										414
168										413
169										412
170										411
171										410
172										409
173										408
174										407
175										406
176										405
177										404
178										403
179										402
180										

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1000-UD	
Type and Diameter of Boring Wash Rotary / 6 inch		Boring Location Unit 1 N 1166066 E 1846192		Total Depth 23 feet	
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X		Elevation and Datum 581.5 feet MSL		Ground Water Depth N/A	
Sampling Method Undisturbed		Sample Driving Hammer/Drop NA / NA		No. of Samples 0	
		Borehole Inclination -90		Logged by J. Cerceo	
				Date Started 6/10/06	
				Date Completed 6/10/06	

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0										Drilled without sampling, refer to B-1000 boring log	Begin drilling 6/10/06	581
1												580
2												579
3												578
4												577
5												576
6										Encountered a gravel zone		575
7												574
8												573
9												572
10												571
11												570
12												569
13												568
14												567
15											Lost all water	566
16										Gravel zone drilling 16 to 21 ft		565
17												564
18												563
19												562
20												561
21											Rig racking	560
22										Refusal occurred in shot rock fill	Tricone refusal, boring terminated on 6/10/06	559
23										Boring terminated		558
24												557
25												556
26												555
27												554
28												553
29												552
30												551
31												550
32												549
33												548
34												547
35												546
36												545
37												544
38												543
39												542
40												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1000-UDA	
Type and Diameter of Boring Wash Rotary / 6 inch		Boring Location Unit 1 N 1166062 E 1846181		Total Depth 29.2 feet	
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X		Elevation and Datum 581.6 feet MSL		Ground Water Depth N/A	
Sampling Method Undisturbed		Sample Driving Hammer/Drop NA / NA		No. of Samples 2	
		Borehole Inclination -90		Logged by J. Cerceo	
				Date Started 6/10/06	
				Date Completed 6/10/06	

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0											Begin B-1000 UDA drilling	581
1											6/10/06	580
2											Drilled without sampling to 23 ft	579
3												578
4												577
5												576
6											Very rocky drilling, losing water	575
7												574
8												573
9												572
10												571
11												570
12												569
13												568
14											Losing water	567
15												566
16												565
17												564
18												563
19												562
20												561
21												560
22												559
23												558
24		UD 1		7.2 24					SM	SAND silty (SM)	Shelby push from 23 to 25 ft	557
25											Drilled without sampling to 28 ft	556
26												555
27												554
28		UD 2		14.4 14.4	●	●	●		SM	SAND silty (SM); 12% gravel, 47% sand, 41% fines	Shelby push 28 to 29.2 ft	553
29											Boring terminated at 29.2 ft on 6/10/06, moved to B-1000 UDB	552
30												551
31												550
32												549
33												548
34												547
35												546
36												545
37												544
38												543
39												542
40												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1000-JDB	
Type and Diameter of Boring Wash Rotary / 6 inch		Boring Location Unit 1 N 1166107 E 1846117		Total Depth 48 feet	
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X		Elevation and Datum 588.9 feet MSL		Ground Water Depth N/A	
Sampling Method Split spoon / Undisturbed		Sample Driving Hammer/Drop 140 lbs / 30 inches		No. of Samples 10	
		Borehole Inclination -90		Logged by J. Cerceo	
				Date Started 6/12/06	
				Date Completed 6/12/06	



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									GP	GRAVEL (GP)	Begin 6/12/06	588
1											Drilled to 28.0 ft without sampling, difficult drilling	587
2												586
3												585
4												584
5												583
6												582
7												581
8												580
9												579
10												578
11												577
12												576
13												575
14												574
15												573
16												572
17												571
18												570
19												569
20												568
21												567
22												566
23												565
24												564
25												563
26												562
27												561
28												560
29		SPT 1A	3 10 14	14 18					SM	SAND silty (SM); strong brown (7.5YR 5/8), white (7.5YR 8/1); damp, medium dense, fine to medium grained, SAPROLITE		559
30												558
31		UD 1		16.8 16.8	●	●	●				Shelby push 30 to 31.4 ft. Shelby push refusal	557
32												556
33		SPT 1B	4 15 20	18 18								555
34		SPT 2A	4 15 25	12 18								554
35												553
36		UD 2		13.2 24	●	●	●			42% fines, 58% sand	Changed to pitcher barrel equipment Pitcher drill 35 to 37 ft.	552
37												551
38		SPT 2B	3 14 24	18 18								550
39												549
40												548

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SOIL LOG - Boring No. B-1000-JDB

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40									SM			548
41		UD 3		8.4	•	•	•				Pitcher drill 41 to 43 ft.	547
42				24								546
43		SPT 3B	50/6	6						SAA, 2% gravel, 63% sand, 35% fines		545
44				6								544
45		UD 4		7.2							Pitcher drill 45 to 46.7 ft	543
46				20.4							Pitcher barrel drill refusal	542
47		SPT 4B	50/5	5						SAA; PATIALLY WEATHERED ROCK	Tricone refusal at 48 ft on 6/12/06	541
48				5								540
49												539
50												538
51												537
52												536
53												535
54												534
55												533
56												532
57												531
58												530
59												529
60												528
61												527
62												526
63												525
64												524
65												523
66												522
67												521
68												520
69												519
70												518
71												517
72												516
73												515
74												514
75												513
76												512
77												511
78												510
79												509
80												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. B-1001	
Type and Diameter of Boring HQ core / 3 inch		Boring Location Unit 1 N 1166067 E 1846370		Total Depth 118.1 feet	
Drilling Contractor and Rig MACTEC/White/331145 / CME 55 LC		Elevation and Datum 565.5 feet MSL	Ground Water Depth 19 feet	Depth to Bedrock 32.9 feet	
Casing Size and Depth 3.5 inch / 28.8 feet		Length of Core Barrel and Bit 8.5 feet / 8.5 feet	No. of Core Boxes 10	Date Started 5/13/06	
		Borehole Inclination -90	Logged by J. Cerceo	Date Completed 5/16/06	

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
0								CONCRETE FLOOR PRE CORED - USING THIN WALLED CORING TOOL	Upper deck slab	565
1										564
2										563
3								OPEN CORRIDOR TO LOWER COMPARTMENT	Existing former Unit 1 corridor	562
4										561
5										560
6										559
7										558
8										557
9										556
10										555
11										554
12										553
13										552
14										551
15										550
16										549
17										548
18										547
19										546
20									Groundwater measured at 19 ft on 5/15/06	545
21										544
22		1	1.9 2.3					CONCRETE PRE CORED, USING THIN WALLED CORING TOOL, rebar layer 21.1 to 21.3 ft and 23.3 to 23.5 ft, rebar diameter approximately 1 1/4 to 1 3/8 inch	Existing former Unit 1. Lower corridor slab (top)	543
23										542
24		2	0.8 1.1							541
25										540
26		3	2.3 2.3					CONCRETE ~5% void spaces up to 3/8 inch, ~50% coarse aggregate (0.75 inch) angular likely quartz diorite, ~35% fine aggregate, ~#2 coarse sand, angular.	Begin coring - HQ Cold joint in concrete at 24.77 ft.	539
27										538
28										537
29		4	4.9 4.9							536
30										535
31										534
32										533
33										532
34		5	4.9 4.9	49	MW	R2 to R3		META-QUARTZ DIORITE, bluish gray (10B 5/1), gray (5YR 6/1); fine to medium grained; intensely to moderately jointed, subvertical, manganese oxide and iron oxide staining, plagioclase, quartz, hornblende, biotite, irregular contact with overlying concrete. CONTINUOUS ROCK	Existing former Unit 1 lower corridor slab (bottom)	531
35										530
36										529
37										528
38										527
39		6	5.0 5.0	54	MW			38.6 ft, Joint dipping ~75°, planar, quartz in filling partially replaced with calcite, open portions 0.10 inch wide.		526
40										

Project Name and Job Number
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ROCK LOG - Boring No. B-1001

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
40						R3				525
41										524
42										523
43										522
44		7	5.0 5.0	86						521
45										520
46										519
47					SW					518
48		8	5.0 5.0	95					End drilling 5/13/06; start drilling 5/14/06, water at 21 ft below top of boring	517
49										516
50										515
51										514
52										513
53										512
54		9	5.0 5.0	100						511
55										510
56						R3 to R4				509
57										508
58		10	4.6 4.6	100						507
59										506
60										505
61		11	0.4 0.4	100	F					504
62										503
63		12	4.7 4.7	94						502
64										501
65										500
66										499
67										498
68		13	5.0 5.0	94						497
69										496
70										495
71										494
72										493
73		14	5.0 5.0	100						492
74										491
75										490
76						R3 to R4				489
77										488
78										487
79		15	5.0 5.0	96						486
80								Quartz pegmatite with calcite zones; quartz with calcite		

Project Name and Job Number
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ROCK LOG - Boring No. B-1001

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
80								phenocrysts scattered, varying in size, shape, and orientation <50% phenocrysts		485
81										484
82										483
83		16	5.0	96						482
84			5.0							481
85										480
86								META-QUARTZ DIORITE; bluish gray (10B 5/1), gray (5YR 6/1), black (N 2.5); fine to medium grain; plagioclase, quartz, hornblende, calcite, pyrite, altered plagioclase along some quartz-diorite contacts.		479
87		17	5.0	84						478
88			5.0							477
89										476
90										475
91		18	1.0	100						474
92			1.0							473
93								At 93 and 108 ft, Mafic inclusions (3.5 cm by 3 cm) (3.5 cm by 1 cm), respectively.	End drilling 5/14/06; start drilling 5/15/06, water at 19 ft	472
94		19	4.0	100	F			At 94 ft, Pegmatite vein noted		471
95			4.0							470
96										469
97		20	4.0	100						468
98			4.0							467
99										466
100										465
101										464
102		21	5.0	100		R4				463
103			5.0							462
104										461
105										460
106										459
107		22	4.2	100						458
108			4.2					Mafic inclusion		457
109										456
110		23	1.1	100						455
111			1.1					Pyrite mineralization along subvertical healed quartz infilled joints		454
112										453
113		24	5.0	100						452
114			5.0							451
115										450
116										449
117		25	2.7	100						448
118			2.7							447
119									Finish coring 5/15/06; 5/16/06 set 4 inch PVC casing to 28.9 ft for	446
120										

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ROCK LOG - Boring No. B-1001

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
120									geophysical logging.	445
121								Total Depth 118.1 ft.		444
122								Groundwater encountered at 19 feet		443
123								Borehole Grouted On 6/13/06		442
124										441
125										440
126										439
127										438
128										437
129										436
130										435
131										434
132										433
133										432
134										431
135										430
136										429
137										428
138										427
139										426
140										425
141										424
142										423
143										422
144										421
145										420
146										419
147										418
148										417
149										416
150										415
151										414
152										413
153										412
154										411
155										410
156										409
157										408
158										407
159										406
160										

Project Name and Job Number
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SOIL LOG - Boring No. B-1001A

Type and Diameter of Boring NQ core / 3 inch	Boring Location Unit 1 N 1166085 E 1846293	Total Depth 270.8 feet
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X	Elevation and Datum 568.1 feet MSL	Ground Water Depth N/A
Sampling Method No sampling	Sample Driving Hammer/Drop NA / NA	No. of Samples 0
	Borehole Inclination -54	Logged by R. Ortiz
		Date Started 4/29/06
		Date Completed 5/9/06

Reviewed by / Date B. Reinicker 5/17/06

Reviewed by / Date CES 11/4/2009

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0										Drilled through soil without sampling. Angle boring 36° from vertical	Start drilling on 4/29/06; drilling 36° off vertical	568
1												567
2												566
3												565
4												564
5												563
6												562
7												561
8												560
9												559
10												558
11												557
12												556
13												555
14												554
15												553
16												552
17												551
18												550
19												549
20												548
21												547
22												546
23												545
24												544
25												543
26												542
27												541
28												540
29												539
30												538
31												537
32												536
33												
34												
35												
36												
37												
38												
39												
40												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389



ROCK LOG - Boring No. B-1001A

Type and Diameter of Boring NQ core / 3 inch	Boring Location Unit 1 N 1166085 E 1846293	Total Depth 270.8 feet
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X	Elevation and Datum 568.1 feet MSL	Ground Water Depth 25.1 feet
Casing Size and Depth 3.5 inch / 36 feet	Length of Core Barrel and Bit 13 feet	No. of Core Boxes 13
	Borehole Inclination -54	Logged by R. Ortiz
		Date Started 4/29/06
		Date Completed 5/9/06

Reviewed by / Date B. Reinicker 5/17/06

Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
36								CONCRETE		538
37		1	4.9 5.0							537
38										536
39										535
40										534
41		2	5.0 5.0							533
42										532
43										531
44										530
45										529
46		3	5.0 5.0	100						528
47					SW	R3 to R4		META-GRANODIORITE; bluish gray (10B 6/1); massive; fine to medium grained; ~15% K-spar CONTINUOUS ROCK	Concrete/rock contact ~80 to 90% water loss RQD value of run 3 applies to rock only	527
48					SW to MW	R3 to R4				526
49										525
50		4	4.9 5.0	71	SW to MW	R2		META-DIORITE to AMPHIBOLITE; very dark gray (N 3); massive to weakly foliated; very fine grained; infilled joint with quartz, calcite, and feldspars at 54 ft		524
51										523
52										522
53										521
54		5	4.9 5.0	83	MW to SW	R3 to R4		META-GRANODIORITE; bluish gray (10B 6/1); massive; fine to medium grained; ~15% K-spar		520
55										519
56										518
57										517
58		6	4.6 5.0	100	SW	R3 to R4			63.5 to 64.75 ft. void attributed to rock excavation	516
59										515
60										514
61										513
62										512
63										511
64										510
65										509
66										508
67		7	5.0 5.0	98	SW to F	R4		META-GRANODIORITE to META-QUARTZ DIORITE; bluish gray (10B 6/1 to 5PB 4/1); massive; fine to medium grained; occasional healed shears with numerous randomly oriented mafic xenoliths.	End day 4/29/06 Start day 4/30/06	507
68										
69										
70										
71										
72										
73		8	5.0 5.0	99	SW to F	R4				
74										
75										
76										

Project Name and Job Number
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ROCK LOG - Boring No. B-1001A

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
76								META-QUARTZ DIORITE; dark bluish gray (10B 4/1); fine to medium grained; large quartz veins		506
77										505
78		9	4.6 5.0	90	SW to F	R4				504
79										503
80										502
81								Very large quartz vein		501
82								Well developed mylonitized zone, pyrite, is highly mineralized with quartz, calcite and other minerals along large, thick (>1.5 inch) quartz, calcite vein that runs vertically from 81.4 to 83.8 ft		500
83		10	4.9 5.0	87	SW to F	R4				499
84									Losing ~80% of water	498
85										497
86								Some healed minor brecciation along quartz infilled mylonitized zone		496
87										495
88		11	4.9 5.0	98	F	R4				494
89										493
90										492
91										491
92										490
93		12	4.9 5.0	94	F	R4				489
94										488
95										487
96										486
97								META-QUARTZ DIORITE to META-GRANODIORITE; very dark bluish gray (10B 3/1); fine to medium grained; massive to very weakly foliated; mylonitic rock fabric along healed joints		485
98		13	5.0 5.0	100	F	R4				484
99									~75 to 80% water loss	483
100										482
101										481
102								META-QUARTZ DIORITE; very dark bluish gray (10B 3/1); fine to medium grained; massive to very weakly foliated; mylonitic rock fabric along healed joints		480
103		14	5.0 5.0	94	F	R4				479
104										478
105										477
106										476
107		15	4.9 5.0	98	F	R4				475
108										
109										
110										
111										
112										
113		16	5.0 5.0	85	SW to F	R4				
114									~80% water loss	
115										
116										

Project Name and Job Number
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ROCK LOG - Boring No. B-1001A

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
116								META-QUARTZ DIORITE; bluish gray (10B 5/1); mylonitic rock fabric along healed joints	End day 4/30/06	474
117									Start day 5/1/06; water level at 25 ft along inclined hole length	473
118		17	5.0	100	F	R4				472
119			5.0							471
120										470
121								META-GRANODIORITE; bluish gray (10B 5/1); fine to medium grained; ~15% K-spar		469
122		18	5.0	100	F	R4				468
123			5.0							467
124										466
125										465
126								META-GRANODIORITE to META-QUARTZ DIORITE; fine to medium grained; massive to very weakly foliated; with mylonitic rock fabric along healed joints	~75% water loss	464
127		19	4.9	98	SW to F	R4				463
128			5.0							462
129										461
130										460
131		20	5.0	100	F	R4				459
132			5.0							458
133										457
134										456
135										455
136								META-GRANODIORITE; bluish gray (10B 5/1); fine to medium grained; massive to weakly foliated; some mafic xenoliths within core		454
137		21	5.0	95	F	R4				453
138			5.0							452
139										451
140										450
141										449
142								META-GRANODIORITE to META-QUARTZ DIORITE; SAA		448
143		22	4.6	92	F	R3 to R4		META-DIORITE; greenish black (10G 2.5/1); very fine to fine grained; weakly foliated; contact with granodiorite is vertical along core axis; plagioclase phenocrysts	~75% water loss	447
144			5.0					Quartz vein; wavy		446
145										445
146										444
147										443
148		23	4.9	98	F	R3 to R4				442
149			5.0							
150								Vein of meta-granodiorite between 149.2 to 150 ft		
151										
152										
153		24	5.0	100	F	R4				
154			5.0							
155										
156										

Project Name and Job Number
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ROCK LOG - Boring No. B-1001A

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
156										441
157										440
158		25	$\frac{5.4}{5.4}$	100	F	R4				439
159										438
160										437
161										436
162		26	$\frac{4.4}{5.0}$	88	F	R4				435
163										434
164										433
165										432
166										431
167		27	$\frac{2.6}{2.6}$	100	F	R4		META-GRANODIORITE; bluish gray (5PB 6/1); fine to medium grained; massive		430
168										429
169		28	$\frac{2.4}{2.4}$	100	F	R3 to R4		META-DIORITE; greenish black (10G 2.5/1); massive to very weakly foliated; very fine to fine grained; few calcite veins		428
170										427
171										426
172										425
173		29	$\frac{5.0}{5.0}$	86	SW to F	R3		SAA; dark greenish gray (5G 4/1); fine grained; more visible plagioclase Xenolith of meta-granodiorite	End day 5/1/06 Start day 5/2/06; water level at 26 ft along inclined hole length	424
174										423
175										422
176										421
177										420
178										419
179		30	$\frac{4.9}{5.0}$	98	SW to F	R3				418
180										417
181										416
182										415
183										414
184		31	$\frac{5.6}{5.6}$	100	SW to F	R3		META-DIORITE; greenish gray (5G 4/1); fine grained; massive; along calcite healed fractures	~80% water loss	413
185										412
186										411
187										410
188										
189		32	$\frac{5.0}{5.0}$	100	SW to F	R3				
190										
191										
192										
193										
194		33	$\frac{5.0}{5.0}$	100	SW to F	R3		Plagioclase phenocrysts		
195										
196										

Project Name and Job Number
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ROCK LOG - Boring No. B-1001A



Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
196										409
197										408
198										407
199		34	$\frac{5.0}{5.0}$	100	SW to F	R3				406
200										405
201									~75 to 80% water loss	404
202										403
203										402
204		35	$\frac{5.0}{5.0}$	100	SW to F	R3				401
205										400
206										399
207										398
208		36	$\frac{3.2}{3.5}$	92	SW to F	R3 to R4		META-QUARTZ DIORITE; bluish gray (5PB 6/1); fine to medium grained; massive to very weakly foliated	Drilling getting harder	397
209										396
210		37	$\frac{1.1}{1.1}$	90	F	R4				395
211								Some mafic xenoliths	End day 5/2/06	394
212									Start day 5/3/06. No hole advance	393
213									Start day 5/8/06. Start hole advance	392
214		38	$\frac{5.4}{5.4}$	100	F	R4				391
215										390
216										389
217										388
218										387
219										386
220		39	$\frac{4.9}{5.0}$	95	F	R4				385
221										384
222								Zone of healed brecciation between 220.5 to 222 ft		383
223										382
224		40	$\frac{2.6}{2.6}$	100	F	R4				381
225										380
226		41	$\frac{2.4}{2.4}$	100	F	R4		META-QUARTZ DIORITE to META-GRANODIORITE; bluish gray (5PB 5/1); massive to very weakly foliated; slight increase in K-spar		379
227								Quartz pegmatite vein		378
228		42	$\frac{1.4}{1.4}$	100	SW to F	R4		SAA; large amount of altered plagioclase and chlorite along fracture planes		
229								SAA		
230		43	$\frac{1.0}{1.1}$	91	SW to F	R4				
231								META-GRANODIORITE to META-QUARTZ DIORITE; fine to medium grained; moderate foliation; with some areas of healed highly altered mylonitic texture; highly altered plagioclase and chlorite	End day 5/8/06	
232		44	$\frac{2.4}{2.5}$	96	SW to F	R3 to R4			Start day 5/9/06; water level at 25.1 ft along inclined hole length	
233										
234								META-QUARTZ DIORITE; bluish gray (5PB 5/1); fine to medium grained; massive to weakly foliated; some healed shear zones at 0 to 70°; some mafic xenoliths		
235		45	$\frac{5.0}{5.0}$	100	F	R4				
236									~75% water loss	

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ROCK LOG - Boring No. B-1001A

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
236										377
237										376
238										375
239		46	5.0 5.0	100	F	R4				374
240								Zone of sheared rock and quartz vein between 240 and 242 ft		373
241										372
242								SAA; with mylonitized zones darkens color to very dark bluish gray (5PB3/1); some chlorite mineralization along quartz veins		371
243		47	4.7 5.0	94	F	R4				370
244										369
245										368
246										367
247								META-QUARTZ DIORITE; bluish gray to very dark bluish gray (5PB 5/1 to 3/1); fine to medium grained; massive to weakly foliated; many quartz veins (0 to 90°) with minor mylonitic textured around veins		366
248		48	4.4 4.6	87	SW to F	R3 to R4				365
249										364
250								SAA; quartz veins at 255 ft. predominantly		363
251										362
252										361
253		49	4.3 4.4	64	SW to F	R4			Water return	360
254										359
255										358
256		50	1.0 1.0	0	SW to F	R3 to R4		SAA; very dark bluish gray (5B 3/1); with quartz veins		357
257								META-QUARTZ DIORITE to META-GRANODIORITE; bluish gray (5PB 5/1); to very dark bluish gray (5PB 3/1); fine to medium grained; massive to slightly foliated; with mylonitic fabric along healed joints		356
258		51	5.0 5.0	89	SW to F	R4				355
259										354
260										353
261										352
262								META-QUARTZ DIORITE; dark bluish gray (5PB 4/1); massive to weakly foliated; some mafic xenoliths		351
263		52	5.0 5.0	76	SW to F	R4				350
264										349
265										348
266										347
267										346
268		53	3.8 3.8	100	F	R4				345
269										
270										
271									Coring terminated on 5/9/06	
272										
273										
274								Total Depth 270.8 ft. Groundwater encountered at 25.1 feet Borehole Grouted On 5/10/06		
275										
276										

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. B-1002	
Type and Diameter of Boring HQ core / 3 inch		Boring Location Unit 1 N 1166061 E 1846444		Total Depth 170.3 feet	
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X		Elevation and Datum 565.338 feet MSL	Ground Water Depth 21.5 feet	Depth to Bedrock 29.8 feet	
Casing Size and Depth 4.5 inch / 25 feet		Length of Core Barrel and Bit 10 feet	No. of Core Boxes 13	Date Started 5/23/06	
		Borehole Inclination -90	Logged by G. Maximov	Date Completed 5/28/06	

Reviewed by / Date F. Syms 5/30/06

Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
0										565
1										564
2										563
3										562
4										561
5										560
6										559
7										558
8										557
9										556
10										555
11										554
12										553
13										552
14										551
15										550
16										549
17										548
18										547
19										546
20										545
21										544
22		1	2.5 2.5					CONCRETE 1 1/4 to 1 3/8 inch rebar from 21.2 to 21.5 ft 5/8 inch rebar at 23.2 to 23.3 ft 1 1/4 inch rebar at 23.4 to 23.5 ft	Concrete pre-cored using thin wall core to 24.75 ft	543
23		2	1.2 1.3							542
24								CONCRETE	Cold joint in concrete	541
25									Start HQ core drilling on 5/23/06	540
26		1	3.8 4.3							539
27										538
28		2	0.7 0.8							537
29										536
30								META-GRANODIORITE; light bluish gray (10B 7/1); medium to coarse grained; equigranular	End of concrete at 29.8 ft	535
31								CONTINUOUS ROCK	Top of rock	534
32		2	4.2 4.2	81	F	R4 to R5				533
33										532
34		3	0.8 1.0	0	SW to F	R3				531
35										530
36		4	4.0 4.0	87	F	R4				529
37										528
38										527
39										526
40										526

Project Name and Job Number
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ROCK LOG - Boring No. B-1002

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
40										525
41		5	$\frac{5.0}{5.0}$	95	F	R4 to R5				524
42										523
43										522
44										521
45										520
46		6	$\frac{4.9}{5.0}$	96	F	R4 to R5				519
47										518
48										517
49										516
50								META-GRANODIORITE; light bluish gray (10B 7/1), medium-coarse grained, equigranular		515
51		7	$\frac{5.0}{5.0}$	94	F	R4 to R5				514
52								51.9 ft, vein 0.5 inch white quartz, 45° inclination		513
53										512
54										511
55										510
56		8	$\frac{4.7}{5.0}$	81	F	R4 to R5				509
57										508
58										507
59										506
60										505
61		9	$\frac{5.0}{5.0}$	89	F	R4 to R5				504
62								61.3 to 62.2 ft, vein 0.5 inch quartz and feldspar infilled		503
63										502
64										501
65		10	$\frac{4.0}{4.0}$	100	F	R4 to R5				500
66										499
67										498
68		11	$\frac{1.0}{1.0}$	100	F	R4 to R5				497
69										496
70										495
71		12	$\frac{5.0}{5.0}$	100	F	R4 to R5				494
72								META-DIORITE; bluish gray (5B 5/1); fine grained; equigranular; well defined foliation contact with metagranodiorite deformed - ductile flow (exhibits migmatitic fabric); calcite veins parallel to foliation 40°		493
73						R2 to R3				492
74										491
75								From 74.7 to 75 ft, meta-granodiorite - xenolith	End of day 5/23/06 Begin day 5/24/06	490
76		13	$\frac{5.0}{5.0}$	100	F	R2 to R3				489
77										488
78						R4 to R5		META-GRANODIORITE; light bluish gray (5PB 7/1); medium to coarse grained; equigranular		487
79										486
80										486

Project Name and Job Number
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ROCK LOG - Boring No. B-1002

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
80										485
81		14	$\frac{4.0}{4.0}$	100	F	R4 to R5		META-GRANODIORITE; light bluish gray (5PB 7/1), medium to coarse grained, equigranular		484
82										483
83		15	$\frac{1.0}{1.0}$	100	F	R4 to R5				482
84										481
85								84.4, to 85.0 ft, 0.5 inch vein, potassium feldspar pegmatite.		480
86		16	$\frac{5.0}{5.0}$	100	F	R4 to R5		META-GRANODIORITE; SAA, with pyrite flecks and inclusions		479
87										478
88										477
89										476
90										475
91		17	$\frac{4.4}{4.4}$	100	F	R4 to R5				474
92										473
93										472
94										471
95										470
96		18	$\frac{5.6}{5.6}$	88	F	R4 to R5				469
97										468
98										467
99						R3 to R4		META-DIORITE; bluish gray to dark bluish gray (10B 5/1 to 10B 4/1); fine to medium grained; equigranular; pervasive healed calcite veins inclined at 30 to 60°		466
100										465
101		19	$\frac{5.0}{5.0}$	100	F	R3 to R4		101.6 ft, 0.3 inch, calcite vein, 30-40°		464
102										463
103										462
104										461
105										460
106		20	$\frac{5.0}{5.0}$	98	F	R3 to R4				459
107										458
108										457
109										456
110						R3 to R4				455
111		21	$\frac{5.0}{5.0}$	100	F	R4				454
112										453
113										452
114										451
115										450
116		22	$\frac{5.0}{5.0}$	100	F	R4				449
117										448
118										447
119										446
120										

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ROCK LOG - Boring No. B-1002

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
120										445
121		23	5.0 5.0	96	F	R4				444
122										443
123										442
124										441
125		24	5.0 5.0	96	F	R4		META-DIORITE, bluish gray to dark bluish gray (10B 4.5/1), fine to medium grained, equigranular, pervasive white veining random orientation		440
126										439
127										438
128										437
129										436
130		25	1.9 2.0	90	F	R4			End day 5/24/06 Begin day 5/26/06	435
131										434
132		26	2.3 2.3	87	F	R4				433
133						R4 to R5 R4 to R5		META-GRANODIORITE; light bluish gray (5PB 6/1); medium grained; equigranular		432
134								META-DIORITE; bluish gray to dark bluish gray (10B 4/1 to 10B 5/1); fine grain, equigranular, pervasive calcite veining		431
135										430
136		27	5.5 5.7	96	F	R4				429
137										428
138										427
139		28	1.0 1.0	100	F	R4 to R5		META-GRANODIORITE; light bluish gray (5PB 5/1); medium grained; equigranular		426
140		29	1.0 1.0	100	F	R4 to R5				425
141										424
142		30	2.8 3.0	93	F	R4		META-DIORITE; bluish gray to dark bluish gray (10B 4/1 to 10B 5/1); fine to medium grained; equigranular; pervasive calcite veining	End of day 5/26/06 Begin day 5/27/06	423
143										422
144										421
145		31	3.1 4.2	64	F	R4 to R5		META-GRANODIORITE; light bluish gray (10B 4.5/1); fine to medium grained; equigranular; pervasive calcite veining	RQD 144 to 148.2 ft artificially low due to drilling induced core breakage	420
146										419
147										418
148		32	0.8 0.8	100	F	R4 to R5 R4 to R5				417
149						R4		META-DIORITE dike, migmatitic fabric		416
150										415
151		33	4.7 5.0	92	F	R4 to R5		153.0 ft, Quartz vein 60° dipping, 0.2 inch thick		414
152										413
153										412
154										411
155						R4 to R5		META-GRANODIORITE; light bluish gray (5PB 6/1); medium grained; equigranular		410
156		34	5.0 5.0	100	F					409
157										408
158						R4		META-DIORITE; bluish gray to dark bluish gray (10B 4/1 to 10B 5/1); fine to medium grained; equigranular; pervasive calcite veining, migmatitic fabric along contact with upper metagranodiorite		407
159										406
160						R4				406

Project Name and Job Number
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ROCK LOG - Boring No. B-1002

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
160								159.8 ft. quartz vein, 1 inch thick, dipping 25°		405
161		35	$\frac{3.7}{3.7}$	97	F	R4 to R5		META-GRANODIORITE; light bluish gray (5PB 6/1);		404
162								medium grained; equigranular		403
163		36	$\frac{1.3}{1.3}$	100	F	R4 to R5				402
164										401
165		37	$\frac{2.9}{2.9}$	91	F	R4 to R5				400
166										399
167									End of day 5/27/06	398
168		38	$\frac{1.8}{1.8}$	100	F	R4 to R5			Begin day 5/28/06	397
169		39	$\frac{1.0}{1.0}$	100	F	R4 to R5				396
170		40	$\frac{0.6}{0.6}$	100	F	R4 to R5			Boring terminated at 170.3 ft	395
171									on 5/28/06 water at 21.5 ft	394
172										393
173										392
174										391
175										390
176										389
177										388
178										387
179										386
180										385
181										384
182										383
183										382
184										381
185										380
186										379
187										378
188										377
189										376
190										375
191										374
192										373
193										372
194										371
195										370
196										369
197										368
198										367
199										366
200										

Total Depth 170.3 ft.
Groundwater encountered at 21.5 feet
Borehole Grouted On 6/13/06

Project Name and Job Number
Lee Nuclear Station COL
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**SOIL LOG - Boring No. B-1003**

Type and Diameter of Boring HQ core / 6 inch	Boring Location Unit 1 N 1165938 E 1846226	Total Depth 100.0 feet
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X	Elevation and Datum 597.2 feet MSL	Ground Water Depth Not Observed
Sampling Method No sampling	Sample Driving Hammer/Drop NA / NA	No. of Samples 0
	Borehole Inclination -90	Logged by R. Ortiz
		Date Started 4/2/06
		Date Completed 4/3/06

Reviewed by / Date F. Syms 5/24/06Reviewed by / Date CES 11/4/2009

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0										No sampling. 6 inch tricone wash drilling to 56 ft.	Begin drilling 4/2/06	597
1												596
2												595
3												594
4												593
5												592
6												591
7												590
8												589
9												588
10												587
11												586
12												585
13												584
14												583
15												582
16												581
17												580
18												579
19												578
20												577
21												576
22												575
23												574
24												573
25												572
26												571
27												570
28												569
29												568
30												567
31												566
32												565
33												564
34												563
35												562
36												561
37												560
38												559
39												558
40												

Project Name and Job Number



Lee Nuclear Station COL

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SOIL LOG - Boring No. B-1003

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40										No sampling. 6 inch tricone wash drilling to 56 ft.		557
41										(Continued from previous page)		556
42												555
43												554
44												553
45												552
46												551
47												550
48												549
49												548
50												547
51												546
52												545
53												544
54												543
55												542
56										Switched to HQ rock coring.		541
57										Refer to rock log for description		540
58												539
59												538
60												537
61												536
62												535
63												534
64												533
65												532
66												531
67												530
68												529
69												528
70												527
71												526
72												525
73												524
74												523
75												522
76												521
77												520
78												519
79												518
80												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. B-1003	
Type and Diameter of Boring HQ core / 6 inch		Boring Location Unit 1 N 1165938 E 1846226		Total Depth 100 feet	
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X		Elevation and Datum 597.2 feet MSL		Ground Water Depth N/A	
Casing Size and Depth 4 inch / 56 feet		Length of Core Barrel and Bit 13 feet / 13 feet		No. of Core Boxes 4	
		Borehole Inclination -90		Logged by R. Ortiz	
				Date Started 4/2/06	
				Date Completed 4/3/06	

Reviewed by / Date F. Syms 5/24/06

Reviewed by / Date M. Gray 10-22-07



Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
56								CONCRETE	Tricone refusal at 56 ft, begin HQ rock core	541
57		1	$\frac{2.8}{3.0}$							540
58										539
59										538
60									100% water loss	537
61		2	$\frac{5.0}{5.0}$							536
62										535
63										534
64								META-QUARTZ DIORITE; light gray (10R 7/1); fine to medium grained; massive; zone of increased weathering (oxidation: 64 to 64.6 ft and 66.8 to 67.7 ft); some minor dissolution features (pits) along healed joints. CONTINUOUS ROCK	Bottom of concrete, top of rock	533
65		3	$\frac{3.7}{3.7}$	86	SW	R3			100% water loss	532
66										531
67										530
68		4	$\frac{1.3}{1.3}$	100	SW	R3				529
69										528
70								SAA; plagioclase, quartz, and biotite are predominant minerals; some pyrite found filling small void spaces		527
71		5	$\frac{5.0}{5.0}$	97	SW	R3				526
72										525
73								Zone of increased oxidation 72.4 to 73.4 ft		524
74										523
75		6	$\frac{5.0}{5.0}$	83	SW	R3		META-QUARTZ DIORITE to META-GRANODIORITE; gray (N 5), massive, fine grained, zones of oxidation along joint planes, large (1 to 2 inch) quartz pegmatite veins below 77.3 ft, some mafic xenoliths also present.		522
76										521
77										520
78										519
79								SAA		518
80		7	$\frac{1.8}{1.8}$	100	SW to F	R3 to R4				517
81										516
82		8	$\frac{3.0}{3.2}$	96	SW to F	R3 to R4		SAA, with minor dissolution (vugs, pits) features along healed joints		515
83										514
84										513
85								SAA; fine to medium grained; some oxidation near joint surfaces; some altered plagioclase along totally to moderately healed joints		512
86		9	$\frac{4.9}{5.0}$	94	SW	R3 to R4		Minor dissolution pits at 86 ft. (coated with calcite and iron oxide)		511
87										510
88										509
89										508
90										507
91		10	$\frac{4.7}{5.0}$	86	SW	R3 to R4				506
92										505
93										504
94										503
95										502
96										

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ROCK LOG - Boring No. B-1003

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
96										501
97		11	6.0 6.0	94	SW to F	R3 to R4		SAA; plagioclase, quartz, biotite, major minerals. No oxidation (iron staining) prevalent near joint surface.		500
98										499
99										498
100										497
101									Boring terminated at 100 ft on 4/3/06	496
102										495
103										494
104										493
105										492
106										491
107										490
108										489
109										488
110										487
111										486
112										485
113										484
114										483
115										482
116										481
117										480
118										479
119										478
120										477
121										476
122										475
123										474
124										473
125										472
126										471
127										470
128										469
129										468
130										467
131										466
132										465
133										464
134										463
135										462
136										

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. B-1004	
Type and Diameter of Boring NQ / HQ core / 4 inch		Boring Location Unit 1 N 1165831 E 1846407		Total Depth 175 feet	
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X		Elevation and Datum 559 feet MSL		Ground Water Depth 9.5 feet	
Casing Size and Depth none / 0 feet		Length of Core Barrel and Bit 13 feet / 13.5 feet		No. of Core Boxes 14	
		Borehole Inclination -90		Logged by R. Ortiz/G. Maximov	
				Date Started 5/12/06	
				Date Completed 5/22/06	

Reviewed by / Date F. Syms 6/12/06

Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
0								CONCRETE; 6 inches concrete core drilled and removed by thin wall bit.		559
1		1	2.9 3.0					CONCRETE	Begin rock core drilling at 3.0 ft.	558
2									Begin coring 5/12/06	557
3										556
4		1	5.4 5.4	76						555
5										554
6										553
7					SW	R3 to R4		META-QUARTZ DIORITE; bluish gray (5PB 5/1); massive; fine to medium grained; minor healed shears; some mafic xenoliths CONTINUOUS ROCK	RQD is applicable to rock only	552
8										551
9		2	1.6 1.6	100	SW	R3 to R4				550
10										549
11										548
12		3	4.9 5.0	93	SW	R3 to R4	CKE-02		Goodman Jack Tests: 12.22 to 12.89 ft	547
13							CKE-01		13.22 to 13.89 ft	546
14										545
15										544
16								SAA; dark bluish gray (5PB 4/1); slightly to moderately sheared with minor brecciation healed	End 5/12/06 Start 5/13/06; water level at 12 ft	543
17		4	4.7 5.0	86	SW	R3 to R4				542
18										541
19										540
20										539
21									Goodman Jack Tests: 22.22 to 22.89 ft	538
22		5	4.3 4.3	87	SW	R4	CKE-04		23.22 to 23.89 ft	537
23							CKE-03			536
24										535
25								SAA; dark bluish gray to bluish gray (5PB 4/1 to 5PB 5/1)		534
26										533
27		6	5.1 5.7	90	SW	R4				532
28									End 5/13/06 Start of day 5/14/06 100% water loss	531
29										530
30								SAA; bluish gray (5PB 5/1)		529
31										528
32										527
33		7	5.1 5.2	94	SW to F	R4	CKE-06		Goodman Jack Tests: 32.89 to 33.56 ft	526
34							CKE-05		33.89 to 34.56 ft	525
35										524
36										523
37										522
38		8	5.2 5.2	85	SW to F	R4				521
39										520
40								From 39.2 to 40.2 ft zone of healed brecciation		519

Project Name and Job Number
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ROCK LOG - Boring No. B-1004

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
40										519
41		9	$\frac{2.5}{2.5}$	100	F	R4	CKE-08 CKE-07		100% water loss	518
42										517
43										516
44		10	$\frac{2.8}{2.8}$	88	F	R4			Goodman Jack Tests: 43.64 to 44.31 ft 44.64 to 45.31 ft	515
45										514
46									End of day 5/14/06 Start of day 5/15/06	513
47		11	$\frac{2.7}{2.9}$	90	F	R4				512
48										511
49								META-QUARTZ DIORITE to META-GRANODIORITE		510
50										509
51		12	$\frac{4.8}{5.0}$	86	F	R4				508
52										507
53										506
54										505
55		13	$\frac{2.4}{2.5}$	100	F	R4		SAA; bluish gray (5PB 5/1); massive; fine to medium grained; with boudinage structures expressed along healed shears quartz vein		504
56										503
57		14	$\frac{2.4}{2.5}$	88	F	R4				502
58										501
59										500
60										499
61		15	$\frac{4.6}{5.0}$	85	SW to F	R4				498
62										497
63										496
64										495
65										494
66		16	$\frac{4.9}{5.0}$	91	F	R4				493
67										492
68										491
69								META-QUARTZ DIORITE; dark bluish gray (5PB 4/1); fine to medium grained; pervasive shear fabric overprints original igneous texture; some zones of highly brecciated material but main texture appears predominantly mylonitic as opposed to brecciated		490
70										489
71		17	$\frac{4.8}{5.0}$	96	F	R4				488
72										487
73										486
74										485
75										484
76		18	$\frac{4.0}{4.0}$	100	F	R4				483
77										482
78										481
79										480
80										479

Project Name and Job Number
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ROCK LOG - Boring No. B-1004

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
80		19	$\frac{5.8}{6.0}$	100	F	R4				479
81										478
82										477
83										476
84										475
85										474
86		20	$\frac{4.8}{5.0}$	78	SW to F	R3 to R4				473
87										472
88										471
89									End of day 5/15/06	470
90		21	$\frac{2.5}{2.5}$	100	F	R4			Start of day 5/16/06	469
91									Water level at 11.1 ft	468
92		22	$\frac{2.4}{2.5}$	96	F	R4		SAA; very dark bluish gray to dark bluish gray (10B 3/1 to 10B 4/1); massive to moderately sheared; fine to medium grained		467
93								Mafic dike at ~ 91.3 to 91.6 ft		466
94									100% water loss	465
95										464
96		23	$\frac{5.0}{5.0}$	100	F	R4				463
97										462
98										461
99								SAA; dark bluish gray (10B 4/1); slightly sheared (healed) with some brecciation (healed) and minor mylonitization		460
100										459
101		24	$\frac{5.0}{5.0}$	88	F	R4				458
102										457
103										456
104		25	$\frac{1.5}{1.5}$	98	F	R4				455
105										454
106		26	$\frac{3.4}{3.5}$	93	F	R4				453
107										452
108										451
109										450
110										449
111		27	$\frac{4.8}{5.0}$	96	F	R4				448
112										447
113										446
114										445
115										444
116		28	$\frac{5.0}{5.0}$	98	F	R3 to R4		META-DIORITE; greenish black (10BG 2.5/1); massive to very weakly foliated; very fine to fine grained		443
117										442
118										441
119										440
120										439

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ROCK LOG - Boring No. B-1004

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
120										439
121		29	$\frac{5.2}{5.2}$	85	SW to F	R3				438
122										437
123										436
124								META-QUARTZ DIORITE; bluish gray (5PB 5/1); massive to slightly sheared (healed); fine to medium grained; some minor mafic xenoliths		435
125		30	$\frac{4.5}{4.5}$	90	F	R3 to R4				434
126										433
127										432
128										431
129		31	$\frac{3.8}{3.8}$	100	F	R4				430
130										429
131										428
132		32	$\frac{1.5}{1.5}$	88	F	R4				427
133										426
134									End of day 5/16/06	425
135									Start of day 5/17/06; water level at 12 ft	424
136		33	$\frac{4.7}{5.0}$	94	F	R4				423
137										422
138										421
139										420
140										419
141		34	$\frac{5.0}{5.0}$	100	F	R4				418
142										417
143										416
144										415
145		35	$\frac{3.0}{3.0}$	89	F	R4				414
146										413
147		36	$\frac{1.9}{2.0}$	95	F	R4		META-QUARTZ DIORITE to META-GRANODIORITE; bluish gray (5PB 5/1); massive; fine to medium grained; some mafic xenoliths; slight increase in K-spar content		412
148									100% water loss	411
149										410
150										409
151		37	$\frac{4.9}{5.0}$	98	F	R4				408
152										407
153										406
154										405
155		38	$\frac{3.3}{3.5}$	94	F	R4				404
156										403
157										402
158		39	$\frac{1.5}{1.5}$	100	F	R4				401
159										400
160										399

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ROCK LOG - Boring No. B-1004

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
160		40	$\frac{4.0}{4.0}$	100	F	R4				399
161										398
162										397
163									End of day at 5/17/06	396
164									Start day 5/22/06; water level at 9.5 ft	395
165		41	$\frac{6.0}{6.0}$	100	F	R4				394
166										393
167										392
168										391
169										390
170		42	$\frac{4.0}{4.0}$	100	F	R4				389
171										388
172										387
173		43	$\frac{0.6}{0.6}$	100	F	R4				386
174		44	$\frac{1.8}{1.8}$	100	F	R4				385
175									Coring terminated on 5/22/06	384
176										383
177										382
178								Total Depth 175 ft.		381
179								Groundwater encountered at 9.5 feet		380
180								Borehole Grouted On 4/4/07		379
181										378
182										377
183										376
184										375
185										374
186										373
187										372
188										371
189										370
190										369
191										368
192										367
193										366
194										365
195										364
196										363
197										362
198										361
199										360
200										359

Project Name and Job Number Lee Nuclear Station COL MACTEC WLA 6234-06-3389		ROCK LOG - Boring No. B-1004A	
Type and Diameter of Boring NQ core / 3 inch		Boring Location Unit 1 N 1165831 E 1846430	
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X		Elevation and Datum 559 feet MSL	Ground Water Depth 14 feet
Casing Size and Depth 4 / 3.5 feet		Length of Core Barrel and Bit 13 feet / 13 feet	No. of Core Boxes 16
		Borehole Inclination -56	Logged by R. Ortiz/E. Weldon
		Date Started 4/14/06	
		Date Completed 4/28/06	

Reviewed by / Date F. Syms 5/28/06

Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
0								CONCRETE removed with 6-inch thin wall bit from 0 to 3.4 ft. NQ core began at 3.4 ft.		559
1		1	3.4 3.4							558
2										557
3									Start coring 4/14/06	556
4		1	3.1 3.1							555
5										554
6										553
7										552
8		2	3.4 4.0	20	SW	R3		META-DIORITE; very dark gray (N 3) to very dark greenish gray (10Y 3/1); massive, fine to medium grained; some healed fractures (calcite/quartz).	Bottom of concrete, top of rock 100% water loss	551
9										550
10										549
11										548
12										547
13		3	5.0 5.0	100	SW to F	R3		SAA; greenish gray (10BG 5/1); some plagioclase phenocrysts, calcite healed fractures. CONTINUOUS ROCK		546
14										545
15										544
16										543
17										542
18		4	5.0 5.0	72	SW	R3 to R4		SAA; massive to weakly foliated; plagioclase and mafic phenocrysts are evenly disbursed from sample	End 4/14/06 Start of day 4/17/06 100% water loss to formation	541
19										540
20										539
21										538
22										537
23		5	4.3 5.0	77	SW	R3 to R4			60% loss of water to formation	536
24										535
25										534
26										533
27										532
28										531
29										530
30										529
31										528
32										527
33		7	5.0 5.0	83	MW to SW	R3 to R4		Pegmatitic texture between 30.5 and 31.8 ft.		526
34										
35										
36										
37										
38		8	5.0 5.0	99	SW	R3 to R4				
39										
40										

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ROCK LOG - Boring No. B-1004A

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
40										525
41										524
42										523
43		9	$\frac{4.8}{5.0}$	95	SW	R3 to R4				522
44										521
45										520
46								META-GRANODIORITE; bluish gray (5PB 5/1); massive, fine to medium grained, very highly fractured		519
47		10	$\frac{2.2}{2.5}$	30	SW	R3				518
48										517
49		11	$\frac{2.5}{2.5}$	82	SW	R3				516
50								SAA; some mafic xenoliths; few quartz veins (pegmatite)	100% water loss to formation	515
51										514
52										513
53		12	$\frac{4.5}{5.0}$	74	SW	R3 to R4				512
54										511
55										510
56										509
57										508
58		13	$\frac{5.0}{5.0}$	84	SW	R3 to R4		Quartz pegmatite vein brittle-ductile flow structures present		507
59										506
60										505
61										504
62										503
63		14	$\frac{4.8}{5.0}$	96	SW	R3 to R4				502
64										501
65										500
66										499
67								META-DIORITE; greenish gray (10BG 5/1); fine grained; massive to weakly foliated		498
68		15	$\frac{5.0}{5.0}$	81	SW	R4				497
69										496
70								META-GRANODIORITE; bluish gray (5PB 5/1); fine to medium grained; massive; mafic xenoliths; some quartz rich veins (pegmatites); some minor brittle-ductile flow structures with little to some displacements.	100% water loss to formation	495
71										494
72										493
73		16	$\frac{5.0}{5.0}$	100	SW	R4				
74										
75										
76										
77										
78		17	$\frac{5.0}{5.0}$	100	SW to F	R4 to R5				
79										
80										

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ROCK LOG - Boring No. B-1004A

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
80										
81		18	$\frac{1.0}{1.0}$	0	SW	R3 to R4			End of drilling 4/17/06 No hole advance 4/18/06 Start 4/19/06	492
82										491
83		19	$\frac{4.0}{4.0}$	100	SW to F	R4				490
84										489
85								META-DIORITE; black, light orange gray; inequigranular 15 to 30% mafics, 30 to 50% feldspar, 10% quartz, occasional xenoclasts of older mafic fine grained metadiorite or amphibolite? (2cm); albite? blue translucent subrounded crystals	100% water loss to formation	488
86		20	$\frac{4.9}{5.0}$	84	SW to F	R4				487
87										486
88										485
89										484
90										483
91		21	$\frac{5.2}{5.2}$	100	SW to F	R4		META-QUARTZ DIORITE; as above increased veins and healed shears in lower part of run. Fabric appears both pegmatitic and migmatitic, grains crushed with brecciated appearance.	End of day on 4/19/06 Begin day 4/24/06; E. Weldon, rig geologist	482
92										481
93								META-QUARTZ DIORITE to META-GRANODIORITE; veins are pegmatitic (very coarse quartz, chlorite, k-spar) minor pyrite.	100% water loss	480
94										479
95		22	$\frac{5.0}{5.0}$	100	F	R4				478
96										477
97										476
98										475
99										474
100										473
101		23	$\frac{5.1}{5.1}$	88	SW to F	R4		As above, upper foot has pegmatitic texture chlorite, quartz, plagioclase and orthoclase rich veins or xenoclasts, also large 5cm mafic xenoclasts are incorporated in the more dioritic groundmass.		472
102										471
103										470
104		24	$\frac{3.9}{4.0}$	95	F	R4 to R5		META-DIORITE with META-GRANODIORITE as above; large vein or dike (<1 ft) (feldspar rich) cuts upper 1.5 ft. Several quartz veins parallel to rock fabric.		469
105										468
106									Drilling slowly	467
107								META-GRANODIORITE similar to above; brecciated, healed joints and flow structures. Veins (quartz) truncated by healed joints.		466
108		25	$\frac{6.1}{6.1}$	95	F	R4 to R5				465
109										464
110										463
111										462
112		26	$\frac{4.9}{4.9}$	62	F	R4		META-GRANODIORITE to META-DIORITE Coarsely foliated (alternating mafic/felsic meta grains diorite above upper 6 inches). Meta granodiorite appears migmatized above contact (2 inches) AMPHIBOLITE dark gray, equigranular, fine grained, >70% mafics		461
113										460
114										
115										
116										
117										
118										
119										
120										

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ROCK LOG - Boring No. B-1004A

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
120										459
121										458
122								META-GRANODIORITE; compositional banding and pervasive healed joints dipping 40°.		457
123		27	$\frac{5.0}{5.0}$	100	F	R4		META-GRANODIORITE to META-QUARTZ DIORITE fabric ranges from predominately brecciated (coarsely) to finely mylonitized zones. Moderately spaced to very closely spaced fractures and healed joints. Veins of quartz (with minor calcite and chlorite, pegmatitic) moderately to widely spaced.		456
124										455
125										454
126										453
127										452
128		28	$\frac{5.0}{5.0}$	96	F	R4				451
129								SAA		450
130										449
131										448
132										447
133		29	$\frac{4.9}{5.0}$	92	F	R4				446
134										445
135										444
136										443
137								Partially migmatized; quartz veins appear to cut granodiorite component but more mafic mylonitized (meta-quartz diorite) component appears to flow around veins.		442
138		30	$\frac{5.0}{5.0}$	100	F	R4				441
139										440
140										439
141										438
142										437
143		31	$\frac{4.7}{5.0}$	94	F	R4				436
144										435
145										434
146										433
147		32	$\frac{5.0}{5.0}$	94	F	R4				432
148										431
149										430
150										429
151										428
152										427
153		33	$\frac{4.0}{5.0}$	99	F	R4				
154										
155										
156										
157										
158		34	$\frac{5.0}{5.0}$	100	F	R4				
159										
160										

Project Name and Job Number
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ROCK LOG - Boring No. B-1004A

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
160										426
161										425
162										424
163		35	4.7 4.7	100	SW to F	R4				423
164										422
165										421
166										420
167										419
168		36	5.0 5.0	100	SW to F	R4			End day 4/24/06 No hole advance 4/25/06 Start of day 4/26/06; R. Ortiz, rig geologist	418
169										417
170										416
171										415
172										414
173		37	5.0 5.0	85	SW to F	R4				413
174										412
175										411
176										410
177										409
178		38	4.9 5.0	84	SW to F	R4				408
179										407
180										406
181										405
182										404
183		39	4.8 5.0	96	F	R4				403
184										402
185										401
186										400
187										399
188		40	5.0 5.0	96	F	R4				398
189										397
190										396
191										395
192										394
193		41	5.3 5.3	90	SW to F	R4				
194										
195										
196										
197										
198		42	5.0 5.0	97	SW to F	R4				
199									100% water loss to formation	
200										

Project Name and Job Number
Lee Nuclear Station COL
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ROCK LOG - Boring No. B-1004A

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
200										393
201										392
202										391
203		43	$\frac{4.9}{5.0}$	94	F	R4				390
204										389
205										388
206										387
207		44	$\frac{2.5}{2.5}$	81	MW SW F	R3 R4 R4		META-QUARTZ DIORITE; dark to bluish gray (5PB 4/1) to bluish gray (5PB 6/1); fine to medium grained; slightly weathered, massive; some oxidation stains within areas of moderate weathering		386
208										385
209		45	$\frac{2.5}{2.5}$	72	SW to F	R4				384
210										383
211									End 4/26/06 Start of day 4/27/06	382
212										381
213		46	$\frac{4.9}{5.0}$	95	SW to F	R4		META-QUARTZ DIORITE; dark bluish gray (5PB 4/1); fine to medium grained; massive; some zones with minor migmatitic fabric, much more fine grained material than the meta quartz diorite described above.		380
214										379
215										378
216										377
217										376
218		47	$\frac{5.0}{5.0}$	95	SW to F	R4				375
219										374
220										373
221										372
222										371
223		48	$\frac{5.0}{5.0}$	94	F	R4		META-DIORITE to META-QUARTZ DIORITE; very dark greenish gray (10GY 3/1); very fine grained to fine grained with some medium grained quartz crystals, massive to very weakly foliated, many large quartz pegmatitic veins throughout, may be heavily altered quartz diorite. Quartz veins have some K-spar and calcite.		370
224										369
225										368
226								Thick quartz pegmatitic vein with associated breccia derived from quartz diorite.		367
227										366
228		49	$\frac{5.0}{5.0}$	90	SW to F	R4		META-QUARTZ DIORITE; fine to medium grained with mafic xenoliths; massive to very weakly foliated.		365
229										364
230										363
231										362
232										361
233		50	$\frac{5.0}{5.0}$	88	F	R4		META-QUARTZ DIORITE; dark greenish gray (5G 4/1), fine to medium grained, none to very weakly foliated, moderately altered, foliated large veins of quartz and calcite appear to be brecciated and may be offset by thin healed shears joints or fractures; pegmatitic texture.		
234										
235										
236										
237		51	$\frac{3.2}{3.2}$	83	SW to F	R4				
238										
239										
240			$\frac{1.8}{1.8}$							

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ROCK LOG - Boring No. B-1004A

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
240		52	1.8	79	SW to F	R4				360
241										359
242		53	$\frac{2.0}{2.0}$	95	SW to F	R4				358
243										357
244		54	$\frac{3.2}{3.2}$	100	SW to F	R4				356
245										355
246										354
247										353
248		55	$\frac{4.8}{5.0}$	96	F	R4				352
249										351
250										350
251										349
252									End day 4/27/06	348
253		56	$\frac{5.0}{5.0}$	100	F	R4			Start of day 4/28/06; water level at 14 ft along inclined length of hole	347
254										346
255										345
256										344
257		57	$\frac{5.0}{5.0}$	100	F	R4				343
258										342
259										341
260										340
261										339
262		58	$\frac{5.0}{5.0}$	95	F	R4				338
263										337
264										336
265									100% water loss to formation	335
266										334
267										333
268		59	$\frac{5.0}{5.0}$	91	SW to F	R4				332
269										331
270										330
271										329
272		60	$\frac{3.0}{3.0}$	100	SW to F	R4				328
273										327
274										326
275		61	$\frac{2.0}{2.0}$	91	F	R4				325
276										324
277										323
278		62	$\frac{5.0}{5.0}$	100	F	R4				322
279									100% water loss	321
280										320



Project Name and Job Number
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ROCK LOG - Boring No. B-1004A

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
280										326
281								SAA		325
282		63	3.7	88	F	R4				324
283			3.7							323
284									Boring terminated on 4/28/06 at 284.7 ft	322
285										321
286										320
287										319
288										318
289										317
290										316
291										315
292										314
293										313
294										312
295										311
296										310
297										309
298										308
299										307
300										306
301										305
302										304
303										303
304										302
305										301
306										300
307										299
308										298
309										297
310										296
311										295
312										294
313										
314										
315										
316										
317										
318										
319										
320										

Total Depth 284.7 ft.
Groundwater encountered at 14 feet
Borehole Grouted On 5/10/06

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. B-1005	
Type and Diameter of Boring NQ core / 3 inch		Boring Location Unit 1 adjacent N 1165715 E 1846277		Total Depth 50 feet	
Drilling Contractor and Rig MACTEC/Burnett/219907 / CME 75		Elevation and Datum 562.2 feet MSL		Ground Water Depth 16.5 feet	
Casing Size and Depth none		Length of Core Barrel and Bit 10 feet / 10 feet		No. of Core Boxes 4	
		Borehole Inclination -90		Logged by G. Maximov	
				Date Started 4/2/06	
				Date Completed 4/2/06	

Reviewed by / Date F. Syms 5/27/06

Reviewed by / Date M. Gray 10-22-07



Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
0										562
1		1	$\frac{2.3}{2.5}$					CONCRETE removed using 6 inch thin wall bit, no rebar, smooth break at 3.1 ft. NQ core began at 4.3 ft.		561
2										560
3		2	$\frac{1.6}{1.8}$	100						559
4									Start core drilling 4/2/06	558
5										557
6		1	4.8							556
7										555
8					SW	R4 to R5		META-GRANODIORITE, bluish gray (10B 6/1), medium grain, equigranular, very closely spaced totally healed fractures CONTINUOUS ROCK	RQD applies to rock only	554
9										553
10		2	$\frac{4.7}{5.0}$	80	SW	R4 to R5				552
11										551
12										550
13										549
14										548
15										547
16		3	$\frac{5.0}{5.0}$	96	F	R4 to R5				546
17										545
18										544
19										543
20										542
21		4	$\frac{5.0}{5.0}$	98	F	R4 to R5				541
22										540
23										539
24										538
25										537
26		5	$\frac{4.9}{5.0}$	48	SW	R4 to R5				536
27										535
28								Meta-diorite dike? upper contact highly irregular, lower contact at 45°		534
29										533
30								META-GRANODIORITE to META-QUARTZ DIORITE, bluish gray (10B 5/1), medium grained, equigranular		532
31		6	$\frac{5.0}{5.0}$	81	F	R4 to R5				531
32										530
33										529
34										528
35								SAA		527
36										526
37		7	$\frac{5.0}{5.0}$	80	F	R4 to R5				525
38										524
39										523
40										

Project Name and Job Number
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ROCK LOG - Boring No. B-1005



Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
40										522
41		8	5.0	89	F	R4 to R5				521
42			5.0							520
43										519
44								SAA, but lighter color (10B 6/1)		518
45										517
46					F	R4 to R5				516
47		9	5.7	74						515
48			6.0							514
49					SW	R4 to R5				513
50								SAA; bluish gray (10B 5/1)	Coring terminated on 4/2/06	512
51										511
52										510
53								Total Depth 50 ft.		509
54								Groundwater encountered at 16.5 feet		508
55								Borehole Grouted On 4/3/06		507
56										506
57										505
58										504
59										503
60										502
61										501
62										500
63										499
64										498
65										497
66										496
67										495
68										494
69										493
70										492
71										491
72										490
73										489
74										488
75										487
76										486
77										485
78										484
79										483
80										

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. B-1006	
Type and Diameter of Boring NQ core / 3 inch		Boring Location Unit 1 adjacent N 1165456 E 1846165		Total Depth 30 feet	
Drilling Contractor and Rig MACTEC/Burnett/219907 / CME 75		Elevation and Datum 589.2 feet MSL	Ground Water Depth N/A	Depth to Bedrock 2 feet	
Casing Size and Depth none		Length of Core Barrel and Bit 10 feet / 10 feet	No. of Core Boxes 1	Date Started 4/3/06	
		Borehole Inclination -90	Logged by G. Maximov	Date Completed 4/4/06	

Reviewed by / Date F. Syms 5/28/06

Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
0								Unsampled gravel fill	Begin drilling on 4/3/06	589
1										588
2		1	1.0 1.0	45	F	R4 to R5		META-QUARTZ DIORITE		587
3										586
4										585
5		2	2.9 5.0	0	MW	R4 to R5				584
6										583
7										582
8										581
9										580
10		3	0.8 5.0	8	MW	R4 to R5				579
11										578
12										577
13					MW	R4 to R5				576
14					HW	R0 to R1		META-GRANODIORITE, bluish gray (10B 6/1), medium grained, equigranular, but highly weathered and pitted, strong oxidation.		575
15		4	2.5 5.0	12						574
16					CW	R0				573
17										572
18										571
19										570
20		5	0.0 5.0	0	CW	R0				569
21										568
22										567
23										566
24										565
25		6	0.2 5.0	0	CW	R0				564
26										563
27										562
28								No core recovered	End 4/3/06 Begin 4/4/06 Lost core barrel, hole abandon at 30 ft Moved to B-1006A	561
29										560
30										559
31										558
32										557
33										556
34										555
35										554
36										553
37										552
38										551
39										550
40										

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. B-1006A	
Type and Diameter of Boring NQ core / 3 inch		Boring Location Unit 1 adjacent N 1165453 E 1846160		Total Depth 90 feet	
Drilling Contractor and Rig MACTEC/Burnett/219907 / CME 75		Elevation and Datum 589.6 feet MSL		Ground Water Depth 25 feet	
Casing Size and Depth 3.5 inch / 14 feet		Length of Core Barrel and Bit 10 feet / 10 feet		No. of Core Boxes 3	
		Borehole Inclination -90		Logged by G. Maximov	
				Date Started 4/10/06	
				Date Completed 4/17/06	

Reviewed by / Date F. Syms 5/28/06

Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
0								No Sampling	Start 4/11/06	589
1									0 to 14 ft - Drilled with NW casing without sampling	588
2										587
3										586
4										585
5										584
6										583
7										582
8										581
9										580
10										579
11										578
12										577
13										576
14										575
15								META-QUARTZ DIORITE, light gray (N 7), microcrystalline, thick quartz vein? massive body of quartz.	Begin NQ rock coring	574
16		1	1.4 5.0	0	SW	R4 to R5				573
17										572
18					HW	R0 to R1		META-GRANODIORITE, originally bluish gray (10B 6/1), medium gray, equigranular, pitted with heavy oxidation.		571
19										570
20										569
21		2	0.3 5.0	0	HW	R0 to R1				568
22										567
23										566
24										565
25										564
26		3	0.0 5.0	0	CW	R0				563
27										562
28								META-DIORITE medium to fine grain, equigranular, weathered salt and pepper appearance with >50% dark minerals, quartz veins up to 0.2 inches wide.		561
29										560
30										559
31		4	0.9 5.0	0	HW	R0 to R1				558
32										557
33										556
34										555
35					MW	R2				554
36		5	3.6 5.0	7				META-GRANODIORITE, originally bluish gray (10B 6/1), medium grained, equigranular		553
37					MW	R3				552
38										551
39										550
40										

Project Name and Job Number
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ROCK LOG - Boring No. B-1006A



Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
40										549
41		6	$\frac{4.0}{5.0}$	0	MW	R3		SAA		548
42										547
43										546
44										545
45										544
46		7	$\frac{3.5}{5.0}$	10	HW to MW	R3				543
47										542
48										541
49										540
50					MW to SW	R3 to R4				539
51		8	$\frac{4.1}{5.0}$	20				META-DIORITE, salt and pepper appearance (aprox. 10B 4/1), medium grain, equigranular, minor poorly developed foliation, >50% dark minerals.		538
52										537
53										536
54										535
55					SW	R3 to R4				534
56		9	$\frac{3.6}{5.0}$	16						533
57										532
58										531
59								SAA, CONTINUOUS ROCK		530
60										529
61		10	$\frac{5.0}{5.0}$	90	F	R4 to R5				528
62										527
63										526
64								Meta-granodiorite xenolith 63.2 to 63.7 ft		525
65										524
66		11	$\frac{4.8}{5.0}$	83						523
67										522
68								META-GRANODIORITE; light bluish gray (10B 7/1); medium to coarse grained; equigranular		521
69					F	R4 to R5				520
70										519
71		12	$\frac{5.0}{5.0}$	80						518
72										517
73										516
74										515
75									End of 4/11/06 Begin day 4/12/06, water level at 25 ft	514
76										513
77		13	$\frac{5.9}{6.0}$	70	F	R4 to R5				512
78										511
79										510
80										

Project Name and Job Number
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ROCK LOG - Boring No. B-1006A

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
80									End day 4/12/06	509
81									Begin day 4/14/06	508
82		14	5.0	100	F	R4 to R5				507
83			5.0							506
84										505
85										504
86										503
87		15	5.0	80	F	R4 to R5				502
88			5.0							501
89								META-GRANODIORITE, light bluish gray (5PB 8/1),	Coring terminated on 4/14/06	500
90								medium grain.		499
91										498
92										497
93								Total Depth 90 ft.		496
94								Groundwater encountered at 25 feet		495
95								Borehole Grouted On 4/15/06		494
96										493
97										492
98										491
99										490
100										489
101										488
102										487
103										486
104										485
105										484
106										483
107										482
108										481
109										480
110										479
111										478
112										477
113										476
114										475
115										474
116										473
117										472
118										471
119										470
120										

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. B-1007	
Type and Diameter of Boring NQ core / 3 inch		Boring Location Unit 1 adjacent N 1165712 E 1846489		Total Depth 51.25 feet	
Drilling Contractor and Rig MACTEC/Burnett/219907 / CME 75		Elevation and Datum 563 feet MSL		Ground Water Depth 7 feet	
Casing Size and Depth none		Length of Core Barrel and Bit 10 feet / 10 feet		No. of Core Boxes 3	
		Borehole Inclination -90		Logged by J. Martin	
				Date Started 3/28/06	
				Date Completed 3/29/06	

Reviewed by / Date F. Syms 5/28/06

Reviewed by / Date M. Gray 10-22-07



Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
0								CONCRETE removed using 6 inch thin wall bit. #6 rebar layer at 8 inches and 43 inches below top.	Concrete pre cored with thin wall bit to 4.25 ft 4 inch diameter steel pipe from 14 to 18 inch	563
1		1	$\frac{2.3}{2.5}$							562
2										561
3		2	$\frac{1.8}{1.8}$							560
4										559
5								CONCRETE	Begin core on 3/28/06	558
6										557
7		1	$\frac{5.0}{5.0}$	82	SW to F	R4 to R5		META-GRANODIORITE, blue gray (N 6), medium grain, equigranular, weak foliation can be seen by mafic minerals orientation, healed fractures closely spaced subparallel to foliation, biotite, quartz, K-spar, plagioclase, few quartz veins. CONTINUOUS ROCK	Losing water circulation at surface	556
8										555
9										554
10										553
11					SW to F	R4 to R5				552
12		2	$\frac{4.9}{5.0}$	70						551
13					F					550
14								1/4 to 1/2 inch quartz vein		549
15										548
16								META-GRANODIORITE gneissic foliation grades to more distinct foliation		547
17		3	$\frac{5.0}{5.0}$	86	F	R4 to R5		META-DIORITE, dark gray (N 4), fine grained, equigranular, contact shows slight gneissic bonding; calcite veins to 2 mm closely spaced 16 to 17 ft.		546
18										545
19										544
20										543
21										542
22		4	$\frac{5.0}{5.0}$	100	F	R4 to R5				541
23										540
24								Separation into mineral bands at contact increase in grain size, contact recrystallization?		539
25										538
26										537
27		5	$\frac{4.7}{5.0}$	58	F	R4 to R5		META-GRANODIORITE, gray (N 6), equigranular, medium grain, numerous calcite veins and quartz		536
28										535
29										534
30										533
31										532
32		6	$\frac{5.0}{5.0}$	77	F	R4 to R5				531
33										530
34										529
35										528
36										527
37		7	$\frac{4.9}{5.0}$	91	F	R4 to R5				526
38										525
39								META-DIORITE, dark gray (N 4), equigranular, fine grained lace with quartz vein, some containing chalcocopyrite, foliated		524
40									End of 3/28/06	523

Project Name and Job Number
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ROCK LOG - Boring No. B-1007

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
40									Begin day 3/29/06	523
41		8	4.7 5.0	88	F	R4 to R5				522
42										521
43										520
44								META-GRANODIORITE, gray (N 6) equigranular, medium grain		519
45										518
46										517
47		9	5.0 5.0	100	F	R4 to R5				516
48								META-DIORITE, foliated, dark gray (N 4) equigranular, fine grained.		515
49										514
50		10	1.9 2.0	95	F	R4 to R5				513
51								META-GRANODIORITE xenolith, irregular		512
52									Coring terminated on 3/29/06	511
53									Water level at 7 ft	510
54										509
55								Total Depth 51.25 ft.		508
56								Groundwater encountered at 7 feet		507
57								Borehole Grouted On 3/29/06		506
58										505
59										504
60										503
61										502
62										501
63										500
64										499
65										498
66										497
67										496
68										495
69										494
70										493
71										492
72										491
73										490
74										489
75										488
76										487
77										486
78										485
79										484
80										483

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. B-1008	
Type and Diameter of Boring NQ core / 3 inch		Boring Location Unit 1 adjacent N 1165623 E 1846335		Total Depth 51 feet	
Drilling Contractor and Rig MACTEC/Burnett/219907 / CME 75		Elevation and Datum 563.2 feet MSL		Ground Water Depth 15 feet	
Casing Size and Depth none		Length of Core Barrel and Bit 10 feet / 10 feet		No. of Core Boxes 3	
		Borehole Inclination -90		Logged by G. Maximov	
				Date Started 3/30/06	
				Date Completed 3/31/06	

Reviewed by / Date F. Syms 5/27/06

Reviewed by / Date M. Gray 10-22-07



Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
0										563
1		1	2.4 2.5					CONCRETE removed using 6 inch thin wall bit. Several #3 rebars from 5.75 to 7.5 inch below the top. Several #5 rebars from 40 to 41 inch, #8 rebar at 3 inch	Concrete removed by thin wall bit to 4.25 ft	562
2										561
3		2	1.8 1.8							560
4										559
5								CONCRETE	Begin core 3/30/06	558
6										557
7		1	3.4 5.8	91	MW	R2		META-DIORITE, pyrite-rich, schistose fabric. CONTINUOUS ROCK	RQD applies to rock only	556
8					F	R4 to R5		META-GRANODIORITE, light gray (N 7), medium to coarse grain.		555
9										554
10										553
11										552
12		2	5.0 5.0	99	F	R4 to R5				551
13										550
14										549
15								META-GRANODIORITE, gray (N 6)		548
16										547
17		3	5.0 5.0	55	F	R4 to R5				546
18										545
19										544
20										543
21								Pervasive calcite infilling along joints		542
22		4	5.0 5.0	66	F	R4 to R5				541
23										540
24										539
25										538
26										537
27		5	5.0 5.0	85	F	R4 to R5				536
28										535
29										534
30								META-GRANODIORITE, gray (N 6), medium to coarse grain with some darker (more mafic) xenoliths.		533
31										532
32		6	5.0 5.0	80	F	R4 to R5				531
33										530
34										529
35										528
36										527
37		7	4.7 5.0	82	F	R4 to R5				526
38										525
39										524
40										

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389



ROCK LOG - Boring No. B-1008



Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
40										523
41										522
42		8	4.9	94	F	R4 to R5		Pervasive calcite veins		521
43			5.0							520
44										519
45										518
46								META-GRANODIORITE, quartz vein and thin calcite veins		517
47										516
48		9	6.0	93	F	R4 to R5		META-QUARTZ DIORITE to META-DIORITE, bluish gray (5B 5/1), medium grained		515
49			6.0					META-GRANODIORITE, gray (N 6)		514
50								META-QUARTZ DIORITE to META-DIORITE, bluish gray (5B 5/1), medium grained		513
51								META-GRANODIORITE, gray (N 6), medium to coarse grained, some calcite veins.		512
52									End day 3/30/06	511
53									Begin 3/31/06; water level at 15 ft	510
54									Coring terminated on 3/31/06	509
55								Total Depth 51 ft.		508
56								Groundwater encountered at 15 feet		507
57								Borehole Grouted On 3/31/06		506
58										505
59										504
60										503
61										502
62										501
63										500
64										499
65										498
66										497
67										496
68										495
69										494
70										493
71										492
72										491
73										490
74										489
75										488
76										487
77										486
78										485
79										484
80										

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. B-1009	
Type and Diameter of Boring Concrete core / 6 inch		Boring Location Unit 1 adjacent N 1165530 E 1846393		Total Depth 2.5 feet	
Drilling Contractor and Rig Thin wall bit / Concrete core		Elevation and Datum 563 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A	
Casing Size and Depth none		Length of Core Barrel and Bit 2.5 feet / 2.5 feet	No. of Core Boxes 1	Date Started 3/13/06	
		Borehole Inclination -90	Logged by B. Reinicker	Date Completed 3/13/06	

Reviewed by / Date C. Sams 4/7/06

Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
0										563
1		1	1.3 2.5					CONCRETE removed using 6 inch thin wall bit by coring sub-contractor, approximately 7/8 inch diameter rebar at 7 inch to 7-7/8 inch. Encountered pipe at 13 1/4 inch. Bottom of retrieval core at 16 1/4 inch.	Start 3/13/06 Water loss at 1 ft Core not recoverable below 16 inch due to pipe	562
2										561
3									End boring 3/13/06, core not continued due to pipe, see B-1009A	560
4										559
5										558
6										557
7										556
8										555
9										554
10										553
11										552
12										551
13										550
14										549
15										548
16										547
17										546
18										545
19										544
20										543
21										542
22										541
23										540
24										539
25										538
26										537
27										536
28										535
29										534
30										533
31										532
32										531
33										530
34										529
35										528
36										527
37										526
38										525
39										524
40										523

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. B-1009A	
Type and Diameter of Boring NQ core / 3 inch		Boring Location Unit 1 adjacent turbine room N 1165529 E 1846392		Total Depth 51 feet	
Drilling Contractor and Rig MACTEC/Burnett/219907 / CME 75		Elevation and Datum 562.9 feet MSL		Ground Water Depth 0 feet	
Casing Size and Depth none		Length of Core Barrel and Bit 10 feet / 10 feet		No. of Core Boxes 3	
		Borehole Inclination -90		Logged by G. Maximov	
				Date Started 3/31/06	
				Date Completed 4/1/06	

Reviewed by / Date F. Syms 5/27/06

Reviewed by / Date M. Gray 10-22-07



Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
0								CONCRETE removed using 6 inch thin wall bit. Light gray, approximately 1 inch diameter rebar at 8 to 9 inches encountered pipe from 14 to 17 3/4 inches. Approximately 1 inch diameter rebar at 40.5 to 41.5 inches	Concrete removed by thin wall to 5 ft; location 19 inch from B-1009	562
1										561
2										560
3										559
4								CONCRETE, dark gray color change at 46.75 inches		558
5								CORING TERMINATED at 5.0 ft.	Begin coring 3/31/06	557
6								CONCRETE		556
7		1	5.0							555
8			5.0							554
9										553
10										552
11										551
12		2	5.0							550
13			5.0							549
14										548
15										547
16										546
17		3	5.0							545
18			5.0							544
19										543
20										542
21								META-GRANODIORITE, gray (N 6), medium coarse grain, some calcite veins CONTINUOUS ROCK	End 3/31/06	541
22		4	4.6	77	F	R4 to R5			Begin 4/1/06; water level at 0 ft due to nearby pumping operation	540
23			5.0							539
24										538
25										537
26										536
27		5	4.7	83	F	R4 to R5				535
28			5.0							534
29								META-QUARTZ DIORITE for 0.2 ft, no definite contact, slightly more mafic, possible xenolith		533
30										532
31										531
32		6	4.4	72	SW	R4 to R5				530
33			5.0							529
34										528
35										527
36								META-GRANODIORITE to META-QUARTZ DIORITE, gray to bluish gray (N 6 to 10B 5/1 to 10B 6/1), medium grain, At about 35 ft. begin to see color variation, gray grading into darker bluish gray, changes occur over intervals of 0.5 to 1 ft.		526
37		7	4.4	81	SW to F	R4 to R5				525
38			5.0							524
39								More prominent calcite veining, veins up to 0.1 inch		523
40										522

Project Name and Job Number
Lee Nuclear Station COL
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ROCK LOG - Boring No. B-1009A

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
40										522
41										521
42		8	5.0	71	F	R4 to R5				520
43			5.0							519
44										518
45										517
46										516
47										515
48		9	5.5	82	F	R4 to R5				514
49			6.0							513
50										512
51										511
52									Coring terminated 4/1/06; water at 16 ft	510
53										509
54								Total Depth 51 ft. Groundwater encountered at 0 feet Borehole Grouted On 4/1/06		508
55										507
56										506
57										505
58										504
59										503
60										502
61										501
62										500
63										499
64										498
65										497
66										496
67										495
68										494
69										493
70										492
71										491
72										490
73										489
74										488
75										487
76										486
77										485
78										484
79										483
80										

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. B-1010	
Type and Diameter of Boring NQ core / 3 inch		Boring Location Unit 1 adjacent N 1165551 E 1846525		Total Depth 51 feet	
Drilling Contractor and Rig MACTEC/Burnett/219907 / CME 75		Elevation and Datum 563.1 feet MSL	Ground Water Depth 7 feet	Depth to Bedrock 6.2 feet	
Casing Size and Depth none		Length of Core Barrel and Bit 10 feet / 10 feet	No. of Core Boxes 3	Date Started 3/29/06	
		Borehole Inclination -90	Logged by G. Maximov	Date Completed 3/29/06	

Reviewed by / Date F. Syms 5/28/06

Reviewed by / Date M. Gray 10-22-07



Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
0										563
1		1	2.0 2.5					CONCRETE removed using 6 inch thin wall bit. 7/8 inch diameter rebar at 8 1/4 inches	Concrete removed by 6 inch thin wall bit to 4.25 ft	562
2								CONCRETE 7/8 to 1 inch diameter rebar at 43 1/2 to 45 inches.		561
3		2	1.8 1.8							560
4								CONCRETE	Begin drilling 3/29/06	559
5										558
6										557
7		1	5.1 5.1	71	F	R4 to R5		META-GRANODIORITE to META-QUARTZ DIORITE, gray (N 5) fine to medium grained, pervasive calcite veins up to 0.5 inch thick along foliation, weak foliation		556
8								CONTINUOUS ROCK		555
9										554
10								Mostly fine grain		553
11										552
12		2	5.7 5.7	89	F	R4 to R5				551
13										550
14										549
15										548
16										547
17		3	4.6 5.0	86	F	R4 to R5		META-DIORITE dark gray (N 5), fine grain, pervasive calcite veins.		546
18										545
19								Gradational Zone; migmatite texture		544
20										543
21								META-GRANODIORITE, gray (N 6), medium to coarse grain		542
22		4	5.0 5.0	68	F	R4 to R5				541
23										540
24										539
25										538
26										537
27		5	4.9 5.0	86	F	R4 to R5				536
28										535
29										534
30										533
31										532
32		6	5.0 5.0	96	F	R4 to R5		META-QUARTZ DIORITE, dark gray (N 5), medium grain, with pervasive calcite veins		531
33										530
34										529
35										528
36										527
37		7	4.5 5.0	87	F	R4 to R5				526
38										525
39										524
40										

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389



ROCK LOG - Boring No. B-1010

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
40										523
41										522
42		8	4.9 5.0	94	F	R4 to R5		METAGRANODIORITE, gray (N 5), medium to coarse grain.		521
43										520
44										519
45										518
46										517
47		9	5.5 5.0	92	F	R4 to R5				516
48										515
49										514
50										513
51										512
52									Coring terminated on 3/29/06; water at 7 ft	511
53										510
54								Total Depth 51 ft. Groundwater encountered at 7 feet Borehole Grouted On 3/29/06		509
55										508
56										507
57										506
58										505
59										504
60										503
61										502
62										501
63										500
64										499
65										498
66										497
67										496
68										495
69										494
70										493
71										492
72										491
73										490
74										489
75										488
76										487
77										486
78										485
79										484
80										

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. B-1011	
Type and Diameter of Boring HQ core / 3.5 inch		Boring Location Unit 1 adjacent N 1165997 E 1846673		Total Depth 220 feet	
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X		Elevation and Datum 537.7 feet MSL		Ground Water Depth 4 feet	
Casing Size and Depth none		Length of Core Barrel and Bit 7 feet / 13 feet		No. of Core Boxes 16	
		Borehole Inclination -90		Logged by R. Ortiz	
				Date Started 3/20/06	
				Date Completed 3/29/06	

Reviewed by / Date F. Syms 5/28/06

Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
0								META-DIORITE, greenish gray, very fine grained, massive.	Begin 3/20/06	537
1		1	$\frac{2.5}{3.0}$	81	SW to F	R3		CONTINUOUS ROCK		536
2										535
3										534
4		2	$\frac{3.9}{4.0}$	80	SW to F	R3		META-GRANODIORITE to META-QUARTZ DIORITE		533
5										532
6										531
7		3	$\frac{1.0}{1.0}$	0	SW to F	R3		META-DIORITE 7.5 to 8 ft		530
8								META-QUARTZ DIORITE to META-GRANODIORITE, fine to medium grained, massive		529
9										528
10		4	$\frac{4.9}{5.0}$	98	SW to F	R3				527
11										526
12										525
13										524
14										523
15		5	$\frac{4.3}{5.0}$	86	SW to F	R3 to R4		META-GRANODIORITE to META-QUARTZ DIORITE; quartz, plagioclase, and biotite gneiss metagranitoid		522
16										521
17										520
18										519
19		6	$\frac{5.0}{5.0}$	82	SW to F	R3 to R4		META-QUARTZ DIORITE, medium to coarse grained, moderately spaced fractures (foliation joints), mafic xenoliths up to 1 inch are present but not prevalent, quartz, plagioclase, biotite gneiss		518
20										517
21										516
22										515
23										514
24		7	$\frac{4.5}{5.0}$	71	SW to F	R3 to R4		SAA, medium to fine grained, quartz and feldspar veins are randomly oriented.		513
25										512
26										511
27										510
28										509
29		8	$\frac{4.9}{5.0}$	85	SW to F	R3 to R4		SAA; quartz, plagioclase gneiss, minor K-spar (as veins) calcite associated with incipient fractures; large pegmatite quartz vein cut half the diameter and half the length of the core between 28 and 30.3 ft		508
30										507
31										506
32									Losing ~50% of water	505
33									Hard, slow drilling.	504
34						R3				503
35		9	$\frac{3.5}{3.5}$	97	SW to F	R4 to R5		SAA, fine to medium grained, quartz, plagioclase gneiss; fractures appear to have manganese oxide and possible slickenside development		502
36								Quartz pegmatite vein from 35 to 38.65 ft		501
37		10	$\frac{1.5}{1.5}$	100	SW to F	R4 to R5				500
38										499
39		11	$\frac{2.8}{2.8}$	94	SW to F	R4 to R5				498
40										

Project Name and Job Number
Lee Nuclear Station COL
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ROCK LOG - Boring No. B-1011

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
40			3.0					Quartz pegmatite vein from 40.2 to 40.6 ft		497
41								SAA, slightly coarser grained than samples above, quartz, plagioclase gneiss		496
42		12	$\frac{1.9}{2.0}$	95	SW to F	R4 to R5				495
43								SAA, massive, predominately equigranular, quartz, plagioclase, biotite gneiss.		494
44		13	$\frac{3.6}{3.6}$	92	SW to F	R3 to R4				493
45										492
46										491
47		14	$\frac{1.3}{1.4}$	93	SW to F	R3 to R4			Start of day 3/22/06; water level at 5.4 ft	490
48										489
49										488
50		15	$\frac{5.0}{5.0}$	78	SW to F	R3 to R4				487
51										486
52										485
53								META-QUARTZ DIORITE to META-GRANODIORITE, bluish gray, medium to fine grained, massive, primarily equigranular, quartz, plagioclase, biotite gneiss, metagranitoid		484
54		16	$\frac{5.0}{5.0}$	89	SW to F	R4 to R5				483
55										482
56										481
57										480
58										479
59										478
60		17	$\frac{4.9}{5.0}$	96	SW to F	R4 to R5		META-QUARTZ DIORITE, bluish gray, quartz, plagioclase, biotite gneiss, some mafic xenoliths up to 1.5 inch wide, many healed joints with calcite.		477
61										476
62										475
63								SAA, massive, equigranular, numerous randomly oriented healed joints, unhealed joint surfaces are partially mineralized with probable chlorite; metagranitoid.		474
64		18	$\frac{5.0}{5.0}$	100	SW to F	R4 to R5				473
65										472
66										471
67										470
68										469
69		19	$\frac{4.8}{5.0}$	96	SW to F	R4 to R5				468
70										467
71										466
72										465
73								SAA, medium to coarse grained, massive to weakly foliated, calcite mineralization along incipient fractures and along joint surfaces, some randomly oriented mafic xenoliths.	End of day 3/22/06 Start day 3/27/06 water level at 3 ft	464
74		20	$\frac{5.0}{5.0}$	100	SW to F	R4 to R5				463
75										462
76										461
77										460
78										459
79										458
80			3.9							

Project Name and Job Number
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ROCK LOG - Boring No. B-1011

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
80		21	4.0	98	SW to F	R4 to R5				457
81										456
82		22	0.9 1.0	66	SW to F	R4 to R5				455
83										454
84								SAA; calcite mineralization along healed fractures and joint surfaces some mafic xenoliths.		453
85		23	4.9 5.0	84	SW to F	R4 to R5				452
86										451
87										450
88								SAA; bluish gray; medium to coarse grained; massive; some to many mafic xenoliths; plagioclase, quartz, biotite gneiss		449
89										448
90		24	5.0 5.0	100	F	R4 to R5				447
91										446
92										445
93										444
94										443
95		25	5.0 5.0	100	F	R4 to R5				442
96										441
97										440
98										439
99								META-QUARTZ DIORITE to META-GRANODIORITE; bluish gray; medium to coarse grained; massive; calcite mineralization and minor K-spar mineralization along healed fractures and joint surfaces; some mafic xenoliths; plagioclase, quartz, biotite gneiss		438
100		26	4.8 5.0	96	SW to F	R4 to R5				437
101										436
102										435
103										434
104										433
105		27	4.3 5.0	80	SW to F	R3 to R4				432
106										431
107										430
108										429
109								SAA; fine to medium grained; sample dominated by plagioclase and quartz with rich K-spar zones; some mafic xenoliths present	End of day 3/27/06 Start of day 3/28/06, water measured at 4 ft	428
110		28	4.8 5.0	84	SW to F	R3 to R4				427
111										426
112										425
113										424
114										423
115		29	4.9 5.0	94	SW to F	R3 to R4				422
116										421
117										420
118										419
119								META-QUARTZ DIORITE, fine to medium grained, massive, unit dominated by quartz and feldspar (plagioclase), also some biotite (~15%), some mafic		418
120		30	3.4	75	SW to F	R3 to R4				417

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389



ROCK LOG - Boring No. B-1011

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
120			3.4					xenoliths.		417
121										416
122		31	$\frac{1.5}{1.6}$	90	SW to F	R3 to R4				415
123								META-QUARTZ DIORITE to META-GRANODIORITE, fine to medium grained, massive, dominated by plagioclase, quartz, and biotite, some mafic xenoliths		414
124						R3				413
125		32	$\frac{4.9}{5.0}$	98	SW to F					412
126						R4 to R5				411
127								SAA		410
128										409
129										408
130		33	$\frac{5.0}{5.0}$	97	F	R4 to R5				407
131										406
132										405
133		34	$\frac{1.0}{1.0}$	85	SW to F	R4 to R5				404
134										403
135						SW to F R4 to R5		META-GRANODIORITE to META-QUARTZ DIORITE, fine to medium grained, massive, plagioclase, quartz, and biotite are dominant minerals, some K-spar is also present, some randomly oriented mafic xenoliths also present.	Hard, slow drilling	402
136		35	$\frac{3.9}{4.0}$	98	SW to F	R4 to R5				401
137										400
138										399
139										398
140		36	$\frac{5.0}{5.0}$	96	SW to F	R4 to R5				397
141										396
142										395
143								META-QUARTZ DIORITE; bluish gray; fine to medium grained; massive; dominated by plagioclase, quartz, and biotite; some mafic xenoliths are found randomly oriented within sample		394
144										393
145		37	$\frac{5.0}{5.0}$	94	SW to F	R4 to R5				392
146										391
147										390
148								META-GRANODIORITE to META-QUARTZ DIORITE, fine to medium grained, massive, plagioclase, quartz, and biotite are the main major minerals, some randomly oriented mafic xenoliths present		389
149										388
150		38	$\frac{5.0}{5.0}$	90	SW to F	R4 to R5				387
151										386
152										385
153								META-GRANODIORITE to META-QUARTZ DIORITE, massive, fine to medium grained, biotite is accessory mineral to plagioclase and quartz	End of day 3/28/06	384
154									Start 3/29/06 water level at 4 ft	383
155		39	$\frac{5.0}{5.0}$	94	SW to F	R4 to R5				382
156										381
157										380
158								SAA, fine to coarse grained, quartz and feldspar (plagioclase and some K-spar); biotite is dominant accessory mineral; some mafic xenoliths present show		379
159										378
160										377

Project Name and Job Number
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ROCK LOG - Boring No. B-1011



Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
160		40	$\frac{4.9}{5.0}$	89	SW to F	R3 to R5		probable elongation		377
161										376
162										375
163										374
164										373
165		41	$\frac{5.0}{5.0}$	85	SW to F	R4 to R5				372
166										371
167										370
168								SAA, bluish gray, plagioclase and quartz are dominant minerals, K-spar, biotite and some chlorite are accessory minerals, some mafic xenoliths.		369
169										368
170		42	$\frac{5.0}{5.0}$	94	SW to F	R3 to R5				367
171										366
172										365
173										364
174										363
175		43	$\frac{4.9}{5.0}$	98	SW to F	R4 to R5				362
176										361
177										360
178										359
179										358
180		44	$\frac{5.0}{5.0}$	93	SW to F	R4 to R5		META-QUARTZ DIORITE to META-GRANODIORITE, massive, fine to medium grained, some shear zones and brecciated areas are present, biotite and K-spar are the primary accessory minerals		357
181										356
182										355
183										354
184										353
185		45	$\frac{4.9}{5.0}$	92	SW to F	R3 to R5				352
186										351
187										350
188								SAA, bluish gray to pinkish gray, massive, fine to coarse grained, plagioclase alteration (translucent pink crystals) appears to be occurring along zones with high amounts of fractures both healed and open, probable foliation associated with joints.		349
189										348
190		46	$\frac{5.0}{5.0}$	98	SW to F	R3 to R4				347
191										346
192										345
193								SAA, some mafic xenoliths are present, weak to very weak foliation probable along joints.		344
194										343
195		47	$\frac{4.8}{5.0}$	96	SW to F	R4 to R5				342
196										341
197										340
198										339
199										338
200										

Project Name and Job Number
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ROCK LOG - Boring No. B-1011

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
200		48	$\frac{5.0}{5.0}$	91	SW to F	R3 to R5		SAA; bluish gray; fine to medium grained; quartz, plagioclase, biotite, and possible K-spar		337
201										336
202										335
203										334
204		49	$\frac{5.0}{5.0}$	100	SW to F	R4 to R5				333
205										332
206										331
207										330
208		50	$\frac{4.8}{5.0}$	64	SW to F	R3 to R4				329
209										328
210										327
211										326
212									Losing some water ~25%	325
213										324
214										323
215										322
216		51	$\frac{7.0}{7.0}$	100	SW to F	R3 to R4				321
217										320
218										319
219										318
220									Coring terminated on 3/29/06	317
221										316
222										315
223										314
224										313
225										312
226										311
227										310
228										309
229										308
230										307
231										306
232										305
233										304
234										303
235										302
236										301
237										300
238										299
239										298
240										

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. B-1012	
Type and Diameter of Boring HQ core / 3.5 inch		Boring Location Unit 2 N 1166228 E 1847098		Total Depth 150.2 feet	
Drilling Contractor and Rig MACTEC/White/331145 / CME 55 LC		Elevation and Datum 566.2 feet MSL	Ground Water Depth 7.2 feet	Depth to Bedrock 1 feet	
Casing Size and Depth none		Length of Core Barrel and Bit 5 feet / 10 feet	No. of Core Boxes 12	Date Started 4/27/06	
		Borehole Inclination -90	Logged by G. Maximov	Date Completed 4/30/06	

Reviewed by / Date F. Syms 5/28/06

Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
0								Drilled without sampling using roller bit		566
1								META-GRANODIORITE, light bluish gray (10B 7.5/1), medium to coarse grain, equigranular.	0 to 1 ft drilled with roller bit Start 4/27/06	565
2										564
3		1	4.5 5.0	32	SW	R3 to R4				563
4									RQD artifically low due to CNS blasting and excavation methods/mechanically disturbed	562
5									End day 4/27/06	561
6									Begin day 4/28/06	560
7					SW	R4		SAA, CONTINUOUS ROCK		559
8		2	5.0 5.0	76	MW to HW	R1				558
9					SW to F	R4				557
10										556
11										555
12										554
13		3	5.0 5.0	100	SW to F	R4 to R5				553
14										552
15								SAA, light bluish gray (5B 7/1), medium grained		551
16										550
17										549
18		4	4.9 5.0	88	F	R5				548
19										547
20										546
21										545
22										544
23		5	5.0 5.0	100	F	R5				543
24										542
25										541
26										540
27										539
28		6	5.0 5.0	100	F	R5				538
29										537
30										536
31								SAA, (10B 6.5/1)		535
32										534
33		7	5.0 5.0	100	F	R5				533
34										532
35										531
36										530
37										529
38		8	5.0 5.0	100	F	R5				528
39										527
40										527

Project Name and Job Number
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ROCK LOG - Boring No. B-1012

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
40										526
41								SAA, light bluish gray (10B 7/1)		525
42										524
43		9	5.0 5.0	100	F	R5				523
44										522
45										521
46										520
47										519
48		10	5.0 5.0	100	F	R5				518
49										517
50										516
51										515
52										514
53		11	5.0 5.0	100	F	R5				513
54										512
55										511
56										510
57					F	R5			End day 4/28/06.	509
58		12	5.0 5.0	100					Begin day 4/29/06 water level at 7.2 ft.	508
59								META-DIORITE zone, bluish gray (5B 5.5/1), medium to fine grained 58.7 to 61 ft		507
60					F	R5				506
61								META-GRANODIORITE, light bluish gray (5PB 7/1), coarse grained		505
62										504
63		13	5.0 5.0	100	F	R5				503
64										502
65										501
66										500
67										499
68		14	5.0 5.0	98	F	R5				498
69										497
70								SAA, light bluish gray (5PB 7/1), coarse grain, equigranular		496
71								Brecciated (healed), sub-vertical, incipient fracture filled with calcite, vein thin, widely spaced		495
72										494
73		15	5.0 5.0	98	F	R5				493
74										492
75										491
76								SAA, with plagioclase along and near healed joints.		490
77										489
78		16	5.0 5.0	100	F	R5				488
79										487
80										487

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ROCK LOG - Boring No. B-1012



Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
80										486
81										485
82										484
83		17	$\frac{5.0}{5.0}$	98	F	R5				483
84										482
85										481
86										480
87										479
88		18	$\frac{5.0}{5.0}$	97	F	R5				478
89										477
90										476
91										475
92										474
93		19	$\frac{5.0}{5.0}$	97	SW to F	R4				473
94										472
95										471
96										470
97										469
98		20	$\frac{5.0}{5.0}$	96	F	R4				468
99										467
100										466
101										465
102										464
103		21	$\frac{4.9}{5.0}$	98	F	R4		META-GRANODIORITE, dark bluish gray (5B 4/1), medium to coarse grain porphyritic weak foliation		463
104										462
105										461
106										460
107										459
108		22	$\frac{4.7}{5.0}$	94	F	R4		SAA, bluish black (10B 2.5/1), but more mafic, healed shear zones and fractures filled with fine grained meta-diorite		458
109										457
110										456
111										455
112								SAA, more pink coloration to feldspar near shear zones, weak foliation 40°		454
113		23	$\frac{5.0}{5.0}$	100	F	R4				453
114										452
115										451
116										450
117										449
118		24	$\frac{5.0}{5.0}$	96	F	R4				448
119										447
120										

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ROCK LOG - Boring No. B-1012

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
120										446
121										445
122										444
123		25	5.0 5.0	86	F	R4		SAA, dark bluish gray (5B 4/1), medium to large grained, felsic grains are generally larger than mafic grains, some zones of healed shears and brecciation quartz grains blue, pyrite crystals, plagioclase		443
124										442
125										441
126										440
127										439
128		26	5.0 5.0	100	SW to F	R4				438
129										437
130								META-DIORITE, dark greenish gray (5GY 4/1) strong foliation dipping 70 to 80° grain sizes aphanitic to medium size.		436
131										435
132										434
133		27	5.0 5.0	100	F	R5		SAA, (5GY 4/1)		433
134										432
135										431
136										430
137								META-DIORITE bluish gray (10PB 6/1), medium grain, strong foliation widely spaced veins with calcite.		429
138		28	5.0 5.0	100	F	R5				428
139										427
140										426
141										425
142										424
143		29	5.0 5.0	100	F	R5				423
144										422
145										421
146								META-GRANODIORITE, light bluish gray (5B 7/1) and bluish gray (5B 5/1), medium grained strong, foliation.		420
147										419
148		30	4.2 4.2	98	F	R5		META-DIORITE, dark greenish gray (5GY 4/1) medium grained.		418
149										417
150										416
151									Coring terminated on 4/30/06	415
152										414
153								Total Depth 150.2 ft. Groundwater encountered at 7.2 feet Borehole Grouted On 1/19/07		413
154										412
155										411
156										410
157										409
158										408
159										407
160										

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. B-1013	
Type and Diameter of Boring NQ core / 3 inch		Boring Location Unit 2 N 1166266 E 1847167		Total Depth 52 feet	
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X		Elevation and Datum 558.7 feet MSL	Ground Water Depth 8.5 feet	Depth to Bedrock 0 feet	
Casing Size and Depth none		Length of Core Barrel and Bit 8 feet / 13 feet	No. of Core Boxes 3	Date Started 5/10/06	
		Borehole Inclination -90	Logged by R. Ortiz	Date Completed 5/11/06	

Reviewed by / Date F. Syms 5/28/06

Reviewed by / Date M. Gray 10-22-07



Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
0								META-GRANODIORITE, bluish gray (5PB 5/1), some chlorite associated with calcite along minor healed shear planes, massive, fine to medium grained	Begin day 5/10/06	558
1		1	$\frac{3.4}{3.5}$	97	SW	R3		CONTINUOUS ROCK		557
2										556
3										555
4										554
5		2	$\frac{4.5}{5.0}$	100	SW	R3		META-GRANODIORITE to META-QUARTZ DIORITE, massive, fine to medium grained, some mafic xenoliths.		553
6										552
7										551
8										550
9								META-QUARTZ DIORITE, dark bluish gray (5B 4/1), massive, fine to medium grained, some mafic xenoliths	End of day 5/10/06 Start of day 5/11/06; at water to 8.5 ft	549
10		3	$\frac{4.3}{5.0}$	86	SW	R3 to R4				548
11										547
12										546
13										545
14										544
15		4	$\frac{3.2}{3.2}$	100	SW to F	R3 to R4				543
16										542
17										541
18		5	$\frac{1.4}{1.8}$	78	SW to F	R3 to R4				540
19										539
20								META-QUARTZ DIORITE to META-GRANODIORITE, dark bluish gray (5B 4/1); fine to medium grained; massive		538
21		6	$\frac{4.3}{5.0}$	86	SW to F	R3 to R4				537
22										536
23										535
24										534
25										533
26		7	$\frac{5.0}{5.0}$	99	SW to F	R3 to R4				532
27										531
28										530
29		8	$\frac{1.5}{1.5}$	100	SW to F	R4		META-QUARTZ DIORITE, dark bluish gray to bluish gray (5B 4/1 to 5PB 5/1), massive, fine to medium grained		529
30										528
31		9	$\frac{2.7}{3.0}$	90	SW to F	R4		META-QUARTZ DIORITE to META-GRANODIORITE, bluish gray (5PB 5/1), fine to medium grained, massive healed, quartz vein at 30.2 ft. minor offset along healed shear		527
32										526
33										525
34										524
35										523
36		10	$\frac{5.3}{5.5}$	96	SW to F	R4				522
37										521
38								META-DIORITE, greenish black (5G 2.5/1), very fine grained, massive to weakly foliated		520
39										519
40										

Project Name and Job Number
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ROCK LOG - Boring No. B-1013

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
40										
41		11	4.2 5.0	84	SW to F	R3 to R4		META-QUARTZ DIORITE to META-GRANODIORITE, fine to medium grained, massive, healed zone of brecciation along quartz vein with altered plagioclase (pink) along margin of quartz vein		518
42										517
43										516
44								META-DIORITE, greenish gray (5G 2.5/1), fine grained, massive to weakly foliated	~30 to 50% water loss	515
45										514
46										513
47		12	7.0 7.0	100	SW to F	R3 to R4				512
48										511
49										510
50									~50% water loss From 50.5 to 52 ft overdrilled to obtain core.	509
51									Drilling terminated	508
52										507
53									Coring terminated on 5/11/06	506
54										505
55										504
56								Total Depth 52 ft. Groundwater encountered at 8.5 feet Borehole Grouted On 4/11/06		503
57										502
58										501
59										500
60										499
61										498
62										497
63										496
64										495
65										494
66										493
67										492
68										491
69										490
70										489
71										488
72										487
73										486
74										485
75										484
76										483
77										482
78										481
79										480
80										479

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. B-1014	
Type and Diameter of Boring NQ / HQ core / 3.5 inch		Boring Location Unit 2 adjacent N 1166150 E 1847262		Total Depth 75.5 feet	
Drilling Contractor and Rig MACTEC/White/331145 / CME 55 LC		Elevation and Datum 544.4 feet MSL		Ground Water Depth 0 feet	Depth to Bedrock 1 feet
Casing Size and Depth 4 inch / 3.4 feet		Length of Core Barrel and Bit 8.1 feet / 8.1 feet		No. of Core Boxes 7	Date Started 5/16/06
		Borehole Inclination -90		Logged by J. Cerceo	Date Completed 5/23/06

Reviewed by / Date B. Reinicker 5/31/06

Reviewed by / Date M. Gray 10-22-07



Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
0								GRAVEL (GP), bluish gray (10B 5/1) fine to coarse, angular, Quartz diorite, diorite	Begin 5/16/06, Goodman jack tests performed in this boring	544
1		1	4.1	100	MW to SW	R3		META-QUARTZ DIORITE; bluish gray (10B 5/1); fine to medium grained; quartz, plagioclase, hornblende, trace pyrite mineralization, staining on joint surfaces, calcite		543
2			5.0		MW	R3		CONTINUOUS ROCK		542
3					MW to SW	R3 to R4		META-DIORITE; black (2.5/N); bluish gray, fine grained; quartz, plagioclase, calcite veins, trace pyrite, hornblende; FILL		541
4										540
5										539
6		2	4.5	90	MW to SW	R3 to R4	CKE-10	META-QUARTZ DIORITE bluish gray (10B 5/1); fine to medium grained; quartz, hornblende, plagioclase, calcite, muscovite, epidote mineralization on face, altered plagioclase	Goodman Jack Tests: 6.29 to 6.96 ft	538
7			5.0				CKE-11		7.29 to 7.96 ft	537
8							CKE-09	META-DIORITE; black (2.5/N); bluish gray; fine grained; hornblende, quartz, plagioclase, calcite, biotite; calcite rich veins	8.29 to 8.96 ft	536
9										535
10										534
11									End of 5/16/06	533
12		3	5.0	100	MW to SW	R3 to R4		META-GRANODIORITE; bluish gray (10B 5/1); fine to medium grained; quartz, plagioclase, hornblende, calcite, muscovite, biotite	Start 5/17/06; water measured at 0.0 ft - boring located in low area requiring pumping for rig access	533
13			5.0							532
14										531
15							CKE-13			530
16		4	3.0	100	SW	R4	CKE-12		Goodman Jack Tests: 14.89 to 15.56 ft	529
17			3.0						16.49 to 17.16 ft	528
18									24.89 to 25.56 ft	527
19		5	2.0	100	SW	R4			Subject to inundation without pumping	527
20			2.0							526
21										525
22										524
23		6	5.0	100	SW	R4				523
24			5.0							522
25										521
26					MW	R3	CKE-14			520
27		7	3.0	87	SW to F	R4				519
28			3.0							518
29										517
30		8	3.0	100		R4		META-GRANODIORITE to META-QUARTZ DIORITE; bluish gray, gray, black; fine to medium grained; few healed fractured with mafic minerals; plagioclase, quartz, hornblende, biotite; mafic inclusion (2.5 cm x 4.5 cm)	End of 5/17/06	516
31			3.0						Start of 5/22/06; water measured 0 ft	515
32					SW to F					514
33						R4		Quartz in filled fracture/dike; joint surfaces show evidence of manganese staining from 32 to 34.5 ft		513
34		9	5.3	100						512
35			5.3							511
36					F	R4				510
37										509
38										508
39		10	5.0	100	F	R4		SAA; plagioclase, quartz, hornblende, micaceous minerals, K-spar, calcite healed vein on few incipient fractures	End of 5/22/06	507
40			5.0					Fine grained felsic bands (38 to 39.7 ft); ~2 to 3 cm wide	Start of 5/23/06; water measured 0 ft	507
										506
										505

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ROCK LOG - Boring No. B-1014

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
40										504
41										503
42										502
43										501
44		11	$\frac{5.0}{5.0}$	100	F	R4		Mafic inclusion (4 cm x 5 cm)		500
45										499
46										498
47										497
48										496
49		12	$\frac{5.0}{5.0}$	100		R4				495
50										494
51										493
52								Quartz and calcite pegmatite (2 cm x 1 cm)		492
53								Calcite quartz and epidote or hornblende pegmatite		491
54		13	$\frac{5.0}{5.0}$	100	F	R4		Meta-diorite dike from 54.5 to 55.6 ft		490
55								SAA; subvertical calcite stringers throughout		489
56										488
57										487
58										486
59		14	$\frac{5.0}{5.0}$	100	F	R4				485
60								Meta-diorite dike from 59.5 to 59.8 ft		484
61										483
62								META-GRANODIORITE AND META-QUARTZ DIORITE;		482
63								bluish gray, gray, pinkish gray (5YR 7/2); black, fine to		481
64		15	$\frac{5.0}{5.0}$	100	F	R4		medium grained; calcite veins throughout.		480
65								Mafic inclusion (10 cm x 8 cm)		479
66								Quartz pegmatite (1 cm x 4.5 cm)		478
67								Mafic inclusion (2 cm x 4 cm)		477
68										476
69		16	$\frac{5.0}{5.0}$	100	F	R4				475
70										474
71								Joint/fracture healed thick with quartz, K-spar, biotite,		473
72								calcite, pyrite		472
73										471
74		17	$\frac{4.0}{4.2}$	95	F	R4				470
75									Coring terminated on 5/23/06	469
76										468
77										467
78								Total Depth 75.5 ft.		466
79								Groundwater encountered at 0 feet		465
80								Borehole Grouted On 4/3/07		465

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. B-1015	
Type and Diameter of Boring HQ core / 3.5 inch		Boring Location Unit 2 N 1166134 E 1847192		Total Depth 250.3 feet	
Drilling Contractor and Rig MACTEC/White/331145 / CME 55 LC		Elevation and Datum 560.1 feet MSL		Ground Water Depth 4.5 feet	Depth to Bedrock 0 feet
Casing Size and Depth 4 inch / 2.5 feet		Length of Core Barrel and Bit 8.1 feet / 8.1 feet		No. of Core Boxes 21	Date Started 5/1/06
		Borehole Inclination -90		Logged by A. Tillery/J. Cerceo	Date Completed 5/13/06

Reviewed by / Date F. Syms 5/28/06

Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
0								META-GRANODIORITE, dark bluish gray (5B 4/1) to bluish gray (5PB 5/1), medium grained, numerous healed joints. Quartz 15 to 20%, plagioclase 30 to 40%, mafics 30%, fine grained mafic xenoliths occasional and usually 1 to 5 cm rounded. Healed joint and foliation are often filled with calcite weak foliation	Begin 5/1/06	560
1		1	4.9 5.0	62	MW to SW	R3				559
2										558
3										557
4		2	1.0 1.0	45	SW	R3			RQD artifiically low due to historic CNS blasting and excavation methods (mechanically disturbed)	556
5										555
6										554
7								SAA CONTINUOUS ROCK		553
8		3	5.0 5.0	100	SW	R3 TO R4				552
9										551
10										550
11										549
12								Some large K-spar crystals		548
13		4	5.0 5.0	84	SW to F	R4				547
14										546
15										545
16								META-GRANODIORITE or META-QUARTZ DIORITE; dark bluish gray (10B 4/1), to light bluish gray (5PB 7/1), fine to medium grained, occasional mafic xenoliths, moderately spaced totally healed fractures, widely spaced vein and completely healed shear zones, quartz crystals		544
17										543
18		5	5.0 5.0	88	SW to F	R4				542
19										541
20										540
21										539
22										538
23		6	4.9 5.0	76	F	R4				537
24										536
25										535
26										534
27										533
28		7	4.9 5.0	86	F	R4				532
29										531
30								SAA, light bluish gray (5PB 7/1) to dark bluish gray (5PB 3/1), medium grained; mafic xenoliths fine, small (1 cm), mafic rock xenoliths throughout healed shear zones and healed joints, joints moderately spaced throughout with weak to no foliation.		530
31										529
32										528
33		8	5.0 5.0	98	F	R4				527
34										526
35										525
36								SAA, slightly coarser grained, more pink feldspar		524
37										523
38		9	5.0 5.0	98	F	R4				522
39										521
40										520

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ROCK LOG - Boring No. B-1015

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
40										520
41									End of day 5/1/06	519
42									Start day 5/2/06 water level	518
43		10	5.0	96	F	R4			4.0 ft	517
44			5.0							516
45										515
46								SAA, dark bluish gray (5B 4/1) to light bluish gray (5PB 7/1), medium sized grains, foliation, healed fractures are often filled with calcite		514
47										513
48		11	5.0	90	F	R4 TO R5				512
49			5.0							511
50										510
51										509
52								SAA, several (1 inch thick) sub vertical healed shears zones, increased amounts of K-spar		508
53		12	4.9	91	F	R4 TO R5				507
54			5.0							506
55								Strong mineral alignment 54.8 to 55.8 ft		505
56								SAA continued strong foliation ~40° dip at 56 to 57 ft		504
57										503
58		13	5.0	98	F	R5				502
59			5.0							501
60										500
61								SAA, dark bluish gray (5B 4/1) to light bluish gray (5PB 7/1) medium grained, blue quartz gray feldspar, some pink feldspar, calcite fills healed fractures, slight foliation, moderately spaced, healed fractures with zones of healed shearing and brecciation		499
62										498
63		14	4.9	72	F	R5				497
64			5.0							496
65										495
66										494
67										493
68		15	5.0	98	F	R4 TO R5				492
69			5.0							491
70										490
71										489
72										488
73		16	4.9	98	F	R5				487
74			5.0							486
75								META-DIORITE, bluish gray (5PB 6/1) to bluish black (10B 2.5/1)		485
76								META-GRANODIORITE or META-QUARTZ DIORITE, dry color: gray (6/N), pink bluish gray (10B 3/1), medium grained, occasional white quartz veins, crystalline quartz, plagioclase. Mafic minerals fine grained, foliation indicated by mineral alignment, intermittent.		484
77										483
78		17	5.0	99	F	R5				482
79			5.0							481
80										

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ROCK LOG - Boring No. B-1015

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
80										480
81										479
82										478
83		18	5.0	96	F	R5				477
84			5.0							476
85										475
86										474
87									End day 5/2/06 Begin 5/3/06	473
88		19	4.8	90	F	R5				472
89			5.0							471
90								SAA, bluish gray (5PB 6/1) to dark bluish gray (10B 4/1), medium grained, slight foliation evidenced by alignment of mineral grains.		470
91										469
92										468
93		20	5.0	100	F	R5				467
94			5.0							466
95										465
96								SAA, some pegmatite feldspar and quartz veins widely spaced		464
97										463
98		21	4.6	92	F	R5				462
99			5.0							461
100										460
101										459
102										458
103		22	5.0	100	F	R5				457
104			5.0							456
105										455
106										454
107								META-GRANODIORITE, light bluish gray to bluish gray, black (2.5/N), red (10R 5/8), fine to medium grained, quartz, plagioclase, K-spar, calcite, epidote, hornblende.	End day 5/3/06 Start 5/9/2006 water measured 2.67 ft	453
108		23	5.0	84	F	R5				452
109			5.0					Brecciated granodiorite healed with epidote and altered plagioclase, calcite, K-spar, quartz.		451
110										450
111										449
112										448
113		24	5.0	98	F					447
114			5.0							446
115										445
116						R5				444
117								META-QUARTZ DIORITE to META-GRANODIORITE, bluish gray to black, gray (7.5YR 6/1), fine to medium grained, gray mineralization and healed fractures; quartz, plagioclase, hornblende, K-spar, calcite, and altered plagioclase, mafic xenoliths		443
118		25	4.9	98	F					442
119			5.0							441
120										

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ROCK LOG - Boring No. B-1015

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
120										440
121										439
122										438
123		26	4.0 4.0	100	F	R5		Healed brecciated zone (122 to 123.3 ft) from multiple fractures healed with mafic minerals. Subvertical fractures within the quartz vein		437
124										436
125		27	1.0 1.0	100						435
126										434
127								Weak foliation from ~126.8 to 128.5		433
128		28	5.0 5.0	88	F	R5				432
129								Weak foliation from partly healed incipient fractures.		431
130										430
131										429
132										428
133		29	5.0 5.0	94	F	R5				427
134										426
135										425
136										424
137										423
138		30	5.0 5.0	100	F	R5		Mafic xenolith Mafic xenolith Stress fractures healed with a gray mineral		422
139										421
140										420
141										419
142								SAA, bluish gray, black, red; fine to medium grained; biotite, muscovite, quartz, K-spar, pyrite, epidote, calcite, hornblende. Mafic vein (142.8 to 143.3 ft)	End drilling 5/9/06 Start day 5/10/06 water at 3.0 ft	418
143		31	5.0 5.0	96	F	R5				417
144										416
145										415
146								Gray mineralization along stress fractures; pyrite, muscovite, or biotite mineralization quartz and K-spar pegmatite.		414
147								META-GRANODIORITE bluish gray, black, light brown (10B 5.5/1, N 2.5, 7.5YR 6/4); fine to medium grained; quartz, plagioclase, hornblende, epidote, biotite, muscovite, pyrope (garnet) calcite and chlorite. Quartz pegmatite, pyrope (garnet) red mineralization.		413
148		32	4.9 5.0	92	F	R5				412
149										411
150										410
151										409
152								META-DIORITE, black and dark greenish gray (5G 4/1); fine grained; calcite and epidote healed most fractures; hornblende, plagioclase, biotite.		408
153		33	5.0 5.0	100	F	R4				407
154										406
155										405
156										404
157										403
158		34	5.0 5.0	98	F	R4				402
159										401
160								META-GRANODIORITE; bluish gray, black, light brown,		401

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ROCK LOG - Boring No. B-1015

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
160								fine to medium grained, plagioclase, quartz, altered plagioclase, hornblende, biotite, epidote, and calcite mineralization.		400
161										399
162										398
163		35	5.0 / 5.0	88	F	R4				397
164								Mafic xenolith		396
165										395
166										394
167										393
168		36	5.0 / 5.0	100	F	R4		META-DIORITE; very dark bluish gray (5PB 3/1); fine grained; quartz pegmatite, hornblende, plagioclase, quartz, biotite, calcite, epidote, muscovite.		392
169										391
170										390
171										389
172					SW	R3				388
173		37	5.0 / 5.0	91	F	R4		META-GRANODIORITE to META-QUARTZ DIORITE; bluish gray to light brown; fine to medium grained, hornblende, plagioclase, quartz, calcite		387
174										386
175										385
176										384
177										383
178		38	5.0 / 5.0	90	F	R4				382
179										381
180										380
181						R5				379
182										378
183		39	5.0 / 5.0	100	F	R5		Mafic inclusion		377
184										376
185										375
186								SAA; healed fractures		374
187										373
188		40	5.0 / 5.0	100	F	R5		Mafic inclusion		372
189								Mafic inclusion		371
190								Mafic inclusion		370
191								Mafic inclusion (6 cm)		369
192									End drilling 5/10/06 Start drilling 5/11/06, water measured 4.5 ft.	368
193		41	5.0 / 5.0	100	F	R5		META-QUARTZ DIORITE to META-GRANODIORITE; bluish gray, black, gray (7.5YR 6/1), fine to medium grained, plagioclase, hornblende, quartz, epidote		367
194								Mafic inclusion (4 cm)		366
195								Mafic inclusion (4 cm)		365
196										364
197								META-QUARTZ DIORITE; bluish gray, black gray (7.5YR 6/1); fine grained; plagioclase, hornblende, quartz, K-spar, mafic mineralization occurred along healed fractures.		363
198		42	5.0 / 5.0	100	F	R5				362
199										361
200										

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ROCK LOG - Boring No. B-1015



Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
200								Mafic inclusion (3 cm)		360
201										359
202								Quartz pegmatite		358
203		43	$\frac{5.0}{5.0}$	100	F	R5		Mafic inclusion (4 cm); fine grained mineralization of pyrite, biotite and muscovite (202 to 202.3 ft)		357
204										356
205										355
206										354
207										353
208		44	$\frac{5.0}{5.0}$	100	F	R5				352
209										351
210										350
211								META-QUARTZ DIORITE; bluish gray, black, gray (7.5YR 6/1); fine to medium grained; mafic mineralization healed in incipient fractures; mafic inclusion (5 cm); quartz, plagioclase, hornblende, calcite, biotite, muscovite.		349
212		45	$\frac{5.0}{5.0}$	100	F	R5				348
213										347
214										346
215								Calcite is mostly equigranular (~2 mm), rhombohedral, white, and pale red to pink (10R 7/3 to 10R 8/3)		345
216		46	$\frac{1.7}{1.7}$	100		R5				344
217								Mafic inclusion (2 cm)		343
218					F					342
219		47	$\frac{3.3}{3.3}$	100		R5			End drilling 5/11/06 Start drilling 5/12/06 Water measured 27.3 ft	341
220								Quartz pegmatite mafic inclusion (6 to 7 cm)		340
221										339
222										338
223		48	$\frac{5.0}{5.0}$	100	F	R5		Quartz pegmatite with pyrite mineralization		337
224								Quartz pegmatite with mafic inclusion (2 cm)		336
225										335
226								Calcite healed joints with occasional vug (2 mm x 2 mm)		334
227								META-QUARTZ DIORITE; bluish gray, black, gray (7.5YR 6/1); fine to medium grained; formation of micaceous minerals mostly near the joints/fractures along with quartz, calcite, K-spar, chlorite, and pyrite		333
228		49	$\frac{4.1}{4.1}$	100	F	R5		vug (2 cm x 2 mm), no staining.		332
229								Calcite crystallization (7 cm x 3 cm)		331
230		50	$\frac{0.9}{0.9}$	100	F	R5		Quartz pegmatite (228.9 to 229.5 ft)		330
231								Mafic dike, fine grained.		329
232										328
233		51	$\frac{5.0}{5.0}$	100	F	R5		Mafic inclusion (4 cm x 3 cm)		327
234										326
235										325
236										324
237								Mafic inclusion (4 cm x 3 cm)		323
238		52	$\frac{5.0}{5.0}$	100	F	R5				322
239										321
240								K-spar pegmatite (2 cm x 3 cm)		

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ROCK LOG - Boring No. B-1015

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
240								Calcite mineralization (3 mm)		320
241								META-QUARTZ DIORITE; bluish gray, black gray (7.5YR 6/1); fine to medium grained; thin to very thin in filling along fractures/joints, tight		319
242								Mafic inclusion (3.5 x 2 cm)		318
243		53	5.0	100	F	R5		Quartz and K-spar pegmatite (4 cm x 3 cm)		317
244			5.0							316
245										315
246								META-QUARTZ DIORITE; bluish gray, black, gray (7.5YR 6/1); fine to medium grained; quartz, plagioclase, hornblende, K-spar, calcite, biotite, epidote		314
247								Quartz and K-spar pegmatite (3 cm x 4 cm)		313
248		54	4.0	93	F	R5		Quartz pegmatite		312
249			4.3							311
250									Boring terminated on 5/12/06 at 250.3 ft, overdrilled 0.3 ft not recovered	310
251										309
252										308
253								Total Depth 250.3 ft.		307
254								Groundwater encountered at 4.5 feet		306
255								Borehole Grouted On 1/19/07		305
256										304
257										303
258										302
259										301
260										300
261										299
262										298
263										297
264										296
265										295
266										294
267										293
268										292
269										291
270										290
271										289
272										288
273										287
274										286
275										285
276										284
277										283
278										282
279										281
280										

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1016	
Type and Diameter of Boring Wash Rotary / NQ core / 3 inch		Boring Location Unit 2 N 1166124 E 1847132		Total Depth 100.2 feet	
Drilling Contractor and Rig MACTEC/White/331145 / CME 55 LC		Elevation and Datum 559.2 feet MSL		Ground Water Depth 2.5 feet	
Sampling Method SPT		Sample Driving Hammer/Drop 140 lbs / 30 inches		No. of Samples 1	
		Borehole Inclination -90		Logged by G. Maximov	
				Date Started 4/25/06	
				Date Completed 4/27/06	

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0												559
1		SPT 1	24 44 50/5	16 17					GP	GRAVEL (GP) with sand Light gray (N 7) slightly damp, dry, very dense, 70% gravel, 29% sand, 17% fines; FILL	Start 4/25/06	558
2												557
3											Switched to NQ core	556
4												555
5												554
6												553
7												552
8												551
9												550
10												549
11												548
12												547
13												546
14												545
15												544
16												543
17												542
18												541
19												540
20												539
21												538
22												537
23												536
24												535
25												534
26												533
27												532
28												531
29												530
30												529
31												528
32												527
33												526
34												525
35												524
36												523
37												522
38												521
39												520
40												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. B-1016	
Type and Diameter of Boring Wash Rotary / NQ core / 3 inch		Boring Location Unit 2 N 1166124 E 1847132		Total Depth 100.2 feet	
Drilling Contractor and Rig MACTEC/White/331145 / CME 55 LC		Elevation and Datum 559.2 feet MSL	Ground Water Depth 2.5 feet	Depth to Bedrock 2.8 feet	
Casing Size and Depth 3.5 inch / 5 feet		Length of Core Barrel and Bit 5 feet / 10 feet	No. of Core Boxes 7	Date Started 4/25/06	
		Borehole Inclination -90	Logged by G. Maximov	Date Completed 4/27/06	

Reviewed by / Date F. Syms 5/26/06

Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
3								META-GRANODIORITE; light bluish gray (10B 7.5/1); medium to coarse grain.	Switched to NQ core	556
4								CONTINUOUS ROCK		555
5										554
6										553
7		2	8.2 8.2	96	F	R5				552
8										551
9										550
10										549
11										548
12										547
13		3	5.0 5.0	87	F	R5				546
14										545
15								META-GRANODIORITE		544
16										543
17										542
18		4	5.0 5.0	74	F	R5				541
19										540
20										539
21										538
22										537
23		5	5.0 5.0	62	F	R5				536
24										535
25										534
26										533
27										532
28		6	5.0 5.0	80	F	R4 to R5				531
29										530
30										529
31										528
32									End day, 4/25/06	527
33									Begin day 4/26/06	527
34		7	5.0 5.0	91	F	R5			Water level at 2.5 ft.	526
35										525
36										524
37								META-GRANODIORITE		523
38										522
39		8	5.0 5.0	100	F	R5				521
40										520
41										519
42										518
										517

Project Name and Job Number
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ROCK LOG - Boring No. B-1016



Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
43		9	5.0 5.0	98	F	R5		META-GRANODIORITE		516
44										515
45										514
46										513
47										512
48		10	5.0 5.0	100	F	R5				511
49										510
50										509
51										508
52										507
53		11	5.0 5.0	100	F	R5		META-DIORITE; bluish gray (5B 5/1); medium to fine grain, pervasive calcite veins with epidote		506
54										505
55										504
56										503
57										502
58		12	5.0 5.0	96	F	R5				501
59										500
60					F	R5				499
61										498
62										497
63		13	5.0 5.0	100	F	R5		META-GRANODIORITE; light bluish gray (5B 7.5/1); coarse grained		496
64										495
65										494
66										493
67										492
68		14	4.9 5.0	93	F	R5				491
69										490
70										489
71					F	R5				488
72										487
73		15	5.0 5.0	91	F	R5				486
74										485
75										484
76										483
77										482
78		16	5.0 5.0	88	F	R5				481
79										480
80										479
81										478
82										477

Project Name and Job Number
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ROCK LOG - Boring No. B-1016

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)		
83		17	5.0	95	F	R5		META-GRANODIORITE	End day 4/26/06 Begin day 4/27/06; water at 0 ft, (rain)	476		
84			5.0							475		
85												474
86		18	5.0	96	F	R5		META-DIORITE; bluish gray (5B 5/1); medium to fine grain.		473		
87												
88											471	
89											470	
90											469	
91		19	5.0	100	F	R5		META-GRANODIORITE; light bluish gray (5B 7.5/1); coarse grained		468		
92												
93											466	
94											465	
95								464				
96	20	4.2	100	F	R5			463				
97												462
98								461				
99								460				
100								Coring terminated on 4/27/06 at 100.2 ft	459			
101								Total Depth 100.2 ft. Groundwater encountered at 2.5 feet Borehole Grouted On 4/27/06	458			
102									457			
103									456			
104									455			
105									454			
106									453			
107									452			
108									451			
109									450			
110									449			
111									448			
112									447			
113									446			
114									445			
115									444			
116									443			
117									442			
118									441			
119									440			
120									439			
121									438			
122									437			

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. B-1017	
Type and Diameter of Boring HQ core / 3.5 inch		Boring Location Unit 2 N 1166004 E 1847155		Total Depth 175.6 feet	
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X		Elevation and Datum 560.7 feet MSL	Ground Water Depth 7 feet	Depth to Bedrock 2.3 feet	
Casing Size and Depth 4.5 inch / 2.3 feet		Length of Core Barrel and Bit 13.8 feet / 13.8 feet	No. of Core Boxes 14	Date Started 5/28/06	
		Borehole Inclination -90	Logged by G. Maximov	Date Completed 6/7/06	

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
0								Gravel FILL	Drilled through gravel with 4 inch roller bit, no sample	560
1										559
2										558
3										557
4		1	4.7 5.0	48	SW	R4		META-GRANODIORITE; light bluish gray (Gley 2), medium to coarse grained.	Begin HQ core 5/29/06	556
5									RQD artificially low due to historic CNS blasting and excavation methods (mechanically disturbed)	555
6										554
7								▽ SAA		553
8		2	1.6 1.6	100	SW	R4		CONTINUOUS ROCK		552
9										551
10										550
11		3	4.8 4.8	88	SW	R4				549
12										548
13										547
14		4	1.5 1.5	100	SW	R4				546
15										545
16										544
17		5	3.4 3.5	97	F	R4 to R5				543
18										542
19										541
20										540
21		6	4.0 4.0	100	F	R4 to R5				539
22										538
23		7	0.8 0.8	100	F	R4 to R5			End of 5/29/06	537
24					F	R4 to R5			Begin day 5/30/06	536
25										535
26		8	5.5 5.5	100	F	R4 to R5		From 25.7 to 26.4 ft, metadiorite vein; dark bluish gray (5PB 4.5/1) fine grained,		534
27					F	R4 to R5		From 26.7 to 27.2 ft, metadiorite vein; dark bluish gray (5PB 4.5/1) fine grained		533
28					F	R4 to R5		META-GRANODIORITE; light bluish gray (5PB 7/1); medium to coarse grained		532
29										531
30		9	3.0 3.0	100	F	R4 to R5				530
31										529
32										528
33		10	2.0 2.0	100	F	R4 to R5				527
34										526
35		11	2.0 2.0	100	F	R4 to R5				525
36										524
37										523
38		12	3.0 3.0	100	F	R4 to R5				522
39										521
40										

Project Name and Job Number
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ROCK LOG - Boring No. B-1017

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
40										520
41		13	$\frac{4.4}{4.4}$	100	F	R4 to R5				519
42										518
43								META-GRANODIORITE		517
44										516
45										515
46		14	$\frac{5.6}{5.6}$	74	F	R4 to R5				514
47										513
48										512
49										511
50		15	$\frac{2.5}{2.5}$	74	F	R4 to R5				510
51										509
52		16	$\frac{2.0}{2.0}$	58	F	R4 to R5				508
53										507
54										506
55										505
56		17	$\frac{5.4}{5.5}$	79	F	R4 to R5				504
57										503
58					F	R4		META-DIORITE; bluish gray (5PB 5/1) fine grained from 57.9 to 58.4 ft		502
59					F	R4 to R5		META-GRANODIORITE; light bluish gray (5PB 7/1); medium grained		501
60										500
61		18	$\frac{5.0}{5.0}$	86	SW	R4				499
62										498
63										497
64										496
65		19	$\frac{2.8}{3.0}$	77	SW	R4				495
66										494
67										493
68		20	$\frac{2.0}{2.0}$	100	F	R4 to R5				492
69										491
70									End of 5/30/06 Begin day 5/31/06 Water level 10 ft.	490
71		21	$\frac{3.5}{3.5}$	87	F	R4 to R5				489
72										488
73		22	$\frac{1.5}{1.5}$	100	F	R4 to R5		META-GRANODIORITE		487
74										486
75										485
76		23	$\frac{5.0}{5.0}$	100	F	R4 to R5				484
77										483
78										482
79										481
80										

Project Name and Job Number
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ROCK LOG - Boring No. B-1017

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
80										480
81		24	$\frac{5.0}{5.0}$	100	F	R4 to R5				479
82										478
83										477
84								META-GRANODIORITE		476
85										475
86		25	$\frac{5.0}{5.0}$	98	F	R4 to R5				474
87										473
88										472
89								META-GRANODIORITE; light bluish gray (5PB 7/1), medium grained, equigranular		471
90										470
91		26	$\frac{5.0}{5.0}$	100	F	R4 to R5				469
92										468
93										467
94										466
95										465
96		27	$\frac{5.0}{5.0}$	97	F	R4 to R5				464
97										463
98										462
99										461
100										460
101		28	$\frac{5.0}{5.0}$	96	F	R4 to R5				459
102										458
103										457
104								META-GRANODIORITE; light bluish gray (5PB 7/1), medium grained, equigranular		456
105										455
106		29	$\frac{5.0}{5.0}$	100	F	R4 to R5				454
107										453
108										452
109										451
110									End of 5/31/06 Begin day 6/5/06	450
111		30	$\frac{5.0}{5.0}$	100	F	R4 to R5				449
112										448
113								Massive quartz vein ~1.3 inch thick		447
114										446
115		31	$\frac{2.0}{2.0}$	100	F	R4 to R5				445
116								Mafic xenolith		444
117										443
118		32	$\frac{3.0}{3.0}$	100	F	R4 to R5				442
119										441
120										441

Project Name and Job Number
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ROCK LOG - Boring No. B-1017



Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
120										440
121		33	$\frac{4.0}{4.0}$	100	F	R4 to R5				439
122										438
123										437
124										436
125										435
126		34	$\frac{6.0}{6.0}$	100	F	R4 to R5				434
127										433
128										432
129										431
130										430
131		35	$\frac{5.0}{5.0}$	100	F	R4 to R5				429
132										428
133										427
134										426
135										425
136		36	$\frac{5.0}{5.0}$	100	F	R4 to R5				424
137										423
138										422
139										421
140										420
141		37	$\frac{5.0}{5.0}$	100	F	R4 to R5				419
142										418
143										417
144										416
145					F	R4 to R5				415
146		38	$\frac{5.0}{5.0}$	97	F	R4		META-DIORITE; bluish gray to dark bluish gray (5PB 4.5/1) fine to medium grained		414
147										413
148										412
149					F	R4 to R5		META-GRANODIORITE; light bluish gray (5PB 7/1); medium grained		411
150					F	R4 to R5		META-DIORITE; dark bluish gray and white, (5B 4/1 and 8/N), medium grained		410
151		39	$\frac{4.9}{5.0}$	98	F	R4 to R5				409
152										408
153					F	R4 to R5		META-GRANODIORITE; light bluish gray (5PB 7/1); medium to coarse grained		407
154										406
155		40	$\frac{2.3}{3.0}$	94	F	R4 to R5				405
156										404
157										403
158		41	$\frac{2.0}{2.0}$	100	F	R4 to R5		SAA; bluish gray (10B 5/1)	End of day 6/6/06 Begin day 6/7/06, Water level 6.3 ft.	402
159										401
160										401

Project Name and Job Number
Lee Nuclear Station COL
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ROCK LOG - Boring No. B-1017

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
160										400
161		42	$\frac{5.0}{5.0}$	94	F	R4 to R5				399
162										398
163										397
164										396
165								META-GRANODIORITE; bluish gray (10B 5/1), medium to coarse grained, equigranular		395
166		43	$\frac{5.0}{5.0}$	100	F	R4 to R5				394
167										393
168										392
169								SAA		391
170										390
171										389
172		44	$\frac{6.6}{6.6}$	100	F	R4 to R5				388
173										387
174										386
175										385
176									Coring terminated on 6/7/06	384
177										383
178								Total Depth 175.6 ft.		382
179								Groundwater encountered at 7 feet		381
180								Borehole Grouted On 1/17/07		380
181										379
182										378
183										377
184										376
185										375
186										374
187										373
188										372
189										371
190										370
191										369
192										368
193										367
194										366
195										365
196										364
197										363
198										362
199										361
200										

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. B-1018	
Type and Diameter of Boring NQ core / 3 inch		Boring Location Unit 2 N 1166028 E 1847265		Total Depth 100 feet	
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X		Elevation and Datum 552.7 feet MSL	Ground Water Depth 2.75 feet	Depth to Bedrock 0 feet	
Casing Size and Depth none		Length of Core Barrel and Bit 5 feet / 10 feet	No. of Core Boxes 6	Date Started 4/13/06	
		Borehole Inclination -90	Logged by G. Maximov/M.Angell	Date Completed 4/17/06	

Reviewed by / Date F. Syms 5/28/06

Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
0								META-GRANODIORITE; light bluish gray (10B 7.5/1), medium to coarse grained	Start 4/13/06	552
1								Fracture zone 0.2 to 11.8 ft		551
2										550
3		1	6.5 / 7.0	23	SW	R4				549
4										548
5										547
6										546
7										545
8									End 4/13/06 Start 4/14/06	544
9		2	3.4 / 4.0	28	SW TO F	R4 TO R5				543
10										542
11										541
12										540
13		3	4.4 / 5.0	44	SW	R3 TO R4		META-GRANODIORITE		539
14										538
15										537
16								SAA		536
17								CONTINUOUS ROCK		535
18										534
19		4	5.0 / 5.0	80	F	R4			100% water loss	533
20										532
21										531
22										530
23		5	5.0 / 5.0	94	F	R4				529
24										528
25										527
26										526
27						R4				525
28								META-DIORITE; dark greenish gray, healed mylonite shear zone with inclusions (Porphyroblasts) of quartz and feldspar and quartz stringers (recrystallized)		524
29		6	5.0 / 5.0	76	F	R2				523
30						R4				522
31								META-GRANODIORITE; light bluish gray (10B 7.5/1); medium to coarse grained.		521
32										520
33		7	5.0 / 5.0	96	F	R4		META-DIORITE; dark greenish gray; fine grained, equigranular with abundant quartz veins (~0.4 ft spacing)		519
34										518
35										517
36										516
37										515
38		8	5.0 / 5.0	95	F	R4				514
39										513
40										

Project Name and Job Number
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ROCK LOG - Boring No. B-1018

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
40										512
41										511
42										510
43		9	5.0 5.0	91	F	R4				509
44										508
45										507
46										506
47										505
48		10	5.0 5.0	97	F	R5				504
49										503
50										502
51										501
52										500
53		11	5.0 5.0	84	F	R5				499
54										498
55										497
56										496
57										495
58		12	5.0 5.0	98	F	R5				494
59										493
60										492
61										491
62										490
63		13	5.0 5.0	100	F	R5				489
64										488
65										487
66										486
67										485
68		14	5.0 5.0	88	F	R5				484
69										483
70										482
71										481
72										480
73		15	4.9 5.0	93	F	R5				479
74										478
75										477
76										476
77										475
78		16	5.0 5.0	100	F	R5				474
79										473
80										472

META-DIORITE; greenish gray (5BG 5.5/1); medium to fine grained, equigranular, with quartz veins, veins/lenses of calcite.

SAA; fine grained, strong foliation; mylonitic texture
Mylonite zone from 56.6 to 65.7 ft
META-GRANODIORITE zone; light bluish gray (5PB 7/1) medium grained, from 56.9 to 57.2 ft
SAA; clear foliation ~60°, mylonitic texture
META-DIORITE

META-GRANODIORITE; light bluish gray (5PB 7/1), medium grained increased fracture frequency totally to moderately healed
Meta-diorite zone as above from 62.2 to 62.7 ft



End of 4/14/06
Start day 4/15/06
Water level at 2 ft.

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389



ROCK LOG - Boring No. B-1018



Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
80									End of 4/15/06	472
81								META-GRANODIORITE	Start day 4/17/06	471
82									Water level at 3.5 ft.	470
83		17	5.0	100	F	R5				469
84			5.0					Widely spaced totally healed fractures.		468
85										467
86										466
87										465
88		18	5.0	100	F	R5				464
89			5.0							463
90										462
91								META-GRANODIORITE		461
92										460
93		19	5.0	100	F	R5				459
94			5.0							458
95										457
96										456
97										455
98		20	4.0	100	F	R5				454
99			4.0							453
100									Coring terminated on 4/17/06	452
101										451
102										450
103								Total Depth 100 ft.		449
104								Groundwater encountered at 2.75 feet		448
105								Borehole Grouted On 4/17/06		447
106										446
107										445
108										444
109										443
110										442
111										441
112										440
113										439
114										438
115										437
116										436
117										435
118										434
119										433
120										433

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1019	
Type and Diameter of Boring Wash Rotary / NQ core / 3 inch			Boring Location Unit 2 adjacent N 1166204 E 1847001		Total Depth 75 feet
Drilling Contractor and Rig MACTEC/White/331145 / CME 55 LC			Elevation and Datum 558.2 feet MSL	Ground Water Depth 15 feet	Depth to Bedrock 12 feet
Sampling Method SPT			Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 2	Date Started 4/18/06
			Borehole Inclination -90	Logged by G. Maximov	Date Completed 4/24/06

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0										GRAVEL FILL	Start 4/18/06	558
1									SM	SAND silty (SM), dark yellowish brown (10YR 4/6) to light olive brown (2.5Y 5/4), damp, very dense, fine sand, 40% fines. SAPROLITE		557
2												556
3												555
4		SPT 1	7 22 50	13.2 18								554
5												553
6												552
7												551
8												550
9		SPT 2	50/5.5	5.5 5.5						SAA, olive brown (2.5Y 4/4), moist, fine/medium sand, 40% fines. SAPROLITE	Switched to NQ rock coring	549
10												548
11												547
12												546
13												545
14												544
15												543
16												542
17												541
18												540
19												539
20												538
21												537
22												536
23												535
24												534
25												533
26												532
27												531
28												530
29												529
30												528
31												527
32												526
33												525
34												524
35												523
36												522
37												521
38												520
39												519
40												

Reviewed by / Date F. Syms 5/25/06

Reviewed by / Date C. Lane 10-27-07

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. B-1019	
Type and Diameter of Boring Wash Rotary / NQ core / 3 inch		Boring Location Unit 2 adjacent N 1166204 E 1847001		Total Depth 75 feet	
Drilling Contractor and Rig MACTEC/White/331145 / CME 55 LC		Elevation and Datum 558.2 feet MSL	Ground Water Depth 15 feet	Depth to Bedrock 12 feet	
Casing Size and Depth 3 inch / 9 feet		Length of Core Barrel and Bit 5 feet / 10 feet	No. of Core Boxes 4	Date Started 4/18/06	
		Borehole Inclination -90	Logged by G. Maximov	Date Completed 4/24/06	

Reviewed by / Date F. Syms 5/25/06

Reviewed by / Date M. Gray 10-22-07



Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
9										
10		1	0.0 3.0	0	CW	R0		NO RECOVERY. SAPROLITE or PARTIALLY WEATHERED ROCK	Refusal, switched to NQ coring 4/18/06	549
11										548
12										547
13					HW TO MW	R2 TO R3		METAGRANODIORITE; light bluish gray (10B 7.5/1); medium grained, but highly weathered and oxidized		546
14		2	3.4 5.0	19						545
15					MW	R2 TO R3		METADIORITE; dark bluish gray (5PB 3.5/1); fine grained, very oxidized		544
16										543
17										542
18					MW	R3		SAA, bluish gray (10B 5/1)		541
19										540
20		3	2.9 5.0	7						539
21					SW	R4				538
22										537
23								SAA		536
24								CONTINUOUS ROCK		535
25		4	5.0 5.0	93	F	R5				534
26										533
27										532
28								SAA with pervasive quartz/calcite veins		531
29										530
30		5	4.9 5.0	93	F	R5				529
31										528
32										527
33										526
34		6	5.0 5.0	93	F	R5		META-GRANODIORITE; light bluish gray (5PB 6.5/1); medium grained, poorly developed foliation		525
35										524
36										523
37										522
38										521
39										520
40		7	4.7 5.0	88	F	R5				519
41										518
42										517
43									End of day 4/18/06	516
44									Begin day 4/19/06	515
45		8	4.8 5.0	96	F	R5			Water level 14 ft	514
46										513
47										512
48										511
49								META-DIORITE; bluish gray (5B 5.5/1); fine to medium		510

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389





ROCK LOG - Boring No. B-1019

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
49		9	4.7 5.0	94	F	R5		grained, grading to fine grained away from contact with metagranodiorite		509
50										508
51										507
52										506
53		10	5.0 5.0	100	F	R5			End of day 4/19/06 Begin day 4/24/06 Water level 15 ft.	505
54										504
55					F			META-GRANODIORITE; light bluish gray (5PB 6.5/1); medium grained		503
56										502
57					F	R5				501
58					F	R5		META-DIORITE dike; bluish gray (5B 5.5/1); fine grained, from 57.5 to 59 ft		500
59		11	4.8 5.0	96	F	R5		META-GRANODIORITE; light bluish gray (5PB 6.5/1); medium to coarse grained		499
60										498
61										497
62										496
63										495
64		12	5.0 5.0	100	F	R5		META-GRANODIORITE		494
65										493
66										492
67										491
68										490
69		13	4.9 5.0	98	F	R5				489
70										488
71										487
72										486
73		14	3.0 3.0	100	F	R5				485
74										484
75									Coring terminated on 4/24/06	483
76										482
77										481
78								Total Depth 75 ft. Groundwater encountered at 15 feet Borehole Grouted On 4/24/06		480
79										479
80										478
81										477
82										476
83										475
84										474
85										473
86										472
87										471
88										470
89										

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1020	
Type and Diameter of Boring Hollow stem auger / HQ core / 7 inch		Boring Location Unit 2 adjacent N 1166389 E 1847104		Total Depth 75 feet	
Drilling Contractor and Rig MACTEC/White/331145 / CME 55 LC		Elevation and Datum 590 feet MSL		Ground Water Depth 35.3 feet	
Sampling Method SPT		Sample Driving Hammer/Drop 140 lbs / 30 inches		No. of Samples 3	
		Borehole Inclination -90		Logged by E. Weldon/M. Angell	
				Date Started 4/4/06	
				Date Completed 4/11/06	

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT, sandy (ML), yellowish brown (10YR 5/4) damp, stiff, <20% sand <10% clay, low plasticity, black manganese oxide veining. SAPROLITE	Start on 4/4/06	590
1												589
2												588
3												587
4		SPT 1	4	18								586
5			4	18								585
6												584
7												583
8												582
9		SPT 2	6	16					SM	SAND silty (SM); dark yellowish brown, (10YR 4/4), damp, dense, <40% silt, low plasticity, angular grains; SAPROLITE		581
10			17	18								580
11												579
12									SM	SPT Refusal, PARTIALLY WEATHERED ROCK	Difficult drilling	578
13											Tricone refusal at 13.5 ft, see rock log	577
14		SPT 3	50/0.5	0.5								576
15												575
16												574
17												573
18												572
19												571
20												570
21												569
22												568
23												567
24												566
25												565
26												564
27												563
28												562
29												561
30												560
31												559
32												558
33												557
34												556
35												555
36												554
37												553
38												552
39												551
40												550

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. B-1020	
Type and Diameter of Boring Hollow stem auger / HQ core / 7 inch		Boring Location Unit 2 adjacent N 1166389 E 1847104		Total Depth 75 feet	
Drilling Contractor and Rig MACTEC/White/331145 / CME 55 LC		Elevation and Datum 590 feet MSL		Ground Water Depth 35.3 feet	
Casing Size and Depth 4.5 inch / 12 feet		Length of Core Barrel and Bit 8 feet / 7 feet		No. of Core Boxes 5	
		Borehole Inclination -90		Logged by E. Weldon/M. Angell	
				Date Started 4/4/06	
				Date Completed 4/11/06	

Reviewed by / Date B. Reinicker 5/3/06

Reviewed by / Date M. Gray 10-22-07



Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
14								No core recovery; PARTIALLY WEATHERED ROCK	Begin HQ rock core	576
15								META-QUARTZ DIORITE; white gray and reddish yellow ;	Low water return	575
16		1	3.5 4.5	64	MW	R2 TO R3		fine to coarse grained; xenoblastic texture; >40% feldspar, 30% quartz, fracture surfaces are stained red and black (Fe and Mn oxides?); black xenoliths occasional, fine grained (~1 to 4 cm)		574
17										573
18										572
19										571
20		2	3.5 5.0	60	HW TO MW			SAA mafic inclusions offset less than (0.5 cm) by subvertical fractures (healed). Mafic inclusions very fine grained, greenish color		570
21										569
22										568
23										567
24								META-QUARTZ DIORITE; black, dark gray, and light gray (5PB 6.5/1), xenoblastic, 20 to 40% mafics, chlorite, mica, hornblende, medium grained CONTINUOUS ROCK		566
25		3	4.7 5.0	89	SW	R3 TO R4				565
26										564
27										563
28										562
29										561
30		4	5.0 5.0	96	F	R4				560
31										559
32										558
33										557
34										556
35		5	5.0 5.0	100	F	R4		34.3 to 34.6 ft Meta-diorite dike		555
36										554
37										553
38										552
39									Resume drilling 4/11/06	551
40		6	5.0 5.0	96	F	R4				550
41										549
42										548
43										547
44								META-GRANODIORITE; coarse grained with local mineralogical banding of mafic minerals; randomly spaced.		546
45		7	5.0 5.0	100	F	R4				545
46										544
47										543
48										542
49										541
50		8	5.0 5.0	96	SW	R4				540
51										539
52										538
53										537

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389





ROCK LOG - Boring No. B-1020

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
54										536
55		9	5.0 5.0	87	SW	R3				535
56										534
57					F	R4		56.3 to 57.7 ft healed fracture zone		533
58								META-GRANODIORITE; medium to coarse grained		532
59								59.2 to 59.7 ft mafic inclusion		531
60		10	5.0 5.0	96	F	R4				530
61										529
62										528
63										527
64								63.5 to 66.2 ft minor mafic inclusions		526
65										525
66		11	5.0 5.0	100	F	R4		META-GRANODIORITE		524
67										523
68										522
69										521
70		12	5.0 5.0	100	F	R4				520
71								From 70.8 to 71.5 ft, massive quartz with pyrite and muscovite		519
72								META-GRANODIORITE; accessory minerals include pyrite, muscovite, and epidote		518
73										517
74		13	2.0 2.0	95	F	R4				516
75									Coring terminated on 4/11/06; water at 37.3 ft	515
76									4/12/06; water at 35.3 ft	514
77										513
78								Total Depth 75 ft.		512
79								Groundwater encountered at 35.3 feet		511
80								Borehole Grouted On 4/26/06		510
81										509
82										508
83										507
84										506
85										505
86										504
87										503
88										502
89										501
90										500
91										499
92										498
93										497

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1021	
Type and Diameter of Boring Wash Rotary / NQ core / 5 inch		Boring Location Unit 2 adjacent N 1165897 E 1847301		Total Depth 75.4 feet	
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X		Elevation and Datum 565.5 feet MSL		Ground Water Depth 10 feet	
Sampling Method SPT		Sample Driving Hammer/Drop 140 lbs / 30 inches		No. of Samples 1	
		Borehole Inclination -90		Logged by R. Ortiz	
				Date Started 4/12/06	
				Date Completed 4/13/06	

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									SM	SAND silty (SM), brownish yellow, (10YR 6/6), moist, ~12% silt, some gravel (~15%)	Start 4/12/06	565
1												564
2												563
3												562
4		SPT 1	46	50/3	9						Refusal at 5 ft., see rock log	561
5												560
6												559
7												558
8												557
9												556
10												555
11												554
12												553
13												552
14												551
15												550
16												549
17												548
18												547
19												546
20												545
21												544
22												543
23												542
24												541
25												540
26												539
27												538
28												537
29												536
30												535
31												534
32												533
33												532
34												531
35												530
36												529
37												528
38												527
39												526
40												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. B-1021	
Type and Diameter of Boring Wash Rotary / NQ core / 5 inch		Boring Location Unit 2 adjacent N 1165897 E 1847301		Total Depth 75.4 feet	
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X		Elevation and Datum 565.5 feet MSL	Ground Water Depth 10 feet	Depth to Bedrock 5 feet	
Casing Size and Depth 4 inch / 5 feet		Length of Core Barrel and Bit 13 feet	No. of Core Boxes 4	Date Started 4/12/06	
		Borehole Inclination -90	Logged by R. Ortiz	Date Completed 4/13/06	

Reviewed by / Date F. Syms 5/23/06

Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
5								META-GRANODIORITE; bluish gray (5PB 5/1); massive, fine to medium grained; few to some mafic xenoliths	Refusal, begin NQ core	560
6		2	1.7 3.0	0	MW	R2				559
7										558
8										557
9										556
10		3	4.8 5.0	30	MW	R2			50% water loss	555
11										554
12										553
13										552
14		4	1.6 2.0	0	MW	R2				551
15										550
16		5	3.0 3.0	66	MW	R2 TO R3			50% water loss	549
17										548
18								SAA, increase in size of mafic xenoliths		547
19										546
20		6	5.0 5.0	61	MW	R3				545
21										544
22										543
23								SAA, decrease in size of mafic xenoliths		542
24								CONTINUOUS ROCK		541
25		7	5.0 5.0	94	SW	R3 TO R4				540
26										539
27										538
28								SAA; bluish gray to greenish gray (5PB 5/1 to 10G 5/1); massive, fine to medium grained, some mafic xenoliths, some altered plagioclase (pink crystals) found near fractured zones		537
29		8	4.9 5.0	85	SW	R3 TO R4				536
30										535
31										534
32										533
33									About one-third water loss	532
34										531
35		9	4.6 5.0	84	SW	R3 TO R4				530
36										529
37										528
38										527
39		10	2.0 2.0	100	SW	R3 TO R4			End of day 4/12/06 Start of day 4/13/06 Water level 10 ft	526
40										525
41								META-GRANODIORITE; bluish gray (5PB 5/1); massive, fine to medium grained, some mafic xenoliths		524
42		11	3.0 3.0	90	SW	R4				523
43										522
44								Many healed incipient fractures (with calcite)		521
45										520

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389





ROCK LOG - Boring No. B-1021

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
45		12	$\frac{4.4}{5.0}$	88	SW	R4				520
46										519
47										518
48										517
49										516
50		13	$\frac{5.0}{5.0}$	96	SW TO F	R4				515
51										514
52										513
53								Two minor healed shears, with calcite		512
54									40 to 50% water loss	511
55		14	$\frac{4.9}{5.0}$	98	SW	R4				510
56										509
57										508
58								Mafic xenoliths randomly oriented (>4 inch long), maybe very weak foliation expressed as zones of mafic mineral accumulation		507
59										506
60		15	$\frac{4.8}{5.0}$	93	SW	R4				505
61										504
62										503
63										502
64										501
65		16	$\frac{5.0}{5.0}$	100	SW	R4				500
66										499
67										498
68								Some mafic xenoliths, incipient fractures with minor offset		497
69										496
70		17	$\frac{5.0}{5.0}$	100	SW	R4				495
71										494
72								Subvertical quartz vein at ~71.5 ft	40% water loss	493
73										492
74		18	$\frac{2.4}{2.4}$	100	SW	R4		Some mafic xenoliths		491
75									Coring terminated at 75 ft on 4/13/06	490
76										489
77										488
78								Total Depth 75.4 ft.		487
79								Groundwater encountered at 10 feet		486
80								Borehole Grouted On 4/13/06		485
81										484
82										483
83										482
84										481
85										

Project Name and Job Number Lee Nuclear Station COL MACTEC WLA 6234-06-3389		SOIL LOG - Boring No. B-1022	
Type and Diameter of Boring Wash Rotary / NQ core / 5 inch/3 inch		Boring Location Unit 2 adjacent N 1165733 E 1847334	
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X		Elevation and Datum 571.5 feet MSL	Ground Water Depth 11.1 feet
Sampling Method SPT		Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 16
		Borehole Inclination -90	Logged by R. Ortiz
		Date Started 4/4/06	
		Date Completed 4/5/06	

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT sandy (ML) red (2.5YR 5/8), medium stiff, fine to coarse sand, ~15% sand, apparent relict rock texture, but very weathered. Texture is not continuous throughout, RESIDUUM	Begin drilling on 4/4/06	571
1												570
2												569
3												568
4		SPT 1	13	14.4								567
5												566
6												565
7												564
8												563
9		SPT 2	14	18					ML	SILT sandy (ML), brownish yellow (10YR 6/8), medium stiff, fine to medium sand, ~15 to 20% sand, SAPROLITE		562
10												561
11												560
12												559
13												558
14		SPT 3	12	18					SAA			557
15												556
16												555
17												554
18												553
19		SPT 4	58	12						SAA, very pale brown to brownish yellow (10YR 8/2 to 10 YR 6/8), damp, very stiff, ~30% sand, SAPROLITE		552
20												551
21												550
22												549
23												548
24		SPT 5	713	15.6					SAA; hard			547
25												546
26												545
27												544
28												543
29		SPT 6	813	18						SILT sandy (ML), light olive brown (2.5YR 5/2), damp, very stiff, 15 to 20% sand, SAPROLITE		542
30												541
31												540
32												539
33												538
34		SPT 7	716	18						SILT (ML), dark olive gray (5Y 3/2), damp, hard, very sand <5% (very fine to fine sand), SAPROLITE		537
35												536
36												535
37												534
38												533
39		SPT 8	619	16					ML	SILT (ML), dark olive gray to yellowish brown (5Y 3/2 to 10YR 5/6)	Refusal at 40 ft., see rock log	532
40												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. B-1022	
Type and Diameter of Boring Wash Rotary / NQ core / 5 inch/3 inch		Boring Location Unit 2 adjacent N 1165733 E 1847334		Total Depth 76 feet	
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X		Elevation and Datum 571.5 feet MSL		Ground Water Depth 11.1 feet	
Casing Size and Depth 4 inch / 40 feet		Length of Core Barrel and Bit 13 feet		No. of Core Boxes 3	
		Borehole Inclination -90		Logged by R. Ortiz	
				Date Started 4/4/06	
				Date Completed 4/5/06	

Reviewed by / Date F. Syms 5/25/06

Reviewed by / Date M. Gray 10-22-07



Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
40								META-GRANODIORITE to META-QUARTZ DIORITE; bluish gray (5PB 5/1); massive, fine to medium grained	Tricone refusal at 40 ft, begin NQ core	531
41		9	$\frac{2.0}{3.0}$	42	MW to SW	R3 to R4				530
42										529
43								SAA		528
44								CONTINUOUS ROCK		527
45		10	$\frac{5.0}{5.0}$	91	SW	R4				526
46										525
47										524
48		11	$\frac{0.5}{0.5}$	70	SW	R4			Very hard drilling	523
49								Likely incipient joints along foliation.		522
50		12	$\frac{3.0}{4.5}$	76	SW	R4				521
51										520
52										519
53										518
54								META-QUARTZ DIORITE; bluish gray (10B 5/1), massive; fine to medium grained; weakly foliated (many incipient joints with preferred orientation); some dissolution pits; quartz pegmatite veins show minor offset along healed fractures, calcite and epidote infilling the healed joints	End of day 4/4/06 Start of day 4/5/06 Water level 11.1 ft.	517
55		13	$\frac{5.0}{5.0}$	94	SW	R4				516
56										515
57										514
58										513
59								META-DIORITE; dark greenish gray (5G 4/1); massive; fine grained; weakly foliated, joints break along foliation, calcite is primarily mineralizing along foliation joints and healed incipient fractures		512
60		14	$\frac{5.0}{5.0}$	91	SW	R3 to R4				511
61										510
62										509
63								META-QUARTZ DIORITE; bluish gray (10B 5/1), massive; fine to medium grained; weakly foliated (many incipient joints with preferred orientation); some dissolution pits; quartz pegmatite veins are offset by healed fractures, calcite and epidote are primary mineral within the healed joints		508
64										507
65		15	$\frac{5.0}{5.0}$	100	SW	R4				506
66								META-DIORITE; dark greenish gray (5G 4/1); fine grained; massive; weakly foliated; epidote and calcite are the primary mineral within healed fractures		505
67										504
68										503
69										502
70										501
71										500
72		16	$\frac{8.0}{8.0}$	100	SW	R4				499
73										498
74										497
75								META-DIORITE; SAA	Coring terminated on 4/5/06	496
76										495
77										494
78										493
79								Total Depth 76 ft. Groundwater encountered at 11.1 feet		492
80										

Project Name and Job Number
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ROCK LOG - Boring No. B-1022

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
80								Borehole Grouted On 4/5/06		491
81										490
82										489
83										488
84										487
85										486
86										485
87										484
88										483
89										482
90										481
91										480
92										479
93										478
94										477
95										476
96										475
97										474
98										473
99										472
100										471
101										470
102										469
103										468
104										467
105										466
106										465
107										464
108										463
109										462
110										461
111										460
112										459
113										458
114										457
115										456
116										455
117										454
118										453
119										452
120										

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1023	
Type and Diameter of Boring Wash Rotary / NQ core / 5 inch		Boring Location Unit 2 adjacent N 1165696 E 1847233		Total Depth 75 feet	
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X		Elevation and Datum 571.2 feet MSL		Ground Water Depth 8 feet	
Sampling Method SPT		Sample Driving Hammer/Drop 140 lbs / 30 inches		No. of Samples 6	
		Borehole Inclination -90		Logged by R. Ortiz	
				Date Started 4/10/06	
				Date Completed 4/11/06	

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT, sandy (ML), olive yellow (2.5Y 6/8), damp, medium stiff, ~15% sand, fine sand, RESIDUUM	Begin 4/10/06	571
1												570
2												569
3												568
4		SPT 1	2 4 4	14.4 18								567
5												566
6												565
7												564
8												563
9		SPT 2	2 3 4	14.4 18					SAA			562
10												561
11												560
12												559
13									ML	SILT, sandy (ML), olive yellow to light gray (2.5Y 6/8 to 5Y 7/2), damp, very stiff, ~15 to 20% sand. SAPROLITE		558
14		SPT 3	4 9 10	18								557
15												556
16												555
17												554
18												553
19		SPT 4	7 11 11	12 18						SILT, sandy (ML), light gray, (2.5Y 7/2) to light olive brown (2.5Y 5/4), damp, very stiff ~25 % sand (fine sand), SAPROLITE		552
20												551
21												550
22												549
23												548
24		SPT 5	11 11 26	15.6 18						SILT, sandy (ML), brownish yellow, (10YR 6/8), to light gray (2.5Y 7/2), damp, hard, ~35-40% fine to medium sand. SAPROLITE		547
25												546
26												545
27		SPT 6	50/2	2 2							Refusal at 27 ft, see rock log	544
28												543
29												542
30												541
31												540
32												539
33												538
34												537
35												536
36												535
37												534
38												533
39												532
40												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. B-1023	
Type and Diameter of Boring Wash Rotary / NQ core / 5 inch		Boring Location Unit 2 adjacent N 1165696 E 1847233		Total Depth 75 feet	
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X		Elevation and Datum 571.2 feet MSL	Ground Water Depth 8 feet	Depth to Bedrock 27 feet	
Casing Size and Depth 4 inch / 27 feet		Length of Core Barrel and Bit 13 feet	No. of Core Boxes 3	Date Started 4/10/06	
		Borehole Inclination -90	Logged by R. Ortiz	Date Completed 4/11/06	

Reviewed by / Date F. Syms 5/25/06

Reviewed by / Date M. Gray 10-22-07



Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
27								METAGRANODIORITE; light bluish gray (5PB 8/1) to reddish yellow (7.5YR 6/8); massive; fine to medium grained	NQ rock coring begins 4/10/06	544
28										543
29		7	4.5 5.0	32	MW	R1 to R2				542
30										541
31										540
32								SAA; Light bluish gray (5PB 8/1); very weak foliation expressed as joints; some zones appear to be brecciated and healed		539
33								CONTINUOUS ROCK		538
34		8	5.0 5.0	75	SW	R3				537
35										536
36										535
37								SAA; light bluish gray to bluish gray (5PB 8/1 to 10B 6/1); many healed joints with calcite mineralization and some epidote, some mafic xenoliths randomly distributed.	End of day 4/10/06	534
38									Start of day 4/11/06	533
39		9	4.5 5.0	94	SW	R3			Water level 8 ft.	532
40									Sharpen bit with sand	531
41										530
42								SAA; bluish gray (10B 6/1); massive; fine to coarse grained, very weakly foliated, biotite mineral groups appear to be slightly elongated along foliation, many healed foliation joints and fractures with calcite mineralization, mafic xenoliths (randomly oriented).		529
43										528
44		10	5.0 5.0	98	SW	R3 to R4				527
45										526
46										525
47										524
48										523
49		11	5.0 5.0	94	SW	R3 to R4				522
50										521
51										520
52								SAA; dark bluish gray (10B 4/1); very weakly foliated, some to many mafic xenoliths		519
53										518
54		12	5.0 5.0	75	SW	R3 to R4				517
55										516
56										515
57								SAA; massive to weakly foliated; fine to medium grained; zone of brecciation (healed)		514
58								Numerous mafic xenoliths, many healed to partly healed joints (w/calcite), some dissolution pits along partly healed joints.		513
59		13	4.8 5.0	89	SW	R3				512
60										511
61										510
62								SAA, cut by high angle (80°) meta-diorite dike		509
63		14	2.3 2.5	27	MW to SW	R2 to R3				508
64										507
65		15	2.5 2.5	80	SW	R3		SAA; dark bluish gray (10B 4/1), fine to medium grained; massive to weakly foliated		506
66										505
67										505

Project Name and Job Number
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ROCK LOG - Boring No. B-1023

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
67								SAA; between 67 to 69 ft. highly sheared (mylonitic textures interfingering with fine grained meta-diorite and pegmatitic quartz veins at 70 ft.		504
68								Epidote mineralization increases and appears to be replacing plagioclase within the matrix and calcite healed fracture.		503
69		16	4.9 5.0	90	SW	R3 to R4				502
70										501
71										500
72								META-GRANODIORITE; dark bluish gray with green; fine to medium grained; massive to very weakly foliated; epidote mineralization between 72 and 73.5 ft. Some mafic xenoliths		499
73		17	3.0 3.0	71	SW	R3 to R4				498
74										497
75								META-DIORITE; greenish black (5G 2.5/1); very fine grained; massive; weakly foliated	Coring terminated 4/11/06	496
76										495
77										494
78								Total Depth 75 ft. Groundwater encountered at 8 feet Borehole Grouted On 4/11/06		493
79										492
80										491
81										490
82										489
83										488
84										487
85										486
86										485
87										484
88										483
89										482
90										481
91										480
92										479
93										478
94										477
95										476
96										475
97										474
98										473
99										472
100										471
101										470
102										469
103										468
104										467
105										466
106										465
107										

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. B-1024	
Type and Diameter of Boring NQ / HQ core / 3 inch		Boring Location Unit 2 adjacent N 1166077 E 1846927		Total Depth 220.2 feet	
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X		Elevation and Datum 539.4 feet MSL		Ground Water Depth 13.1 feet	Depth to Bedrock 1 feet
Casing Size and Depth 3 inch / 1 feet		Length of Core Barrel and Bit 7 feet / 12 feet		No. of Core Boxes 17	Date Started 3/13/06
		Borehole Inclination -90		Logged by R. Ortiz	Date Completed 3/20/06

Reviewed by / Date F. Syms 6/6/06

Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
1								META-DIORITE; quartz vein with some epidote mineralization upper 4 inches	Begin NQ 3/13/06	538
2		1	1.6 2.0	0	SW to F	R3 to R4		META-GRANODIORITE; bluish gray (10B 5/1); equigranular	At 3 ft begin HQ	537
3								SAA; numerous quartz veins; weak to moderate fabric; slight foliation		536
4								CONTINUOUS ROCK		535
5		2	5.0 5.0	86	SW to F	R4				534
6										533
7										532
8								SAA; quartz, plagioclase and biotite are the primary minerals; chalcopryite, pyrite, and chlorite are secondary minerals	Hard drilling	531
9										530
10		3	4.0 4.0	83	SW to F	R3 to R4				529
11										528
12		4	1.0 1.0	100	SW to F	R4			Stopped drilling 3/13/06. Resume drilling 3/15/06; Water at 7.33 ft	527
13								Numerous quartz veins and calcite filled discontinuities		526
14		5	1.5 2.0	75	SW to F	R4				525
15								Numerous healed fractures remineralized with quartz and calcite.	100% water loss	524
16		6	3.0 3.0	98	SW to F	R3				523
17										522
18								Numerous incipient fractures with probable dissolution features along fracture margins	Still losing water	521
19										520
20		7	5.0 5.0	83	SW	R3				519
21										518
22										517
23										516
24		8	1.8 2.0	90	SW to F	R4 to R5		Mylonitic fabric, healed	Losing water	515
25										514
26		9	1.5 2.0	80	SW to F	R4				513
27										512
28		10	1.5 2.0	75	SW to F	R3 to R4				511
29								SAA; calcite, chlorite, and quartz are the predominant fracture filling materials; minor pyrite present		510
30										509
31		11	5.0 5.0	96	SW to F	R3 to R4			Losing water	508
32										507
33										506
34								Quartz, calcite, and possible K-spar mineralization along veins	End drilling 3/15/06. Begin drilling 3/16/06; water at 17.67 ft	505
35										504
36		12	4.5 5.0	63	SW	R3			Losing water	503
37										502
38										501
39										500
40									Losing water	499
41										

Project Name and Job Number
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ROCK LOG - Boring No. B-1024

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
41		13	4.8 5.0	76	SW	R3				498
42										497
43										496
44										495
45										494
46		14	4.8 5.0	89	SW to F	R4				493
47										492
48										491
49										490
50		15	2.0 2.0	100	F	R4 to R5				489
51										488
52		16	3.0 3.0	91	F	R5				487
53										486
54										485
55		17	1.5 1.5	100	F	R5			Hard drilling	484
56										483
57		18	2.4 2.5	96	F	R4 to R5				482
58										481
59					F					480
60										479
61		19	6.0 6.0	94		R4 to R5				478
62					SW to F					477
63										476
64										475
65										474
66		20	5.0 5.0	98	F	R4 to R5				473
67										472
68										471
69										470
70									End drilling 3/16/06. Begin drilling 3/17/06 water at 17.4 ft	469
71		21	4.7 5.0	94	SW to F	R4				468
72										467
73										466
74										465
75										464
76		22	5.0 5.0	80	SW to F	R3 to R4				463
77										462
78										461
79										460
80										459
81									Losing water	459

Project Name and Job Number
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ROCK LOG - Boring No. B-1024

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
81		23	$\frac{4.9}{5.0}$	89	F	R4				458
82										457
83										456
84								META-DIORITE; black to dark gray; very fine grained; mafic minerals epidote visible within matrix and along calcite veins, calcite veins randomly oriented to foliation surfaces.	Hard drilling	455
85		24	$\frac{3.0}{3.0}$	87	SW to F	R3 to R4				454
86										453
87										452
88		25	$\frac{2.0}{2.0}$	100	F	R4			Hard drilling	451
89								SAA; Dark gray black to dark green very fine grained, epidote visible, calcite veins follow foliation but also occur randomly 89 to 92.2 ft.	Losing water	450
90										449
91		26	$\frac{5.0}{5.0}$	96	SW to F	R4 to R5				448
92								META-GRANODIORITE, quartz, plagioclase, biotite gneiss, some mafic xenoliths, random calcite veins		447
93										446
94								META-GRANODIORITE; bluish gray (10B 5/1); quartz feldspar with biotite and epidote, incipient fractures mineralized with quartz and minor calcite; large accumulation of quartz and probable feldspar at 96 ft.		445
95										444
96		27	$\frac{4.9}{5.0}$	93	SW to F	R4 to R5			Losing some water	443
97										442
98										441
99										440
100										439
101		28	$\frac{5.0}{5.0}$	100	F	R4 to R5				438
102								META-DIORITE; black to dark gray; very fine grained; mafic mineral; epidote visible within matrix and along calcite veins.		437
103										436
104										435
105									Faster drilling	434
106		29	$\frac{4.7}{5.0}$	94	F	R4 to R5				433
107										432
108										431
109										430
110										429
111		30	$\frac{4.9}{5.0}$	94	F	R4 to R5				428
112										427
113										426
114								SAA; greenish gray to black, many little porphyroblasts, calcite, and epidote from prominent veins along weak foliation; biotite, chlorite		425
115										424
116		31	$\frac{4.8}{5.0}$	96	F	R4 to R5				423
117										422
118										421
119								META-DIORITE; gray to greenish black; very fine grained	End of drilling 3/17/06. Start drilling 3/18/06; water at 13.5 ft	420
120										419
121										

Project Name and Job Number
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ROCK LOG - Boring No. B-1024

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
121		32	$\frac{4.8}{5.0}$	96	F	R4 to R5				418
122										417
123										416
124										415
125								Massive gray to greenish black, matrix equigranular.		414
126		33	$\frac{5.0}{5.0}$	98	F	R4 to R5				413
127										412
128										411
129										410
130										409
131		34	$\frac{4.8}{5.0}$	92	F	R4 to R5				408
132										407
133										406
134										405
135										404
136		35	$\frac{4.9}{5.0}$	88	F	R4				403
137										402
138									Losing water	401
139										400
140										399
141		36	$\frac{4.8}{5.0}$	84	F	R3 to R4		META-GRANODIORITE; bluish gray (10B 5/1); medium to coarse grained; weak to very weak foliation; quartz plagioclase, and biotite; numerous incipient fractures mineralized with calcite, numerous mafic xenoliths	Harder drilling	398
142										397
143								SAA		396
144									End of drilling 3/18/06. Start drilling 3/19/06; water at 15.2 ft	395
145										394
146		37	$\frac{4.9}{5.0}$	77	F	R4 to R5				393
147										392
148										391
149										390
150										389
151		38	$\frac{4.3}{5.0}$	72	SW to F	R4				388
152										387
153										386
154										385
155								Some epidote along margins of quartz veins.	Losing some water	384
156		39	$\frac{4.8}{5.0}$	92	SW to F	R3 to R4				383
157										382
158										381
159										380
160		40	$\frac{2.0}{2.0}$	85	F	R3 to R4				379
161										

Project Name and Job Number
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ROCK LOG - Boring No. B-1024



Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
161		41	$\frac{1.0}{1.0}$	95	F	R3 to R4				378
162			$\frac{2.0}{2.0}$							377
163		42	$\frac{2.0}{2.0}$	100	F	R4				376
164										375
165									Water return	374
166		43	$\frac{4.9}{5.0}$	92	SW to F	R3 to R4				373
167										372
168										371
169										370
170										369
171		44	$\frac{3.9}{4.0}$	89	SW to F	R3 to R4		Quartz pegmatite veins		368
172										367
173										366
174										365
175										364
176		45	$\frac{6.0}{6.0}$	97	SW to F	R4 to R5		META-DIORITE; fine grained; weak foliation plagioclase biotite, hornblende; phenocrysts, minor thin calcite veins along healed incipient fractures.		363
177										362
178										361
179										360
180									End of drilling 3/19/06. Start drilling 3/20/06; water at 13.1 ft	359
181		46	$\frac{4.8}{5.0}$	95	F	R3 to R4		Dark greenish gray; very fine grained; biotite, hornblende, plagioclase gneiss. Epidote and calcite form veins along ~ 60° foliation. Epidote veins up to 0.5 inch wide.		358
182										357
183										356
184										355
185										354
186		47	$\frac{4.8}{5.0}$	96	F	R4 to R5		Plagioclase and epidote rich zone appears to cross the foliation		353
187										352
188										351
189										350
190										349
191		48	$\frac{4.9}{5.0}$	98	F	R4 to R5				348
192										347
193										346
194										345
195										344
196		49	$\frac{4.7}{5.0}$	94	F	R4 to R5			Losing some water	343
197								Numerous calcite veins along foliation		342
198										341
199										340
200								META-GRANODIORITE; plagioclase, quartz, biotite, heavily brecciated in sections that have undergone some		339
201										

Project Name and Job Number
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ROCK LOG - Boring No. B-1024

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
201		50	5.3	100	SW to F	R3 to R4		shearing healed. Numerous random incipient fractures.		338
202			5.3							337
203										336
204										335
205										334
206		51	4.7	100	SW to F	R3 to R4		Quartz pegmatite veins with healed highly brecciated zone		333
207			4.7							332
208										331
209										330
210										329
211		52	4.0	90	SW to F	R4 to R5				328
212			4.0							327
213								2.5 to 3 inch wide quartz vein associated with a zone of healed brecciation	Losing some water	326
214										325
215										324
216										323
217		53	7.2	94	SW to F	R4 to R5		High density of random incipient fractures mineralized with calcite.		322
218			7.2							321
219										320
220									End of drilling 3/20/06, coring terminated	319
221										318
222										317
223								Total Depth 220.2 ft.		316
224								Groundwater encountered at 13.1 feet		315
225								Borehole Grouted On 6/13/06		314
226										313
227										312
228										311
229										310
230										309
231										308
232										307
233										306
234										305
235										304
236										303
237										302
238										301
239										300
240										299
241										

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389										 		SOIL LOG - Boring No. B-1025	
Type and Diameter of Boring Wash Rotary / NQ core / 3.5 inch					Boring Location Unit 1 CT N 1165263 E 1845471			Total Depth 52 feet					
Drilling Contractor and Rig MACTEC/White/331145 / CME 55					Elevation and Datum 609.7 feet MSL		Ground Water Depth N/A		Depth to Bedrock 28.5 feet				
Sampling Method SPT					Sample Driving Hammer/Drop 140 lbs / 30 inches		No. of Samples 5		Date Started 4/12/06				
					Borehole Inclination -90		Logged by M. Angell/G. Maximov		Date Completed 4/13/06				

Reviewed by / Date <u>F. Syms 5/24/06</u>											
Reviewed by / Date <u>C. Lane 10-27-07</u>											
Lithology										Remarks	
Depth (feet)										Elevation (feet)	
0	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)		
1									ML	SILT, sandy with gravel (ML); light yellowish gray, moist, stiff to very stiff, 30% sand and gravel. FILL	
2											
3											
4	SPT 1		5	16.8						SILT sandy (ML), reddish brown (with light yellow streaks), moist, stiff, 30% sand, FILL	
5											
6											
7											
8											
9	SPT 2		3	16.8						SILT sandy (ML) little to no gravel, light yellowish brown (10YR 6/4), moist, stiff, 2% gravel, 19% sand, 80% fines; FILL	
10			7							SILT sandy (ML)	
11										At 9.4' color becomes yellowish brown (10YR 5/4).	
12											
13											
14	SPT 3		4	15.6						SILT, sandy (ML) with minor gravel, light yellowish brown (10YR 6/4), moist, stiff. FILL	
15			5								
16											
17											
18											
19	SPT 4		6	18					ML	SILT sandy (ML), greenish gray (10Y 6/1), moist, very stiff, 30% very fine sand. SAPROLITE	
20			12								
21											
22											
23											
24	SPT 5		45						SM	SAND silty (SM), light gray (N 7), moist. PARTIALLY WEATHERED ROCK	
25			50/3.5	9.5							
26											
27											
28										Refusal at 28.5 ft, see rock log	
29	SPT 6		60/1	0							
30				1							
31											
32											
33											
34											
35											
36											
37											
38											
39											
40											

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. B-1025	
Type and Diameter of Boring Wash Rotary / NQ core / 3.5 inch		Boring Location Unit 1 CT N 1165263 E 1845471		Total Depth 52 feet	
Drilling Contractor and Rig MACTEC/White/331145 / CME 55		Elevation and Datum 609.7 feet MSL	Ground Water Depth N/A	Depth to Bedrock 28.5 feet	
Casing Size and Depth none		Length of Core Barrel and Bit 5 feet	No. of Core Boxes 1	Date Started 4/12/06	
		Borehole Inclination -90	Logged by M. Angell/G. Maximov	Date Completed 4/13/06	

Reviewed by / Date F. Syms 5/24/06

Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
29								META-GRANODIORITE; light bluish gray (10B 7.5/1); medium grained, equigranular, foliation at ~45°	Begin NQ core	581
30		1	$\frac{2.1}{3.5}$	41	MW	R1				580
31										579
32										578
33										577
34		2	$\frac{3.2}{5.0}$	50	MW	R1				576
35										575
36										574
37										573
38										572
39		3	$\frac{3.8}{5.0}$	50						571
40										570
41										569
42										568
43					MW	R5		META QUARTZITE; light bluish gray (10B 7/1), microcrystalline, pitted		567
44		4	$\frac{1.5}{5.0}$	11	SW	R3 to R4		METAGNANODIORITE; light bluish gray (10B 7/1), medium grained, equigranular		566
45										565
46										564
47										563
48					SW to F	R4		SAA, migmatitic texture CONTINUOUS ROCK	End drilling 4/12/06 Begin drilling 4/13/06	562
49		5	$\frac{4.6}{5.0}$	90						561
50					F	R4 to R5		METADIORITE; bluish gray (5PB 5.5/1); medium grained, equigranular, very clear foliation at 30 to 40°		560
51										559
52									Coring terminated at 52 ft on 4/13/06	558
53										557
54										556
55										555
56										554
57										553
58										552
59										551
60										550
61										549
62										548
63										547
64										546
65										545
66										544
67										543
68										542

Project Name and Job Number Lee Nuclear Station COL MACTEC WLA 6234-06-3389					SOIL LOG - Boring No. B-1025-UD						
Type and Diameter of Boring Wash Rotary / Tricone 3 inch					Boring Location Unit 1 CT N 1165268 E 1845470			Total Depth 21 feet			
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75					Elevation and Datum 609.7 feet MSL		Ground Water Depth N/A		Depth to Bedrock N/A		
Sampling Method Undisturbed					Sample Driving Hammer/Drop NA / NA			No. of Samples 4		Date Started 5/27/06	
					Borehole Inclination -90			Logged by J. Cerceo		Date Completed 5/27/06	

Reviewed by / Date B. Reinicker 5/30/06

Reviewed by / Date C. Lane 10-27-07

Elevation (feet)

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0												609
1											Drilled without sampling to 4 ft. Refer to B-1025 for log material descriptions and unit assignments	608
2												607
3												606
4											Shelby push 4 to 6 ft.	605
5		UD 1		20.4/24					ML	SILT (ML)		604
6											Drilled without sampling to 8 ft.	603
7												602
8											Shelby push 8 to 10 ft.	601
9		UD 2		22/24	●	●	●		ML	SILT sandy (ML); 2% gravel, 19% sand, 61% fines		600
10											Drilled without sampling to 12 ft	599
11												598
12											Shelby push 12 to 14 ft	597
13		UD 3		25/24					ML	SILT (ML)		596
14											Drilled without sampling to 20 ft.	595
15												594
16												593
17												592
18												591
19												590
20											Shelby push 20 to 21 ft	589
21		UD 4		22.8/12	●	●	●		SP-SM	SAND silty (SP-SM); 7% gravel, 87% sand, 6% fines	Shelby tube refusal at 21 ft	588
22												587
23												586
24												585
25												584
26												583
27												582
28												581
29												580
30												579
31												578
32												577
33												576
34												575
35												574
36												573
37												572
38												571
39												570
40												570

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389



SOIL LOG - Boring No. B-1026

Type and Diameter of Boring Hollow stem auger / 8 inch	Boring Location Unit 1 CT N 1164883 E 1845089	Total Depth 99.9 feet
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75	Elevation and Datum 610.2 feet MSL	Ground Water Depth N/A
Sampling Method Dry auger	Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 20
	Borehole Inclination -90	Logged by J. Cerceo
		Date Started 4/12/06
		Date Completed 4/13/06

Reviewed by / Date F. Syms 5/24/06

Reviewed by / Date CES 11/4/2009

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT, sandy (ML), strong brown, gravel covered with grass, FILL	Start drilling on 4/12/06	610
1									ML	SILT, sandy (ML), brown (7.5YR 4/3), dry, very stiff fine sand, rock fragments, clayey fill deposits, non plastic trace roots. FILL		609
2												608
3												607
4	SPT 1	6	18	11	●							606
5												605
6												604
7												603
8												602
9	SPT 2	7	18	12	●					SAA, red (2.5YR 4/6); 24% sand, 1% gravel, 75% fines. FILL	Classification based on B-1026-UD UD-1 at 9 to 11 ft	601
10												600
11												599
12												598
13												597
14	SPT 3	5	15	10	●	●				SAA, light brown (7.5YR 6/3) 26% sand, 4% gravel, 70% fines. FILL		596
15												595
16												594
17												593
18												592
19	SPT 4	10	12	19	●	●	●		SM	SAND silty with gravel (SM); 47% sand, 9% gravel, 44% fines. FILL		591
20												590
21												589
22												588
23												587
24	SPT 5	6	18	13	●							586
25												585
26												584
27												583
28												582
29	SPT 6	6	18	13	●							581
30												580
31												579
32												578
33												577
34	SPT 7	2	11	6	●				ML	SILT, sandy (ML), dark red (2.5YR 3/6), dry, stiff, low plasticity, trace rock fragments, trace roots. 28% sand, 73% fines. FILL	End day 4/12/06 Begin day 4/13/06, no water at 33.5 feet	576
35												575
36									ML	SILT, sandy (ML), strong brown (7.5YR 5/8), wet, stiff, micaceous, low plasticity. SAPROLITE	Classification based on B-1026-UD UD-3 at 34 to 36 ft	574
37												573
38											Very hard drilling at 35.7 feet	572
39	SPT 8	1	18	7	●							571
40												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389



SOIL LOG - Boring No. B-1026

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40									ML			570
41												569
42												568
43												567
44	SPT 9	2 4 7	18 18	●						SILT, sandy (ML); 35% sand, 65% fines		566
45											Classification based on B-1026-UD UD-5 at 45 to 47 ft	565
46										SILT sandy (ML); 35% sand, 65% fines		564
47												563
48												562
49	SPT 10	2 4 6	18 18							SAA; nonplastic		561
50												560
51												559
52												558
53												557
54	SPT 11	3 6 10	18 18	●	●					SAA; very stiff, very micaceous; 42% sand, 58% fines. SAPROLITE		556
55												555
56												554
57												553
58												552
59	SPT 12	3 7 9	18 18									551
60												550
61												549
62												548
63												547
64	SPT 13	4 9 13	18 18	●	●					SILT, sandy (ML); 42% sand, 58% fines		546
65												545
66												544
67									▼			543
68												542
69	SPT 14	5 8 12	18 18	●						SILT, sandy (ML); strong brown with black (N 2.5) seams or veins, wet, very stiff, micaceous to very micaceous, nonplastic, 15% to 20 % fine sand. SAPROLITE		541
70												540
71												539
72												538
73									SM	SAND, silty (SM); strong brown with black; medium dense, 54% sand, 46% fines. SAPROLITE	Harder drilling at 72.2 feet	537
74	SPT 15	4 8 13	18 18	●	●							536
75												535
76												534
77												533
78												532
79	SPT 16	6 12 18	18 18	●						SAA; wet, non plastic, very micaceous		531
80												

Project Name and Job Number



Lee Nuclear Station COL

6234-06-3389



SOIL LOG - Boring No. B-1026

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
80									SM			530
81												529
82												528
83												527
84	SPT 17	8 18 34	18 18	●	●				ML	SILT, sandy (ML); 48% sand, 52% fines		526
85												525
86												524
87									SM	SAND, silty (SM); yellowish brown (10YR 5/6) and dark olive gray (5Y 3/2), very dense, wet, fine sand <10% silt. SAPROLITE		523
88												522
89	SPT 18	27 31 36	18 18	●								521
90												520
91												519
92												518
93												517
94	SPT 19	14 26 34	18 18							SAA, brown (7.5YR 5/3) with pinkish white (7.5YR 8/2)		516
95												515
96												514
97												513
98												512
99	SPT 20	24 31 50/5	18 17						SM	SAND, silty (SM), brown (7.5YR 5/3), wet, very dense, micaceous, fine sand, <10% silt PARTIALLY WEATHERED ROCK	Boring terminated at 99.9 ft on 4/13/06; water at 67 ft	511
100												510
101												509
102												508
103										Total Depth 99.9 ft. Groundwater encountered at 67 feet Borehole Grouted On 4/17/06		507
104												506
105												505
106												504
107												503
108												502
109												501
110												500
111												499
112												498
113												497
114												496
115												495
116												494
117												493
118												492
119												491
120												



Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. B-1026	
Type and Diameter of Boring Hollow stem auger / 8 inch		Boring Location Unit 1 CT N 1164883 E 1845089		Total Depth 99.9 feet	
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75		Elevation and Datum 610.2 feet MSL		Ground Water Depth 67 feet	
Casing Size and Depth		Length of Core Barrel and Bit		No. of Core Boxes N/A	
		Borehole Inclination -90		Logged by J. Cerceo	
				Date Started 4/12/06	
				Date Completed 4/13/06	

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
100										510
101										509
102										508
103										507
104										506
105										505
106										504
107										503
108										502
109										501
110										500
111										499
112										498
113										497
114										496
115										495
116										494
117										493
118										492
119										491
120										490
121										489
122										488
123										487
124										486
125										485
126										484
127										483
128										482
129										481
130										480
131										479
132										478
133										477
134										476
135										475
136										474
137										473
138										472
139										471

Total Depth 99.9 ft.
 Groundwater encountered at 67 feet
 Borehole Grouted On 4/17/06

Reviewed by / Date F. Syms 5/24/06

Reviewed by / Date M. Gray 10-22-07

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1026-UD	
Type and Diameter of Boring Wash Rotary / 3 inch		Boring Location Unit 1 CT N 1164870 E 1845091		Total Depth 47 feet	
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75		Elevation and Datum 609.9 feet MSL		Ground Water Depth N/A	
Sampling Method Undisturbed		Sample Driving Hammer/Drop NA / NA		No. of Samples 5	
		Borehole Inclination -90		Logged by J. Cerceo	
				Date Started 5/28/06	
				Date Completed 5/28/06	



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0												
1											Drilled without sampling to 8 ft. Refer to B-1026 log for material description and unit assignments.	609
2												608
3												607
4												606
5												605
6												604
7												603
8												602
9												601
10		UD 1		21.6/24	●	●	●		ML	SILT, sandy (ML); 24% sand, 1% gravel, 75% fines	Shelby push 9 to 11 ft.	600
11											Drilled without sampling to 12 ft.	599
12											Shelby push 12 to 14 ft.	598
13		UD 2		18.5/24	●	●	●		ML	SILT, sandy (ML); 2% gravel, 23% sand, 76% fines		597
14											Drilled without sampling to 34 ft.	596
15												595
16												594
17												593
18												592
19												591
20												590
21												589
22												588
23												587
24												586
25												585
26												584
27												583
28												582
29												581
30												580
31												579
32												578
33												577
34											Shelby push 34 to 36 ft.	576
35		UD 3		27/24	●	●	●		ML	SILT, sandy (ML); 28% sand, 73% fines		575
36											Drilled without sampling to 40 ft.	574
37												573
38												572
39												571
40												570

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389





SOIL LOG - Boring No. B-1026-UD

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40												
41	UD 4			27.25 24	●				ML	SILT (ML)	Shelby push 40 to 42 ft.	569
42											Drilled without sampling to 45 ft.	568
43												567
44												566
45												565
46	UD 5			27 24	●	●	●		ML	SILT, sandy (ML); 35% sand, 65% fines	Shelby push 45 to 47 ft. Boring terminated at 47 ft	564
47												563
48												562
49												561
50												560
51												559
52												558
53												557
54												556
55												555
56												554
57												553
58												552
59												551
60												550
61												549
62												548
63												547
64												546
65												545
66												544
67												543
68												542
69												541
70												540
71												539
72												538
73												537
74												536
75												535
76												534
77												533
78												532
79												531
80												530

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1027	
Type and Diameter of Boring Wash Rotary / NQ core / 3 inch		Boring Location Unit 1 CT N 1165384 E 1845448		Total Depth 50 feet	
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75		Elevation and Datum 609.7 feet MSL		Ground Water Depth 8 feet	
Sampling Method SPT		Sample Driving Hammer/Drop 140 lbs / 30 inches		No. of Samples 6	
		Borehole Inclination -90		Logged by J. Cerceo	
				Date Started 4/13/06	
				Date Completed 4/14/06	



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0												
1									ML	Grass over a gravel mat, sand with silt	Begin 4/13/06	609
2										SILT sandy (ML), red (10R 4/6), rock fragment, non plastic. FILL		608
3												607
4		SPT 1	6	18								606
5			8	18								605
6												604
7												603
8												602
9		SPT 2	4	15						SAA; yellowish red (5YR 4/6)		601
10			8	18								600
11												599
12												598
13												597
14		SPT 3	3	14						SAA		596
15			8	18								595
16			12									594
17												593
18									SM	SAND silty (SM), light bluish gray (10B 8/1) and (10B 7/1) with black (N 2.5) seams, fine sand, shows distinct rock texture, SAPROLITE/PARTIALLY WEATHERED ROCK	Very hard drilling at approximately 16.5 ft	592
19		SPT 4	25	12								591
20			50/6	12								590
21												589
22									SM	SAND gravelly (SP), light bluish gray (10B 8/1), very dense, quartz gravel and sand, subangular fine to coarse sand. PARTIALLY WEATHERED ROCK		588
23												587
24		SPT 5	50/6	6							End 4/13/06 Start 4/14/06; water at 8 ft	586
25				6								585
26												584
27												583
28											Refusal at 28.8 ft, see rock log	582
29		SPT 6	50/4	4						Drill refusal, refer to rock log		581
30				4								580
31												579
32												578
33												577
34												576
35												575
36												574
37												573
38												572
39												571
40												570

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. B-1027	
Type and Diameter of Boring Wash Rotary / NQ core / 3 inch		Boring Location Unit 1 CT N 1165384 E 1845448		Total Depth 50 feet	
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75		Elevation and Datum 609.7 feet MSL	Ground Water Depth 8 feet	Depth to Bedrock 31.6 feet	
Casing Size and Depth 3 inch / 13 feet		Length of Core Barrel and Bit 13.1 feet	No. of Core Boxes 2	Date Started 4/13/06	
		Borehole Inclination -90	Logged by J. Cerceo	Date Completed 4/14/06	

Reviewed by / Date F. Syms 5/26/06

Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
29										
30		7	2.7 5.0	0	CW	R0 to R1		SAND, gravelly (SP), light bluish gray (10B 8/1), very dense, quartz gravel and sand, subangular fine to coarse sand. PARTIALLY WEATHERED ROCK	Begin NQ rock coring	580
31										579
32					HW	R3		QUARTZITE; light bluish gray (5PB 7/1); pyrite and dendritic manganese oxide formation along fracture surfaces.		578
33					CW	R1				577
34								META-GRANODIORITE; light bluish gray; foliation dipping 35 to 60°; very thinly laminated		576
35		8	4.2 4.6	41	MW	R2		Quartz dike at 36.3 to 37.3 ft.		575
36					MW to SW	R3 to R4				574
37					MW	R3				573
38										572
39										571
40		9	4.0 4.0	56	MW	R3				570
41										569
42										568
43		10	1.6 1.6	37	MW	R3		META-GRANODIORITE to SCHIST; light bluish gray; fine to medium grained; strongly foliated. (40 to 60° dip)		567
44										566
45								Dissolution pits and iron oxide stains throughout sample.	Losing ~50% water	565
46										564
47		11	3.7 6.0	51	MW	R3				563
48										562
49										561
50									Coring terminated at 50 ft on 4/14/06	560
51										559
52										558
53								Total Depth 50 ft.		557
54								Groundwater encountered at 8 feet		556
55								Borehole Grouted On 4/14/06		555
56										554
57										553
58										552
59										551
60										550
61										549
62										548
63										547
64										546
65										545
66										544
67										543
68										542

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1028	
Type and Diameter of Boring Wash Rotary / 3 inch		Boring Location Unit 2 CT N 1166140 E 1848027		Total Depth 103.55 feet	
Drilling Contractor and Rig MACTEC/White/331145 / CME 55 LC		Elevation and Datum 609.8 feet MSL		Ground Water Depth N/A	
Sampling Method SPT		Sample Driving Hammer/Drop 140 lbs / 30 inches		No. of Samples 21	
		Borehole Inclination -90		Logged by R. Ortiz	
				Date Started 3/7/06	
				Date Completed 3/8/06	

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML		Begin drilling 3/7/06	609
1											Fill	608
2												607
3												606
4	SPT 1	3	18	18	●	●				SILT sandy with gravel (ML), yellowish red (5YR 5/6), damp, medium stiff, 56% fines, 37% sand, 7% gravel. FILL		605
5												604
6												603
7												602
8												601
9	SPT 2	3	14	18	●					SILT sandy (ML), reddish brown (5YR 4/4), damp, stiff ~15% sand. FILL		600
10												599
11												598
12												597
13												596
14	SPT 3	7	10	18	●	●	●			SILT sandy with gravel (ML), yellowish red (5YR 4/6), very stiff; 36% sand; 3% gravel, 61% fines; FILL		595
15												594
16												593
17											Hard bouncing drilling	592
18												591
19	SPT 4	5	18	18	●					SILT sandy (ML), red to strong brown (2.5YR 4/8 to 7.5YR 5/6), damp, very stiff, ~30% sand, fine sand. FILL		590
20												589
21												588
22												587
23												586
24	SPT 5	5	15	18	●					SILT sandy (ML), red (2.5YR 4/8), damp, stiff to very stiff, fine to coarse sand, 1% gravel, 32% sand, 67% fines. FILL	Classification based on B-1028-UD, UD-2 at 24 to 26 ft	585
25												584
26												583
27												582
28												581
29	SPT 6	13	0	18						NO SAMPLE RECOVERED		580
30												579
31												578
32												577
33												576
34	SPT 7	8	6	18	●	●				SILT sandy (ML), red (2.5YR 5/6), damp, very stiff, 35% sand, 65% fines, slightly sticky, slightly plastic. FILL		575
35												574
36												573
37											Classification based on B-1028-UD, UD-3 at 39 to 41 ft	572
38												571
39	SPT 8	4	17	18	●					SILT sandy (ML), red (2.5YR 4/8) 43% sand, 57% fines. FILL		570
40												570

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SOIL LOG - Boring No. B-1028



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40											End of day 3/7/06	569
41											Begin drilling on 3/8/06	568
42												567
43												566
44	/	SPT 9	5 9	14 18	●					SILT, sandy (ML); reddish brown (5YR 4/4), damp, stiff to very stiff, >30% sand. FILL		565
45												564
46												563
47												562
48												561
49	/	SPT 10	6 7 10	17 18	●	●				SILT sandy (ML), light olive brown (2.5Y 5/3), damp, very stiff, 30% sand, 70% fines. FILL		560
50												559
51												558
52												557
53												556
54	/	SPT 11	6 11 10	15 18	●					SILT sandy, clayey (ML), red (2.5YR 4/6), damp, very stiff, ~30% sand, minor clay. FILL		555
55												554
56												553
57												552
58												551
59	/	SPT 12	7 10 13	15 18	●	●				SILT, sandy (ML); red (2.5YR 4/6); very stiff; 33% sand; 2% gravel, 65% fines. FILL		550
60												549
61												548
62												547
63												546
64	/	SPT 13	5 9 12	18 18	●					SILT sandy (ML), red (10R 4/6), damp, very stiff, ~20% sand, fine sand, FILL		545
65												544
66												543
67												542
68									ML	SILT sandy, clayey (ML), light greenish gray (5G 8/1), damp, medium stiff, 36% sand, 64% fines, ALLUVIUM		541
69	/	SPT 14	8 7 8	16 18	●	●						540
70												539
71												538
72												537
73											Switched from roller cone to wing bit	536
74	/	SPT 15	4 30 11	9.5 18	●					SILT clayey with sand (ML), light greenish gray (5G 8/1) to brownish yellow (10YR 6/8), damp, hard, ~30% sand. ALLUVIUM		535
75												534
76									SM	SAND silty (SM), light brownish gray (10YR 6/2), moist, loose, 54% sand, 47% fines. RESIDUUM		533
77												532
78											Classification based on B-1028-UD, UD-6 at 79 to 81 ft	531
79	/	SPT 16	2 2 5	18 18	●							530
80												

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SOIL LOG - Boring No. B-1028

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
80									SM			529
81												528
82												527
83												526
84	SPT 17	7 11 12	18 18	●						SAA, pale brown (10YR 6/3); very stiff. RESIDUUM		525
85												524
86												523
87												522
88												521
89	SPT 18	6 8 14	9.5 18	●						SAA; pale yellow (2.5Y 7/4); moist; very stiff; ~30% sand. RESIDUUM		520
90												519
91												518
92												517
93												516
94	SPT 19	3 4 9	15 18	●					SM	SAND, silty (SM); yellow (10YR 8/8), moist, medium dense, fine to medium sand. SAPROLITE 58% sand, 42% fines	Classification based on B-1028-UD, UD-7 at 94 to 94.6 ft	515
95												514
96												513
97												512
98												511
99	SPT 20	19 50/2	7 8	●	●				SM	SAND silty (SM), yellow (2.5Y 7/8), moist, 62% sand, 35% fines; 3% gravel; PARTIALLY WEATHERED ROCK		510
100												509
101												508
102												507
103												506
104	SPT 21	60/0.5	0 0.5							NO SAMPLE RECOVERED. PARTIALLY WEATHERED ROCK.	Boring terminated on 3/8/06 at 103.55 ft	505
105												504
106												503
107												502
108												501
109												500
110												499
111												498
112												497
113												496
114												495
115												494
116												493
117												492
118												491
119												490
120												490

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1028-UD	
Type and Diameter of Boring Wash Rotary / 4 inch		Boring Location Unit 2 CT N 1166150 E 1848024		Total Depth 94.6 feet	
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X		Elevation and Datum 609.9 feet MSL		Ground Water Depth N/A	
Sampling Method Undisturbed		Sample Driving Hammer/Drop NA / NA		No. of Samples 7	
		Borehole Inclination -90		Logged by J. Cerceo	
				Date Started 6/8/06	
				Date Completed 6/9/06	

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0												
1												609
2												608
3												607
4												606
5		UD 1		27.6 26.75					ML	SILT, sandy (ML)	Offset 8.5 ft from B-1028. Begin 6/8/06 Drilled without sampling to 4 ft. Refer to B-1028 log for material descriptions and unit assignments. Shelby push 4 to 6.3 ft.	605
6												604
7											Drilled without sampling to 24 ft.	603
8												602
9												601
10												600
11												599
12												598
13												597
14												596
15												595
16												594
17												593
18												592
19												591
20												590
21												589
22												588
23												587
24												586
25		UD 2		18.6 24	●	●	●		ML	SILT, sandy (ML); 1% gravel, 32% sand, 68% fines	Shelby push 24 to 26 ft	585
26												584
27											Drilled without sampling to 39 ft.	583
28											End 6/8/06	582
29											Start 6/9/06	581
30												580
31												579
32												578
33												577
34												576
35												575
36												574
37												573
38												572
39												571
40		UD		25						Description provided on following page.	Shelby push 39 to 41.1 ft	570

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SOIL LOG - Boring No. B-1028-UD



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40		3		25	●	●	●		ML	SILT, sandy (ML); 43% sand, 57% fines		569
41											Drilled without sampling to 64 ft	568
42												567
43												566
44												565
45												564
46												563
47												562
48												561
49												560
50												559
51												558
52												557
53												556
54												555
55												554
56												553
57												552
58												551
59												550
60												549
61												548
62												547
63												546
64											Shelby push 64 to 66 ft	545
65	UD 4		22.2 24						ML	SILT, sandy (ML)		544
66											Drilled without sampling to 69 ft.	543
67												542
68												541
69											Shelby push 69 to 71 ft	540
70	UD 5		24.6 24						ML	SILT, sandy, clayey (ML)		539
71											Drilled without sampling to 79 ft	538
72												537
73												536
74												535
75												534
76												533
77												532
78												531
79											Shelby push 79 to 81 ft.	530
80	UD		26.4							Description provided on following page.		

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SOIL LOG - Boring No. B-1028-UD

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
80		6		24	●	●	●		SM	SAND, silty (SM); 47% fines, 54% sand		529
81											Drilled without sampling to 94 ft.	528
82												527
83												526
84												525
85												524
86												523
87												522
88												521
89												520
90												519
91												518
92												517
93												516
94		UD 7		7	●	●	●		SM	SAND, silty (SM) 42% fines, 58% sand	Shelby push 94 to 94.6 ft	515
95											Shelby push refusal, boring terminated on 6/9/06	514
96												513
97												512
98												511
99												510
100												509
101												508
102												507
103												506
104												505
105												504
106												503
107												502
108												501
109												500
110												499
111												498
112												497
113												496
114												495
115												494
116												493
117												492
118												491
119												490
120												490

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1029	
Type and Diameter of Boring Hollow stem auger / 8 inch		Boring Location Unit 2 CT N 1165581 E 1848117		Total Depth 99.25 feet	
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75		Elevation and Datum 609.8 feet MSL		Ground Water Depth 49.3 feet	
Sampling Method SPT		Sample Driving Hammer/Drop 140 lbs / 30 inches		No. of Samples 20	
		Borehole Inclination -90		Logged by J. Cerceo	
				Date Started 4/11/06	
				Date Completed 4/12/06	

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0												
1												609
2												608
3												607
4	SPT 1	23 11 8	3 18							GRAVEL (GP) with grass	Begin 4/11/06	606
5												605
6												604
7												603
8												602
9	SPT 2	3 6 9	3 18							SILT sandy (ML), red (2.5YR 4/6), dry, very stiff, fine to medium sand, fine gravel, low to non plastic. FILL		601
10												600
11												599
12												598
13												597
14	SPT 3	1 5 8	14 18							SAA		596
15												595
16												594
17												593
18												592
19	SPT 4	4 8 13	16 18							SAA; 30% sand, 2% gravel, 68% fines. FILL		591
20												590
21												589
22												588
23												587
24	SPT 5	2 8 10	12 18							SAA; clayey fill deposits. FILL		586
25												585
26												584
27												583
28												582
29	SPT 6	3 5 9	18 18							SAA; 34% sand; 1% gravel, 65% fines. FILL		581
30												580
31												579
32												578
33												577
34	SPT 7	3 6 10	15 18							SILT sandy (ML), strong brown (7.5YR 5/6), dry, fine sand, non plastic. FILL		576
35												575
36												574
37												573
38												572
39	SPT 8	11 12 17	2 18							SAA; 32% sand, 68% fines. FILL		571
40												570

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SOIL LOG - Boring No. B-1029



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40												569
41												568
42												567
43												566
44	SPT 9	9	11	18								565
45												564
46												563
47												562
48												561
49	SPT 10	5	13	18	●	●		∇		SILT, sandy with clay (ML), red (10R 4/8), dry, very stiff, 39% sand, 61% fines, quartzite fragments. FILL		560
50												559
51												558
52												557
53												556
54	SPT 11	4	6	18					ML	SILT, sandy (ML), light red (2.5YR 6/6) damp, very stiff, mottled, micaceous, fine to medium sand. RESIDUUM		555
55												554
56												553
57												552
58												551
59	SPT 12	3	9	18	●	●				SAA; moist; 46% sand, 54% fines	Groundwater first encountered during drilling at 59 ft	550
60												549
61												548
62												547
63												546
64	SPT 13	7	13	18						SAA; wet, hard, laminated banding		545
65												544
66												543
67												542
68												541
69	SPT 14	9	13	16	●	●				SAA; yellow (10YR 7/6), very pale brown (10YR 7/4), wet, coarse quartz fragments, very stiff; 40% sand, 60% fines. FILL		540
70												539
71												538
72												537
73												536
74	SPT 15	3	9	18						SAA; very dark brown veins, wet, fine to coarse subrounded sand. FILL		535
75												534
76												533
77												532
78												531
79	SPT 16	4	10	18								530
80												530

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SOIL LOG - Boring No. B-1029

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
80												529
81												528
82												527
83												526
84		SPT 17	5 12 18	14 18							End 4/11/06	525
85											Begin 4/12/06; water at 49.3 ft	524
86											Stiffer drilling	523
87												522
88												521
89		SPT 18	14 19 26	17 18					SM	SAND, silty (SM), brownish yellow (10YR 6/8) and very pale brown (10YR 8/3); wet, dense, <10% silt, fine to medium sand, micaceous. SAPROLITE		520
90												519
91												518
92									SM	SAND, silty (SM); mottled, very pale brown (10YR 8/3), brownish yellow (10YR 6/8), and very dark brown (10YR 2/2); wet, very dense, fine to medium sand, micaceous, PARTIALLY WEATHERED ROCK	Very hard drilling	517
93											Partially weathered rock	516
94		SPT 19	32 50/6	9 12								515
95												514
96												513
97												512
98												511
99		SPT 20	45 50/3	9 9						SAND silty (SM) PARTIALLY WEATHERED ROCK/SAPROLITE	Boring terminated on 4/12/06	510
100												509
101												508
102										Total Depth 99.25 ft. Groundwater encountered at 49.3 feet Borehole Grouted On 4/12/06		507
103												506
104												505
105												504
106												503
107												502
108												501
109												500
110												499
111												498
112												497
113												496
114												495
115												494
116												493
117												492
118												491
119												490
120												490

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1030	
Type and Diameter of Boring Wash Rotary / Tricone 3 7/8 inch		Boring Location Unit 2 CT N 1165963 E 1848403		Total Depth 98.8 feet	
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850		Elevation and Datum 609.7 feet MSL		Ground Water Depth N/A	
Sampling Method SPT		Sample Driving Hammer/Drop 140 lbs / 30 inches		No. of Samples 20	
		Borehole Inclination -90		Logged by J. Martin	
				Date Started 4/11/06	
				Date Completed 4/12/06	

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT slightly sandy, clayey (ML); yellowish-red (5YR 4/6), damp, stiff, low plasticity, micaceous. FILL	Begin 4/11/06	609
1												608
2												607
3												606
4		SPT 1	4 5	18 18								605
5												604
6												603
7												602
8												601
9		SPT 2	4 24	8.4 18	●	●			SM	SAND, silty with gravel (SM); mottled, yellowish-red (5YR 4/6) and reddish-yellow (5YR 7/8), damp, dense, non-plastic with large angular gravel 9.5 ft, micaceous; 21% gravel, 41% sand, 38% fines. FILL		600
10												599
11												598
12												597
13												596
14		SPT 3	4 6	12 18					ML	SILT, sandy (ML) trace clay, reddish-brown (2.5YR 4/4); moist, damp, stiff, non-plastic, small sub-angular gravel, micaceous. FILL		595
15												594
16												593
17												592
18												591
19		SPT 4	5 8	7.2 18	●	●				SILT (ML), low to non-plasticity, micaceous; 3% gravel, 43% sand, 54% fines. FILL		590
20												589
21												588
22												587
23												586
24		SPT 5	5 9	18 18						SAA, red (2.5YR 4/6); slight increase in clay content, low plasticity, micaceous. FILL		585
25												584
26												583
27												582
28												581
29		SPT 6	5 6	14.4 18						SILT slightly sandy, clayey (ML) strong brown (7.5YR 5/6), moist, stiff, low-plasticity, abundant small weathered gravels, micaceous. FILL		580
30												579
31												578
32												577
33												576
34		SPT 7	4 8	15.6 18	●	●				SILT sandy with gravel (ML) trace clay, primarily red (2.5YR 4/6) with various other weathered colors staining, moist, stiff, no to low plasticity except in some lenses of greater clay content with low to mid plasticity, micaceous; 2% gravel, 30% sand, 68% fines. FILL		575
35												574
36												573
37												572
38												571
39		SPT 8	4 13	14.4 18						SAA, only becoming very stiff at 38.2 ft. FILL		570
40												570

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SOIL LOG - Boring No. B-1030



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40												569
41												568
42												567
43												566
44	/	SPT 9	6 12	15.6 18	●	●				SILT sandy, clayey (ML) reddish brown (5YR 4/4); moist, very stiff, non-plastic, micaceous, 40% sand, 60% fines. FILL		565
45												564
46												563
47												562
48												561
49	/	SPT 10	5 8 12	15.6 18						SAA		560
50												559
51												558
52												557
53												556
54	/	SPT 11	5 7 10	15.6 18	●	●				SILT, sandy, trace clay (ML) reddish-brown (5YR 4/4); moist, very stiff, low to non-plastic, micaceous; 40% sand, 1% gravel, 59% fines. FILL		555
55												554
56												553
57												552
58												551
59	/	SPT 12	9 13 17	18 18						SILT, slightly sandy, clayey (ML); yellowish-red (5YR 4/6), damp, very stiff, low to medium plasticity, micaceous. FILL		550
60												549
61												548
62												547
63												546
64	/	SPT 13	3 6 6	18 18					ML	SILT, slightly sandy, clayey (ML); mottled, red (2.5YR 4/8) and reddish-yellow (7.5YR 6/6), damp to moist, stiff, low-plasticity. RESIDUUM	End 4/11/06 Start 4/12/06	545
65												544
66												543
67												542
68												541
69	/	SPT 14	2 3 4	18 18					ML	SILT (ML), yellowish-brown (10YR 5/6), moist to wet, medium stiff, non-plastic, micaceous, manganese oxide and iron oxide staining. SAPROLITE		540
70												539
71												538
72												537
73												536
74	/	SPT 15	2 2 4	18 18						SAA, mottled appearance due to manganese oxide and iron oxide staining.		535
75												534
76												533
77												532
78												531
79	/	SPT 16	2 3 4	18 18						SAA; dark yellowish-brown (10YR 4/6).		530
80												530

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SOIL LOG - Boring No. B-1030



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
80									ML			529
81												528
82												527
83												526
84	SPT 17	4 4 5	18 18							SAA; olive brown (2.5YR 4/4), trace clay, very micaceous. SAPROLITE		525
85												524
86												523
87												522
88												521
89	SPT 18	3 5 8	16.8 18							SAA; light brownish-gray (2.5YR 6/2) from 88.5 to 89.5 ft, then to olive-yellow (2.5YR 6/6), stiff, SAPROLITE		520
90												519
91												518
92												517
93												516
94	SPT 19	19 34 50	18 18						SP-SM	SAND, silty (SP/SM), light gray (2.5YR 7/1), damp to moist, very dense, manganese-oxide staining and quartz in thin fracture. PARTIALLY WEATHERED ROCK		515
95												514
96												513
97												512
98												511
99	SPT 20	50/3	3 3							SAA, PARTIALLY WEATHERED ROCK	SPT refusal, boring terminated on 4/12/06	510
100												509
101												508
102												507
103												506
104												505
105												504
106												503
107												502
108												501
109												500
110												499
111												498
112												497
113												496
114												495
115												494
116												493
117												492
118												491
119												490
120												490

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		  SOIL LOG - Boring No. B-1031	
Type and Diameter of Boring Wash Rotary / 3 inch		Boring Location Switchyard N 1164731 E 1847445	
Drilling Contractor and Rig MACTEC/White/33115 / CME 55 LC		Elevation and Datum 604 feet MSL	Ground Water Depth N/A
Sampling Method SPT		Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 8
		Borehole Inclination -90	Logged by J. Cerceo
		Date Started 3/3/06	
		Date Completed 3/3/06	



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									GM	GRAVEL with fines for 8 inches	Begin drilling 3/3/06	604
1									ML	SILT, sandy (ML); red (2.5YR 4/6), damp, stiff, micaceous, non-plastic. FILL		603
2												602
3												601
4		SPT 1	5	13.2								600
5			8	18								599
6												598
7												597
8												596
9		SPT 2	4	13.2						SILT, sandy (ML); red (2.5YR 4/6), very stiff with trace clay; 32% sand; 1% gravel, 67% fines. FILL		595
10			8	18								594
11												593
12												592
13												591
14		SPT 3	4	18					SM	SAND, silty (SM); yellowish brown (10YR 5/4); damp, medium dense, micaceous, quartzite fragments. FILL		590
15			7	18								589
16												588
17												587
18												586
19		SPT 4	5	18					ML	SILT, sandy (ML); yellowish brown (10YR 5/4); damp, stiff, micaceous, quartzite fragments. SAPROLITE		585
20			6	18								584
21												583
22												582
23												581
24		SPT 5	2	18						SILT, sandy (ML); very pale brown (10YR 7/3); moist, medium stiff; 44% sand, 56% fines, mottled, micaceous. SAPROLITE	Classification based on B-1031-UDA UD-2 at 24 to 26 ft	580
25			3	18								579
26			4									578
27												577
28												576
29		SPT 6	2	16								575
30			4	16					SM	SAND, silty (SM); dark grayish brown (10YR 4/2); moist, very dense, micaceous. PARTIALLY WEATHERED ROCK		574
31												573
32												572
33												571
34		SPT 7	40	12						SAND, silty (SM); pale brown (10YR 6/3); moist very dense micaceous. PARTIALLY WEATHERED ROCK		570
35			50/4	10								569
36												568
37												567
38												566
39		SPT 8	50/3	3						SAA; very dark grayish brown (10YR 3/2)	Boring terminated 3/3/06	565
40												564

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1031-UD	
Type and Diameter of Boring Wash Rotary / 4 inch nominal		Boring Location Switchyard N 1164740 E 1847445		Total Depth 16 feet	
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75		Elevation and Datum 604 feet MSL		Ground Water Depth N/A	
Sampling Method Undisturbed		Sample Driving Hammer/Drop NA / NA		No. of Samples 2	
		Borehole Inclination -90		Logged by J. Cerceo	
				Date Started 5/29/06	
				Date Completed 5/29/06	

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0												604
1												603
2												602
3												601
4									ML	SILT, sandy (ML).		600
5		UD 1		27.75 24					ML		Shelby push 4 to 6 ft.	599
6									ML	SILT, sandy (ML).		598
7											Drilled without sampling to 14 ft.	597
8												596
9												595
10												594
11												593
12												592
13												591
14												590
15		UD 2		0 24						No recovery.	Shelby push 14 to 16 ft. No recovery. Boring terminated on 5/29/06.	589
16												588
17												587
18												586
19												585
20												584
21												583
22												582
23												581
24												580
25												579
26												578
27												577
28												576
29												575
30												574
31												573
32												572
33												571
34												570
35												569
36												568
37												567
38												566
39												565
40												564

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1031-JDA	
Type and Diameter of Boring Wash Rotary / 4 inch nominal		Boring Location Switchyard N 1164728 E 1847439		Total Depth 37 feet	
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X		Elevation and Datum 603.8 feet MSL		Ground Water Depth N/A	
Sampling Method Undisturbed		Sample Driving Hammer/Drop NA / NA		No. of Samples 6	
		Borehole Inclination -90		Logged by J. Cerceo	
				Date Started 6/7/06	
				Date Completed 6/8/06	

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0												
1											Offset 11.4 ft from B-1031 UD	603
2											Drilled without sampling to 14 ft.	602
3												601
4												600
5												599
6												598
7												597
8												596
9												595
10												594
11												593
12												592
13												591
14												590
15		UD 1		19.2 24					SM	SAND, silty (SM).	Shelby push 14 to 16 ft.	589
16												588
17											Drilled without sampling to 24 ft.	587
18												586
19												585
20												584
21												583
22												582
23												581
24												580
25		UD 2		22.8 24	●	●	●		ML	SILT, sandy (ML); 44% sand, 56% fines.	Shelby push 24 to 26 ft	579
26												578
27											Drilled without sampling to 27 ft.	577
28		UD 3		0 24						No Recovery.	End 6/7/06 Start 6/8/06	576
29										No Recovery.	Water was near the surface	575
30		UD 4		0 24							Shelby push 27 to 29 ft, no recovery	574
31		UD 5		12 12					SM	SAND, silty (SM).	Shelby push 29 to 31 ft	573
32											No recovery	572
33											Shelby push 31 to 32 ft.	571
34											Shelby tube refusal at 32.0 ft	570
35												569
36		UD 6		10.8 24					SM	SAND, silty (SM).	Pitcher barrel sample 35 to 37 ft; softer zone of pitcher drilling 35.4 to 36.6 ft	568
37											Boring terminated 6/8/06	567
38												566
39												565
40												564

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1032	
Type and Diameter of Boring Wash Rotary / 3 inch		Boring Location Switchyard N 1164553 E 1846696		Total Depth 40.2 feet	
Drilling Contractor and Rig MACTEC/White/33115 / CME 55 LC		Elevation and Datum 603.9 feet MSL		Ground Water Depth N/A	
Sampling Method SPT		Sample Driving Hammer/Drop 140 lbs / 30 inches		No. of Samples 8	
		Borehole Inclination -90		Logged by R. Ortiz	
				Date Started 3/4/06	
				Date Completed 3/4/06	

Reviewed by / Date F. Syms 5/23/06

Reviewed by / Date C. Lane 10-27-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT, (ML); yellowish brown (10YR 4/8) to olive brown (2.5Y 4/4); damp, medium stiff, <15% sand, non-plastic. FILL	Begin drilling 3/4/06	603
1												602
2												601
3												600
4		SPT 1	245	1818								599
5												598
6												597
7												596
8												595
9		SPT 2	468	1818						SAA; brownish yellow (10YR 6/8). FILL		594
10												593
11												592
12												591
13									ML	SILT, sandy (ML) brown (10YR 5/3); damp to moist, hard, ~20 to 25% sand, non-plastic. SAPROLITE		590
14		SPT 3	101621	1518								589
15												588
16												587
17												586
18												585
19		SPT 4	253750	1818						SILT, sandy (ML); brown (10YR 5/3); damp, hard, >30% sand, fine to coarse sand. SAPROLITE		584
20												583
21												582
22									ML	SILT, sandy (ML) with minor gravel; brown to dark brown (10YR 4/3); damp to moist, hard, coarse to very coarse sand, fine gravel, gravel are lithic fragments of unweathered rock. PARTIALLY WEATHERED ROCK		581
23		SPT 5	3050/5	911								580
24												579
25												578
26												577
27												576
28												575
29		SPT 6	81025	1318						SILT, sandy (ML) with minor gravel; brown to dark brown (10YR 4/3); damp to moist, >30% sand, fine gravel, hard. PARTIALLY WEATHERED ROCK		574
30												573
31												572
32												571
33												570
34		SPT 7	202026	1218						SILT, sandy (ML); brown (10YR 5/3); damp, hard ~30% sand, fine sands, minor fine gravel (from weathering of lithic fragments). PARTIALLY WEATHERED ROCK		569
35												568
36												567
37												566
38												565
39		SPT 8	50/3	43						SILT, sandy (ML); strong brown (7.5YR 5/6); damp, hard, ~>30% sand, medium to coarse sand, minor		564
40												564



Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

MACTEC



SOIL LOG - Boring No. B-1032

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40		SPT	50/2	4						fine gravel. PARTIALLY WEATHERED ROCK	Boring terminated on 3/4/06	563
41		9		2						SAA, yellowish brown (10YR 5/6). PARTIALLY WEATHERED ROCK		562
42												561
43												560
44												559
45												558
46												557
47												556
48												555
49												554
50												553
51												552
52												551
53												550
54												549
55												548
56												547
57												546
58												545
59												544
60												543
61												542
62												541
63												540
64												539
65												538
66												537
67												536
68												535
69												534
70												533
71												532
72												531
73												530
74												529
75												528
76												527
77												526
78												525
79												524
80												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1033	
Type and Diameter of Boring Wash Rotary / 3 inch		Boring Location Switchyard N 1164557 E 1847059		Total Depth 40.5 feet	
Drilling Contractor and Rig MACTEC/White/33115 / CME 55 LC		Elevation and Datum 604.4 feet MSL		Ground Water Depth N/A	
Sampling Method SPT		Sample Driving Hammer/Drop 140 lbs / 30 inches		No. of Samples 10	
		Borehole Inclination -90		Logged by R. Ortiz	
				Date Started 3/5/06	
				Date Completed 3/5/06	



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0											Begin drilling 3/5/06	604
1												603
2												602
3												601
4		SPT 1	6	8	●				ML	SILT, sandy (ML); red (2.5YR 4/8); damp, medium stiff, fine sand, poorly graded. FILL		600
5												599
6												598
7												597
8												596
9		SPT 2	5	18	●					SILT, sandy, clayey (ML); red (2.5YR 4/6); damp, stiff, fine sand, poorly graded, 57% fines. FILL	Classification based on B-1033-UD UD-2 at 10 to 12 ft	595
10			6									594
11												593
12												592
13												591
14		SPT 3	4	15	●	●				SILT, sandy, clayey (ML); red (2.5YR 4/8), damp, stiff grades into a SILT with sand (ML) yellowish red (5YR 4/6), poorly graded; 36% sand, 64% fines. FILL		590
15			8									589
16												588
17												587
18												586
19		SPT 4	4	16	●					SILT, sandy (ML); red, (10YR 4/6); damp, stiff, ~25% sand. FILL		585
20			8									584
21												583
22									ML	SILT, sandy (ML); gray (7.5YR 6/10) to yellow brown (10YR 5/4); damp, hard >30% sand, fine sand, large quartz clast (~1.0 inch). SAPROLITE	Rocky drilling	582
23												581
24		SPT 5	11	18	●							580
25			20									579
26			38									578
27												577
28												576
29		SPT 6	7	18	●					SILT, sandy (ML); light brownish gray (2.5YR 6/2); hard, >30% sand, fine sand, large pieces of quartz. SAPROLITE	Rocky drilling, bouncing rig	575
30			20									574
31			16									573
32									ML	SILT, sandy (ML) with minor gravel; yellowish brown (10YR 5/6); damp, >30% sand, gravel due to the breakdown of lithic fragments, poorly graded. PARTIALLY WEATHERED ROCK		572
33												571
34		SPT 7	48	12								570
35			50/5	11								569
36												568
37												567
38												566
39		SPT 8	41	12						SAA, brown to dark brown (10YR 4/3).		565
40			50/4	10								565

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389





SOIL LOG - Boring No. B-1033

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40		SPT		6						SAA, yellowish brown (10YR 5/6). PARTIALLY		564
41		50/6		6						WEATHERED ROCK.	Boring terminated on 3/5/06	563
42												562
43												561
44												560
45												559
46												558
47												557
48												556
49												555
50												554
51												553
52												552
53												551
54												550
55												549
56												548
57												547
58												546
59												545
60												544
61												543
62												542
63												541
64												540
65												539
66												538
67												537
68												536
69												535
70												534
71												533
72												532
73												531
74												530
75												529
76												528
77												527
78												526
79												525
80												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1033-UD	
Type and Diameter of Boring Wash Rotary / 6 inch		Boring Location Switchyard N 1164563 E 1847059		Total Depth 28 feet	
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X		Elevation and Datum 604.1 feet MSL		Ground Water Depth N/A	
Sampling Method Undisturbed		Sample Driving Hammer/Drop NA / NA		No. of Samples 4	
		Borehole Inclination -90		Logged by J. Cerceo	
				Date Started 6/8/06	
				Date Completed 6/8/06	

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0											Drilled without sampling to 4 ft.	604
1												603
2												602
3												601
4												600
5		UD 1		19.2/24					ML	SILT, sandy (ML).	Shelby push from 4 to 6 ft	599
6											Drilled without sampling to 10 ft.	598
7												597
8												596
9												595
10											Shelby push from 10 to 12 ft	594
11		UD 2		24/24	●	●	●		ML	SILT, sandy (ML); 43% sand, 57% fines.		593
12											Drilled without sampling to 22 ft.	592
13												591
14												590
15												589
16												588
17												587
18												586
19												585
20												584
21												583
22											Pitcher drill from 22 to 24 ft	582
23		UD 3		7.2/24					ML	SILT, sandy (ML).		581
24											Drilled without sampling to 26 ft.	580
25												579
26											Pitcher drill from 26 to 28 ft	578
27		UD 4		19.2/24					ML	SILT, sandy (ML).	Boring terminated on 6/8/06	577
28												576
29												575
30												574
31												573
32												572
33												571
34												570
35												569
36												568
37												567
38												566
39												565
40												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1034	
Type and Diameter of Boring Wash Rotary / 3 inch		Boring Location Switchyard N 1164327 E 1847522		Total Depth 39.3 feet	
Drilling Contractor and Rig MACTEC/White/33115 / CME 55 LC		Elevation and Datum 604 feet MSL		Ground Water Depth 17.47 feet	
Sampling Method SPT		Sample Driving Hammer/Drop 140 lbs / 30 inches		No. of Samples 6	
		Borehole Inclination -90		Logged by E. Weldon	
				Date Started 3/5/06	
				Date Completed 3/6/06	

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT, sandy (ML); yellowish brown (10YR 5/8) to red (10R 4/8); damp, very stiff, <10% sand and clay, poorly graded. SAPROLITE	Begin drilling 3/5/06	604
1												603
2												602
3												601
4	SPT 1		9	18								600
5												599
6												598
7												597
8												596
9	SPT 2		6	16						SILT, sandy (ML); brown (10YR 5/3); damp, very stiff, <10% sand (fine), poorly graded, <10% clay. SAPROLITE		595
10												594
11												593
12												592
13												591
14	SPT 3		3	17						SILT, sandy (ML); yellow (10YR 7/8) to yellowish brown (10YR 5/4); damp, stiff, 10-15% fine sand, <10% clay, poorly graded. SAPROLITE		590
15												589
16												588
17												587
18												586
19	SPT 4		3	16						SILT, sandy (ML); brown (10YR 5/3); damp, stiff, <30% fine sand, <10% clay. SAPROLITE		585
20												584
21												583
22												582
23												581
24	SPT 5		5	18						SILT, sandy (ML); white (5Y 8/1) to light yellowish brown (2.5YR 6/4); very stiff, damp ~30% fine sand <10% clay. SAPROLITE		580
25												579
26												578
27												577
28												576
29	SPT 6		14	12					ML	SILT, sandy (ML); very pale brown (10YR 7/3); damp, >30% sand, fine to medium grained, poorly to moderately graded. PARTIALLY WEATHERED ROCK		575
30												574
31										PARTIALLY WEATHERED ROCK		573
32										No samples recovered		572
33												571
34	SPT 7		50/1	0								570
35	CORE			0							End of day 3/5/06 Begin day 3/6/06 Rock cored 34 to 35 ft, no recovery, return to SPT sampling	569
36				12								568
37												567
38												566
39	SPT 8		50/0.25	0							Boring terminated 3/6/06 39.3 ft	565
40												564



Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389



SOIL LOG - Boring No. B-1034

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40		SPT		0.0								564
41		9										563
42												562
43												561
44												560
45												559
46												558
47												557
48												556
49												555
50												554
51												553
52												552
53												551
54												550
55												549
56												548
57												547
58												546
59												545
60												544
61												543
62												542
63												541
64												540
65												539
66												538
67												537
68												536
69												535
70												534
71												533
72												532
73												531
74												530
75												529
76												528
77												527
78												526
79												525
80												524

Total Depth 39.3 ft.
Groundwater encountered at 17.47 feet
Borehole Grouted On 3/6/06

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1035	
Type and Diameter of Boring Wash Rotary / 3 inch		Boring Location Switchyard N 1164164 E 1847146		Total Depth 40.2 feet	
Drilling Contractor and Rig MACTEC/White/33115 / CME 55 LC		Elevation and Datum 604.6 feet MSL		Ground Water Depth N/A	
Sampling Method SPT		Sample Driving Hammer/Drop 140 lbs / 30 inches		No. of Samples 9	
		Borehole Inclination -90		Logged by E. Weldon	
				Date Started 3/6/06	
				Date Completed 3/7/06	



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML		Begin drilling on 3/6/06	604
1												603
2												602
3												601
4		SPT 1	33	13						SILT, sandy (ML); light yellowish brown (2.5Y 6/4); damp, medium stiff, <10% sand (very fine), and clay. RESIDUUM		600
5												599
6												598
7												597
8												596
9		SPT 2	33	15						SILT, sandy (ML); yellowish brown (10YR 5/4); damp, medium stiff, <10 % sand or clay, poorly graded. RESIDUUM		595
10												594
11												593
12												592
13												591
14		SPT 3	69	13						SILT, sandy (ML); dark yellowish brown (10YR 5/6); damp, very stiff >30 % sand (well sorted, fine) >10% clay, poorly graded. RESIDUUM		590
15												589
16												588
17												587
18												586
19		SPT 4	18	16						SILT, sandy, clayey (ML); olive brown (2.5Y 4/4); damp, hard, < 20% very fine sand, < 10% clay. RESIDUUM		585
20			30									584
21			46									583
22												582
23												581
24		SPT 5	50/1	1					ML	SILT, (ML); dark olive gray (5Y 3/2); micaceous. PARTIALLY WEATHERED ROCK		580
25												579
26												578
27												577
28												576
29		SPT 6	49	11					ML	SILT, clayey, sandy and rock fragments, brown (10YR 4/3) to dark grayish brown (10YR 4/2); damp, <15 % clay. PARTIALLY WEATHERED ROCK		575
30			50/3	9								574
31												573
32												572
33												571
34		SPT 7	50/3	6						SILT, sandy (ML); dark yellowish brown (10YR 3/4); damp, <15% sand (fine) <10% clay. PARTIALLY WEATHERED ROCK	End drilling 3/6/06 Begin drilling 3/7/06	570
35				3								569
36												568
37												567
38												566
39		SPT 8	36	12						SILT, sandy (ML); grayish brown (2.5Y 5/2); ~25% sand, fine sand, poorly graded. PARTIALLY		565
40			50/5.5	11.5								565

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389



SOIL LOG - Boring No. B-1035



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40		SPT	50/2	4						WEATHERED ROCK	Boring terminated 3/7/06 at	564
41		9		2						SAA, olive brown (2.5YR 4/3)	40.2 ft	563
42												562
43												561
44												560
45												559
46												558
47												557
48												556
49												555
50												554
51												553
52												552
53												551
54												550
55												549
56												548
57												547
58												546
59												545
60												544
61												543
62												542
63												541
64												540
65												539
66												538
67												537
68												536
69												535
70												534
71												533
72												532
73												531
74												530
75												529
76												528
77												527
78												526
79												525
80												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1036	
Type and Diameter of Boring Wash Rotary / 3 inch		Boring Location Low flow reservoir dam N 1166863 E 1844076		Total Depth 23.5 feet	
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75		Elevation and Datum 591.1 feet MSL		Ground Water Depth N/A	
Sampling Method SPT		Sample Driving Hammer/Drop 140 lbs / 30 inches		No. of Samples 4	
		Borehole Inclination -90		Logged by J. Cerceo	
				Date Started 6/5/06	
				Date Completed 6/6/06	

Reviewed by / Date B. Reinicker 6/14/06

Reviewed by / Date C. Lane 10-27-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0										Surface vegetation root mat (~0.2 ft)	Begin drilling 6/5/06	591
1										Gravel mat (~0.1 ft)		590
2										SILT, sandy (ML); strong brown (7.5YR 5/6); dry;		589
3										very stiff; <20% sand; fine to medium grained; <5%		588
4		SPT 1	4	18						fine gravel; nonplastic; FILL		587
5												586
6												585
7												584
8												583
9		SPT 2	4	18						SAA; micaceous; lifts of fine grained gravel		582
10			8	18								581
11												580
12												579
13											Losing water	578
14		SPT 3	9	18						SAA; damp, very stiff; <20% sand; fine to medium	End 6/5/06	577
15			13	18						grained; <5% fine gravel; non to low plasticity; FILL	Start 6/6/06; no water	576
16			16									575
17											Hole caving, little to no water return	574
18												573
19		SPT 4	0	18						SAA; strong brown; (7.5 YR 5/6); damp to moist;	Overdrilled by 6 inches	572
20			6	18						<20% sand, <5% gravel, red clayey lifts; fine to		571
21			11							medium sand, <5% roots, low to non plastic; FILL		570
22												569
23												568
24											Boring terminated due to no	567
25											water recirculation	566
26												565
27												564
28												563
29												562
30												561
31												560
32												559
33												558
34												557
35												556
36												555
37												554
38												553
39												552
40												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1037	
Type and Diameter of Boring Wash Rotary / 3 inch		Boring Location East side excavation pit N 1166205 E 1847506		Total Depth 78.75 feet	
Drilling Contractor and Rig MACTEC/White/33115 / CME 55		Elevation and Datum 589.3 feet MSL		Ground Water Depth 17.5 feet	
Sampling Method SPT		Sample Driving Hammer/Drop 140 lbs / 30 inches		No. of Samples 16	
		Borehole Inclination -90		Logged by E. Weldon	
				Date Started 3/29/06	
				Date Completed 3/29/06	

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML		Begin drilling 3/29/06	589
1												588
2												587
3												586
4		SPT 1	5	13						SILT, sandy, (ML); mottled red (10R 5/6) to brownish yellow (10YR 6/6), mottled, damp, stiff, medium plastic, poorly graded. Fragments of SAPROLITE (relict rock texture evident), sand is fine grained. FILL		585
5			8	18								584
6												583
7												582
8												581
9		SPT 2	5	14						SILT, sandy (ML) strong brown (7.5YR 5/6) and olive gray (5Y 5/2) at tip of shoe SAPROLITE (as above), very stiff, sand, <20 % fine grained. FILL		580
10			9	18								579
11												578
12												577
13												576
14		SPT 3	3	13						SILT, sandy with clay (ML); variegated strong brown and olive gray; medium stiff to stiff; 34% sand 66% fines. FILL		575
15			5	18								574
16												573
17												572
18												571
19		SPT 4	3	13					ML	SILT, sandy (ML); dark yellowish brown (10YR 4/4) to green-gray grayish brown (2.5Y 5/2), medium stiff, damp, layers (~2 inch) of clay, 41% sand, 2% gravel, 57% fines. SAPROLITE	Classification based on B-1037-UD UD-2 at 19 to 21 ft	570
20			4	18								569
21												568
22												567
23									SM	SAND, silty (SM); yellow (2.5Y 7/6); moist, loose, fine to medium SAND, relict rock texture throughout, some red laminations clay (0.5 cm). SAPROLITE		566
24		SPT 5	3	14								565
25			2	18								564
26												563
27												562
28												561
29		SPT 6	2	16						SAND, silty (SM); white (2.5Y 8/0 to 2.5Y 5/2); moist, loose, fine grained SAND, to medium SAND, mica-rich, poorly graded, low plasticity, 5% gravel, 47% sand, 48% fines. SAPROLITE	Classification based on B-1037-UD UD-4 at 29 to 31 ft	560
30			4	18								559
31												558
32												557
33												556
34		SPT 7	2	17						SAND, silty (SM); loose. Some red clay layers medium black Manganese layers (<1 cm) also parallel foliation. SAPROLITE		555
35			3	18								554
36												553
37												552
38												551
39		SPT 8	4	12						SAND, silty (SM); olive gray (5Y 4/2) to white and grayish brown (2.5Y 8/1 to 2.5Y 5/2), damp,		550
40			7	18								549

Project Name and Job Number
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SOIL LOG - Boring No. B-1037



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40										medium dense, fine grained, 53% SAND,, 47% fines. SAPROLITE	Boring abandoned due to squeezing of sidewall. Move hole to continue	549
41										SAND, silty (SM); yellow (2.5Y 7/6); moist, loose, fine to medium SAND, relict rock texture throughout, some red laminations clay (0.5 cm). SAPROLITE		548
42										(Continued from previous page)		547
43									ML	SILT, sandy (ML); olive gray (5Y 4/2) to white and grayish brown (2.5Y 8/1 to 2.5Y 5/2); 48% sand, 52% fines. SAPROLITE	Classification based on B-1037-UD UD-6 at 43 to 45 ft	546
44	SPT 9	3	17									545
45		6	18									544
46												543
47												542
48												541
49	SPT 10	5	15							SILT, sandy (ML); yellow and brownish yellow (10YR 7/6 to 10YR 6/6), damp, very stiff, 45% sand, 55% fines. SAPROLITE		540
50		8	18									539
51		10										538
52												537
53												536
54	SPT 11	7	16							SILT, sandy (ML); brownish yellow (10YR 6/6), very stiff, sand, is fine to medium grained; SAPROLITE	Losing about 70% water at 53 ft	535
55		8	18									534
56												533
57												532
58												531
59	SPT 12	5	16							SILT, sandy (ML) to SILT, clayey (ML) yellow and white (2.5Y 7/6 to 2.5Y 8/2) to brownish yellow (10YR 6/6) to olive brown (2.5Y 4/4), very stiff, damp, 50% SAND, 50% fines. SAPROLITE	Classification based on B-1037-UD UD-8 at 59 to 61 ft	530
60		6	18									529
61												528
62												527
63												526
64	SPT 13	8	15						SM	SAND, silty (SM), brownish yellow (10YR 6/6), damp, medium dense, 45% fines, 55% SAND, is fine to medium grained. SAPROLITE		525
65		9	18									524
66		13										523
67												522
68												521
69	SPT 14	14	15							SAND, silty (SM); sand has slightly increased coarser component, damp, very dense, moderately graded. SAPROLITE		520
70		29	18									519
71		43										518
72												517
73									SM	SAND, silty (SM); brownish yellow (10YR 6/6); SAND, fine to coarse grained. PARTIALLY WEATHERED ROCK		516
74	SPT 15	50/2	2									515
75			2									514
76											Drill grinding and crunching	513
77												512
78										No recovery.		511
79	SPT 16	50/1.5	1.5								Boring terminated, refer to B-1037A located for offset boring 10 ft north from	510
80			1.5									510

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389



SOIL LOG - Boring No. B-1037

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
80											B-1037	509
81												508
82										Total Depth 78.75 ft.		507
83										Groundwater encountered at 17.5 feet		506
84										Borehole Grouted On 4/26/06		505
85												504
86												503
87												502
88												501
89												500
90												499
91												498
92												497
93												496
94												495
95												494
96												493
97												492
98												491
99												490
100												489
101												488
102												487
103												486
104												485
105												484
106												483
107												482
108												481
109												480
110												479
111												478
112												477
113												476
114												475
115												474
116												473
117												472
118												471
119												470
120												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1037-UD	
Type and Diameter of Boring Wash Rotary / 6 inch		Boring Location General N 1166209 E 1847500		Total Depth 68 feet	
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X		Elevation and Datum 589.2 feet MSL		Ground Water Depth N/A	
Sampling Method Undisturbed		Sample Driving Hammer/Drop NA / NA		No. of Samples 9	
		Borehole Inclination -90		Logged by J. Cerceo	
				Date Started 6/9/06	
				Date Completed 6/10/06	

Reviewed by / Date B. Reinicker 6/13/06

Reviewed by / Date C. Lane 10-27-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0											Boring located NW of B-1037	589
1											Drilled without sampling to 13 ft.	588
2												587
3												586
4												585
5												584
6												583
7												582
8												581
9												580
10												579
11												578
12												577
13											Shelby push 13 to 15 ft	576
14		UD 1		21.6/24					ML	SILT, sandy (ML).		575
15											Drilled without sampling to 19 ft.	574
16												573
17												572
18												571
19		UD 2		19.2/24	●	●	●		ML	SILT, sandy (ML); 2% gravel, 41% sand, 57% fines.	Shelby push 19 to 21 ft	570
20												569
21											Drilled without sampling to 23 ft.	568
22												567
23		UD 3		24/24					SM	SAND, silty (SM).	Shelby push 23 to 25 ft	566
24												565
25											Drilled without sampling to 29 ft.	564
26												563
27												562
28												561
29		UD 4		22.8/24	●	●	●		SM	SAND, silty (SM); 5% gravel, 47% sand, 48% fines.	Shelby push 29 to 31 ft	560
30											Drilled without sampling to 33 ft.	559
31												558
32												557
33		UD 5		24/24					SM	SAND, silty (SM).	Shelby push 33 to 35 ft	556
34												555
35											Drilled without sampling to 43 ft.	554
36												553
37												552
38												551
39												550
40												

Project Name and Job Number
Lee Nuclear Station COL
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SOIL LOG - Boring No. B-1037-UD

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40												549
41												548
42												547
43												546
44		UD 6		24/24	●	●	●		ML	SILT, sandy (ML); 48% sand, 52% fines.	Shelby push 43 to 45 ft	545
45											Drilled without sampling to 53 ft.	544
46												543
47												542
48												541
49												540
50												539
51												538
52												537
53											Shelby push 53 to 55 ft	536
54		UD 7		24/24					ML	SILT, sandy (ML).		535
55											Drilled without sampling to 59 ft.	534
56												533
57												532
58												531
59											Shelby push 59 to 61 ft.	530
60		UD 8		24/24	●	●	●		ML	SILT, sandy (ML); 50% sand, 50% fines.		529
61												528
62												527
63											Pitcher barrel 63 to 65 ft	526
64		UD 9		14.4/24					ML	SILT, sandy (ML).		525
65												524
66												523
67												522
68											Tricone refusal. Boring terminated	521
69												520
70												519
71												518
72												517
73												516
74												515
75												514
76												513
77												512
78												511
79												510
80												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389



SOIL LOG - Boring No. B-1037A

Type and Diameter of Boring HQ core / 3.75 inch	Boring Location East side excavation pit N 1166215 E 1847504	Total Depth 96.6 feet
Drilling Contractor and Rig MACTEC/White/33115 / CME 55 LC	Elevation and Datum 589.3 feet MSL	Ground Water Depth N/A
Sampling Method No sampling	Sample Driving Hammer/Drop NA / NA	No. of Samples 0
	Borehole Inclination -90	Logged by E. Weldon
		Date Started 4/2/06
		Date Completed 4/4/06

Reviewed by / Date F. Syms 5/25/06

Reviewed by / Date CES 11/4/2009

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0										Drill without sampling, offset 10 ft north from boring B-1037 for downhole geophysical measurements	Start 4/2/06	589
1												588
2												587
3												586
4												585
5												584
6												583
7												582
8												581
9												580
10												579
11												578
12												577
13												576
14												575
15												574
16												573
17												572
18												571
19												570
20												569
21												568
22												567
23												566
24												565
25												564
26												563
27												562
28												561
29												560
30												559
31												558
32												557
33												556
34												555
35												554
36												553
37												552
38												551
39												550
40												

Project Name and Job Number



Lee Nuclear Station COL

6234-06-3389



SOIL LOG - Boring No. B-1037A



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40										Drill without sampling, offset 10 ft north from boring B-1037 for downhole geophysical measurements (Continued from previous page)		549
41												548
42												547
43												546
44												545
45												544
46												543
47												542
48												541
49												540
50												539
51												538
52												537
53												536
54												535
55												534
56												533
57												532
58												531
59												530
60												529
61												528
62												527
63												526
64												525
65												524
66												523
67												522
68												521
69												520
70										Refer to rock log.		519
71											End of day 4/2/06; water ~40 ft set PVC casing	518
72											Begin 4/3/06; begin core drilling	517
73												516
74												515
75												514
76												513
77												512
78												511
79												510
80												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. B-1037A	
Type and Diameter of Boring HQ core / 3.75 inch		Boring Location East side excavation pit N 1166215 E 1847504		Total Depth 96.6 feet	
Drilling Contractor and Rig MACTEC/White/33115 / CME 55 LC		Elevation and Datum 589.3 feet MSL		Ground Water Depth 33 feet	
Casing Size and Depth 4 inch / 70.6 feet		Length of Core Barrel and Bit 8.6 feet / 8.6 feet		No. of Core Boxes 3	
		Borehole Inclination -90		Logged by E. Weldon	
				Date Started 4/2/06	
				Date Completed 4/4/06	

Reviewed by / Date F. Syms 5/25/06

Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
71		1	1.0 1.0	70	MW	R3		META-GRANODIORITE; mottled white (7.5YR 8/1); reddish yellow (7.5YR 8/6) and black (7.5YR 2/1); porphyroblastic, fine to coarse grained, reddish yellow oxides along fracture surfaces, healed fractures dip 50°, vugs/pits along healed incipient fractures; very closely spaced irregular incipient healed fractures.		518
72										517
73										516
74		2	3.3 5.0	32	MW	R2 to R3				515
75										514
76										513
77								SAA; increasing xenoliths of leucocratic to mafic composition		512
78								CONTINUOUS ROCK		511
79		3	5.0 5.0	90	MW	R2 to R3				510
80										509
81								META-QUARTZ DIORITE		508
82								META-GRANODIORITE		507
83										506
84		4	5.0 5.0	100	F	R4 to R5		META-QUARTZ DIORITE; pegmatitic dikes (feldspar-rich) with calcite veins and quartz veins, and very closely to closely spaced incipient and healed fractures and foliation joints.		505
85										504
86										503
87								META-GRANODIORITE; xenoblastic, fine to coarse grained; mafics >40%, feldspar 30 to 40%, quartz 20 to 30%.		502
88										501
89		5	5.0 5.0	100	F	R4 to R5				500
90										499
91										498
92								SAA; slightly mafic mineral composition near 94 ft	End of day 4/3/06	497
93									Begin day 4/4/06 water level	496
94		6	4.9 5.0	98	F	R5		Migmatitic texture highly mafic zone.	33 ft	495
95										494
96										493
97									End of coring	492
98										491
99										490
100								Total Depth 96.6 ft.		489
101								Groundwater encountered at 33 feet		488
102								Borehole Grouted On 4/26/06		487
103										486
104										485
105										484
106										483
107										482
108										481
109										480
110										479

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. B-1038	
Type and Diameter of Boring Wash Rotary / NQ core / 3 inch / NQ		Boring Location Unit 2 N 1166165 E 1847350		Total Depth 50.2 feet	
Drilling Contractor and Rig MACTEC/Abingdon / CME 75		Elevation and Datum 546.5 feet MSL	Ground Water Depth 1 feet	Depth to Bedrock 4.1 feet	
Casing Size and Depth none		Length of Core Barrel and Bit 13.1 feet	No. of Core Boxes 3	Date Started 5/29/06	
		Borehole Inclination -90	Logged by J. Cerceo	Date Completed 5/31/06	

Reviewed by / Date B. Reinicker 10/6/06

Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
4		1	2.2	67	MW to SW	R3		Wash rotary refusal at 4.1 ft.	Gravel fill to 4.1 ft for use as drill pad	542
5			2.2					META-GRANODIORITE; bluish gray (5PB 6/1); black (N 2.5); light red (2.5YR 6/8); fine to medium grained; quartz, plagioclase, K-spar, hornblende, iron and manganese staining on some joint surfaces; micaceous minerals		541
6		2	1.6	100	MW to SW	R3		Little to no iron staining		540
7			1.6							539
8		3	0.2	100	MW to SW	R3		CONTINUOUS ROCK	End day 5/29/06	538
9		4	0.2	100	MW to SW	R3			Start 5/30/06; water at 1 ft - area requires pumping to access drill rig.	537
10		5	0.8	57	MW to SW	R3				536
11		6	0.8	89	MW to SW	R3				535
12			0.4							534
13		7	1.8	100	MW to SW	R3				533
14			1.8							532
15		8	2.3	100	MW to SW	R3				531
16			0.5							530
17		9	4.3	100	MW to SW	R3				529
18			4.3							528
19								SAA; calcite in healed very closely spaced veins; mafic inclusion (~4 cm x 2 cm)		527
20		10	5.0	100	F	R4				526
21			5.0							525
22										524
23										523
24										522
25		11	5.0	95	F	R4				521
26			5.0							520
27										519
28										518
29										517
30		12	5.0	100	F	R4				516
31			5.0							515
32										514
33								META-GRANODIORITE		513
34										512
35		13	5.2	95	F	R4				511
36			5.2							510
37										509
38										508
39		14	2.0	100	F	R4				507
40			2.0					META-GRANODIORITE		506
41										505
42		15	4.1	100	F	R4				504
43			4.1							503

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389



ROCK LOG - Boring No. B-1038

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
44										502
45								SAA; epidote and calcite mineralization within some healed fractures	End day 5/30/06	501
46									Start 5/31/06; water measured 1.0 ft - area requires pumping to access drill rig.	500
47		16	5.9 5.9	98	F	R4				499
48										498
49										497
50										496
51									Boring terminated on 5/31/06	495
52										494
53								Total Depth 50.2 ft.		493
54								Groundwater encountered at 1 feet		492
55								Borehole Grouted On 1/19/07		491
56										490
57										489
58										488
59										487
60										486
61										485
62										484
63										483
64										482
65										481
66										480
67										479
68										478
69										477
70										476
71										475
72										474
73										473
74										472
75										471
76										470
77										469
78										468
79										467
80										466
81										465
82										464
83										463

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389





SOIL LOG - Boring No. B-1044

Type and Diameter of Boring Wash Rotary / NQ core / 3 inch / NQ	Boring Location ISFSI N 1167711 E 1847455	Total Depth 43.6 feet
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75	Elevation and Datum 588 feet MSL	Ground Water Depth N/A
Sampling Method SPT	Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 9
	Borehole Inclination -90	Logged by J. Cerceo
		Date Started 5/1/06
		Date Completed 5/1/06

Reviewed by / Date F. Syms 5/22/06



Reviewed by / Date C. Lane 10-27-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0										Field straw grass root mat (3 inches thick)		588
1									SP-SM	SAND silty (SP to SM)		587
2										Light bluish gray (5PB 7/1), dense to very dense		586
3										<5% silt, fine to coarse sand, SAPROLITE		585
4		SPT 1	8	19	18							584
5			17									583
6												582
7												581
8												580
9		SPT 2	13	21	18							579
10			25									578
11												577
12												576
13												575
14		SPT 3	50/1	2	1					SAA; SAPROLITE.	Refusal at 13.6 ft., see rock log	574
15												573
16												572
17												571
18												570
19												569
20												568
21												567
22												566
23												565
24												564
25												563
26												562
27												561
28												560
29												559
30												558
31												557
32												556
33												555
34												554
35												553
36												552
37												551
38												550
39												549
40												548



Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. B-1044	
Type and Diameter of Boring Wash Rotary / NQ core / 3 inch / NQ		Boring Location ISFSI N 1167711 E 1847455		Total Depth 43.6 feet	
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75		Elevation and Datum 588 feet MSL		Ground Water Depth N/A	Depth to Bedrock 23.6 feet
Casing Size and Depth 3.75 inch / 13.6 feet		Length of Core Barrel and Bit 13.1 feet		No. of Core Boxes 3	Date Started 5/1/06
		Borehole Inclination -90		Logged by J. Cerceo	Date Completed 5/1/06

Reviewed by / Date F. Syms 5/22/06Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
14								Weathered mafic minerals such as hornblende, replaced with biotite, meta quartzite and muscovite.	SPT refusal at 13.6 feet Beginning NQ Rock core	574
15										573
16		4	4.3 5.0	36	HW	R2 to R3				572
17								Quartz vein with mineralization of biotite		571
18										570
19					MW	R3		Vugs manganese rich staining		569
20										568
21		5	5.0 5.0	44	HW	R2		Biotite mineralization around the quartz vein		567
22										566
23					MW	R3				565
24								META-GRANODIORITE to META-QUARTZ DIORITE; bluish gray (10PB 5/1); fine grained, felsic banding moderately spaced, thin and medium thick altered plagioclase or K-spar near subvertical closely spaced fractures. CONTINUOUS ROCK		564
25										563
26		6	5.0 5.0	66	HW	R2		Quartzite pegmatite vein (27.6 to 27.9)		562
27										561
28										560
29										559
30										558
31		7	4.8 5.0	96						557
32										556
33										555
34								META-QUARTZ DIORITE to META-GRANODIORITE; fine to medium grained, moderately spaced fractures, primary minerals quartz, hornblende, K-spar, biotite, muscovite.		554
35					SW to F	R3				553
36		8	5.0 5.0	100				Red aphanitic mineralization		552
37										551
38										550
39								Mafic xenoliths with calcite healed fractures		549
40										548
41		9	5.0 5.0	100						547
42										546
43								Mafic xenoliths.		545
44									Over drilled ~5 inch to ensure final depth and mechanical break near end of run	544
45										543
46										542
47										541
48										540
49										539
50										538
51										537
52										536
53										535

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1045	
Type and Diameter of Boring Wash Rotary / NQ2 core / 3 inch / NQ			Boring Location ISFSI N 1167756 E 1847636		Total Depth 54 feet
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75			Elevation and Datum 588.4 feet MSL	Ground Water Depth N/A	Depth to Bedrock 21 feet
Sampling Method SPT			Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 11	Date Started 4/24/06
			Borehole Inclination -90	Logged by J. Cerceo	Date Completed 5/1/06

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	Field straw grass root mat	Begin drilling 4/24/06	588
1									ML	SILT, sandy (ML) red (10R 5/6); >10% fine sand, low plasticity, clayey fill deposits, fine gravel. FILL		587
2									ML			586
3									ML			585
4		SPT 1	3	10	●				ML	SAA; 5% gravel, 52% fines, 43% sand. FILL	End 4/24/06 Start 4/25/06 No water encountered Classification based on B-1045-UD, UD-1 at 4 to 6 ft	584
5									ML			583
6									ML			582
7									ML			581
8									ML			580
9		SPT 2	3	15	●				ML	SAA, red (10R 5/6); more dry, 41% sand, 59% fines. FILL	Classification based on B-1045-UD, UD-2 at 9 to 10.2 ft	579
10									ML			578
11									ML			577
12									ML			576
13									ML	SILT, sandy (ML); red (10R 5/6) reddish brown (5YR 4/4), white (5YR 8/1); medium dense, fine to medium sand, trace quartz rock fragments.		575
14		SPT 3	15	18					ML	RESIDUUM	Classification based on B-1045-UD UD-3 at 14 to 16 ft	574
15									ML	SAA; 48% sand, 52% fines		573
16									ML			572
17									ML			571
18									ML			570
19		SPT 4	3	9					SM	SAND, silty (SM); pinkish gray (7.5YR 7/2); and brown (7.5YR 5/3); fine to medium sand, very dense, <10% silt, subangular, plagioclase and quartz rock fragments.	End 4/25/06. No water encountered Start 4/30/06. No water encountered Tricone refusal at 21.0 ft, see rock log	569
20			50/4	7					SM	SAPROLITE		568
21									SM			567
22									SM			566
23									SM			565
24									SM			564
25									SM			563
26									SM			562
27									SM			561
28									SM			560
29									SM			559
30									SM			558
31									SM			557
32									SM			556
33									SM			555
34									SM			554
35									SM			553
36									SM			552
37									SM			551
38									SM			550
39									SM			549
40									SM			549

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. B-1045	
Type and Diameter of Boring Wash Rotary / NQ2 core / 3 inch / NQ		Boring Location ISFSI N 1167756 E 1847636		Total Depth 54 feet	
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75		Elevation and Datum 588.4 feet MSL	Ground Water Depth N/A	Depth to Bedrock 21 feet	
Casing Size and Depth none		Length of Core Barrel and Bit 13.1 feet	No. of Core Boxes 3	Date Started 4/24/06	
		Borehole Inclination -90	Logged by J. Cerceo	Date Completed 5/1/06	

Reviewed by / Date F. Syms 5/22/06

Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
21								META-QUARTZ DIORITE; bluish gray (5PB 6/1) to light bluish gray (5PB 7/1); fine to medium grained; hornblende, biotite, plagioclase, quartz. PARTIALLY WEATHERED ROCK	Begin rock core at 21.0 ft on 5/1/06 Did not use casing	567
22		5	2.4 3.0	30	HW to MW	R2 to R3				566
23					HW	R2				565
24										564
25										563
26		6	4.7 5.0	88	MW				100% water recirculation loss	562
27										561
28										560
29								META-QUARTZ DIORITE; healed breccia filled with biotite or hornblende.		559
30										558
31		7	5.0 5.0	100		R3				557
32										556
33										555
34										554
35					SW to F					553
36		8	5.0 5.0	100						552
37										551
38										550
39										549
40								META-QUARTZ DIORITE; bluish gray (5PB 6/1); fine to medium grained; plagioclase, quartz, hornblende, calcite, epidote, chlorite; subvertical epidote healed fractures		548
41		9	4.8 5.0	88				Altered plagioclase near closely spaced healed fractures.		547
42					CW	R2		Chlorite and meta-quartzite healed fracture, weathered with manganese oxide stained vugs.		546
43										545
44										544
45										543
46		10	4.9 5.0	98				Fine grained zone from 45.1 to ~ 46.5 ft.		542
47										541
48					SW to F	R3				540
49										539
50								SAA; fine to medium grained; mafic xenoliths.		538
51		11	4.5 5.0	88						537
52										536
53										535
54									Last 0.5 ft of core left in hole	534
55									Boring terminated on 5/1/06	533
56										532
57								Total Depth 54 ft.		531
58								Borehole Grouted On 5/1/06		530
59										529
60										528
61										



Project Name and Job Number Lee Nuclear Station COL MACTEC WLA 6234-06-3389					SOIL LOG - Boring No. B-1045-UD						
Type and Diameter of Boring Wash Rotary / 4 inch					Boring Location ISFSI N 1167749 E 1847628			Total Depth 16 feet			
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X					Elevation and Datum 588.4 feet MSL		Ground Water Depth N/A		Depth to Bedrock N/A		
Sampling Method Undisturbed					Sample Driving Hammer/Drop NA / NA			No. of Samples 3		Date Started 6/11/06	
					Borehole Inclination -90			Logged by J. Cerceo		Date Completed 6/11/06	

Reviewed by / Date B. Reinicker 6/13/06

Reviewed by / Date C. Lane 10-27-07

Elevation (feet)

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0												588
1											Drilled without sampling to 4 ft.	587
2												586
3												585
4											Shelby push 4 to 6 ft	584
5		UD 1		20.4 24	●	●	●		ML	SILT, sandy (ML); 5% gravel, 43% sand, 52% fines.		583
6											Drilled without sampling to 9 ft.	582
7												581
8												580
9											Shelby push 9 to 10.2 ft	579
10		UD 2		14.4 14.4	●	●	●		ML	SILT, sandy (ML); 41% sand, 59% fines.	Shelby push refusal at 10.2 ft	578
11											Drilled without sampling to 14 ft.	577
12												576
13												575
14											Shelby push 14 to 16 ft	574
15		UD 3		18 24	●	●	●		ML	SILT, sandy (ML); 48% sand, 52% fines.		573
16											Boring terminated	572
17												571
18												570
19												569
20												568
21												567
22												566
23												565
24												564
25												563
26												562
27												561
28												560
29												559
30												558
31												557
32												556
33												555
34												554
35												553
36												552
37												551
38												550
39												549
40												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1046	
Type and Diameter of Boring Wash Rotary / NQ core / 4 inch / NQ		Boring Location ISFSI N 1167815 E 1847834		Total Depth 93.3 feet	
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75		Elevation and Datum 588.3 feet MSL	Ground Water Depth 36 feet	Depth to Bedrock 61.4 feet	
Sampling Method SPT		Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 12	Date Started 4/18/06	
		Borehole Inclination -90	Logged by J. Cerceo	Date Completed 4/24/06	



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	Grassmat 0.3 feet	Begin drilling 4/18/06	588
1									ML	SILT, sandy (ML) red (2.5YR 4/6); stiff; clayey (fill) deposits, fine gravel; fine sand; 39% sand, 61% fines. FILL		587
2									ML			586
3									ML			585
4		SPT 1	8 7	18	●	●			ML		Very hard drilling	584
5									ML			583
6									ML			582
7									ML			581
8									ML			580
9		SPT 2	3 4 6	18 18	●				ML	SILT, sandy (ML); light red (2.5YR 6/8); stiff; <10% sand; trace clayey fill deposits; scattered rock fragments. FILL		579
10									ML			578
11									ML			577
12									ML			576
13									ML			575
14		SPT 3	3 6 5	11 18	●				ML	SAA; non to low plastic silts; quartz gravel pieces in first 6 inch 12% gravel, 36% sand, 53% fines. FILL	Classification based on B-1046-UD, UD-3 at 14 to 16 ft	574
15									ML			573
16									ML			572
17									ML			571
18									ML		Stiff drilling at 17.0 feet	570
19		SPT 4	4 6 7	14 18	●				SM	SAND silty (SM) red (2.5YR 4/8), dry, fine sand, medium dense; <15% silt, sparse and scattered rock fragments, FILL		569
20									SM			568
21									SM			567
22									SM			566
23									SM			565
24		SPT 5	3 5 6	13 18	●				ML	SILT, sandy (ML) Light red (2.5YR 6/8), dry to damp, stiff, fine sand non to low plasticity; 25% sand, 74% fines. RESIDUUM	Classification based on B-1046-UD, UD-5 at 24 to 26 ft Harder drilling at ~ 25.5 feet	564
25									ML			563
26									ML			562
27									ML			561
28									ML			560
29		SPT 6	4 6 8	15 18					ML	SAA; micaceous.		559
30									ML			558
31									ML			557
32									ML			556
33									ML			555
34		SPT 7	3 4 7	17 18	●				SM	SAND, silty (SM), reddish yellow (5YR 6/6) medium dense, <30% silt, fine sand, quartz fragments, poorly graded. RESIDUUM		554
35									SM			553
36									SM			552
37									SM			551
38									SM			550
39		SPT 8	4 4 6	18 18	●				CL	CLAY, sandy (CL), red (10R 4/6); trace sand		549
40									CL			549

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389





SOIL LOG - Boring No. B-1046

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40									SM	medium plasticity. RESIDUUM		548
41										SAND, silty (SM); reddish yellow (5YR 6/6); loose, ~15% silt, fine sand, quartz fragments. RESIDUUM		547
42										(Continued from previous page)		546
43												545
44	SPT 9	5 12 20	18 18						ML	SILT, sandy (ML); reddish yellow (5YR 6/6); hard, 44% sand, 56% fines. RESIDUUM	Classification based on B-1046-UD UD-8 44 to 46 ft	544
45												543
46												542
47												541
48												540
49	SPT 10	15 22 37	15 18							SAA; hard, fine to medium sand, coarse component appears to be quartz or plagioclase. RESIDUUM		539
50												538
51												537
52												536
53												535
54	SPT 11	27 39 46	17 18							SAA; reddish yellow (5YR 6/6); hard, fine to medium sand. RESIDUUM		534
55												533
56												532
57												531
58									SM	SAND, silty (SM); reddish yellow (5YR 6/6); fine to medium sand.		530
59	SPT 12	50/1	1							SAPROLITE/PARTIALLY WEATHERED ROCK		529
60												528
61												527
62												526
63												525
64												524
65												523
66												522
67												521
68												520
69												519
70												518
71												517
72												516
73												515
74												514
75												513
76												512
77												511
78												510
79												509
80												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. B-1046	
Type and Diameter of Boring Wash Rotary / NQ core / 4 inch / NQ		Boring Location ISFSI N 1167815 E 1847834		Total Depth 93.3 feet	
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75		Elevation and Datum 588.3 feet MSL		Ground Water Depth 36 feet	Depth to Bedrock 61.4 feet
Casing Size and Depth 3.5 inch / 58.6 feet		Length of Core Barrel and Bit 13.1 feet / 13.1 feet		No. of Core Boxes 3	Date Started 4/18/06
		Borehole Inclination -90		Logged by J. Cerceo	Date Completed 4/24/06

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
59					RS to CW	R0 to R2		SAND, (SP); yellowish red (5YR 5/6); quartz vein. PARTIALLY WEATHERED ROCK	End SPT sampling at 58.6 feet; SPT refusal. Begin NQ rock core. See core log.	529
60		13	2.4 / 4.7	0	HW to MW	R3				528
61					HW	R2				527
62								META-GRANODIORITE, bluish gray (10B 6/1), fine to medium grained, joints are moderately open with very thin manganese staining. Quartz is the chief accessory mineral. PARTIALLY WEATHERED ROCK.		526
63										525
64		14	4.0 / 4.0	38	MW	R3				524
65										523
66					HW	R0				522
67										521
68								SAA, mafic xenoliths, epidote filling in some healed fractures.		520
69										519
70		15	6.0 / 6.0	95					Lost 100% water ~70 ft	518
71										517
72					MW to SW	R3				516
73								SAA; PARTIALLY WEATHERED ROCK		515
74										514
75		16	5.0 / 5.0	58						513
76										512
77						R2				511
78										510
79		17	4.9 / 5.0	88				META-DIORITE, dark bluish gray (5B 4/1) and dark brown (7.5YR 3/3), fine grained, foliation dipping 50°, calcite filled fractures with accessory minerals biotite or hornblende. CONTINUOUS ROCK.	End 4/18/06 Start 4/19/06 water at 38.0 feet	509
80								META-DIORITE, black (N 2.5), fine grained, calcite filled fractures with accessory minerals hornblende and biotite.		508
81										507
82								META-GRANODIORITE, light bluish gray, fine to medium grained, having accessory mineralization of calcite, biotite, quartz, plagioclase.		506
83										505
84										504
85		18	5.0 / 5.0	76	SW to F	R3				503
86										502
87										501
88										500
89								META-GRANODIORITE, bluish gray, (10B 6/1) fine to medium grained, biotite, quartz, plagioclase, calcite mineralization.	End 4/19/06 Start 4/24/06 water at 36.0 feet	499
90		19	4.7 / 5.0	82						498
91										497
92										496
93										495
94									Coring terminated 4/24/06	494
95										493
96								Total Depth 93.3 ft. Groundwater encountered at 36 feet Borehole Grouted On 4/24/06		492
97										491
98										490

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1046-UD	
Type and Diameter of Boring Wash Rotary / 6 inch		Boring Location N 1167822 E 1847835		ISFSI N 1167822 E 1847835	
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X		Elevation and Datum 588 feet MSL		Ground Water Depth N/A	
Sampling Method Undisturbed		Sample Driving Hammer/Drop NA / NA		No. of Samples 9	
		Borehole Inclination -90		Logged by J. Cerceo	
				Date Started 6/10/06	
				Date Completed 6/11/06	



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0											6/10/06 Drilled without sampling to 4 ft.	588
1												587
2												586
3												585
4		UD 1		0						No recovery.	Shelby push 4 to 4.25 ft	584
5				3							Shelby push refusal	583
6											No recovery	582
7											Drilled without sampling to 10 ft.	581
8												580
9												579
10												578
11		UD 2		23.4					ML	SILT, sandy (ML).	Shelby push 10 to 12 ft.	577
12				24								576
13											Drilled without sampling to 14 ft.	575
14												574
15		UD 3		15.6		●	●	●	ML	SILT, sandy (ML); 12% gravel, 36% sand, 52% fines	Shelby push 14 to 16 ft	573
16				24								572
17											Drilled without sampling to 19 ft.	571
18												570
19												569
20		UD 4		23.4					SM	SAND, silty (SM).	Shelby push 19 to 21 ft.	568
21				24								567
22											Drilled without sampling to 24 ft.	566
23												565
24												564
25		UD 5		22.8		●	●	●	ML	SILT, sandy (ML); 25% sand, 74% fines.	Shelby push 24 to 26 ft.	563
26				24								562
27											Drilled without sampling to 32 ft.	561
28												560
29												559
30												558
31												557
32												556
33		UD 6		16.2					SM	SAND, silty (SM).	Shelby push 32 to 34 ft	555
34				24							End 6/10/06	554
35											Start 6/11/06	553
36											Groundwater not available	552
37											Drilled without sampling to 40 ft.	551
38												550
39												549
40												548

Project Name and Job Number
Lee Nuclear Station COL
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SOIL LOG - Boring No. B-1046-UD

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40											Shelby push 40 to 42.3 ft.	548
41	UD 7			27.6 28					SM	SAND, silty (SM).		547
42											Drilled without sampling to 44 ft.	546
43											Changed over to pitcher barrel equipment	545
44	UD 8			19.2 24	●	●	●		ML	SILT, sandy (ML); 44% sand, 56% fines.	Pitcher drill from 44 to 46 ft.	544
45												543
46											Drilled without sampling to 52 ft.	542
47												541
48												540
49												539
50												538
51												537
52												536
53	UD 9			8.4 24					SM	SAND, silty (SM).	Pitcher drill 52 to 54 ft.	535
54												534
55											Boring terminated 6/11/06	533
56												532
57												531
58												530
59												529
60												528
61												527
62												526
63												525
64												524
65												523
66												522
67												521
68												520
69												519
70												518
71												517
72												516
73												515
74												514
75												513
76												512
77												511
78												510
79												509
80												508

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1047	
Type and Diameter of Boring Wash Rotary / NQ core / 3 inch / NQ		Boring Location ISFSI N 1167543 E 1847907		Total Depth 93.5 feet	
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850		Elevation and Datum 588.1 feet MSL		Ground Water Depth 32 feet	
Sampling Method SPT		Sample Driving Hammer/Drop 140 lbs / 30 inches		No. of Samples 11	
		Borehole Inclination -90		Logged by A. Tillery/E. Weldon	
				Date Started 4/25/06	
				Date Completed 4/27/06	



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									SM	SAND, silty (SM), yellow (10YR 7/8), damp, loose and yellow with quartz grain, mottled with dark black manganese and white spots. RESIDUUM	Begin drilling 4/25/06	588
1												587
2												586
3												585
4		SPT 1	4	18								584
5			3	18								583
6												582
7												581
8												580
9		SPT 2	3	16	•	•				SAND, silty (SM), yellow (10YR 7/8); damp, loose, mottled; large zone of black mineral manganese near top of sample; 43% fines, 57% sand.		579
10			4	18								578
11												577
12												576
13												575
14		SPT 3	4	17	•	•				SAND, silty (SM); much less yellow (2.5YR 5/3); damp, medium dense, more gray, white and black, still mottled, biotite quartz and fewer black inclusions; 42% fines, 58% sand. RESIDUUM		574
15			5	18								573
16			8									572
17												571
18												570
19		SPT 4	5	13	•				SM	SAND, silty (SM); gray upper 6 inches (10YR 7/2); damp, medium dense, bottom half (below 6 inches) more yellow (10YR 7/6). SAPROLITE		569
20			8	18								568
21												567
22												566
23												565
24		SPT 5	6	16	•	•				SAA, yellow (10YR 7/6); damp, medium dense, mottled yellow, gray, some black manganese oxide, 49% fines, 51% sand. SAPROLITE		564
25			7	18								563
26			10									562
27												561
28												560
29		SPT 6	5	15						SAA; yellow (10YR 6/6); damp; hard; mottled		559
30			12	18					SM	SAND, silty (SM); yellow, gray and some black; PARTIALLY WEATHERED ROCK		558
31			26									557
32												556
33												555
34		SPT 7	34	16	•	•				SAND, silty (SM); yellow gray (10YR 6/4); damp, very dense, mica, quartz, less black manganese oxide, 39% fines, 61% sand. PARTIALLY WEATHERED ROCK		554
35			46	17								553
36			50/5									552
37												551
38												550
39		SPT 8	32	12						SAA, gray (2.5Y 7/2); damp, mottled. PARTIALLY WEATHERED ROCK		549
40			50/6									548

Project Name and Job Number
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SOIL LOG - Boring No. B-1047



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40												548
41												547
42												546
43												545
44	SPT 9	50/2	4	2						SAND, silty (SM); yellow (2.5Y 6/8); damp, some gravel sized rock fragments. PARTIALLY WEATHERED ROCK		544
45												543
46												542
47												541
48												540
49	SPT 10	50/4	6	4						SAND, silty (SM); yellow (10YR 5/8); damp, quartz fragments up to 0.5 cm, mottled. PARTIALLY WEATHERED ROCK		539
50												538
51												537
52												536
53												535
54	SPT 11	36 50/4	11	10	●	●				SAND, silty (SM) (2.5Y 6/3); 37% fines, 63% sand. PARTIALLY WEATHERED ROCK		534
55												533
56												532
57												531
58												530
59	SPT 12	50/1	0	1						No recovery.	SPT sampling terminated 58.5 ft. See rock log	529
60												528
61												527
62												526
63												525
64												524
65												523
66												522
67												521
68												520
69												519
70												518
71												517
72												516
73												515
74												514
75												513
76												512
77												511
78												510
79												509
80												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. B-1047	
Type and Diameter of Boring Wash Rotary / NQ core / 3 inch / NQ		Boring Location ISFSI N 1167543 E 1847907		Total Depth 93.5 feet	
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850		Elevation and Datum 588.1 feet MSL		Ground Water Depth 32 feet	Depth to Bedrock 58.5 feet
Casing Size and Depth 3.5 inch / 58.5 feet		Length of Core Barrel and Bit 5 feet / 3 feet		No. of Core Boxes 2	Date Started 4/25/06
		Borehole Inclination -90		Logged by A. Tillery/E. Weldon	Date Completed 4/27/06

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
59								META-GRANODIORITE; gray to black to light orange; equigranular texture to moderately coarse grained. Weak foliation shown by mineral alignment and compositional segregation. Foliation direction varies from horizontal to 35°. Many healed fractures, brecciated in places, closely spaced with rough some vugs and pits weathered out.	End 4/25/06 Begin 4/26/06; water at 27.2 ft	529
60										528
61		1	4.4 5.0	37	MW	R1 to R2				527
62										526
63										525
64								Fractures healed with calcite		524
65										523
66		2	5.0 5.0	50	MW	R1 to R2				522
67										521
68								Meta-mafic dike or amphibolite from 67.8 to 69 ft		520
69								META-GRANODIORITE as above. CONTINUOUS ROCK.		519
70										518
71		3	5.0 5.0	68	MW to SW	R2 to R3		Meta-mafic dike or amphibolite from 70.6 to 71.4 ft		517
72								META-QUARTZ DIORITE to META-GRANODIORITE light color mineral lining fractures, minerals albite, quartz, feldspar, mafics, minor calcite, talc, and epidote.		516
73										515
74										514
75										513
76		4	5.0 5.0	68	MW to SW	R2 to R3				512
77										511
78										510
79		5	0.5 0.5	0	MW to SW	R2 to R3				509
80		6	2.5 2.5	68	MW to SW	R2 to R3				508
81										507
82		7	1.6 2.0	37	MW to SW	R2 to R3				506
83										505
84								AMPHIBOLITE; dark bluish gray (5B 4/1); very fine grained; foliation dip 60°, xenoliths of meta-quartz diorite/meta-granodiorite.		504
85										503
86		8	4.3 5.0	68	SW	R3				502
87										501
88								META-QUARTZ DIORITE to META-GRANODIORITE as described above		500
89									End 4/26/06 Begin 4/27/06; water at 32 ft	499
90										498
91		9	4.8 5.0	90	F	R4			Losing water	497
92										496
93										495
94									Boring terminated 4/27/06	494
95										493
96								Total Depth 93.5 ft.		492
97								Groundwater encountered at 32 feet		491
98								Borehole Grouted On 4/27/06		490

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1047-UD	
Type and Diameter of Boring Wash Rotary / 6 inch		Boring Location ISFSI N 1167548 E 1847908		Total Depth 40 feet	
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X		Elevation and Datum 588.2 feet MSL		Ground Water Depth N/A	
Sampling Method Undisturbed		Sample Driving Hammer/Drop NA / NA		No. of Samples 5	
		Borehole Inclination -90		Logged by J. Cerceo	
				Date Started 6/11/06	
				Date Completed 6/11/06	

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0											6/11/06 Drilled without sampling to 4 ft.	588
1												587
2												586
3												585
4		UD 1		23.4 24					ML	SILT, sandy (ML).	Shelby push 4 to 6 ft	584
5												583
6											Drilled without sampling to 9 ft.	582
7												581
8												580
9		UD 2		25 25					ML	SILT, sandy (ML).	Shelby push 9 to 11.1 ft	579
10												578
11											Drilled without sampling to 14 ft.	577
12												576
13												575
14		UD 3		22.8 24	●	●	●		SM	SAND, silty (SM); 35% fines, 65% sand.	Shelby push 14 to 16 ft.	574
15												573
16											Drilled without sampling to 24 ft.	572
17												571
18												570
19												569
20												568
21												567
22												566
23												565
24		UD 4		15.6 19.2	●	●	●		ML	SILT, sandy (ML); 1% gravel, 47% sand, 52% fines.	Shelby push 24 to 25.6 ft. Shelby push refusal	564
25												563
26											Drilled without sampling to 34 ft.	562
27											Changed to pitcher sample equipment	561
28												560
29												559
30												558
31												557
32												556
33												555
34		UD 5		0 24						No recovery.	Pitcher drill from 34 to 36 ft.	554
35												553
36											Drilled without sampling to 40 ft. Tricone refusal, boring terminated	552
37												551
38												550
39												549
40												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1048	
Type and Diameter of Boring Wash Rotary / NQ core / 4 inch / NQ		Boring Location ISFSI N 1167477 E 1847718		Total Depth 84.5 feet	
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850		Elevation and Datum 587.5 feet MSL		Ground Water Depth 25 feet	
Sampling Method SPT		Sample Driving Hammer/Drop 140 lbs / 30 inches		No. of Samples 9	
		Borehole Inclination -90		Logged by E. Weldon	
				Date Started 4/27/06	
				Date Completed 4/29/06	



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT, sandy (ML); strong brown (7.5YR 5/8); damp, stiff, sand ~10%, clay <10 to 15%, very fine sand, manganese oxide, veins, mottled. FILL	Begin drilling 4/27/06	587
1												586
2												585
3												584
4		SPT 1	3 4 5	20.4 18								583
5									ML	SILT, sandy (ML); red (2.5YR 4/8) to yellowish brown (10 YR 5/4); damp, medium stiff, manganese oxide, veining. RESIDUUM		582
6												581
7												580
8												579
9		SPT 2	2 3 4	18 18								578
10												577
11												576
12												575
13												574
14		SPT 3	3 3 4	18 18					ML	SILT, sandy (ML); light gray (7.5Y 7/4); damp, medium stiff, relict foliation apparent with parallel manganese veining, 74% fines. SAPROLITE	B-1048-UD, UD-2 at 14 to 16 ft	573
15												572
16												571
17												570
18												569
19		SPT 4	2 4 5	14.4 18						SAA; dark brown (10YR 3/3) to yellowish red (5YR 5/8); stiff, moist, sand (very fine) manganese oxide veins parallel to foliation. SAPROLITE		568
20												567
21												566
22												565
23												564
24		SPT 5	3 6 8	18 18					Δ	SAA; olive gray (5Y 4/2) with reddish yellow (7.5YR 6/8) veins occasional damp, stiff, 1% gravel, 63% fines. SAPROLITE	B-1048-UD, UD-2 at 24 to 26 ft	563
25												562
26												561
27												560
28												559
29		SPT 6	12 22 48	18 18						SAA; light gray (10YR 7/2) to olive (5Y 5/3); hard, damp, fine to medium. SAPROLITE		558
30												557
31												556
32												555
33												554
34		SPT 7	11 12 24	16.8 18						SAA; olive gray (5Y 4/2); damp; hard; sand is very fine. SAPROLITE		553
35												552
36												551
37												550
38												549
39		SPT 8	7 11 17	20.4 18						SAA; olive gray (5Y 4/2); damp, very stiff. SAPROLITE		548
40												

Project Name and Job Number
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SOIL LOG - Boring No. B-1048

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40												547
41												546
42									SM			545
43												544
44		SPT 9	50/4	0/4								543
45											Refusal at 44.4 ft., see rock log	542
46												541
47												540
48												539
49												538
50												537
51												536
52												535
53												534
54												533
55												532
56												531
57												530
58												529
59												528
60												527
61												526
62												525
63												524
64												523
65												522
66												521
67												520
68												519
69												518
70												517
71												516
72												515
73												514
74												513
75												512
76												511
77												510
78												509
79												508
80												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. B-1048	
Type and Diameter of Boring Wash Rotary / NQ core / 4 inch / NQ		Boring Location ISFSI N 1167477 E 1847718		Total Depth 84.5 feet	
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850		Elevation and Datum 587.5 feet MSL		Ground Water Depth 25 feet	Depth to Bedrock 44.5 feet
Casing Size and Depth 3.5 inch / 44.5 feet		Length of Core Barrel and Bit 8 feet / 8 feet		No. of Core Boxes 3	Date Started 4/27/06
		Borehole Inclination -90		Logged by E. Weldon	Date Completed 4/29/06

Reviewed by / Date F. Syms 5/23/06

Reviewed by / Date M. Gray 10-22-07



Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
45								META-QUARTZ DIORITE; speckled light gray (10YR 7/1) to gray (10YR 6/6) to dark gray (10YR 4/1); equigranular; xenoblastic 40% feldspar, 25 to 30% mafics; biotite and hornblende, minor pyrite; occasional amphibolite xenoliths. PARTIALLY WEATHERED ROCK	Tricone refusal at 44.4 ft, drilled casing to 44.5 to start rock coring	543
46										542
47		1	1.7 5.0	0	HW to MW	R1 to R2			Start NQ core on 4/28/06.	541
48									Total water loss	540
49									Water loss continuous	539
50										538
51									Water loss continuous	537
52		2	2.4 5.0	20	HW to MW	R1 to R2				536
53										535
54										534
55										533
56										532
57		3	4.0 5.0	30	MW	R2 to R3			Water loss continuous	531
58										530
59										529
60										528
61		4	3.4 3.6	42	MW	R2				527
62										526
63										525
64		5	0.5 1.4	0	HW to MW	R1				524
65								AMPHIBOLITE to META-DIORITE; dark gray, hornblende, mica, biotite, plagioclase and pyrite; porphyroblasts randomly oriented; Epidote? green mineralization within 3 mm of contact	PARTIALLY WEATHERED ROCK	523
66										522
67		6	4.6 5.0	54	HW to MW	R1 to R3				521
68								META-QUARTZ DIORITE OR META-GRANODIORITE		520
69										519
70								SAA. META-QUARTZ DIORITE to META-GRANODIORITE.		518
71								CONTINUOUS ROCK		517
72		7	4.9 5.0	78	MW to SW	R2 to R3				516
73										515
74								AMPHIBOLITE to META-DIORITE; dark gray, equigranular, fine grained		514
75								META-QUARTZ DIORITE; sheared, with healed mylonitized fabric near (within 6 inch contact); calcite fills the finely sheared zone near contact.		513
76										512
77		8	4.1 5.0	68	SW	R4				511
78										510
79										509
80								META-GRANODIORITE or META-QUARTZ DIORITE; orthoclase-rich or plagioclase rich (altered)		508
81		9	3.3 3.3	91	SW	R3 to R4				507
82										506
83										505
84		10	1.7 1.7	76	SW	R3 to R4		SAA; epidote rich vein; brecciated and healed		504
								META-DIORITE to AMPHIBOLITE; dark gray,		503

Project Name and Job Number
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ROCK LOG - Boring No. B-1048



Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
85								porphyroblastic	Coring terminated on 4/29/06; water at 25 ft	503
86										502
87										501
88								Total Depth 84.5 ft.		500
89								Groundwater encountered at 25 feet		499
90								Borehole Grouted On 4/29/06		498
91										497
92										496
93										495
94										494
95										493
96										492
97										491
98										490
99										489
100										488
101										487
102										486
103										485
104										484
105										483
106										482
107										481
108										480
109										479
110										478
111										477
112										476
113										475
114										474
115										473
116										472
117										471
118										470
119										469
120										468
121										467
122										466
123										465
124										464
										463

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1048-UD	
Type and Diameter of Boring Wash Rotary / 4 inch		Boring Location ISFSI N 1167471 E 1847715		Total Depth 26 feet	
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X		Elevation and Datum 587.5 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A	
Sampling Method Undisturbed		Sample Driving Hammer/Drop NA / NA	No. of Samples 3	Date Started 6/11/06	
		Borehole Inclination -90	Logged by J. Cerceo	Date Completed 6/11/06	

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0												587
1												586
2												585
3												584
4												583
5		UD 1		21.6 24					ML	SILT, sandy (ML).	Shelby push 4 to 6 ft	582
6												581
7												580
8												579
9												578
10												577
11												576
12												575
13												574
14												573
15		UD 2		15.6 24	●	●	●		ML	SILT, sandy (ML); 26% sand, 74% fines.	Shelby push 14 to 16 ft	572
16												571
17												570
18												569
19												568
20												567
21												566
22												565
23												564
24												563
25		UD 3		24 24	●	●	●		ML	SILT, sandy (ML); 1% gravel, 36% sand, 63% fines.	Shelby push 24 to 26 ft.	562
26												561
27											Boring terminated at 26 ft on 6/11/06	560
28												559
29												558
30												557
31												556
32												555
33												554
34												553
35												552
36												551
37												550
38												549
39												548
40												

Project Name and Job Number Lee Nuclear Station COL MACTEC WLA 6234-06-3389		SOIL LOG - Boring No. B-1049	
Type and Diameter of Boring Wash Rotary / NQ core / Tricone 3 7/8 inch		Boring Location ISFSI N 1167470 E 1847541	Total Depth 81 feet
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850		Elevation and Datum 587.4 feet MSL	Ground Water Depth 23.8 feet
Sampling Method SPT		Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 6
		Borehole Inclination -90	Logged by E. Weldon
			Date Started 4/29/06
			Date Completed 5/1/06

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT, sandy (ML); red (2.5YR 5/8); dry, stiff, <5% clay, <10% sand, fine to coarse sand. FILL	Start on 4/29/06	587
1												586
2												585
3												584
4		SPT 1	6 7	19.2 18	●							583
5												582
6												581
7									ML	SILT, sandy (ML); very pale brown (10YR 8/3 and 10YR 7/3); damp, medium stiff, very fine <1% clay; manganese oxide veins subhorizontal. SAPROLITE		580
8												579
9		SPT 2	2 2 4	15.6 18								578
10												577
11												576
12												575
13												574
14		SPT 3	4 5 7	18 18					SP	SAND, silty (SP); gray (10YR 6/1) to yellow (10YR 7/6); medium dense, damp, fine grained. SAPROLITE		573
15												572
16												571
17												570
18												569
19		SPT 4	6 7 14	16.8 18						SAND, (SP); light gray (10YR 7/1); white (10YR 8/1), and yellow (10YR 8/6); damp, medium dense, fine grained, <5% clay, <10% silt. SAPROLITE		568
20												567
21												566
22												565
23												564
24		SPT 5	7 11 12	15.6 18					▽	SAND, (SP) as above; medium dense, manganese oxide vein (~45° dip). SAPROLITE		563
25												562
26												561
27												560
28												559
29		SPT 6	12 13 12	16.8 18						SAND, (SP); grayish brown (10YR 5/2) to white (5Y 8/1); damp; medium dense. SAPROLITE		558
30											SPT sampling terminated at 31.0 ft. See rock core log.	557
31												556
32												555
33												554
34												553
35												552
36												551
37												550
38												549
39												548
40												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. B-1049	
Type and Diameter of Boring Wash Rotary / NQ core / Tricone 3 7/8 inch		Boring Location ISFSI N 1167470 E 1847541		Total Depth 81 feet	
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850		Elevation and Datum 587.4 feet MSL	Ground Water Depth 23.8 feet	Depth to Bedrock 31 feet	
Casing Size and Depth 3.5 inch / 31 feet		Length of Core Barrel and Bit 8 feet	No. of Core Boxes 3	Date Started 4/29/06	
		Borehole Inclination -90	Logged by E. Weldon	Date Completed 5/1/06	

Reviewed by / Date F. Syms 5/27/06Reviewed by / Date M. Gray 10-22-07



Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
31								META-QUARTZ DIORITE or META-GRANODIORITE;	Tricone refusal on 4/29/06	556
32								black, pale yellow, light gray, speckled equigranular.	Start NQ rock core on	555
33								Weak 20° foliation in upper and ~30° in mid to lower	4/30/06; water at 18.3 ft	554
34		1	3.6 5.0	52	MW to HW	R1 to R3		core.		553
35								Mafics (hornblende, biotite, minor pyrite probably) 15 to		552
36								40%. Feldspar ~40%, quartz ~10 to 20% (gray blue)		551
37								SAA. CONTINUOUS ROCK	Total water loss.	550
38										549
39		2	5.0 5.0	88	SW	R3 to R4				548
40								SAA		547
41										546
42										545
43								Fabric becomes increasingly gneissic, felsic and mafic		544
44		3	4.9 5.0	70	MW to SW	R3 to R4		mineral separation and banding is more pronounced.		543
45										542
46										541
47										540
48		4	5.0 5.0	98	SW to F	R4 to R5				539
49										538
50										537
51										536
52										535
53		5	4.9 5.0	92	SW to F	R4 to R5				534
54										533
55										532
56										531
57								META-QUARTZ DIORITE; Speckled black, gray, blue		530
58		6	5.0 5.0	100	SW to F	R4 to R5		gray; equigranular, aggregates fine grained; mafic and		529
59								felsic minerals; xenoblastic except in veins		528
60										527
61										526
62										525
63										524
64		7	4.9 5.0	96	SW to F	R4 to R5				523
65										522
66								SAA		521
67										520
68		8	5.1 5.1	94	F	R4 to R5			End day 4/30/06	519
69									5/1/06 start drilling; water	518
70								Foliation strong and very closely spaced healed fractures	level at 23.8 ft	517
71								with shear, offset approximately 1 cm.	100% water loss	

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389





ROCK LOG - Boring No. B-1049

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
71								SAA		516
72									Water loss continues	515
73		9	4.8 4.9	97	F	R5				514
74										513
75										512
76		10	0.5 0.5	100	F	R5		SAA		511
77										510
78		11	4.5 4.5	93	F	R5				509
79										508
80										507
81									Coring terminated on 5/1/06	506
82										505
83										504
84								Total Depth 81 ft. Groundwater encountered at 23.8 feet Borehole Grouted On 5/1/06		503
85										502
86										501
87										500
88										499
89										498
90										497
91										496
92										495
93										494
94										493
95										492
96										491
97										490
98										489
99										488
100										487
101										486
102										485
103										484
104										483
105										482
106										481
107										480
108										479
109										478
110										477
111										

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1050	
Type and Diameter of Boring Wash Rotary / NQ core / 3.75 inch / NQ		Boring Location Unit 1 N 1164915 E 1846053		Total Depth 73.4 feet	
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75		Elevation and Datum 597 feet MSL		Ground Water Depth 13 feet	
Sampling Method SPT		Sample Driving Hammer/Drop 140 lbs / 30 inches		No. of Samples 15	
		Borehole Inclination -90		Logged by J. Cerceo	
				Date Started 5/2/06	
				Date Completed 5/3/06	

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0												597
1									SP	Field straw grass root mat ~3 inch	Begin drilling 5/2/06	596
2										Gravel with sand and silt, very dense, dry, finable.	Very hard drilling	595
3										PARTIALLY WEATHERED ROCK		594
4		SPT 1	50/4	4/4								593
5												592
6												591
7												590
8												589
9												588
10												587
11												586
12												585
13												584
14												583
15												582
16												581
17												580
18												579
19												578
20												577
21												576
22												575
23												574
24												573
25												572
26												571
27												570
28												569
29												568
30												567
31												566
32												565
33												564
34												563
35												562
36												561
37												560
38												559
39												558
40												557

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. B-1050	
Type and Diameter of Boring Wash Rotary / NQ core / 3.75 inch / NQ		Boring Location Unit 1 N 1164915 E 1846053		Total Depth 73.4 feet	
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75		Elevation and Datum 597 feet MSL	Ground Water Depth 13 feet	Depth to Bedrock 3.4 feet	
Casing Size and Depth 3.75 inch / 3.4 feet		Length of Core Barrel and Bit 13.1 feet / 13.1 feet	No. of Core Boxes 3	Date Started 5/2/06	
		Borehole Inclination -90	Logged by J. Cerceo	Date Completed 5/3/06	



Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
4								META-GRANODIORITE to META-QUARTZ DIORITE; dark reddish brown (5YR 2.5/2); fine grained; biotite, muscovite, quartz, altered plagioclase and pyrite. PARTIALLY WEATHERED ROCK.	Begin NQ rock core	593
5										592
6		2	1.2 5.0	0						591
7										590
8										589
9										588
10										587
11		3	1.5 5.0	0						586
12										585
13					RS to CW	R1 to R2	▽			584
14										583
15										582
16		4	1.4 5.0	0						581
17										580
18										579
19										578
20										577
21		5	1.0 5.0	0						576
22										575
23										574
24										573
25								SAA; increased mafic minerals, biotite, muscovite, hornblende		572
26		6	1.5 5.0	0	RS to CW	R0 to R1				571
27										570
28										569
29								META-DIORITE; dark reddish brown (5YR 2.5/2); fine grained; mafic minerals include biotite, and hornblende; highly weathered plagioclase. PARTIALLY WEATHERED ROCK		568
30										567
31		7	0.8 5.0	0	RS to CW	R0 to R1				566
32										565
33										564
34										563
35										562
36		8	0.9 5.0	0						561
37										560
38										559
39								META-QUARTZ DIORITE; very dark gray (10YR 3/1) and dark reddish brown; fine grained, quartz, plagioclase, hornblende, biotite, muscovite.		558
40										557
41		9	2.3 5.0	7						556
42										555
43					HW	R3				554

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389





ROCK LOG - Boring No. B-1050

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
44					RS to CW	R1				553
45		10	1.3 / 5.0	0	HW	R0 to R1				552
46						R2				551
47										550
48										549
49		11	1.7 / 5.0	10	RS to CW	R0 to R1		SAA; bluish gray (5PB 6/1); fine grained, hornblende, plagioclase, biotite, pyrite, quartz.	End day 5/2/06 Begin 5/3/06; water at 13 ft	548
50										547
51										546
52					HW	R2				545
53					RS to CW	R0 to R1				544
54										543
55		12	1.9 / 5.0	0	HW	R2				542
56										541
57					RS to CW	R0 to R1				540
58										539
59								META-QUARTZ DIORITE; bluish gray; fine grained, hornblende, quartz, plagioclase. PARTIALLY WEATHERED ROCK		538
60		13	3.5 / 5.0	44	HW	R2				537
61					RS to CW	R0 to R1				536
62										535
63										534
64								META-QUARTZ DIORITE; bluish gray; fine to medium grained, most fractures healed with quartz and micaceous minerals. CONTINUOUS ROCK.		533
65		14	5.0 / 5.0	100				Quartz Pegmatite vein.		532
66										531
67					SW to F	R3		Subvertical fractures healed with quartz.		530
68										529
69								META-QUARTZ DIORITE; bluish gray; fine grained; hornblende, quartz, plagioclase, biotite.		528
70										527
71		15	5.0 / 5.0	100				Foliation dipping 50° perpendicular to healed quartz fractures.		526
72										525
73										524
74									Coring terminated on 5/3/06	523
75										522
76								Total Depth 73.4 ft.		521
77								Groundwater encountered at 13 feet		520
78								Borehole Grouted On 5/3/06		519
79										518
80										517
81										516
82										515
83										514

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1051	
Type and Diameter of Boring Wash Rotary / NQ core / Tricone 3 7/8 inch		Boring Location Unit 1 Pipeline N 1164991 E 1846392		Total Depth 71.5 feet	
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850		Elevation and Datum 587.7 feet MSL		Ground Water Depth 14.7 feet	
Sampling Method SPT		Sample Driving Hammer/Drop 140 lbs / 30 inches		No. of Samples 5	
		Borehole Inclination -90		Logged by E. Weldon	
				Date Started 5/9/06	
				Date Completed 5/10/06	

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									CL	CLAY, silty (CL); yellowish red (5YR 5/6) to grayish brown (2.5Y 5/2); damp, stiff, <10% sand, occasional subangular rock fragment (<3 mm). FILL	Start 5/9/06	587
1												586
2												585
3												584
4	SPT 1		4 5 4	19.2 18								583
5												582
6												581
7												580
8												579
9	SPT 2		8 12 9	13.2 18	●	●			SM SM	SAND, silty with gravel (SM); grayish brown (5YR 5/6); dry; subangular; gravel sized rock pieces. FILL		578
10										SAND, silty (SM) with gravel, reddish yellow (7.5YR 6/8) to yellow (10YR 8/6), damp, medium dense, 21% gravel, 51% sand, 28% fines; SAPROLITE		577
11												576
12												575
13												574
14	SPT 3		26 40 29	15.6 18	●	●			SM	SAND, silty with gravel (SM); yellowish brown (10YR 5/6) to light yellowish brown (10YR 6/4), damp, very dense, 4% gravel, 62% sand, 34% fines. SAPROLITE		573
15												572
16												571
17												570
18												569
19	SPT 4		12 20 50/5	13.2 17	●	●				SAND, silty (SM); yellowish brown (10YR 5/6); damp, very dense, mostly medium grained sand, 28% gravels, 56% sand, 16% fines. SAPROLITE		568
20												567
21												566
22												565
23												564
24	SPT 5		14 18 31	18 18	●	●				SAND, silty, with gravel (SM); brown to very dark brown (10YR 4/3 to 10YR 3/1) to strong brown (7.5YR 5/6); damp, dense, 2% gravels, 61% sand, 37% fines. SAPROLITE		563
25											Tricone refusal 26.5 ft., see rock log	562
26												561
27												560
28												559
29												558
30												557
31												556
32												555
33												554
34												553
35												552
36												551
37												550
38												549
39												548
40												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. B-1051	
Type and Diameter of Boring Wash Rotary / NQ core / Tricone 3 7/8 inch		Boring Location Unit 1 Pipeline N 1164991 E 1846392		Total Depth 71.5 feet	
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850		Elevation and Datum 587.7 feet MSL		Ground Water Depth 14.7 feet	Depth to Bedrock 26.5 feet
Casing Size and Depth 3.5 inch / 26.5 feet		Length of Core Barrel and Bit 8 feet		No. of Core Boxes 3	Date Started 5/9/06
		Borehole Inclination -90		Logged by E. Weldon	Date Completed 5/10/06

Reviewed by / Date F. Syms 5/26/06

Reviewed by / Date M. Gray 10-22-07



Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
27								META-DIORITE to AMPHIBOLITE; black (2.5Y 2/0) to yellowish red (5YR 5/8) where weathered; equigranular; fine grained >50 to 60% mafic minerals (hornblende, biotite?, pyroxene?), 40 to 50% plagioclase? mostly strongly foliated near quartz veining. Very closely spaced incipient and healed fractures joints throughout. PARTIALLY WEATHERED ROCK.	Tricone refusal switched to NQ rock coring.	561
28		1	3.5 4.0	0	HW to MW	R2				560
29									Losing ~20% water	559
30										558
31		2	0.7 1.0	0	HW	R2				557
32										556
33		3	2.0 3.8	0	HW	R1 to R2			70% water loss	555
34										554
35								More leucocratic and coarse grained, more brecciated 34.5 to 43.5 ft		553
36		4	1.3 1.2	69	HW to MW	R2		META-QUARTZ DIORITE or META-DIORITE; brecciated with very closed spaced fractures, slightly more coarse grained texture.	End 5/9/06 Start 5/10/06	552
37								SAA; healed or filled fracture joints throughout entire core. Orientations vary, intersecting and irregular. More brecciated in lower part of run 5.		551
38										550
39		5	4.7 4.8	35	MW	R2				549
40										548
41										547
42										546
43		6	2.0 2.2	41	MW	R2				545
44								METADIORITE to AMPHIBOLITE; upper ~ 1 ft. mylonitized? to schistose and darker color (dark gray) and more mafic than above.		544
45		7	2.5 3.0	13	HW to MW	R2			~80% water loss	543
46										542
47										541
48		8	2.7 2.7	15	HW	R2				540
49										539
50								META-QUARTZ DIORITE or META-DIORITE; gray to brownish gray; equiangular, fine grained; (mafic inclusions) around hornblende? Hornblende and biotite 50 to 70%, plagioclase and quartz 50 to 30%		538
51		9	1.0 2.3	0	HW to MW	R2				537
52								Rock is weathered with MgO mineralization in all fracture and joint surfaces, and some FeO staining also. Veins forming along incipient joints and foliation joints, very closely spaced incipient joints, fractures.		536
53		10	2.4 2.4	16	HW to MW	R2		SAA, but also moderately spaced veins of quartz obliquely to vertical		535
54								Minor calcite and epidote associated with quartz veins		534
55		11	1.7 2.6	0	HW to MW	R2		SAA. PARTIALLY WEATHERED ROCK.		533
56										532
57										531
58										530
59		12	4.8 5.0	68	MW to SW	R2 to R3				529
60										528
61										527
62									100% water loss	526
63										525
64		13	5.0 5.0	64	MW to SW	R2 to R3				524
65										523
66										522

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389



ROCK LOG - Boring No. B-1051

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
67								META-DIORITE or AMPHIBOLITE; as above, but more weathered.		521
68								PARTIALLY WEATHERED ROCK.		520
69		14	4.6 5.0	18	HW to MW	R2 to R3				519
70										518
71										517
72									Coring terminated on 5/10/06; water at 14.7 ft	516
73										515
74										514
75										513
76										512
77										511
78										510
79										509
80										508
81										507
82										506
83										505
84										504
85										503
86										502
87										501
88										500
89										499
90										498
91										497
92										496
93										495
94										494
95										493
96										492
97										491
98										490
99										489
100										488
101										487
102										486
103										485
104										484
105										483
106										482

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1052	
Type and Diameter of Boring Wash Rotary / NQ core / Tricone 3 7/8 inch		Boring Location Unit 1 Pipeline N 1165181 E 1846736		Total Depth 70.7 feet	
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850		Elevation and Datum 587.4 feet MSL		Ground Water Depth 26.5 feet	
Sampling Method SPT		Sample Driving Hammer/Drop 140 lbs / 30 inches		No. of Samples 11	
		Borehole Inclination -90		Logged by E. Weldon	
				Date Started 5/3/06	
				Date Completed 5/9/06	



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT, (ML); yellowish red (5YR 5/8); damp, stiff, <5% clay and <5 % sand (very fine), low plasticity, some subangular rock fragments. FILL	Start 5/3/06 Fill	587
1												586
2												585
3												584
4	SPT 1		3	15.6								583
5				18								582
6												581
7												580
8												579
9	SPT 2		3	16.8					SC	SAND, clayey with gravel (SM); gray (5Y 6/1); damp, loose, 10% gravel, 46% sand, 44% fines medium plasticity. ALLUVIUM		578
10			5	18					CL	CLAY, silty, sandy (CL); pale yellow (2.5Y 7/6) and yellowish red (5YR 5/8). SAPROLITE		577
11												576
12												575
13									SM	SAND, silty with gravel (SM); very pale brown (10YR 7/4); damp to moist, 8% gravel, 70% sand, 22% fines. Grains are angular to subangular. PARTIALLY WEATHERED ROCK		574
14	SPT 3		50/6	6								573
15				6								572
16												571
17												570
18												569
19	SPT 4		50/4.5	5.4						SAND, silty with gravel (SM); dark grayish brown (2.5Y 4/2), moist, 7% gravel, 63% sand, 30% fines well graded, gravels are subangular. PARTIALLY WEATHERED ROCK		568
20				4.5								567
21												566
22												565
23												564
24	SPT 5		50/4	4					GM	GRAVEL with silt (GM); dark grayish brown (2.5Y 4/2); moist; 43% gravel, 42% sand, 15% fines. PARTIALLY WEATHERED ROCK		563
25				4								562
26												561
27												560
28												559
29	SPT 6		50/5	6						SAA; grayish brown (2.5Y 5/2); damp, <10% clay, well graded to moderately graded. PARTIALLY WEATHERED ROCK		558
30				5								557
31												556
32												555
33												554
34	SPT 7		50/5.5	5.5						SAA; olive gray (5Y 5/2). PARTIALLY WEATHERED ROCK		553
35				5.5								552
36												551
37												550
38												549
39	SPT 8		50/1	1								548
40				1								

Project Name and Job Number



Lee Nuclear Station COL
6234-06-3389

SOIL LOG - Boring No. B-1052



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40												547
41												546
42												545
43												544
44	SPT 9	12	20	18					ML	SILT, sandy (ML); pinkish white (7.5YR 8/2) and reddish yellow (7.5YR 7/8) and dark brown (7.5YR 4/2); damp, poorly graded, low plasticity. PARTIALLY WEATHERED ROCK		543
45												542
46												541
47												540
48												539
49	SPT 10	50/3	4.8	3					GW	GRAVEL, sandy (GW) olive gray (5Y 5/2); damp, ~10% clay, angular to subangular gravels (<1 cm). PARTIALLY WEATHERED ROCK.	End of drilling 5/3/06 Begin drilling 5/8/06; water at 26.5 ft Hard drilling 48.8 to 53.7 ft	538
50												537
51												536
52												535
53												534
54	SPT 11	50/2	0	2						No recovery.	Tricone refusal 53.65 ft., see rock log	533
55												532
56												531
57												530
58												529
59												528
60												527
61												526
62												525
63												524
64												523
65												522
66												521
67												520
68												519
69												518
70												517
71												516
72												515
73												514
74												513
75												512
76												511
77												510
78												509
79												508
80												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. B-1052	
Type and Diameter of Boring Wash Rotary / NQ core / Tricone 3 7/8 inch		Boring Location Unit 1 Pipeline N 1165181 E 1846736		Total Depth 70.7 feet	
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850		Elevation and Datum 587.4 feet MSL		Ground Water Depth 26.5 feet	
Casing Size and Depth 3.5 inch / 53.7 feet		Length of Core Barrel and Bit 8 feet		No. of Core Boxes 1	
		Borehole Inclination -90		Logged by E. Weldon	
				Date Started 5/3/06	
				Date Completed 5/9/06	

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
54								META-GRANODIORITE or META-QUARTZ DIORITE; speckled gray, black, buffed, equigranular. ~30% quartz, ~30% mafics, ~30 feldspar (plagioclase).	Tricone refusal, begin NQ core	533
55										532
56		1	5.0 5.0	50	MW	R3				531
57										530
58										529
59								SAA. Very closely spaced calcite healed fractures.		528
60										527
61		2	4.7 5.0	66	MW to SW	R3				526
62										525
63										524
64								Increase in mafic minerals and development of foliation and healed mylonitization fabric		523
65										522
66		3	4.5 4.5	62	SW	R3		META-QUARTZ DIORITE; increasingly healed mylonitized and foliated fabric.		521
67										520
68								SAA. CONTINUOUS ROCK		519
69									100% water loss	518
70		4	2.5 2.5	72	SW	R3			~50% water loss	517
71									Coring terminated on 5/9/06	516
72										515
73										514
74								Total Depth 70.7 ft. Groundwater encountered at 26.5 feet Borehole Grouted On 5/9/06		513
75										512
76										511
77										510
78										509
79										508
80										507
81										506
82										505
83										504
84										503
85										502
86										501
87										500
88										499
89										498
90										497
91										496
92										495
93										494



Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1053	
Type and Diameter of Boring Wash Rotary / Tricone 3 7/8 inch		Boring Location Unit 2 Pipeline N 1165781 E 1847797		Total Depth 13.5 feet	
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850		Elevation and Datum 589.3 feet MSL		Ground Water Depth N/A	
Sampling Method SPT		Sample Driving Hammer/Drop 140 lbs / 30 inches		No. of Samples 2	
		Borehole Inclination -90		Logged by E. Weldon	
				Date Started 5/11/06	
				Date Completed 5/11/06	

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML		Start on 5/11/06	589
1												588
2												587
3												586
4		SPT 1	224	15.6/18						SILT, sandy, gravelly (ML); yellowish red (5YR 5/6 to 5YR 4/6); damp, medium stiff, <20% sand, <5% clay, angular gravels, low to medium plasticity, sands are fine to medium grained. FILL		585
5												584
6												583
7												582
8												581
9		SPT 2	002	0/18						No sample recovery, very soft.		580
10												579
11												578
12												577
13												576
14											Boring terminated at 13.5 ft on 5/11/06 due to apparent subsurface obstruction continue drilling on B-1053A offset 3.6 ft southerly	575
15												574
16												573
17												572
18												571
19												570
20												569
21												568
22												567
23												566
24												565
25												564
26												563
27												562
28												561
29												560
30												559
31												558
32												557
33												556
34												555
35												554
36												553
37												552
38												551
39												550
40												



Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1053-UD	
Type and Diameter of Boring Wash Rotary / 4 inch		Boring Location Unit 2 Pipeline N 1165682 E 1847817		Total Depth 26.3 feet	
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X		Elevation and Datum 589.3 feet MSL		Ground Water Depth N/A	
Sampling Method Undisturbed		Sample Driving Hammer/Drop NA / NA		No. of Samples 2	
		Borehole Inclination -90		Logged by J. Cerceo	
				Date Started 6/8/06	
				Date Completed 6/8/06	

Reviewed by / Date B. Reinicker 6/13/06
 Reviewed by / Date C. Lane 10-27-07



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0												589
1											Offset 3.4 ft from B-1053C Drilled without sampling to 19 ft.	588
2												587
3												586
4												585
5												584
6												583
7												582
8												581
9												580
10												579
11												578
12												577
13												576
14												575
15												574
16												573
17												572
18												571
19												570
20		UD 1		26.75 27.25					ML	SILT, sandy (ML).	Shelby push 19 to 21.3 ft	569
21												568
22											Drilled without sampling to 24 ft.	567
23												566
24												565
25		UD 2		25.5 26.75	●	●	●		ML	SILT, sandy (ML); 71% fines, 29% sand.	Shelby push 24 to 26.3 ft	564
26											Boring terminated at 26.3 ft	563
27												562
28												561
29												560
30												559
31												558
32												557
33												556
34												555
35												554
36												553
37												552
38												551
39												550
40												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1053A	
Type and Diameter of Boring Wash Rotary / Tricone 3 7/8 inch		Boring Location Unit 2 Pipeline N 1165778 E 1847798		Total Depth 16 feet	
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850		Elevation and Datum 589.3 feet MSL		Ground Water Depth N/A	
Sampling Method SPT		Sample Driving Hammer/Drop 140 lbs / 30 inches		No. of Samples 1	
		Borehole Inclination -90		Logged by E. Weldon	
				Date Started 5/11/06	
				Date Completed 5/11/06	

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0										Drilled without sampling to 13.5 ft, see B-1053. FILL	B-1053A is offset 3.6 ft from B-1053 to the south.	589
1											Drilled without sampling to 13.5 ft	588
2												587
3												586
4												585
5												584
6												583
7												582
8												581
9												580
10												579
11										Drill clanging, possible subsurface obstruction.		578
12												577
13												576
14		SPT 1	0 1 2	6 18					ML	SILT, sandy (ML); brown (7.5YR 5/4); moist, soft, fine to medium sand, minor gravel sized component, 30 to 40 % sand. FILL	Begin SPT sampling	575
15											Tricone refusal at 16.0 ft. on 5/11/06; possible subsurface obstruction, boring terminated	574
16											Offset ~17 ft west to B-1053B to continue drilling	573
17												572
18												571
19												570
20												569
21												568
22												567
23												566
24												565
25												564
26												563
27												562
28												561
29												560
30												559
31												558
32												557
33												556
34												555
35												554
36												553
37												552
38												551
39												550
40												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1053B	
Type and Diameter of Boring Wash Rotary / Tricone 3 7/8 inch		Boring Location Unit 2 N 1165778 E 1847780		Total Depth 13.5 feet	
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850		Elevation and Datum 589.6 feet MSL		Ground Water Depth N/A	
Sampling Method		Sample Driving Hammer/Drop		No. of Samples	
		Borehole Inclination -90		Logged by E. Weldon	
				Date Started 5/12/06	
				Date Completed 5/12/06	

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0												
1										Drilled without sampling to 13.5 ft	Start 5/12/06	589
2										No sample collected	Drilled without sampling to 13.5 ft	588
3												587
4												586
5												585
6												584
7												583
8												582
9												581
10												580
11												579
12												578
13												577
14												576
15											No sample recovered	575
16											Boring terminated due to possible subsurface obstruction and offset to B-1053C ~100 ft southerly to continue drilling	574
17												573
18												572
19												571
20												570
21												569
22												568
23												567
24												566
25												565
26												564
27												563
28												562
29												561
30												560
31												559
32												558
33												557
34												556
35												555
36												554
37												553
38												552
39												551
40												550

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1053C	
Type and Diameter of Boring Wash Rotary / NQ core / Tricone 3 7/8 inch		Boring Location Unit 2 Pipeline N 1165682 E 1847809		Total Depth 69.2 feet	
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850		Elevation and Datum 589.5 feet MSL		Ground Water Depth 17.4 feet	
Sampling Method SPT		Sample Driving Hammer/Drop 140 lbs / 30 inches		No. of Samples 11	
		Borehole Inclination -90		Logged by E. Weldon	
				Date Started 5/12/06	
				Date Completed 5/12/06	



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT, (ML); brown (7.5YR 5/4) to yellowish red (5YR 5/8); damp; medium stiff or soft; <15% fine grained sand, FILL	5/12/06 Start drilling	589
1												588
2												587
3												586
4		SPT 1	2 3 4	15.6 18					SM	SAND, silty (SM); red (2.5YR 5/8) to very pale brown (10YR 7/3); damp, loose, >40 % silt; sand is fine to medium, manganese oxide veining. SAPROLITE		585
5												584
6												583
7												582
8												581
9		SPT 2	2 3 5	16.2 18	●	●				SAA; brownish yellow (10YR 6/6) to light brownish gray (10YR 6/2) to very dark grayish brown (10YR 3/2); damp, loose; 53% sand, 47% fines, manganese oxide veins (relict) rock texture. SAPROLITE		580
10												579
11												578
12												577
13												576
14		SPT 3	2 1 2	19.2 18	●	●				SAA; brownish yellow (10YR 6/8); moist and very loose, 4% gravel, 54% sand, 42% fines. SAPROLITE		575
15												574
16												573
17												572
18												571
19		SPT 4	1 2 2	12 18	●					SAA; damp, very loose, fine to coarse sand, manganese oxide veins, some fine gravels <5%, subangular. SAPROLITE		570
20												569
21												568
22												567
23												566
24		SPT 5	2 2 4	19.2 18	●				ML	SILT, sandy (ML); gray (5Y 5/1) to yellow (2.5Y 7/6); moist, medium stiff, 29% sand, 71% fines. SAPROLITE	Classification based on B-1053-UD UD-2 from 24 to 26.3 ft	565
25												564
26												563
27												562
28												561
29		SPT 6	9 11 14	15.6 18	●	●			SM	SAND, silty (SM); gray to white to olive gray (5Y 6/1 to 5Y 8/1 to 5Y 4/2), damp, medium dense, 61% sand, 39% fines. SAPROLITE		560
30												559
31												558
32												557
33												556
34		SPT 7	7 13 24	19.2 18	●					SAND, silty (SM); olive to dark olive (5Y 5/3 to 5Y 3/2); damp, dense, sand is mostly fine grained, micaceous. SAPROLITE		555
35												554
36												553
37												552
38												551
39		SPT 8	12 26 50	18 18	●	●			ML	SILT, sandy (ML); light olive brown (2.5Y 5/4) to yellowish brown (10YR 5/8); damp, hard,		550
40												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389



SOIL LOG - Boring No. B-1053C



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40									ML	manganese oxide veins more coarse grained; 33% sand, 67% fines. PARTIALLY WEATHERED ROCK		549
41												548
42									SM	SAND, silty (SM); olive brown (2.5Y 4/4). PARTIALLY WEATHERED ROCK		547
43												546
44		SPT 9	25 50/5	10.8 11	●							545
45												544
46												543
47												542
48												541
49		SPT 10	50/4	6 4						SAND, silty (SM); strong brown to dark brown (7.5YR 5/6 to 10YR 4/3); damp; fine to medium grained. PARTIALLY WEATHERED ROCK		540
50												539
51												538
52												537
53												536
54		SPT 11	50/3	4.8 3						SAND, silty, gravelly (SM); very dark grayish brown (10YR 3/2) to yellowish brown (10YR 5/6); damp, gravels >40% angular, sand is predominantly medium to coarse. PARTIALLY WEATHERED ROCK	Tricone refusal at 54.2 ft. see rock log	535
55												534
56												533
57												532
58												531
59												530
60												529
61												528
62												527
63												526
64												525
65												524
66												523
67												522
68												521
69												520
70												519
71												518
72												517
73												516
74												515
75												514
76												513
77												512
78												511
79												510
80												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. B-1053C	
Type and Diameter of Boring Wash Rotary / NQ core / Tricone 3 7/8 inch		Boring Location Unit 2 Pipeline N 1165682 E 1847809		Total Depth 69.2 feet	
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850		Elevation and Datum 589.5 feet MSL		Ground Water Depth 17.4 feet	
Casing Size and Depth 3.5 inch / 53.5 feet		Length of Core Barrel and Bit		No. of Core Boxes N/A	
		Borehole Inclination -90		Logged by E. Weldon	
				Date Started 5/12/06	
				Date Completed 5/12/06	

Reviewed by / Date F. Syms 5/25/06

Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
55								META-QUARTZ DIORITE; yellowish brown (10YR 5/8) to gray (10YR 6/1) to very dark gray (10YR 3/1); coarse, equigranular but mafics sometimes aggregates of very fine crystals. Plagioclase ~50%, quartz ~15 to 25%, hornblende and mica 15 to 25%	Tricone refusal at 54.2 ft. Switched to NQ rock core	535
56		1	4.8 / 5.0	58	HW to SW	R1 to R3			100% water return	534
57										533
58										532
59								SCHIST; dark brown (10YR 3/3); fine grained hornblende schist.		531
60										530
61		2	4.6 / 5.0	54				META-DIORITE; dark gray (7.5YR 4/0) with white porphyroblasts of plagioclase (or quartz?); strong foliation of porphyroblast 50 to 60° with thin quartz veins parallel to the foliation, veins fractured and totally filled with calcite.		529
62										528
63										527
64										526
65								SAA. Foliation at 70°, moderate to closely spaced quartz veins typically cut by foliation. CONTINUOUS ROCK		525
66										524
67		3	5.0 / 5.0	98					100% water return	523
68										522
69										521
70									Coring terminated on 5/12/06	520
71									5/13/06 water at 17.4 ft	519
72								Total Depth 69.2 ft.		518
73								Groundwater encountered at 17.4 feet		517
74								Borehole Grouted On 4/13/06		516
75										515
76										514
77										513
78										512
79										511
80										510
81										509
82										508
83										507
84										506
85										505
86										504
87										503
88										502
89										501
90										500
91										499
92										498
93										497
94										496

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1054	
Type and Diameter of Boring Wash Rotary / NQ core / Tricone 3 7/8 inch		Boring Location Unit 2 N 1165836 E 1847569		Total Depth 83.5 feet	
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850		Elevation and Datum 590.9 feet MSL		Ground Water Depth 19.4 feet	
Sampling Method SPT		Sample Driving Hammer/Drop 140 lbs / 30 inches		No. of Samples 9	
		Borehole Inclination -90		Logged by E. Weldon	
				Date Started 5/13/06	
				Date Completed 5/14/06	



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML		Start on 5/13/06	590
1												589
2												588
3												587
4		SPT 1	4	9.6								586
5			6	18								585
6												584
7												583
8												582
9		SPT 2	1	3.6								581
10			1/12	18								580
11												579
12												578
13												577
14		SPT 3	0	6.6								576
15			0	18								575
16			1									574
17												573
18												572
19		SPT 4	6	16.8					ML			571
20			8	18								570
21			10									569
22												568
23												567
24		SPT 5	12	14.4					SM			566
25			19	18								565
26			23									564
27												563
28												562
29		SPT 6	12	18					ML			561
30			14									560
31												559
32												558
33												557
34		SPT 7	3	16.8								556
35			9	18								555
36			19									554
37												553
38												552
39		SPT 8	3	18								551
40			6									

Project Name and Job Number
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SOIL LOG - Boring No. B-1054

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40												550
41												549
42												548
43												547
44		SPT 9	50/0.5	0.5						No sample recovery. PARTIALLY WEATHERED ROCK	Very hard drilling with tricone Refusal at 43.5 ft., see rock log	546
45												545
46												544
47												543
48												542
49												541
50												540
51												539
52												538
53												537
54												536
55												535
56												534
57												533
58												532
59												531
60												530
61												529
62												528
63												527
64												526
65												525
66												524
67												523
68												522
69												521
70												520
71												519
72												518
73												517
74												516
75												515
76												514
77												513
78												512
79												511
80												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. B-1054	
Type and Diameter of Boring Wash Rotary / NQ core / Tricone 3 7/8 inch		Boring Location Unit 2 N 1165836 E 1847569		Total Depth 83.5 feet	
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850		Elevation and Datum 590.9 feet MSL		Ground Water Depth 19.4 feet	Depth to Bedrock 43.5 feet
Casing Size and Depth 3.5 inch / 43.5 feet		Length of Core Barrel and Bit 8 feet		No. of Core Boxes 2	Date Started 5/13/06
		Borehole Inclination -90		Logged by E. Weldon	Date Completed 5/14/06

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
44								META-QUARTZ DIORITE or META-DIORITE; gray to dark gray (2.5Y 5/1 to 2.5Y 4/1); fine to medium grained; foliated. Streaked fabric suggests slight mylonitization throughout.	Refusal at 43.5 ft. Begin NQ core	547
45		1	4.5 5.0	84	SW	R3 to R4				546
46									Losing ~20% water	545
47										544
48										543
49									100% water loss	542
50		2	5.0 5.0	78	HW to SW	R1 to R3				541
51										540
52										539
53					CW					538
54								PARTIALLY WEATHERED ROCK and SAPROLITE SILT, sandy (ML); grayish brown (2.5Y 5/2); damp, <20 to 30 % sand, some fragments of partially weathered rock, very micaceous. SAPROLITE	End of 5/13/06 5/14/06 Start drilling; water at 19.4 ft	537
55		3	1.1 5.0	0	CW				100% water loss	536
56										535
57										534
58										533
59										532
60		4	3.7 5.0	34	HW to SW			META-DIORITE; very dark gray (7.5YR 3/1); fine to medium grained, slightly foliated texture. Shear fabric dipping ~40°		531
61										530
62										529
63								META-DIORITE schistose		528
64										527
65		5	2.4 2.8	28	HW to MW					526
66										525
67		6	0.3	0	HW			META-QUARTZ DIORITE; white to dark yellowish brown, schistose		524
68		7	0.7 1.5 1.5	0	HW			GRANODIORITE; white to dark yellowish brown (10YR 8/2 to 10YR 4/4); strongly foliated; medium to fine grained, >70% mica		523
69										522
70					HW					521
71		8	1.4 5.0	14				GRANODIORITE; lowest 0.3 ft is fracture zone fragments of altered weathered vugged calcite in filled quartz vein and schistose meta diorite.		520
72					SW to F			METADIORITE; very dark gray; fine grained; moderately foliated (50°); closely spaced calcite/quartz veins (<1 cm wide) parallel to foliation; coarse to medium grained ~72.4 ft. CONTINUOUS ROCK		519
73										518
74										517
75		9	5.0 3.7	98	SW to F					516
76										515
77										514
78		10	1.2 1.3	92	SW to F			Salt and pepper appearance sometimes seen where quartz veins are partially consumed or adjacent to them.		513
79								METADIORITE		512
80										511
81		11	3.9 4.7	74	SW to F					510
82										509
83										508

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ROCK LOG - Boring No. B-1054

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
84		12	0.3	100	SW to F				Coring terminated on 5/14/06	507
85			0.3							506
86										505
87								Total Depth 83.5 ft.		504
88								Groundwater encountered at 19.4 feet		503
89								Borehole Grouted On 4/14/06		502
90										501
91										500
92										499
93										498
94										497
95										496
96										495
97										494
98										493
99										492
100										491
101										490
102										489
103										488
104										487
105										486
106										485
107										484
108										483
109										482
110										481
111										480
112										479
113										478
114										477
115										476
116										475
117										474
118										473
119										472
120										471
121										470
122										469
123										468

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		SOIL LOG - Boring No. B-1055	
Type and Diameter of Boring Wash Rotary / NQ core / Tricone 3 7/8 inch		Boring Location Unit 2 N 1166463 E 1847463	
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850		Elevation and Datum 590.5 feet MSL	Ground Water Depth 26.6 feet
Sampling Method SPT		Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 9
		Borehole Inclination -90	Logged by E. Weldon
			Date Started 5/14/06
			Date Completed 5/15/06



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT, sandy, gravelly (ML); reddish brown (2.5YR 3/2) to red (2.5 YR 4/6) to yellowish brown (10YR 5/6); dry to damp, stiff, ~30 to 40% sand, mostly fine to medium grained, <5% clay, <20% gravels, angular to subangular. FILL	Start drilling 5/14/06	590
1												589
2												588
3												587
4		SPT 1	7	23.4								586
5												585
6												584
7												583
8												582
9		SPT 2	4	16.8						SILT, sandy (ML); yellowish red (5YR 5/6) and mottled red (10R 5/8); damp, stiff, 1% gravel, 56% fines, 43% sand. FILL	End 5/14/06 Start 5/15/06	581
10												580
11												579
12												578
13											Losing 80% water	577
14		SPT 3	2	15.6					SM	SAA; reddish yellow (7.5YR 6/8); damp, 42% sand, 58% fines. FILL		576
15										SAND, silty (SM); light reddish brown (2.5YR 6/4); loose. SAPROLITE		575
16												574
17												573
18												572
19		SPT 4	2	14.4						SAND, silty (SM); brownish yellow (10YR 6/6); damp, loose, sand 1% gravel, 54% sand, 45% fines, manganese oxide veins. SAPROLITE		571
20												570
21												569
22												568
23											Losing 80% water	567
24		SPT 5	2	3.6						SAA; wet, loose, and some (several <1 cm) weathered red stained quartz gravels. SAPROLITE		566
25												565
26												564
27												563
28												562
29		SPT 6	3	14.4						SAA; light olive gray (5Y 6/2) to yellow (10YR 7/6) to yellowish red (5YR 5/8); damp, medium dense, 8% gravel, 53% sand, 39% fines, also manganese oxide veining, some minor coarse sand and fine quartz gravels. SAPROLITE.		561
30												560
31												559
32												558
33												557
34		SPT 7	4	13.2						SAND, silty (SM); brownish yellow (10YR 6/6) to white (10YR 8/2); damp, medium dense; 64% sand, 36% fines. SAPROLITE		556
35												555
36												554
37												553
38												552
39		SPT 8	9	14.4						SAA; brownish yellow (10YR 6/6); damp, dense, 61% sand, 39% fines. SAPROLITE		551
40												550

Project Name and Job Number
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SOIL LOG - Boring No. B-1055



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40									SM			550
41												549
42												548
43												547
44												546
45		SPT 9	28 50/5	11 11	● ●				SM	SAND, silty with gravel (SM); brownish yellow (10YR 6/6); damp, very dense, 11% gravel, 64% sand, 25% fines, manganese oxide vein subvertical. SAPROLITE	Tricone refusal 45.8 ft, drilled casing to 46 ft, see rock log	545
46										SAND, silty with gravel (SM). PARTIALLY WEATHERED ROCK		544
47												543
48												542
49												541
50												540
51												539
52												538
53												537
54												536
55												535
56												534
57												533
58												532
59												531
60												530
61												529
62												528
63												527
64												526
65												525
66												524
67												523
68												522
69												521
70												520
71												519
72												518
73												517
74												516
75												515
76												514
77												513
78												512
79												511
80												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. B-1055	
Type and Diameter of Boring Wash Rotary / NQ core / Tricone 3 7/8 inch		Boring Location Unit 2 N 1166463 E 1847463		Total Depth 66 feet	
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850		Elevation and Datum 590.5 feet MSL		Ground Water Depth 26.6 feet	
Casing Size and Depth 3.5 inch / 46 feet		Length of Core Barrel and Bit 8 feet		No. of Core Boxes 2	
		Borehole Inclination -90		Logged by E. Weldon	
				Date Started 5/14/06	
				Date Completed 5/15/06	

Reviewed by / Date F. Syms 5/26/06

Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
46								META-GRANODIORITE or META-QUARTZ DIORITE; reddish yellow (7.5YR 7/8) alteration 46 to 48.5 ft to gray (7.5YR 6/1); medium to coarse grained, healed brecciated to ductilely sheared to slightly mylonitized fabric; feldspar 40 to 30 %; amphiboles and micas ~ 30%; quartz ~ 10%. CONTINUOUS ROCK	Losing 40% water	544
47		1	5.0 5.0	46	HW to MW	R2 to R3				543
48										542
49										541
50										540
51								META-QUARTZ DIORITE; black to grayish brown (2.5Y 2.5/1) to 2.5Y 5/2; subvertical quartz vein (1 to 2 cm).		539
52		2	4.1 5.0	58	SW	R4				538
53										537
54										536
55										535
56								SAA; META-QUARTZ DIORITE. CONTINUOUS ROCK.		534
57										533
58		3	3.7 4.2	94	SW to F	R4				532
59										531
60										530
61		4	0.8 0.8	100	SW to F	R4		SAA; increased mafic content (>50%) foliated weakly.		529
62										528
63										527
64		5	4.7 5.0	94	F	R4 to R5				526
65										525
66										524
67									Boring terminated 5/15/06 5/16/06; water at 26.6 ft	523
68										522
69								Total Depth 66 ft. Groundwater encountered at 26.6 feet Borehole Grouted On 4/16/06		521
70										520
71										519
72										518
73										517
74										516
75										515
76										514
77										513
78										512
79										511
80										510
81										509
82										508
83										507
84										506
85										505
86										

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1056	
Type and Diameter of Boring Wash Rotary / 3 inch		Boring Location Borrow Area 1 N 1163896 E 1846786		Total Depth 58.9 feet	
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850		Elevation and Datum 642.8 feet MSL		Ground Water Depth N/A	
Sampling Method SPT		Sample Driving Hammer/Drop 140 lbs / 30 inches		No. of Samples 12	
		Borehole Inclination -90		Logged by J. Martin	
				Date Started 4/12/06	
				Date Completed 4/13/06	



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT, trace clay (ML); mottled red (2.5YR 4/8) and reddish yellow (7.5YR 6/6); dry, medium stiff, micaceous. RESIDUUM	Start drilling 4/12/06	642
1												641
2												640
3												639
4		SPT 1	33	12								638
5			4	18								637
6												636
7												635
8												634
9		SPT 2	22	13.2					ML	SILT, trace clay (ML); mottled red (2.5YR 4/8) and reddish yellow (7.5YR 6/6); dry, soft; with manganese oxide staining along relict fracture traces. SAPROLITE	Stopped on 4/12/06 Started 4/13/06	633
10			2	18								632
11												631
12												630
13												629
14		SPT 3	33	12						SILT, (ML) with some very fine sand and trace clay, very pale brown (10YR 7/4), damp to dry; medium stiff, MnO staining and relict rock texture, micaceous. SAPROLITE		628
15			5	18								627
16												626
17												625
18												624
19		SPT 4	33	12					SAA.			623
20			5	18								622
21												621
22												620
23												619
24		SPT 5	45	14.4					SAA.			618
25			7	18								617
26												616
27												615
28												614
29		SPT 6	46	15.6					SAA; slightly more fine sand; moist.			613
30			8	18								612
31												611
32												610
33												609
34		SPT 7	810	14.4					SAA with slight color shift to light yellowish brown (10YR 6/4); medium stiff and highly micaceous. SAPROLITE			608
35			14	18								607
36												606
37												605
38												604
39		SPT 8	811	15.6					SAA.			603
40			17	18								603

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SOIL LOG - Boring No. B-1056

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40												602
41												601
42												600
43												599
44	SPT 9	11 13 19	15.6 18							SILT, sandy (ML), very fine sand; very sandy. SAPROLITE		598
45												597
46												596
47												595
48												594
49	SPT 10	6 8 13	18 18							SILT, (ML) with trace clay, light yellowish brown (10YR 6/4), moist, medium stiff, micaceous. SAPROLITE		593
50												592
51												591
52												590
53												589
54	SPT 11	9 14 43	15.6 18							SAA.		588
55									ML	SILT, sandy (ML) with trace clay, light yellowish brown (10YR 6/6); moist, hard, micaceous. PARTIALLY WEATHERED ROCK		587
56												586
57												585
58												584
59	SPT 11	50/4	4 4							SAA; olive brown (2.5YR 4/4). PARTIALLY WEATHERED ROCK	Boring terminated 4/13/06	583
60												582
61												581
62												580
63												579
64												578
65												577
66												576
67												575
68												574
69												573
70												572
71												571
72												570
73												569
74												568
75												567
76												566
77												565
78												564
79												563
80												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1057	
Type and Diameter of Boring Wash Rotary / 3 inch		Boring Location Borrow Area 1 N 1163743 E 1846819		Total Depth 54.8 feet	
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850		Elevation and Datum 639.1 feet MSL		Ground Water Depth N/A	
Sampling Method SPT		Sample Driving Hammer/Drop 140 lbs / 30 inches		No. of Samples 11	
		Borehole Inclination -90		Logged by J. Martin	
				Date Started 4/17/06	
				Date Completed 4/17/06	



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT, clayey (ML); variegated red (2.5YR 4/8); brownish yellow (10YR 6/6); and very pale brown (10YR 7/4), damp, medium stiff, micaceous, low plasticity, also some manganese oxide staining. SAPROLITE	Begin 4/17/06	639
1												638
2												637
3												636
4		SPT 1	22	16.8								635
5												634
6												633
7												632
8												631
9		SPT 2	22	16.8						SAA.		630
10												629
11												628
12												627
13												626
14		SPT 3	25	15.6						SILT, trace clay; variegated red (10R 4/8); olive brown (2.5Y 4/3); and olive yellow (2.5Y 6/8), damp, stiff, micaceous, variegated, non-plastic. SAPROLITE		625
15												624
16												623
17												622
18												621
19		SPT 4	23	16.8						SAA; red (2.5YR 5/8); yellow (10YR 7/6); and light gray (10YR 7/1); damp, medium, stiff, micaceous, non-plastic, manganese oxide staining. SAPROLITE		620
20												619
21												618
22												617
23												616
24		SPT 5	23	15.6						SAA; trace sand; yellow (10YR 7/6) and light gray (10YR 7/2); damp, medium stiff, thin, manganese oxide, stains, micaceous. SAPROLITE		615
25												614
26												613
27												612
28												611
29		SPT 6	33	18						SAA.		610
30										SAA; quartz vein (small gravel) at 29.8 ft.		609
31												608
32									SP-SM	SAND, silty, light gray (10YR 7/1) and yellow (10YR 7/6); damp, medium dense; with quartz vein at 34.5 ft. SAPROLITE		607
33												606
34		SPT 7	46	14.4								605
35												604
36												603
37												602
38									SP-SM	SAND, silty, light gray (10YR 7/1) and yellow (10YR 7/6), dense. PARTIALLY WEATHERED ROCK		601
39		SPT 8	10	12								600
40												

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SOIL LOG - Boring No. B-1057

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40												599
41												598
42												597
43												596
44	SPT 9	18	16.8							SAA.		595
45		25	18									594
46		26										593
47												592
48												591
49	SPT 10	25	13.2						SW-SM	SAND, silty, variegated olive yellow (2.5Y 6/6) and light yellowish brown (2.5Y 6/3); damp, very dense, micaceous. PARTIALLY WEATHERED ROCK		590
50		29	18									589
51		33										588
52												587
53												586
54	SPT 11	47	15.6							SAA with some gravel. PARTIALLY WEATHERED ROCK	Refusal to SPT sampler at 54.8 ft, boring terminated on 4/17/06	585
55		48	15.6									584
56		50/3										583
57												582
58												581
59												580
60												579
61												578
62												577
63												576
64												575
65												574
66												573
67												572
68												571
69												570
70												569
71												568
72												567
73												566
74												565
75												564
76												563
77												562
78												561
79												560
80												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1058	
Type and Diameter of Boring Wash Rotary / 3 inch		Boring Location Borrow Area 1 N 1163577 E 1846860		Total Depth 45 feet	
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850		Elevation and Datum 638.4 feet MSL		Ground Water Depth N/A	
Sampling Method SPT		Sample Driving Hammer/Drop 140 lbs / 30 inches		No. of Samples 9	
		Borehole Inclination -90		Logged by J. Martin	
				Date Started 4/15/06	
				Date Completed 4/17/06	



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT, trace sand (ML) and trace clay; red (2.5YR 4/8) and brownish yellow (10YR 6/8); damp to dry, medium stiff, micaceous. SAPROLITE.	Begin 4/15/06	638
1												637
2												636
3												635
4		SPT 1	3	15.6							Stopped 4/15/06	634
5				18							Started 4/17/06	633
6												632
7												631
8												630
9		SPT 2	3	14.4						SAA, stiff; 1/4 inch quartz vein at 9 ft and angling 50°.		629
10			4	18								628
11												627
12												626
13												625
14		SPT 3	4	14.4						SILT (ML), red (2.5YR 5/8) and strong brown (7.5YR 5/8); damp, stiff, non-plastic, micaceous. SAPROLITE		624
15			5	18								623
16												622
17												621
18												620
19		SPT 4	4	14.4						SILT (ML), red (2.5YR 5/8) and strong brown (7.5YR 5/8); damp, medium stiff, with prominent fracture traces with manganese staining (black), micaceous non-plastic. SAPROLITE		619
20			4	18								618
21												617
22												616
23												615
24		SPT 5	3	15.6						SAA; with some clay, non to low plasticity. SAPROLITE		614
25			5	18								613
26												612
27												611
28												610
29		SPT 6	4	14.4						SAA; brownish yellow (10YR 6/8), damp, stiff, micaceous, manganese oxide staining. SAPROLITE		609
30			5	18						Quartz vein at 29.1 ft ~25°		608
31												607
32												606
33												605
34		SPT 7	4	16.8								604
35			10	18					GW	GRAVEL (GW); gray (10YR 5/1); dense. PARTIALLY WEATHERED ROCK		603
36			29									602
37												601
38												600
39		SPT 8	10	16.8					GP-GM	GRAVEL, silty (GP to GM); brownish yellow (10YR 6/8) and gray (10YR 6/1); damp to moist, mainly		599
40			16	18								

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SOIL LOG - Boring No. B-1058

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40										quartz gravels, medium dense. PARTIALLY WEATHERED ROCK.		598
41												597
42												596
43												595
44		SPT 9	15 36 50/5.5	17.5						SAA; dense to very dense SAA; dense to very dense. PARTIALLY WEATHERED ROCK.		594
45											Refusal to SPT sampler on 4/17/06, boring terminated	593
46												592
47												591
48												590
49												589
50												588
51												587
52												586
53												585
54												584
55												583
56												582
57												581
58												580
59												579
60												578
61												577
62												576
63												575
64												574
65												573
66												572
67												571
68												570
69												569
70												568
71												567
72												566
73												565
74												564
75												563
76												562
77												561
78												560
79												559
80												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1059	
Type and Diameter of Boring Wash Rotary / 3 inch		Boring Location Borrow Area west of Motor Pool N 1164621 E 1845733		Total Depth 55 feet	
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850		Elevation and Datum 687 feet MSL		Ground Water Depth N/A	
Sampling Method SPT		Sample Driving Hammer/Drop 140 lbs / 30 inches		No. of Samples 13	
		Borehole Inclination -90		Logged by J. Martin	
				Date Started 4/18/06	
				Date Completed 4/18/06	



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									GW	GRAVEL (GW), yellowish brown (10YR 5/4); dry, very loose, gravel coarse and very fine sand, some low organic content, granitic and quartz gravels. FILL	Start 4/18/06	687
1												686
2												685
3												684
4		SPT 1	14	15.6					ML			683
5									ML	SILT clayey (ML), dark red (2.5YR 3/6), dry to damp, medium stiff, micaceous. TOPSOIL ZONE	Apparent topsoil 4.1 to 4.5 ft over saprolite	682
6										SILT (ML) dark red (2.5YR 3/6), and pinkish white (2.5YR 8/2), variegated, dry, stiff, non-plastic. SAPROLITE		681
7												680
8												679
9		SPT 2	46	18						SAA, without pinkish white, with an olive brown (2.5Y 4/4) variegation along with the red, damp, soft to medium stiff, non-plastic, very micaceous. SAPROLITE		678
10												677
11												676
12												675
13												674
14		SPT 3	36	15.6						SAA; variegated colors red, olive. brown, and pinkish white.		673
15												672
16												671
17												670
18												669
19		SPT 4	34	15.6						SAA, weak red (10R 4/4), red (10R 5/6), and light brown (7.5YR 6/4).		668
20												667
21												666
22												665
23												664
24		SPT 5	46	13.2					SM	SAND, silty (SM);, predominantly white (10YR 8/1) and yellow (10YR 7/6) with some pale red (10R 6/4); and manganese oxide staining, dry, medium dense, sand is very fine. SAPROLITE		663
25												662
26												661
27									ML	SILT, sandy (ML); variegated weak red (10R 4/4), light brown (7.5YR 6/4), olive brown (2.5Y 4/4), and red (2.5YR 4/6); damp to dry, medium stiff, micaceous, manganese oxide staining and quartz gravel vein at 29 ft, non-plastic. SAPROLITE		660
28												659
29		SPT 6	44	18								658
30												657
31												656
32												655
33												654
34		SPT 7	38	15.6						SILT, clayey (ML); variegated yellowish brown (10YR 5/8), and yellow (10YR 7/6); dry, stiff, manganese oxide staining, low plasticity. SAPROLITE		653
35												652
36												651
37												650
38												649
39		SPT 8	25	15.6						SAA, abundant relict fractures filled with very pale brown (10YR 8/4) colored mineral, also some dark,		648
40												647

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SOIL LOG - Boring No. B-1059

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40										yellowish brown (10YR 4/4).		647
41												646
42												645
43												644
44		SPT 3	5	13.2						SAA, dark red (2.5YR 3/6) and olive brown (2.5Y 4/4); low plasticity. SAPROLITE		643
45				18						SILT, clayey (ML) with talc, white(2.5YR 8/1), and pale red (10R 6/4); dry, soft and getting slightly sandy at 45 ft, non-plastic. SAPROLITE		642
46												641
47												640
48												639
49		SPT 10	17	13.2						GRAVEL, sandy, silty (GW to GM); dark red (10R 3/6) to light red (10R 6/8) with gray (2.5Y 6/1) smokey quartz, dry, very dense, gravel is large and angular, quartz vein. SAPROLITE		638
50			27	18								637
51			35									636
52												635
53												634
54		SPT 11	3	13.2						ML	SILT, clayey (ML), yellowish brown (10YR 5/6); damp, stiff, micaceous, low plasticity. SAPROLITE.	633
55				18							Boring terminated on 4/18/06	632
56												631
57												630
58												629
59												628
60												627
61												626
62												625
63												624
64												623
65												622
66												621
67												620
68												619
69												618
70												617
71												616
72												615
73												614
74												613
75												612
76												611
77												610
78												609
79												608
80												607

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1060	
Type and Diameter of Boring Wash Rotary / 3 inch		Boring Location Borrow Area 1 N 1163796 E 1847079		Total Depth 54.4 feet	
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850		Elevation and Datum 634.5 feet MSL		Ground Water Depth N/A	
Sampling Method SPT		Sample Driving Hammer/Drop 140.5 lbs / 30 inches		No. of Samples 11	
		Borehole Inclination -90		Logged by J. Martin	
				Date Started 4/13/06	
				Date Completed 4/14/06	



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT, clayey (ML), mottled red (2.5YR 4/8) and reddish-yellow (7.5YR 6/8); damp, medium stiff, low plasticity, slightly micaceous. RESIDUUM.	Begin drilling 4/13/06	634
1												633
2												632
3												631
4		SPT 1	2 2 4	10.8 18								630
5												629
6												628
7									ML	SILT, clayey, trace sand (ML); mottled, red (10R 4/8), yellowish red (5YR 5/6), and reddish yellow (7.5YR 6/6); moist, medium stiff, manganese oxide staining, micaceous, and non-plastic to low plasticity. SAPROLITE.		627
8												626
9		SPT 2	2 2 3	15.6 18								625
10												624
11												623
12												622
13												621
14		SPT 3	2 2 4	10.8 18						SAA.	End drilling 4/13/06 Resumed on 4/14/06	620
15												619
16												618
17												617
18												616
19		SPT 4	2 2 5	16.8 18						SILT (ML) with trace clay; mottled red (2.5YR 5/8) and reddish-yellow (7.5YR 6/6); moist, medium stiff, manganese oxide staining (black) with 1/2 inch quartz gravel vein zone at 20 ft, non-plastic, micaceous. SAPROLITE.		615
20												614
21												613
22												612
23												611
24		SPT 5	2 2 5	14.4 18						SILT, clayey (ML), mottled pinkish gray (7.5YR 6/2) and reddish yellow (7.5YR 6/6), moist, medium stiff; manganese oxide staining, low-plasticity, micaceous. SAPROLITE		610
25												609
26												608
27												607
28												606
29		SPT 6	3 4 7	15.6 18					ML	SILT, sandy (ML); light yellowish brown (10YR 6/4); moist, stiff, micaceous, very fine sand, non-plastic. SAPROLITE		605
30												604
31												603
32												602
33												601
34		SPT 7	4 7 10	13.2 18						SAA; trace to some clay, non-plastic to low plasticity.		600
35												599
36												598
37												597
38												596
39		SPT 8	3 10 17	15.6 18						SAA, with an interval from 38.5 to 38.9 ft of mottled yellowish brown (10YR 5/8) and olive gray (5Y 5/2).		595
40												595

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SOIL LOG - Boring No. B-1060

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40										SAPROLITE		594
41												593
42									SP-SM	SAND, silty (SP to SM), yellow (10YR 7/6); moist, dense, non-plastic, micaceous, very fine silt. SAPROLITE.		592
43												591
44		SPT 9	10 23 27	15.6 18								590
45												589
46												588
47												587
48												586
49		SPT 10	15 26 37	15.6 18						SAA; very dense.		585
50												584
51												583
52												582
53												581
54		SPT 11	36 50/5	10.8 11						SAA. SAPROLITE	Refusal to SPT at 54.4 ft, boring terminatd on 4/14/06	580
55												579
56												578
57												577
58												576
59												575
60												574
61												573
62												572
63												571
64												570
65												569
66												568
67												567
68												566
69												565
70												564
71												563
72												562
73												561
74												560
75												559
76												558
77												557
78												556
79												555
80												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1061	
Type and Diameter of Boring Wash Rotary / 3 inch		Boring Location Borrow Area west of Motor Pool N 1164300 E 1845630		Total Depth 50 feet	
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850		Elevation and Datum 685.3 feet MSL		Ground Water Depth N/A	
Sampling Method SPT		Sample Driving Hammer/Drop 140.5 lbs / 30 inches		No. of Samples 10	
		Borehole Inclination -90		Logged by M. Gray/A. Tillery	
				Date Started 4/23/06	
				Date Completed 4/23/06	

Reviewed by / Date F. Syms 5/24/06

Reviewed by / Date C. Lane 10-27-07



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT (ML); red (10YR 4/6); dry, medium stiff to stiff, trace clay. RESIDUUM	Begin drilling 4/23/06	685
1												684
2												683
3												682
4		SPT 1	3	18								681
5										SAA. Quartzite clast.		680
6												679
7												678
8												677
9		SPT 2	4	16						SILT (ML); red (10YR 3/6); dry to damp, very stiff, bonds of lighter silt (yellow) mottled. RESIDUUM		676
10			6	18								675
11												674
12												673
13												672
14		SPT 3	5	14						SILT (ML); red (10YR 4/8); dry to damp, very stiff; mottled with pale yellow/gray silt medium MnO ₂ , micaceous fabric; Fractures at 35 to 45° lined with yellow silt. RESIDUUM		671
15			8	18								670
16												669
17												668
18												667
19		SPT 4	5	12						SILT (ML); red (10YR 3/6); damp, very stiff, laminated 0.1 inch band of yellow, very light gray silt. RESIDUUM		666
20			9	18								665
21												664
22												663
23												662
24		SPT 5	5	16						SAA; red (10YR 3/6); damp, very stiff, yellow silt bands (5YR 3/3), change to dark red and black. Quartz vein. 1 inch. RESIDUUM		661
25			8	18								660
26			10									659
27												658
28												657
29		SPT 6	5	15					ML	SILT (ML); red (7.5YR 3/3), damp, very stiff, mica grains, non-plastic. RESIDUUM		656
30			8	18						SILT (ML); yellow (7.5YR 6/6); damp, very stiff, rock structure evident in color bands. SAPROLITE		655
31												654
32												653
33												652
34		SPT 7	7	14						SAA; yellow (7.5YR 4/6); red (10R 3/6) mottled, damp, very stiff, sandy texture (<15 % sand). SAPROLITE		651
35			12	18								650
36			11									649
37												648
38												647
39		SPT 8	6	14						SAA; yellow (2.5Y 8/3); damp, very stiff, mottled with gray and red bands, some dark (black) bands		646
40			12	18								645

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SOIL LOG - Boring No. B-1061

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40										manganese inclusions. SAPROLITE		645
41												644
42												643
43												642
44	SPT 9		5 7 12	13 18						SAA; red (10R 4/4); damp, very stiff, red with yellow veins, 1 weathered quartz vein (0.5 inches), most yellow veins <1 mm thick, some black manganese oxide patches surrounded by yellow sand except within weathered quartz. SAPROLITE		641
45												640
46												639
47												638
48												637
49	SPT 10		5 9 12	17 18						SAA; red (10R 5/8) mottled with (2.5Y 5/4) or (2.5Y 7/4), very stiff, micaceous, manganese oxide, little to no sand, SAPROLITE	SPT refusal, boring terminated on 4/23/06	636
50												635
51												634
52												633
53												632
54												631
55												630
56												629
57												628
58												627
59												626
60												625
61												624
62												623
63												622
64												621
65												620
66												619
67												618
68												617
69												616
70												615
71												614
72												613
73												612
74												611
75												610
76												609
77												608
78												607
79												606
80												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1062	
Type and Diameter of Boring Wash Rotary / 3 inch		Boring Location Borrow Area 1 N 1164027 E 1847313		Total Depth 40 feet	
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850		Elevation and Datum 621.6 feet MSL		Ground Water Depth N/A	
Sampling Method SPT		Sample Driving Hammer/Drop 140.5 lbs / 30 inches		No. of Samples 8	
		Borehole Inclination -90		Logged by J. Martin	
				Date Started 4/15/06	
				Date Completed 4/15/06	



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									CL-ML	SILT, clayey (ML to CL), dark red (2.5YR 3/6); damp, stiff, low to medium plasticity, micaceous. RESIDUUM	Begin 4/15/06	621
1												620
2												619
3												618
4		SPT 1	35	15.6	18							617
5												616
6												615
7									ML	SILT, trace sandy (ML) and trace clay; dark red (2.5YR 3/6) and strong brown (7.5YR 5/8); damp, medium stiff, mottled, micaceous, non-plastic to low plasticity, manganese oxide staining and quartz gravel veins at 8.8 ft. RESIDUUM		614
8												613
9		SPT 2	35	13.2	18							612
10												611
11												610
12									ML	SILT (ML) with some clay; dark red (2.5YR 3/6) at 13.5 to 13.8 ft, then variegated yellowish-red (5YR 4/6) and light gray (5YR 7/1); damp, stiff, micaceous, non-plastic to low plasticity. SAPROLITE		609
13												608
14		SPT 3	36	14.4	18							607
15												606
16												605
17												604
18												603
19		SPT 4	37	15.6	18					SAA, variegated red (10YR 5/8), light brown (7.5YR 6/4), and light gray (7.5YR 7/1). SAPROLITE		602
20												601
21												600
22												599
23												598
24		SPT 5	37	13.2	18					SAA, yellowish-brown (10YR 5/4). SAPROLITE		597
25												596
26												595
27												594
28												593
29		SPT 6	24	16.8	18					SAA, strong brown (7.5YR 5/8) and olive brown (2.5YR 4/3). SAPROLITE		592
30												591
31												590
32												589
33												588
34		SPT 7	25	18	18					SAA, with little more clay content; dark olive brown (2.5Y 3/3) with olive yellow (2.5Y 6/6); weathering along relict fracture traces, very micaceous, low plasticity. SAPROLITE.		587
35												586
36												585
37												584
38												583
39		SPT 8	24	16.8	18					SAA, yellowish-brown (10YR 5/6).	Boring terminated at 40 ft on	582
40												

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SOIL LOG - Boring No. B-1062



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40											4/15/06	581
41												580
42												579
43												578
44												577
45												576
46												575
47												574
48												573
49												572
50												571
51												570
52												569
53												568
54												567
55												566
56												565
57												564
58												563
59												562
60												561
61												560
62												559
63												558
64												557
65												556
66												555
67												554
68												553
69												552
70												551
71												550
72												549
73												548
74												547
75												546
76												545
77												544
78												543
79												542
80												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1063	
Type and Diameter of Boring Wash Rotary / Tricone 3 7/8 inch		Boring Location Borrow Area CT 1 N 1165768 E 1845001		Total Depth 28.8 feet	
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850		Elevation and Datum 610.9 feet MSL		Ground Water Depth N/A	
Sampling Method Split Spoon		Sample Driving Hammer/Drop 140 lbs / 30 inches		No. of Samples 6	
		Borehole Inclination -90		Logged by E. Weldon	
				Date Started 5/2/06	
				Date Completed 5/2/06	

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT, sandy (ML). FILL	Begin drilling 5/2/06	610
1											Drill clanking possible rock pieces	609
2												608
3												607
4		SPT 1	10 17 21	19.2 18					ML	SILT, sandy (ML); pale brown (10YR 6/3) to pale yellowish brown (10YR 6/4); damp, hard, >30% sand (fine), <10 % clay, some relict rock texture and manganese oxide veins (black) (subvertical). SAPROLITE		606
5												605
6												604
7												603
8												602
9		SPT 2	10 16 20	15.6 18	●	●	●			SILT, sandy (ML); brownish yellow (10YR 6/8) to yellowish brown (10YR 5/8); damp, hard, 26% sand, 74% fines. Remnant foliation, micaceous, manganese oxide veining (subvertical). SAPROLITE	100% return water	601
10												600
11												599
12												598
13		SPT 3	26 50/5	9.6 11	●	●	●			SILT, sandy (ML); light yellowish brown (2.5Y 6/4); 13% sand, 87% fines.		597
14												596
15												595
16												594
17												593
18												592
19		SPT 4	6 10 13	14.4 18						SILT, clayey (ML) dark yellowish brown (10YR 4/6), damp, very stiff, <15% sand (very fine), relict foliation manganese oxide veins (black). SAPROLITE		591
20												590
21												589
22												588
23												587
24		SPT 5	26 33 36	16.8 18						SILT, clayey (ML); light brownish gray (2.5Y 6/2); damp, hard, <10% sand (fine). SAPROLITE		586
25												585
26												584
27												583
28									ML	SILT (ML); white (5Y 8/1); damp. PARTIALLY WEATHERED ROCK	Tricone refusal at 28.8 ft.	582
29		SPT 6	50/3	1.2 3							Boring terminated on 5/2/06	581
30												580
31												579
32												578
33												577
34												576
35												575
36												574
37												573
38												572
39												571
40												570

Project Name and Job Number Lee Nuclear Station COL MACTEC WLA 6234-06-3389		SOIL LOG - Boring No. B-1064	
Type and Diameter of Boring Wash Rotary / Tricone 3 7/8 inch		Boring Location Borrow Area CT 1 N 1166042 E 1845355	
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850		Elevation and Datum 609.4 feet MSL	Ground Water Depth N/A
Sampling Method Split Spoon		Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 4
		Borehole Inclination -90	Logged by E. Weldon
		Date Started 5/2/06	
		Date Completed 5/2/06	

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT, sandy (ML); yellowish brown (10YR 5/4) to dark gray (5Y 4/1) to white (5Y 8/2); damp, stiff, 3% gravel, 38% sand, 59% fines. FILL	Begin 5/2/06	609
1												608
2												607
3												606
4		SPT 1	4 4 6	20.4 18	●	●	●					605
5												604
6												603
7												602
8												601
9		SPT 2	4 7 11	15.6 18	●	●	●		MH	SILT, sandy (MH); red (2.5YR 4/8) to yellowish brown (10YR 5/4); damp, very stiff, 23% sand, 77% fines. FILL		600
10												599
11												598
12												597
13												596
14		SPT 3	7 8 9	16.8 18	●	●	●		ML	SILT sandy with gravel (ML), strong brown (7.5YR 5/6), damp, very stiff, 7% gravel, 31% sand, 62% fines. FILL		595
15												594
16												593
17									ML	SILT, sandy (ML); white (5Y 8/1); dry, gravel sized fragments of quartz, very angular. PARTIALLY WEATHERED ROCK	Hard drilling, abundant rock fragments	592
18												591
19		SPT 4	50/5	6 5							100% water loss	590
20											Tricone refusal at 20 ft on 5/2/06, boring terminated	589
21												588
22												587
23												586
24												585
25												584
26												583
27												582
28												581
29												580
30												579
31												578
32												577
33												576
34												575
35												574
36												573
37												572
38												571
39												570
40												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1065	
Type and Diameter of Boring Wash Rotary / Tricone 3 7/8 inch		Boring Location Borrow Area CT 1 N 1165642 E 1845273		Total Depth 30 feet	
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850		Elevation and Datum 610.1 feet MSL		Ground Water Depth N/A	
Sampling Method Split Spoon		Sample Driving Hammer/Drop 140 lbs / 30 inches		No. of Samples 6	
		Borehole Inclination -90		Logged by E. Weldon	
				Date Started 5/2/06	
				Date Completed 5/2/06	

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									SP-SM	SAND, silty with gravel (SP-SM); brown (7.5YR 5/4) to pinkish white (7.5YR 8/2); dry to damp, sand medium to coarse grained, 11% fines, 84% sand, 5% gravel (< 4 cm, subangular). FILL	Start 5/2/06 Hard drilling	610
1												609
2												608
3												607
4		SPT 1	27 22 10	18 18	●	●						606
5												605
6												604
7												603
8												602
9		SPT 2	8 11 14	18 18					ML	SILT, sandy (ML); reddish yellow (7.5YR 6/8), damp, <2% clay, manganese oxide veins (black, 2-3 mm thick) various orientations. RESIDUUM		601
10												600
11												599
12												598
13												597
14		SPT 3	6 8 10	17 18						SILT, sandy (ML); reddish yellow (7.5YR 6/8); 50% sand (very fine) 50% silt. RESIDUUM		596
15												595
16												594
17									ML	SILT, sandy (ML); olive (5Y 5/3 to 5Y 4/3) to dark yellowish brown, (10YR 4/6); damp, hard, sand 50% fine to medium grained, 50% silt low to medium plasticity, black manganese oxide veins. SAPROLITE		593
18												592
19		SPT 4	9 9 25	16 18								591
20												590
21												589
22												588
23												587
24		SPT 5	5 7 12	18 18						SILT, sandy (ML); light olive brown (2.5YR 5/4); damp, stiff, ~30% sand, fine to medium grained, no clay; micaceous. SAPROLITE		586
25												585
26												584
27									SM	SAND, silty (SM); pale yellow (2.5Y 7/4) to dark grayish brown (2.5Y 4/2), damp, medium dense, fine to medium sand, 40% silt, micaceous. SAPROLITE		583
28												582
29		SPT 6	9 13 14	18 18							No water encountered. Boring terminated at 30 ft on 5/2/06	581
30												580
31												579
32												578
33										Total Depth 30 ft.		577
34										Borehole Grouted On 5/2/06		576
35												575
36												574
37												573
38												572
39												571
40												570

Project Name and Job Number Lee Nuclear Station COL MACTEC WLA 6234-06-3389		SOIL LOG - Boring No. B-1066	
Type and Diameter of Boring Wash Rotary / 3 inch		Boring Location Borrow Area 1 N 1163965 E 1847564	
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850		Elevation and Datum 632.8 feet MSL	Ground Water Depth N/A
Sampling Method SPT		Sample Driving Hammer/Drop 140.5 lbs / 30 inches	No. of Samples 7
		Borehole Inclination -90	Logged by J. Martin
		Date Started 4/14/06	
		Date Completed 4/14/06	

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT, clayey (ML); mottled red (2.5YR 4/8), and reddish-yellow (7.5YR 6/8), damp to dry, medium stiff, low plasticity, micaceous. RESIDUUM	Begin 4/14/06	632
1												631
2												630
3												629
4		SPT 1	3	18								628
5										SILT (ML); variegated pinkish white (5YR 8/2) and yellowish red (5YR 4/6); dry, medium stiff, non-plastic, micaceous. RESIDUUM		627
6												626
7												625
8												624
9		SPT 2	2	16.5						SILT, clayey (ML); intervals of dark red (2.5YR 3/6) and strong brown (7.5YR 5/8); moist, medium stiff, manganese oxide. RESIDUUM		623
10			3	18								622
11												621
12												620
13												619
14		SPT 3	2	16.5						SAA strong brown (7.5YR 5/8). RESIDUUM		618
15			3	18								617
16												616
17												615
18												614
19		SPT 4	2	16.5					ML	SILT, clayey (ML), mottled very pale brown grains (10YR 7/8) and strong brown (7.5YR 5/8). SAPROLITE		613
20			4	18								612
21												611
22												610
23												609
24		SPT 5	3	13.2						SAA; with increasing very pale brown and manganese oxide staining. SAPROLITE		608
25			6	18								607
26												606
27												605
28												604
29		SPT 6	2	14.4						SAA.		603
30			3	18								602
31			4									601
32												600
33												599
34		SPT 7	3	13.2						SAA. SAPROLITE		598
35			4	18							Boring terminated on 4/14/06	597
36			5									596
37												595
38												594
39												593
40												593

Project Name and Job Number Lee Nuclear Station COL MACTEC WLA 6234-06-3389		SOIL LOG - Boring No. B-1067	
Type and Diameter of Boring Wash Rotary / 3 inch		Boring Location Borrow Area 1 N 1163861 E 1847598	
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850		Elevation and Datum 629 feet MSL	Ground Water Depth N/A
Sampling Method SPT		Sample Driving Hammer/Drop 140.5 lbs / 30 inches	No. of Samples 12
		Borehole Inclination -90	Logged by J. Martin
			Date Started 4/18/06
			Date Completed 4/18/06



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML		Begin 4/18/06	629
1												628
2												627
3												626
4		SPT 1	4 5 4	16.8 18						SILT (ML) with trace clay and trace sand; mottled, red (2.5YR 4/8) and reddish yellow (7.5YR 7/6); damp, stiff, micaceous, non-plastic. RESIDUUM		625
5												624
6												623
7												622
8												621
9		SPT 2	2 2 3	16.8 18						SILT, sandy (ML) with trace clay; variegated pink (7.5YR 7/3) and reddish yellow (7.5YR 6/8), variegated, damp, medium stiff, micaceous, non-plastic. RESIDUUM		620
10												619
11												618
12												617
13									ML	SILT, sandy (ML); variegated red (2.5YR 5/8), reddish-yellow (7.5YR 6/8), and white (7.5YR 8/1); damp to dry, stiff, micaceous, non-plastic. SAPROLITE		616
14		SPT 3	2 3 6	13.2 18								615
15												614
16												613
17												612
18									SM	SAND, silty (SM); intervals of light gray (2.5Y 7/1) and light olive brown (2.5Y 5/6); damp to dry, loose, micaceous. SAPROLITE		611
19		SPT 4	3 3 4	14.4 18								610
20												609
21												608
22												607
23												606
24		SPT 5	3 4 5	14.4 18						SAND, silty (SM); light gray (10YR 7/1) with yellow (10YR 8/8); damp, loose, weathering and manganese oxide staining (black) along relict fractures, micaceous, with quartz vein (gravel) at 23.5 ft. SAPROLITE		605
25												604
26												603
27												602
28									ML	SILT, sandy (ML); light gray (10YR 7/1) with yellow (10YR 8/8); damp, stiff, non-plastic. SAPROLITE		601
29		SPT 6	4 6 7	12 18								600
30												599
31												598
32												597
33												596
34		SPT 7	3 4 6	14.4 18						SILT (ML) with trace clay; light olive brown (2.5Y 5/6); damp, stiff, micaceous. SAPROLITE		595
35												594
36												593
37												592
38												591
39		SPT 8	3 5 6	15.6 18						SILT, sandy (ML) with trace clay; light olive brown (2.5Y 5/4) and yellow (2.5Y 7/8); damp, stiff,		590
40												589

Project Name and Job Number
Lee Nuclear Station COL
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SOIL LOG - Boring No. B-1067

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40										micaceous. SAPROLITE		589
41												588
42												587
43												586
44	SPT 9	6 10 14	18 18							SAA, light olive brown (2.5Y 5/4); very stiff.		585
45												584
46												583
47												582
48												581
49	SPT 10	9 10 15	18 18							SAA; olive yellow (2.5Y 6/6) and light olive brown (2.5Y 5/6); relict rock fabric, moist to damp, very stiff, manganese oxide staining. SAPROLITE		580
50												579
51												578
52									SP-SM	SAND, silty (SP-SM); variegated yellowish brown (10YR 5/6) and gray (10YR 5/1); moist to damp, dense. SAPROLITE		577
53												576
54	SPT 11	7 15 23	15.6 18									575
55												574
56												573
57												572
58												571
59	SPT 12	8 12 15	18 18							SAA; some very pale brown (10YR 8/4); medium dense. SAPROLITE	Boring terminated at 60 ft on 4/18/106	570
60												569
61												568
62												567
63												566
64												565
65												564
66												563
67												562
68												561
69												560
70												559
71												558
72												557
73												556
74												555
75												554
76												553
77												552
78												551
79												550
80												549

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1068	
Type and Diameter of Boring Wash Rotary / Tricone 4 inch		Boring Location Switchyard N 1164807 E 1847481		Total Depth 39 feet	
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X		Elevation and Datum 605.7 feet MSL		Ground Water Depth N/A	
Sampling Method SPT		Sample Driving Hammer/Drop 140 lbs / 30 inches		No. of Samples 20	
		Borehole Inclination -90		Logged by G. Maximov	
				Date Started 8/20/06	
				Date Completed 8/20/06	



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT, sandy (ML); yellowish brown (10YR 5/6); dry to damp; stiff; ~75% silt, 20% very fine sand, trace subangular gravel. FILL	Begin 8/20/06	605
1		SPT 1	2 5 6	15 24								604
2										SAA.		603
3		SPT 2	3 5 6	17 24								602
4										SAA; yellowish brown to reddish yellow (5YR 5/6).		601
5		SPT 3	2 5 5	4 24								600
6										SAA; red (2.5YR 4/6); thin clayey layers.		599
7		SPT 4	2 4 5	20 24								598
8										SAA; yellowish red (5YR 5/8).		597
9		SPT 5	2 6 7	19 24								596
10										SAA; 10% gravel, 75% fines.	Lab data from B-1068-UD, UD-2 at 10 to 12 ft	595
11		SPT 6	2 4 6	19 24								594
12										SAA.		593
13		SPT 7	2 6 7	15 24						SAA; red (2.5YR 4/6); more clay rich layer 60% silt, 30% clay, 10% sand.		592
14												591
15		SPT 8	2 3 3	20 24					SP	SAND, (SP); yellowish red (5YR 5/8); wet; loose; medium sand. FILL		590
16									SM	SAND silty (SM); yellowish brown (10YR 5/6); damp; medium dense; mostly fine sand. FILL		589
17		SPT 9	3 5 8	19 24						SAA; alternating with layers of SILT clayey with sand (ML); red (2.5YR 4/6) from 15.3 to 17 ft.		588
18												587
19		SPT 10	6 11 14	16 24								586
20										SAA; with alternating silt layers. FILL		585
21		SPT 11	3 5 7	20 24								584
22										SAA. FILL		583
23		SPT 12	4 6 9	16 24								582
24										SAA; gravels up to 0.4 inch; very fine sand. FILL	B-1068-UD, UD-4 at 24 to 26 ft had 9% gravel, 65% fines, was (ML)	581
25		SPT 13	5 6 7	10 24								580
26										SAA; loose.		579
27		SPT 14	1 2 4	10 24								578
28										SAA.		577
29		SPT 15	3 4 6	20 24								576
30												

Project Name and Job Number
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SOIL LOG - Boring No. B-1068

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
30												575
31		SPT 16	2 6 6	20 24						SAND silty (SM); yellowish brown (10YR 5/6); damp; medium dense; mostly fine sand. FILL (Continued from previous page)		574
32										SAND, silty (SM); yellowish brown (10YR 5/6); damp; medium dense; ~60% very fine sand; 40% fines; trace gravels.		573
33		SPT 17	3 5 6	7 24						SAA; poor recovery due to quartz gravel.		572
34												571
35		SPT 18	2 3 5	11 24					SM	SAND, silty (SM); alternating dark yellowish brown (10YR 4/4) and speckled light gray (10YR 7/2); damp; loose. SAPROLITE		570
36												569
37		SPT 19	3 4 5	16 24					SM	SAND, silty (SM); yellowish red (5YR 4/6) to reddish gray (5YR 5/2); damp; loose. SAPROLITE		568
38		SPT 20	50/2	0 2						No recovery. PARTIALLY WEATHERED ROCK	Tricone refusal at 39 ft on 8/20/06; boring terminated	567
39												566
40												565
41												564
42												563
43												562
44												561
45												560
46												559
47												558
48												557
49												556
50												555
51												554
52												553
53												552
54												551
55												550
56												549
57												548
58												547
59												546
60												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		  SOIL LOG - Boring No. B-1068-UD	
Type and Diameter of Boring Wash Rotary / Tricone 3 7/8 inch		Boring Location Switchyard N 1164805 E 1847471	
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X		Elevation and Datum 605.8 feet MSL	Ground Water Depth N/A
Sampling Method Undisturbed		Sample Driving Hammer/Drop NA / NA	No. of Samples 5
		Borehole Inclination -90	Logged by G. Maximov
		Date Started 8/23/06	
		Date Completed 8/23/06	

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0											Drilled without sampling 0 to 6 ft	605
1												604
2												603
3												602
4												601
5												600
6											Shelby push 6 to 8 ft	599
7		UD 1		18 24					SM	SAND, silty (SM).		598
8											Drilled without sampling 8 to 10 ft	597
9												596
10											Shelby push 10 to 12 ft	595
11		UD 2		19.5 24	●	●	●		ML	SILT, sandy (ML); 10% gravel, 15% sand, 75% fines.		594
12											Drilled without sampling 12 to 16 ft	593
13												592
14												591
15												590
16											Shelby push 16 to 18 ft	589
17		UD 3		17.5 24					SM	SAND, silty (SM).		588
18											Drilled without sampling 18 to 24 ft	587
19												586
20												585
21												584
22												583
23												582
24											Shelby push 24 to 26 ft	581
25		UD 4		22 24	●	●	●		ML	SILT, sandy (ML); 9% gravel, 26% sand, 65% fines.		580
26											Drilled without sampling 26 to 30 ft	579
27												578
28												577
29												576
30											Shelby push 30 to 32 ft	575
31		UD 5		17 24					SM	SAND, silty (SM).	Boring terminated on 8/23/06	574
32												573
33												572
34												571
35												570
36												569
37												568
38												567
39												566
40												566

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1069	
Type and Diameter of Boring Wash Rotary / Tricone 4 inch		Boring Location Switchyard N 1164802 E 1847447		Total Depth 40 feet	
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X		Elevation and Datum 604.9 feet MSL		Ground Water Depth N/A	
Sampling Method SPT		Sample Driving Hammer/Drop 140 lbs / 30 inches		No. of Samples 20	
		Borehole Inclination -90		Logged by G. Maximov	
				Date Started 8/19/06	
				Date Completed 8/19/06	



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0										Unsamed gravels.	Begin on 8/19/06	
1	SPT 1	4 5 4	17 24						ML	SILT, sandy, clayey (ML); yellowish red (5YR 5/6); dry; stiff to very stiff; trace gravels up to 1 inch diameter; fine sands. FILL		604
2												603
3	SPT 2	6 7 12	21 24							SAA; yellowish brown (10YR 5/8). FILL		602
4												601
5	SPT 3	3 5 7	7 24							SAA; yellowish red (5YR 5/6); damp. FILL		600
6												599
7	SPT 4	2 3 5	19 24							SAA; strong brown (7.5YR 5/6) to yellowish red (5YR 5/6).		598
8												597
9	SPT 5	3 4 7	18 24									596
10												595
11	SPT 6	3 7 8	19 24							SAA with some pieces of weathered diorite and granodiorite (~1.5 inch across).		594
12												593
13	SPT 7	3 4 7	14 24						SP	SAND, clayey, silty (SP); yellow (2.5Y 7/4); damp; medium dense.		592
14									ML	SILT, sandy, clayey (ML) strong brown (2.5YR 5/6) to yellowish red (5YR 5/6).		591
15	SPT 8	1 1 3	8 24						SP	SAND, clayey, silty (SP); yellow (2.5Y 7/4); damp; soft.		590
16									SM	SILT, sandy, clayey (ML), soft; strong brown (2.5YR 5/6) to yellowish red (5YR 5/6).		589
17	SPT 9	2 4 5	18 24							SAND, clayey, silty (SP); yellow (2.5Y 7/4); damp; soft.		588
18												587
19	SPT 10	3 5 6	20 24							SILT, sandy, clayey (ML); yellowish red (5YR 5/6); damp; stiff; and SAND silty, clayey (SM); pale yellow (2.5Y 7/4); damp; medium dense; saprolite-fragments; both with trace gravels up to 1 inch diameter. FILL		586
20												585
21	SPT 11	3 6 7	15 24						SM	SAND, silty, clayey (SM); light yellowish brown (10YR 6/4); damp; medium dense; fine sand; laminated appearance; micaceous; trace gravels. FILL		584
22												583
23	SPT 12	3 6 8	15 24							SAA.		582
24												581
25	SPT 13	1 2 5	11 24							SAA; loose; some meta-granodiorite pieces just above 26 ft depth. FILL		580
26												579
27	SPT 14	2 5 5	21 24							SAA; some siltier layer, slightly darker, yellowish brown (10YR 5/4).		578
28												577
29	SPT 15	2 4 5	20 24							SAA.		576
30												575

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SOIL LOG - Boring No. B-1069

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
30									SM	SAND, silty, clayey (SM); light yellowish brown to yellowish brown (10YR 5.5/4); damp to moist; loose; micaceous; laminated appearance; trace gravels up to 1 inch diameter. FILL		574
31		SPT 16	2 4 4	15 24								573
32												572
33		SPT 17	1 3 5	16 24								571
34										SAA.		570
35		SPT 18	2 4 6	11 24								569
36										SAA.		568
37		SPT 19	2 7 9	14 24								567
38										Quartz gravels (subangular up to 0.5 inch). FILL		566
39		SPT 20	4 5 6	22 24					ML	SILT, sandy, clayey (ML); red (2.5YR 4/6); damp; stiff; micaceous; laminated. FILL	End of drilling on 8/19/06; boring terminated at 40 ft	565
40												564
41												563
42												562
43												561
44												560
45												559
46												558
47												557
48												556
49												555
50												554
51												553
52												552
53												551
54												550
55												549
56												548
57												547
58												546
59												545
60												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1070	
Type and Diameter of Boring Wash Rotary / Tricone 4 inch		Boring Location Cooling Tower N 1165725 E 1848283		Total Depth 106 feet	
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X		Elevation and Datum 610.7 feet MSL		Ground Water Depth N/A	
Sampling Method SPT		Sample Driving Hammer/Drop 140 lbs / 30 inches		No. of Samples 50	
		Borehole Inclination -90		Logged by G. Maximov	
				Date Started 8/17/06	
				Date Completed 8/19/06	

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0										Gravel fill, no sample collected.	Start 8/17/06	610
1		SPT 1	5 12 7	16 24					ML	SILT clayey (ML); red (2.5YR 5/8); dry to damp; very stiff; trace gravel up to 1.2 inch diameter (sub-angular); trace fine to very fine sand. FILL		609
2												608
3		SPT 2	5 7 8	17 24								607
4										SAA; red (2.5YR 5/8); stiff		606
5		SPT 3	2 6 7	1 24								605
6										SILT sandy, clayey (ML); light yellowish brown (10YR 6/4); more very fine sand		604
7		SPT 4	5 6 7	17 24								603
8										SAA; red (2.5YR 5/8)		602
9		SPT 5	3 5 6	16 24							Lab data from B-1070-UD, UD-2 9 to 11 ft	601
10										SAA; alternating layers of light yellowish brown and red; 10% gravel, 57% fines		600
11		SPT 6	3 5 6	18 24								599
12										SAA		598
13		SPT 7	3 5 7	10 24								597
14												596
15		SPT 8	2 4 7	15 24								595
16												594
17		SPT 9	3 6 7	16 24						SILT sandy, clayey and gravels (ML); alternating bands of red (2.5YR 5/8) and light yellowish brown (10 YR 6/4); stiff to very stiff; damp; sand mostly fine; sub angular gravels up to 1.2 inch diameter; FILL		593
18										SAA		592
19		SPT 10	3 10 11	18 24							B-1070-UD, UD-4, 19 to 21 ft	591
20										Increased sand content from 19.4 to 19.6 ft 23% gravel, 29% fines		590
21		SPT 11	3 8 8	4 24								589
22										SAA; red (2.5YR 5/8).		588
23		SPT 12	3 5 6	21 24								587
24										SAA; laminated in light yellowish brown layers. FILL		586
25		SPT 13	2 5 6	17 24								585
26										SAA; red (2.5YR 5/8).		584
27		SPT 14	2 6 9	9 24								583
28										Thin layer of fine sand		582
29		SPT 15	5 5 7	21 24						SAA; light yellowish brown (10YR 6/4)	B-1070-UD, UD-6 at 29 to 31 ft	581
30												

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SOIL LOG - Boring No. B-1070

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
30										No recovery; 4% gravel, 59% fines. FILL		580
31		SPT 16	5 5 5	0 24								579
32												578
33		SPT 17	3 6 10	19 24						SILT, sandy, clayey with gravels (ML); alternating bands of red (2.5YR 5/8); and light yellowish brown (10YR 6/4); stiff to very stiff; damp; sand mostly fine; clay; 5% sub angular gravels up to 1.2 inch diameter		577
34										SAA; light yellowish brown.		576
35		SPT 18	4 7 8	19 24								575
36										SAA; light yellowish brown.		574
37		SPT 19	3 5 6	16 24								573
38										SAA; reddish yellow (7.5YR 6/6).		572
39		SPT 20	4 10 12	14 21						Layer of higher gravel content, gravels composed of weathered meta-granodiorite from 38.8 to 41.4 ft		571
40											End of day 8/17/06	570
41		SPT 21	2 5 12	15 24							Begin day 8/18/06; water at 0 ft	569
42								ML		SAA; red (2.5YR 5/8), very pale brown (10YR 7/3) from 41.4 to 41.8 ft., increased sand content. FILL		568
43		SPT 22	4 11 12	7 24						SAA; red (2.5YR 5/8)		567
44											B-1070-UD, UD-8 at 44 to 45.6 ft	566
45		SPT 23	5 6 11	14 24						SAA; yellowish red (5YR 5/6); 2% gravel, 57% fines.		565
46												564
47		SPT 24	4 8 9	20 24						SILT, sandy, clayey and gravels (ML); red (2.5YR 3/8) to yellowish red (5YR 4/6); laminated appearance, damp; stiff to very stiff; sand mostly fine, 5% sub-angular gravels up to 1.2 inch diameter. FILL		563
48												562
49		SPT 25	5 6 10	19 24						More clay rich layer 46.4 to 46.8 ft		561
50												560
51		SPT 26	3 6 6	19 24								559
52										SAA; light brown (7.5YR 6/4).		558
53		SPT 27	4 5 8	16 24								557
54										SAA; yellowish red (7.5YR 6/6).		556
55		SPT 28	2 6 7	8 24								555
56										SAA; yellowish red (7.5YR 6/6).		554
57		SPT 29	2 8 11	15 24								553
58										SAA; brown (7.5YR 5/4). FILL.		552
59		SPT 30	3 6 10	21 24								551
60												

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SOIL LOG - Boring No. B-1070



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
60												
61		SPT 31	6 11 13	6 24							SILT sandy, clayey and gravels (ML); brown (7.5YR 5/4) to yellowish red (5YR 4/6); laminated appearance; moist; stiff to very stiff; ~55% silt, 30% fine sand; 10% clay, 5% sub-angular gravels up to 1.2 inch diameter. FILL	550
62												549
63		SPT 32	8 8 13	15 24							Damp from 62 to 64 ft	548
64												547
65		SPT 33	3 5 7	20 24							SAA; yellowish red with light yellowish brown (10YR 6/4) from 64.9 to 65.3 ft.	546
66												545
67		SPT 34	2 6 9	17 24							Yellowish red (no gravels); moist from 66.4 to 67 ft.	544
68												543
69		SPT 35	1 5 7	12 24							Yellowish red (no gravels); damp at 68 to 70 ft.	542
70												541
71		SPT 36	4 7 9	22 24							SAA.	540
72												539
73		SPT 37	5 10 11	17 24							SAA; yellowish red (5YR 4/6) some small gravels/coarse sand	538
74												537
75		SPT 38	2 2 7	24 24							SAA; gravels present; wet between 74.8 and 75.3 ft. FILL	536
76												535
77		SPT 39	4 6 9	22 24							SAA; with some mottled color variations; damp; stiff to very stiff; 55% silt, 30% fine sand; 10% clay; 5% sub-angular gravels up to 1.2 inch diameter; laminated. FILL	534
78												533
79		SPT 40	6 8 11	16 24							SAA; brown (7.5YR 5/4).	532
80											Thin clay rich layer.	531
81		SPT 41	6 7 12	7 24					ML		SAA; red (2.5YR 4/8); moist. FILL	530
82												529
83		SPT 42	2 9 13	18 24							SAA; strong brown (7.5YR 5/6); from 82.9 to 83.4 ft	528
84												527
85		SPT 43	2 8 11	14 24							SAA; red (2.5YR 4/8) FILL	526
86												525
87		SPT 44	5 10 12	21 24					SM		SAND silty, clayey and gravels (SM); strong brown (7.5YR 5/6); moist; medium dense; some small gravels <5%; fine to very fine sand; 20% silt; 5% clay. FILL	524
88											SAA	523
89		SPT 45	2 7 10	17 24								522
90												521

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SOIL LOG - Boring No. B-1070

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
90												520
91		SPT 46	5 8 10	19 24								519
92												518
93		SPT 47	3 13 17	15 24					SM			517
94												516
95		SPT 48	6 8 16	18 24								515
96												514
97		SPT 49	5 13 26	21 24								513
98												512
99		SPT 50	9 19 22	16 24								511
100												510
101											End of day 8/18/06 Begin day 8/19/06 Drilled without sampling 100 to 106 ft	509
102												508
103												507
104												506
105												505
106												504
107											Tricone refusal at 106 ft; boring terminated on 8/19/06	503
108												502
109												501
110												500
111												499
112												498
113												497
114												496
115												495
116												494
117												493
118												492
119												491
120												491

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1070-UD	
Type and Diameter of Boring Wash Rotary / Tricone 4 inch		Boring Location Cooling Tower N 1165720 E 1848293		Total Depth 57.7 feet	
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X		Elevation and Datum 610.7 feet MSL		Ground Water Depth N/A	
Sampling Method Undisturbed		Sample Driving Hammer/Drop NA / NA		No. of Samples 11	
		Borehole Inclination -90		Logged by G. Maximov	
		Reviewed by / Date B. Reinicker 8/23/06			
		Reviewed by / Date C. Lane 10-27-07			



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0											Start 8/21/06	610
1											Drilled without sampling 0 to 4 ft	609
2												608
3												607
4		UD 1		18/24					ML	SILT (ML).	Shelby push 4 to 6 ft	606
5												605
6									SM	SAND, silty (SM).	Drilled without sampling 6 to 9 ft	604
7												603
8												602
9		UD 2		18/24	●	●	●		ML	SILT, sandy (ML); 10% gravel, 33% sand, 57% fines.	Shelby push 9 to 11 ft	601
10											End day 8/21/06	600
11											Begin day 8/22/06	599
12											Drilled without sampling 11 to 14 ft	598
13												597
14		UD 3		19/24					SM	SAND, silty (SM).	Shelby push 14 to 16 ft	596
15												595
16											Drilled without sampling 16 to 19 ft	594
17												593
18												592
19		UD 4		12/24	●	●	●		SM	SAND, silty (SM); 23% gravel, 47% sand, 29% fines.	Shelby push 19 to 21 ft	591
20												590
21											Drilled without sampling 21 to 24 ft	589
22												588
23												587
24		UD 5		15/24					ML	SILT, sandy (ML).	Shelby push 24 to 26 ft	586
25												585
26											Drilled without sampling 26 to 29 ft	584
27												583
28												582
29		UD 6		15/24	●	●	●		ML	SILT, sandy (ML); 4% gravel, 37% sand, 59% fines.	Shelby push 29 to 31 ft	581
30												580
31											Drilled without sampling 31 to 34 ft	579
32												578
33												577
34		UD 7		18.5/24					SM	SAND, silty (SM).	Shelby push 34 to 36 ft	576
35												575
36											Drilled without sampling 36 to 44 ft	574
37												573
38												572
39												571
40												

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SOIL LOG - Boring No. B-1070-UD

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40												570
41												569
42												568
43												567
44												566
45		UD 8		17/20	●	●	●		ML	SILT, sandy (ML); 2% gravel, 41% sand, 57% fines.	Shelby push 44 to 45.6 ft	566
46											Drilled without sampling 45.6 to 49 ft	565
47												564
48												563
49									ML	SILT, sandy (ML).	Shelby push 49 to 51 ft	562
50		UD 9		16.5/24								561
51									SM	SAND, silty (SM).	Drilled without sampling 51 to 54 ft	560
52												559
53												558
54											Shelby push 54 to 56 ft	557
55		UD 10		15/24					SM	SAND, silty (SM).		556
56												555
57		UD 11		8/20					SM	SAND, silty (SM).	Shelby push 56 to 57.7 ft	554
58											Boring terminated 8/22/06	553
59												552
60												551
61												550
62												549
63												548
64												547
65												546
66												545
67												544
68												543
69												542
70												541
71												540
72												539
73												538
74												537
75												536
76												535
77												534
78												533
79												532
80												531

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389			  SOIL LOG - Boring No. B-1071		
Type and Diameter of Boring Wash Rotary / Tricone 3 7/8 inch			Boring Location Cooling Tower N 1165707 E 1848320		Total Depth 100 feet
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X			Elevation and Datum 610.5 feet MSL	Ground Water Depth 6.5 feet	Depth to Bedrock N/A
Sampling Method			Sample Driving Hammer/Drop	No. of Samples	Date Started 8/16/06
			Borehole Inclination -90	Logged by G. Maximov	Date Completed 8/17/06

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0												
1		SPT 1	283	1424					ML	Gravels; no sample collected	Begin 8/16/06	610
2												609
3		SPT 2	578	1224						SAA; red (2.5YR 5/6); mottled appearance with trace fine sands; clay ~10%; micaceous; low plasticity; FILL		608
4												607
5		SPT 3	578	924								606
6												605
7		SPT 4	345	1924					▽	SAA; brownish yellow (10YR 6/6); FILL		604
8												603
9		SPT 5	356	1824						SAA; red (2.5YR 4/6); with trace gravels; up to 1.5 inch diameter. FILL		602
10												601
11		SPT 6	467	2024						SAA; slightly more clay-rich layer ~30% clay from 10 to 11 ft.		600
12										SAA; red (2.5YR 4/6) and brownish yellow (10YR 6/6); 3 to 4 inch lifts. FILL		599
13		SPT 7	347	1724						SILT, sandy (ML); yellowish brown (10YR 5/4); damp; stiff; gravels up to 1 inch from 12.6 to 13 ft		598
14										SILT, clayey (ML); red (2.5YR 4/6); damp; stiff; alternating with ~4 inch layers of brownish yellow, SILT sandy, and gravels		597
15		SPT 8	477	1824								596
16												595
17		SPT 9	368	2024						SILT, clayey (ML); alternating bands of red (2.5YR 5/6) and brownish yellow (10YR 6/6); damp; stiff; with fine to medium sands and trace gravels; ~10% clay; gravels average ~1 inch diameter; becomes micaceous. FILL		594
18												593
19		SPT 10	487	2024						SAA; brownish yellow to 19.4 ft, then red. FILL		592
20												591
21		SPT 11	225	1024						SAA; red (2.5 YAR 5/6); medium stiff. FILL		590
22												589
23		SPT 12	256	724						SAA; yellowish red layer (5YR 4/6); moist; stiff. FILL		588
24												587
25		SPT 13	779	1224						SAA; red (2.5YR 5/6) from 25.8 ft down; very stiff. FILL		586
26												585
27		SPT 14	379	2024						SAA; alternating red and brownish yellow below. FILL		584
28												583
29		SPT 15	478	1724						SAA; stiff; thin gray layer from 29.8 to 29.9 ft. FILL		582
30												581

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SOIL LOG - Boring No. B-1071

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
30									ML	SAA; reddish yellow (7.5YR 6/6); moist to damp; stiff; with fine to medium sands; trace gravels up to 1 inch diameter; ~10% clay; micaceous; mottled with brownish gray (10 YR 6/2) from 30.5 to 31 ft		580
31		SPT 16	3 6 7	23 24								579
32										SAA; no gravels, trace sands		578
33		SPT 17	4 7 7	19 24						Thin greenish gray layer (10BG 6/1) from 33.1 to 33.3 ft		577
34										SAA; red (7.5YR 4/6); to 35.3 ft, then light yellowish brown (10YR 6/4). FILL		576
35		SPT 18	2 6 8	15 24								575
36										SAA; very stiff; with fine lamination in fill material; FILL		574
37		SPT 19	4 8 10	23 24								573
38										SAA; yellowish red (5YR 5/6) with fine lamination		572
39		SPT 20	5 7 12	4 24								571
40										SAA; alternating red and light yellowish brown layers. FILL		570
41		SPT 21	6 10 11	13 24								569
42												568
43		SPT 22	2 11 15	15 24								567
44										SAA; alternating layers of red (2.5YR 4/8) and mottled brown (7.5YR 5/3); damp; stiff. FILL		566
45		SPT 23	2 3 8	13 24								565
46										SILT clayey and trace sand (ML); alternating layers of red (2.5YR 4/8) and brown (7.5YR 5/3); damp; very stiff; trace gravel up to 1.5 inch diameter; sub angular; micaceous. FILL		564
47		SPT 24	4 9 9	18 24						SAA; stiff. FILL		563
48												562
49		SPT 25	3 4 6	18 24								561
50										SAA; with reddish yellow (7.5YR 6/6); clayish layer from 51.8 to 51.9 ft. FILL		560
51		SPT 26	2 6 9	12 24								559
52										SAA; very stiff; fine to medium grained; ~10% sand. FILL		558
53		SPT 27	4 8 9	21 24								557
54										SAA; stiff.		556
55		SPT 28	3 5 8	13 24								555
56										SAA; light brown (7.5YR 6/3); moist; light brown (gravel); low plasticity. FILL		554
57		SPT 29	6 10 10	7 24								553
58										SAA; more gravel from 58.7 ft down; ~5% coarse sand/small gravel. FILL		552
59		SPT 30	4 9 12	22 24								551
60												

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SOIL LOG - Boring No. B-1071

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
60									ML	SAA; yellowish brown (10YR 5/4); damp to moist; very stiff; micaceous; gravel sub angular (mostly quartz); up to 0.8 inch diameter; ~5 to 10% coarse sand and gravel; >10% clay; low plasticity. FILL		550
61		SPT 31	4 8 12	17 24								549
62												548
63		SPT 32	5 13 14	4 24								547
64												546
65		SPT 33	4 10 12	19 24						SAA; reddish brown (5YR 5/4) to brown (7.5YR 5/4); damp; ~5% medium sand. FILL		545
66												544
67		SPT 34	4 6 7	22 24						SAA; yellowish red (5YR 5/8). FILL		543
68												542
69		SPT 35	4 11 12	18 24						SAA; some olive green layers at 68.8 ft. FILL		541
70												540
71		SPT 36	4 10 10	19 24						SAA; red (2.5YR 5/6). FILL		539
72												538
73		SPT 37	4 9 11	18 24						SAA. FILL		537
74												536
75		SPT 38	6 7 13	17 21								535
76										SILT, clayey, sandy (ML); red (2.5YR 5/6); damp; very stiff; ~10% clay, ~5% fine to medium sand; trace gravels; micaceous; low to medium plasticity. FILL		534
77		SPT 39	5 11 14	20 24								533
78										Highly weathered meta-granodiorite fragments from 77.6 to 77.9 ft.		532
79		SPT 40	4 7 8	21 24								531
80												530
81		SPT 41	6 9 14	22 24						SAA; red to reddish yellow (2.5YR 6/8); no gravels. FILL	End of day 8/16/06 Begin day 8/17/06; water level at 6.5 ft	529
82												528
83		SPT 42	2 8 11	20 24						SAA; zone of high gravel/coarse sand content (~40%); angular clasts up to 1.2 inch diameter, average coarse sand size from 82.3 to 83.1 ft		527
84										SAA; red to reddish yellow (2.5YR 6/3); with trace gravels. FILL		526
85		SPT 43	3 5 9	14 24						SAA; red (2.5YR 5/6), stiff. FILL		525
86												524
87		SPT 44	3 7 9	11 24						SAA; more reddish brown (7.5YR 4/4); very stiff; sand increase to ~15% (fine sand). FILL		523
88												522
89		SPT 45	4 10 10	24 24								521
90									SM			

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389



SOIL LOG - Boring No. B-1071

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
90												520
91		SPT 46	5 8 8	18 24								519
92												518
93		SPT 47	4 4 8	8 24								517
94												516
95		SPT 48	2 5 9	8 24								515
96												514
97		SPT 49	2 3 4	16 24					ML			513
98												512
99		SPT 50	2 4 5	20 24								511
100											Boring terminated on 8/17/06	510
101												509
102												508
103												507
104												506
105												505
106												504
107												503
108												502
109												501
110												500
111												499
112												498
113												497
114												496
115												495
116												494
117												493
118												492
119												491
120												

Total Depth 100 ft.
Groundwater encountered at 6.5 feet
Borehole Grouted On 8/19/06

Project Name and Job Number Lee Nuclear Station COL MACTEC WLA 6234-06-3389		SOIL LOG - Boring No. B-1072	
Type and Diameter of Boring Wash Rotary / Tricone 2 7/8 inch		Boring Location Borrow Area N 1164001 E 1847171	
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X		Elevation and Datum 630.2 feet MSL	Ground Water Depth N/A
Sampling Method SPT		Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 9
		Borehole Inclination -90	Logged by G. Maximov
		Date Started 8/21/06	
		Date Completed 8/21/06	



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML		Start drilling 8/21/06	630
1												629
2												628
3												627
4		SPT 1	24	14						SILT, clayey (ML); red (2.5Y 4/8); dry to damp; stiff; 80% silt, 20% clay. RESIDUUM		626
5												625
6												624
7												623
8												622
9		SPT 2	13	12						SILT, sandy, clayey (ML); yellowish red (5YR 5/8); to red (10R 5/6); dry to damp; medium stiff; ~60% silt, 30% very fine sand; ~10% clay. RESIDUUM		621
10												620
11												619
12												618
13												617
14		SPT 3	23	12								616
15									ML	SILT, clayey, sandy (ML); brownish yellow (10YR 6/6); damp; medium stiff; black lenses of manganese oxide oriented at 35° (relict rock texture); ~70% silt, ~20% clay, ~10% fine sand. SAPROLITE		615
16												614
17												613
18												612
19		SPT 4	13	16								611
20												610
21												609
22												608
23												607
24		SPT 5	13	13						SAA; mottled strong brown (7.5YR 5/8). SAPROLITE		606
25												605
26												604
27												603
28												602
29		SPT 6	13	18						SAA.		601
30												600
31												599
32												598
33												597
34		SPT 7	13	21						SAA; brownish yellow (10YR 6/8). SAPROLITE		596
35												595
36												594
37												593
38												592
39		SPT 8	13	17						SAA.		591
40												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389



SOIL LOG - Boring No. B-1072

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40												590
41												589
42												588
43												587
44		SPT 9	7 15 40/4	16 16						SAA; light olive brown (2.5Y 5/4); more micaceous; manganese oxide veins. SAPROLITE		586
45											Tricone refusal at 45 ft on 8/21/06; boring terminated	585
46												584
47												583
48												582
49												581
50												580
51												579
52												578
53												577
54												576
55												575
56												574
57												573
58												572
59												571
60												570
61												569
62												568
63												567
64												566
65												565
66												564
67												563
68												562
69												561
70												560
71												559
72												558
73												557
74												556
75												555
76												554
77												553
78												552
79												551
80												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1073	
Type and Diameter of Boring Wash Rotary / NQ core / Tricone 3 7/8 inch		Boring Location N 1163676 E 1847239		Total Depth 78.5 feet	
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X		Elevation and Datum 626.7 feet MSL		Ground Water Depth N/A	
Sampling Method SPT		Sample Driving Hammer/Drop 140 lbs / 30 inches		No. of Samples 8	
		Borehole Inclination -90		Logged by G. Maximov	
				Date Started 8/20/06	
				Date Completed 8/21/06	



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML		Start 8/20/06	626
1												625
2												624
3												623
4		SPT 1	1 33	7 18						SILT, sandy, clayey (ML); red (2.5YR 4/6) and brownish yellow (10YR 6/6); damp; medium stiff; micaceous. RESIDUUM		622
5												621
6												620
7												619
8												618
9		SPT 2	2 33	10 18						SAA.		617
10												616
11												615
12												614
13												613
14		SPT 3	2 33	9 18						SAA; brownish yellow (10YR 6/6).		612
15												611
16												610
17									ML	SILT, sandy (ML); light yellowish brown (2.5Y 6/4); damp; medium stiff; micaceous; ~60% silt, ~40% fine sand. SAPROLITE		609
18												608
19		SPT 4	2 34	11 18								607
20												606
21												605
22												604
23												603
24		SPT 5	2 45	13 18								602
25												601
26												600
27												599
28												598
29		SPT 6	3 58	16 18						SAA; light yellowish brown to brownish yellow (10YR 6/8); original veining and fracture in parent rock. SAPROLITE		597
30												596
31												595
32									SM	SAND, silty (SM); yellow (2.5Y 7/6); dry to damp; very dense; micaceous ~40% silt. SAPROLITE		594
33												593
34		SPT 7	6 2039	12 18								592
35												591
36												590
37												589
38												588
39		SPT 8	9 1220	15 18								587
40												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389



SOIL LOG - Boring No. B-1073



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40									ML	SILT, sandy (ML); light yellowish brown (2.5Y 6/4); damp; hard; micaceous. SAPROLITE		586
41												585
42											Tricone refusal at 42 ft on 8/20/06, see rock log	584
43												583
44												582
45												581
46												580
47												579
48												578
49												577
50												576
51												575
52												574
53												573
54												572
55												571
56												570
57												569
58												568
59												567
60												566
61												565
62												564
63												563
64												562
65												561
66												560
67												559
68												558
69												557
70												556
71												555
72												554
73												553
74												552
75												551
76												550
77												549
78												548
79												547
80												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. B-1073	
Type and Diameter of Boring Wash Rotary / NQ core / Tricone 3 7/8 inch		Boring Location N 1163676 E 1847239		Total Depth 78.5 feet	
Drilling Contractor and Rig MACTEC/Banks/337153 / CME 550 X		Elevation and Datum 626.7 feet MSL	Ground Water Depth N/A	Depth to Bedrock 42 feet	
Casing Size and Depth 3.5 inch / 42 feet		Length of Core Barrel and Bit 13.5 feet	No. of Core Boxes 2	Date Started 8/20/06	
		Borehole Inclination -90	Logged by G. Maximov	Date Completed 8/21/06	

Reviewed by / Date B. Reinicker 8/23/06

Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
42								META-GRANODIORITE; light brownish gray (2.5Y 6/2); medium grained; equigranular; oxidation staining.	8/20/06 begin NQ coring	584
43										583
44										582
45		1	4.1 6.5	0	MW	R2 to R3				581
46										580
47										579
48										578
49										577
50		2	2.8 4.0	0	MW	R2 to R3				576
51								SAA; bluish gray (5PB 5/1)		575
52					SW to F	R4			Hard drilling	574
53		3	1.0 1.0	40	SW to F	R4				573
54					HW	R0		Friable layer, thin (~0 to 2 inch)		572
55		4	2.8 3.0	12	HW	R2			100% water loss	571
56					HW to MW	R3		SAA; fine to medium grained		570
57					MW					569
58		5	2.0 2.0	35	SW to MW	R4		META-GRANODIORITE		568
59					SW to MW	R3				567
60					SW to MW	R3		Change in weathering to fresh. CONTINUOUS ROCK.		566
61		6	4.8 5.0	67						565
62					F	R4 to R5		SAA; slightly darker to bluish gray (5PB 5/1)		564
63										563
64		7	1.2 1.2	100	F	R4 to R5		SAA; calcite veining	End of day 8/20/06 Begin day 8/21/06	562
65								SAA.		561
66										560
67		8	3.7 3.7	97	F	R4 to R5				559
68										558
69										557
70		9	2.3 2.3	100	F	R4 to R5		SAA; pervasive calcite veining		556
71								SAA.		555
72		10	2.7 2.8	100	F	R4 to R5		META-GRANODIORITE		554
73								SAA.		553
74										552
75										551
76		11	4.9 5.0	98	F	R4 to R5				550
77										549
78										548
79									End drilling 8/21/06, boring terminated	547
80										546
81										545
82										

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. B-1074	
Type and Diameter of Boring Wash Rotary / NQ core / 4 inch			Boring Location Unit 1 N 1166070 E 1846246		Total Depth 67.5 feet
Drilling Contractor and Rig MACTEC/Warren/211797 / CME 75			Elevation and Datum 569.2 feet MSL	Ground Water Depth 21.1 feet	Depth to Bedrock 31.5 feet
Sampling Method SPT			Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 9	Date Started 3/5/07
			Borehole Inclination -90	Logged by J. Cerceo	Date Completed 3/9/07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML		Begin drilling at 1:30 pm 3.25 inch hollow augering with center bit	569
1									ML			568
2									ML			567
3									ML			566
4		SPT 1	1 1/2	0 18					ML	SILT, sandy (ML), yellowish brown (10YR 5/8), to yellowish red (5YR 4/6), moist, soft, nonplastic, micaceous FILL	No recovery from split spoon	565
5									ML			564
6									ML			563
7									ML			562
8									ML			561
9		SPT 2	1 2/2	5 18					ML	SILT, sandy (ML), yellowish brown (10YR 5/6), moist, soft, ~ 20% fine sand, 10% fine gravel FILL		560
10									ML			559
11									ML			558
12									ML			557
13									ML			556
14		SPT 3	1 2/2	12 18					ML	SILT, sandy (ML), yellowish red (5YR 4/6), moist, soft, ~10% fine sand, ~10% fine gravel, micaceous nonplastic, FILL		555
15									ML			554
16									ML			553
17									ML			552
18									ML			551
19		SPT 4	WOH 2 2	4 18					ML	SILT, sandy (ML), yellowish red (5YR 4/6), moist, soft 10% fine sand, 5-10% fine gravel, micaceous, nonplastic, FILL		550
20									ML			549
21									ML			548
22									ML			547
23									ML			546
24		SPT 5	WOH 2 3	8 18					ML			545
25									ML			544
26									ML			543
27									ML			542
28									ML			541
29									SM	SAND, silty (SM) with gravel, dark gray (7.5YR 4/1) and dark brown (7.5YR 3/2), wet, very dense fine sandy, ~15% silt, micaceous FILL	Groundwater at 28.5 ft	540
30		SPT 6	WOH 26 50/2	18 18					GP	Gravel (GP), dark gray (N 4) wet, fine gravel, <15% fine sand PARTIALLY WEATHERED ROCK	Rods sunk 0.8 ft to 29.3 ft Weight of hammer (WOH) for 5" - 26/1"	539
31									GP		Gravel layer "shot rock" or the like at 29.9 ft	538
32									GP		Auger refusal at 29.9 ft	537
33									GP		Setup wash drilling equipment	536
34									GP		2 7/8" roller cone through hollow augers	535
35									GP			534
36									GP			533
37									GP			532
38									GP			531
39									GP			530
40									GP			



Project Name and Job Number Lee Nuclear Station COL 6234-06-3389							ROCK LOG - Boring No. B-1074		
Type and Diameter of Boring Wash Rotary / NQ core / 4 inch							Boring Location Unit 1 N 1166070 E 1846246		Total Depth 67.5 feet
Drilling Contractor and Rig MACTEC/Warren/211797 / CME 75							Elevation and Datum 569.2 feet MSL	Ground Water Depth 21.1 feet	Depth to Bedrock 31.5 feet
Casing Size and Depth 4 inch / 31 feet							Length of Core Barrel and Bit 8.5 feet / 8.5 feet	No. of Core Boxes 2	Date Started 3/5/07
							Borehole Inclination -90	Logged by J. Cerceo	Date Completed 3/9/07
							Reviewed by / Date M. Gray 3/29/07		
							Reviewed by / Date M. Gray 10-22-07		
							Lithology	Remarks	Elevation (feet)
32							META-GRANODIORITE; light gray to very dark gray (N 7 to N 3), speckled "salt and pepper" appearance, 20 to 25% mafics, 15 to 20% quartz, 55 to 65% plagioclase, 0.5 inch thick, vuggy quartz vein at 33 ft at 60°, medium grained, moderately to highly weathered, medium strong to strong, healed joint dipping 45° present from 32.55 to 32.75 feet	No record of sample 7 or run 8 When the casing was set, casing was not centered over the cored hole. Continued coring (Run 9) from depth of casing at 31.5 ft.	537
33									536
34							Manganese oxide staining on most natural joints, dry	Groundwater measured at 12.5 ft 30 minutes after drilling terminated	535
35									534
36							End drilling for 3/5/07. Groundwater measured at 25.4 ft	Changed to higher gear at ~36.7 ft	533
37									532
38							Losing ~70% of water down hole	Driller noted a void at 38.0 to 38.1 Ft	531
39									530
40							Run 11 core was stuck in barrel broken while getting it out	Pressuremeter Test: 42.7 ft on 3/7/07	529
41									528
42							META-GRANODIORITE to META-QUARTZ DIORITE; brown (7.5YR 4/4) quartz mica schist, fine grained, moderately weathered, medium strong, dry	Pressuremeter Test: 44.4 ft on 3/7/07	527
43									526
44							META-GRANODIORITE; primarily light gray (N 7), with grains that are very dark gray (N 3), ~ 75% plagioclase, 10 to 15% quartz, 10% hornblende, medium grained, slightly weathered, strong, dry.	Water level 7:30 a.m. 3/8/07	525
45									524
46							Natural joints coated with oxide minerals from 46.2 to 53.1 ft. Hornblendes weathered along grain margins (7.5YR 4/6). Below 53.1 weathering decreasing.	Conducted SPT test at 46.0 ft 50/2" (7A)	523
47									522
48							Diabase dike intrudes at an angle of 70° from 51.1 to 51.55 ft. Quartz intrusions that are vuggy at 52.7, 53.3, 53.6, 54.6, and 54.8 ft.	Pressuremeter Test: 49.2 ft on 3/8/07	521
49									520
50							Subvertical incipient fractures from 51.6 to 53.0 ft.	Gray water returns for Run 14	519
51									518
52							Secondary mineralization on joint faces includes oxides and epidote	SPT conducted from 51.0 ft Pressuremeter Test: 53.3 ft on 3/8/07	517
53									516
54							Rock becomes slightly weathered from 55.8 to 58.4 ft.	Pressuremeter Test: 54.8 ft on 3/8/07	515
55									514
56							META-QUARTZ DIORITE; light gray matrix (7/N) with medium gray (5/N) and dark brown (7.5YR 3/4) phenocrysts, 75% plagioclase, ~ 10% quartz, ~ 10% hornblende, medium grained, strong, dry, many steeply dipping very thin dikes, 0.5 inch vuggy quartz intrusion near 62.6 ft.	Brown to clear water returns for Run 15	513
57									512
58							No core recovery from 60.5 ft to 61.0 ft	Pressuremeter Test: 62.8 ft on 3/8/07	511
59									510
60							Pressuremeter Test: 64.3 ft on 3/8/07	Drill string vibrating a lot during Run 17	509
61									508
62							Stopped after 1.5 ft of drilling PVC casing, broke with mud entering hole	Stopped drilling and abandoned hole	507
63									506
64							Total Depth 67.5 ft. Groundwater encountered at 21.1 feet		505
65									504
66									503
67									502
68									501
69									500
70									499
71									498

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389



ROCK LOG - Boring No. B-1074

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
72								Borehole Grouted On 4/6/07	Water level on 3/11/07 10:15 a.m. is 21.1 ft below ground surface	497
73										496
74										495
75										494
76										493
77										492
78										491
79										490
80										489
81										488
82										487
83										486
84										485
85										484
86										483
87										482
88										481
89										480
90										479
91										478
92										477
93										476
94										475
95										474
96										473
97										472
98										471
99										470
100										469
101										468
102										467
103										466
104										465
105										464
106										463
107										462
108										461
109										460
110										459
111										458

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. B-1074A	
Type and Diameter of Boring NQ / HQ Core / 4 inch		Boring Location Unit 1 N 1166067 E 1846253		Total Depth 121.9 feet	
Drilling Contractor and Rig MACTEC/Warren/211797 / CME 75		Elevation and Datum 569.2 feet MSL		Ground Water Depth 23.7 feet	Depth to Bedrock 31.9 feet
Casing Size and Depth 4 inch / 39.5 feet		Length of Core Barrel and Bit 8.5 feet / 8.5 feet		No. of Core Boxes 6	Date Started 3/9/07
		Borehole Inclination -90		Logged by R. Turner	Date Completed 3/22/07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
32								Rock fragments from 31.9 to 39.5 ft. fresh, strong, granodiorite	Based on B-1074 soil was not logged, top of rock at 31.9 ft	537
33										536
34										535
35										534
36										533
37										532
38										531
39										530
40								META-GRANODIORITE; light gray to gray (7/N to 6/N), medium grained, ~ 15% hornblende/pyroxene, ~ 35% quartz, ~40% plagioclase, ~10% potassium feldspar, fresh, strong, dry, vuggy quartz veins at 41.4, 41.9 and 42.7 ft., walls of the vugs are coated with secondary oxide mineralization	Casing set 8.4 ft into rock to 39.5 ft	529
41		1	4.5 5.0	88	F	R4		By 43 ft. potassium feldspar increases to ~ 15% CONTINUOUS ROCK		528
42										527
43										526
44										525
45									Rod vibrating a lot during run 2 especially the last foot	524
46										523
47		2	4.4 5.0	88	F	R4				522
48										521
49										520
50										519
51								META-GRANODIORITE; light to medium gray (7/N to 5/N), medium grained, 10 to 15% hornblende and pyroxene, ~ 10% potassium feldspar, 55 to 65% plagioclase, fresh, strong, dry, few vuggy intrusive veins	Very little water return during Run 3 (Losing ~90%)	518
52		3	3.6 4.5	80	F	R4	Lee12			517
53							Lee11		Pressuremeter Test: 52.2 ft on 3/12/07	516
54									Pressuremeter Test: 53.2 ft on 3/12/07	515
55		4	2.5 2.5	100	F	R4	Lee10		Very little water return during Run 4 (losing 90%+ down hole)	514
56									Pressuremeter Test: 54.7 ft on 3/12/07	513
57								DIORITE; medium dark gray (3/N), fine grained, fresh, medium strong, dry		512
58								META-GRANODIORITE; light gray to light bluish gray (7/N to 10B 7/1), medium grained, 50% plagioclase, 20 to 25% quartz, 10 to 15% hornblende and pyroxene, 5% potassium feldspar, fresh, strong, dry		511
59		5	2.8 5.0	56	F	R3 to R4	Lee14	Thin (0.1 ft) layer of phyllite/schist at contact	At 59.5 ft rod advance approximately ~0.6 ft very quickly	510
60									Pressuremeter Test: 60.8 ft on 3/12/07	509
61									Pressuremeter Test: 62.3 ft on 3/12/07	508
62		6	2.0 2.0	100	F	R4	Lee13			507
63										506
64								0.5 to 0.8 inch quartz vein at 64 ft.		505
65										504
66		7	4.9 5.0	98	F	R4	Lee17	META-GRANODIORITE; light gray to bluish gray (7/N to 10B 6/1), medium grained, 15 to 20% hornblende/pyroxene, 30% quartz, 40 to 45% plagioclase, 5% potassium feldspar, fresh, strong, dry	Pressuremeter Test: 65.3 ft on 3/12/07	503
67							Lee16	0.3 ft. thick mafic rich zone at 66.6 ft.	Pressuremeter Test: 66.8 ft on 3/12/07	502
68							Lee15		Drill rod vibrated a lot from 67.5 ft to 68.5 ft	501
69									Pressuremeter Test: 68.3 ft on 3/13/07	500
70		8	2.0 2.0	100	F	R4		At approximately 69 ft. potassium feldspar increases to ~ 15%, plagioclase decreases to 30 to 35%		499
71								Few vuggy thin veins cut through at high angles.	At ~68.8 ft drill rapidly advanced 0.2 ft (soft zone).	498

Project Name and Job Number
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6234-06-3389



ROCK LOG - Boring No. B-1074A

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
72		9	$\frac{3.8}{3.9}$	90	F	R4	Lee21		While reaming HQ, lost all water returns at 70 ft	497
73							Lee20		Pressuremeter Test: 72.3 ft on 3/13/07	496
74									Drill rod chatter from 72.5 ft to 73.5 ft	495
75							Lee19		Pressuremeter Test: 73.8 ft on 3/13/07	494
76		10	$\frac{3.3}{3.1}$	100	F	R4	Lee18		Pressuremeter Test: 75.3 ft on 3/13/07	493
77									Pressuremeter Test: 75.8 ft on 3/13/07	492
78									Rod chatter from 77.5 ft to 78.5 ft	491
79		11	$\frac{3.4}{3.5}$	90	F	R4			Pressuremeter Test: 80.5 ft on 3/14/07	490
80							Lee22	META-GRANODIORITE; light gray to light bluish gray (7/N to 10B 7/1), medium grained, fresh, strong, dry.	Sharp contact	489
81							Lee24	META-DIORITE; dark bluish gray (10B 4/1), fine grained, ~55% mafics, ~ 45% plagioclase, fresh, strong, dry,	Pressuremeter Test: 81.7 ft on 3/14/07	488
82		12	$\frac{3.7}{3.5}$	100	F	R4	Lee23	numerous very thin to thin (up to 0.2 inch) quartz veins cut core at high angles.	Driller Jason Cain took over rig from Jimmy Warren after Run 12.	487
83								Diorite is very slightly metamorphosed.	Switched to HQ coring with 5 ft runs.	486
84									Water level 9:00 a.m. 3/15/07 at 22.8 ft	485
85		13	$\frac{1.6}{1.6}$	97	F	R4			Pressuremeter Test: 83.2 ft on 3/14/07	484
86										483
87		14	$\frac{2.9}{3.0}$	97	F	R4		META-GRANODIORITE; light gray to light bluish gray (7/N to 10B 7/1), medium grained, ~ 30% mafics, ~ 25% quartz, ~ 40% plagioclase, ~ 5% potassium feldspar, fresh, strong, dry.		482
88										481
89										480
90								Some phenocrysts of mafics up to 0.7 inch present from 89.8 to 91.2 ft.		479
91										478
92		15	$\frac{4.9}{5.0}$	98	F	R4		Very thin (<0.1 inch) quartz veins closely to moderately spaced cut through at high angles.		477
93								Veins at 91.7 and 93.1 ft. are very vuggy, incipient fracture planes.		476
94										475
95										474
96		16	$\frac{4.4}{4.4}$	100	F	R4		META-GRANODIORITE; bluish gray (10B 7/1), ~ 40% potassium feldspar, ~ 30% quartz, ~ 20% mafics, ~ 10% plagioclase, medium grained, fresh, strong, dry, numerous closely spaced thin (<0.1 inch) mafic intrusions.	Gradational contact	473
97									Water level at 9:50 a.m. 23.7 ft	472
98									3/21/07 taped hole to 96.0 ft	471
99		17	$\frac{0.4}{0.4}$	87.5	F	R4				470
100										469
101		18	$\frac{4.7}{5.0}$	88	F	R4			Poor water returns during Runs 18,19, and 20	468
102								Thin (<0.1 inch) mafic intrusions not visible at 101.9 ft.		467
103										466
104								At 103.5 ft. potassium feldspar percentage decreases to 10 to 15%, ~ 30 to 35% mafics, ~ 25% quartz, ~ 35% plagioclase.		465
105										464
106		19	$\frac{5.0}{5.0}$	100	F	R4				463
107										462
108								Thin foliated bands of from 108 to 108.1 ft. and 108.5 to 108.7 ft.		461
109										460
110										459
111		20	$\frac{4.9}{5.0}$	98	F	R4		META-GRANODIORITE; bluish gray (10B 7/1), medium grained, ~ 30 to 35% mafics, ~ 30% plagioclase, ~ 20% quartz, ~ 15 to 20 % potassium feldspar, fresh, strong,		458

Project Name and Job Number
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ROCK LOG - Boring No. B-1074A

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
112			5.0					dry, fine grained zone from 110 to 110.1 ft. , below 110.1 ft are few subvertical healed joints.		457
113										456
114								Steeply dipping healed joints from 114.3 to 115.1 ft.	Poor water returns during Run 21	455
115		21	$\frac{2.6}{3.0}$	87	F	R4				454
116									Slight rod chatter from 115.9 to 116.7 ft	453
117										452
118										451
119		22	$\frac{4.3}{5.0}$	85	F	R4			It is possible that some core from Run 22 was left in hole. RQD for the 4.25 ft retrieved would be 100%	450
120										449
121										448
122										447
123									Attempted to measure depth to bottom but weight on measuring tape would not sink through mud in hole.	446
124										445
125								Total Depth 121.9 ft.		444
126								Groundwater encountered at 23.7 feet		443
127								Borehole Grouted On 4/6/07		442
128										441
129										440
130										439
131										438
132										437
133										436
134										435
135										434
136										433
137										432
138										431
139										430
140										429
141										428
142										427
143										426
144										425
145										424
146										423
147										422
148										421
149										420
150										419
151										418

Project Name and Job Number
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SOIL LOG - Boring No. B-1075

Type and Diameter of Boring Hollow stem / 6.5 inch	Boring Location Unit 1 N 1166030 E 1846256	Total Depth 23.7 feet
Drilling Contractor and Rig MACTEC/Warren/211797 / CME 75	Elevation and Datum 569.7 feet MSL	Ground Water Depth N/A
Sampling Method Hollow-stem augers with split sampler	Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 4
	Borehole Inclination -90	Logged by R. Turner
		Date Started 3/22/07
		Date Completed 3/22/07

Reviewed by / Date M. Gray 3/29/07

Reviewed by / Date C. Lane 10-27-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0												569
1												568
2												567
3												566
4	SPT 1	4	12	18					SM	SAND silty (SM), strong brown (7.5YR 4/6), loose to very loose density, subangular, minimum size is silt, maximum size is fine sand damp FILL		565
5												564
6												563
7											Gravel layer from 7.0 ft to 7.5 ft	562
8												561
9	SPT 2	1	6	18					SM	SAND silty (SM), yellowish brown (10YR 5/4), very loose density, subangular, minimum size is silt, maximum size is fine sand, damp, FILL		560
10												559
11												558
12												557
13												556
14	SPT 3	2	6	18					SM	SAND silty with gravel (SM), strong brown (7.5YR 4/6), very loose density, subangular, minimum size is silt, maximum size is a 1 inch piece of gravel FILL, damp		555
15												554
16												553
17												552
18												551
19	SPT 4	WOH 1	9	18					SW-SM	SAND silty (SW-SM), medium toughness, yellowish brown (10YR 5/4) medium stiff, slow dilatency, nonplastic, well graded, damp to moist, maximum size coarse sand FILL	WOH = weight of hammer	550
20											Hole abandoned as the augers hit rock or gravel layer and deviated from vertical	549
21												548
22												547
23												546
24	SPT 5	50/2	3	2					GW	GRAVEL, light gray (7/N), angular, 1.5 inch, single piece SPT refusal	SPT refusal at 23.5 ft. See B-1075A	545
25												544
26												543
27												542
28												541
29												540
30												539
31												538
32												537
33												536
34												535
35												534
36												533
37												532
38												531
39												530
40												530

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. B-1075A	
Type and Diameter of Boring Hollow stem / HQ Core / 6.5 inch		Boring Location Unit 1 N 1166036 E 1846257		Total Depth 150.4 feet	
Drilling Contractor and Rig MACTEC/Warren/211797 / CME 75		Elevation and Datum 569.5 feet MSL	Ground Water Depth 23.4 feet	Depth to Bedrock 24.3 feet	
Casing Size and Depth 4.5 inch / 23.7 feet		Length of Core Barrel and Bit 8.6 feet / 8.6 feet	No. of Core Boxes 11	Date Started 3/23/07	
		Borehole Inclination -90	Logged by R. Turner	Date Completed 3/27/07	

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
25		1	0.3 0.3	0	SW	R4		META-GRANODIORITE; light gray (N 7) to light bluish gray (10B 7/1), 35 to 40% quartz, 25 to 30% plagioclase, ~ 20% biotite/hornblende, ~ 10% potassium feldspar, slightly weathered, strong, dry.		545
26										544
27		2	4.5 5.0	86	SW	R4		Vuggy incipient fractures from 25.5 to 26.4 ft.		543
28										542
29										541
30										540
31										539
32		3	5.4 5.0	28	SW	R4				538
33								Natural joints from 32.5 to 33.7 ft. have iron oxide secondary mineralization	No water returns during last 0.5 inches of Run 3	537
34										536
35										535
36								META-GRANODIORITE; light bluish gray (10B 7/1), ~ 30% quartz, ~ 30% potassium feldspar, ~ 25% plagioclase, ~ 15% biotite, medium grained, fresh, strong, dry.		534
37		4	5.0 5.0	94	F	R4		Fine grained zone from 36.4 to 36.6 ft. (primarily composed of potassium feldspar)		533
38								CONTINUOUS ROCK		532
39										531
40								SAA; between 40 and 42.5 ft. potassium feldspar decreases to 5 to 10%, quartz increase to ~ 40%.		530
41										529
42		5	4.7 5.0	86	F	R4				528
43										527
44										526
45										525
46										524
47		6	4.7 5.0	68	F	R4		SAA; from 45.9 to 49.3 ft. core intersects a subvertical quartz vein which spalls off		523
48										522
49										521
50										520
51								META-GRANODIORITE; light bluish gray (10B 7/1), medium grained, ~ 30 to 35% biotite/hornblende, ~ 25% quartz, ~ 20% potassium feldspar, ~ 20% plagioclase, fresh, strong dry.		519
52		7	4.8 5.0	76	SW to F	R4		Slightly weathered from 52.6 to 54.6 ft.		518
53								Vuggy incipient fracture from 53 to 53.55 ft.		517
54										516
55										515
56										514
57		8	5.3 5.0	93	F	R4		SAA; from 55.8 to 57.0 ft few subvertical mafic veins		513
58								Subvertical quartz vein intrusion from 57.7 to 58.4 ft.		512
59									Mechanical breaks from 58.3 ft to 59.3 ft caused while removing core from sample barrel	511
60										510
61										509
62		9	5.1 5.0	100	F	R4				508
63										507
64								0.8 inch thick quartz vein at 63.6 ft.		506

Project Name and Job Number
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ROCK LOG - Boring No. B-1075A

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
65										505
66		10	$\frac{3.0}{3.0}$	100	F	R4		META-GRANODIORITE;; light bluish gray (10B 7/1), medium grained, ~ 35% biotite/hornblende, ~ 25% quartz, ~ 25% plagioclase, ~ 15% potassium feldspar, fresh, strong, dry.		504
67										503
68		11	$\frac{2.1}{2.0}$	100	F	R4		Very thin quartz vein (0.1 inch) cuts core from 65.7 to 66.3 ft.		502
69								Very thin quartz vein (<0.1 inch) at 68.5 ft.		501
70								Quartz veins at 69.2 and 69.4 ft. (~0.1 to 0.2 inch thick)	At 70, 0.3 ft, drill advanced rapidly	500
71										499
72		12	$\frac{4.4}{5.0}$	88	F	R4				498
73										497
74										496
75										495
76								0.1 inch quartz vein at 75.8 ft.		494
77		13	$\frac{5.0}{5.0}$	100	F	R4				493
78										492
79										491
80										490
81		14	$\frac{1.7}{3.0}$	57	F	R4		META-QUARTZ DIORITE; light bluish gray to bluish gray (10B 7/1 to 10B 6/1), medium grained, ~ 35% biotite/hornblende, ~35% quartz, ~ 25% plagioclase, ~ 5% potassium feldspar, strong, fresh, dry.	Gradational contact at 80 ft After Run 14 was cored, the core wouldn't break at the bottom	489
82										488
83		15	$\frac{1.7}{2.0}$	85	F	R4		META-GRANODIORITE;; light bluish gray (10B 7/1), medium grained, fresh, strong, dry, 0.1 to 0.7 inch quartz veins.	Pulled rod to get core out 82.8 ft gradational contact	487
84										486
85										485
86		16	$\frac{5.0}{5.0}$	100	F	R5		META-DIORITE; dark bluish gray (10B 4/1), fine grained, fresh, strong, 0.1 to 0.2 inch quartz veins from 86 to 88.1 ft.	At ~85 ft, water returns changed from light to dark gray	484
87										483
88										482
89										481
90										480
91		17	$\frac{4.9}{5.0}$	97	F	R5		META-GRANODIORITE;; light bluish gray (10B 7/1), ~ 35% quartz, ~ 30% plagioclase, ~ 25% biotite/hornblende, ~ 10% potassium feldspar, medium grained, fresh, very strong, phenocrysts of mafics 0.5 to 2.4 inch from 90.5 to 92.8 ft.	Sharp contact that occurs between 89.6 ft and 89.8 ft	479
92										478
93										477
94										476
95										475
96		18	$\frac{4.9}{5.0}$	97	F	R5		META-GRANODIORITE;; light bluish gray (10B 7/1), medium grained, fresh, very strong, dry. Zone from 94.9 to 95.6 ft. is ~ 40% quartz, ~ 40% plagioclase, ~ 15% potassium feldspar, ~ 5% biotite/hornblende.		474
97								Below 95.6 ft. rock is ~ 40% biotite/hornblende, ~ 30% quartz, ~ 20% plagioclase, ~ 10% potassium feldspar.		473
98								From 96.2 to 97.4 ft. are 6 healed joints dipping 60 to 70 degrees spaced 1.5 to 4.0 inches apart.		472
99										471
100										470
101										469
102		19	$\frac{5.0}{5.0}$	100	F	R5				468
103										467
104								Two generations of quartz vein intrusions between 102.9 and 103.3 ft., a feldspathic quartz vein cuts and offsets a		466

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ROCK LOG - Boring No. B-1075A



Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
105								pure quartz vein.		465
106								META-QUARTZ DIORITE; bluish gray (10B 6/1), medium grained, fresh, very strong, dry.	Gradational contact	464
107		20	5.3 5.0	100	F	R5		0.8 inch thick feldspathic quartz vein cuts core at 65 degrees from 105.85 to 106.55 ft.		463
108								From 107.3 to 107.7 ft. and 108.2 to 108.45 ft. rock is fine grained and gneissic.		462
109										461
110										460
111								META-QUARTZ DIORITE; light bluish gray (10B 7/1), medium grained, ~ 45% biotite/hornblende, ~ 35% quartz, ~15% plagioclase, ~ 5% potassium feldspar, fresh, very strong, dry.	Gradational contact	459
112		21	4.7 5.0	93	F	R5		META-GRANODIORITE; light bluish gray (10B 7/1), medium to coarse grained, ~ 35% quartz, ~ 30% biotite/hornblende, ~ 20% plagioclase, ~ 15% potassium feldspar, fresh, very strong, dry.		458
113								1.2 inch quartz vein from 112.25 to 113.1 ft.		457
114								healed microfaulted quartz veins from 113.8 to 114.1 ft.		456
115								0.2 inch thick quartz vein at 116.6 ft.		455
116								Granite from 116.8 to 117.3 ft.		454
117		22	5.0 5.0	100	F	R5				453
118										452
119								From 118.8 to 119.6 ft. a single 3 inch thick quartz vein comprises 40 to 60% of the core		451
120								META-QUARTZ DIORITE; bluish gray (10B 6/1), fine to medium grained, 50 to 55% quartz, 35 to 40% plagioclase, ~ 10% biotite, <5% potassium feldspar, fresh, very strong, dry.	Measured water level at 23.4 ft at 7:30 a.m., 3/26/07	450
121		23	3.2 3.2	100	F	R5		Subvertical mafic intrusion from 119.8 to 120.45 ft.		449
122										448
123		24	1.9 2.0	95	F	R5				447
124										446
125										445
126								META-QUARTZ DIORITE; light bluish gray (10B 7/1), ~ 40% biotite/hornblende, ~ 30% quartz, ~ 30 % plagioclase, ~ 5% potassium feldspar, medium grained, fresh, very strong, dry.		444
127		25	5.0 5.0	100	F	R5		Granitic zone with 0.5 inch thick quartz vein from 125.5 to 125.8 ft.		443
128										442
129										441
130										440
131										439
132		26	5.1 5.0	100	F	R5				438
133										437
134										436
135										435
136		27	2.0 2.0	100	F	R5		0.3 inch thick quartz vein cuts core at 70 degrees from 135.1 to 135.5 ft.		434
137										433
138		28	2.7 3.0	90	F	R5				432
139										431
140									Mechanical breaks from 138.5 to 139.5 ft caused while removing core from sample barrel	430
141								META-QUARTZ DIORITE; light bluish gray (10B 7/1), medium grained, ~ 40% biotite, ~ 35% quartz, ~ 20% plagioclase, ~ 5% potassium feldspar, fresh, very strong, dry.		429
142		29	4.7 5.0	94	F	R5		0.1 inch quartz vein from 140.2 to 140.6 ft.		428
143								0.5 to 0.7 inch thick quartz vein from 142.5 to 142.75 ft.		427
144										426

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ROCK LOG - Boring No. B-1075A

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
145										425
146										424
147		30	5.0	100	F	R5		Mafic xenoliths present from 147 to 147.9 ft.		423
148			5.0							422
149										421
150		31	0.6	100	F	R5				420
151			0.6							419
152										418
153										417
154								Total Depth 150.4 ft. Groundwater encountered at 23.4 feet Borehole Grouted On 4/6/07		416
155										415
156										414
157										413
158										412
159										411
160										410
161										409
162										408
163										407
164										406
165										405
166										404
167										403
168										402
169										401
170										400
171										399
172										398
173										397
174										396
175										395
176										394
177										393
178										392
179										391
180										390
181										389
182										388
183										387
184										386

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. MW-1200	
Type and Diameter of Boring CME Sampler / 7 inch/NQ		Boring Location General site N 1166347 E 1845577		Total Depth 8.5 feet	
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75		Elevation and Datum 591.5 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A	
Sampling Method Continuous Sampler		Sample Driving Hammer/Drop NA / NA	No. of Samples 1	Date Started 3/18/06	
		Borehole Inclination -90	Logged by M. Cooke	Date Completed 3/18/06	

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									SM	Topsoil, sandy (SM).	Begin drilling 3/18/06	591
1									SM	SAND, silty (SM); light yellowish brown to white (10YR 6/4 to 10YR 8/1); dry; fine to medium grained; contains 2 to 3 inch fragments of weathered rock. FILL		590
2												589
3												588
4		CME 1		30							Hard drilling 3.5 to 6 ft	587
5				30								586
6												585
7										PARTIALLY WEATHERED ROCK		584
8										Refusal to hollow stem auger, moved 4 ft east from MW-1200 to core rock, see soil and rock log MW-1200A	CME sampler refusal	583
9										Refer to MW-1200A for rock description		582
10												581
11												580
12												579
13												578
14												577
15												576
16												575
17												574
18												573
19												572
20												571
21												570
22												569
23												568
24												567
25												566
26												565
27												564
28												563
29												562
30												561
31												560
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37												554
38												553
39												552
40												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. MW-1200A	
Type and Diameter of Boring Wash Rotary / NQ core / Tricone 3 7/8 inch		Boring Location General site N 1166348 E 1845580		Total Depth 63.5 feet	
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850		Elevation and Datum 591.8 feet MSL		Ground Water Depth 23 feet	
Casing Size and Depth 3.5 inch / 8.5 feet		Length of Core Barrel and Bit 8 feet		No. of Core Boxes 3	
		Borehole Inclination -90		Logged by M. Cooke	
				Date Started 3/27/06	
				Date Completed 3/28/06	

Reviewed by / Date F. Syms 5/28/06















Reviewed by / Date M. Gray 10-22-07



Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
9									Begin NQ core	583
10									Began rock coring, see rock log	582
11		1	1.0 5.0	0	CW to HW	R0 to R1				581
12										580
13										579
14								META-GRANODIORITE; bluish gray (10B 6/1); highly weathered; no recovery. PARTIALLY WEATHERED ROCK.		578
15										577
16		2	2.0 5.0	0	CW to HW	R0 to R1				576
17										575
18										574
19								SAA.	~10% loss of coring water	573
20										572
21		3	1.0 5.0	0	CW to HW	R0 to R1				571
22										570
23								▽		569
24								SAA.		568
25										567
26		4	2.0 5.0	0	CW to HW	R0 to R1				566
27										565
28										564
29									End day 3/27/06	563
30									Begin day 3/28/06; water at 23 ft	562
31		5	4.5 5.0	58	CW to HW	R0 to R1				561
32								META-GRANODIORITE; bluish gray (10B 6/1); weakly foliated ~ 30 to 45°, 1 to 3 mm grain size; pitting and vugs on surface of core from dissolution of secondary minerals (calcite); quartz veins along foliation.		560
33					MW	R3		SAA; highly weathered 33.5 to 36 ft.		559
34										558
35					HW to MW	R2				557
36		6	5.0 5.0	23						556
37					MW	R3				555
38										554
39								SAA; highly weathered 38.5 to 40.7 ft, more pronounced foliation.		553
40					HW	R1 to R2				552
41		7	5.0 5.0	18						551
42					MW	R3				550
43										549
44								SAA; fracture parallel to foliation 43.2 to 43.5 ft.		548
45										547
46		8	5.0 5.0	0	HW	R1 to R2		Quartz dike 45.7 to 47 ft.		546
47										545
48										544

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389



ROCK LOG - Boring No. MW-1200A

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)	
49		9	5.0 5.0	81	SW to F	R3 to R4		META-DIORITE; dark bluish gray (10B 4/1); medium to coarse grained; slight foliation inclined at 30 to 45° ; quartz, plagioclase, biotite, hornblende; CONTINUOUS ROCK		543	
50										542	
51										541	
52		10	5.0 5.0	97	F	R4		Quartz rich zone Shear zone 60°, highly weathered, brecciated along boundaries		540	
53										539	
54										538	
55		11	5.0 5.0	100	F	R4		SAA.		537	
56										536	
57										535	
58										534	
59										533	
60										532	
61										531	
62										530	
63										529	
64									End drilling 3/28/06	528	
65										527	
66										526	
67									Total Depth 63.5 ft. Groundwater encountered at 23 feet Borehole Grouted On 3/29/06		525
68											524
69											523
70										522	
71										521	
72										520	
73										519	
74										518	
75										517	
76										516	
77										515	
78										514	
79										513	
80										512	
81										511	
82										510	
83										509	
84										508	
85										507	
86										506	
87										505	
88										504	

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. MW-1201	
Type and Diameter of Boring CME Sampler / 7 inch/NQ		Boring Location General site N 1166696 E 1846574		Total Depth 150 feet	
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75		Elevation and Datum 589.5 feet MSL	Ground Water Depth 36.2 feet	Depth to Bedrock 99 feet	
Sampling Method Continuous Sampler/Standard		Sample Driving Hammer/Drop NA / NA	No. of Samples 13	Date Started 3/18/06	
		Borehole Inclination -90	Logged by M. Cooke	Date Completed 3/21/06	

Reviewed by / Date F. Syms 5/28/06

Reviewed by / Date C. Lane 10-27-07



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	4 topsoil inch with decomposed organics	Begin drilling 3/18/06	589
1										SILT sandy (ML); yellowish brown (10YR 5/6); damp to dry; fine to medium sand; trace mica, trace gravel. FILL		588
2												587
3												586
4											Begin CME continuous sampling	585
5												584
6		CME 1		60/60								583
7												582
8												581
9										SAA; red (10R 4/8).		580
10												579
11		CME 2		60/60								578
12										At 12 ft, gravel zone, contains 2 inch diameter angular quartz gravel size rock fragments.		577
13												576
14												575
15												574
16		CME 3		60/60								573
17												572
18												571
19												570
20												569
21		CME 4		60/60								568
22												567
23												566
24										SAA.		565
25												564
26		CME 5		12/60							Low recovery, sampler likely blocked by gravel	563
27												562
28												561
29												560
30									SM	SAND, silty (SM); yellowish brown (10YR 5/6); damp; fine grained. FILL		559
31		CME 6		60/60					ML	SILT, sandy (ML); weak red (10R 4/4); damp; fine sand. FILL		558
32												557
33												556
34												555
35												554
36		CME 7		60/60					∇			553
37												552
38												551
39												550
40												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389



SOIL LOG - Boring No. MW-1201

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40												549
41		CME 8		60 60								548
42												547
43												546
44												545
45												544
46		CME 9		45 60								543
47												542
48												541
49										48.5 to 52.5 ft becomes wet.	End drilling 3/18/06 Begin drilling 3/19/06; water at 42 ft	540
50												539
51		CME 10		48 60								538
52												537
53									SM	SAND silty (SM); brownish yellow to yellow (10YR 6/8 to 10YR 7/6); dry; fine to medium grained; quartz, mica, ~1/8 inch rock fragments; relict metamorphic texture; 3 inch weathered quartz dike; SAPROLITE	Hard drilling 52.5 to 58.5 ft	536
54												535
55												534
56		CME 11		42 60								533
57												532
58												531
59											Very hard drilling	530
60												529
61		CME 12		60 60								528
62										Quartz dike.		527
63										Quartz dike.		526
64												525
65												524
66		CME 13		30 60								523
67												522
68										Refusal to CME sampler and hollow stem augers. Refer to rock log for continuation of borehole log		521
69												520
70												519
71												518
72												517
73												516
74												515
75												514
76												513
77												512
78												511
79												510
80												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. MW-1201	
Type and Diameter of Boring CME Sampler / 7 inch/NQ		Boring Location General site N 1166696 E 1846574		Total Depth 150 feet	
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75		Elevation and Datum 589.5 feet MSL		Ground Water Depth 36.2 feet	
Casing Size and Depth 3.5 inch / 68.5 feet		Length of Core Barrel and Bit 13 feet		No. of Core Boxes 7	
		Borehole Inclination -90		Logged by M. Cooke	
				Date Started 3/18/06	
				Date Completed 3/21/06	

Reviewed by / Date F. Syms 5/28/06

Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
69								SAND silty (SM); dark yellowish brown (10YR 3/6); with rock fragments; SAPROLITE.	End of day 3/19/06; water at 36.75 ft	521
70									Begin coring 3/20/06; water at 37 ft	520
71		1	0.0 5.5	0	RS to CW	R0				519
72										518
73										517
74										516
75								SAND silty (SM) dark yellowish brown (10YR 3/6); medium to coarse grained with rock fragments; SAPROLITE		515
76		2	0.8 5.0	0	CW	R0				514
77										513
78										512
79										511
80										510
81		3	1.0 5.0	0	CW	R0				509
82										508
83										507
84										506
85										505
86		4	1.0 5.0	0	HW to CW	R0				504
87										503
88										502
89										501
90										500
91		5	1.5 5.0	0	HW to CW	R0				499
92										498
93										497
94										496
95										495
96		6	1.0 5.0	0	HW to CW	R0				494
97										493
98										492
99										491
100								META-GRANODIORITE; white (10YR 8/1); weathered yellow oxidation; texture and foliation obscured by highly weathering conditions; numerous open veinlets and vugs due to weathering of secondary minerals along interlocking series of fracture; quartz, plagioclase, calcite. PARTIALLY WEATHERED ROCK.	End drilling 3/20/06	490
101		7	5.0 5.0	0	HW	R1 to R2			Begin drilling 3/21/06; water at 36.2 ft	489
102										488
103										487
104										486
105										485
106		8	1.5 5.0	0	CW	R0		PARTIALLY WEATHERED ROCK SAA.		484
107										483
108										482
										481

Project Name and Job Number
Lee Nuclear Station COL
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ROCK LOG - Boring No. MW-1201



Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
109		9	4.3 5.0	0	HW	R1 to R2		META-GRANODIORITE; weathered yellow (10YR 7/8); branching/interlocking vertical fractures, abundant calcite along fractures and vugs. PARTIALLY WEATHERED ROCK		481
110										480
111										479
112										478
113					CW	R0		SAA.		477
114										476
115					MW	R2 to R3		META-DIORITE; greenish gray (10GY 4/1); very fine grained, calcite in stringers and parallel to foliation; CONTINUOUS ROCK		475
116		10	5.0 5.0	83						474
117					F	R4				473
118										472
119										471
120										470
121		11	5.0 5.0	100						469
122					F	R4				468
123										467
124										466
125										465
126		12	5.0 5.0	80						464
127					F	R4				463
128										462
129										461
130										460
131		13	5.0 5.0	94						459
132					F	R4				458
133										457
134										456
135										455
136		14	5.0 5.0	100						454
137					F	R4				453
138										452
139										451
140										450
141		15	5.0 5.0	94						449
142					F	R4				448
143										447
144										446
145										445
146										444
147		16	6.0 6.0	91						443
148					F	R4				442
										441

Project Name and Job Number
Lee Nuclear Station COL
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ROCK LOG - Boring No. MW-1201

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
149								SAA.		441
150					MW	R3				440
151									End drilling 3/21/06	439
152										438
153										437
154										436
155										435
156										434
157										433
158										432
159										431
160										430
161										429
162										428
163										427
164										426
165										425
166										424
167										423
168										422
169										421
170										420
171										419
172										418
173										417
174										416
175										415
176										414
177										413
178										412
179										411
180										410
181										409
182										408
183										407
184										406
185										405
186										404
187										403
188										402
										401

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. MW-1202	
Type and Diameter of Boring CME Sampler / 8 inch/NQ		Boring Location General site N 1167007 E 1847460		Total Depth 48.5 feet	
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850		Elevation and Datum 587.3 feet MSL	Ground Water Depth 24 feet	Depth to Bedrock N/A	
Sampling Method Continuous Sampler		Sample Driving Hammer/Drop NA / NA	No. of Samples 9	Date Started 3/14/06	
		Borehole Inclination -90	Logged by J. Cerceo	Date Completed 3/15/06	

Reviewed by / Date F. Syms 5/28/06

Reviewed by / Date C. Lane 10-27-07



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									SM	SAND, silty (SM); weak red (10R 4/4); dry; fine to medium grained; some quartz rock fragments; zones of light brown fine sand. FILL	Begin drilling on 3/14/06	587
1												586
2												585
3												584
4												583
5												582
6		CME 1		34.8 60								581
7												580
8												579
9										SAA; damp to moist; micaceous.		578
10												577
11		CME 2		7.2 60								576
12												575
13												574
14												573
15												572
16		CME 3		43.2 60								571
17									ML	SILT, clayey, sandy (ML); dark brown (7.5YR 3/3); moist; micaceous; trace quartz fragments; trace wood fragments. FILL		570
18												569
19												568
20												567
21		CME 4		60 60					ML	SILT, (ML); strong brown (7.5YR 4/6); moist; low plasticity; micaceous; trace fine sand. RESIDUUM	Water on rods at ~22 ft	566
22												565
23									∇	SAA; red (2.5YR 4/6); and reddish yellow (7.5YR 6/6) with black (7.5YR 2.5/1); seams; wet; low plasticity; little mica. RESIDUUM	Saturated soil cuttings	564
24												563
25												562
26		CME 5		58.8 60								561
27												560
28									ML	SILT, (ML); red (2.5YR 4/6); and reddish yellow (7.5YR 6/6) with black (7.5YR 2.5/1); seams; wet; low plasticity; little mica. SAPROLITE		559
29												558
30												557
31		CME 6		25.2 60								556
32												555
33												554
34										SAA; mottled very dark brown (10YR 2/2) to yellowish brown (10YR 5/4) to grayish brown (10YR 5/2); wet; trace fine sand; very micaceous; low to no plasticity. SAPROLITE		553
35												552
36		CME 7		31.2 60								551
37											Harder drilling	550
38												549
39										SAA; yellowish brown (10YR 5/4) to grayish brown (10YR 5/2); wet; 10% sand; nonplastic; micaceous.		548
40												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389



SOIL LOG - Boring No. MW-1202

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40												547
41		CME 8		32.4/60					ML	SAPROLITE		546
42												545
43												544
44										SAA. SAPROLITE		543
45												542
46		CME 9		40.8/60								541
47												540
48											End of day 3/14/06	539
49											Begin day 3/15/06; water at 24 ft	538
50											Very hard drilling, lost drilling tools in the hole	537
51											See MW-1202A	536
52										Total Depth 48.5 ft.		535
53										Groundwater encountered at 24 feet		534
54										Borehole Grouted On 4/10/06		533
55												532
56												531
57												530
58												529
59												528
60												527
61												526
62												525
63												524
64												523
65												522
66												521
67												520
68												519
69												518
70												517
71												516
72												515
73												514
74												513
75												512
76												511
77												510
78												509
79												508
80												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. MW-1202A	
Type and Diameter of Boring Wash Rotary / Tricone 3 7/8 inch		Boring Location General site N 1167013 E 1847466		Total Depth 115.6 feet	
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850		Elevation and Datum 587.5 feet MSL		Ground Water Depth 16.8 feet	
Sampling Method SPT		Sample Driving Hammer/Drop 140 lbs / 30 inches		No. of Samples 7	
		Borehole Inclination -90		Logged by J. Cerceo	
				Date Started 3/15/06	
				Date Completed 3/18/06	



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0												587
1										No samples attempted, refer to MW-1202.	Offset boring from MW-1202.	586
2											Drilled without sampling to 48.5 ft	585
3												584
4												583
5												582
6												581
7												580
8												579
9												578
10												577
11												576
12												575
13												574
14												573
15												572
16												571
17									▽			570
18												569
19												568
20												567
21												566
22												565
23												564
24												563
25												562
26												561
27												560
28												559
29												558
30												557
31												556
32												555
33												554
34												553
35												552
36												551
37												550
38												549
39												548
40												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389



SOIL LOG - Boring No. MW-1202A

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40										No samples attempted, refer to MW-1202.	Offset boring from MW-1202.	547
41										(Continued from previous page)	Drilled without sampling to 48.5 ft.	546
42												545
43											Begin SPT sampling at 48.5 ft	544
44												543
45												542
46												541
47												540
48												539
49	SPT 1	6 8 10	13.2 24						SM	SAND, silty (SM); light gray (5YR 7/1) and yellowish brown (10YR 5/4); damp; fine to medium grained; 15% silt; trace mica. SAPROLITE	Start MW-1202A at 48.5 ft with SPT sampling	538
50											Drove spoon with hammer 24 inches to obtain continuous soil sample	537
51	SPT 2	4 7 8	18 24								SPT HAMMER WEIGHT NOT CERTIFIED-SPT BLOWS FOR INFORMATION ONLY AND NOT DESIGN INPUT	536
52												535
53	SPT 3	4 5 10	12 24									534
54												533
55	SPT 4	8 10 15	19.2 24							SAA; light gray (5YR 7/1); and very dark greenish gray (5BG 3/1); fine to medium grained; 20% silt, micaceous. SAPROLITE		532
56												531
57	SPT 5	5 8 39	20.4 20.4									530
58												529
59	SPT 6	50/1.2	0 1.2						SP	SAND (SP); black (5YR 2.5/1); and light gray (5YR 7/1); micaceous. PARTIALLY WEATHERED ROCK	See rock log MW-1202A	528
60												527
61	SPT 7	50/1.2	0 1.2									526
62												525
63												524
64												523
65												522
66												521
67												520
68												519
69												518
70												517
71												516
72												515
73												514
74												513
75												512
76												511
77												510
78												509
79												508
80												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. MW-1202A	
Type and Diameter of Boring Wash Rotary / Tricone 3 7/8 inch		Boring Location General site N 1167013 E 1847466		Total Depth 115.6 feet	
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850		Elevation and Datum 587.5 feet MSL	Ground Water Depth 16.8 feet	Depth to Bedrock 60.6 feet	
Casing Size and Depth 3.5 inch / 60.6 feet		Length of Core Barrel and Bit 8.1 feet	No. of Core Boxes 8	Date Started 3/15/06	
		Borehole Inclination -90	Logged by J. Cerceo	Date Completed 3/18/06	

Reviewed by / Date F. Syms 5/28/06

Reviewed by / Date M. Gray 10-22-07



Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
61								META-GRANODIORITE; very pale brown (10YR 7/2); fine to medium grained. Highly jointed rock dipping 0 to 90° partly healed with manganese iron oxide and calcite	Start drilling 3/17/06; water at 16.8 ft; partial loss of water return	526
62									See rock log MW-1202A	525
63		1	4.8 / 5.0	28	HW	R2 to R3				524
64										523
65										522
66								SAA.		521
67								Foliations dipping 35 to 55°		520
68		2	5.0 / 5.0	42	HW	R2 to R3				519
69										518
70										517
71										516
72										515
73		3	5.0 / 5.0	56	HW	R2 to R3				514
74										513
75										512
76								SAA; bluish gray (10B 5/1)		511
77										510
78		4	3.2 / 5.0	42	HW	R2 to R3				509
79										508
80										507
81						R2 to R3		SAA. CONTINUOUS ROCK.		506
82								Joints not filled or healed		505
83		5	4.8 / 4.8	74	HW	R1 to R2		Badly broken zone		504
84										503
85								SAA; medium to coarse grained; weakly foliated; biotite, calcite		502
86										501
87					SW	R3 to R4				500
88		6	5.0 / 5.0	98						499
89										498
90										497
91										496
92										495
93		7	5.0 / 5.0	86	SW	R3 to R4				494
94										493
95										492
96										491
97										490
98		8	4.9 / 5.0	92	SW	R3 to R4				489
99										488
100										487

Project Name and Job Number
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ROCK LOG - Boring No. MW-1202A

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
101										486
102										485
103		9	5.2 5.2	98	SW	R3 to R4		META-GRANODIORITE, as described above.		484
104										483
105										482
106								SAA.		481
107										480
108		10	5.0 5.0	100	SW	R3 to R4				479
109										478
110										477
111								SAA.		476
112										475
113		11	4.7 5.0	86	SW	R3 to R4				474
114										473
115										472
116									Coring terminated at 115.6 ft on 3/18/06	471
117										470
118										469
119								Total Depth 115.6 ft. Groundwater encountered at 16.8 feet Borehole Grouted On 4/10/06		468
120										467
121										466
122										465
123										464
124										463
125										462
126										461
127										460
128										459
129										458
130										457
131										456
132										455
133										454
134										453
135										452
136										451
137										450
138										449
139										448
140										447

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. MW-1203	
Type and Diameter of Boring CME Sampler / 8 inch/NQ		Boring Location Cooling Tower Unit 2 N 1166694 E 1847841		Total Depth 112.5 feet	
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850		Elevation and Datum 589.5 feet MSL		Ground Water Depth 18 feet	
Sampling Method Continuous Sampler		Sample Driving Hammer/Drop NA / NA		No. of Samples 8	
		Borehole Inclination -90		Logged by M. DePalma	
				Date Started 3/29/06	
				Date Completed 3/31/06	

Reviewed by / Date F. Syms 5/26/06

Reviewed by / Date C. Lane 10-27-07



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	1 ft of topsoil		589
1										SILT, sandy (ML); orange red (5YR 5/8); dry; micaceous. FILL	Auger cuttings examined 0 to 3.5 ft	588
2												587
3												586
4										SILT, sandy (ML); yellowish red (5YR 5/8); dry; micaceous; black lenses observed. FILL		585
5												584
6		CME 1		21.5/60								583
7												582
8												581
9												580
10		CME 2		60/60					ML	SILT, sandy (ML); yellowish red (5YR 5/6); stratified red, gray bands near end of run; SAPROLITE		579
11												578
12												577
13												576
14										Strong brown (7.5YR 5/6); damp; micaceous.		575
15												574
16		CME 3		60/60								573
17												572
18									SM			571
19										Brown (7.5YR 5/2); moist.		570
20												569
21		CME 4		60/60								568
22												567
23												566
24												565
25												564
26		CME 5		38/60							Wet 26 to 27 ft	563
27												562
28												561
29										Damp to moist.		560
30												559
31		CME 6		30/60								558
32												557
33												556
34												555
35												554
36		CME 7		25/60								553
37												552
38												551
39									SM	SAND, silty (SM); pinkish gray (7.5YR 6/2) medium to coarse grained; moist; micaceous. SAPROLITE		550
40												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389



SOIL LOG - Boring No. MW-1203

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40		CME		13.5						Description on previous page.		549
41		8		48								548
42											Auger refusal at 42.75 ft on 3/27/06, see rock log begins 42.5 ft	547
43												546
44												545
45												544
46												543
47												542
48												541
49												540
50												539
51												538
52												537
53												536
54												535
55												534
56												533
57												532
58												531
59												530
60												529
61												528
62												527
63												526
64												525
65												524
66												523
67												522
68												521
69												520
70												519
71												518
72												517
73												516
74												515
75												514
76												513
77												512
78												511
79												510
80												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. MW-1203	
Type and Diameter of Boring CME Sampler / 8 inch/NQ		Boring Location Cooling Tower Unit 2 N 1166694 E 1847841		Total Depth 112.5 feet	
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850		Elevation and Datum 589.5 feet MSL		Ground Water Depth 18 feet	
Casing Size and Depth 3.5 inch / 42.5 feet		Length of Core Barrel and Bit 8 feet		No. of Core Boxes 5	
		Borehole Inclination -90		Logged by M. DePalma	
				Date Started 3/29/06	
				Date Completed 3/31/06	

Reviewed by / Date F. Syms 5/26/06

Reviewed by / Date M. Gray 10-22-07



Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
43								META-GRANODIORITE; gray (N 7); fine to medium grained, other dark minerals, green, gray clay (CL) at the top of core run		547
44										546
45		1	0.3 5.0	0	CW to HW	R0 to R1				545
46										544
47										543
48								SAA; no recovered clay		542
49										541
50		2	1.0 5.0	0	CW to HW	R0 to R1				540
51										539
52										538
53										537
54										536
55		3	1.7 5.0	0	CW to HW	R0 to R1				535
56										534
57										533
58								META-GRANODIORITE; gray (10Y 7/1); fine grained; biotite, epidote, iron staining; foliation 40°		532
59										531
60		4	3.6 5.0	0	HW to MW	R1				530
61										529
62										528
63								Foliation 30° less secondary minerals		527
64										526
65		5	2.7 5.0	10	MW	R2				525
66										524
67										523
68								META-GRANODIORITE; dark green gray (10Y 4/1); foliated 30 to 45°		522
69										521
70		6	2.7 5.0	0	MW	R1 to R2				520
71										519
72										518
73								META-GRANODIORITE; (10Y 6/1); medium to fine grained; foliated 30 to 45°		517
74										516
75		7	4.4 5.0	0	HW to MW	R1 to R2				515
76										514
77										513
78										512
79								SAA; (N 8); foliated 30°.		511
80		8	5.0 5.0	47	MW to SW	R2 to R3		Schist layer from 78.5 to 79.5 ft.		510
81										509
82										508
										507

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389



ROCK LOG - Boring No. MW-1203

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
83								SAA		507
84										506
85		9	$\frac{5.0}{5.0}$	47	SW	R3				505
86										504
87								Quartz vein from 86.5 to 87.5 ft.		503
88								SAA; (N 5); quartz dike through first 1.5 ft; epidote veins; pyrite. CONTINUOUS ROCK.	End drilling on 3/30/06	502
89								Quartz dike predominant 88 to 92.5 ft; light bluish gray mineral inclusions.	Begin drilling 3/31/06	501
90		10	$\frac{4.8}{5.0}$	68	SW	R4				500
91										499
92										498
93								META-DIORITE; very dark gray (N 3); quartz dike upper 3 inches, foliation widely spaced at top 1.5 ft.		497
94										496
95		11	$\frac{4.8}{5.0}$	85	SW to F	R4 to R5				495
96										494
97										493
98										492
99										491
100		12	$\frac{5.0}{5.0}$	97.5	F	R4		Calcite veins from 99.5 to 100.5 ft.		490
101										489
102										488
103								Epidote veins at 102.5 ft.		487
104										486
105		13	$\frac{5.0}{5.0}$	100	F	R4 to R5		Pyrite phenocrysts at 104.5 ft.		485
106										484
107										483
108								SAA		482
109										481
110		14	$\frac{5.0}{5.0}$	100	F	R4 to R5				480
111										479
112										478
113									Coring terminated 3/31/06	477
114										476
115								Total Depth 112.5 ft.		475
116								Groundwater encountered at 18 feet		474
117								Borehole Grouted On 3/31/06		473
118										472
119										471
120										470
121										469
122										468
										467

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. MW-1204	
Type and Diameter of Boring CME Sampler / 7.5 inch/NQ		Boring Location Cooling Tower Unit 2 N 1166135 E 1848031		Total Depth 98.4 feet	
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75		Elevation and Datum 609.8 feet MSL		Ground Water Depth 39 feet	
Sampling Method Continuous Sampler		Sample Driving Hammer/Drop NA / NA		No. of Samples 19	
		Borehole Inclination -90		Logged by C. Gaskins/ E. Weldon	
				Date Started 3/30/06	
				Date Completed 4/2/06	

Reviewed by / Date B. Reinicker 5/4/06

Reviewed by / Date C. Lane 10-27-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0												
1											Drilled without sampling to 3.5 ft	609
2												608
3												607
4									ML		SILT sandy (ML); (5YR 7/6 to 10YR 7/4); moist; 80% silt, 20% sand; <5% coarse sand to fine gravel; FILL	606
5												605
6		CME 1		60								604
7				60								603
8												602
9											SAA.	601
10												600
11		CME 2		60								599
12				60								598
13												597
14												596
15											No recovery, sampler blocked by rock fragment.	595
16		CME 3		4								594
17				60								593
18												592
19											No recovery.	591
20												590
21		CME 4		0								589
22				60								588
23												587
24									ML		SILT, sandy (ML); (5YR 5/6); moist; medium stiff; 65% silt; 35% sand; less than 5% coarse sand and fine gravel; FILL	586
25												585
26		CME 5		12								584
27				60								583
28												582
29											SAA; (10YR 5/4 to 5YR 5/6 to 10R 4/6); stiff to very stiff.	581
30												580
31		CME 6		60								579
32				60								578
33												577
34											SAA; (5YR 4/4, 5YR 5/6, 10R 6/6, 10YR 5/4, 10R 4/6)	576
35											Large round rock fragment	575
36		CME 7		60								574
37				60								573
38												572
39									∇		SAA; (5YR 5/6, 5YR 6/4, 5YR 4/4, 10R 6/6, 10YR 5/4, 10R 4/6)	571
40												570

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389



SOIL LOG - Boring No. MW-1204



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40												
41		CME 8		60 60						SILT, sandy (ML); (5YR 5/6); moist; medium stiff; 65% silt; 35% sand; less than 5% coarse sand and fine gravel; FILL (Continued from previous page)		569
42												568
43												567
44										SAA; (5YR 5/6, 5YR 6/4, 5YR 4/4, 10R 6/6, 10YR 5/4, 10R 4/6)		566
45												565
46		CME 9		60 60								564
47												563
48												562
49										SAA; (5YR 5/6, 5YR 6/4, 5YR 4/4, 10R 6/6, 10YR 5/4, 10R 4/6)		561
50										Angular rock fragment		560
51		CME 10		60 60								559
52												558
53												557
54										SAA; (5YR 5/6, 5YR 6/4, 5YR 4/4, 10R 6/6, 10YR 5/4, 10R 4/6)		556
55												555
56		CME 11		28 60								554
57												553
58												552
59										SAA; (5YR 5/6, 5YR 6/4, 5YR 4/4, 10R 6/6, 10YR 5/4, 10R 4/6)		551
60												550
61		CME 12		7 60								549
62												548
63												547
64										SILT sandy (ML); (5R 4/6); wet; 80% silt, 20% sand. FILL	End of day 3/30/06 Begin day 3/31/06; water level at 39 ft	546
65												545
66		CME 13		36 60								544
67												543
68												542
69										SAA; (10YR 6/6). FILL		541
70												540
71		CME 14		6 60								539
72												538
73												537
74									SM	SAND silty (SM); (5YR 7/2); wet; 55% sand; 45% silt. FILL		536
75												535
76		CME 15		9 60								534
77												533
78												532
79									ML	SILT sandy (ML); (10YR 6/6); moist to wet; 55% silt, 45% sand. SAPROLITE		531
80												530

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389



SOIL LOG - Boring No. MW-1204



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
80												
81		CME 16		36 60						SILT sandy (ML); (10YR 6/6); moist to wet; 55% silt, 45% sand. SAPROLITE (Continued from previous page)		529
82												528
83												527
84										SAA; (10YR 6/2 to 10YR 6/6 to 10YR 4/2). SAPROLITE		526
85												525
86		CME 17		48 60								524
87												523
88												522
89										SAA; (10YR 4/2 to 10YR 6/6). SAPROLITE		521
90												520
91		CME 18		60 60								519
92												518
93												517
94									SM	SAND silty (SM); (10YR 5/4 to 10YR 6/6); 75% sand; 25% silt. SAPROLITE		516
95												515
96		CME 19		58.8 58.8								514
97												513
98												512
99											Auger refusal at 98.4 ft; rock coring equipment lost in hole; moved 5 ft east; advanced casing to 100 ft; begin NQ coring on 4/1/06 MW-1204A on field log	511
100												510
101												509
102										Total Depth 98.4 ft. Groundwater encountered at 39 feet Borehole Grouted On 4/3/06		508
103												507
104												506
105												505
106												504
107												503
108												502
109												501
110												500
111												499
112												498
113												497
114												496
115												495
116												494
117												493
118												492
119												491
120												490

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. MW-1204A	
Type and Diameter of Boring NQ core / 7.5 inch		Boring Location Cooling Tower Unit 2 N 1166132 E 1848026		Total Depth 135 feet	
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75		Elevation and Datum 609.6 feet MSL		Ground Water Depth 37.1 feet	
Casing Size and Depth 3.5 inch / 100 feet		Length of Core Barrel and Bit 13 feet		No. of Core Boxes 10	
		Borehole Inclination -90		Logged by E. Weldon	
				Date Started 4/1/06	
				Date Completed 4/3/06	

Reviewed by / Date B. Reinicker 5/4/06

Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
100								Drilled without sampling to 100 ft. See MW-1204 for soil description	Begin NQ coring on 4/1/06	509
101										508
102		1	0.2 4.6	0	CW	R0 to R4		SAND, silty (ML); reddish yellow (7.5 YR 6/8); white to light gray quartzite fragment; equigranular; very coarse grained. SAPROLITE		507
103										506
104										505
105								META-GRANODIORITE; white to dark gray (N 8 to 2.5Y 3/1); porphyroblastic; fine to coarse grained; reddish yellow to black staining; foliation 50°; hornblende, biotite, quartz, feldspars.		504
106		2	1.3 5.0	0	CW to MW	R3				503
107										502
108										501
109										500
110										499
111								META-QUARTZ DIORITE		498
112		3	3.3 5.0	0	MW	R3				497
113										496
114										495
115								META-GRANODIORITE; bluish gray (10B 5/1); fine to medium grained; quartz and weathered plagioclase altered K-spar.	End of day 4/1/06	494
116									Begin day 4/2/06; water at 37.1 ft; changed from a 10 ft core barrel to a 5 ft core barrel	493
117		4	4.6 5.4	33	MW	R3				492
118										491
119										490
120										489
121								SAA; xenoliths, schist, scattered vugs; small dendritic manganese and iron staining. CONTINUOUS ROCK		488
122										487
123		5	4.8 5.0	90	MW	R3				486
124										485
125										484
126										483
127								META-DIORITE; fine to medium grained; thin laminated foliation; quartz, hornblende.		482
128		6	5.0 5.0	100	SW to F	R3 to R4		META-GRANODIORITE; bluish gray; fine to medium grained; various thin fractures filled with calcite.		481
129										480
130										479
131										478
132		7	4.9 5.0	98	SW to F	R3 to R4				477
133										476
134										475
135										474
136									End of drilling on 4/2/06 at 135 ft; boring terminated	473
137										472
138								Total Depth 135 ft.		471
139								Groundwater encountered at 37.1 feet		470
140								Borehole Grouted On 4/3/06		

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. MW-1205	
Type and Diameter of Boring CME Sampler / 7 inch/NQ		Boring Location General site N 1165628 E 1848312		Total Depth 150 feet	
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75		Elevation and Datum 609.6 feet MSL		Ground Water Depth 43.9 feet	
Sampling Method Continuous Sampler		Sample Driving Hammer/Drop NA / NA		No. of Samples 23	
		Borehole Inclination -90		Logged by M. Cooke	
				Date Started 3/4/06	
				Date Completed 3/17/06	

Reviewed by / Date F. Syms 5/25/06

Reviewed by / Date C. Lane 10-27-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									GP	Crushed stones with fines.	Drilled without sampling to 3.5 ft.	609
1									ML	SILT, sandy (ML); red (10R 4/6); damp to dry; ~15% very fine to fine sand; non plastic; micaceous. FILL	Logged with auger cuttings	608
2												607
3												606
4		SPT 1	4	18								605
5												604
6		CME 1		27.6								603
7				42								602
8												601
9										SAA; mottled with brownish yellow (10YR 6/6).		600
10		CME 2		27.6								599
11				60								598
12												597
13												596
14		CME 3		18								595
15				18								594
16												593
17		CME 4		60								592
18				60								591
19										SILT, sandy (ML) SAA; yellowish brown (10YR 5/6); dry to damp; ~35% fine sand. FILL		590
20												589
21												588
22		CME 5		60								587
23				60								586
24												585
25									CL	CLAY, sandy (CL); red (10R 4/8); dry; hard; ~30% fine sand; low to medium plasticity; FILL		584
26									ML	SILT, sandy (ML); brownish yellow (10YR 6/6); with zones of red (10R 4/8); dry to damp; ~35% fine sand; low plasticity to non plastic. FILL		583
27		CME 6		60								582
28				60								581
29												580
30												579
31												578
32		CME 7		60					SM	SAND, silty (SM); yellow (10YR 7/8); moist; ~30% fines; poorly graded. FILL		577
33				60					ML	SILT, sandy (ML); yellowish brown (10YR 5/6); dry; low plasticity. FILL		576
34												575
35												574
36											End drilling 3/4/06	573
37											Begin drilling on 3/5/06;	572
38		CME 8		51.6							water at 34.1 ft	571
39				60							very wet zone 35 to 36.5 ft	570
40											Dry 37.85 to 40 ft	

Project Name and Job Number
Lee Nuclear Station COL
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SOIL LOG - Boring No. MW-1205



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40										SILT, sandy (ML); yellowish brown (10YR 5/6); dry; low plasticity. FILL		569
41										(Continued from previous page)		568
42		CME 9		60						SAA; zones of red (2.5YR 4/8); dry.		567
43				60								566
44										Zone of subangular to angular 2 to 3 inch quartz fragments.		565
45										SAA; dark yellowish brown (10YR 4/6 to 10YR 3/6); damp to moist; fine to coarse sand composed of quartz and small rock fragments; trace gravel-sized rock fragments. FILL		564
46		CME 10		49.2							Hard drilling to hollow stem auger	563
47				60								562
48												561
49												560
50										SAA; red (10R 4/6) to dark yellowish brown (10YR 4/6); moist. FILL		559
51		CME 11		60								558
52				60								557
53				60								556
54												555
55										SAA; dark yellowish brown; rock fragments. FILL		554
56		CME 12		60								553
57				60								552
58				60								551
59												550
60										SAA; brownish yellow (10YR 6/8) to dark yellowish brown (10YR 4/6); trace gravel. FILL		549
61		CME 13		38.4								548
62				60								547
63												546
64												545
65										SAA; with some 1 to 2 inch diameter rock fragments. FILL		544
66		CME 14		60								543
67				60								542
68				60								541
69												540
70												539
71		CME 15		60								538
72				60								537
73				60								536
74												535
75										SAA; red (10R 4/6). FILL		534
76		CME 16		32.4								533
77				32.4								532
78												531
79		CME 17		27.6								530
80				27.6								530

Project Name and Job Number
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SOIL LOG - Boring No. MW-1205

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
80											End drilling 3/5/06	529
81											Begin drilling 3/6/06; water at 59.4 ft	528
82		CME 18		27.6 60						SILT, sandy (ML); yellowish brown (10YR 5/6); dry; low plasticity. FILL (Continued from previous page)	Hard drilling 80 to 85 ft	527
83										SAA; some zones containing 1 to 2 inch gravels; medium to coarse grained sand.		526
84												525
85												524
86		CME 19		36 36								523
87											Hard drilling 87 to 88 ft	522
88										Wood fragment at 88 ft.		521
89										Sandy zone with rock fragments from 89 to 90 ft.		520
90		CME 20		60 60						Decomposed wood fragment at 89 ft.	End drilling on 3/7/06	519
91											Begin drilling on 3/13/06	518
92												517
93											Wet soil 93 to 95.7 ft	516
94												515
95		CME 21		60 60								514
96									SM	SAND, silty (SM); (10YR 6/6, 2.5YR 4/8); moist.		513
97									SM	ALLUVIUM		512
98										SAND, silty (SM); yellow (10R 7/8); dry to damp; fine to medium grained; quartz poorly graded.		511
99										RESIDUUM		510
100		CME 22		54 60						SAA; (2.5Y 3/3); wet		509
101									ML	SILT, (ML); olive brown (2.5Y 4/3); moist; <10% sand; non plastic; slight relict foliated rock texture.		508
102										RESIDUUM		507
103										SAA; brownish yellow (2.5YR 6/6) 101.5 to 103 ft.		506
104		CME 23		30 30							Hard drilling	505
105											See rock log	504
106												503
107												502
108												501
109												500
110												499
111												498
112												497
113												496
114												495
115												494
116												493
117												492
118												491
119												490
120												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. MW-1205	
Type and Diameter of Boring CME Sampler / 7 inch/NQ		Boring Location General site N 1165628 E 1848312		Total Depth 150 feet	
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75		Elevation and Datum 609.6 feet MSL		Ground Water Depth 43.9 feet	Depth to Bedrock 105.5 feet
Casing Size and Depth 3.5 inch / 105.5 feet		Length of Core Barrel and Bit 13 feet		No. of Core Boxes 10	Date Started 3/4/06
		Borehole Inclination -90		Logged by M. Cooke	Date Completed 3/17/06

Reviewed by / Date F. Syms 5/25/06Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
106					MW			META-GRANODIORITE; light bluish gray (10B 7/1); fine to medium grained; slight 60° foliation; quartz, feldspar; biotite; some veinlets of quartz and/or calcite; some pyrite mineralization along fractures; some fine grained muscovite; numerous vugs on surface of core lined with sulfides.	Auger refusal at 105.5 ft on 3/13/06	504
107		1	1.9 3.5	29	SW	R3			Begin drilling 3/14/06; water at 60.1 ft	503
108										502
109					MW					501
110					HW	R3		Oxidized fracture 109.4 to 109.9 ft	100% water loss	500
111		2	4.9 5.0	40	MW					499
112					HW	R2 to R3		Oxidized fracture 111.3 to 113 ft		498
113										497
114					MW	R3				496
115					MW	R2 to R3		Calcite mineralization along fractures 114.6 to 114.9 ft		495
116		3	3.5 5.0	20				Oxidized fracture zone 115.7 to 119 ft		494
117					HW	R2				493
118										492
119								Highly weathered fracture zone 119 to 120.5 ft		491
120					HW	R2				490
121		4	3.9 5.0	58				Amphibolite xenolith 120.5 to 120.9 ft; veinlets and stringers are lined with biotite; slight mylonitic structure		489
122					SW to F	R3 to R4				488
123										487
124					MW	R3		SAA. CONTINUOUS ROCK.		486
125										485
126		5	5.0 5.0	86	MW to SW	R3 to R4		Quartz, plagioclase, hornblende, biotite		484
127										483
128										482
129								SAA.		481
130		6	5.0 5.0	77	MW to SW	R3 to R4			End drilling 3/16/06	480
131									Begin drilling 3/17/06; water at 43.9 ft	479
132								Epidote zone; plagioclase altered to epidote	still losing water	478
133										477
134										476
135								META-GRANODIORITE		475
136		7	5.0 5.0	69	SW to F	R3 to R4				474
137										473
138										472
139										471
140										470
141		8	5.0 5.0	74	F	R4				469
142										468
143										467
144										466
145								META-GRANODIORITE		465

Project Name and Job Number
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ROCK LOG - Boring No. MW-1205

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
146		9	5.0	90	F	R4		META-GRANODIORITE		464
147			5.0							463
148										462
149										461
150		10	1.0	83	F	R4				460
151			1.0						Coring terminated at 150 ft on 3/17/06	459
152										458
153										457
154										456
155										455
156										454
157										453
158										452
159										451
160										450
161										449
162										448
163										447
164										446
165										445
166										444
167										443
168										442
169										441
170										440
171										439
172										438
173										437
174										436
175										435
176										434
177										433
178										432
179										431
180										430
181										429
182										428
183										427
184										426
185										425

Project Name and Job Number Lee Nuclear Station COL MACTEC WLA 6234-06-3389 <small>William Letts & Associates, Inc.</small>										SOIL LOG - Boring No. MW-1206					
Type and Diameter of Boring CME Sampler / 8 inch/NQ										Boring Location General site N 1166650 E 1846689		Total Depth 93 feet			
Drilling Contractor and Rig Gregg/Smith/311025 / CME 55										Elevation and Datum 589.6 feet MSL		Ground Water Depth N/A		Depth to Bedrock 59 feet	
Sampling Method Continuous Sampler										Sample Driving Hammer/Drop NA / NA		No. of Samples 10		Date Started 4/2/06	
										Borehole Inclination -90		Logged by J. Martin		Date Completed 4/4/06	



										Reviewed by / Date <u>F. Syms 5/28/06</u>					
										Reviewed by / Date <u>C. Lane 10-27-07</u>					
										Lithology		Remarks		Elevation (feet)	
0	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	SILT, trace sandy (ML) with trace clay; yellowish brown (10YR 5/4); moist; micaceous; and few small angular pieces gravel. FILL SAA; but with variety of gravel small to large.		Drilled without sampling to 3.5 ft observed auger cuttings		589	
1								ML	588						
2													587		
3													586		
4													585		
5													584		
6		CME 1		60/60									583		
7													582		
8													581		
9													580		
10		CME 2		60/60					ML	SILT, clayey, slightly sandy (ML); red (2.5YR 4/6); light gray (10YR 7/2); and yellowish brown (10YR 5/6); moist; damp; randomly varying lenses (interval). Large cobble of quartz zone 12 to 12.4 ft.		SAA; more ribbed appearance along core; mostly stiff.		579	
11									578						
12													577		
13													576		
14													575		
15		CME 3		60/60									574		
16													573		
17													572		
18													571		
19													570		
20		CME 4		60/60						SAA. FILL				569	
21									568						
22													567		
23													566		
24													565		
25		CME 5		60/60									564		
26													563		
27													562		
28													561		
29													560		
30		CME 6		60/60						SAA. FILL				559	
31									558						
32													557		
33													556		
34									ML	SILT, sandy (ML); yellowish red (5YR 4/6); damp. RESIDUUM				555	
35		CME 7		60/60					ML					554	
36										SILT, sandy (ML); light gray (10YR 7/2); damp; relict rock texture; lamination at ~30 to 0°; of manganese oxide staining. SAPROLITE				553	
37									552						
38													551		
39													550		
40															

Project Name and Job Number
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SOIL LOG - Boring No. MW-1206



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40												549
41		CME 8		54 60					ML	SILT, sandy to SAND silty; brownish yellow (10YR 6/6); foliation 30°; increasing grain size with depth; fine to medium sand; SAPROLITE		548
42												547
43									GM	GRAVEL (GM) quartz with silt; wet; angular; blocky.		546
44									ML	SAPROLITE		545
45									ML	SILT, sandy (ML); yellowish red (5YR 4/6); damp.		544
46		CME 9		49.2 60						SAPROLITE		543
47									SM	SILT, sandy to SAND silty; light gray (10YR 7/2) to brownish yellow (10YR 6/6); moist to wet.		542
48										SAPROLITE		541
49		CME 10		6 6						SAND and GRAVEL in SILT matrix (SM); damp to moist; quartz veins ~60°; foliation at ~30°.	Refusal at 49 ft.	540
50										PARTIALLY WEATHERED ROCK.		539
51										No sample collected		538
52												537
53												536
54												535
55											Advanced casing ~10 ft through PWR before start coring; no samples collected.	534
56											Rock coring began at 59 ft	533
57											See rock log	532
58												531
59												530
60												529
61												528
62												527
63												526
64												525
65												524
66												523
67												522
68												521
69												520
70												519
71												518
72												517
73												516
74												515
75												514
76												513
77												512
78												511
79												510
80												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. MW-1206	
Type and Diameter of Boring CME Sampler / 8 inch/NQ		Boring Location General site N 1166650 E 1846689		Total Depth 93 feet	
Drilling Contractor and Rig Gregg/Smith/311025 / CME 55		Elevation and Datum 589.6 feet MSL		Ground Water Depth N/A	Depth to Bedrock 59 feet
Casing Size and Depth 3.5 inch / 59 feet		Length of Core Barrel and Bit 8 feet		No. of Core Boxes 7	Date Started 4/2/06
		Borehole Inclination -90		Logged by J. Martin	Date Completed 4/4/06

Reviewed by / Date F. Syms 5/28/06

Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
59								META-GRANODIORITE; light gray (7.5YR 7/1); medium grained; some iron and manganese staining on fracture surfaces; kaolinitization of feldspar; quartz, feldspar, biotite, hornblende		530
60		1	1.2 / 4.0	0	CW to MW	R0 to R2				529
61										528
62										527
63										526
64		2	3.8 / 5.0	0	CW to MW	R0 to R2				525
65										524
66										523
67										522
68										521
69										520
70		3	4.7 / 5.0	56	SW to MW	R3 to R4		META-GRANODIORITE; bluish gray (5B 5/1); medium grained; iron and manganese staining; pyrite on fractures surfaces; most incipient joints are quartz healed CONTINUOUS ROCK	Losing some water	519
71										518
72										517
73										516
74								META-GRANODIORITE; quartz and calcite observed along incipient joints		515
75		4	4.9 / 5.0	64	SW to MW	R3 to R4				514
76										513
77										512
78										511
79								SAA; some phyllic texture; incipient joints with quartz and calcite; few vugs. CONTINUOUS ROCK.		510
80		5	5.0 / 5.0	75	SW to F	R3 to R4				509
81										508
82										507
83										506
84								SAA; some schistosity/gneissic foliation; quartz vein with some orange coloration; few diorite xenoliths throughout		505
85		6	5.0 / 5.0	100	SW to F	R4 to R5				504
86										503
87								Gneissic foliation from 86.2 to 88 ft		502
88										501
89								SAA; dark bluish gray (10B 4/1); medium grained; extensive interconnected incipient joints; quartz, biotite, feldspar, and hornblende; mostly low angle incipient joints		500
90		7	5.0 / 5.0	100	SW to F	R4 to R5				499
91										498
92										497
93								META-DIORITE to HORNFELS SCHIST; black (N 2.5); fine grained to aphanitic	Coring terminated on 4/4/06	496
94										495
95										494
96										493
97										492
98										491
99										

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. MW-1207	
Type and Diameter of Boring CME Sampler / 7 inch/NQ		Boring Location General site N 1166840 E 1846668		Total Depth 62 feet	
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850		Elevation and Datum 588.8 feet MSL		Ground Water Depth N/A	
Sampling Method Continuous Sampler/Standard		Sample Driving Hammer/Drop NA / NA		No. of Samples 21	
		Borehole Inclination -90		Logged by M. DePalma	
				Date Started 4/1/06	
				Date Completed 4/1/06	

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT, sandy (ML); red; dry. FILL		588
1												587
2												586
3												585
4												584
5												583
6		CME 1		30 60								582
7												581
8												580
9												579
10												578
11		CME 2		43 60					ML	SILT, sandy (ML); reddish brown (2.5YR 5/3); dry; mica; stratifications of white. FILL		577
12												576
13												575
14												574
15		CME 3		60 60						SAA; brown red (10YR 3/6); dry; slight mica; gravel fragment throughout; mottled white and light red. FILL		573
16												572
17												571
18												570
19												569
20		CME 4		42 60								568
21												567
22									SC	SAND, clayey (SC); green gray (5Y 5/1); damp; micaceous; organics from 23 to 23.5 ft. FILL		566
23												565
24												564
25		CME 5		46 60							Organics present; fine to medium grained	563
26												562
27												561
28												560
29												559
30		CME 6		37 60					SM	SAND, silty (SM); yellow green gray (2.5Y 5/3); wet to moist; fine to medium grained; micaceous; quartz fragment at bottom. RESIDUUM		558
31												557
32												556
33												555
34										SAA; less moisture		554
35												553
36		CME 7		41 60								552
37												551
38												550
39												549
40												549

Project Name and Job Number
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SOIL LOG - Boring No. MW-1207

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40												548
41		CME 8		24 60						SAND, silty (SM); yellow green gray (2.5Y 5/3); wet to moist; fine to medium grained; micaceous; quartz fragment at bottom. RESIDUUM (Continued from previous page)		547
42												546
43												545
44												544
45												543
46		CME 9		31 60								542
47												541
48												540
49												539
50												538
51		CME 10		24 60								537
52												536
53												535
54										SAA. RESIDUUM		534
55												533
56		CME 11		21 60								532
57												531
58												530
59												529
60		CME 12		26 42								528
61												527
62												526
63											Auger refusal at 62 ft on 4/1/06, moved 4 ft south and used NQ core barrel to drilled to 87 ft.	525
64											See MW-1207A	524
65												523
66												522
67												521
68												520
69												519
70												518
71												517
72												516
73												515
74												514
75												513
76												512
77												511
78												510
79												509
80												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389



SOIL LOG - Boring No. MW-1207A

Type and Diameter of Boring Wash Rotary / NQ core	Boring Location General site N 1166836 E 1846666	Total Depth 133.5 feet
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850	Elevation and Datum 588.8 feet MSL	Ground Water Depth Not Observed
Sampling Method Rock core/SPT	Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 14
	Borehole Inclination -90	Logged by M. DePalma
		Date Started 4/3/06
		Date Completed 4/4/06

Reviewed by / Date B. Reinicker 5/4/06

Reviewed by / Date CES 11/4/2009

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0										Drilled without sampling to 62 ft. See MW-1207		588
1												587
2												586
3												585
4												584
5												583
6												582
7												581
8												580
9												579
10												578
11												577
12												576
13												575
14												574
15												573
16												572
17												571
18												570
19												569
20												568
21												567
22												566
23												565
24												564
25												563
26												562
27												561
28												560
29												559
30												558
31												557
32												556
33												555
34												554
35												553
36												552
37												551
38												550
39												549
40												548

Project Name and Job Number

Lee Nuclear Station COL

6234-06-3389



SOIL LOG - Boring No. MW-1207A



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40										Drilled without sampling to 62 ft. See MW-1207		548
41										(Continued from previous page)		547
42												546
43												545
44												544
45												543
46												542
47												541
48												540
49												539
50												538
51												537
52												536
53												535
54												534
55												533
56												532
57												531
58												530
59												529
60												528
61												527
62												526
63									SC	SAA; gray (10YR 5/2); medium to coarse grained sand. PARTIALLY WEATHERED ROCK	Begin NQ coring	525
64		CORE 1		10								524
65				60								523
66												522
67										No recovery.		521
68												520
69		CORE 2		0								519
70				60								518
71												517
72										No recovery.		516
73												515
74		CORE 3		0								514
75				60								513
76												512
77										No recovery.		511
78												510
79		CORE		0								509
80												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389



SOIL LOG - Boring No. MW-1207A



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
80		4		60						No recovery. (Continued from previous page)		508
81										No recovery.		507
82												506
83												505
84		CORE		0								504
85		5		60								503
86												502
87		SPT	50/3	3					SC	SAND, clayey (SC); gray tan (10YR 5/2); wet; medium to coarse grained. PARTIALLY WEATHERED ROCK	Coring terminated at 87 ft, used SPT sampler to 108.5 ft SPT HAMMER WEIGHT NOT CERTIFIED-SPT BLOWS FOR INFORMATION ONLY	501
88		1		3								500
89												499
90												498
91		SPT	50/3	2								497
92		2		3								496
93												495
94		SPT	50/2	2								494
95		3		2								493
96												492
97		SPT	50/6	6						SAA; orange brown (7.5YR 6/6); moist; finer grained than previous sample.		491
98		4		6								490
99										SAA; less clay, more silt; medium to fine grained.		489
100		SPT	16 20 30	13 18								488
101		5										487
102		SPT	41 50/5	10 11					SM	SAND, silty (SM); orange brown (7.5YR 6/6); moist; fine to medium grained; mottled black, brown, micaceous.		486
103		6										485
104		SPT	50/4	3								484
105		7		4								483
106												482
107		SPT	41 50/3	4 9						SAA; more clay content. PARTIALLY WEATHERED ROCK	SPT refusal at 108.5 ft, see rock log	481
108		8										480
109		SPT	50/1	1								479
110		9		1								478
111												477
112												476
113												475
114												474
115												473
116												472
117												471
118												470
119												469
120												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. MW-1207A	
Type and Diameter of Boring Wash Rotary / NQ core		Boring Location General site N 1166836 E 1846666		Total Depth 133.5 feet	
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850		Elevation and Datum 588.8 feet MSL		Ground Water Depth N/A	
Casing Size and Depth 4 inch / 97 feet		Length of Core Barrel and Bit 8 feet		No. of Core Boxes 3	
		Borehole Inclination -90		Logged by M. DePalma	
				Date Started 4/3/06	
				Date Completed 4/4/06	

Reviewed by / Date B. Reinicker 5/4/06

Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
109					HW	R0		META-GRANODIORITE; bluish gray (5PB 7/1)	SPT refusal at 108.5 ft, see soil log	480
110								Quartz dike from 109.5 to 110.5 ft		479
111		1	4.5 5.0	22				SAA; bluish gray (5PB 7/1); biotite slightly foliated 30 to 45°; micaceous; several incipient fractures throughout		478
112					MW	R1 to R2				477
113										476
114								Vugs from 114 to 115 ft		475
115										474
116		2	3.2 5.0	44	MW	R2				473
117										472
118								Quartz fragment		471
119								Gneiss layer; dark gray (N 3); foliated 30 to 45° from 119 to 122 ft; incipient fractures throughout		470
120					HW	R1				469
121		3	4.7 5.0	50						468
122								META-GRANODIORITE; bluish gray (N 3); biotite foliated 30 to 45°		467
123					HW to MW	R1 to R2		SAA. CONTINUOUS ROCK.		466
124										465
125										464
126		4	5.0 5.0	97	MW to SW	R2 to R4				463
127										462
128								SAA. quartz fragment		461
129								Quartz vein		460
130										459
131		5	5.0 5.0	83	SW to F	R3 to R4				458
132										457
133										456
134									Borehole terminated at 133.5 on 4/4/06	455
135										454
136										453
137										452
138										451
139										450
140										449
141										448
142										447
143										446
144										445
145										444
146										443
147										442
148										441

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. MW-1208	
Type and Diameter of Boring CME Sampler / 8 inch/NQ		Boring Location General site N 1167184 E 1846588		Total Depth 139.3 feet	
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75		Elevation and Datum 587.1 feet MSL	Ground Water Depth 38.2 feet	Depth to Bedrock 59.3 feet	
Sampling Method Continuous Sampler		Sample Driving Hammer/Drop NA / NA	No. of Samples 12	Date Started 3/27/06	
		Borehole Inclination -90	Logged by J. Cerceo	Date Completed 3/29/06	

Reviewed by / Date F. Syms 5/29/06

Reviewed by / Date C. Lane 10-27-07



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0										Topsoil over gravel and sand	Observed auger cuttings to classify above top of first CME sample.	587
1												586
2									MH	SILT (MH); dusky red (2.5YR 3/2); dry; <10% sand and/or gravel; decomposing roots. FILL		585
3												584
4												583
5												582
6		CME 1		60	60				ML	SILT, sandy (ML); pale red (10R 6/3); dry; <30% sand; layers of gravel and sand; some weathered rock pieces; roots. FILL		581
7												580
8												579
9												578
10												577
11		CME 2		60	60							576
12												575
13												574
14												573
15												572
16		CME 3		60	60				SM	SAND, silty (SM); pale red (10R 6/4); dry; fine to medium grained; 5 to 12% silt.		571
17									ML	SILT, sandy (ML); red (10R 4/6); damp; low to non plastic; fine sand; quartz. FILL		570
18												569
19												568
20												567
21		CME 4		60	60							566
22												565
23												564
24									SM	SAND, silty (SM); red (10R 4/6) to yellowish red (5YR 5/8) to reddish brown (5YR 4/3); dry to damp; some clayey silt; micaceous; trace roots. FILL		563
25												562
26		CME 5		50.4	60							561
27												560
28												559
29												558
30												557
31		CME 6		33.6	60							556
32												555
33												554
34												553
35												552
36		CME 7		60	60							551
37												550
38									▽		Saturated soil encountered	549
39									ML	SILT sandy (ML); wet; fine to medium sand; clayey deposits; quartz; RESIDUUM		548
40												548

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389



SOIL LOG - Boring No. MW-1208

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40												547
41		CME 8		52.8 60					SM	SAND, silty (SM); white (10YR 8/1), mottled with very dark brown (10YR 2/2); wet to moist; fine to coarse grained. SAPROLITE		546
42												545
43												544
44												543
45												542
46		CME 9		44.4 60								541
47												540
48												539
49												538
50												537
51		CME 10		44.4 60								536
52												535
53												534
54										SAA; strong brown (7.5YR 5/6); some silt from 55 to 57.5 ft.		533
55												532
56		CME 11		46.8 60								531
57												530
58										SAA; white (10 YR 8/1), mottled with very dark brown (10 YR 2/2); wet to damp; coarse quartz fragments. SAPROLITE		529
59		CME 12		9.6 9.6							CME refusal at 59.3 ft on 3/27/06, see rock log	528
60												527
61												526
62												525
63												524
64												523
65												522
66												521
67												520
68												519
69												518
70												517
71												516
72												515
73												514
74												513
75												512
76												511
77												510
78												509
79												508
80												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. MW-1208	
Type and Diameter of Boring CME Sampler / 8 inch/NQ		Boring Location General site N 1167184 E 1846588		Total Depth 139.3 feet	
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75		Elevation and Datum 587.1 feet MSL	Ground Water Depth 38.2 feet	Depth to Bedrock 59.3 feet	
Casing Size and Depth 3.5 inch / 59.3 feet		Length of Core Barrel and Bit 13 feet	No. of Core Boxes 4	Date Started 3/27/06	
		Borehole Inclination -90	Logged by J. Cerceo	Date Completed 3/29/06	

Reviewed by / Date F. Syms 5/29/06

Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
60								META-GRANODIORITE; with quartz fine grained	Begin core drilling on 3/28/06; water level at 47 ft	527
61									Lost water recirculation	526
62		1	1.2 / 5.0	0	CW	R0 to R1				525
63					MW	R3				524
64					CW	R0 to R1				523
65					CW	R0 to R1			Still losing some water circulation (approx. 200 gallons per 5 ft run)	522
66		2	1.0 / 5.0	0	MW	R3 to R4				521
67					CW	R0 to R1				520
68					CW	R0 to R1				519
69					HW to CW	R0 to R1				518
70					HW to CW	R0 to R1				517
71					MW	R2 to R3				516
72		3	4.2 / 5.0	20	MW	R2 to R3				515
73					HW	R0 to R1				514
74					HW	R0 to R1				513
75								Quartz veins	Still losing some water circulation (200 gallons per 4 ft.)	512
76		4	1.2 / 4.0	0	CW to HW	R0 to R3				511
77										510
78										509
79								META-GRANODIORITE; fine grained; pyrite; meta-diorite xenoliths		508
80		6	2.5 / 4.0	33	CW to HW	R0 to R3				507
81								No recovery 80.2 to 82.4 ft		506
82										505
83		7	2.0 / 2.0	30	CW to HW	R0 to R3		META-GRANODIORITE; fine grained; pyrite; meta-diorite xenoliths		504
84										503
85										502
86		8	4.7 / 5.0	46	CW to HW	R0 to R3				501
87										500
88										499
89										498
90								META-GRANODIORITE		497
91										496
92		9	5.0 / 5.0	56	CW to HW	R0 to R3				495
93										494
94								Quartz vein		493
95										492
96										491
97		10	5.0 / 5.0	60	CW to HW	R0 to R3				490
98										489
99								Dike 98 to 98.8 ft		488

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389



ROCK LOG - Boring No. MW-1208

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
100								Dike 99 to 99.3 ft		487
101		11	1.7 5.0	8	CW to HW	R0 to R3				486
102										485
103										484
104										483
105										482
106		12	5.0 5.0	52	CW to HW	R0 to R3				481
107										480
108										479
109										478
110								META-GRANODIORITE; bluish gray (5B 5/1); fine to medium grained; quartz; pyrite; manganese oxide staining	End drilling 3/28/06 Begin drilling 3/29/06; water at 38.2 ft	477
111		13	3.9 5.0	50	MW to SW	R3 to R4				476
112										475
113								Xenolith of meta-diorite		474
114					CW to HW	R2		Vugs, iron and manganese oxide staining		473
115								BIOTITE SCHIST; greenish black (10Y 2.5/1); fine grained		472
116		14	2.3 5.0	10	CW to HW	R2				471
117										470
118										469
119										468
120					MW to SW	R4		META-GRANODIORITE; bluish gray (5B 5/1); xenolith schist		467
121										466
122		15	2.7 5.0	40	CW	R0 to R1				465
123								META-DIORITE; black (N 2.5); fine grained; iron staining		464
124					F	R3 to R4				463
125								SAA. CONTINUOUS ROCK.		462
126										461
127		16	4.9 5.0	98	F	R3 to R4				460
128										459
129										458
130										457
131								Poorly developed foliation		456
132		17	4.9 5.0	98	F	R3 to R4		META-GRANODIORITE; bluish gray (5B 5/1); medium grained		455
133										454
134								SAA		453
135										452
136										451
137		18	5.0 5.0	80	F	R3 to R4				450
138										449
139										448

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389



ROCK LOG - Boring No. MW-1208

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
140									Boring terminated at 139.3 ft on 3/29/06	447
141									Boring terminated at 139.3 ft on 3/29/06	446
142								Total Depth 139.3 ft.		445
143								Groundwater encountered at 38.2 feet		444
144								Borehole Grouted On 3/29/06		443
145										442
146										441
147										440
148										439
149										438
150										437
151										436
152										435
153										434
154										433
155										432
156										431
157										430
158										429
159										428
160										427
161										426
162										425
163										424
164										423
165										422
166										421
167										420
168										419
169										418
170										417
171										416
172										415
173										414
174										413
175										412
176										411
177										410
178										409
179										408

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389			SOIL LOG - Boring No. MW-1209		
Type and Diameter of Boring CME Sampler / 8 inch/NQ			Boring Location General site N 1165080 E 1848078		Total Depth 125.5 feet
Drilling Contractor and Rig Gregg/Smith/311025 / CME 55			Elevation and Datum 586.6 feet MSL	Ground Water Depth 51.5 feet	Depth to Bedrock 83.1 feet
Sampling Method Continuous Sampler			Sample Driving Hammer/Drop NA / NA	No. of Samples 16	Date Started 3/28/06
			Borehole Inclination -90	Logged by J. Martin	Date Completed 3/31/06

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT, trace sand, trace clay (ML); brownish yellow (10YR 6/8); dry to damp; low plasticity; some small to medium gravel; few inches of organic topsoil at top. FILL	Observed auger cuttings to classify above top of first CME sample.	586
1									ML	SILT, sandy (ML); trace clay; yellowish brown (10YR 5/8); dry to damp; with some angular to subangular gravel and saprolite clasts. FILL		585
2									ML			584
3									ML			583
4									ML			582
5									ML			581
6		CME 1		18/60					ML			580
7									ML			579
8									ML			578
9									SP-SM	SAND, silty, gravelly (SP-SM); brownish yellow (10YR 6/8); dry to damp; gravel is small to large; fine sand; quartz subrounded. FILL		577
10		CME 2		24/60					SP-SM			576
11									ML			575
12									ML			574
13									SM			573
14									ML			572
15		CME 3		60/60					SM	SAND, silty (SM); light yellowish brown (10YR 6/4); damp. FILL		571
16									SW	SILT (ML); brown (7.5YR 5/4); damp. FILL		570
17									ML	SAND, gravelly (SW); yellow (10YR 7/6); damp to dry. FILL		569
18									SM	SILT, (ML); brown (7.5YR 5/4); damp. FILL		568
19									SM	SAND, silty (SM); light yellowish brown (10YR 6/4); damp. FILL		567
20		CME 4		60/60					ML	SILT, (ML); brown (7.5YR 5/4); with intervals of silt and silty sand. Quartz clasts from 20.8 to 21 ft		566
21									ML			565
22									ML			564
23									ML	SAA; moist to wet silty sand interval		563
24									ML	SAA; brown (7.5YR 5/4); moist. FILL		562
25		CME 5		60/60					ML			561
26									ML			560
27									ML			559
28									ML			558
29									SM	SAND, silty (SM); brown (7.5YR 5/2); wet. FILL		557
30		CME 6		60/60					SM			556
31									ML	SILT, (ML); strong brown (7.5YR 5/6); moist; soft; with large saprolite and rock clasts. FILL		555
32									ML			554
33									ML			553
34									SM	SAND, silty (SM); strong brown (7.5YR 5/6); wet. FILL		552
35		CME 7		60/60					ML	SILT (ML); light brown to gray (10YR 6/2); moist; with organics. FILL		551
36									ML	SAA; no organics		550
37									ML			549
38									ML	SAA; strong brown (7.5YR 5/6); moist to damp. FILL		548
39									ML	SILT, sandy (ML); yellowish brown (10YR 5/6); moist to damp. FILL		547
40									ML			547

Reviewed by / Date F. Syms 5/29/06

Reviewed by / Date C. Lane 10-27-07

Project Name and Job Number
Lee Nuclear Station COL
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SOIL LOG - Boring No. MW-1209



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40										SILT, sandy (ML); yellowish brown (10YR 5/6); moist to damp. FILL		546
41		CME 8		60						(Continued from previous page)		545
42				60						SAA; yellowish brown (10YR 3/6); large roots in fill		544
43									SP	SAND (SP); yellowish brown (10YR 5/4); trace clay; damp; FILL		543
44									ML	SILT (ML); red (2.5YR 5/6); damp. FILL		542
45										SAA; wet 43.5 to 44.3 ft, then moist		541
46		CME 9		60								540
47				60								539
48												538
49										SAA; wet from 48.5 to 48.8 ft.		537
50												536
51		CME 10		60					∇	Quartz clasts interval.		535
52				60								534
53										SAA; wet from 53.5 to 56 ft. FILL		533
54												532
55												531
56		CME 11		50.4								530
57				60						SILT slightly sandy (ML); brown to dark brown (10YR 4/3); moist; organics. ALLUVIUM		529
58												528
59									ML	SILT, sandy (ML); with abundant organics, roots and large rounded to subrounded gravels. ALLUVIUM	End of drilling 3/29/06	527
60											Begin drilling 3/30/06; water at 51.5 ft	526
61		CME 12		60								525
62				60								524
63												523
64												522
65												521
66		CME 13		44.4								520
67				60					CH	CLAY, sandy (CH); very dark grayish brown (10YR 3/2); wet. ALLUVIUM		519
68									SW	SAND, gravelly (SW); gray (2.5Y 5/1); wet; fine to medium quartz gravel. ALLUVIUM		518
69									GW	SAND, gravelly (SW-GW); coarse sand with very large gravel and cobbles at 69.1 ft; gravel is quartz, epidote and granite subangular to angular.		517
70									GM	ALLUVIUM		516
71		CME 14		49.2					ML	GRAVEL silty, clayey; light gray (5Y 7/1); moist; gravel consist of weathered rock fragments.		515
72				60						SAPROLITE		514
73												513
74									ML	SILT, clayey (ML); olive (5Y 4/3); grading to yellowish brown (10YR 5/8); moist; foliated with relict rock texture; micaceous; SAPROLITE		512
75												511
76		CME 15		56.4						SILT, (ML); olive (5Y 4/3); yellowish brown (10YR 5/8) to 76.5 ft; micaceous; manganese oxide staining.		510
77				60								509
78												508
79												507
80												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389



SOIL LOG - Boring No. MW-1209

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
80		CME		45.6						SILT, (ML); olive (5Y 4/3); yellowish brown (10YR 5/8) to 76.5 ft; micaceous; manganese oxide staining.		506
81		16		45.6							See rock log	505
82										(Continued from previous page)		504
83												503
84												502
85												501
86												500
87												499
88												498
89												497
90												496
91												495
92												494
93												493
94												492
95												491
96												490
97												489
98												488
99												487
100												486
101												485
102												484
103												483
104												482
105												481
106												480
107												479
108												478
109												477
110												476
111												475
112												474
113												473
114												472
115												471
116												470
117												469
118												468
119												467
120												467

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. MW-1209	
Type and Diameter of Boring CME Sampler / 8 inch/NQ		Boring Location General site N 1165080 E 1848078		Total Depth 125.5 feet	
Drilling Contractor and Rig Gregg/Smith/311025 / CME 55		Elevation and Datum 586.6 feet MSL	Ground Water Depth 51.5 feet	Depth to Bedrock 83.1 feet	
Casing Size and Depth none / 82.3 feet		Length of Core Barrel and Bit 5.2 feet	No. of Core Boxes 2	Date Started 3/28/06	
		Borehole Inclination -90	Logged by J. Martin	Date Completed 3/31/06	

Reviewed by / Date F. Syms 5/29/06

Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
83					CW	R0		No recovery	Hollow stem auger refusal at 82.3 ft on 3/30/06	504
84		1	4.0 / 4.7	7	SW to F	R3 to R4		META-GRANODIORITE; light gray (10YR 7/1); medium grained; pyrite visible; feldspar, quartz, biotite, and hornblende	Begin drilling 3/31/06	503
85									Losing water	502
86										501
87										500
88								META-GRANODIORITE; gray (5Y 6/1); medium grained with pyrite; feldspar, quartz, hornblende, biotite, vuggy		499
89		2	1.2 / 5.0	0	SW to CW	R0 to R4				498
90										497
91										496
92										495
93										494
94		3	0.1 / 5.0	0	CW	R0 to R3			Low recovery zone; partially weathered rock	493
95										492
96										491
97										490
98										489
99		4	0.0 / 5.0	0	CW	R0				488
100										487
101										486
102										485
103										484
104		5	1.8 / 4.0	15	SW to CW	R0 to R3				483
105										482
106										481
107								META-DIORITE; black (2.5Y 2.5/1); fine grained; some pyrite on fracture faces; phyllitic/shistose texture	Low recovery zone; partially weathered rock	480
108		6	0.9 / 5.0	0	SW to CW	R0 to R3				479
109										478
110								Interval of vuggy phyllite about 2 inch thick		477
111								SAA; gray (5Y 6/1); grain size lost to schistosity; increase mica.		476
112										475
113		7	4.6 / 5.0	44	SW to F	R2 to R4		META-GRANODIORITE; Bluish gray (5B 5/1); medium to coarse grained; pyllitic; feldspar, quartz, hornblende, biotite		474
114										473
115										472
116										471
117								SAA; slight color change to pinkish yellow of feldspar due to alteration. CONTINUOUS ROCK.		470
118		8	5.0 / 5.0	100	F	R4 to R5				469
119										468
120										467
121										466
122								SAA.		465



Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389



ROCK LOG - Boring No. MW-1209

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
123		9	4.5	100	F	R4 to R5		SAA.		464
124			4.5							463
125										462
126									Coring terminated on 3/31/06	461
127										460
128										459
129										458
130										457
131										456
132										455
133										454
134										453
135										452
136										451
137										450
138										449
139										448
140										447
141										446
142										445
143										444
144										443
145										442
146										441
147										440
148										439
149										438
150										437
151										436
152										435
153										434
154										433
155										432
156										431
157										430
158										429
159										428
160										427
161										426
162										425

Total Depth 125.5 ft.
Groundwater encountered at 51.5 feet
Borehole Grouted On 4/2/06

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. MW-1210	
Type and Diameter of Boring CME Sampler / 7 inch/NQ		Boring Location Unit 2 adjacent N 1165324 E 1847451		Total Depth 38 feet	
Drilling Contractor and Rig MACTEC/White/331145 / CME 55 LC		Elevation and Datum 589.4 feet MSL	Ground Water Depth 15 feet	Depth to Bedrock N/A	
Sampling Method Continuous Sampler/Standard		Sample Driving Hammer/Drop NA / NA	No. of Samples 23	Date Started 3/20/06	
		Borehole Inclination -90	Logged by E. Weldon	Date Completed 3/20/06	

Reviewed by / Date F. Syms 5/20/06

Reviewed by / Date C. Lane 10-27-07



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML		Drilled with hollow stem auger to 3.5 ft; classified auger cuttings.	589
1												588
2												587
3												586
4										SILT sandy (ML); red (10R 5/6); damp; medium stiff; <15% sand; <15% clay; medium plasticity; mottled; some roots; FILL		585
5												584
6		CME 1		60/60								583
7												582
8												581
9										SAA; red (2.5YR 4/6) to strong brown (7.5R 5/6); damp; <10% clay; <15% sand; occasional angular gravel. FILL		580
10												579
11		CME 2		60/60								578
12												577
13												576
14									ML			575
15									ML	SILT clayey (ML); red (2.5YR 4/8); damp; high plasticity; poorly graded		574
16		CME 3		60/60								573
17												572
18												571
19									ML			570
20										SILT sandy (ML); reddish brown (5YR 5/6); wet; <15% sand; <10% clay; thick black manganese oxide along broken surfaces. RESIDUUM		569
21		CME 4		44.4/60								568
22												567
23												566
24										SAA; yellowish red (5YR 5/6); damp. RESIDUUM		565
25												564
26		CME 5		60/60					ML			563
27										SILT sandy (ML); yellow (10YR 7/6); damp; <15% sand; <10% clay; relic rock texture; SAPROLITE		562
28												561
29										SAA; wet; low plasticity; >30% sand; <10% clay. SAPROLITE		560
30												559
31		CME 6		42/60					ML			558
32										SILT clayey (ML); white (2.5Y 8/0).SAPROLITE		557
33												556
34									ML			555
35										SILT sandy (ML); very pale brown (10YR 7/2 to 7/3) to light gray (10YR 8/1 to 7/1); very moist to damp; low plasticity; relic texture of meta igneous rock. SAPROLITE		554
36		CME 7		39.6/54								553
37												552
38											End of drilling 3/20/06; water level at 15 ft. See MW-1210A.	551
39												550
40												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389



SOIL LOG - Boring No. MW-1210

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40										Total Depth 38 ft.		549
41										Groundwater encountered at 15 feet		548
42										Borehole Grouted On 6/12/06		547
43												546
44												545
45												544
46												543
47												542
48												541
49												540
50												539
51												538
52												537
53												536
54												535
55												534
56												533
57												532
58												531
59												530
60												529
61												528
62												527
63												526
64												525
65												524
66												523
67												522
68												521
69												520
70												519
71												518
72												517
73												516
74												515
75												514
76												513
77												512
78												511
79												510
80												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. MW-1210A	
Type and Diameter of Boring Wash Rotary / NQ core / 3 inch		Boring Location Unit 2 adjacent N 1165324 E 1847455		Total Depth 126.3 feet	
Drilling Contractor and Rig MACTEC/White/331145 / CME 55 LC		Elevation and Datum 589.4 feet MSL	Ground Water Depth 16.6 feet	Depth to Bedrock 96.3 feet	
Sampling Method Rock core/SPT		Sample Driving Hammer/Drop 140 lbs / 30 inches	No. of Samples 19	Date Started 3/21/06	
		Borehole Inclination -90	Logged by E. Weldon	Date Completed 3/23/06	

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0												589
1												588
2												587
3												586
4												585
5												584
6												583
7												582
8												581
9												580
10												579
11												578
12												577
13												576
14												575
15												574
16												573
17												572
18												571
19												570
20												569
21												568
22												567
23												566
24												565
25												564
26												563
27												562
28												561
29												560
30												559
31												558
32												557
33												556
34												555
35												554
36												553
37												552
38												551
39												550
40												

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389



SOIL LOG - Boring No. MW-1210A



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40		CORE		48						No recovery; drilled with NQ core barrel		549
41												548
42										No recovery; drilled with NQ core barrel		547
43												546
44		CORE		0								545
45				60								544
46												543
47										No recovery; drilled with NQ core barrel		542
48												541
49		CORE		0								540
50				60								539
51												538
52												537
53		SPT 1	5 4 6	12 24					ML	SILT sandy (ML); brownish yellow to white (10YR 6/6 to 10YR 8/1); damp; <15% sand; poorly graded; low to medium plasticity. SAPROLITE	Started SPT sampler	536
54		SPT 2	4 8 9	19.2 24						SILT sandy, gravelly (ML); white (2.5YR 8/1) to yellow (10YR 7/6); damp; >30% sand; <15% clay; fine to coarse sand. SAPROLITE		535
55												534
56												533
57												532
58												531
59		SPT 3	3 6 13	18 18						SAA; pale yellow (5Y 7/2 to 7/3) to olive yellow (2.5Y 6/6), with white (2.5Y 8/1) damp; >30% sand, <15% clay; relict rock texture. SAPROLITE		530
60												529
61												528
62												527
63												526
64		SPT 4	7 8 11	16.8 18						SILT sandy (ML); white to yellow (2.5Y 8/1 to 2.5Y 7/4); damp; <20% sand; <15% clay; poorly graded; relict rock texture. SAPROLITE		525
65												524
66												523
67												522
68												521
69												520
70		SPT 5	9 12 21	18 18								519
71											End of day 3/21/06 Begin day 3/22/06; water at 16.5 ft	518
72		SPT 6	21 30 35	16.8 18						SAA; white to dark yellowish brown (10YR 8/1 to 10YR 4/4); damp; sand ~40%, clay <10%; fine grained sand. SAPROLITE		517
73												516
74		SPT 7	22 25 38	16.8 18						SAA; fine to medium grained; micaceous		515
75												514
76												513
77		SPT 8	9 19 31	18 18						SAA; white to dark yellowish brown (10YR 8/1 to 10YR 3/4); damp; sand ~ 40 to 50%; <10% clay; fine grained; relict foliation 60° dip; micaceous. SAPROLITE		512
78												511
79		SPT	6 9	21.6					ML	SILT clayey (ML); dark yellowish brown (10YR 3/4);		510
80												

Project Name and Job Number
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SOIL LOG - Boring No. MW-1210A



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
80		9	15	18					ML	damp; <15% clay; very poorly graded; low plasticity; micaceous. SAPROLITE		509
81												508
82		SPT 10	5 7 14	18 18						SAA; dark grayish brown (10YR 4/4 to 3/2); damp. SAPROLITE		507
83												506
84		SPT 11	7 12 17	18 18								505
85												504
86												503
87		SPT 12	7 11 18	16.8 18					ML	SILT (ML); dark olive gray (5Y 3/2); damp; <5% sand; <10% clay; relict texture; several thin white veins. SAPROLITE		502
88												501
89		SPT 13	9 12 22	18 18						SAA; very dark grayish brown (2.5Y 3/2); damp; <10% sand or clay; relict foliation 55°. SAPROLITE		500
90												499
91												498
92		SPT 14	21 25 50	18 18						SAA; sub vertical iron stained vein (0.5 cm). SAPROLITE		497
93												496
94		SPT 15	11 21 30	15.6 18					ML	SILT sandy, gravelly (ML); very dark grayish brown (2.5Y 3/2); mottled with red, white and black manganese; damp; fine to coarse sand <15%; fine to medium grained gravel <10%; non plastic.	96.3 ft started NQ coring - See rock log.	495
95												494
96		SPT 16	50/2	1.8 2					ML	SILT sandy, gravelly (ML); black; dark yellowish brown and white (2.5Y 2/1, 10 YR 4/6, 2.5Y 8/1); damp. PARTIALLY WEATHERED ROCK		493
97												492
98												491
99												490
100												489
101												488
102												487
103												486
104												485
105												484
106												483
107												482
108												481
109												480
110												479
111												478
112												477
113												476
114												475
115												474
116												473
117												472
118												471
119												470
120												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. MW-1210A	
Type and Diameter of Boring Wash Rotary / NQ core / 3 inch		Boring Location Unit 2 adjacent N 1165324 E 1847455		Total Depth 126.3 feet	
Drilling Contractor and Rig MACTEC/White/331145 / CME 55 LC		Elevation and Datum 589.4 feet MSL	Ground Water Depth 16.6 feet	Depth to Bedrock 96.3 feet	
Casing Size and Depth 3.75 inch / 96.3 feet		Length of Core Barrel and Bit 8 feet	No. of Core Boxes 6	Date Started 3/21/06	
		Borehole Inclination -90	Logged by E. Weldon	Date Completed 3/23/06	



Reviewed by / Date F. Syms 5/20/06

Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
97		11	2.0 5.0	28	F	R4 to R5		META-GRANODIORITE; light gray (5YR 7/1); coarse, crystalline; probably pegmatite vein; manganese dendritic formation and white mica on fracture surfaces; minor rounded inclusions of intrusive dark igneous rocks.	Started NQ coring 7/22/06	493
98									100% water loss	492
99										491
100										490
101										489
102		12	4.9 5.0	78	F	R3 to R4		META-GRANODIORITE (MICA SCHIST); black (7.5YR 2.5/1) with white (7.5YR 8/1) veins of calcite; equigranular; fine to coarse grained; strong foliation 45°; mica present and possible chlorite, minor pyrite. CONTINUOUS ROCK.		488
103										487
104										486
105										485
106										484
107		13	5.0 5.0	84	F	R4		META-DIORITE; with thick (1 to 1.5 ft) quartzite veins; low angle 10° laminations of calcite crosscut 45° to foliation; pyrite is parallel to the low angle calcite veins		483
108										482
109										481
110										480
111										479
112		14	5.0 5.0	100	F	R5		META-DIORITE; white, black, and greenish black; hornblende (diopside); abundant calcite, feldspar (albite?), quartz, epidote and chlorite in lower part Migmatite texture from 112 to 115 ft	End of day 3/22/06 Begin day 3/23/06; water at 16.6 ft Still losing all coring water	478
113								Minor pyrite		477
114										476
115										475
116										474
117		15	5.0 5.0	86	SW to F	R4		META-DIORITE with epidote, chlorite, garnet (?), orthoclase and calcite Red and green assemblages of minerals: epidote, calcite, chlorite, garnet from 116.7 to 117.8 ft		473
118										472
119										471
120								META-GRANODIORITE; with light gray mica, quartz and feldspar, xenoblastic porphyroblastic, microcrystalline to coarse grained mafic minerals, mica, chlorite, hornblende very fine grained		470
121										469
122										468
123		16	5.0 5.0	86	SW to F	R4		Becomes increasingly foliated and sheared; mylonitized; chlorite filling shears along foliations, completely healed.		467
124										466
125										465
126										464
127									Coring terminated on 3/23/06	463
128										462
129								Total Depth 126.3 ft. Groundwater encountered at 16.6 feet Borehole Grouted On 6/12/06		461
130										460
131										459
132										458
133										457
134										456
135										455
136										454

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. MW-1211	
Type and Diameter of Boring CME Sampler / 7 inch/NQ		Boring Location Unit 1 adjacent N 1165196 E 1846389		Total Depth 65.5 feet	
Drilling Contractor and Rig MACTEC/White/331145 / CME 55 LC		Elevation and Datum 589.3 feet MSL		Ground Water Depth 21.5 feet	
Sampling Method Continuous Sampler		Sample Driving Hammer/Drop NA / NA		No. of Samples 3	
		Borehole Inclination -90		Logged by J. Cerceo/E. Weldon	
				Date Started 3/13/06	
				Date Completed 3/16/06	

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0										Topsoil		589
1									SP-SM	SAND, gravelly (SP-SM); light brown (7.5YR 6/4); dry; fine to coarse grained; ~30% gravel; FILL		588
2									ML	SILT, sandy (ML); reddish brown (2.5YR 5/4); dry; 15% sand; some gravel zones; FILL		587
3												586
4									SM	SAND, silty (SM); light brown (7.5YR 6/4); dry; fine to coarse grained; with some gravel zones; FILL		585
5												584
6												583
7									SP	SAND, gravelly (SP); very pale brown (10YR 7/3); dry; fine to coarse; ~35% gravel, ~10% silt; FILL		582
8									ML	SILT, sandy (ML); red (2.5YR 4/6); dry to damp; fine sand; trace clay; some gravel; FILL		581
9												580
10												579
11												578
12									SM	SAND, silty (SM); gray (5YR 6/1); wet; fine to medium grained; trace gravel; FILL	End of CME sampling See rock log Begin rock coring, see rock log	577
13												576
14												575
15												574
16												573
17												572
18												571
19												570
20												569
21												568
22												567
23												566
24												565
25												564
26												563
27												562
28												561
29												560
30												559
31												558
32												557
33												556
34												555
35												554
36												553
37												552
38												551
39												550
40												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. MW-1211	
Type and Diameter of Boring CME Sampler / 7 inch/NQ		Boring Location Unit 1 adjacent N 1165196 E 1846389		Total Depth 65.5 feet	
Drilling Contractor and Rig MACTEC/White/331145 / CME 55 LC		Elevation and Datum 589.3 feet MSL	Ground Water Depth 21.5 feet	Depth to Bedrock 12.5 feet	
Casing Size and Depth 3.5 inch / 13 feet		Length of Core Barrel and Bit 8.1 feet	No. of Core Boxes 4	Date Started 3/13/06	
		Borehole Inclination -90	Logged by J. Cerceo/E. Weldon	Date Completed 3/16/06	

Reviewed by / Date F. Syms 5/29/06


Reviewed by / Date M. Gray 10-22-07



Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
13		1	0.0 1.0	0	CW			META-GRANODIORITE; with quartzite vein (4 inch) light to medium gray; equigranular		576
14		2	2.5 2.5	60	SW	R3		META-QUARTZ DIORITE; medium gray; schistose (micas aligning in planes); upper one foot more weathered and higher K-spar content		575
15								SAA; gray; coarse equigranular; schistose to mylonitized texture		574
16										573
17										572
18		3	5.0 5.0	92	SW to F	R3 to R4				571
19										570
20										569
21								∇ META-QUARTZ DIORITE; medium gray; coarse equigranular; slightly schistose		568
22										567
23		4	5.0 5.0	60	SW to F	R3 to R4		META-GRANODIORITE; above contact with meta-quartz diorite gradual; increase in K-spar		566
24										565
25										564
26								SAA; very pale brown (10YR 7/3); to white (10YR 8/1); fine to coarse equigranular to migmatite		563
27										562
28		5	4.8 5.0	38	SW to HW	R2 to R3				561
29										560
30								META-QUARTZ DIORITE; above contact with meta-granodiorite transitional within 0.5 ft noted by increase in quartz and decrease in orthoclase and light pink to medium gray		559
31									End of day 3/14/06 Begin day 3/15/06	558
32		6	4.1 5.0	54	F	R4 to R5		META-QUARTZ DIORITE; gray (N 6); fine to medium grained; closed to moderately spaced healed joints/fractures		557
33										556
34										555
35										554
36								SAA; mylonitized shears are often conjugate pairs or subvertical; calcite crystallized along shears		553
37										552
38		7	4.2 4.4	64	SW to MW	R3				551
39										550
40										549
41								SAA; but more inclusions (mafic and felsic)		548
42								CONTINUOUS ROCK		547
43		8	4.9 5.0	82	SW to F	R3 to R4				546
44										545
45										544
46										543
47										542
48		9	4.9 5.0	100	SW	R3				541
49										540
50										539
51									End of day 3/15/06 Begin day 3/16/06; water level 21.5 ft	538
52										537

Project Name and Job Number
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ROCK LOG - Boring No. MW-1211

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)		
53		10	5.0	82	SW	R4				536		
54			5.0			META-GRANODIORITE; gray; fine to coarse grained		535				
55										534		
56		11	5.0 5.0	100	SW to F	R4				533		
57											532	
58												531
59						R3 to R4					530	
60										META-DIORITE; medium to dark gray, fine to coarse grained; foliation dips ~10°; with quartz; plagioclase, and minor orthoclase		529
61												528
62												527
63		12	4.9 5.1	80	SW to F	R3					526	
64												525
65									524			
66									Coring terminated on 3/16/06	523		
67										522		
68										521		
69										520		
70										519		
71										518		
72										517		
73										516		
74										515		
75										514		
76										513		
77										512		
78										511		
79										510		
80										509		
81										508		
82										507		
83										506		
84										505		
85										504		
86										503		
87										502		
88										501		
89										500		
90										499		
91										498		
92										497		

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. MW-1212	
Type and Diameter of Boring CME Sampler / 8 inch			Boring Location Unit 1 CT N 1165375 E 1845450		Total Depth 22 feet
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850			Elevation and Datum 609.7 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Sampling Method Continuous Sampler			Sample Driving Hammer/Drop NA / NA	No. of Samples 4	Date Started 3/18/06
			Borehole Inclination -90	Logged by J. Cerceo	Date Completed 3/19/06

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									GP	GRAVEL sandy, silty (GP); gray (N 6); dry; fine.		609
1									SM	FILL SAND silty (SM); yellowish red (5YR 5/8); dry; fine to medium grained; >15% silt; little fine gravel with trace clay and rock fragments. FILL		608
2												607
3												606
4												605
5												604
6		CME 1		33.6 60								603
7												602
8												601
9									ML	SILT sandy (ML); strong brown (7.5YR 5/6); damp; fine to medium grained; sand >30%; fine gravel <5%; low plasticity; micaceous. SAPROLITE	End drilling 3/18/06 Begin drilling 3/19/06; no water encountered	600
10		CME 2		52.8 60								599
11												598
12												597
13												596
14												595
15		CME 3		22.8 60								594
16									SM	SAND silty (SM); brownish yellow (10YR 6/8); dry to damp; fine to medium grained; <10% silt; micaceous. SAPROLITE		593
17												592
18												591
19		CME 4		42 41					SM	SAND silty (SM); pinkish gray (7.5YR 7/2); dry; >10% silt; appreciable rock fragments; PARTIALLY WEATHERED ROCK	Offset to MW-1212A See rock log	590
20												589
21												588
22												587
23												586
24												585
25												584
26												583
27												582
28												581
29												580
30												579
31												578
32												577
33												576
34												575
35												574
36												573
37												572
38												571
39												570
40												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. MW-1212A	
Type and Diameter of Boring NQ2 core / 3 inch		Boring Location Unit 1 CT N 1165371 E 1845450		Total Depth 89.2 feet	
Drilling Contractor and Rig TRIGON/Wichard/190742 / CME 850		Elevation and Datum 609.3 feet MSL		Ground Water Depth 32.9 feet	
Casing Size and Depth 3.5 inch / 20.2 feet		Length of Core Barrel and Bit 8.1 feet		No. of Core Boxes 5	
		Borehole Inclination -90		Logged by J. Cerceo	
				Date Started 3/20/06	
				Date Completed 3/21/06	

Reviewed by / Date F. Syms 5/29/06

Reviewed by / Date M. Gray 10-22-07



Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
21								Drilled without sampling to 20.2 ft. See MW-1212	Begin NQ core	589
22								META-GRANODIORITE; greenish gray (5GY 6/1) to light gray (N 7); fine grained; biotite rich; massive		588
23		1	3.6 5.0	6	MW	R3		Silicified zone from 21 to 22.9 ft		587
24								No recovery from 23.3 to 24.2 ft		586
25								Developed gneissic texture from 24.2 to 25.2 ft		585
26								META-GRANODIORITE, silty, fine sand, rock highly weathered. PARTIALLY WEATHERED ROCK.		584
27										583
28		2	0.7 5.0	0	CW					582
29										581
30										580
31								META-GRANODIORITE; light greenish gray (10GY 7/1); fine grained; foliated; vugs 2 to 5 mm in width; biotite rich quartz plagioclase	Losing water (100 gallons per 5 ft.)	579
32										578
33		3	4.5 5.0	18	MW	R3				577
34								Vugs increase in size, stained with manganese oxide from 33.2 to 35 ft		576
35					CW	R0				575
36								SAA; light greenish gray (10GY 7/1); highly weathered zone; fine grained. PARTIALLY WEATHERED ROCK.		574
37										573
38		4	4.9 5.0	54	HW	R0 to R1				572
39										571
40					SW to F	R4				570
41									Losing more water (200 gallons per 5 ft.)	569
42										568
43		5	5.0 5.0	84	SW to F	R4				567
44										566
45										565
46										564
47										563
48		6	5.0 5.0	56	SW to F	R4				562
49										561
50										560
51								META-GRANODIORITE; bluish gray (5PB 6/1). CONTINUOUS ROCK.		559
52										558
53		7	4.9 5.0	88	SW to F	R4				557
54										556
55										555
56									Losing water (200 gallons per 3 ft.)	554
57										553
58		8	5.0 5.0	90	SW to F	R4				552
59										551
60										550

Project Name and Job Number
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ROCK LOG - Boring No. MW-1212A

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
61										549
62										548
63		9	$\frac{5.0}{5.0}$	82	SW to F	R4				547
64										546
65										545
66								META-GRANODIORITE; bluish gray (5PB 6/1); fine grained; slightly foliated; biotite speckled; manganese oxide stained vugs	Losing water (100 gallons per 1 ft.)	544
67		10	$\frac{4.0}{4.0}$	66	SW	R3				543
68										542
69								QUARTZITE; light gray (5Y 7/1)		541
70								META-GRANODIORITE; bluish gray (5PB 6/1)	End drilling 3/20/06 Begin drilling 3/21/06; water level at 31 ft	540
71										539
72		11	$\frac{5.0}{5.0}$	84	SW	R3 to R4				538
73										537
74										536
75										535
76										534
77		12	$\frac{5.0}{5.0}$	64	SW	R3 to R4				533
78										532
79										531
80										530
81								SAA; fine; foliated vugs with manganese oxide staining.		529
82		13	$\frac{5.0}{5.0}$	94	SW	R4				528
83										527
84										526
85								SAA; bluish gray (5PB 6/1) to bluish black (10B 2.5/1); fine grained; foliated; quartz veins; manganese oxide stained vugs		525
86										524
87		14	$\frac{4.9}{5.0}$	100	SW to F	R4				523
88										522
89										521
90									End drilling 3/21/06; coring terminated On 3/22/06; water at 32.9 ft	520
91										519
92								Total Depth 89.2 ft. Groundwater encountered at 32.9 feet Borehole Grouted On 3/22/06		518
93										517
94										516
95										515
96										514
97										513
98										512
99										511
100										510

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. MW-1213	
Type and Diameter of Boring CME Sampler / 8 inch/NQ		Boring Location Switchyard N 1164716 E 1847770		Total Depth 78.3 feet	
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75		Elevation and Datum 578.5 feet MSL		Ground Water Depth 10.1 feet	
Sampling Method Continuous Sampler		Sample Driving Hammer/Drop NA / NA		No. of Samples 6	
		Borehole Inclination -90		Logged by J. Cerceo	
				Date Started 4/4/06	
				Date Completed 4/10/06	

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									GP	GRAVEL, silty, sandy (GP); 0.3 ft of topsoil. FILL	Observed auger cuttings to classify above top of first CME sample.	578
1									ML	SILT, sandy (ML); red (2.5YR 3/6); dry. FILL		577
2												576
3												575
4									SM	SAND, silty (SM); brown (7.5YR 4/3); dry; 30% silt; trace gravel; rock fragments. FILL		574
5												573
6		CME 1		60	60							572
7												571
8												570
9												569
10												568
11		CME 2		60	60							567
12												566
13												565
14												564
15												563
16		CME 3		60	60							562
17												561
18									ML	SILT, (ML); yellowish red (5YR 4/6); moist to wet; no to low plasticity. RESIDUUM	Water on sampler	560
19												559
20												558
21		CME 4		39.6	60							557
22												556
23												555
24												554
25												553
26		CME 5		34.8	60							552
27												551
28												550
29												549
30												548
31		CME 6		28.8	60							547
32									SM	SAND, silty (SM); pale brown (10YR 6/3); damp to moist; <10% silt; dark rock fabric like veins. PARTIALLY WEATHERED ROCK	Auger refusal at 34 ft, see rock log	546
33												545
34		CME 7		0	6							544
35												543
36												542
37												541
38												540
39												539
40												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. MW-1213	
Type and Diameter of Boring CME Sampler / 8 inch/NQ		Boring Location Switchyard N 1164716 E 1847770		Total Depth 78.3 feet	
Drilling Contractor and Rig MACTEC/Christian/211797 / CME 75		Elevation and Datum 578.5 feet MSL	Ground Water Depth 10.1 feet	Depth to Bedrock 52.6 feet	
Casing Size and Depth 2 inch / 34 feet		Length of Core Barrel and Bit 13.1 feet	No. of Core Boxes 4	Date Started 4/4/06	
		Borehole Inclination -90	Logged by J. Cerceo	Date Completed 4/10/06	

Reviewed by / Date F. Syms 5/29/06

Reviewed by / Date M. Gray 10-22-07



Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
34								SAND silty (SM); pale brown (10YR 6/3); wet; <10% silt.		544
35								PARTIALLY WEATHERED ROCK		543
36		1	2.9 4.3	0	RS	R0				542
37										541
38										540
39									End drilling on 4/4/06	539
40									Begin drilling 4/5/06; water	538
41		2	0.3 5.0	0	RS	R0			level at 18.4 ft	537
42										536
43										535
44										534
45										533
46		3	0.0 5.0	0	RS	R0				532
47										531
48										530
49										529
50										528
51		4	1.6 5.0	0	RS	R0				527
52										526
53					HW	R3		META-GRANODIORITE; bluish gray (10B 6/1); fine to		525
54								medium grained; manganese staining on the fracture		524
55								faces		523
56		5	1.1 4.0	0	HW	R3				522
57										521
58		6	0.9 1.0	0	HW	R3				520
59								SAA; several schist xenoliths; chlorite, K-spar,		519
60								plagioclase, biotite, iron staining on surfaces		518
61		7	5.0 5.0	30	HW to MW	R3				517
62										516
63										515
64		8	2.5 2.5	60	MW	R3		SAA; bluish gray; fine to medium grained; chlorite		514
65								staining vugs <1 mm, quartz		513
66								xenoliths from 63.3 to 65.8 ft		512
67		9	2.4 2.5	72	MW	R3		Vugs on the side of the core show pyrite mineralization	End day 4/5/06	511
68									Begin day 4/10/06; water	510
69									level at 10.1 ft	509
70								SAA; epidote initially along healed fractures		508
71		10	4.9 5.0	98	SW to F	R3 to R4		Mafic zone 68.7 to 69.2 ft; fine grained; calcite healed		507
72								fractures; biotite rich speckling with pyrite xenoliths		506
73								increased in size and frequency		505
74										

Project Name and Job Number
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ROCK LOG - Boring No. MW-1213

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
74										504
75										503
76		11	4.8 5.0	96	F	R3 to R4				502
77										501
78								META-GRANODIORITE; dark bluish gray (10B 4/1); fine grained; calcite, epidote and altered plagioclase filling most fractures.		500
79									Coring terminated at 78.3 ft on 4/10/06	499
80										498
81								Total Depth 78.3 ft.		497
82								Groundwater encountered at 10.1 feet		496
83								Borehole Grouted On 4/10/06		495
84										494
85										493
86										492
87										491
88										490
89										489
90										488
91										487
92										486
93										485
94										484
95										483
96										482
97										481
98										480
99										479
100										478
101										477
102										476
103										475
104										474
105										473
106										472
107										471
108										470
109										469
110										468
111										467
112										466
113										465
114										

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. MW-1214	
Type and Diameter of Boring CME Sampler / 7 inch		Boring Location Switchyard N 1164174 E 1847143		Total Depth 15 feet	
Drilling Contractor and Rig MACTEC/White/331145 / CME 55 LC		Elevation and Datum 604.5 feet MSL		Ground Water Depth N/A	
Sampling Method Continuous Sampler		Sample Driving Hammer/Drop NA / NA		No. of Samples 3	
		Borehole Inclination -90		Logged by E. Weldon	
				Date Started 3/17/06	
				Date Completed 3/17/06	

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0										Augered to 3.5 ft without sampling.	Auger drilled to 3.5 ft to begin CME sampler	604
1												603
2												602
3												601
4									ML	SILT clayey (ML); light yellowish brown (10YR 6/4) damp; <15% clay; very micaceous. SAPROLITE		600
5												599
6		CME 1		60						SAA; dark yellowish brown (10YR 4/4).		598
7												597
8												596
9										SILT sandy (ML); yellowish brown (10YR 5/6 to 10YR 5/4); damp; soft; <15 to 20% fine sand; <10% clay some manganese oxide veinlets. SAPROLITE		595
10												594
11		CME 2		60								593
12												592
13												591
14		CME 3		18						SAA; yellowish brown (10YR 5/4). SAPROLITE		590
15									GM	GRAVEL (GM); yellowish brown (10YR 5/6); damp; <15% fines; PARTIALLY WEATHERED ROCK	Auger refusal 15 ft; moved 5 ft from this hole and extended casing to 16 ft, begin rock coring, see soil log and rock log MW-1214A	589
16												588
17												587
18												586
19												585
20												584
21												583
22												582
23												581
24												580
25												579
26												578
27												577
28												576
29												575
30												574
31												573
32												572
33												571
34												570
35												569
36												568
37												567
38												566
39												565
40												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		ROCK LOG - Boring No. MW-1214A	
Type and Diameter of Boring NQ core / 8 inch/NQ		Boring Location Switchyard N 1164175 E 1847147		Total Depth 96 feet	
Drilling Contractor and Rig MACTEC/White/331145 / CME 55 LC		Elevation and Datum 604.5 feet MSL	Ground Water Depth 14 feet	Depth to Bedrock 16 feet	
Casing Size and Depth 3 inch / 18 feet		Length of Core Barrel and Bit 8.1 feet	No. of Core Boxes 4	Date Started 3/17/06	
		Borehole Inclination -90	Logged by E. Weldon	Date Completed 3/19/06	

Reviewed by / Date F. Syms 5/23/06Reviewed by / Date M. Gray 10-22-07

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
16										588
17										587
18		1	$\frac{2.5}{5.0}$	0	HW to MW	R0 to R3		META-QUARTZ DIORITE; light brownish gray (2.5Y 6/2); porphyroblastic; fine to coarse grained; foliation 45 to 50°. Fractures mainly parallel foliation or break subvertically; minor minerals mica and pyrite; fine grained pyroxene or amphibole; plagioclase and quartz		586
19										585
20										584
21										583
22										582
23		2	$\frac{3.0}{5.0}$	22	HW to MW	R1				581
24										580
25										579
26					HW	R1		SAA; dark grayish brown (10YR 4/2)		578
27										577
28		3	$\frac{3.3}{5.0}$	7	MW	R1		SAA; (2.5Y 8/1); rock slightly stronger		576
29								SAA; but heavily fractured; less biotite than above		575
30										574
31										573
32								META-GRANODIORITE; color change to dark grayish brown; medium to coarse grained; equigranular; crystals aligned parallel to foliation at 30°. PARTIALLY WEATHERED ROCK.		572
33		4	$\frac{2.2}{5.0}$	0	HW	R0				571
34										570
35										569
36										568
37										567
38		5	$\frac{2.6}{5.0}$	8	HW	R0				566
39										565
40										564
41										563
42						R1		SAA; very pale brown (10YR 7/3); foliation at 30°; abundant incipient fractures.	Begin drilling 3/19/04; water at 14 ft; losing some water	562
43		6	$\frac{3.4}{5.0}$	9	MW	R2		SAA; medium to coarse grained; porphyroblastic texture; very fine grained minerals, feldspar, quartz		561
44										560
45										559
46										558
47								META-GRANODIORITE; with biotite; gray (2.5Y 6/1); fine to coarse grained biotite; quartz, feldspar (plagioclase), other mafics; healed fractures throughout; veins filled with pyrite; minor calcite. PARTIALLY WEATHERED ROCK.		557
48		7	$\frac{5.0}{5.0}$	26	SW	R3				556
49										555
50										554
51								SAA; grayish brown (2.5Y 5/2).		553
52										552
53		8	$\frac{5.0}{5.0}$	40	SW	R3				551
54										550
55										549
56										

Project Name and Job Number
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ROCK LOG - Boring No. MW-1214A

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
56								SAA; grey (5Y 5/1); fine to medium grained; pervasive healed shears; very closed spaced fractures irregular and planar parallel to foliation. Joint surfaces display mica aligned parallel to foliation. Vugs and pits in fractures		548
57										547
58		9	$\frac{5.0}{5.0}$	34	SW	R3				546
59										545
60								META-GRANODIORITE; medium to coarse grained; migmatized/cataclasized textured; abundant iron oxide stains on fracture surfaces		544
61										543
62									Still losing some water	542
63		10	$\frac{2.2}{5.0}$	0	SW	R3				541
64										540
65										539
66								SAA; dark gray (2.5Y 4/1); becoming fine grained near 70 ft.		538
67										537
68		11	$\frac{2.1}{5.0}$	0	SW	R3				536
69										535
70										534
71								SAA; fine grained.		533
72									Losing all water	532
73		12	$\frac{5.0}{5.0}$	80	F	R4		Thin healed shears common, often parallel, some calcite filled; calcite veins (<5 mm) planar to irregular and discontinuous		531
74										530
75										529
76								SAA; gray (2.5Y 6/1).		528
77										527
78		13	$\frac{4.7}{5.0}$	70	F	R4				526
79										525
80					HW to MW	R1		META-GRANODIORITE; gray (5Y 5/1); vugs and pits along foliation and fracture/shear lines; some fractures surfaces stained black. PARTIALLY WEATHERED ROCK.		524
81										523
82									Still losing all water	522
83		14	$\frac{2.8}{5.0}$	0	HW to MW	R1				521
84										520
85					SW	R3				519
86								META-GRANODIORITE biotite rich; gray with foliated sheared (mylonitized); fabric ~40 to 60°. CONTINUOUS ROCK.		518
87										517
88		15	$\frac{4.8}{5.0}$	84	SW	R3		SAA; gray; fine to medium grained throughout core; crystals xenoblastic; very closely spaced irregular fractures; minor calcite veins thin (1 mm); quartz vein (1 cm)		516
89										515
90					SW to F	R4				514
91										513
92										512
93		16	$\frac{4.8}{5.0}$	90	F	R3 to R4				511
94										510
95										509
96										

Project Name and Job Number
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ROCK LOG - Boring No. MW-1214A

Depth (feet)	Lithology	Run No.	Recovery / Cut	% RQD	Weathering	Strength	In-Situ Testing	Lithology	Remarks	Elevation (feet)
96									Coring terminated at 96 ft	508
97										507
98										506
99										505
100										504
101										503
102										502
103										501
104										500
105										499
106										498
107										497
108										496
109										495
110										494
111										493
112										492
113										491
114										490
115										489
116										488
117										487
118										486
119										485
120										484
121										483
122										482
123										481
124										480
125										479
126										478
127										477
128										476
129										475
130										474
131										473
132										472
133										471
134										470
135										469
136										

Total Depth 96 ft.
Groundwater encountered at 14 feet
Borehole Grouted On 3/28/06

Project Name and Job Number
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SOIL LOG - Boring No. MW-1215

Type and Diameter of Boring No samples / 12 inch/8 inch	Boring Location General site N 1166710.545 E 1846624.819	Total Depth 101.5 feet
Drilling Contractor and Rig Geologic / D120 / Air	Elevation and Datum 589.69 feet MSL	Ground Water Depth Not Observed
Sampling Method No sampling	Sample Driving Hammer/Drop NA / NA	No. of Samples 0
	Borehole Inclination -90	Logged by J. Jordan
		Date Started 4/17/06
		Date Completed 4/17/06

Reviewed by / Date J. Jordan 4/14/06

Reviewed by / Date CES 11/4/2009

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0												589
1											Drilled with 12 inch hollow stem augers	588
2											Refusal at 69 ft. Switched to air drill	587
3												586
4												585
5												584
6												583
7												582
8												581
9												580
10												579
11												578
12												577
13												576
14												575
15												574
16												573
17												572
18												571
19												570
20												569
21												568
22												567
23												566
24												565
25												564
26												563
27												562
28												561
29												560
30												559
31												558
32												557
33												556
34												555
35												554
36												553
37												552
38												551
39												550
40												550

Project Name and Job Number

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SOIL LOG - Boring No. MW-1215

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
40												549
41											Drilled with 12 inch hollow stem augers	548
42											Refusal at 69 ft. Switched to air drill	547
43												546
44												545
45												544
46												543
47												542
48												541
49												540
50												539
51												538
52												537
53												536
54												535
55												534
56												533
57												532
58												531
59												530
60												529
61												528
62												527
63												526
64												525
65												524
66												523
67												522
68												521
69											Air rotary drilling, easy drilling	520
70												519
71												518
72												517
73												516
74												515
75												514
76												513
77												512
78												511
79												510
80												

Project Name and Job Number
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SOIL LOG - Boring No. MW-1215

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
80											Air rotary drilling, harder drilling	509
81											Removed drill rods, hole caved, removed cave-in to 88 ft with 12 inch hollow stem augers, then used 8 inch mud rotary drilling (with water) to remove additional cuttings to 101.5 ft.	508
82											Boring terminated at 101.5 ft, installed well	507
83												506
84												505
85												504
86												503
87												502
88												501
89												500
90												499
91												498
92												497
93												496
94												495
95												494
96												493
97												492
98												491
99												490
100												489
101												488
102												487
103												486
104										Total Depth 101.5 ft.		485
105												484
106												483
107												482
108												481
109												480
110												479
111												478
112												477
113												476
114												475
115												474
116												473
117												472
118												471
119												470
120												

Project Name and Job Number
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SOIL LOG - Boring No. MW-1216

Type and Diameter of Boring Geoprobe / 2 1/4 inch	Boring Location South of Power Block N 1165171.882 E 1846927.273	Total Depth 28.0 feet
Drilling Contractor and Rig Geologic / Geoprobe	Elevation and Datum 588.009 feet MSL	Ground Water Depth Not Observed
Sampling Method Continuous Sampler	Sample Driving Hammer/Drop NA / NA	No. of Samples 7
	Borehole Inclination -90	Logged by J. Laughlin
		Date Started 7/19/06
		Date Completed 7/19/06

Reviewed by / Date B. Reinicker 8/1/06

Reviewed by / Date CES 11/4/2009

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT sandy, gravelly (ML); light yellow to tan (2.5Y 8/2); dry; no plasticity; becoming stiff at 2.5 ft. FILL	Using geoprobe sampler for continuous sampling	588
1												587
2		CME 1		42/48								586
3												585
4											Continuous samples were taken using Geoprobe system, which results in a sample similar to a CME Sampler	584
5									ML	SILT (ML); reddish brown (2.5YR 5/8); no plasticity; RESIDUUM		583
6		CME 2		40/48								582
7												581
8												580
9										SILT with some gravel seams; tan (7.5YR 7/4)		579
10		CME 3		44/48								578
11									SM	SAND silty (SM); yellow brown (2.5Y 7/4); dry		577
12									ML	SILT (ML); reddish brown; no plasticity		576
13									SM	SAND silty (SM); yellow brown (2.5Y 7/4); dry; fine grained; SAPROLITE		575
14		CME 4		44/48								574
15												573
16												572
17												571
18		CME 5		44/48						SAA; becoming moist at 18 ft	Becoming moist	570
19												569
20												568
21									SM	SAND silty (SM); light gray (10R 7/1); moist		567
22		CME 6		44/48								566
23										SAA; brown; moist to wet	Moist to wet	565
24												564
25												563
26		CME 7		44/48						SAND silty (SM); brown (10YR 5/6); fine grained; becoming saturated at 25 ft	Saturated appearance	562
27										BORING TERMINATED at 28 ft.		561
28											Boring terminated	560
29												559
30												558
31										Total Depth 28 ft.		557
32												556
33												555
34												554
35												553
36												552
37												551
38												550
39												549
40												

Project Name and Job Number
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SOIL LOG - Boring No. MW-1217

Type and Diameter of Boring Geoprobe / 2 1/4 inch	Boring Location South of Power Block N 1165042.463 E 1846983.878	Total Depth 19.8 feet
Drilling Contractor and Rig Geologic / Geoprobe	Elevation and Datum 587.635 feet MSL	Ground Water Depth Not Observed
Sampling Method Continuous Sampler	Sample Driving Hammer/Drop NA / NA	No. of Samples 5
	Borehole Inclination -90	Logged by J. Laughlin
		Date Started 7/19/06
		Date Completed 7/19/06

Reviewed by / Date B. Reinicker 8/1/06

Reviewed by / Date CES 11/4/2009

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT gravelly (ML); gray (10Y 8/1); dry; no plasticity; FILL	Using geoprobe sampler for continuous sampling	587
1		CME 1		46					ML	SILT sandy, some gravel (ML); red brown (2.5YR 5/6); dry; no plasticity; FILL		586
2				48								585
3												584
4												583
5		CME 2		46					GW-GM	GRAVEL silty (GW-GM); dry	Continuous samples were taken using Geoprobe system, which results in a sample similar to a CME Sampler	582
6				48					ML	SILT sandy (ML); (2.5YR 5/6); dry; no plasticity; FILL		581
7												580
8												579
9		CME 3		46					GW-GM	GRAVEL silty (GW-GM); gray; dry		578
10				48					ML	SAND silty (ML); FILL		577
11												576
12												575
13		CME 4		46								574
14				48								573
15									GW-GM	GRAVEL; dry (FILL)		572
16									CL	CLAY silty (CL); brown (7.5YR 5/2); moist to wet; RESIDUUM		571
17		CME 5		45.8								570
18				45.6					SW	SAND (SW); gray brown; wet to saturated; SAPROLITE		569
19												568
20											Geoprobe refusal. Boring terminated	567
21												566
22												565
23												564
24												563
25												562
26												561
27												560
28												559
29												558
30												557
31												556
32												555
33												554
34												553
35												552
36												551
37												550
38												549
39												548
40												

Total Depth 19.8 ft.

Project Name and Job Number
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SOIL LOG - Boring No. MW-1218

Type and Diameter of Boring Geoprobe / 2 1/4 inch	Boring Location South of Power Block N 1164859.672 E 1847139.635	Total Depth 16.0 feet
Drilling Contractor and Rig Geologic / Geoprobe	Elevation and Datum 588.121 feet MSL	Ground Water Depth Not Observed
Sampling Method Continuous Sampler	Sample Driving Hammer/Drop NA / NA	No. of Samples 4
	Borehole Inclination -90	Logged by J. Laughlin
		Date Started 7/19/06
		Date Completed 7/19/06

Reviewed by / Date B. Reinicker 8/1/06

Reviewed by / Date CES 11/4/2009

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0										GRAVEL (GP)	Using geoprobe sampler for continuous sampling	588
1									ML	SILT gravelly (ML); tan and light brown (10YR 8/4); dry; no plasticity		587
2		CME 1		46 48								586
3									GM	GRAVEL (GM); predominantly quartz angular grains	Continuous samples were taken using Geoprobe system, which results in a sample similar to a CME Sampler	585
4									ML			584
5									GM	SILT gravelly (ML); (10YR 7/4)		583
6		CME 2		45 48					ML	GRAVEL (GM); predominantly quartz angular grains		582
7										SILT sandy (ML); tan (10YR 7/6); no plasticity		581
8									SM	SAND silty (SM) with gravel seam from 8.5 to 8.75 ft; dry; no plasticity; becoming moist at 10.5 ft	Becomes very dense	580
9												579
10		CME 3		45 48							Becomes moist	578
11												577
12												576
13									GM	GRAVEL (GM)		575
14		CME 4		43 48					SM	SAND silty (SM) (10YR 7/4)		574
15									SM	SAND silty (SM); (10YR 6/8) SAPROLITE	Becomes wet	573
16										BORING TERMINATED at 16 ft	Boring terminated	572
17												571
18												570
19										Total Depth 16 ft.		569
20												568
21												567
22												566
23												565
24												564
25												563
26												562
27												561
28												560
29												559
30												558
31												557
32												556
33												555
34												554
35												553
36												552
37												551
38												550
39												549
40												

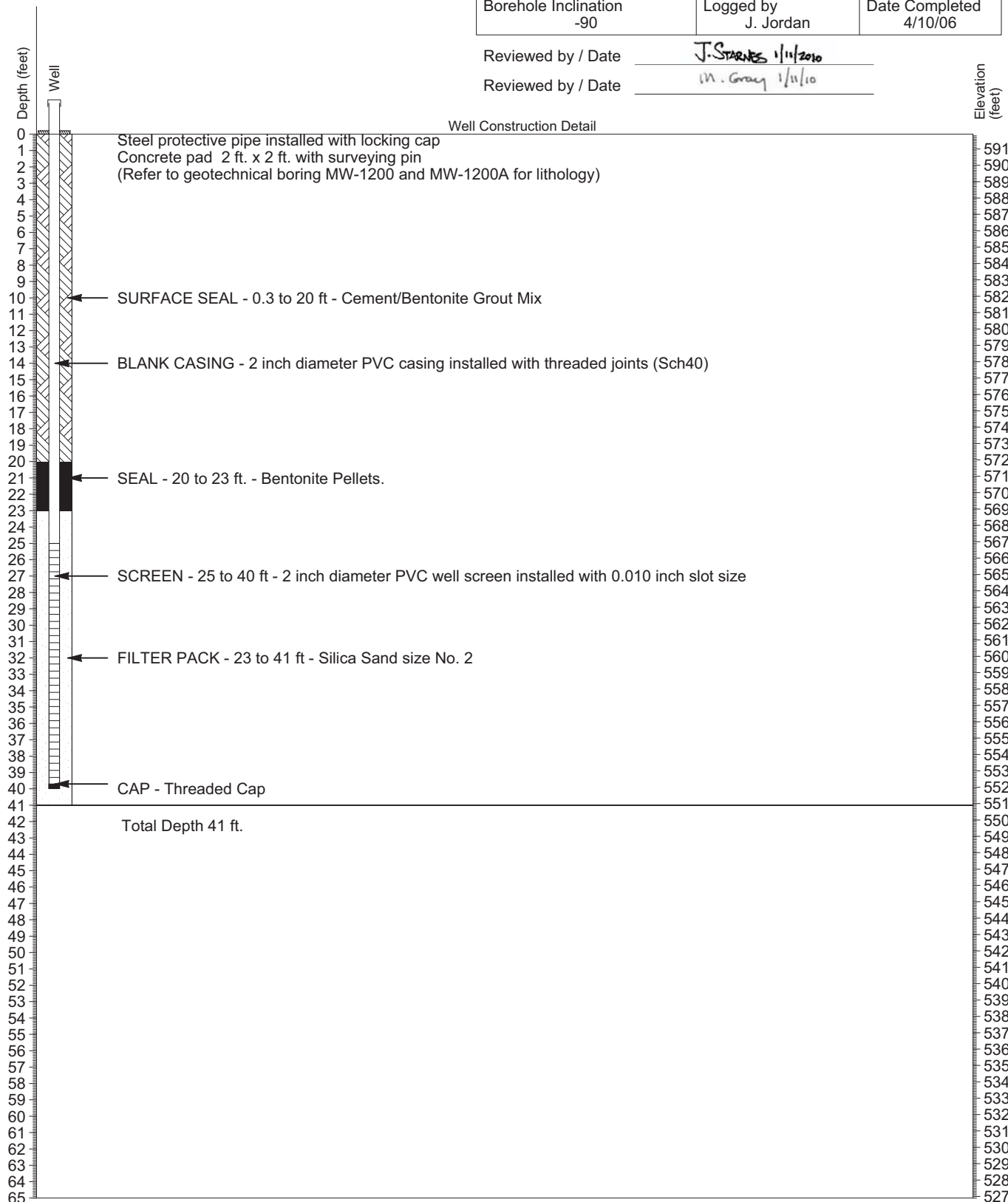
Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 	WELL CONSTRUCTION LOG - MW-1200 (well)	
Type and Diameter of Boring Air Rotary / 6 inch		Boring Location General site N 1166348.442 E 1845571.069		Total Depth 41.0 feet
Drilling Contractor and Rig Geologic Exp / Mantak / D25KW		Elevation and Datum 591.9 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Casing Size and Depth 2 inch / 40 feet	Top of Casing Elevation 594 feet	Length of Core Barrel and Bit N/A	No. of Core Boxes N/A	Date Started 4/10/06
		Borehole Inclination -90	Logged by J. Jordan	Date Completed 4/10/06



Reviewed by / Date

J. Sparks 1/11/2010

Reviewed by / Date

M. Gray 1/11/10



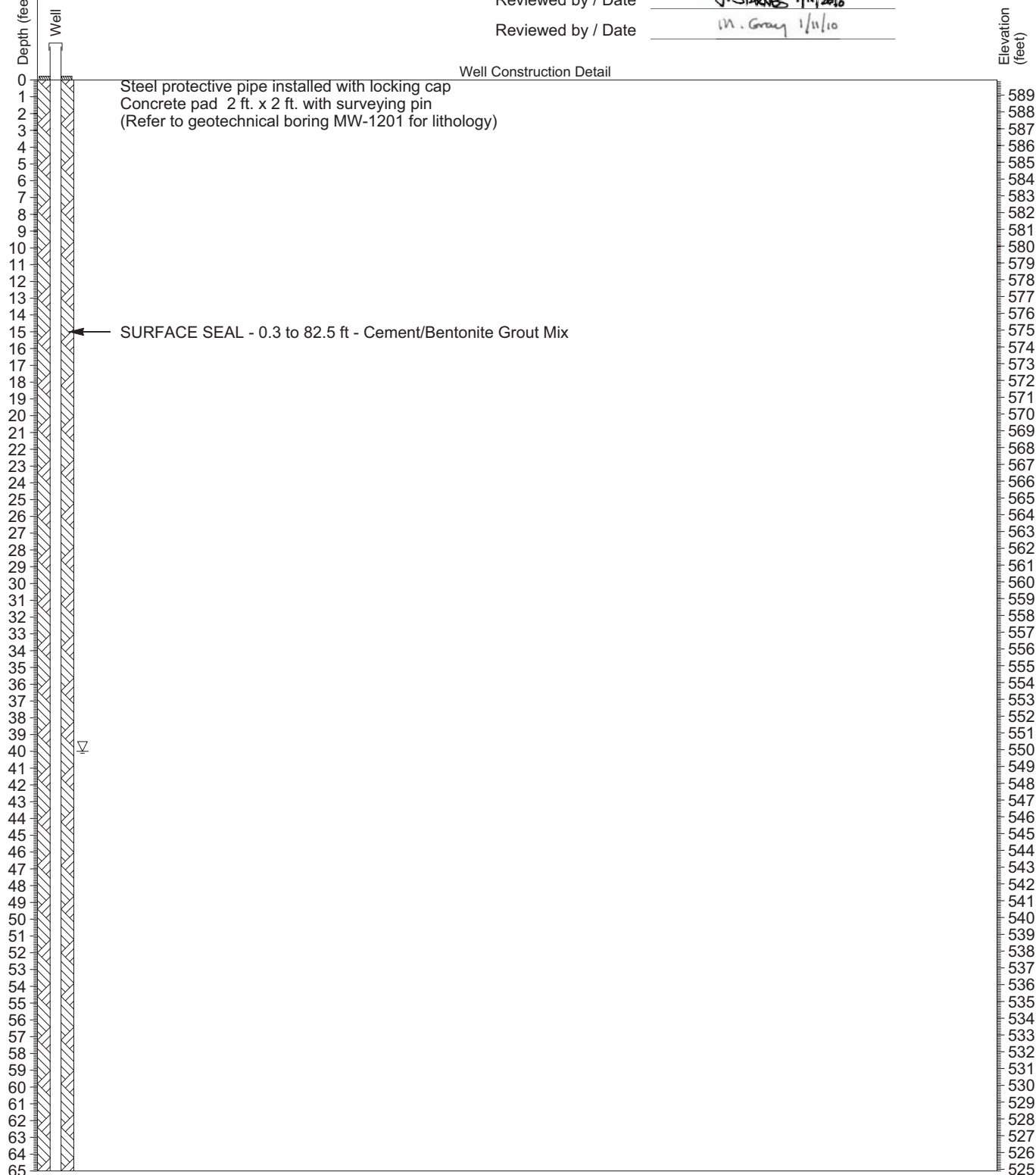
Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 	WELL CONSTRUCTION LOG - MW-1201 (well)	
Type and Diameter of Boring Air Rotary / 10 inch / 6 inch		Boring Location General site N 1166689.304 E 1846578.824		Total Depth 102.5 feet
Drilling Contractor and Rig Geologic Exp / Mantak / D120/D25KW		Elevation and Datum 589.9 feet MSL	Ground Water Depth 40 feet	Depth to Bedrock N/A
Casing Size and Depth 2 inch / 101.5 feet	Top of Casing Elevation 592.1 feet	Length of Core Barrel and Bit N/A	No. of Core Boxes N/A	Date Started 4/19/06
		Borehole Inclination -90	Logged by J. Jordan	Date Completed 4/19/06

Reviewed by / Date

J. Sparks 1/11/2010

Reviewed by / Date

M. Gray 1/11/10



Project Name and Job Number

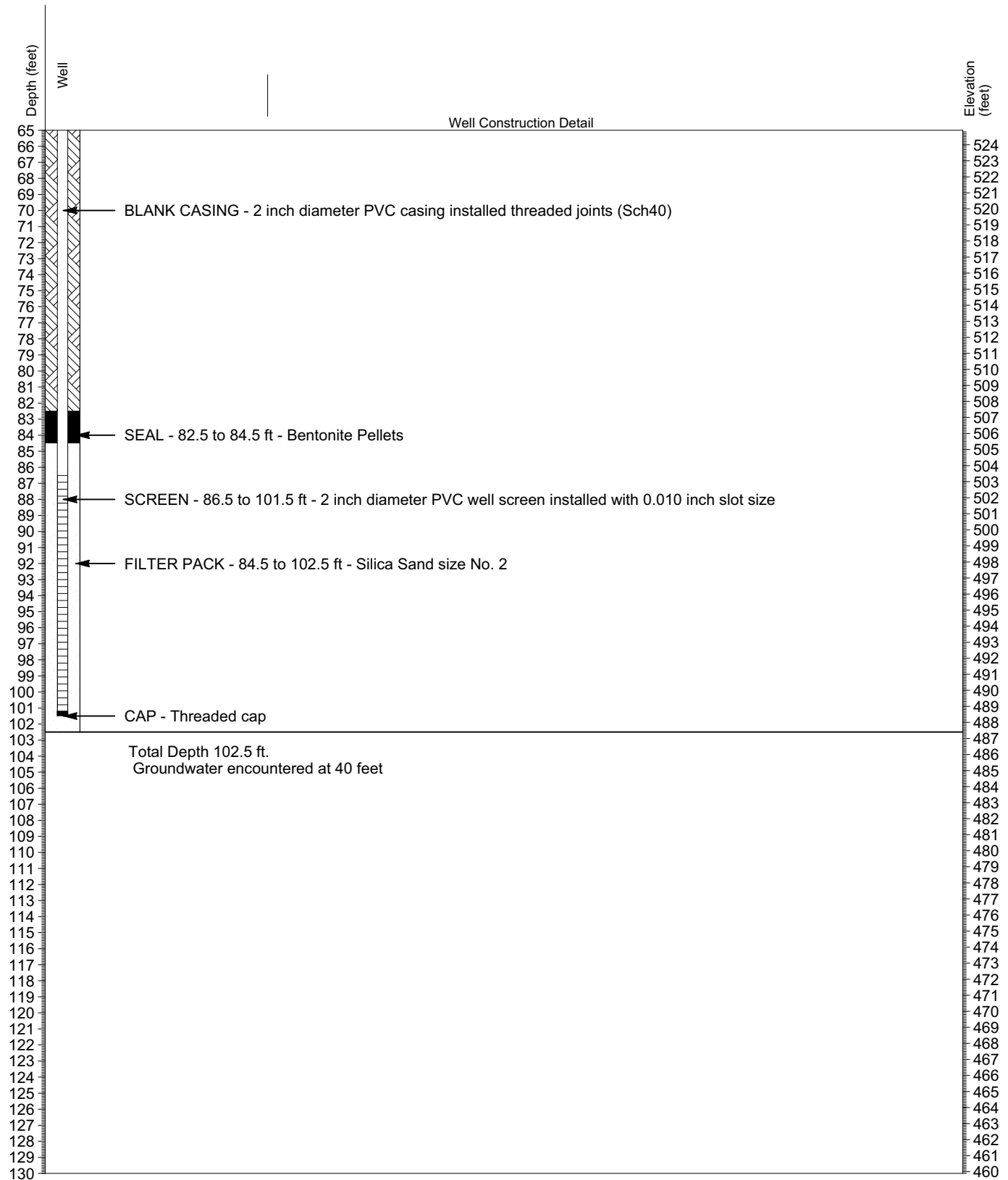
Lee Nuclear Station COL



6234-06-3389

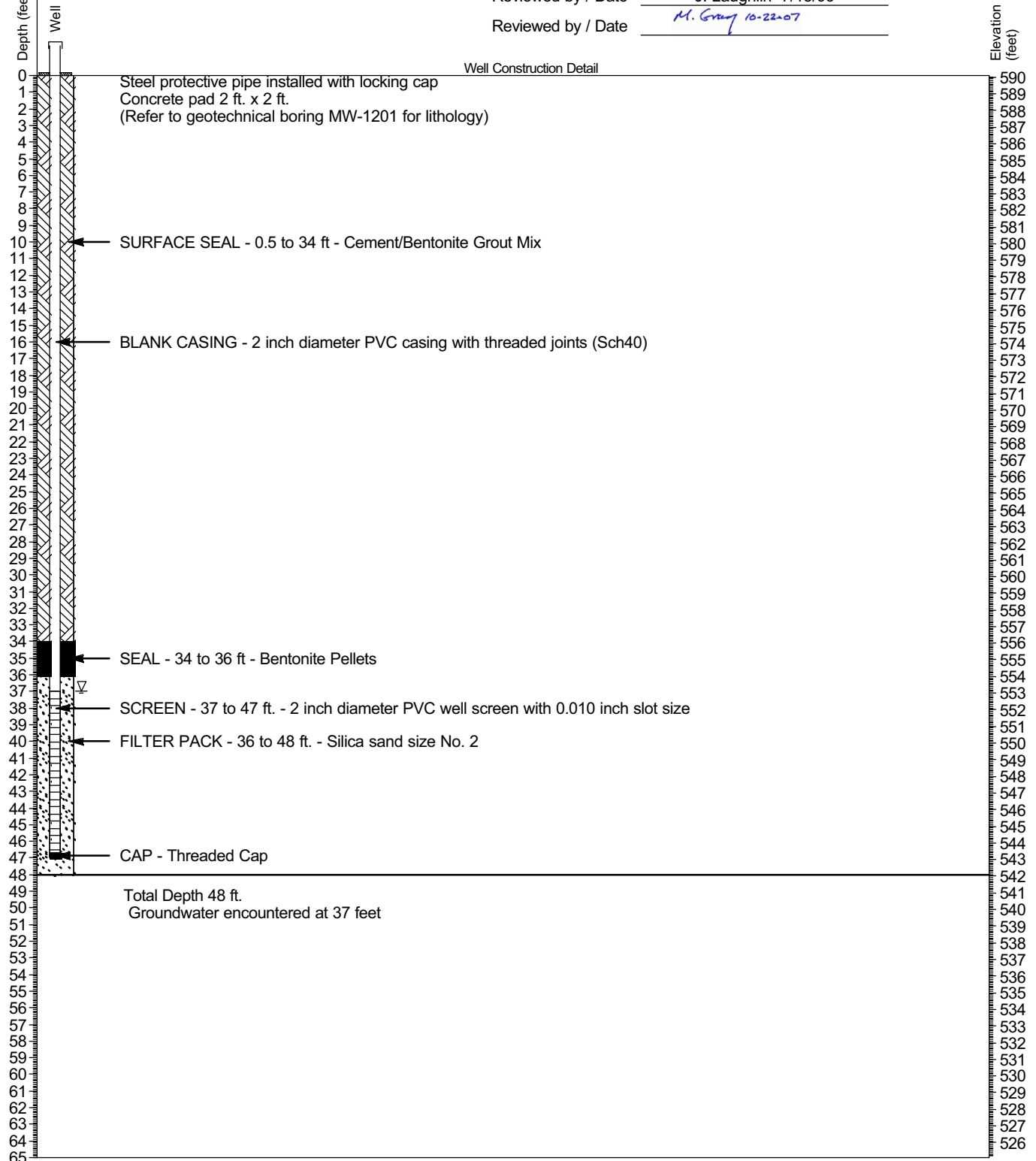
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WELL CONSTRUCTION LOG - MW-1201 (well)



Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		  WELL CONSTRUCTION LOG - MW-1201A (well)		
Type and Diameter of Boring Hollow stem auger / 8.25 inch		Boring Location General site N 1166693.529 E 1846576.539		Total Depth 48 feet
Drilling Contractor and Rig Geologic Exp / Mantak / D120		Elevation and Datum 590.1 feet MSL	Ground Water Depth 37 feet	Depth to Bedrock N/A
Casing Size and Depth 2 inch / 47 feet	Top of Casing Elevation 592.1 feet	Length of Core Barrel and Bit N/A	No. of Core Boxes N/A	Date Started 7/18/06
		Borehole Inclination -90	Logged by J. Laughlin	Date Completed 7/18/06

Reviewed by / Date J. Laughlin 7/18/06Reviewed by / Date M. Gray 10-22-07

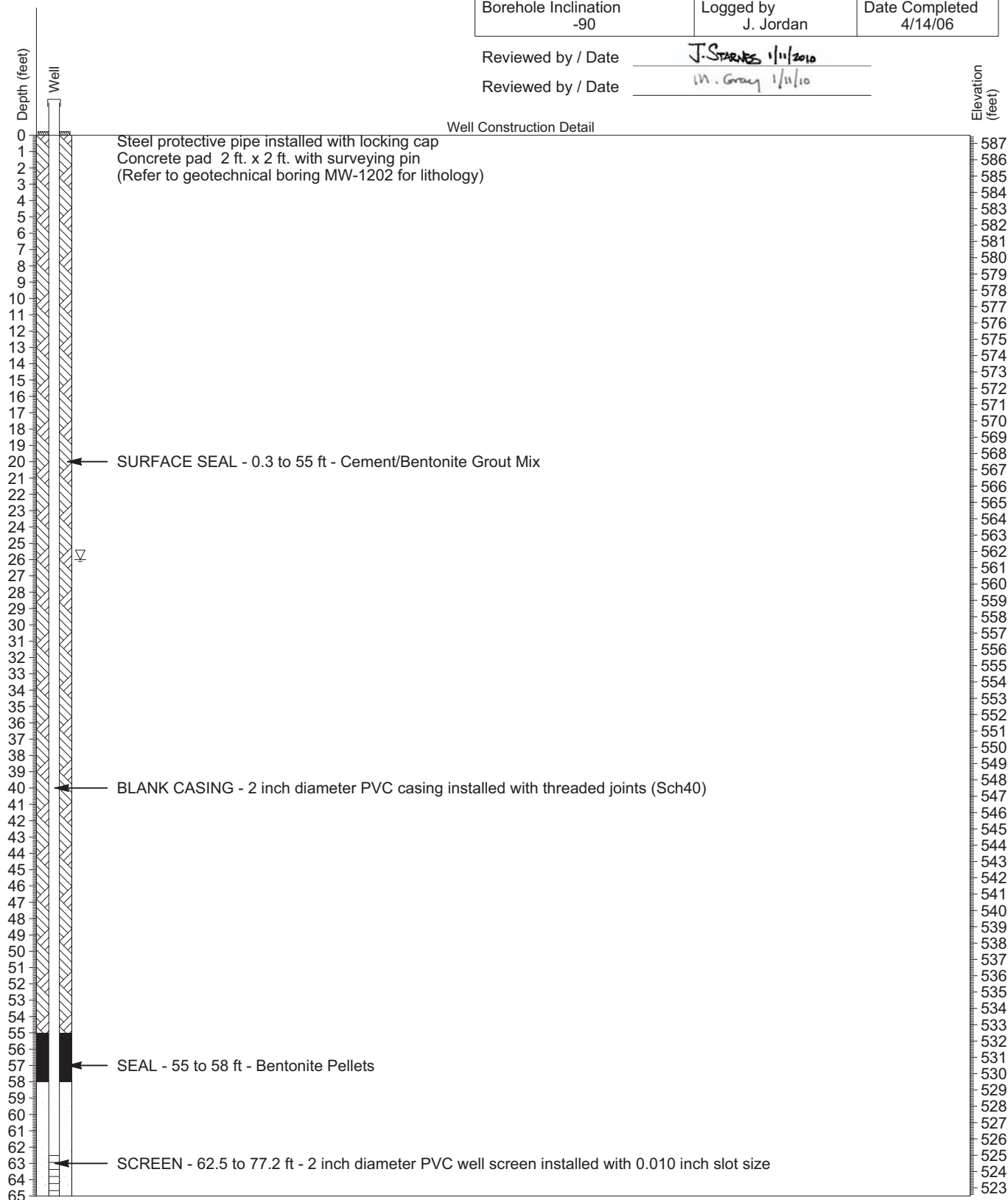
Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 	WELL CONSTRUCTION LOG - MW-1202 (well)	
Type and Diameter of Boring Hollow stem / Air Rotary / 10 inch / 6 inch		Boring Location General site N 1167018.978 E 1847472.03		Total Depth 78.5 feet
Drilling Contractor and Rig Geologic Exp / Mantak / D25KW/D50		Elevation and Datum 587.5 feet MSL	Ground Water Depth 26 feet	Depth to Bedrock N/A
Casing Size and Depth 2 inch / 77.5 feet	Top of Casing Elevation 589.7 feet	Length of Core Barrel and Bit N/A	No. of Core Boxes N/A	Date Started 4/14/06
		Borehole Inclination -90	Logged by J. Jordan	Date Completed 4/14/06

Reviewed by / Date

J. STARKES 1/11/2010

Reviewed by / Date

M. Gray 1/11/10



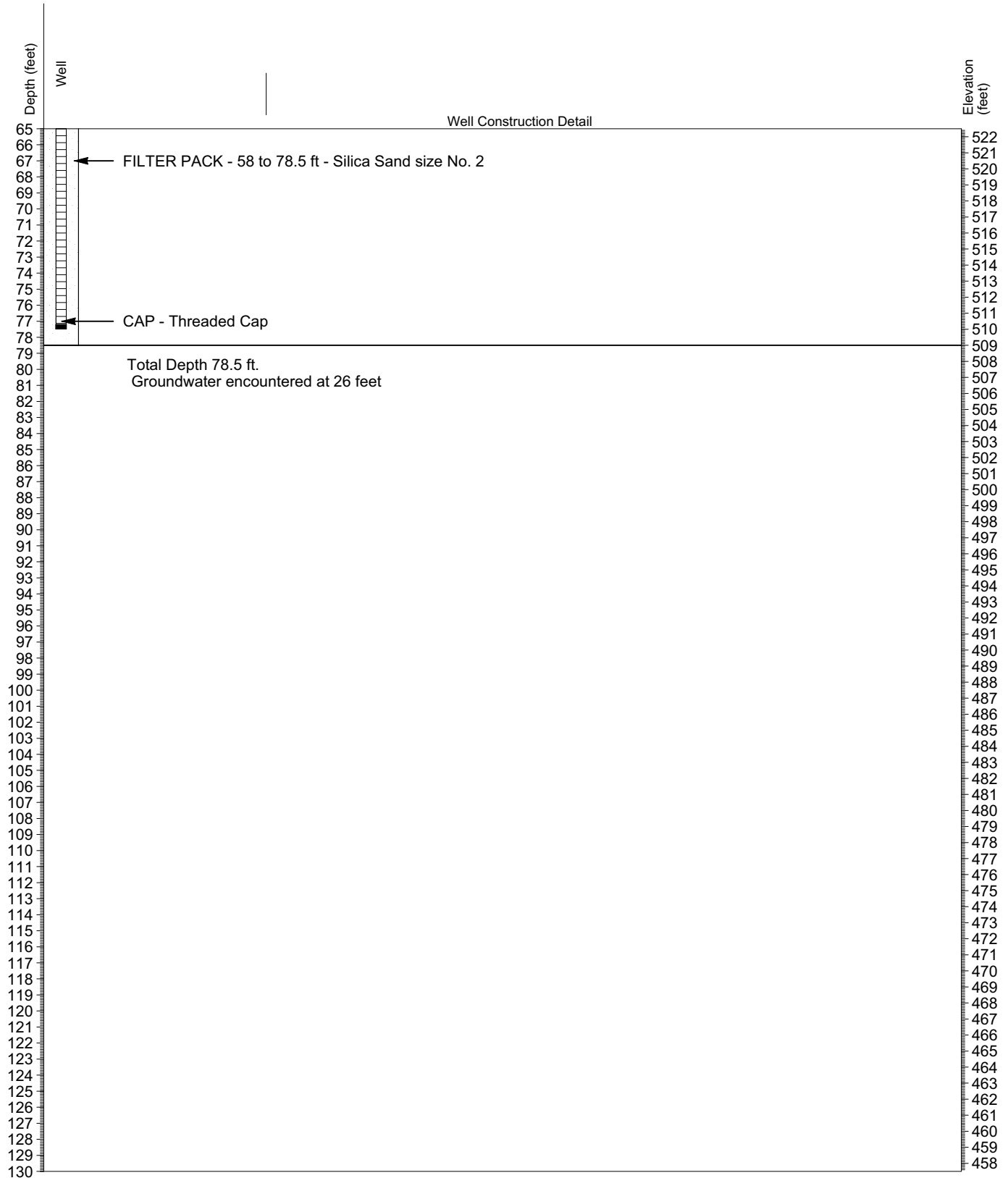
Project Name and Job Number



Lee Nuclear Station COL

6234-06-3389

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WELL CONSTRUCTION LOG - MW-1202 (well)



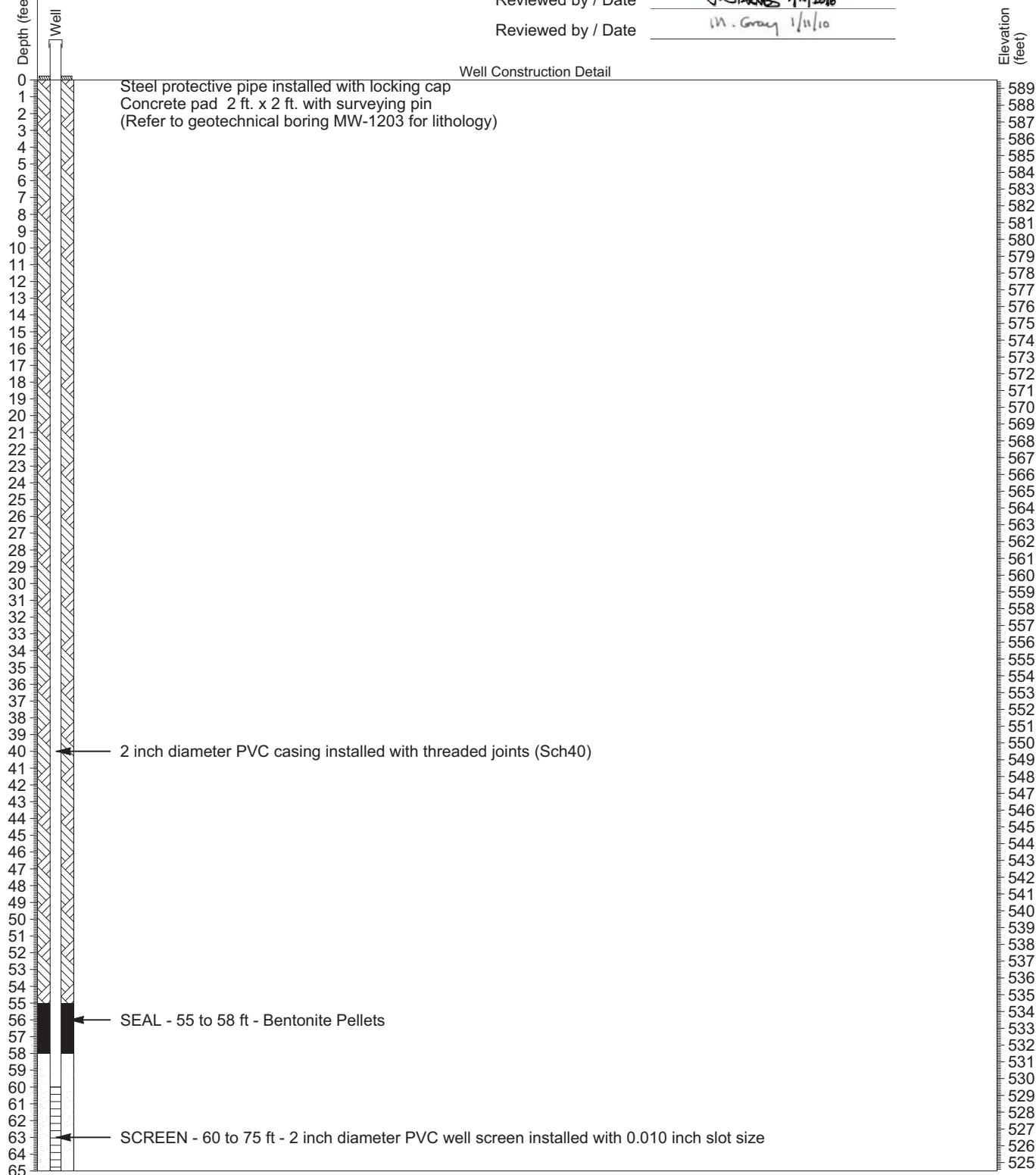
Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 	WELL CONSTRUCTION LOG - MW-1203 (well)	
Type and Diameter of Boring Air Rotary / 6 inch		Boring Location Cooling Tower Unit 2 N 1166702.12 E 1847838.422		Total Depth 77.0 feet
Drilling Contractor and Rig Geologic Exp / Mantak / D25KW		Elevation and Datum 589.5 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Casing Size and Depth 2 inch / 75 feet	Top of Casing Elevation 591.9 feet	Length of Core Barrel and Bit N/A	No. of Core Boxes N/A	Date Started 4/11/06
		Borehole Inclination -90	Logged by J. Jordan	Date Completed 4/11/06

Reviewed by / Date

J. STARKES 1/11/2010

Reviewed by / Date

M. Gray 1/11/10



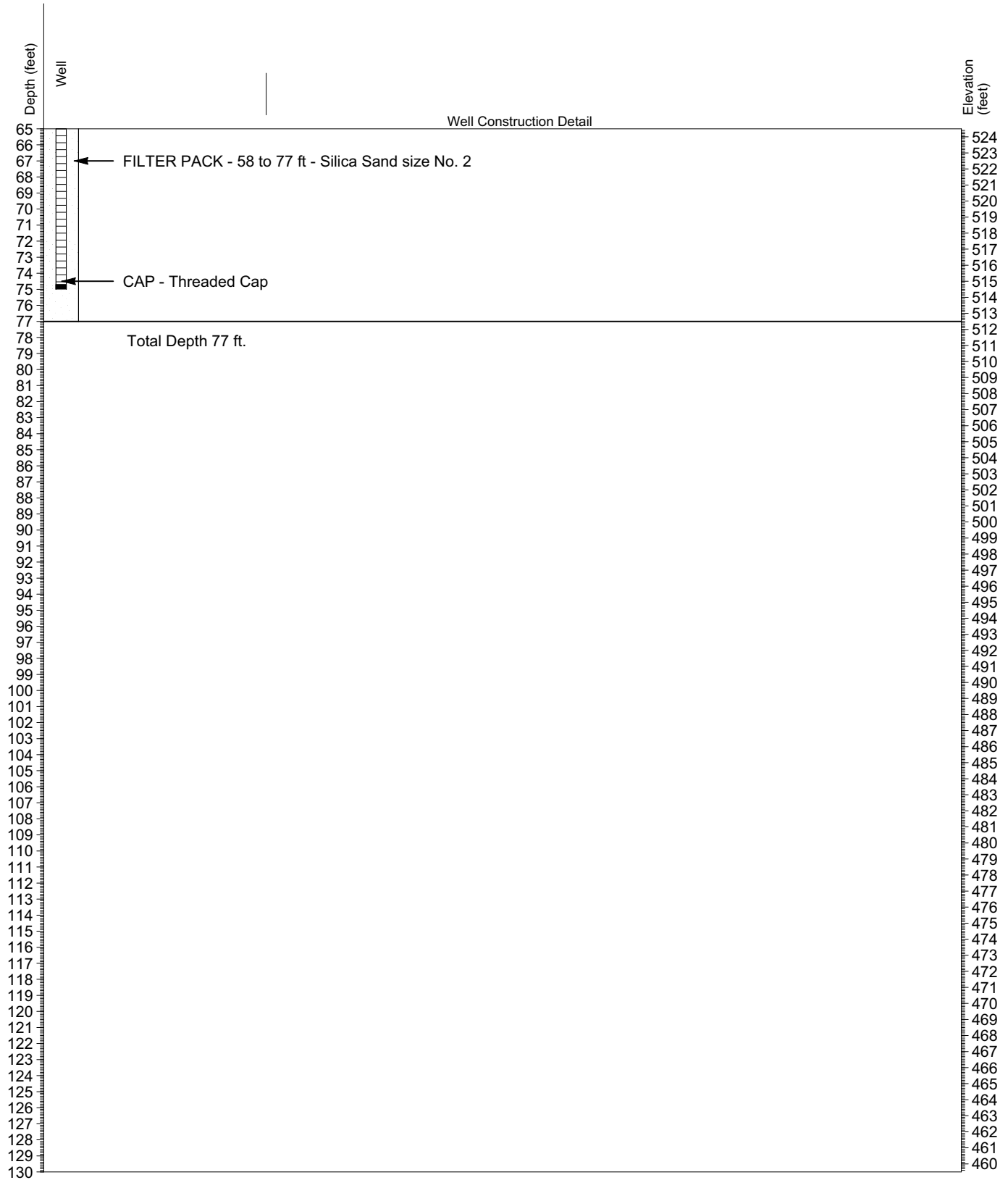
Project Name and Job Number



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WELL CONSTRUCTION LOG - MW-1203 (well)



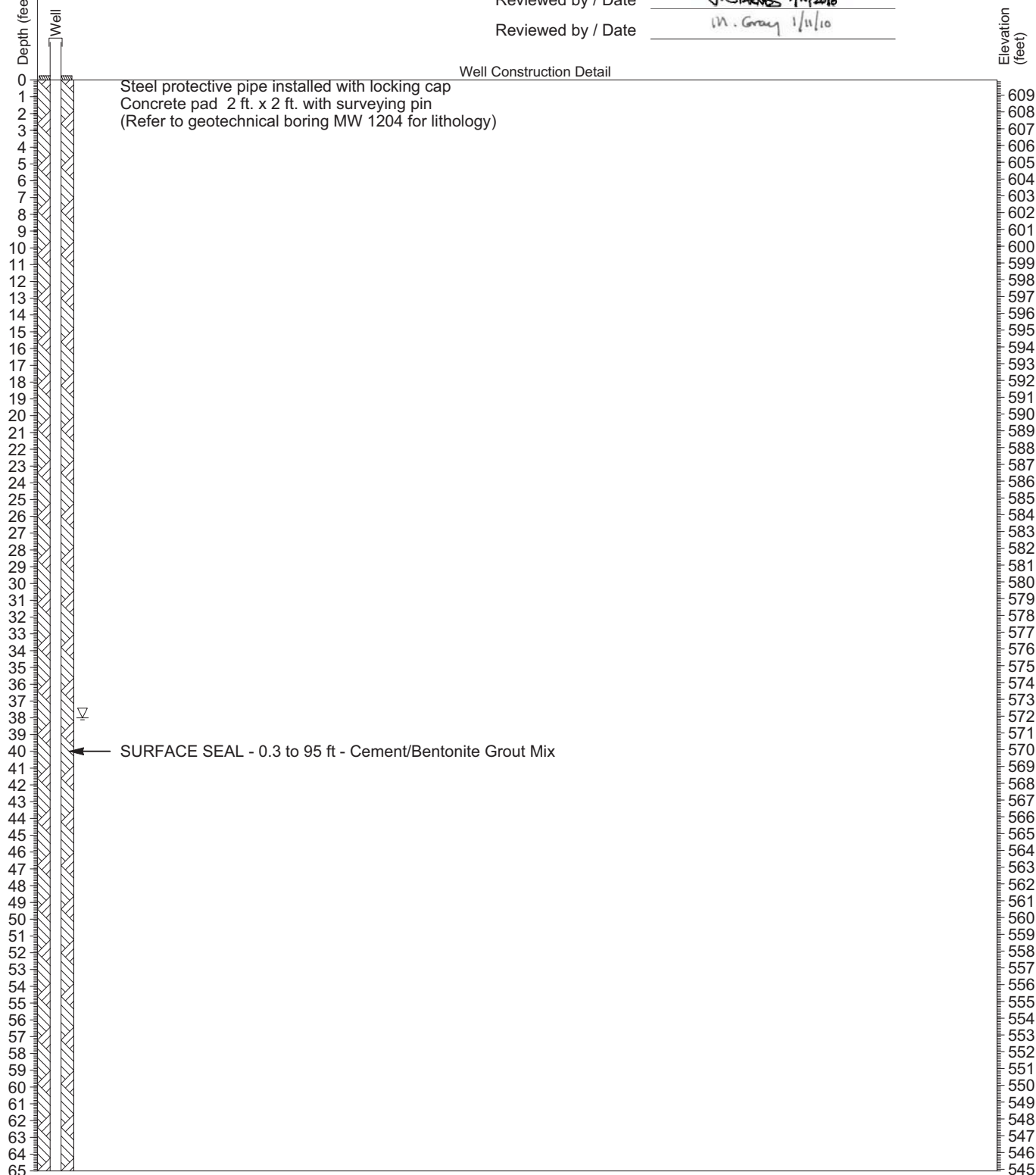
Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 	WELL CONSTRUCTION LOG - MW-1204 (well)	
Type and Diameter of Boring Hollow stem / Air Rotary / 6 inch		Boring Location Cooling Tower Unit 2 N 1166141.154 E 1848033.4		Total Depth 115.0 feet
Drilling Contractor and Rig Geologic Exp / Mantak / D120/D25KW		Elevation and Datum 609.9 feet MSL	Ground Water Depth 38 feet	Depth to Bedrock N/A
Casing Size and Depth 2 inch / 114 feet	Top of Casing Elevation 612.4 feet	Length of Core Barrel and Bit N/A	No. of Core Boxes N/A	Date Started 4/14/06
		Borehole Inclination -90	Logged by J. Cerceo	Date Completed 4/14/06

Reviewed by / Date

J. STARKES 1/11/2010

Reviewed by / Date

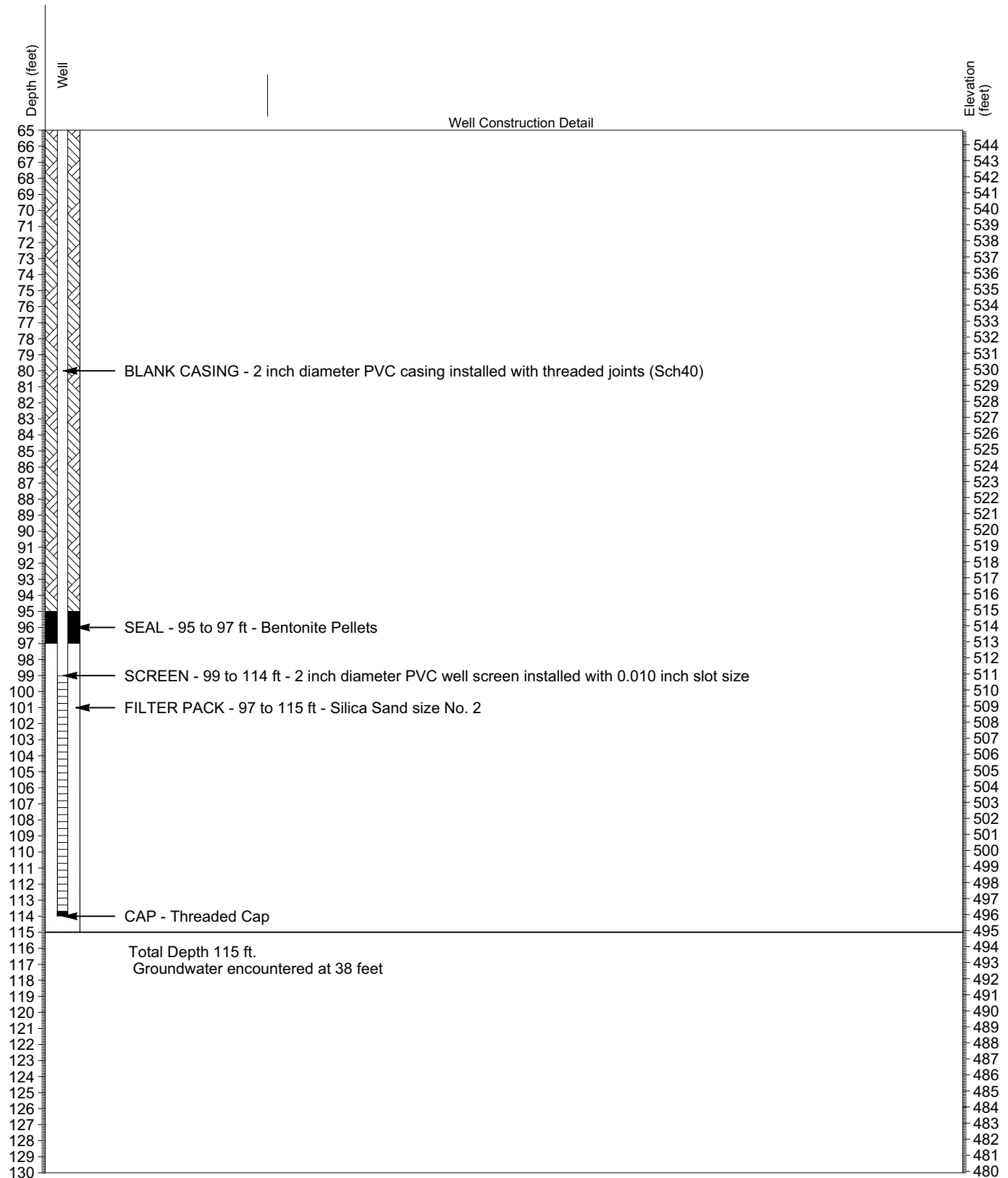
M. Gray 1/11/10





Project Name and Job Number

Lee Nuclear Station COL

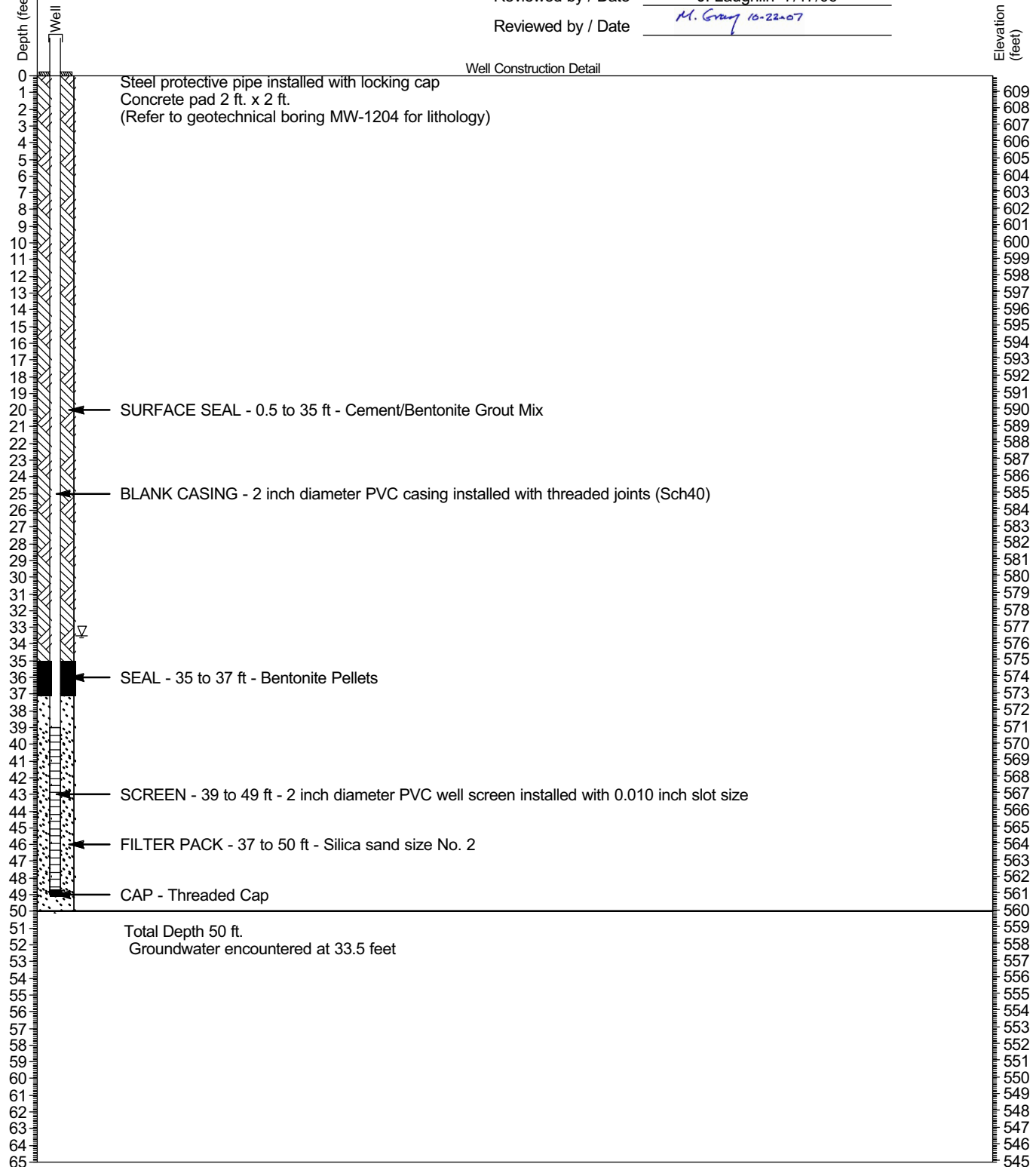
6234-06-3389



**WELL CONSTRUCTION LOG - MW-1204 (well)**

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		  WELL CONSTRUCTION LOG - MW-1204A (well)		
Type and Diameter of Boring Hollow stem auger / 8.25 inch		Boring Location Cooling Tower Pad N 1166133.724 E 1848034.258		Total Depth 50 feet
Drilling Contractor and Rig Geologic Exp / Mantak / D120		Elevation and Datum 609.9 feet MSL	Ground Water Depth 33.5 feet	Depth to Bedrock N/A
Casing Size and Depth 2 inch / 49 feet	Top of Casing Elevation 612.4 feet	Length of Core Barrel and Bit N/A	No. of Core Boxes N/A	Date Started 7/17/06
		Borehole Inclination -90	Logged by J. Laughlin	Date Completed 7/17/06

Reviewed by / Date J. Laughlin 7/17/06

Reviewed by / Date M. Gray 10-22-07



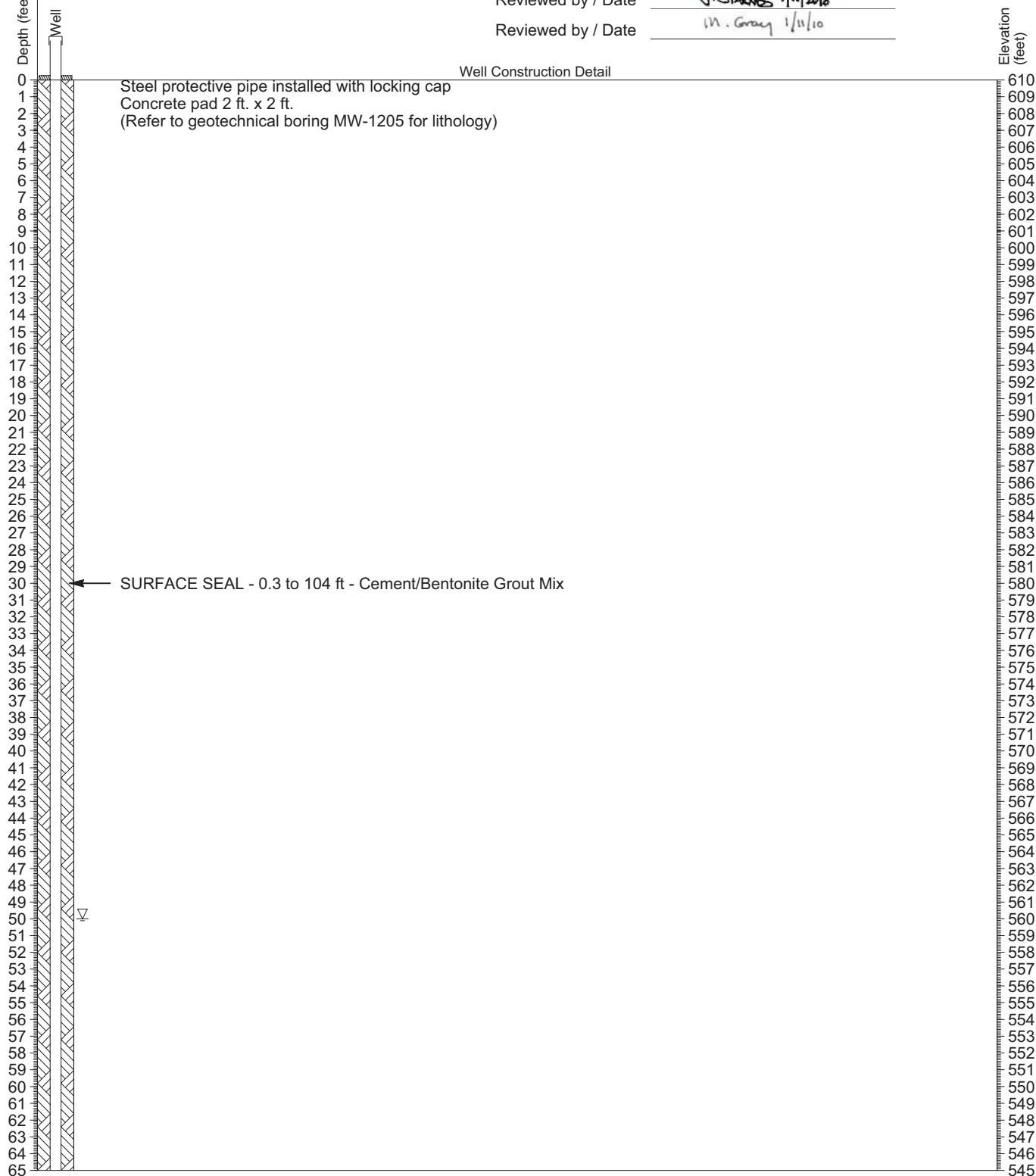
Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 	WELL CONSTRUCTION LOG - MW-1205 (well)	
Type and Diameter of Boring Hollow stem / Air Rotary / 10 inch / 6 inch		Boring Location General site N 1165631.431 E 1848304.849		Total Depth 124.0 feet
Drilling Contractor and Rig Geologic Exp / Mantak / D120/D25KW		Elevation and Datum 610 feet MSL	Ground Water Depth 50 feet	Depth to Bedrock N/A
Casing Size and Depth 2 inch / 123 feet	Top of Casing Elevation 612.6 feet	Length of Core Barrel and Bit N/A	No. of Core Boxes N/A	Date Started 4/15/06
		Borehole Inclination -90	Logged by J. Cerceo	Date Completed 4/15/06

Reviewed by / Date

J. STARNES 1/11/2010

Reviewed by / Date

M. Gray 1/11/10



Project Name and Job Number

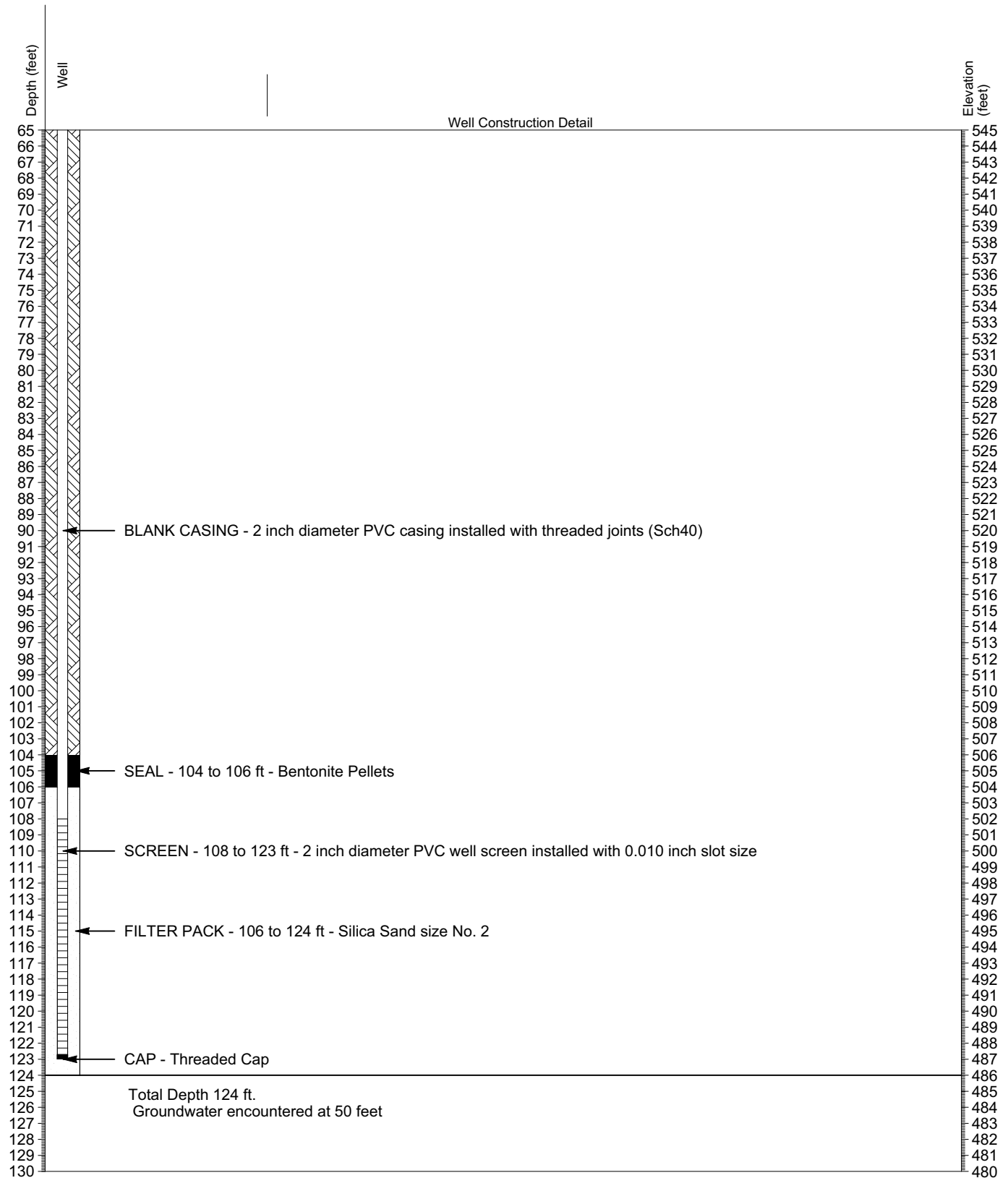
Lee Nuclear Station COL



6234-06-3389

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WELL CONSTRUCTION LOG - MW-1205 (well)



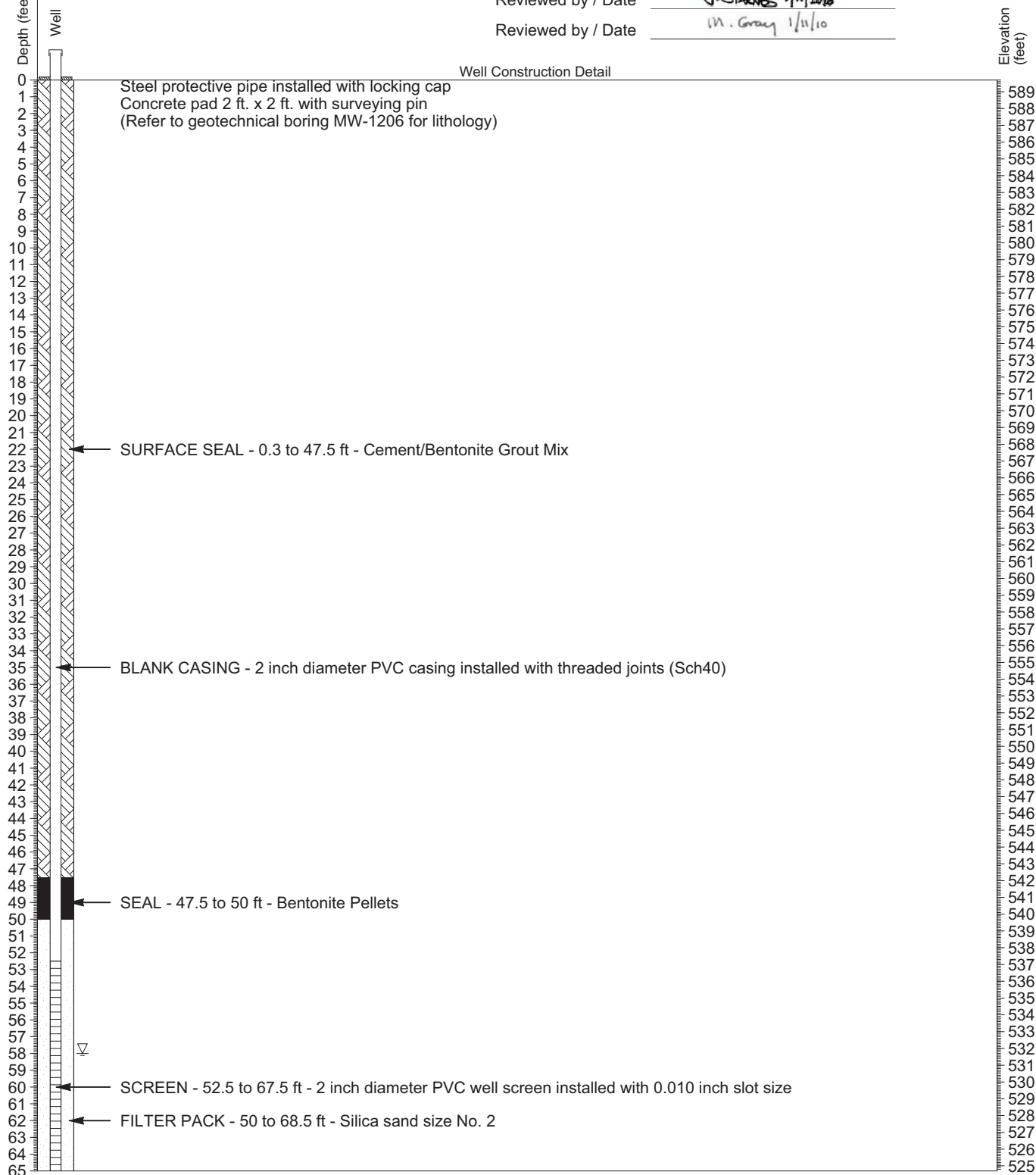
Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 	WELL CONSTRUCTION LOG - MW-1206 (well)	
Type and Diameter of Boring Hollow stem / Air Rotary / 10 inch / 6 inch		Boring Location General site N 1166655.908 E 1846689.086		Total Depth 68.5 feet
Drilling Contractor and Rig Geologic Exp / Mantak / D120/D25KW		Elevation and Datum 589.7 feet MSL	Ground Water Depth 58 feet	Depth to Bedrock N/A
Casing Size and Depth 2 inch / 67.5 feet	Top of Casing Elevation 591.5 feet	Length of Core Barrel and Bit N/A	No. of Core Boxes N/A	Date Started 4/18/06
		Borehole Inclination -90	Logged by J. Jordan	Date Completed 4/18/06

Reviewed by / Date

J. STARNES 1/11/2010

Reviewed by / Date

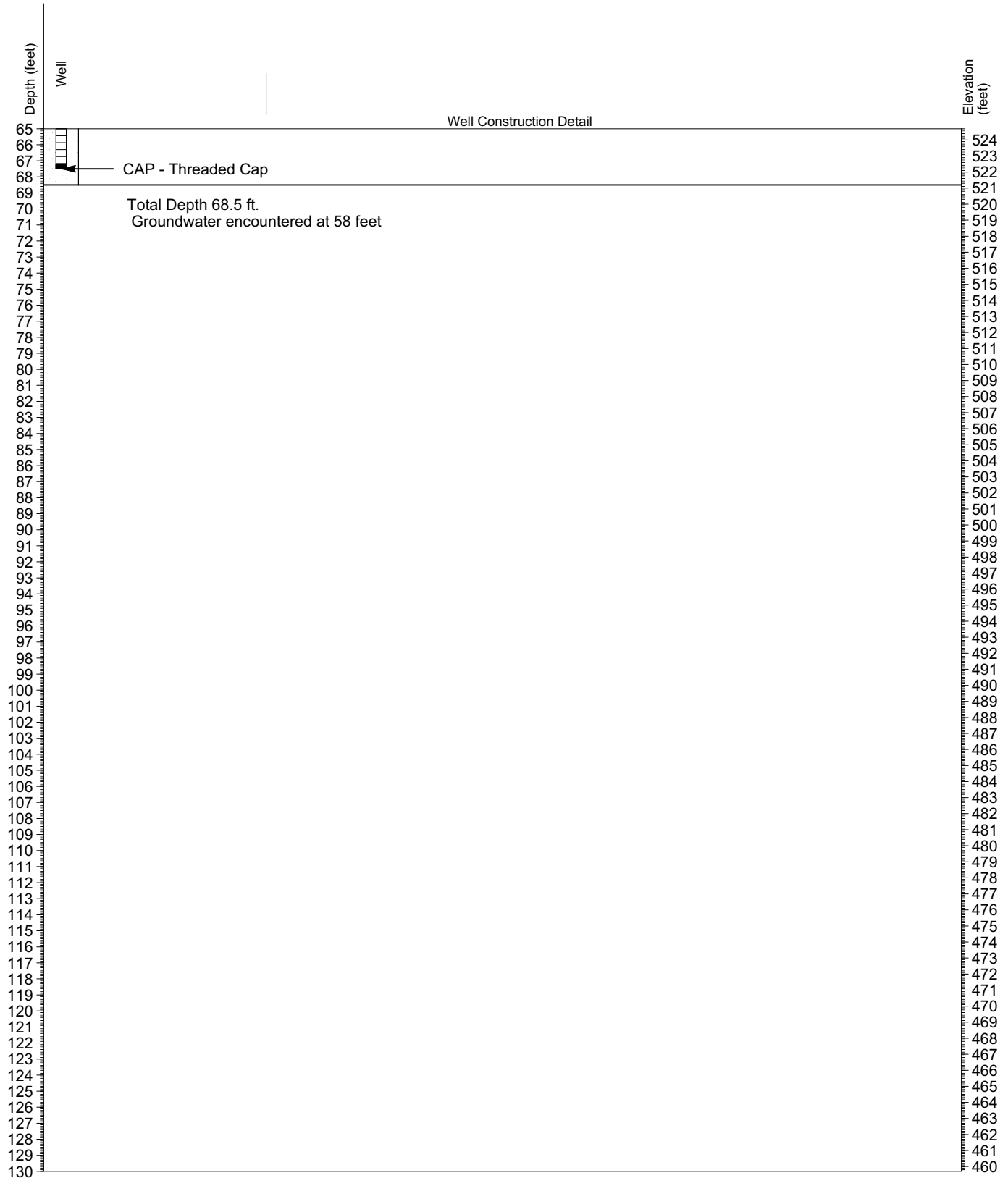
M. Gray 1/11/10





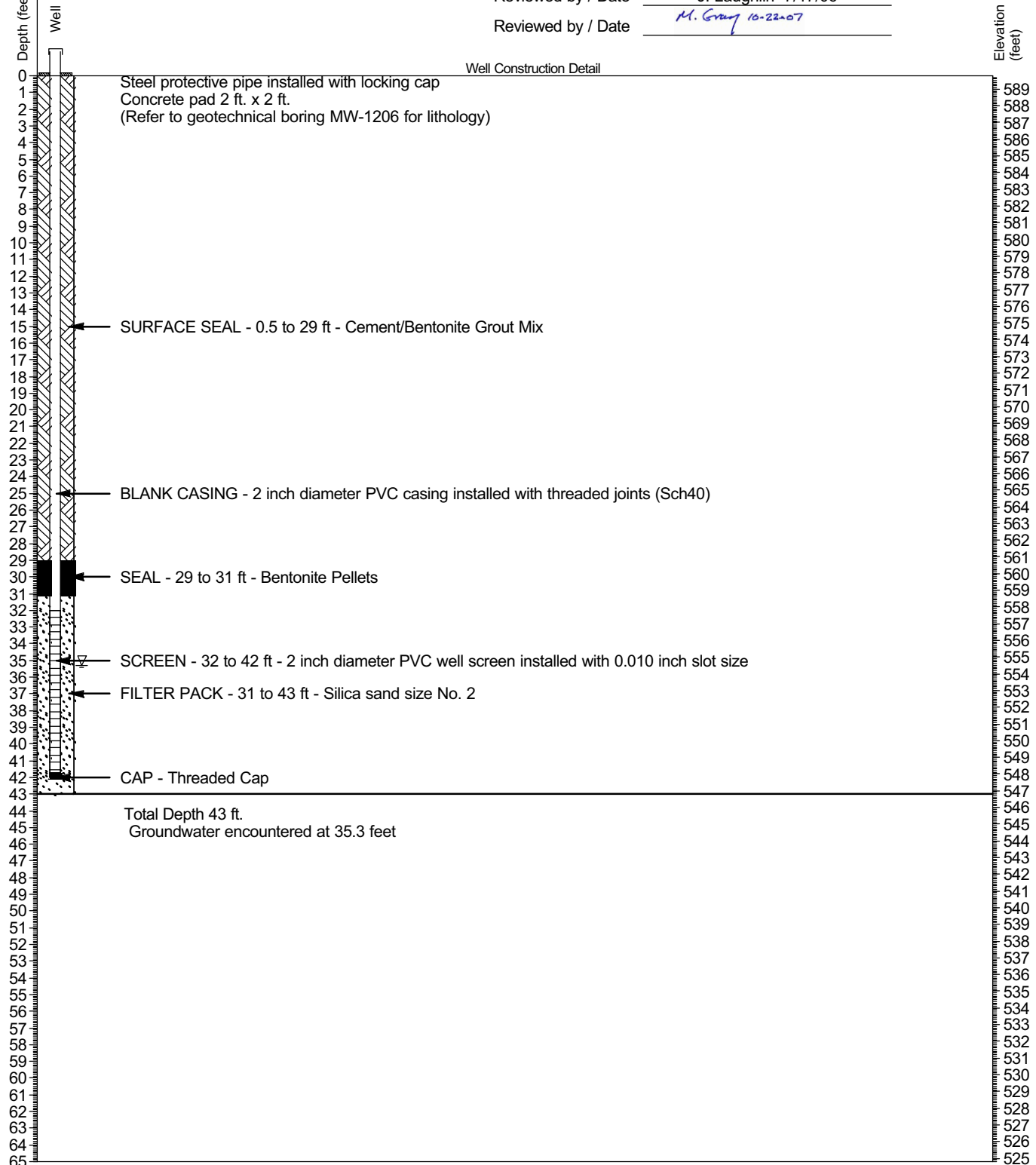
Project Name and Job Number



Lee Nuclear Station COL

6234-06-3389

**WELL CONSTRUCTION LOG - MW-1206 (well)**

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		  WELL CONSTRUCTION LOG - MW-1206A (well)		
Type and Diameter of Boring Hollow stem auger / 8.25 inch		Boring Location General site N 1166656.288 E 1846693.299		Total Depth 43 feet
Drilling Contractor and Rig Geologic Exp / Mantak / D120		Elevation and Datum 589.8 feet MSL	Ground Water Depth 35.3 feet	Depth to Bedrock N/A
Casing Size and Depth 2 inch / 42 feet	Top of Casing Elevation 591.4 feet	Length of Core Barrel and Bit N/A	No. of Core Boxes N/A	Date Started 7/17/06
		Borehole Inclination -90	Logged by J. Laughlin	Date Completed 7/17/06

Reviewed by / Date J. Laughlin 7/17/06Reviewed by / Date M. Gray 10-22-07

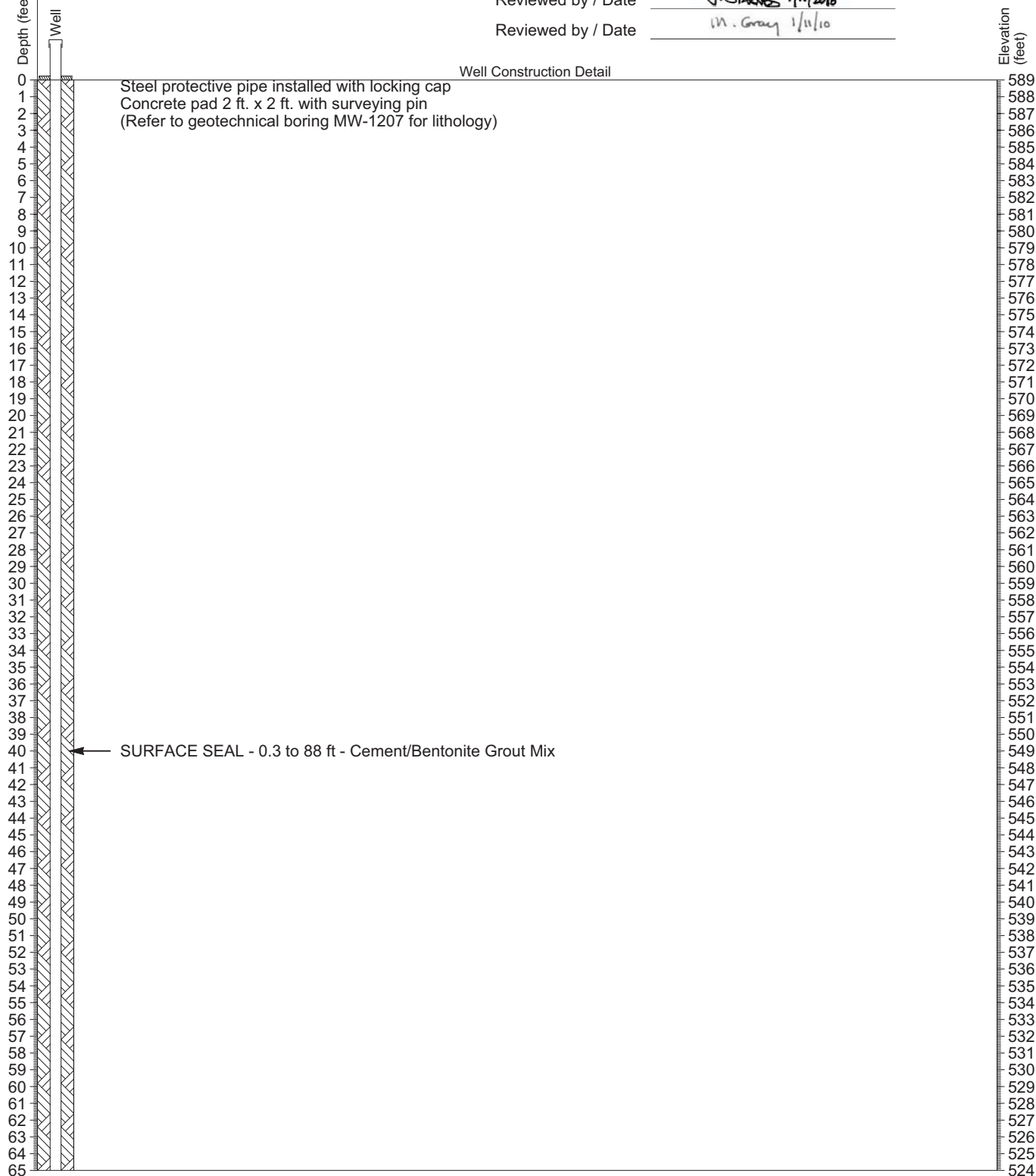
Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 	WELL CONSTRUCTION LOG - MW-1207 (well)	
Type and Diameter of Boring Hollow stem / Air Rotary / 10 inch / 6 inch		Boring Location General site N 1166849.173 E 1846668.764		Total Depth 108.0 feet
Drilling Contractor and Rig Geologic Exp / Mantak / D120/D25KW		Elevation and Datum 589 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Casing Size and Depth 2 inch / 107.3 feet	Top of Casing Elevation 591.4 feet	Length of Core Barrel and Bit N/A	No. of Core Boxes N/A	Date Started 4/24/06
		Borehole Inclination -90	Logged by B. Reinicker	Date Completed 4/24/06

Reviewed by / Date

J. STARKES 1/11/2010

Reviewed by / Date

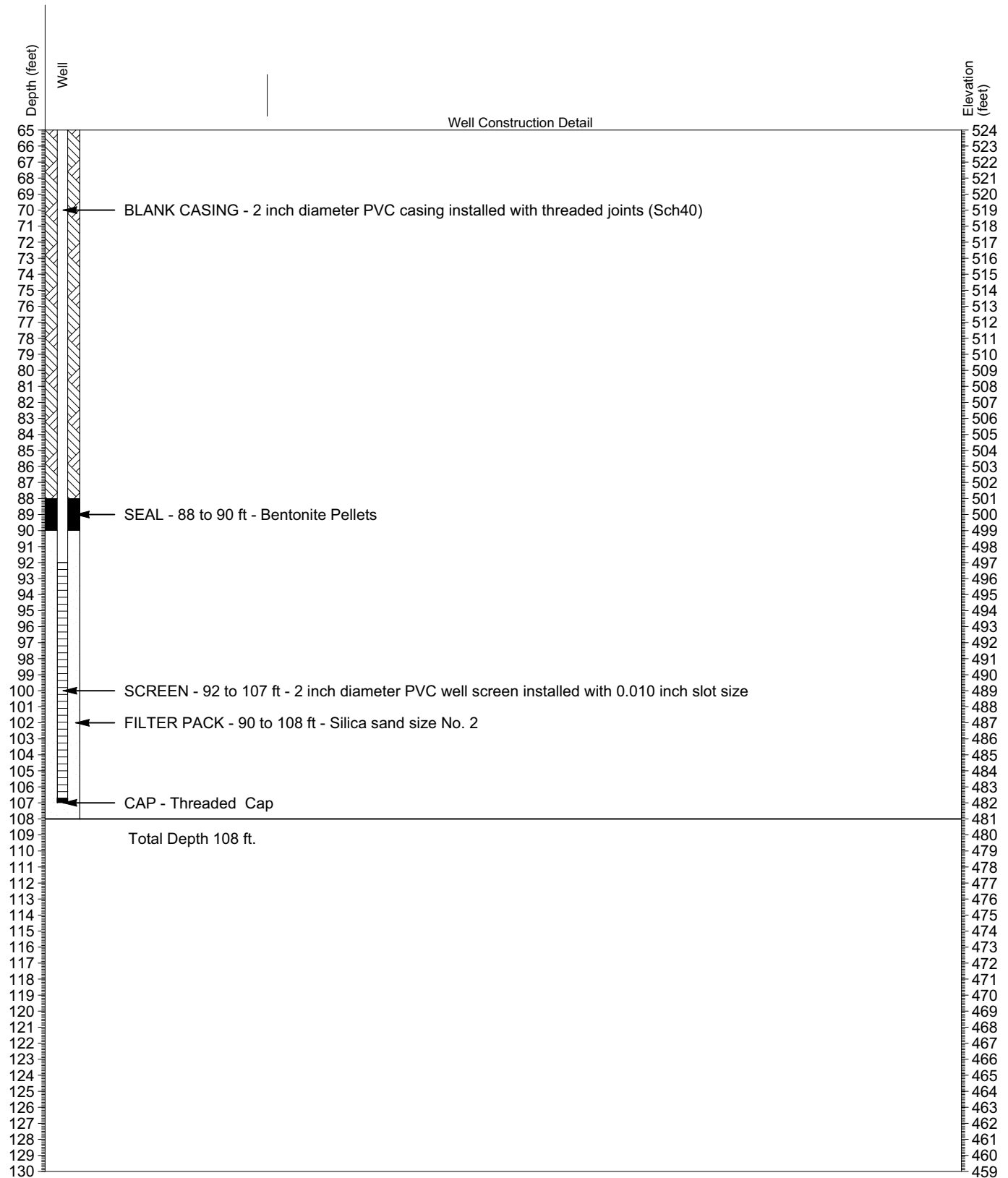
M. Gray 1/11/10





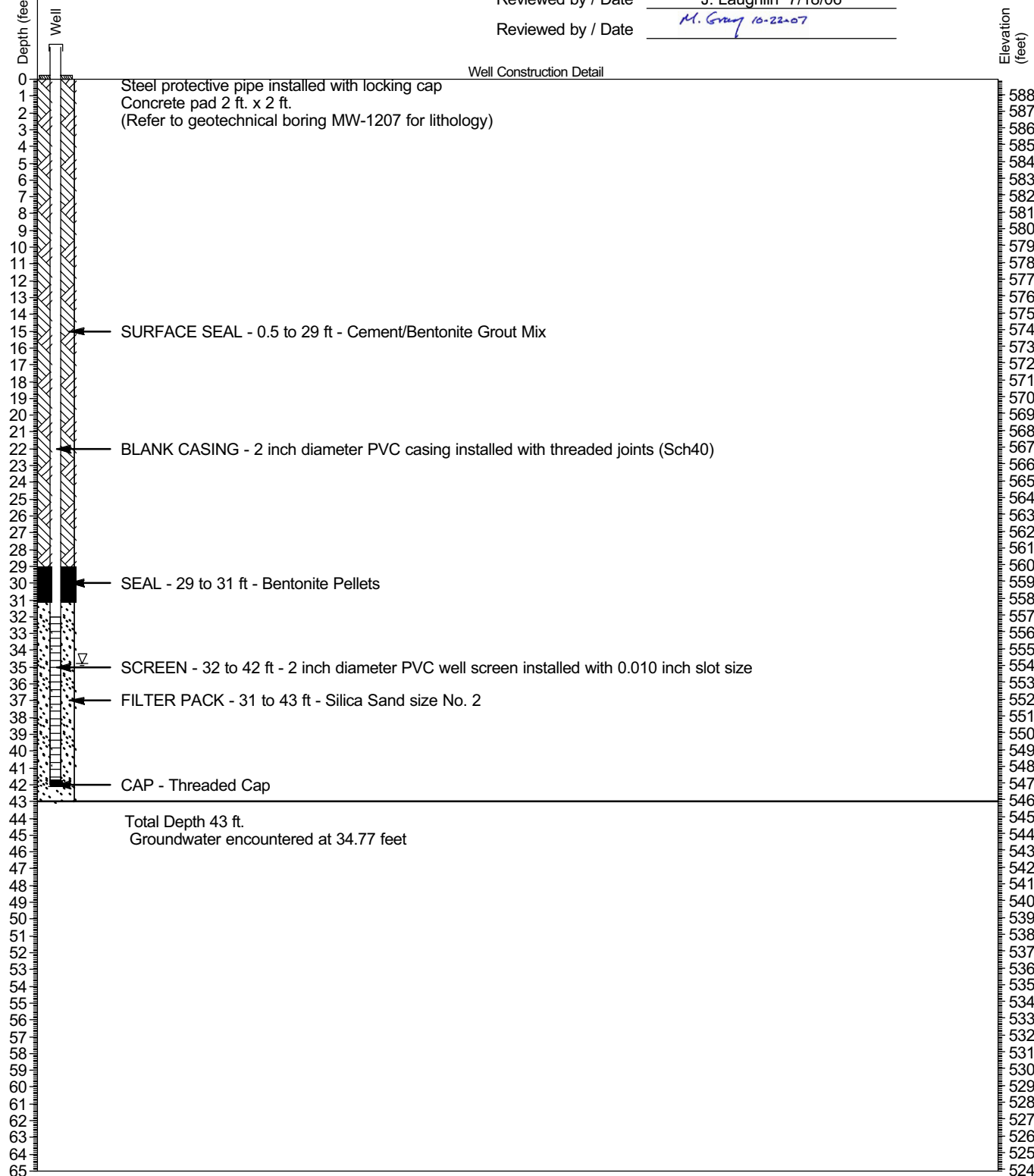
Project Name and Job Number



Lee Nuclear Station COL

6234-06-3389

**WELL CONSTRUCTION LOG - MW-1207 (well)**

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		  WELL CONSTRUCTION LOG - MW-1207A (well)		
Type and Diameter of Boring Hollow stem / 8.25 inch		Boring Location General site N 1166846.232 E 1846673.41		Total Depth 43 feet
Drilling Contractor and Rig Geologic Exp / Mantak / D120		Elevation and Datum 588.9 feet MSL	Ground Water Depth 34.77 feet	Depth to Bedrock N/A
Casing Size and Depth 2 inch / 42 feet	Top of Casing Elevation 591 feet	Length of Core Barrel and Bit N/A	No. of Core Boxes N/A	Date Started 7/18/06
		Borehole Inclination -90	Logged by J. Laughlin	Date Completed 7/18/06

Reviewed by / Date J. Laughlin 7/18/06Reviewed by / Date M. Gray 10-22-07

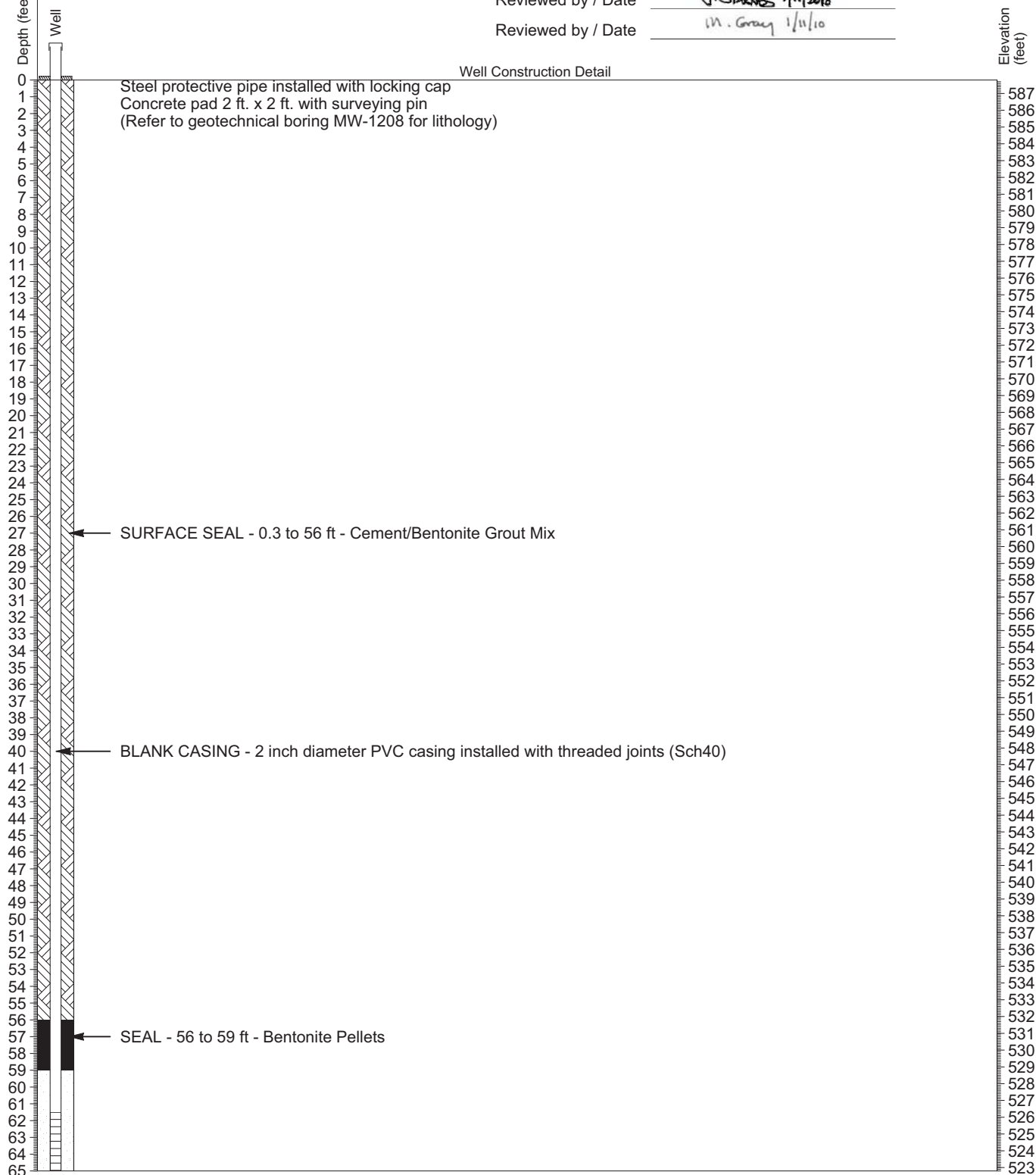
Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 	WELL CONSTRUCTION LOG - MW-1208 (well)	
Type and Diameter of Boring Hollow stem / Air Rotary / 10 inch / 6 inch		Boring Location General site N 1167188.532 E 1846583.513		Total Depth 79.0 feet
Drilling Contractor and Rig Geologic Exp / Mantak / D120/D25KW		Elevation and Datum 587.8 feet MSL	Ground Water Depth N/A	Depth to Bedrock N/A
Casing Size and Depth 2 inch / 76.5 feet	Top of Casing Elevation 590 feet	Length of Core Barrel and Bit N/A	No. of Core Boxes N/A	Date Started 4/13/06
		Borehole Inclination -90	Logged by J. Jordan	Date Completed 4/13/06

Reviewed by / Date

J. Sparks 1/11/2010

Reviewed by / Date

M. Gray 1/11/10



Project Name and Job Number

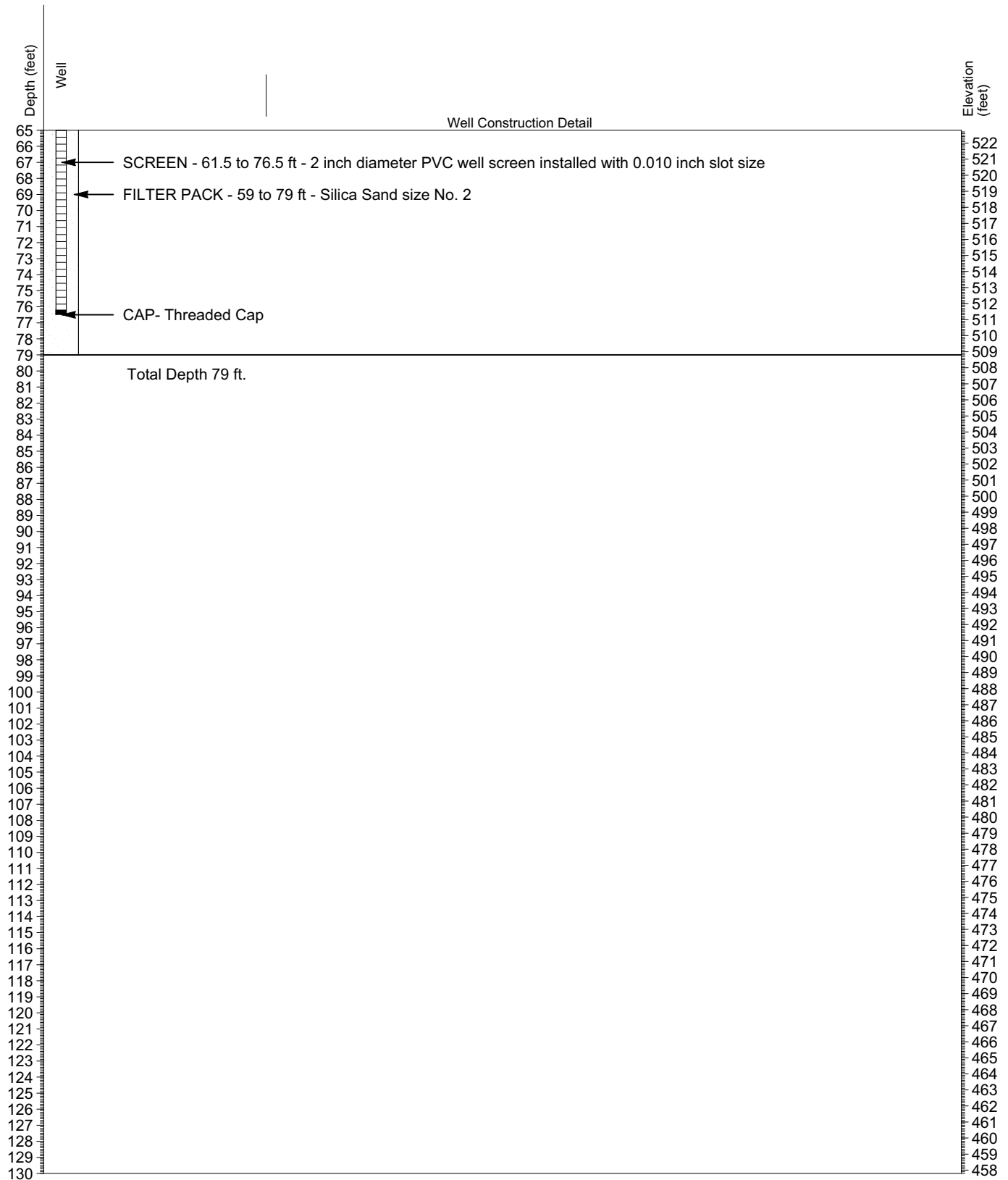
Lee Nuclear Station COL



6234-06-3389

 MACTEC

 WLA
William Lettis & Associates, Inc.

WELL CONSTRUCTION LOG - MW-1208 (well)



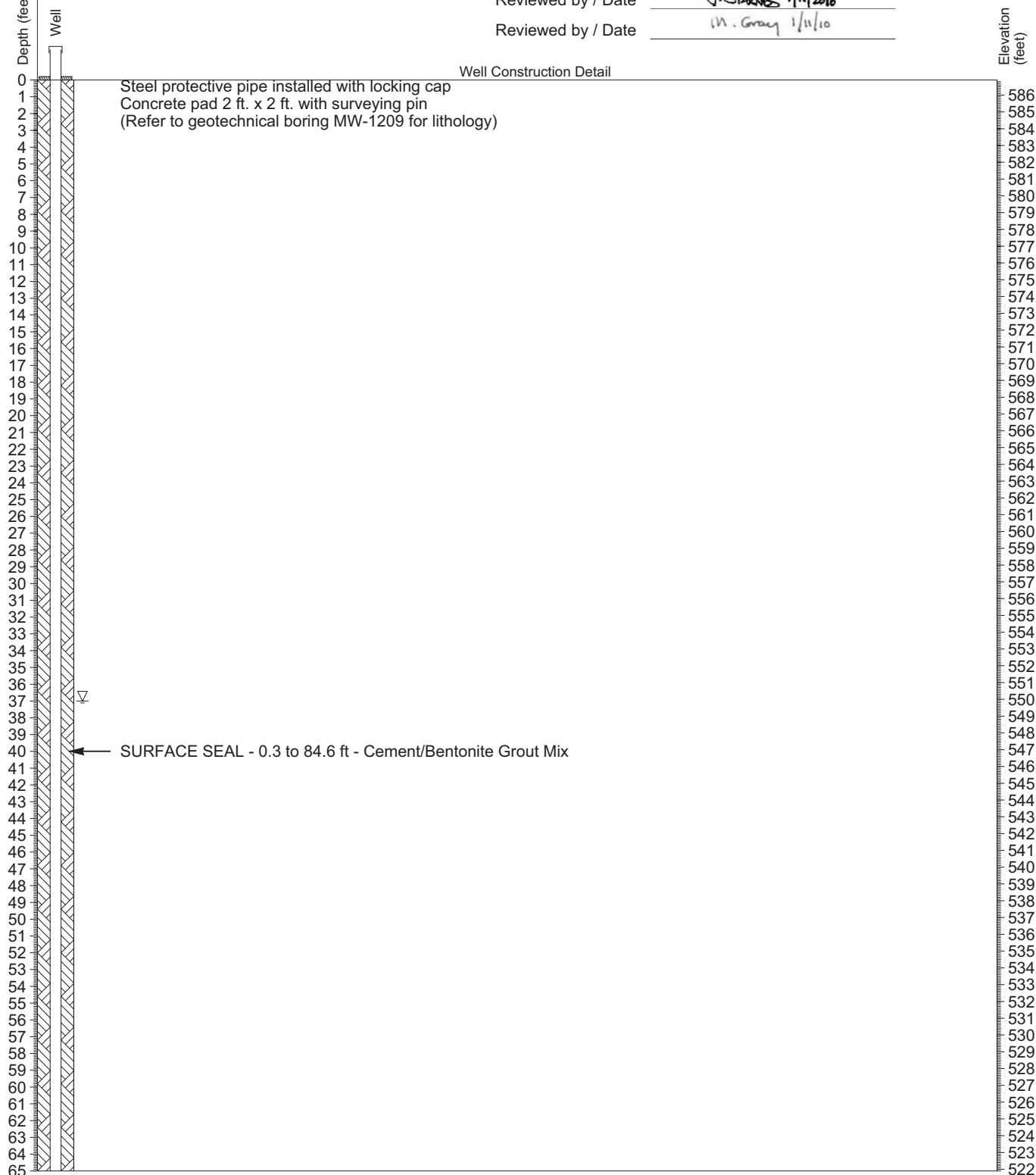
Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 	WELL CONSTRUCTION LOG - MW-1209 (well)	
Type and Diameter of Boring Hollow stem / Air Rotary / 10 inch / 6 inch		Boring Location General site N 1165084.761 E 1848071.547		Total Depth 106.0 feet
Drilling Contractor and Rig Geologic Exp / Mantak / D120/D25KW		Elevation and Datum 586.9 feet MSL	Ground Water Depth 37 feet	Depth to Bedrock N/A
Casing Size and Depth 2 inch / 104 feet	Top of Casing Elevation 588.9 feet	Length of Core Barrel and Bit N/A	No. of Core Boxes N/A	Date Started 4/18/06
		Borehole Inclination -90	Logged by J. Jordan	Date Completed 4/18/06

Reviewed by / Date

J. STARKES 1/11/2010

Reviewed by / Date

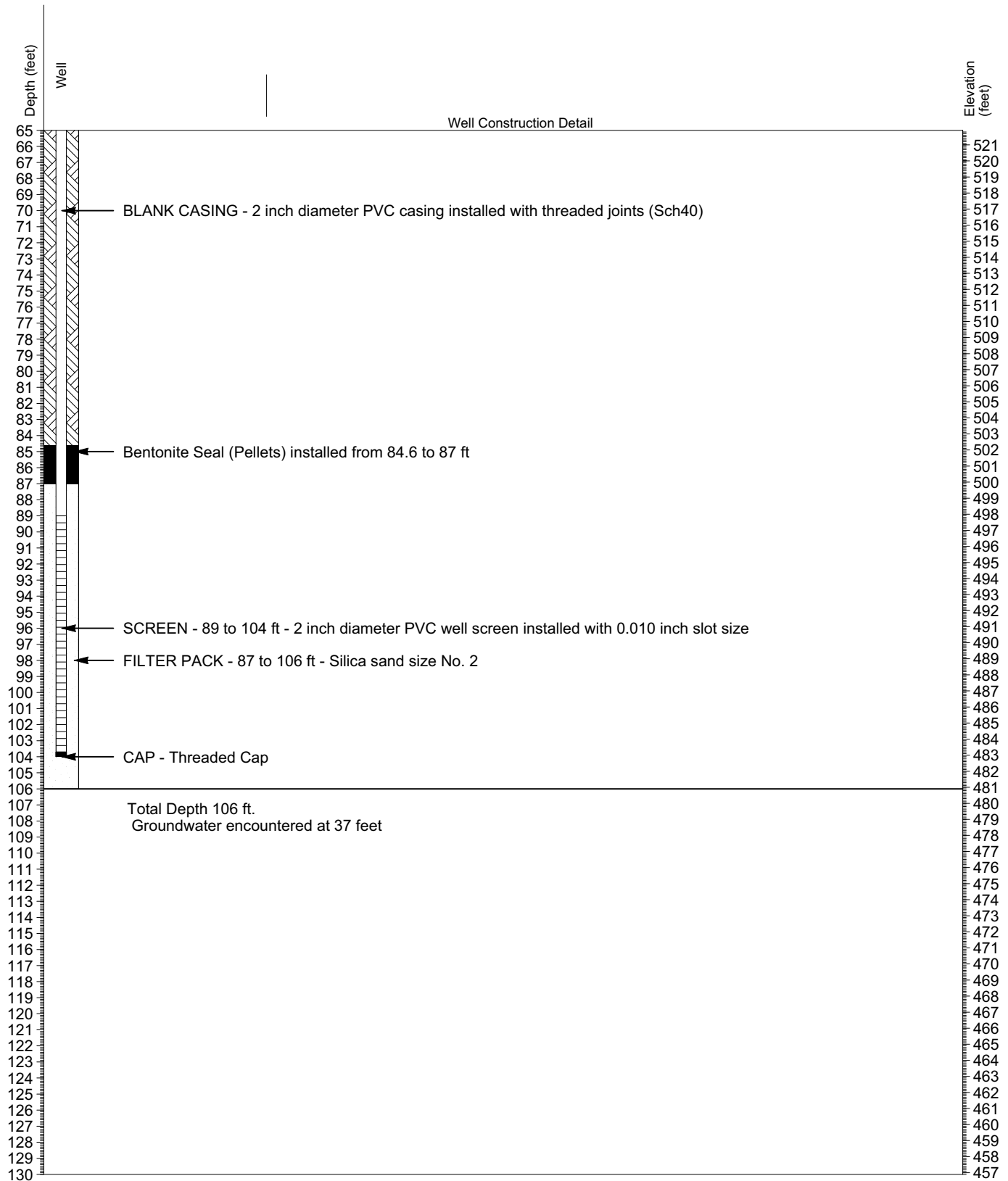
M. Gray 1/11/10





Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

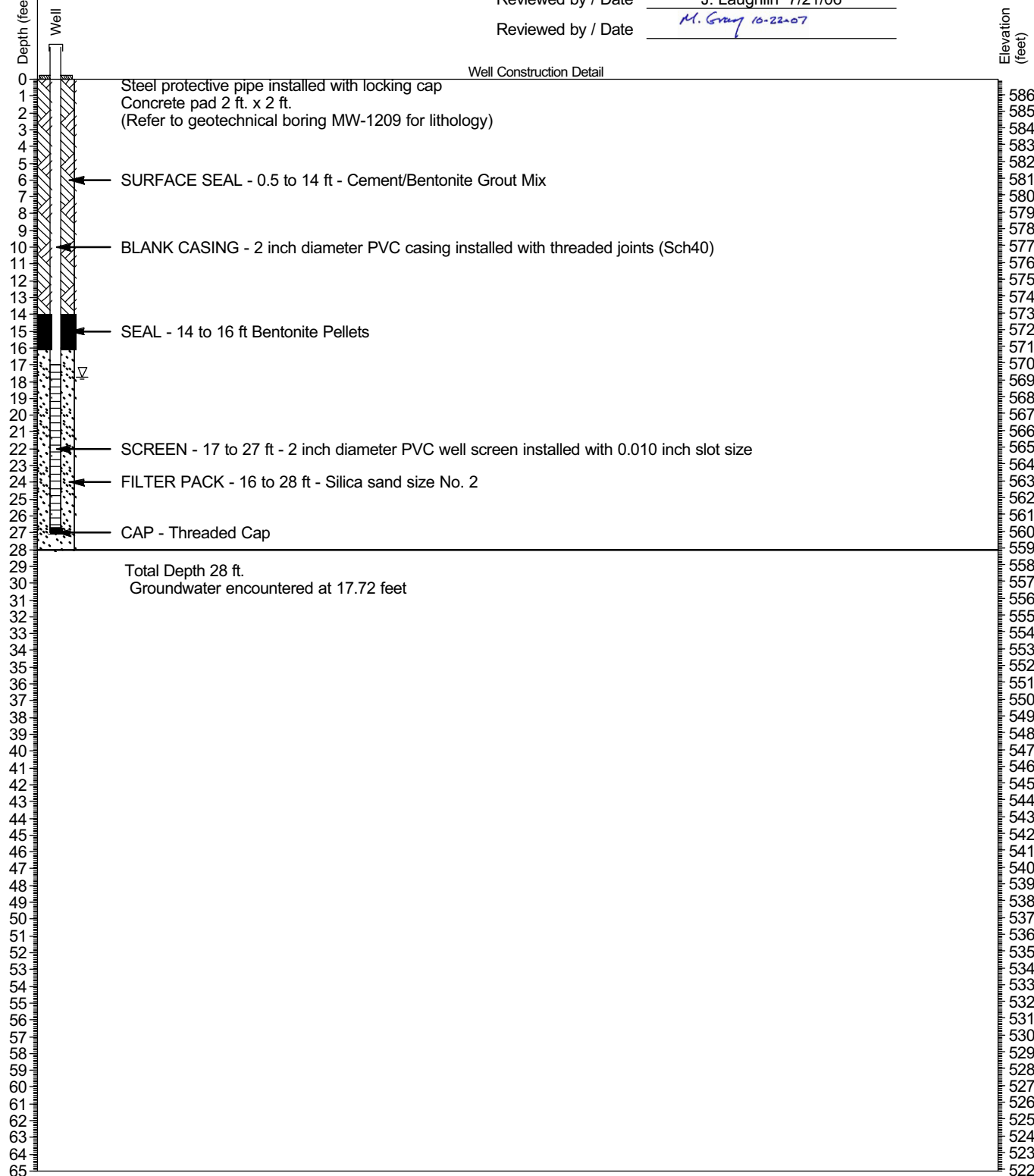




WELL CONSTRUCTION LOG - MW-1209 (well)



Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		  WELL CONSTRUCTION LOG - MW-1209A (well)		
Type and Diameter of Boring Hollow stem / 8.25 inch		Boring Location General site N 1165076.658 E 1848072.885		Total Depth 28 feet
Drilling Contractor and Rig Geologic Exp / Mantak / D120		Elevation and Datum 586.9 feet MSL	Ground Water Depth 17.72 feet	Depth to Bedrock N/A
Casing Size and Depth 2 inch / 27 feet	Top of Casing Elevation 589 feet	Length of Core Barrel and Bit N/A	No. of Core Boxes N/A	Date Started 7/17/06
		Borehole Inclination -90	Logged by J. Laughlin	Date Completed 7/17/06

Reviewed by / Date J. Laughlin 7/21/06

Reviewed by / Date *M. Gray 10-22-07*

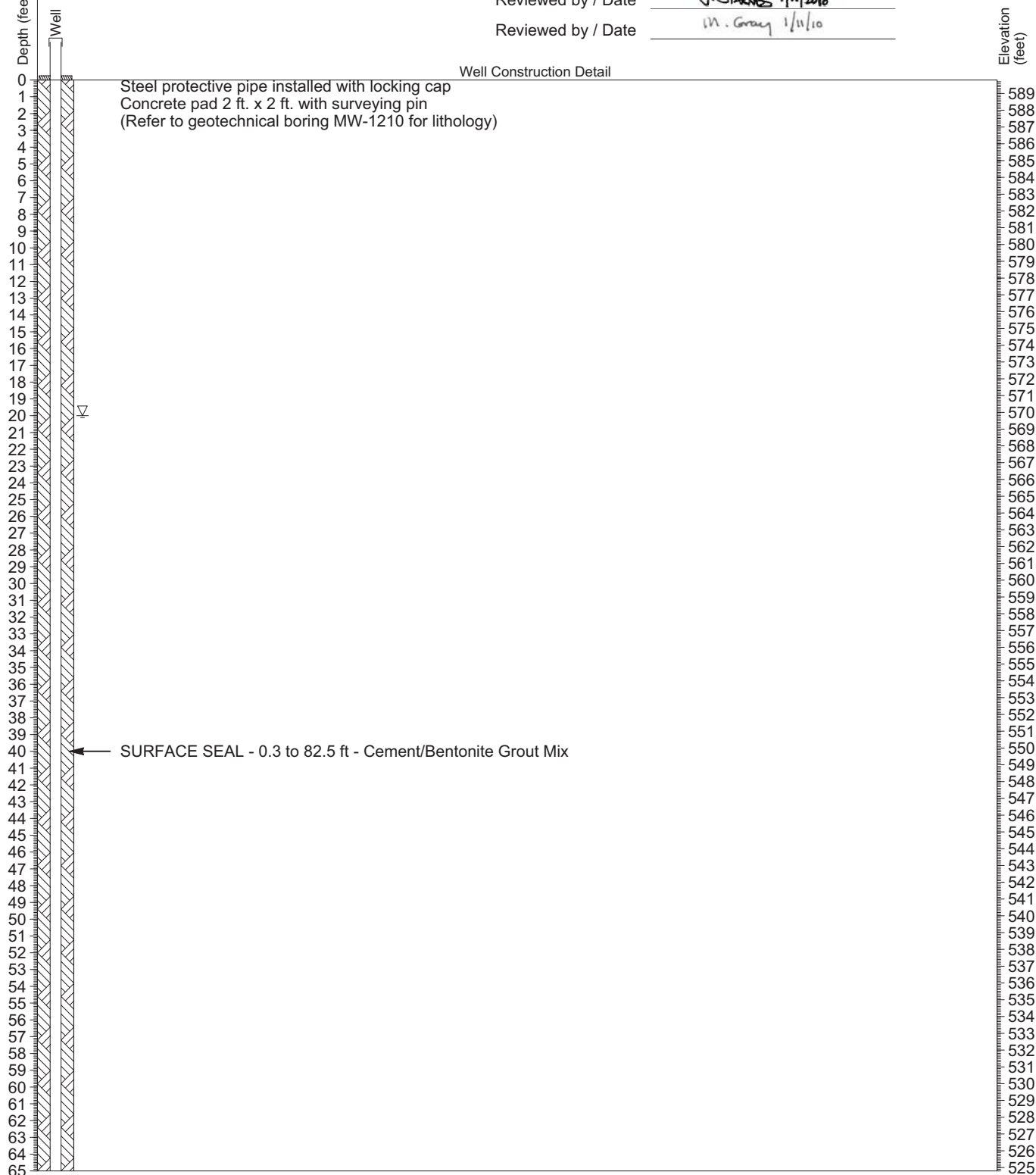
Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 	WELL CONSTRUCTION LOG - MW-1210 (well)	
Type and Diameter of Boring Hollow stem / Air Rotary / 10 inch / 6 inch		Boring Location Unit 2 adjacent N 1165321.305 E 1847439.208		Total Depth 101.5 feet
Drilling Contractor and Rig Geologic Exp / Mantak / D120/D25KW		Elevation and Datum 589.8 feet MSL	Ground Water Depth 20 feet	Depth to Bedrock N/A
Casing Size and Depth 2 inch / 101.5 feet	Top of Casing Elevation 592.3 feet	Length of Core Barrel and Bit N/A	No. of Core Boxes N/A	Date Started 4/15/06
		Borehole Inclination -90	Logged by J. Cerceo	Date Completed 4/16/06

Reviewed by / Date

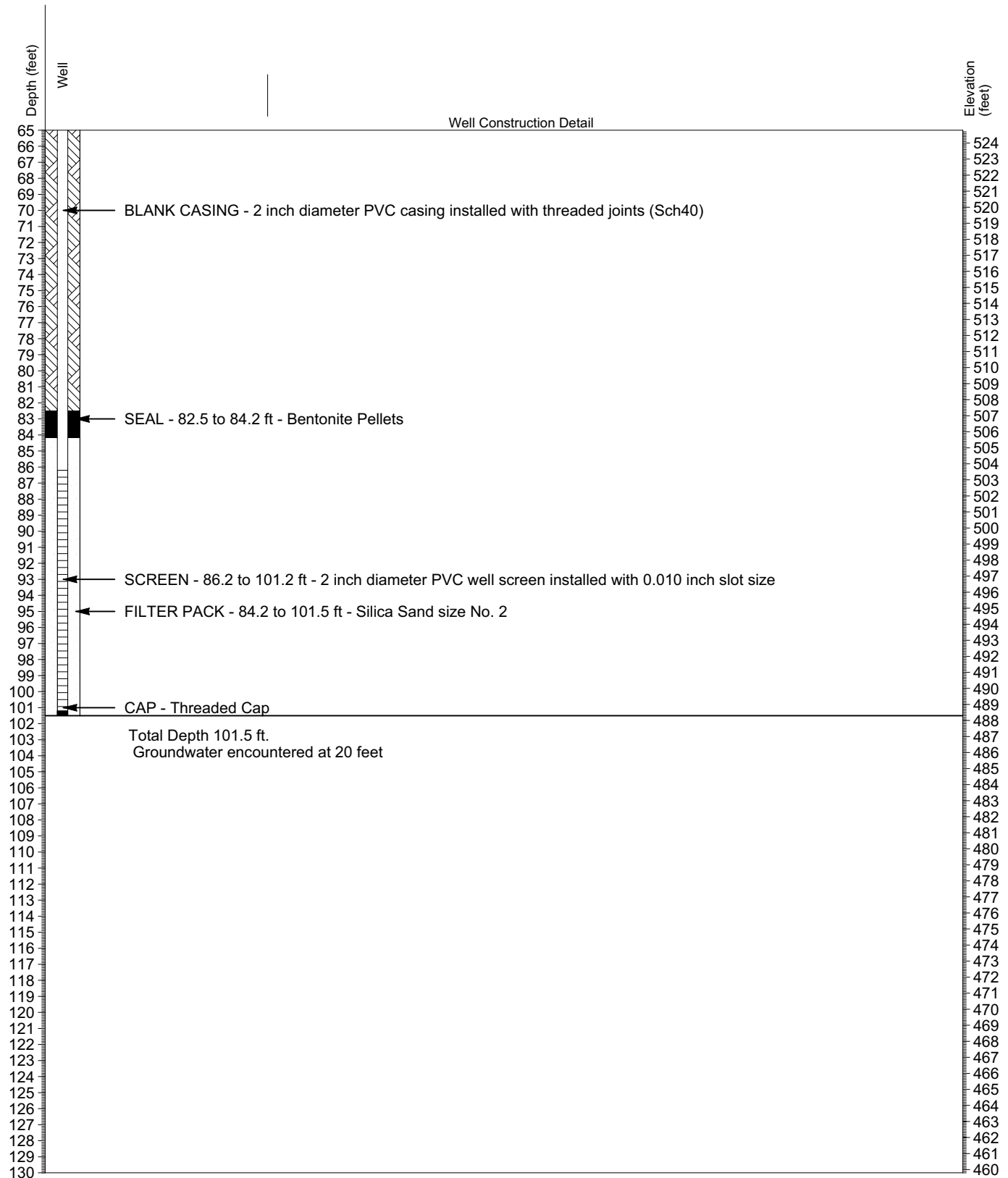
J. STARNES 1/11/2010



Reviewed by / Date

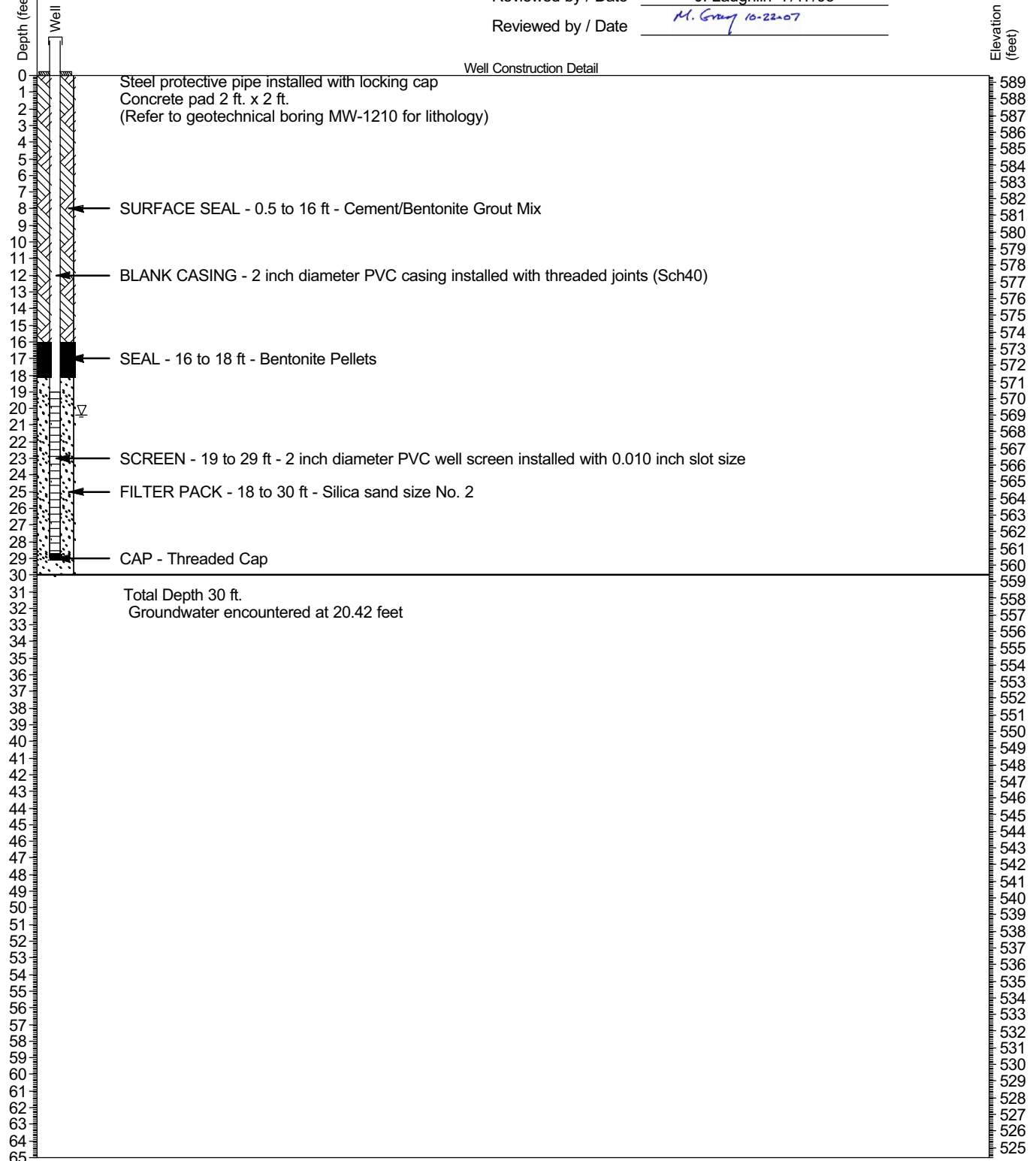
M. Gray 1/11/10





Project Name and Job Number

Lee Nuclear Station COL
6234-06-3389**MACTEC****WELL CONSTRUCTION LOG - MW-1210 (well)**

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		  WELL CONSTRUCTION LOG - MW-1210A (well)		
Type and Diameter of Boring Hollow stem auger / 8.25 inch		Boring Location Unit 2 adjacent N 1165312.832 E 1847436.803		Total Depth 30 feet
Drilling Contractor and Rig Geologic Exp / Mantak / D120		Elevation and Datum 589.4 feet MSL	Ground Water Depth 20.42 feet	Depth to Bedrock N/A
Casing Size and Depth 2 inch / 29 feet	Top of Casing Elevation 591.7 feet	Length of Core Barrel and Bit N/A	No. of Core Boxes N/A	Date Started 7/17/06
		Borehole Inclination -90	Logged by J. Laughlin	Date Completed 7/17/06

Reviewed by / Date J. Laughlin 7/17/06Reviewed by / Date M. Gray 10-22-07

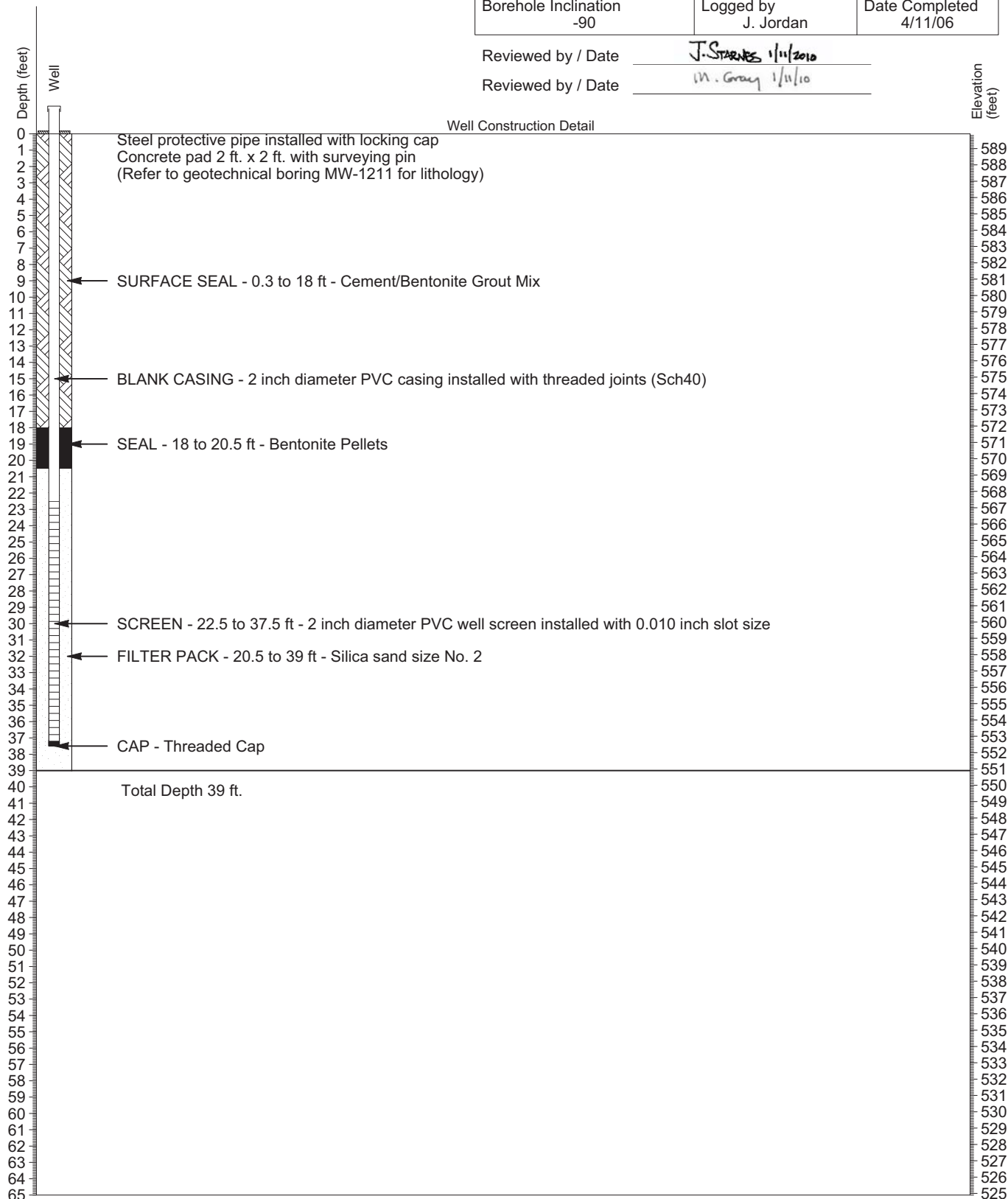
Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		WELL CONSTRUCTION LOG - MW-1211 (well)	
Type and Diameter of Boring Air Rotary / 6 inch		Boring Location Unit 1 adjacent N 1165197.583 E 1846406.261		Total Depth 39.0 feet	
Drilling Contractor and Rig Geologic Exp / Mantak / D25KW		Elevation and Datum 589.9 feet MSL		Ground Water Depth N/A	Depth to Bedrock N/A
Casing Size and Depth 2 inch / 37.5 feet	Top of Casing Elevation 591.6 feet	Length of Core Barrel and Bit N/A		No. of Core Boxes N/A	Date Started 4/11/06
		Borehole Inclination -90		Logged by J. Jordan	Date Completed 4/11/06



Reviewed by / Date

J. Starnes 1/11/2010

Reviewed by / Date

M. Gray 1/11/10



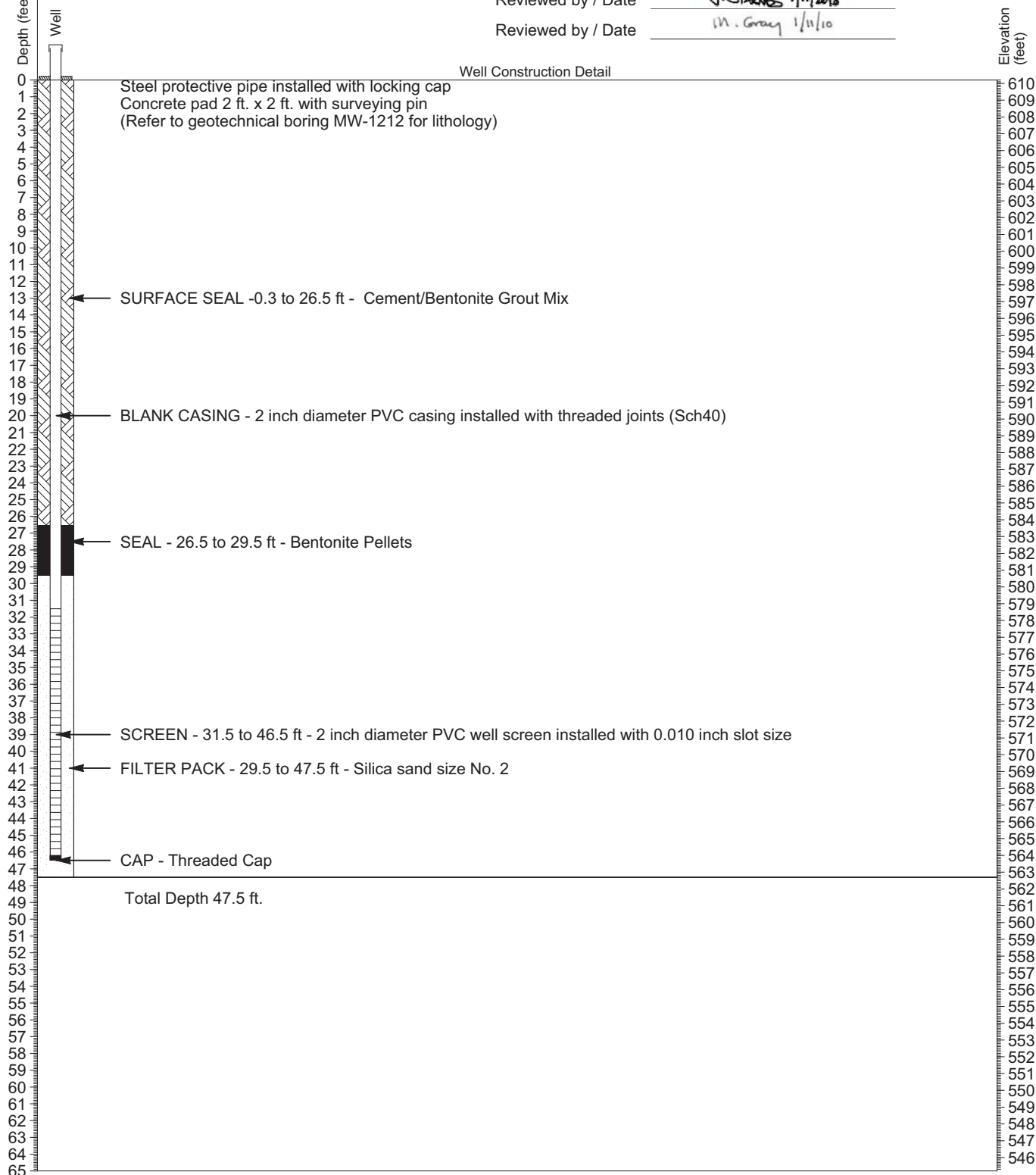
Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		WELL CONSTRUCTION LOG - MW-1212 (well)	
Type and Diameter of Boring Air Rotary / 6 inch		Boring Location Unit 1 CT N 1165365.927 E 1845452.195		Total Depth 47.5 feet	
Drilling Contractor and Rig Geologic Exp / Mantak / D25KW		Elevation and Datum 610.2 feet MSL		Ground Water Depth N/A	Depth to Bedrock N/A
Casing Size and Depth 2 inch / 46.5 feet	Top of Casing Elevation 612.3 feet	Length of Core Barrel and Bit N/A		No. of Core Boxes N/A	Date Started 4/10/06
		Borehole Inclination -90		Logged by J. Jordan	Date Completed 4/10/06



Reviewed by / Date

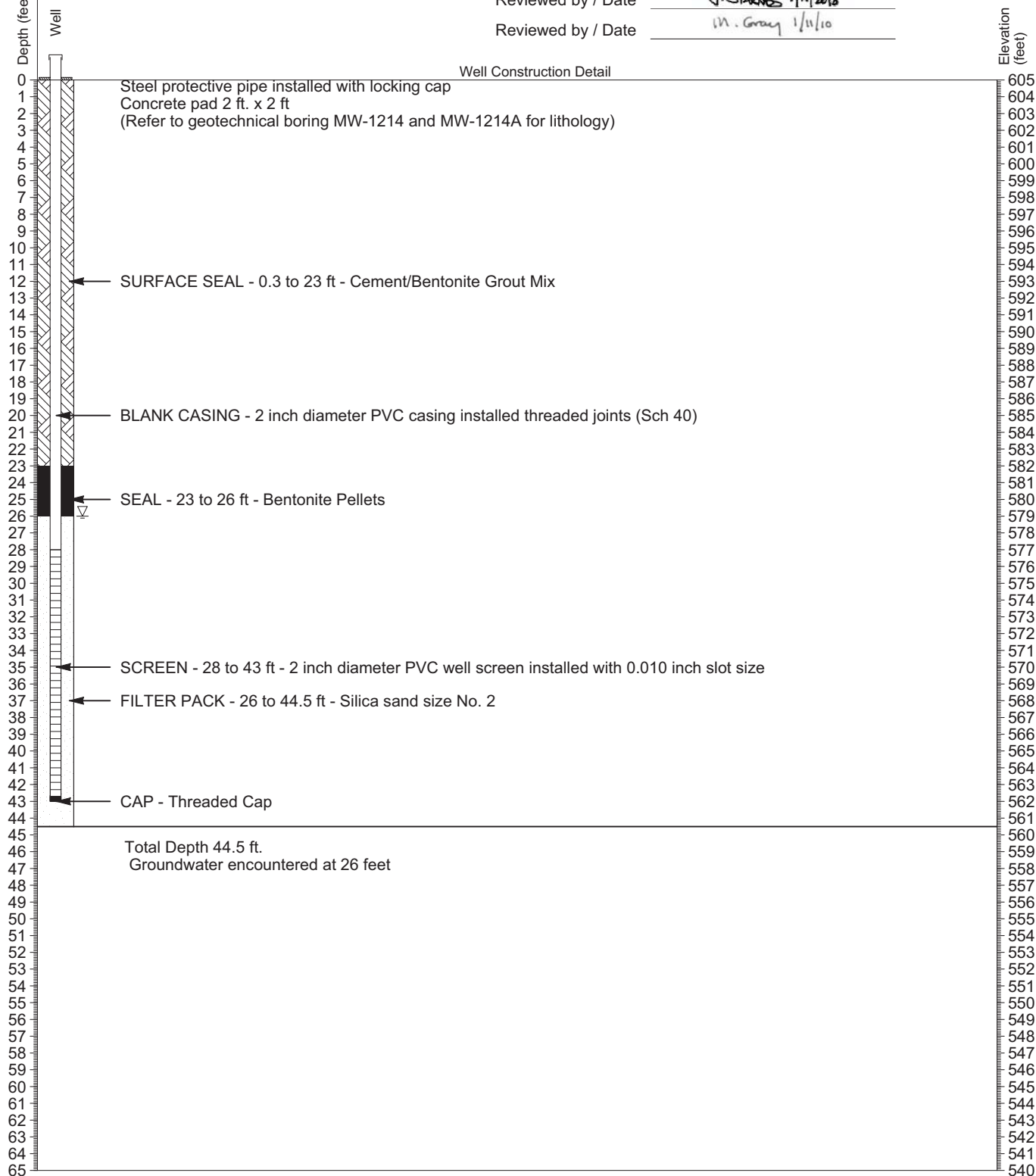
J. Starnes 1/11/2010



Reviewed by / Date

M. Gray 1/11/10

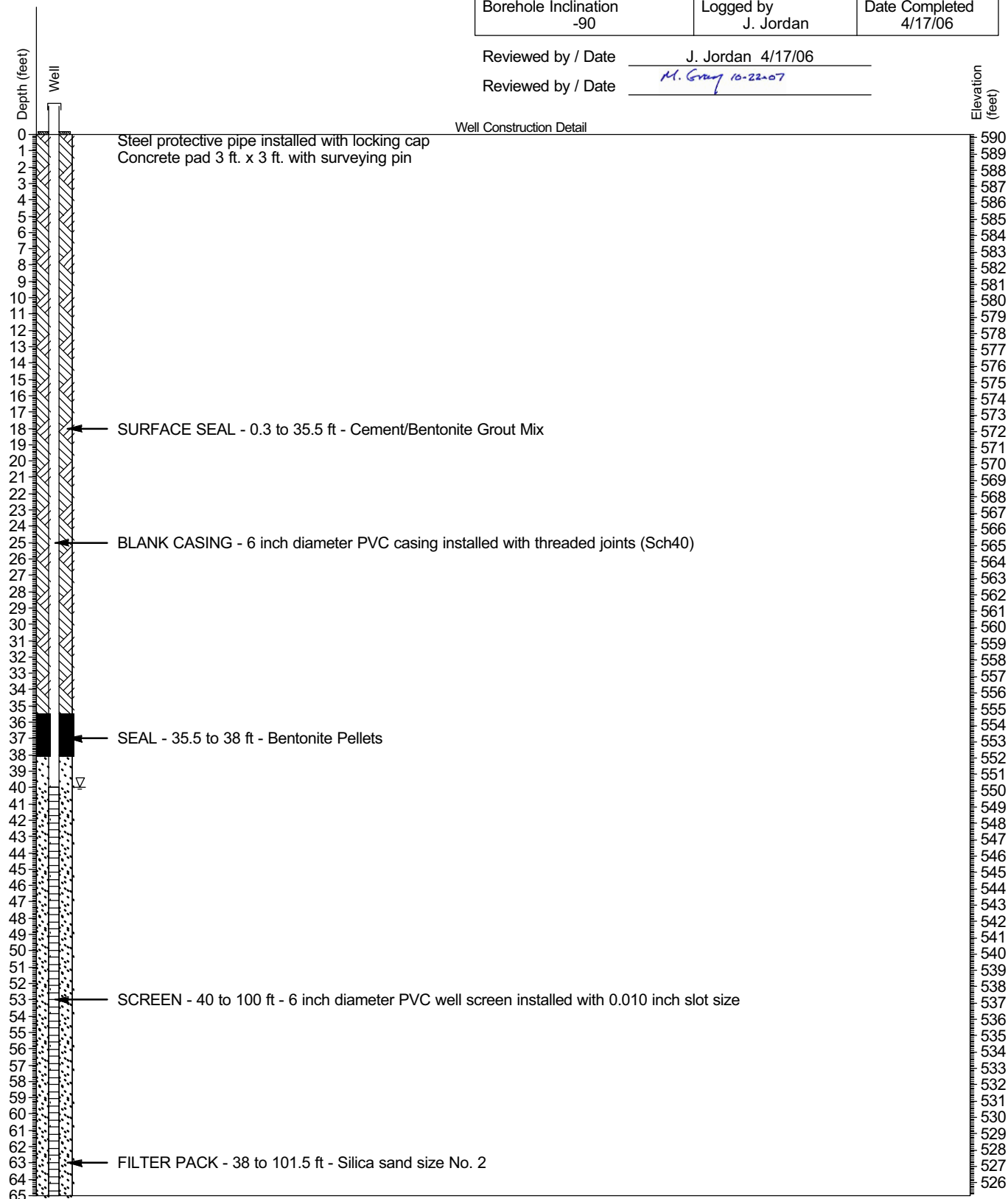


Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		WELL CONSTRUCTION LOG - MW-1214 (well)	
Type and Diameter of Boring Air Rotary / 6 inch		Boring Location Switchyard N 1164177.882 E 1847153.83		Total Depth 44.5 feet	
Drilling Contractor and Rig Geologic Exp / Mantak / D25KW		Elevation and Datum 605 feet MSL		Ground Water Depth 26 feet	Depth to Bedrock N/A
Casing Size and Depth 2 inch / 43 feet	Top of Casing Elevation 606.5 feet	Length of Core Barrel and Bit N/A		No. of Core Boxes N/A	Date Started 4/11/06
		Borehole Inclination -90		Logged by J. Jordan	Date Completed 4/11/06

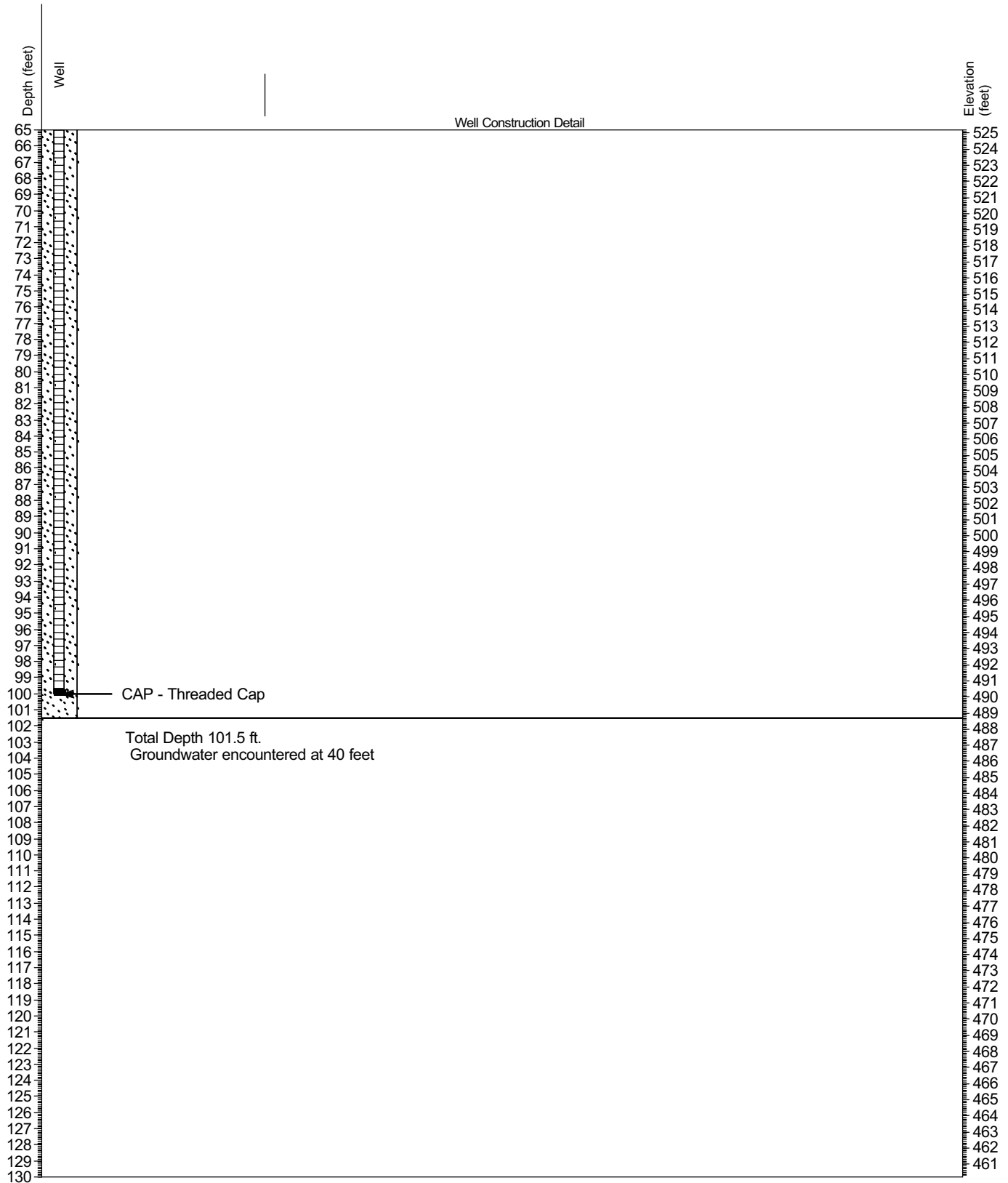
Reviewed by / Date J. Starnes 1/11/2010Reviewed by / Date M. Gray 1/11/10

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		  WELL CONSTRUCTION LOG - MW-1215 (well)		
Type and Diameter of Boring No samples / 12 inch/8 inch		Boring Location General site N 1166710.545 E 1846624.819		Total Depth 101.5 feet
Drilling Contractor and Rig Geologic Exp / Mantak / D120/D25KW		Elevation and Datum 590.2 feet MSL	Ground Water Depth 40 feet	Depth to Bedrock N/A
Casing Size and Depth 6 inch / 100 feet	Top of Casing Elevation 592.1 feet	Length of Core Barrel and Bit N/A	No. of Core Boxes N/A	Date Started 4/17/06
		Borehole Inclination -90	Logged by J. Jordan	Date Completed 4/17/06

Reviewed by / Date J. Jordan 4/17/06

Reviewed by / Date *M. Gray 10-22-07*

Project Name and Job Number
Lee Nuclear Station COL
6234-06-3389

**WELL CONSTRUCTION LOG - MW-1215 (well)**

Project Name and Job Number

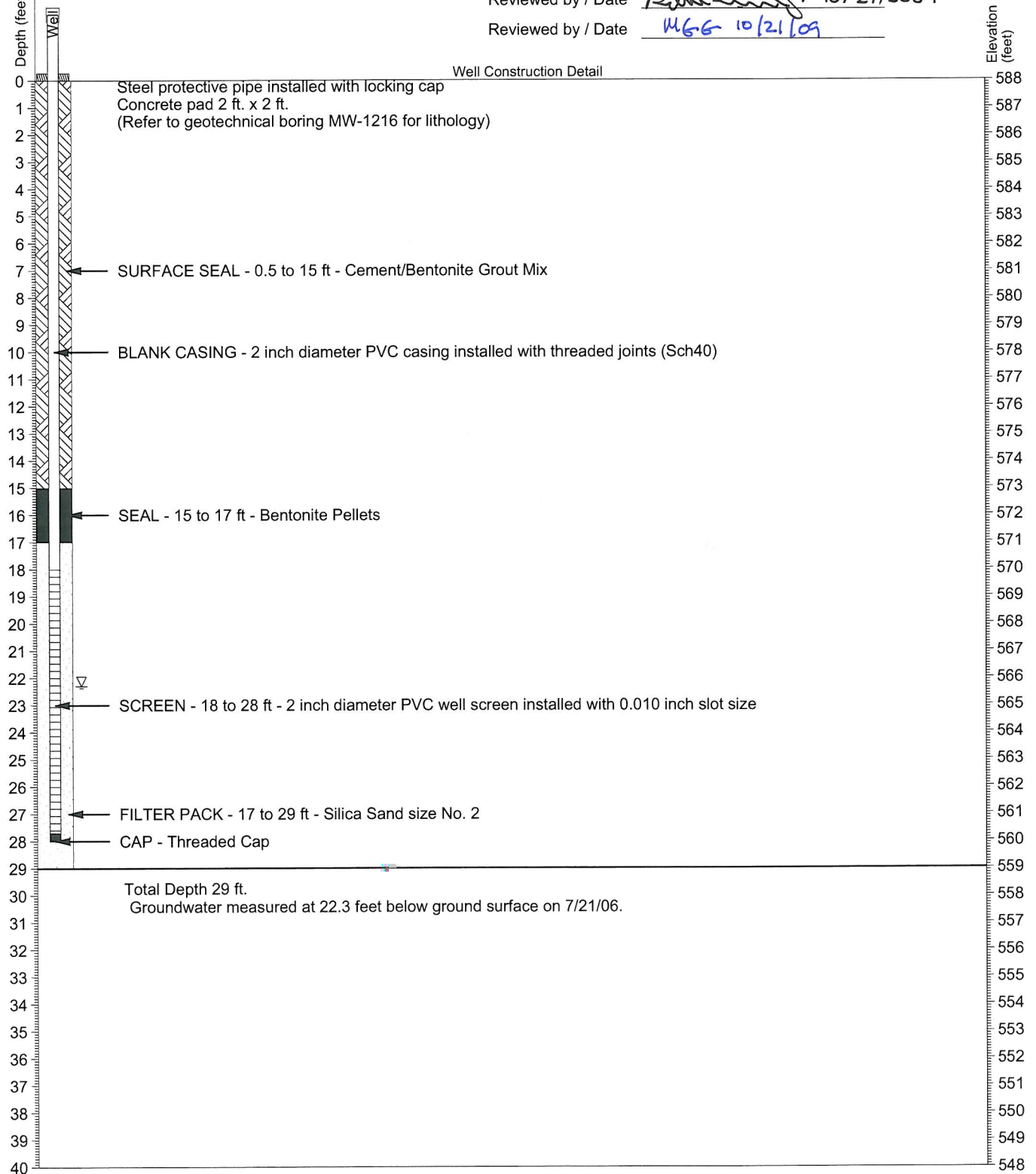
Lee Nuclear Station COL
6234-06-3389

MACTEC



WELL CONSTRUCTION LOG - MW-1216 (well)

Type and Diameter of Boring Hollow stem auger / 8.25 inch		Boring Location South of Power Block N 1165171.882 E 1846927.273		Total Depth 29.0 feet
Drilling Contractor and Rig Geologic Exp / Mantak / D120		Elevation and Datum 588 feet MSL	Ground Water Depth 22.3 feet	Depth to Bedrock N/A
Casing Size and Depth 2 inch / 28 feet	Top of Casing Elevation 590.7 feet	Length of Core Barrel and Bit N/A	No. of Core Boxes N/A	Date Started 7/18/06
		Borehole Inclination -90	Logged by J. Laughlin	Date Completed 7/18/06

Reviewed by / Date R. L. Laughlin 10/21/2009Reviewed by / Date WLG 10/21/09

Project Name and Job Number

Lee Nuclear Station COL

6234-06-3389



WELL CONSTRUCTION LOG - MW-1217 (well)

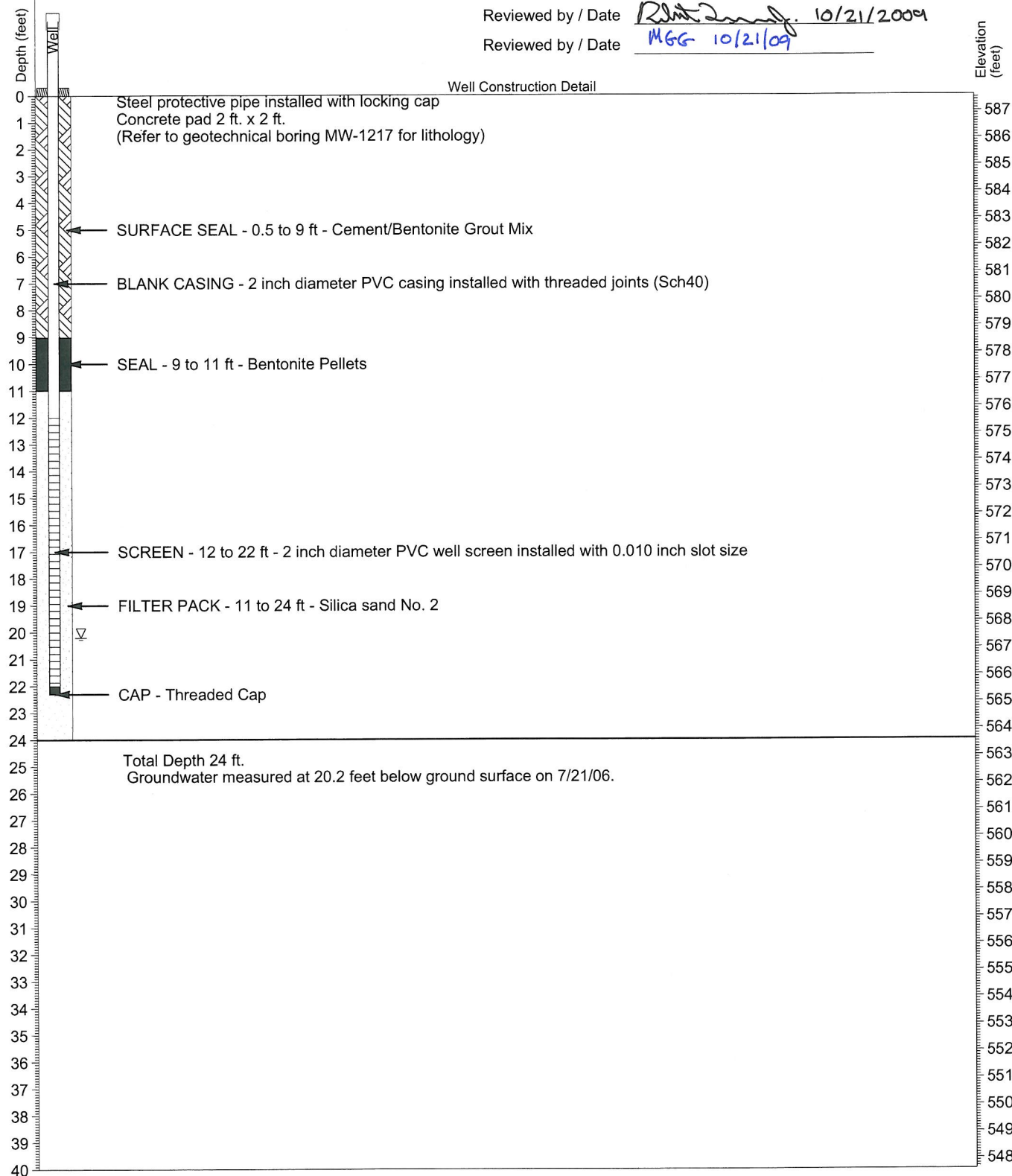
Type and Diameter of Boring Hollow stem auger / 8.25 inch		Boring Location South of Power Block N 1165042.463 E 1846983.878		Total Depth 24.0 feet
Drilling Contractor and Rig Geologic Exp / Mantak / D120		Elevation and Datum 587.6 feet MSL	Ground Water Depth 20.2 feet	Depth to Bedrock N/A
Casing Size and Depth 2 inch / 22 feet	Top of Casing Elevation 590.1 feet	Length of Core Barrel and Bit N/A	No. of Core Boxes N/A	Date Started 7/19/06
		Borehole Inclination -90	Logged by J. Laughlin	Date Completed 7/19/06

Reviewed by / Date

R. J. Laughlin 10/21/2009

Reviewed by / Date

MGG 10/21/09



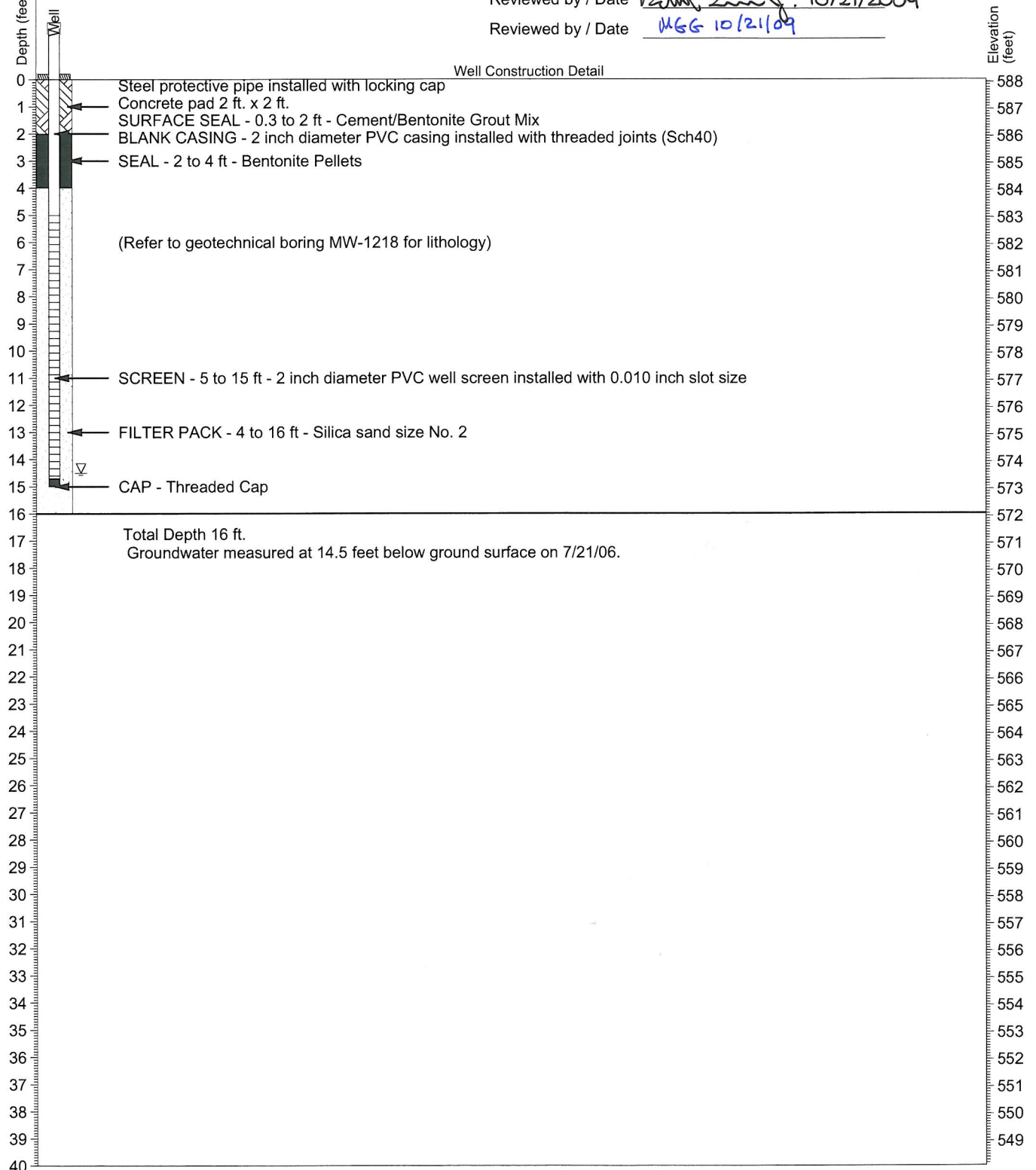
Project Name and Job Number

Lee Nuclear Station COL
6234-06-3389

MACTEC



WELL CONSTRUCTION LOG - MW-1218 (well)

Type and Diameter of Boring
Hollow stem auger / 8.25 inchBoring Location
South of Power Block
N 1164859.672 E 1847139.635Total Depth
16.0 feetDrilling Contractor and Rig
Geologic Exp / Mantak / D120Elevation and Datum
588.1 feet MSLGround Water Depth
14.5 feetDepth to Bedrock
N/ACasing Size and Depth
2 inch / 15 feetTop of Casing Elevation
590.2 feetLength of Core Barrel and Bit
N/ANo. of Core Boxes
N/ADate Started
7/18/06Borehole Inclination
-90Logged by
J. LaughlinDate Completed
7/18/06Reviewed by / Date Robert J. 10/21/2009Reviewed by / Date WGG 10/21/09

APPENDIX 2AA
ATTACHMENT 2 – LEE NUCLEAR STATION SPT ENERGY
MEASUREMENTS

This Attachment contains a table showing results of STP energy measurement testing performed by MACTEC Engineering, Inc. for the Lee Nuclear Station COL investigation. Tests were performed between April 10, 2006 and August 5, 2006, and were performed in compliance with ASTM standard D4633-05.

WLS COL 2.5-1

TABLE B-1: SUMMARY OF SPT ENERGY MEASUREMENTS (ASTM D4633-05)

Lee Nuclear Station COL Project
 Gaffney, Cherokee County, South Carolina
 MACTEC Project No. 6234-06-3389

Rig Serial No.	Rig Owner	Rig Operator	Boring No. Tested	Date Tested	Sample Depth (feet)	SPT Blow Count (blows per six inches)	No. of Blows Analyzed	Average Measured Energy (ft-lbs) ^a	Energy Transfer Ratio (%) ^b
337153 (CME 550x)	MACTEC (Atlanta Office)	Robert Banks	B-1023	4/10/2006	13.5 - 15.0	4 - 9 - 10	23	260	74.3%
					18.5 - 20.0	7 - 11 - 11	28	273	78.0%
					23.5 - 25.0	11 - 11 - 26	48	278	79.4%
					27.0 - 28.5	50 / 2"	39	277	79.1%
Total Average for Rig:						273.7	78.2%		
211797 (CME 75 Truck) ^c	MACTEC (Abingdon Office)	Wayne Gibson	B-403	8/5/2006	8.5 - 10.0	2 - 3 - 7	10	253	72.3%
					13.5 - 15.0	6 - 7 - 14	23	287	82.0%
					18.5 - 20.0	WOH - 6 - 13	20	262	74.9%
					23.5 - 25.0	3 - 5 - 10	18	262	74.9%
Total Average for Rig:						268.8	76.8%		
331145 (CME 55LC Truck) ^c	MACTEC (Raleigh Office)	David White	B-304	6/5/2006	11.0 - 12.5	4 - 5 - 7	16	293	83.7%
					13.5 - 15.0	4 - 6 - 8	18	290	82.9%
					18.5 - 20.0	4 - 6 - 7	17	288	82.3%
					23.5 - 25.0	5 - 7 - 10	22	287	82.0%
					28.5 - 30.0	5 - 7 - 7	19	291	83.1%
Total Average for Rig:						289.6	82.8%		

Prepared By: *SL*

Date: 12-7-06

Checked By: *Clay Lamm*

Date: 12-7-06

TABLE B-1: SUMMARY OF SPT ENERGY MEASUREMENTS (ASTM D4633-05)

Lee Nuclear Station COL Project
 Gaffney, Cherokee County, South Carolina
 MACTEC Project No. 6234-06-3389

Rig Serial No.	Rig Owner	Rig Operator	Boring No. Tested	Date Tested	Sample Depth (feet)	SPT Blow Count (blows per six inches)	No. of Blows Analyzed	Average Measured Energy (ft-lbs) ^a	Energy Transfer Ratio (%) ^b
190742 (CME 850 Track)	Trigon (Greensboro Office)	Willie Duggins	B-1030	4/11/2006	13.5 - 15.0	4 - 6 - 7	18	278	79.4%
					18.5 - 20.0	5 - 8 - 9	23	289	82.6%
					23.5 - 25.0	5 - 6 - 9	22	293	83.7%
					28.5 - 30.0	5 - 6 - 6	18	294	84.0%
					33.5 - 35.0	4 - 6 - 8	19	293	83.7%
					38.5 - 40.0	4 - 13 - 11	29	279	79.7%
						Total Average for Rig:	287.2	82.1%	

^aMeasured Energy is energy based on the EFV method, as outlined in ASTM D4633-05, for each blow recorded by the PDA. In some cases, the initial blow produced poor quality data, and was not used to calculate the Average Measured Energy.

^bEnergy Transfer Ratio is the Measured Energy divided by the theoretical SPT energy of 350 foot-pounds (140 pound hammer falling 2.5 feet).

^cRig was tested at VC Summer COL site in Jenkinsville, South Carolina (MACTEC Project No. 6234-06-3534S).

Prepared By: <i>SL</i>	Date: <i>12-7-06</i>	Checked By: <i>Clay Sama</i>	Date: <i>12-7-06</i>
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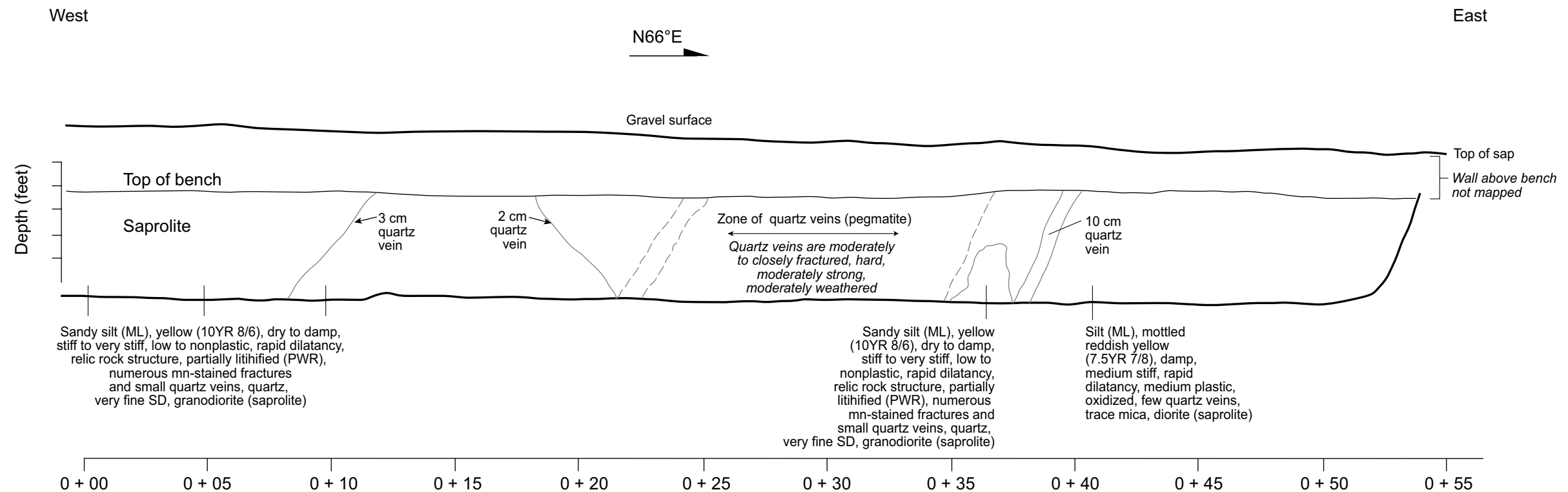
APPENDIX 2AA
ATTACHMENT 3 – LEE NUCLEAR STATION TEST PIT AND TRENCH LOGS

This Attachment contains test pit and trench logs resulting from the COL investigation. A list of the test pits and trenches is included within this attachment.

WLS COL 2.5-1

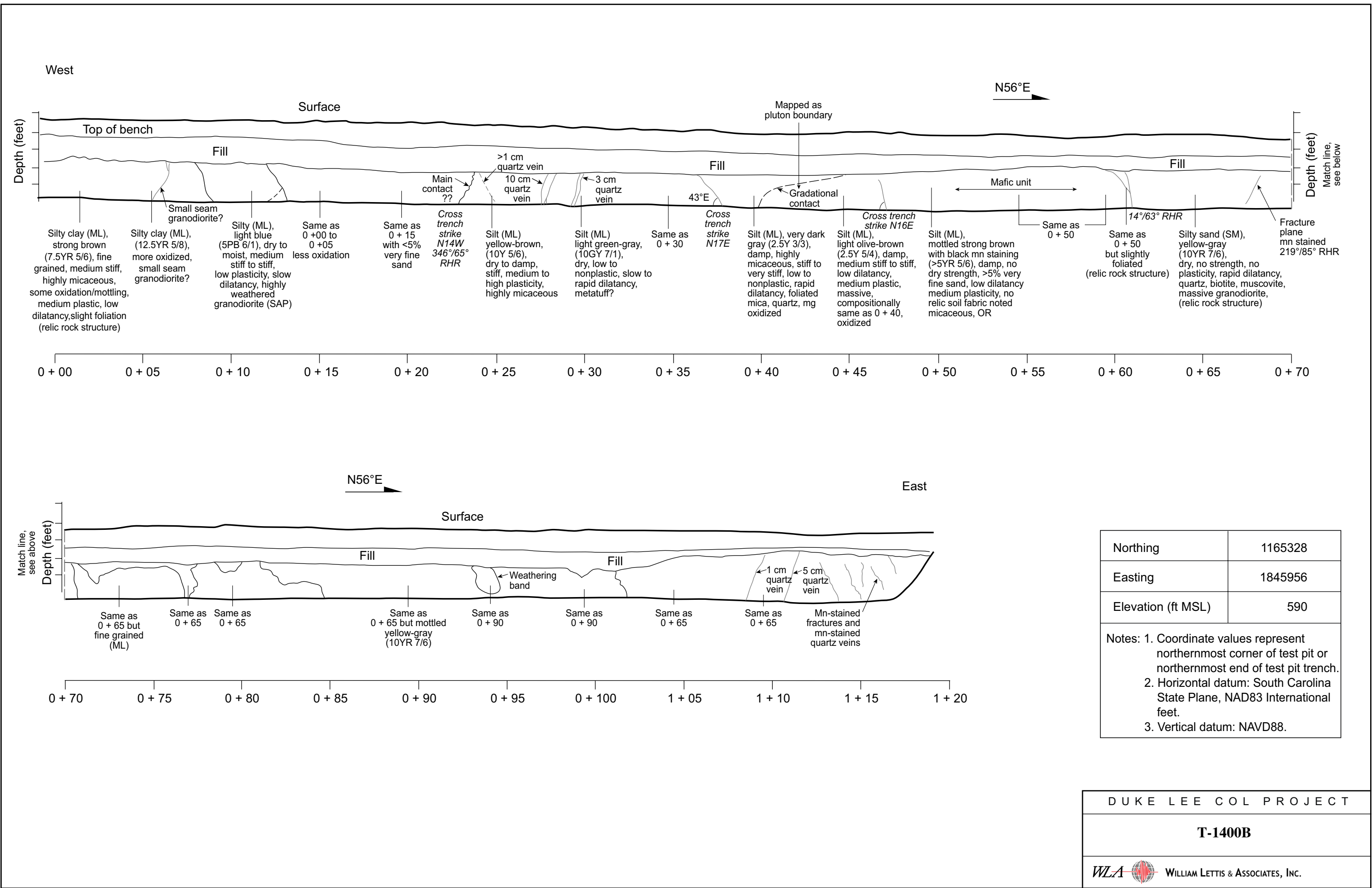
T-1400A
T-1400B
T-1401
T-1402
T-1403
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T-1423
T-1424
T-1425
T-1426

A large, empty rectangular box with a black border, intended for a drawing. The box is centered on the page and occupies most of the available space below the text. It is a simple black outline with no internal markings or text.

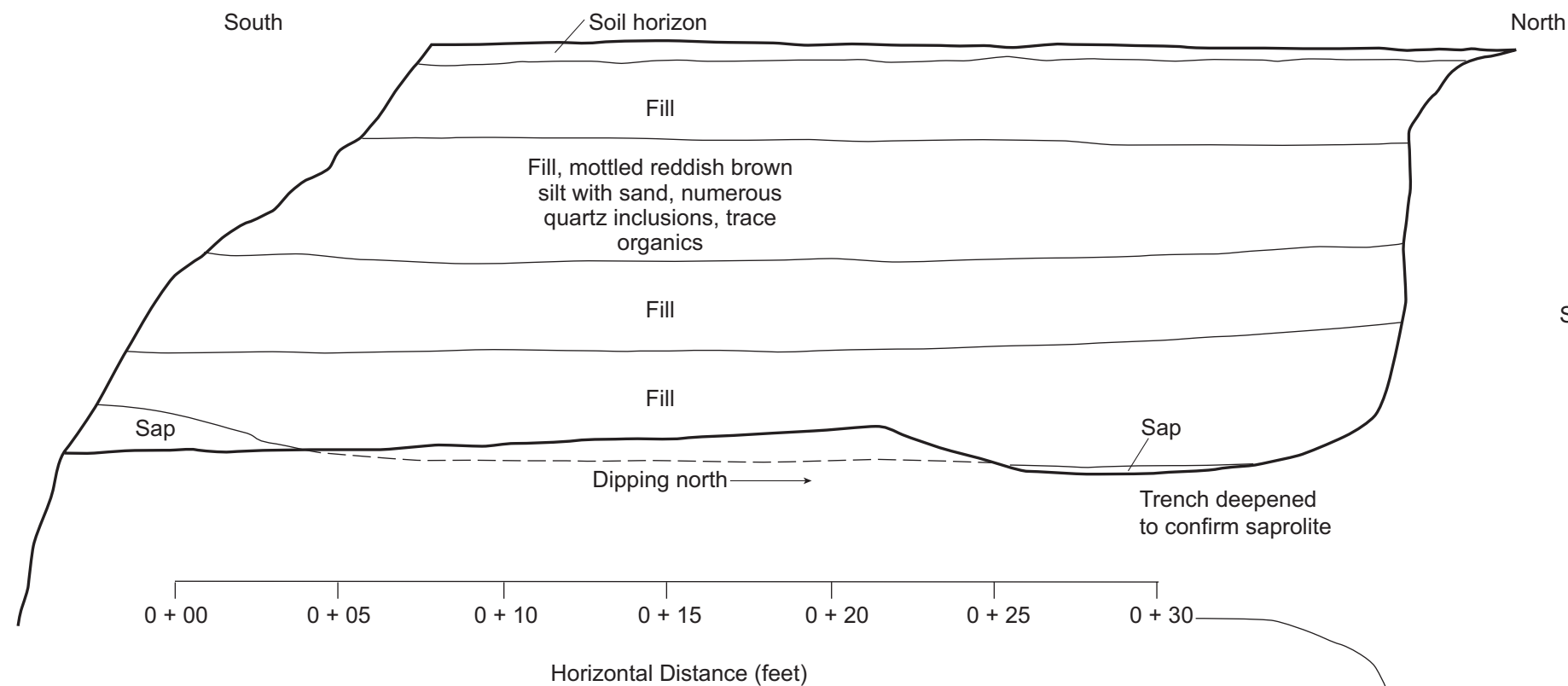


Northing	1165455
Easting	1846182
Elevation (ft MSL)	589
Notes: 1. Coordinate values represent northernmost corner of test pit or northernmost end of test pit trench. 2. Horizontal datum: South Carolina State Plane, NAD83 International feet. 3. Vertical datum: NAVD88.	

DUKE LEE COL PROJECT	
Trench Log – T-1400A	
WZA	WILLIAM LETTIS & ASSOCIATES, INC.



View: west wall



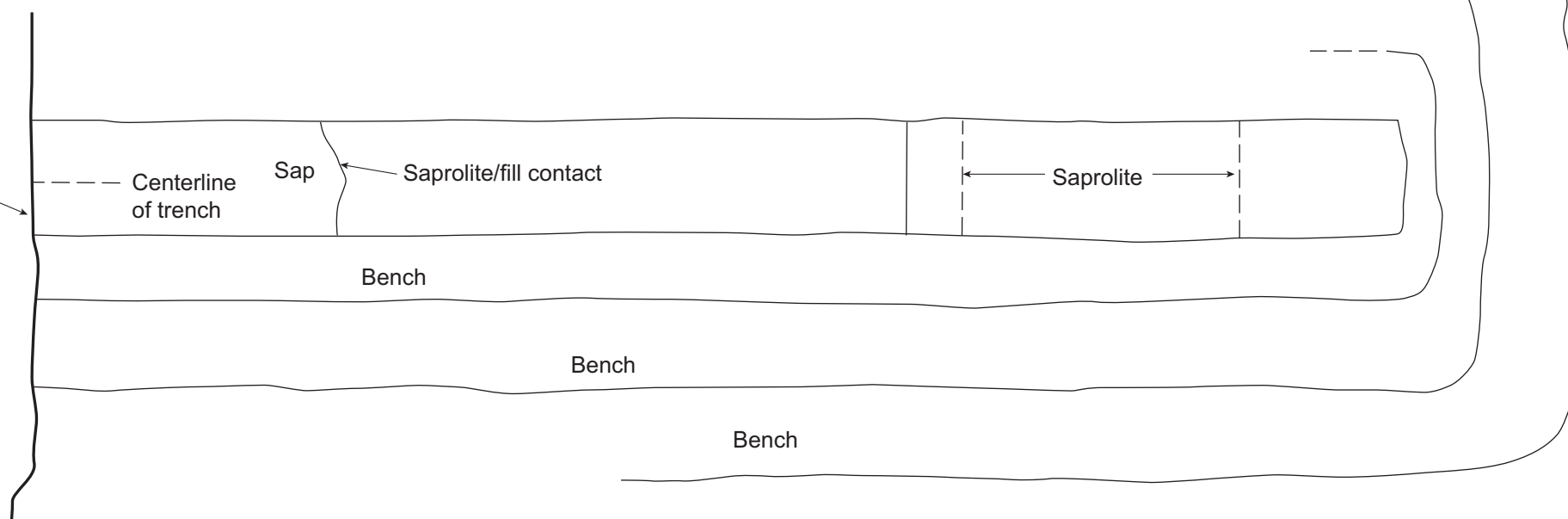
Unit Descriptions

Sap Saprolite, light greenish gray (10Y 8/1), silt (ML) very stiff, damp, oxidation staining (granite saprolite)

Northing	1166317
Easting	1846816
Elevation (ft MSL)	590
Notes: 1. Coordinate values represent northernmost corner of test pit or northernmost end of test pit trench. 2. Horizontal datum: South Carolina State Plane, NAD83 International feet. 3. Vertical datum: NAVD88.	

Plan view

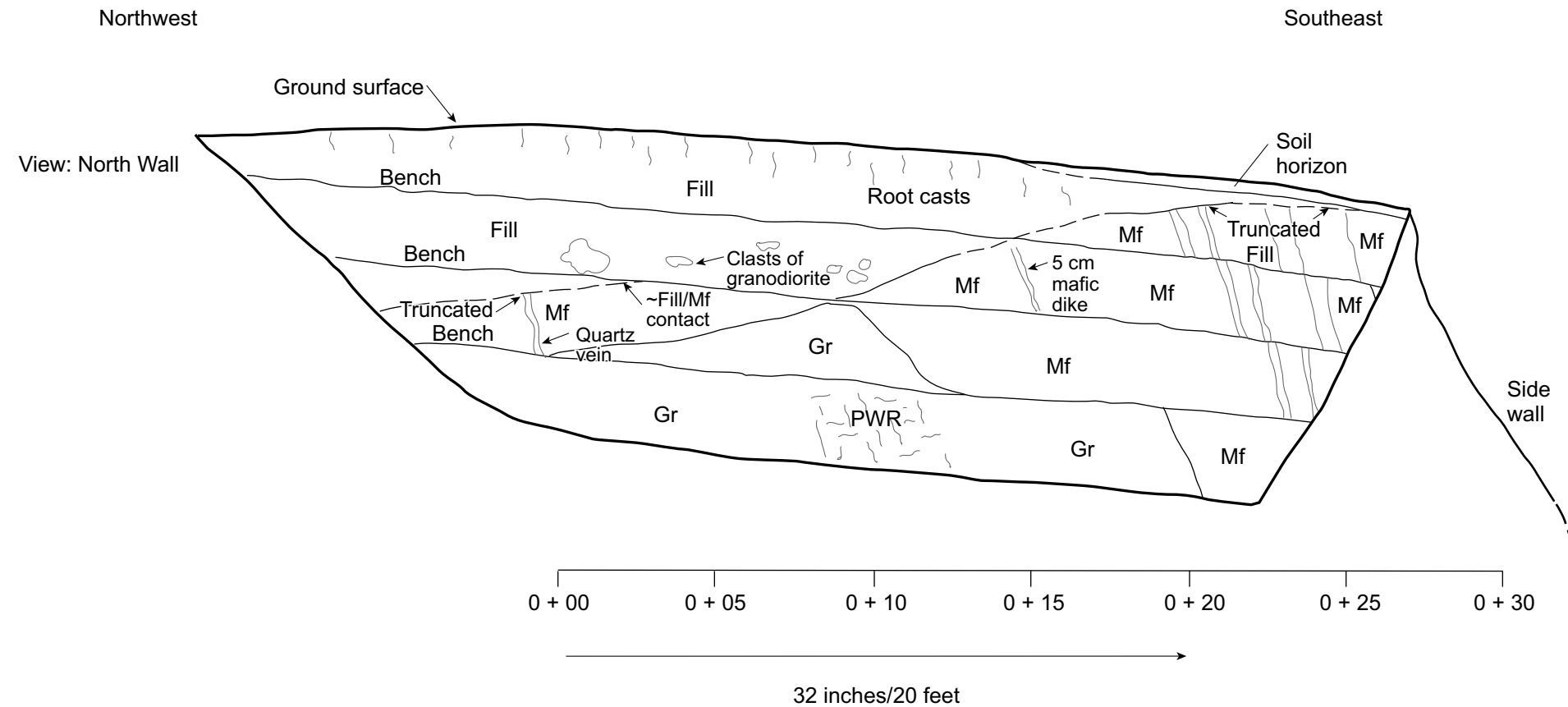
Face of north wall of open excavation



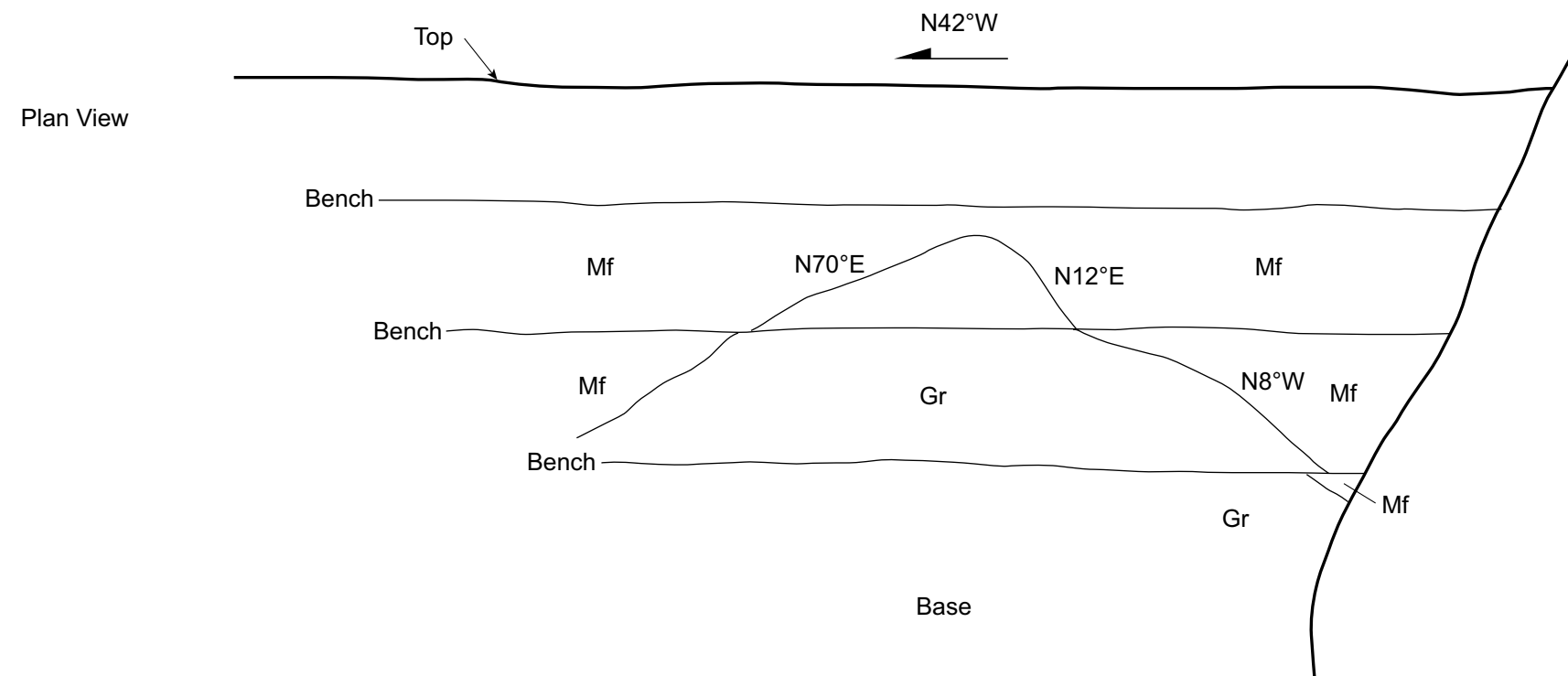
DUKE LEE COL PROJECT

T-1401

WLA  **WILLIAM LETTIS & ASSOCIATES, INC.**



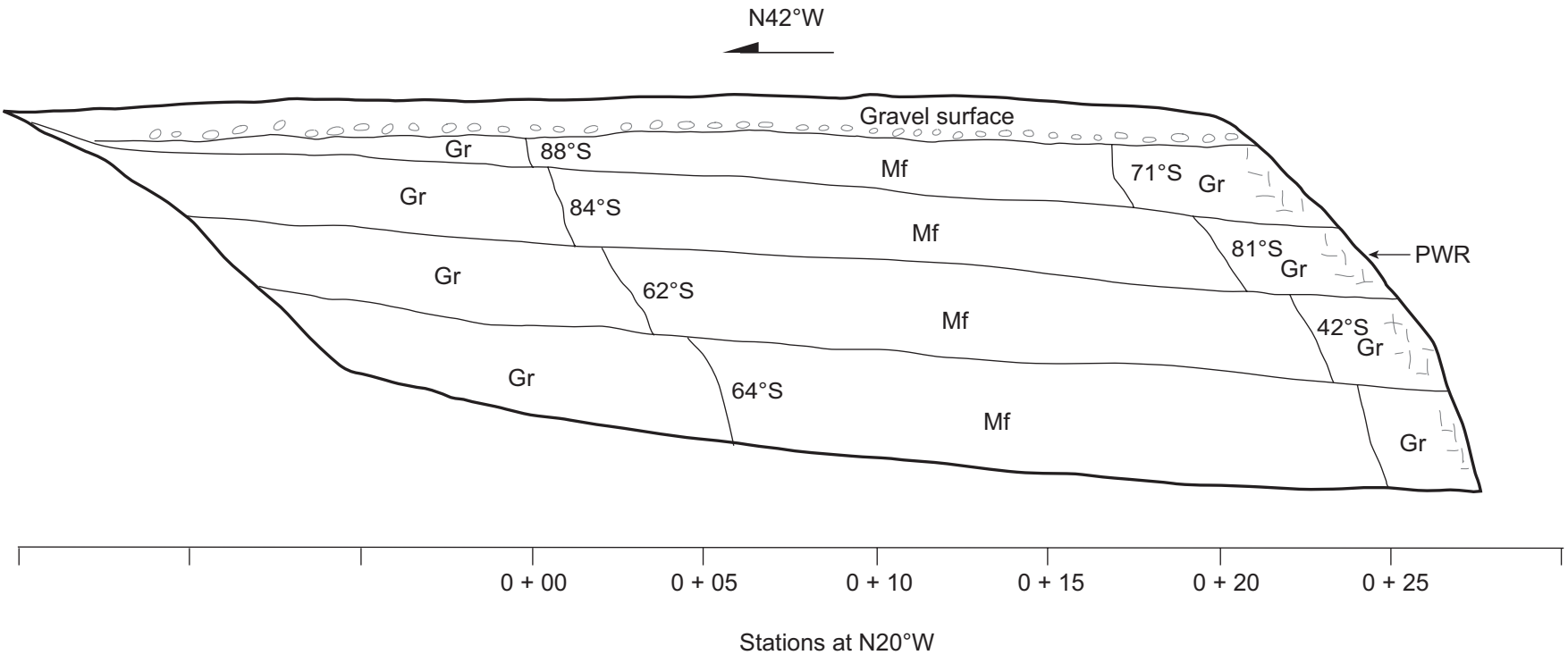
Unit Descriptions	
Gr (granitic saprolite)	Sandy silt (ML), to silt with fine sand, light gray (10YR 7/1), dry, very stiff, no dry strength, rapid dilatancy, nonplastic, >30% quartz sand, ~15% mica
Mf (mafic saprolite)	Silt (ML), brownish yellow (10YR 6/8), damp to dry, stiff, no dry strength, slow to rapid dilatancy, high to medium plasticity
PWR	Partially weathered rock



Northing	1166377
Easting	1846888
Elevation (ft MSL)	590
Notes: 1. Coordinate values represent northernmost corner of test pit or northernmost end of test pit trench. 2. Horizontal datum: South Carolina State Plane, NAD83 International feet. 3. Vertical datum: NAVD88.	

DUKE LEE COL PROJECT	
T-1402	
WLA	WILLIAM LETTIS & ASSOCIATES, INC.

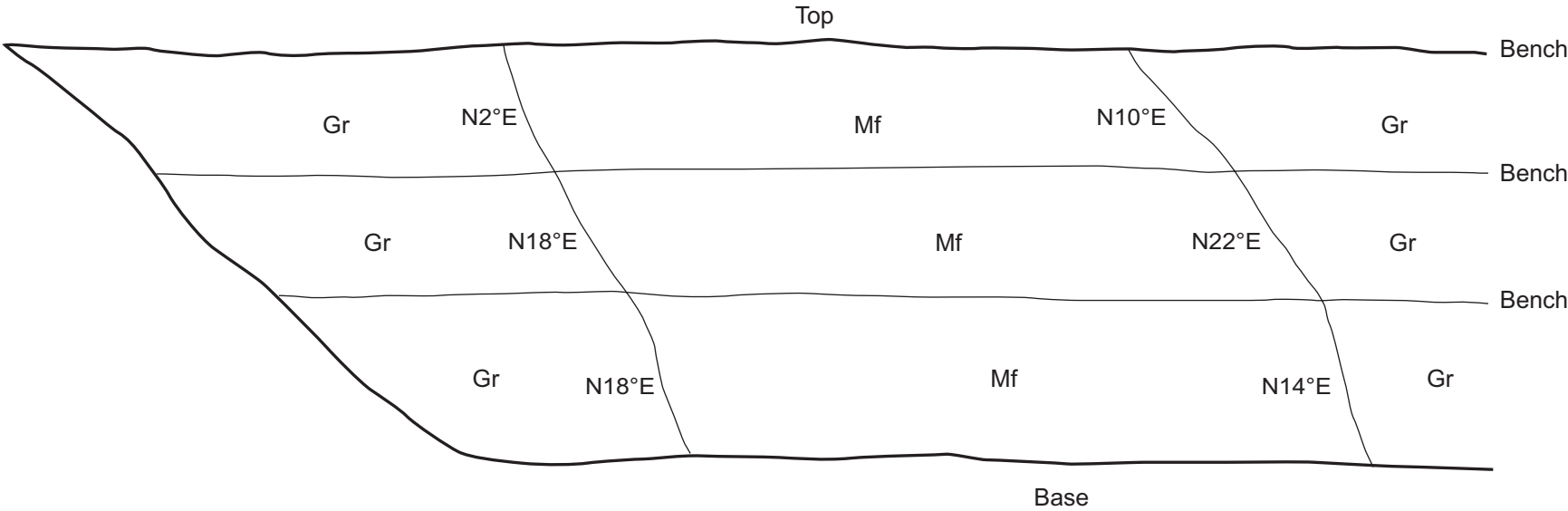
View: looking northeast




Unit Descriptions

- GR
(granitic saprolite)
- Sandy silt (ML), light gray (10YR 7/1), dry, stiff to hard, quartz 15%, mica <5%, no dry strength, nonplastic, rapid dilatancy, slightly more lithified at southern end of test pit
- Mf
(mafic saprolite)
- Silt (ML), yellowish brown (10YR 5/8), dry to damp, stiff to medium stiff, >50% fines, no dry strength, non-plastic, oxidation staining

Plan view



Northing	1166394
Easting	1847141
Elevation (ft MSL)	590
Notes: 1. Coordinate values represent northernmost corner of test pit or northernmost end of test pit trench. 2. Horizontal datum: South Carolina State Plane, NAD83 International feet. 3. Vertical datum: NAVD88.	

DUKE LEE COL PROJECT	
T-1403	
 WILLIAM LETTIS & ASSOCIATES, INC.	


T-1404



Cut in northwest corner (old unit 2)





View: looking north

Northing	1166250
Easting	1846714
Elevation (ft MSL)	551
Notes: 1. Coordinate values represent northernmost corner of test pit or northernmost end of test pit trench. 2. Horizontal datum: South Carolina State Plane, NAD83 International feet. 3. Vertical datum: NAVD88.	



DUKE LEE COL PROJECT	
T-1404	
	WILLIAM LETTIS & ASSOCIATES, INC.

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. T-1419	
Type and Diameter of Boring Pit / NA		Boring Location Borrow Area 1 near B-1056 N 1163896 E 1846789		Total Depth 20 feet	
Drilling Contractor and Rig Hall Construction / Trackhoe		Elevation and Datum 642.5 feet MSL		Ground Water Depth N/A	
Sampling Method Bulk		Sample Driving Hammer/Drop NA		No. of Samples 1	
		Borehole Inclination -90		Logged by F. Syms	
				Date Started 5/15/06	
				Date Completed 5/15/06	



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT very sandy (ML); red brown (7.5YR 6/4); dry; non plastic; micaceous; RESIDUAL SOIL	Bulk sample of surficial soil placed in 5 gallon bucket labeled "surface sample".	642
1												641
2												640
3												639
4												638
5												637
6									ML	SILT very sandy (ML); yellowish brown to gray (10YR 7/3); micaceous; relict rock fabric; SAPROLITE	Saved three 5-gallon buckets of material (all identical)	636
7												635
8												634
9												633
10			240							51% fines, 49% sand	Lab tests results represent a composite sample of entire test pit from 0 to 20 ft	632
11												631
12												630
13												629
14												628
15												627
16												626
17												625
18												624
19												623
20										Test pit terminated at 20 ft. Test pit backfilled with excavated material after sampling		622
21												621
22												620
23												619
24												618
25												617
26												616
27												615
28												614
29												613
30												612
31												611
32												610
33												609
34												608
35												607
36												606
37												605
38												604
39												603
40												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. T-1420	
Type and Diameter of Boring Pit / NA		Boring Location Borrow Area 1 near B-1058 N 1163582 E 1846854		Total Depth 20 feet	
Drilling Contractor and Rig Hall Construction / Trackhoe		Elevation and Datum 638 feet MSL		Ground Water Depth N/A	
Sampling Method Bulk		Sample Driving Hammer/Drop NA		No. of Samples 1	
		Borehole Inclination -90		Logged by F. Syms	
				Date Started 5/15/06	
				Date Completed 5/15/06	



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT (ML); red brown (2.5YR 5/8); dry to moist; some quartz blocks; non plastic; RESIDUAL SOIL	Bulk sample of surficial soil placed in 5 gallon bucket labeled "surface sample".	638
1												637
2												636
3												635
4												634
5									ML	SILT sandy (ML); light gray and yellow (10YR 7/3); dry; non plastic; few quartz blocks; micaceous; relict structure; SAPROLITE		633
6												632
7											Saved three 5-gallon buckets of material (all identical)	631
8												630
9												629
10			240							39% sand, 61% fines		628
11											Lab tests results represent a composite sample of entire test pit from 0 to 20 ft.	627
12												626
13												625
14												624
15												623
16												622
17												621
18												620
19												619
20										Test pit terminated at 20 ft. Test pit backfilled with excavated material after sampling		618
21												617
22												616
23												615
24												614
25												613
26												612
27												611
28												610
29												609
30												608
31												607
32												606
33												605
34												604
35												603
36												602
37												601
38												600
39												599
40												598

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. T-1421	
Type and Diameter of Boring Pit / NA		Boring Location Borrow Area West of Former Motor Pool N 1164323 E 1845632		Total Depth 20 feet	
Drilling Contractor and Rig Hall Construction / Trackhoe		Elevation and Datum 685.5 feet MSL		Ground Water Depth N/A	
Sampling Method Bulk		Sample Driving Hammer/Drop NA		No. of Samples 1	
		Borehole Inclination -90		Logged by F. Syms	
				Date Started 5/22/06	
				Date Completed 5/22/06	



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT (ML); red brown (10YR 3/5); dry; very fine sand; non plastic; micaceous; RESIDUAL SOIL		685
1												684
2												683
3												682
4												681
5												680
6											Saved three 5-gallon buckets of material (all identical)	679
7												678
8												677
9												676
10			240							54% fines, 26% sand, 20% gravel	Lab tests results represent a composite sample of entire test pit from 0 to 20 ft	675
11												674
12												673
13												672
14												671
15												670
16												669
17												668
18												667
19												666
20									ML	SILT (ML); light brown, gray (7.5YR 6/3); relict rock fabric; non plastic; micaceous; quartzite vein noted; PARTIALLY WEATHERED ROCK		665
21										Test pit terminated at 20 ft. Test pit backfilled with excavated material after sampling		664
22												663
23												662
24												661
25												660
26												659
27												658
28												657
29												656
30												655
31												654
32												653
33												652
34												651
35												650
36												649
37												648
38												647
39												646
40												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. T-1422	
Type and Diameter of Boring Pit / NA		Boring Location Borrow Area 1 N 1163992 E 1847171		Total Depth 20 feet	
Drilling Contractor and Rig Hall Construction / Trackhoe		Elevation and Datum 630.8 feet MSL		Ground Water Depth N/A	
Sampling Method Bulk		Sample Driving Hammer/Drop NA		No. of Samples 1	
		Borehole Inclination -90		Logged by F. Syms	
				Date Started 5/15/06	
				Date Completed 5/15/06	



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT sandy (ML); red brown; dry; very fine sand; some clay bands; moderately to non plastic; RESIDUAL SOIL	Bulk sample of surficial soil placed in 5 gallon bucket labeled "surface sample".	630
1									ML	SILT sandy (ML); yellowish brown mottled; dry; very fine sand; relict rock fabric; micaceous; SAPROLITE		629
2												628
3												627
4												626
5												625
6											Saved three 5-gallon buckets of material (all identical)	624
7												623
8												622
9												621
10			240							73% fines, 27% sand	Lab tests results represent a composite sample of entire test pit from 0 to 20 ft	620
11												619
12												618
13												617
14												616
15												615
16												614
17												613
18												612
19												611
20										Test pit terminated at 20 ft. Test pit backfilled with excavated material after sampling		610
21												609
22												608
23												607
24												606
25												605
26												604
27												603
28												602
29												601
30												600
31												599
32												598
33												597
34												596
35												595
36												594
37												593
38												592
39												591
40												591

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. T-1423	
Type and Diameter of Boring Pit / NA		Boring Location Borrow Area 1 N 1163666 E 1847256		Total Depth 20 feet	
Drilling Contractor and Rig Hall Construction / Trackhoe		Elevation and Datum 625.8 feet MSL		Ground Water Depth N/A	
Sampling Method Bulk		Sample Driving Hammer/Drop NA		No. of Samples 1	
		Borehole Inclination -90		Logged by F. Syms	
				Date Started 5/15/06	
				Date Completed 5/15/06	



Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT (ML); red brown; little to no sand; trace root clasts	Bulk sample of surficial soil placed in 5 gallon bucket labeled "surface sample".	625
1												624
2												623
3												622
4												621
5												620
6									SM	SAND silty (SM); light gray, yellow; fine sand; trace rock fabric; micaceous; mottled appearance	Saved three 5-gallon buckets of material (all identical)	619
7												618
8												617
9												616
10			240							47% fines; 53% sand	Lab tests results represent a composite sample of entire test pit from 0 to 20 ft	615
11												614
12												613
13												612
14												611
15												610
16												609
17												608
18												607
19												606
20										Test pit terminated at 20 ft. Test pit backfilled with excavated material after sampling		605
21												604
22												603
23												602
24												601
25												600
26												599
27												598
28												597
29												596
30												595
31												594
32												593
33												592
34												591
35												590
36												589
37												588
38												587
39												586
40												585

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. T-1424	
Type and Diameter of Boring Pit / NA		Boring Location Borrow Area 1 N 1164081 E 1847436		Total Depth 19 feet	
Drilling Contractor and Rig Hall Construction / Trackhoe		Elevation and Datum 628.3 feet MSL		Ground Water Depth N/A	
Sampling Method Bulk		Sample Driving Hammer/Drop NA		No. of Samples 1	
		Borehole Inclination -90		Logged by F. Syms	
				Date Started 5/15/06	
				Date Completed 5/15/06	

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT (ML); red brown (7.5YR 7/3); dry; very fine sand < 5%; trace clay; RESIDUAL SOIL	Bulk sample of surficial soil placed in 5 gallon bucket labeled "surface sample".	628
1												627
2												626
3												625
4												624
5												623
6									ML	SILT sandy (ML); yellowish brown (2.5Y 5/3); dry; with relict rock fabric; SAPROLITE	Saved three 5-gallon buckets of material (all identical)	622
7												621
8												620
9												619
10			228							62% fines; 38% sand	Lab tests results represent a composite sample of entire test pit from 0 to 20 ft	618
11												617
12												616
13												615
14												614
15									ML	SILT sandy (ML); light brown, trace black; dry; relict fabric at bottom of hole; SAPROLITE; PARTIALLY WEATHERED ROCK?;		613
16												612
17												611
18												610
19										Test pit terminated at 19 ft. Test pit backfilled with excavated material after sampling		609
20												608
21												607
22												606
23												605
24												604
25												603
26												602
27												601
28												600
29												599
30												598
31												597
32												596
33												595
34												594
35												593
36												592
37												591
38												590
39												589
40												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. T-1425	
Type and Diameter of Boring Pit / NA		Boring Location Borrow Area 1 near B-1067 N 1163869 E 1847595		Total Depth 20 feet	
Drilling Contractor and Rig Hall Construction / Trackhoe		Elevation and Datum 629.6 feet MSL		Ground Water Depth N/A	
Sampling Method Bulk		Sample Driving Hammer/Drop NA		No. of Samples 1	
		Borehole Inclination -90		Logged by F. Syms	
				Date Started 5/15/06	
				Date Completed 5/15/06	

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT (ML); red brown (7.5YR 7/3); slightly moist; non plastic; RESIDUAL SOIL	Bulk sample of surficial soil placed in 5 gallon bucket labeled "surface sample".	629
1												628
2												627
3												626
4												625
5												624
6												623
7											Saved three 5-gallon buckets of material (all identical)	622
8									ML	SILT sandy (ML); light tan, yellow (2.5Y 5/6); dry; fine sand; relict rock fabric; SAPROLITE		621
9												620
10			240							68% fines; 32% sand	Lab tests results represent a composite sample of entire test pit from 0 to 20 ft	619
11												618
12												617
13									ML	SILT sandy (ML); light gray (2.5Y 5/4); dry; very fine; micaceous; SAPROLITE		616
14												615
15												614
16												613
17												612
18												611
19												610
20										Test pit terminated at 20 ft. Test pit backfilled with excavated material after sampling		609
21												608
22												607
23												606
24												605
25												604
26												603
27												602
28												601
29												600
30												599
31												598
32												597
33												596
34												595
35												594
36												593
37												592
38												591
39												590
40												

Project Name and Job Number Lee Nuclear Station COL 6234-06-3389		 		SOIL LOG - Boring No. T-1426	
Type and Diameter of Boring Pit / NA		Boring Location Cooling Tower Pad - Former Unit 1 N 1166029 E 1845369		Total Depth 20 feet	
Drilling Contractor and Rig Hall Construction / Trackhoe		Elevation and Datum 609.6 feet MSL		Ground Water Depth N/A	
Sampling Method Bulk		Sample Driving Hammer/Drop NA		No. of Samples 1	
		Borehole Inclination -90		Logged by F. Syms	
				Date Started 5/22/06	
				Date Completed 5/22/06	

Reviewed by / Date B. Reinicker 5/30/06

Reviewed by / Date C. Lane 10-27-07

Depth (feet)	Sample	Sample Type & No.	Uncorrected Blows/6 inches	Recovery (inches)	Water Content	Grain Size	Atterberg Limits	Lithology	Soil Type (USCS)	Lithology	Remarks	Elevation (feet)
0									ML	SILT trace clay (ML); brown (7.5YR 5/6); dry; some stiff zones; moderately plastic; mottled; occasional rocks greater than 6 inch diameter; FILL		609
1												608
2												607
3												606
4												605
5												604
6											Saved three 5-gallon buckets of material (all identical)	603
7												602
8												601
9												600
10			240						71% fines; 26% sand		Lab tests results represent a composite sample of entire test pit from 0 to 20 ft	599
11												598
12												597
13												596
14												595
15												594
16												593
17												592
18												591
19												590
20										Test pit terminated at 20 ft. Test pit backfilled with excavated material after sampling		589
21												588
22												587
23												586
24												585
25												584
26												583
27												582
28												581
29												580
30												579
31												578
32												577
33												576
34												575
35												574
36												573
37												572
38												571
39												570
40												

APPENDIX 2AA

ATTACHMENT 4 – LEE NUCLEAR STATION PACKER TEST RESULTS

This attachment contains Packer Test results from four locations on the Lee site: B-1004, B-1015, MW-1201, and MW-1210. Tests were performed by MACTEC Engineering, Inc. Tabular as well as graphical representations of the data are included.

WLS COL 2.5-1

**B-1004 Packer Test Data
Cherokee COL Site
MACTEC Project 6234-06-3389**

Given Parameters

Test Section Length $_$, ft: 5
Radius of Borehole r_o , ft: 0.125
GW Elevation, ft: 10.25

Interval: 26-31

Test ID	Q, GPM	P _g , psi	P _f , psi	P _g - P _f , psi	h _f , ft	H _g , ft	H _o , ft
T1	25.4	5	1.34	3.66	3.09	12.25	20.70
T2	29	6	1.79	4.21	4.13	12.25	21.97
T3	13.4	1	0.6	0.4	1.38	12.25	13.17

Q/H _o , GPM/ft	1.24
K _e , ft/year	10,235

Interval: 39-44

Test ID	Q, GPM	P _g , psi	P _f , psi	P _g - P _f , psi	h _f , ft	H _g , ft	H _o , ft
T1	12.5	8	0.83	7.17	1.92	14.25	30.80
T4	18.4	14	1.22	12.78	2.82	14.25	43.74
T5	12.7	8	0.84	7.16	1.94	14.25	30.77
T6	5.3	8	0.33	7.67	0.76	14.25	31.95
T7	18	14	1.2	12.8	2.77	14.25	43.79
T8	21.1	17	1.45	15.55	3.35	14.25	50.13

Q/H _o , GPM/ft	0.42
K _e , ft/year	3,467

Note: T2 & T3 not conducted

Interval: 45-50

Test ID	Q, GPM	P _g , psi	P _f , psi	P _g - P _f , psi	h _f , ft	H _g , ft	H _o , ft
T1	15	9	1.2	7.8	2.77	13.25	31.25
T4	4.6	7	0.4	6.6	0.92	13.25	28.48
T5	26.2	20	2.45	17.55	5.65	13.25	53.75
T6	1.73	13	0.14	12.86	0.32	13.25	42.93
T7	3.8	3	0.3	2.7	0.69	13.25	19.48

Q/H _o , GPM/ft	0.41
K _e , ft/year	3,384

Note: T2 & T3 not conducted

Notes:

Q = flow rate

Test ID, flow rate (GPM) and gauge pressure taken from field measurements. Head loss due to pipe taken from USBR Figure 17.4, confirmed based on field measurement.

P_g is equal to gauge pressure, P_f is equal to pressure loss due to pipe friction (psi), h_f is equal to head loss due to pipe friction (ft)

H_{gravity} is equal to depth to water + height of surface pressure gauge above the datum (excess pressure due to weight of water in flowpipe)

$H_o = (P_{g_w}) + H_{gravity} - h_f$

$K_e = ((Q/H_o) * (1/_)) * 1/2\pi * \ln(R/r_o) * (525,600 \text{ min/year}) * (.1337 \text{ ft}^3/\text{gal})$

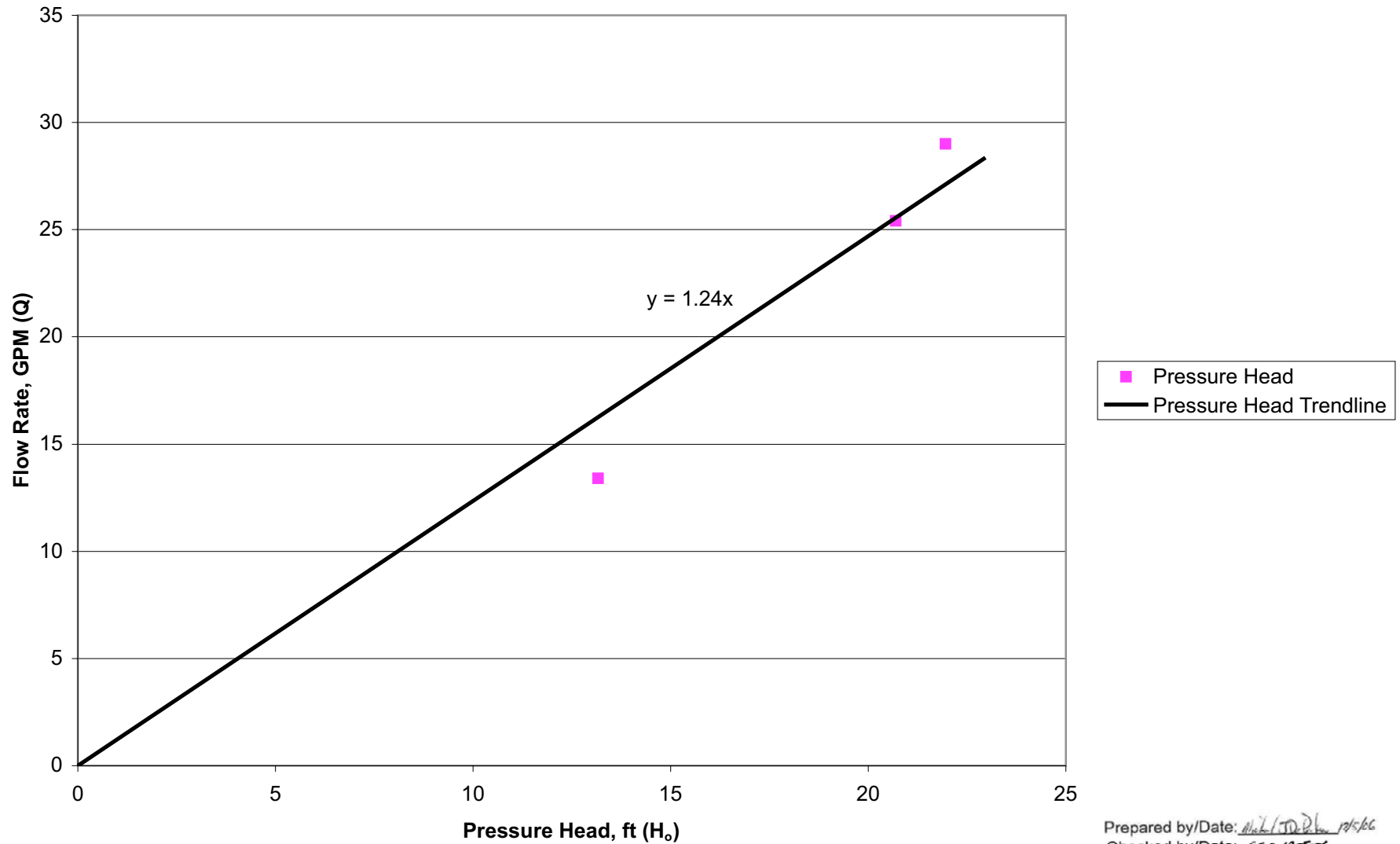
R is equal to total length between packers, $_$

Radius of borehole (r_o) taken from outside diameter of core bit, 3 inches

Q/H_o is equal to the slope of the linear trendline of H_o (x-axis) and Q (y-axis)

Prepared by/Date: Mike J. D. 12/5/06
Checked by/Date: CEJ 12-5-06

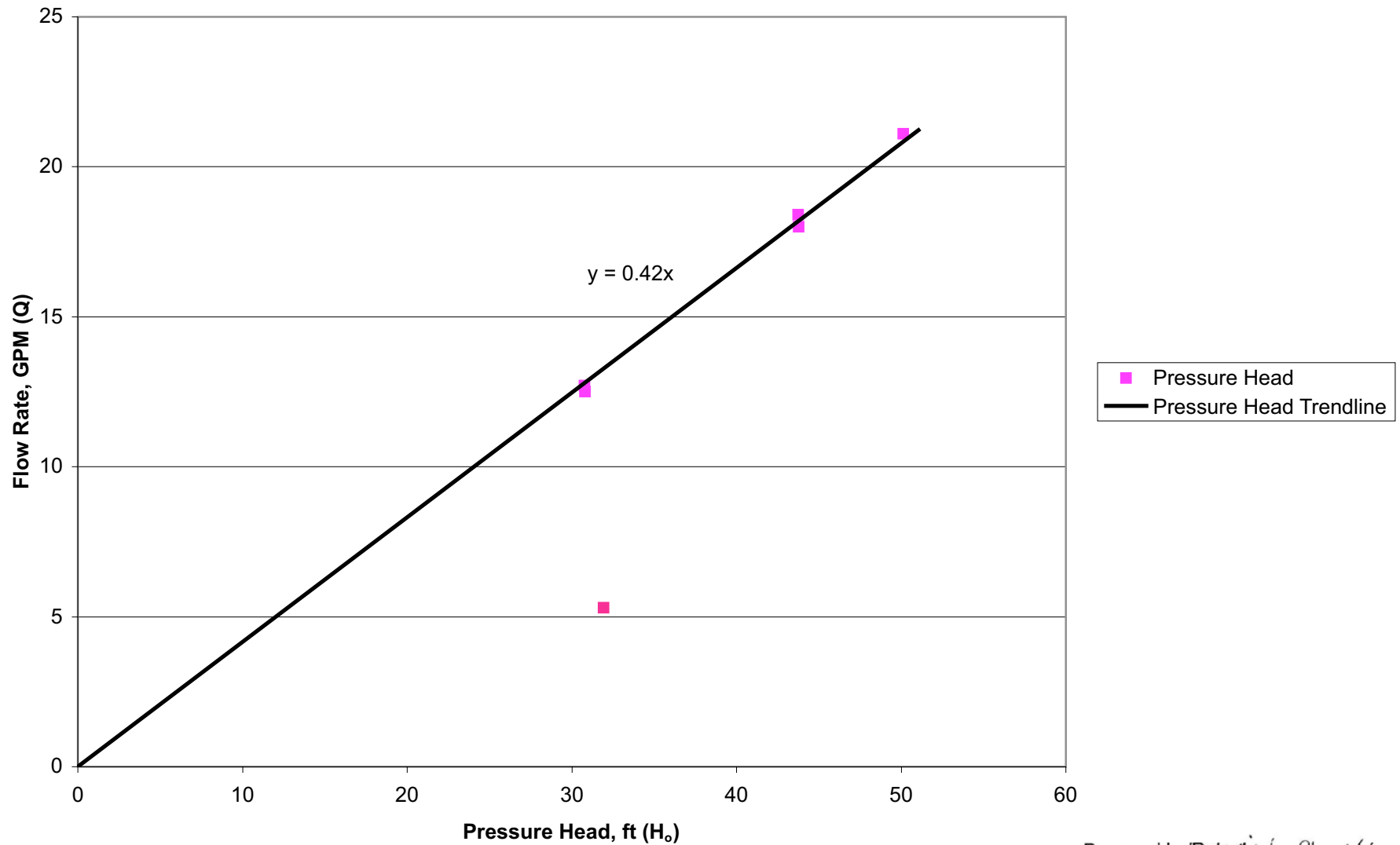
Pressure Head vs. Flow Rate, B-1004 Interval 26-31 ft. bls



Prepared by/Date: ALC/MDL 12/5/06
Checked by/Date: CLF 12-5-06

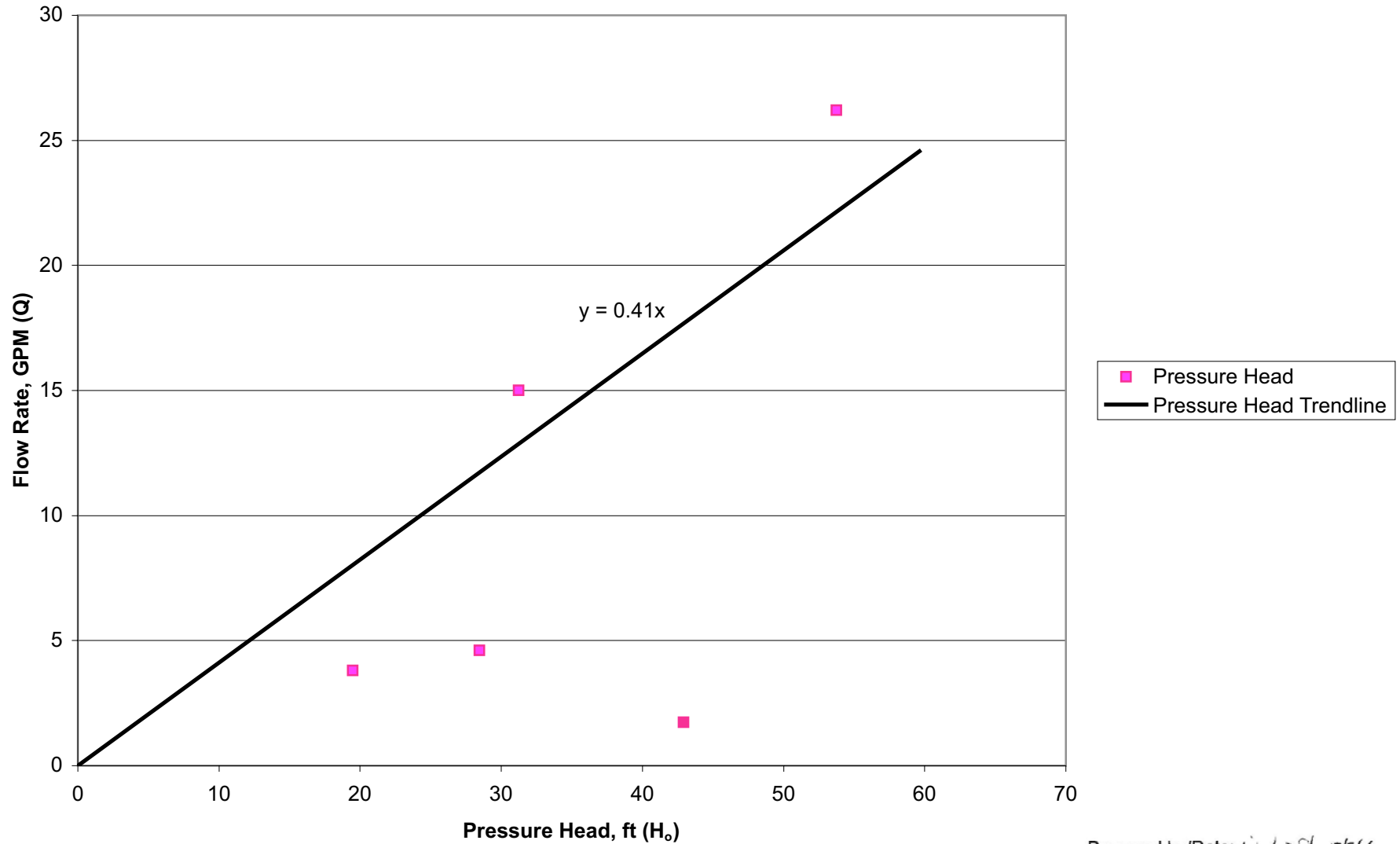
Attachment B, Table B-2
DCN: CH 248

Pressure Head vs. Flow Rate, B-1004 Interval 39-44 ft. bls



Prepared by/Date: M. J. D. 12/5/06
 Checked by/Date: C. E. 12-5-06

Pressure Head Vs. Flow Rate, B-1004 Interval 45-50 ft. bls



Prepared by/Date: W. H. D. 12/5/06
 Checked by/Date: C.S. 12-5-06

**B-1015 Packer Test Data
Cherokee COL Site
MACTEC Project 6234-06-3389**

Given Parameters

Test Section Length Δ , ft: 5
Radius of Borehole r_w , ft: 0.125
GW Elevation, ft: 8

Interval: 8.5-13.5

Test ID	Q, GPM	P _g , psi	P _f , psi	P _g - P _f , psi	h _f , ft	H _{gravity} , ft	H _o , ft
T1	0	1.5	0	1.5	0	13	16.46
T2	0	4.5	0	4.5	0	13	23.38
T3	0.05	10	0	10	0	13	36.08
T4	4.5	15	0.08	14.92	0.18	13	47.43

Q/H _o , GPM/ft	0.09
K _e , ft/year	743

Interval: 22-27

Test ID	Q, GPM	P _g , psi	P _f , psi	P _g - P _f , psi	h _f , ft	H _{gravity} , ft	H _o , ft
T1	1.56	5	0.04	4.96	0.09	11	22.45
T2	4	20	0.16	19.84	0.37	11	56.78
T3	9.5	25	0.4	24.6	0.92	11	67.77
T4	1.6	11	0.06	10.94	0.15	11	36.24

Q/H _o , GPM/ft	0.10
K _e , ft/year	825

Interval: 31-36

Test ID	Q, GPM	P _g , psi	P _f , psi	P _g - P _f , psi	h _f , ft	H _{gravity} , ft	H _o , ft
T1	1.8	7	0.05	6.95	0.12	12	28.04
T2	8.5	22	0.43	21.57	0.99	12	61.78
T3	19.2	40	1.6	38.4	3.69	12	100.62

Q/H _o , GPM/ft	0.17
K _e , ft/year	1,403

Notes:

Q = flow rate

Test ID, flow rate (GPM) and gauge pressure taken from field measurements. Head loss due to pipe taken from USBR Figure 17.4, confirmed based on field measurement.

P_g is equal to gauge pressure, P_f is equal to pressure loss due to pipe friction (psi), h_f is equal to head loss due to pipe friction (ft)

H_{gravity} is equal to depth to water + height of surface pressure gauge above the datum (excess pressure due to weight of water in flowpipe)

$$H_o = (P_g / \gamma_w) + H_{gravity} - h_f$$

$$K_e = ((Q/H_o) * (1/\Delta)) * 1/2\pi * \ln(R/r_w) * (525,600 \text{ min/year}) * (1.337 \text{ ft}^3/\text{gal})$$

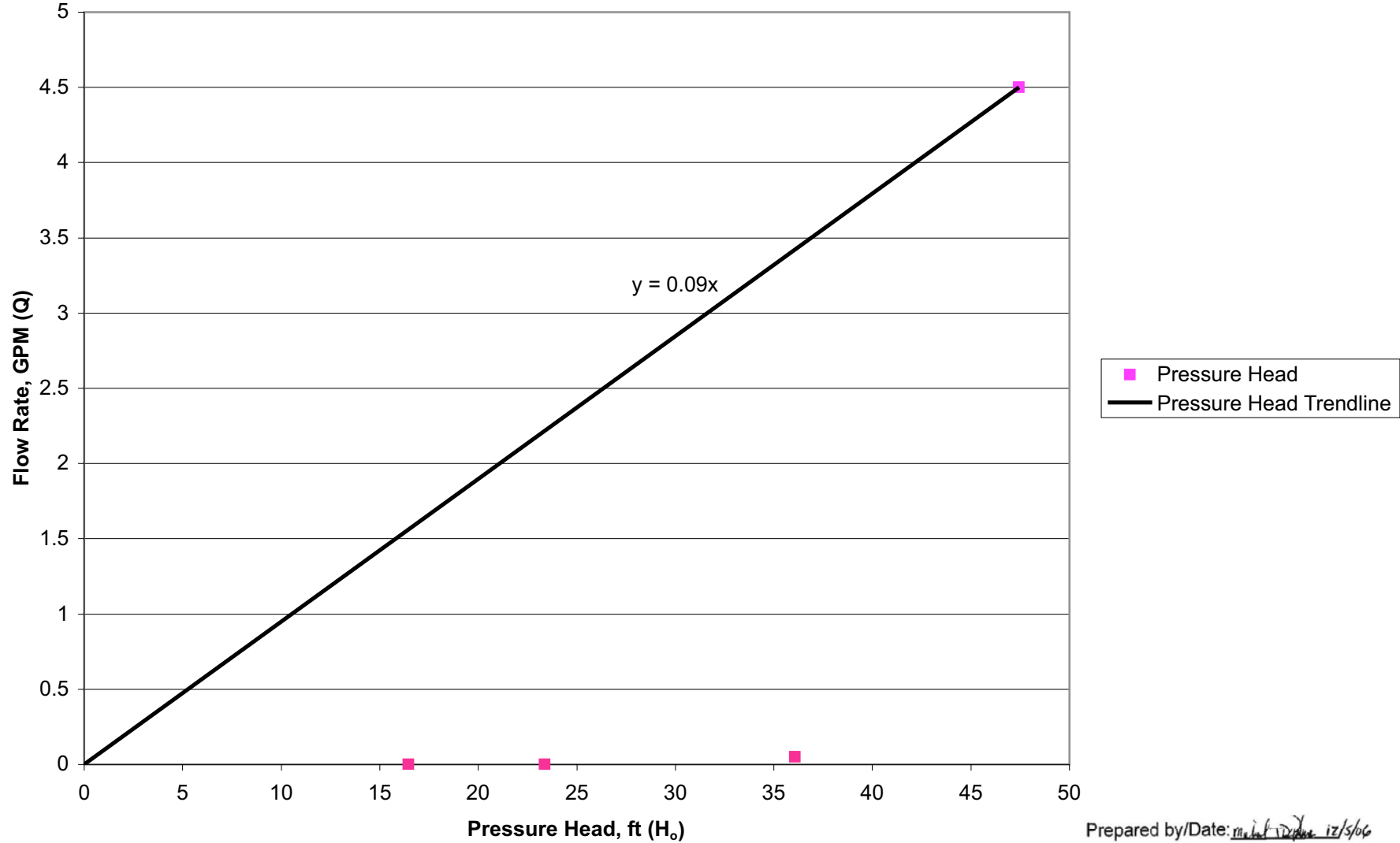
R is equal to total length between packers, Δ

Radius of borehole (r_w) taken from outside diameter of core bit, 3 inches

Q/H_o is equal to the slope of the linear trendline of H_o (x-axis) and Q (y-axis)

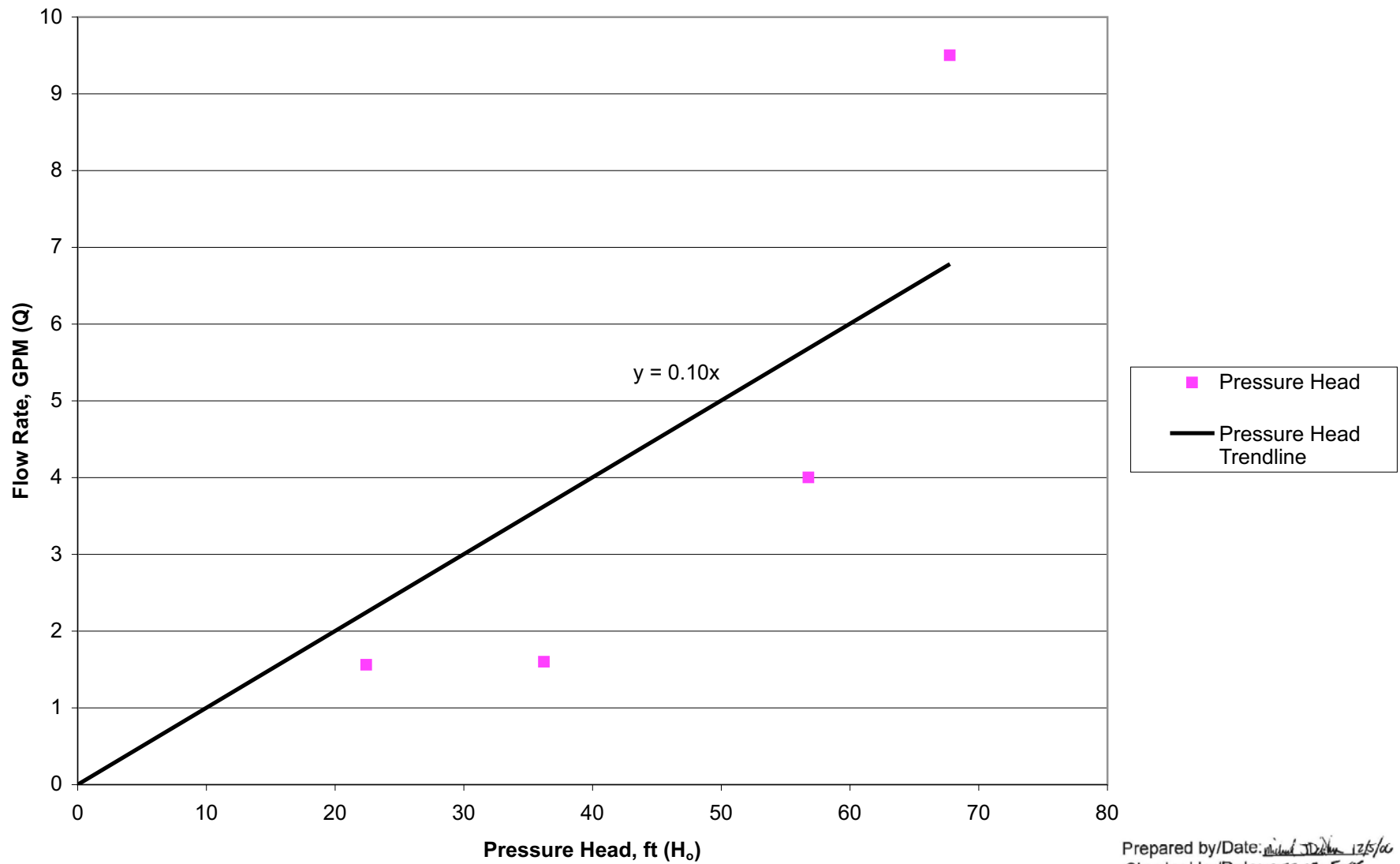
Prepared by/Date: Michael J. DePina 12/5/06
Checked by/Date: CAS 12-5-06

Pressure Head vs. Flow Rate, B-1015 Interval 8.5-13.5 ft. bls



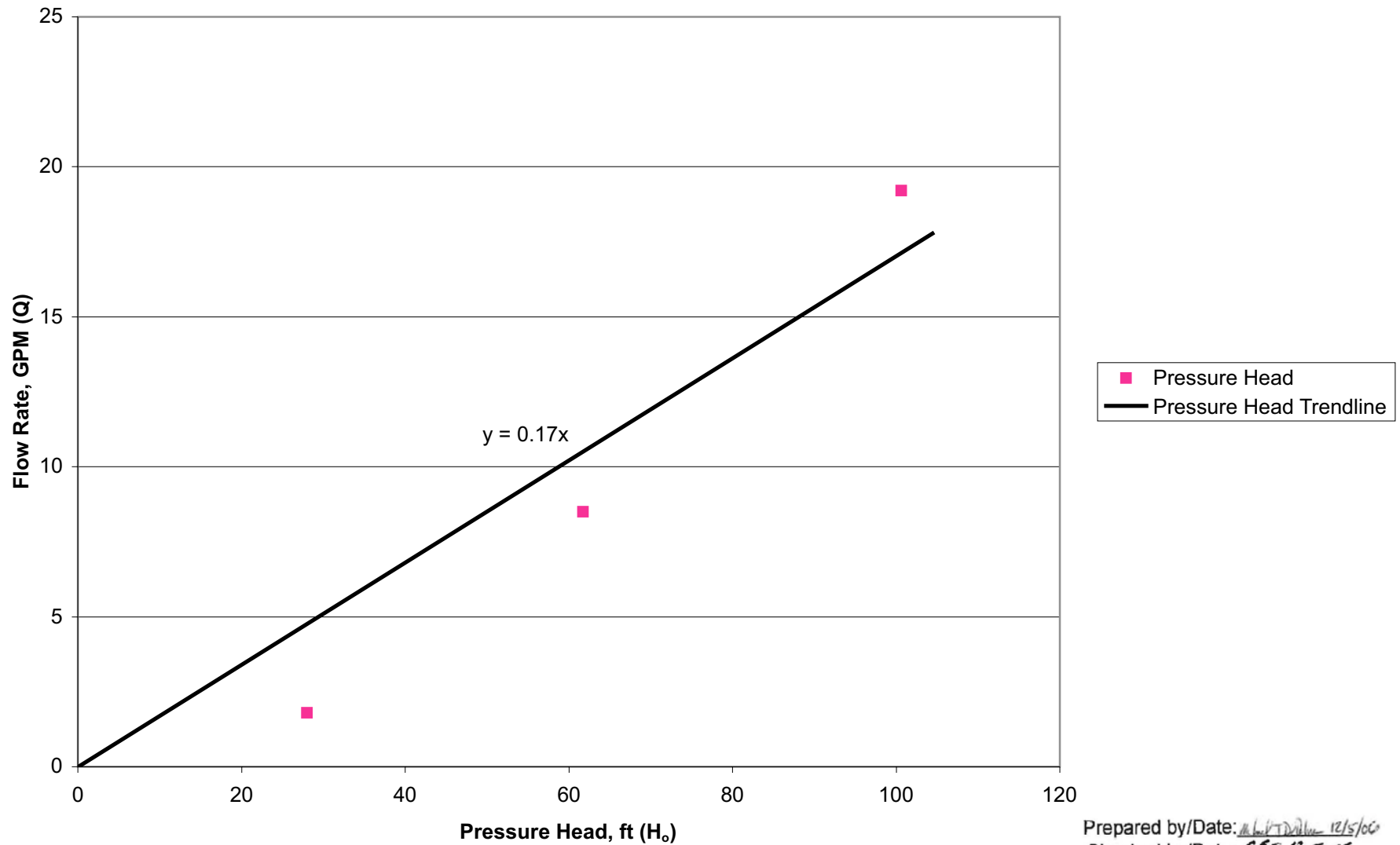
Prepared by/Date: maia v. 12/5/06
Checked by/Date: CE 12-5-06

Pressure Head vs. Flow Rate, B-1015 Interval 22-27 ft. bls



Prepared by/Date: Michael J. D'Amico 12/5/06
 Checked by/Date: CS 12-5-06

Pressure Head vs. Flow Rate, B-1015 Interval 31-36 ft. bls



Prepared by/Date: ALB/TD/12/5/06
Checked by/Date: CE 12-5-06

**MW-1201 Packer Test Data
Cherokee COL Site
MACTEC Project 6234-06-3389**

Given Parameters

Test Section Length L , ft: 10
Radius of Borehole r_o , ft: 0.125
GW Elevation, ft: 37

Interval: 87-97

Test ID	Q, GPM	P _g , psi	P _f , psi	P _g - P _f , psi	h _f , ft	H _g , ft	H _o , ft
T1	1.03	11	0.21	10.79	0.48	40	64.90
T4/T5	1.86	20	0.28	19.72	0.65	40	85.51
T7	0.46	12	0.15	11.85	0.35	40	67.35
T8	1.93	24	0.31	23.69	0.72	40	94.67

Note: T2 & T3 and T6 not conducted

Q/H _o , GPM/ft	0.020
K _e , ft/year	98

Interval: 117-127

Test ID	Q, GPM	P _g , psi	P _f , psi	P _g - P _f , psi	h _f , ft	H _g , ft	H _o , ft
T1	1.36	20	0.35	19.65	0.81	40	85.35
T4	2	30	0.39	29.61	0.90	40	108.33
T5	2.83	37	0.61	36.39	1.41	40	123.98
T6	0.13	15	0.2	14.8	0.46	40	74.15
T7	1.9	35	0.37	34.63	0.85	40	119.92
T8	2.16	41	0.39	40.61	0.90	40	133.72

Note: T2 & T3 not conducted

Q/H _o , GPM/ft	0.018
K _e , ft/year	88

Interval: 127-137

Test ID	Q, GPM	P _g , psi	P _f , psi	P _g - P _f , psi	h _f , ft	H _g , ft	H _o , ft
T1	1.86	23	0.42	22.58	0.97	40	92.11
T4	2.63	23	0.61	22.39	1.41	40	91.67
T5	2.9	30	1.06	28.94	2.45	40	106.78
T6	1	15	0.02	14.98	0.04	40	74.58
T7	1.8	23	0.61	22.39	1.41	40	91.67

Note: T2 & T3 and T8 not conducted

Q/H _o , GPM/ft	0.023
K _e , ft/year	113

Notes:

Q = flow rate

Test ID, flow rate (GPM) and gauge pressure taken from field measurements. Head loss due to pipe taken from USBR Figure 17.4, confirmed based on field measurement.

P_g is equal to gauge pressure, P_f is equal to pressure loss due to pipe friction (psi), h_f is equal to head loss due to pipe friction (ft)

H_{gravity} is equal to depth to water + height of surface pressure gauge above the datum (excess pressure due to weight of water in flowpipe)

$$H_o = (P_g / \gamma_w) + H_{gravity} - h_f$$

$$K_e = ((Q/H_o) * (1/L)) * 1/2\pi * \ln(R/r_o) * (525,600 \text{ min/year}) * (.1337 \text{ ft}^3/\text{gal})$$

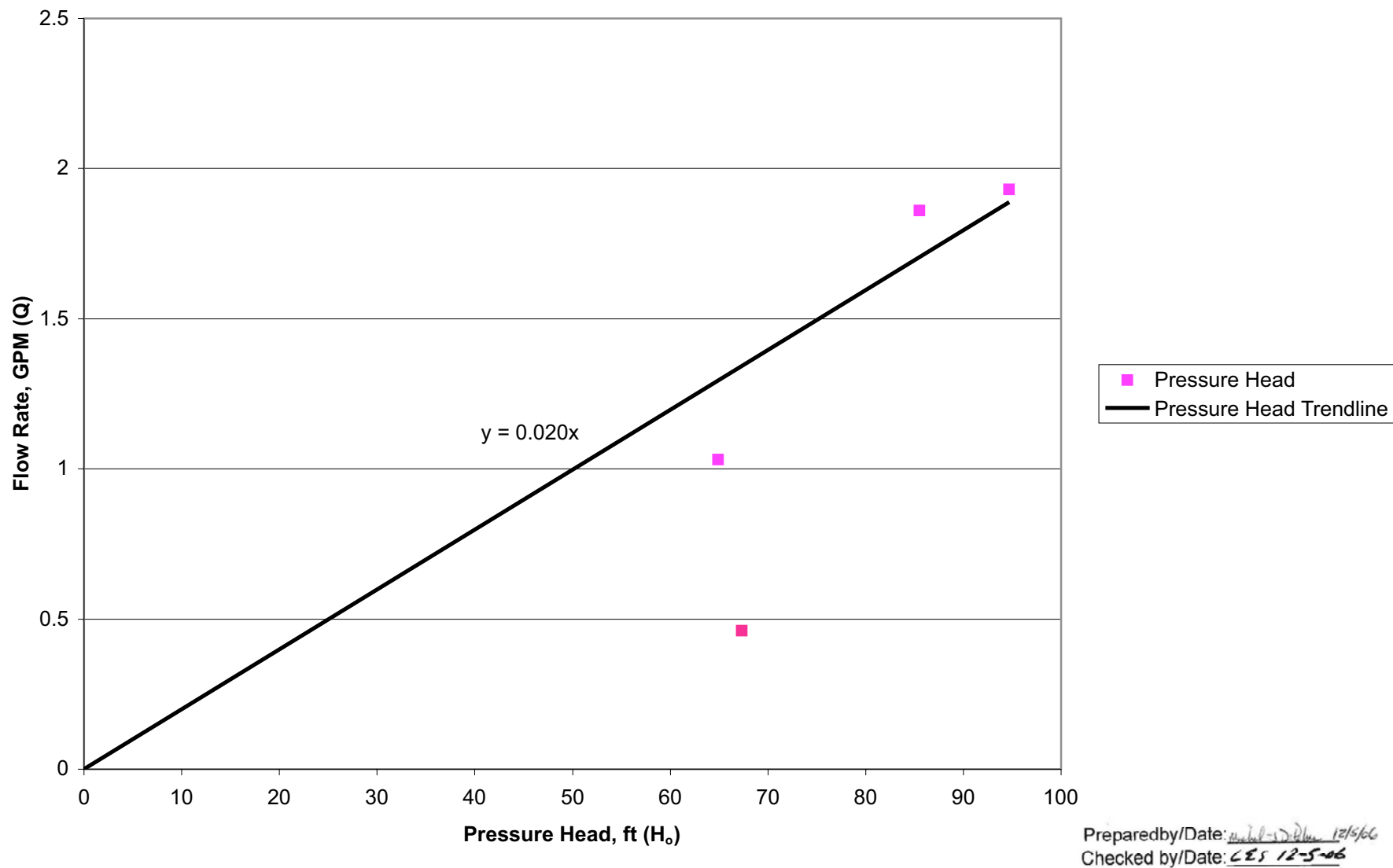
R is equal to total length between packers, L

Radius of borehole (r_o) taken from outside diameter of core bit, 3 inches

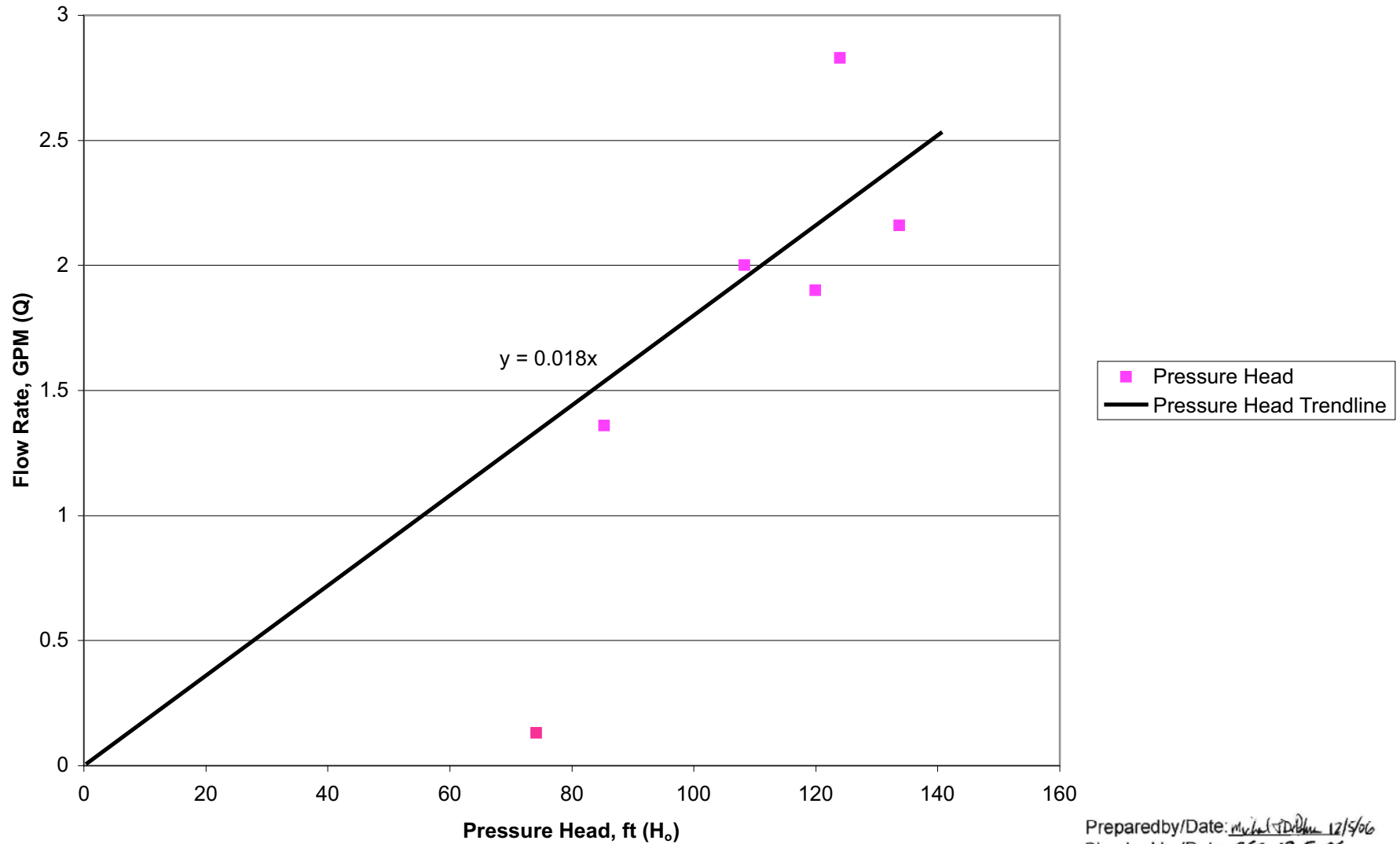
Q/H_o is equal to the slope of the linear trendline of H_o (x-axis) and Q (y-axis)

Prepared by/Date: mike J. D. 12/5/06
Checked by/Date: CES 12-5-06

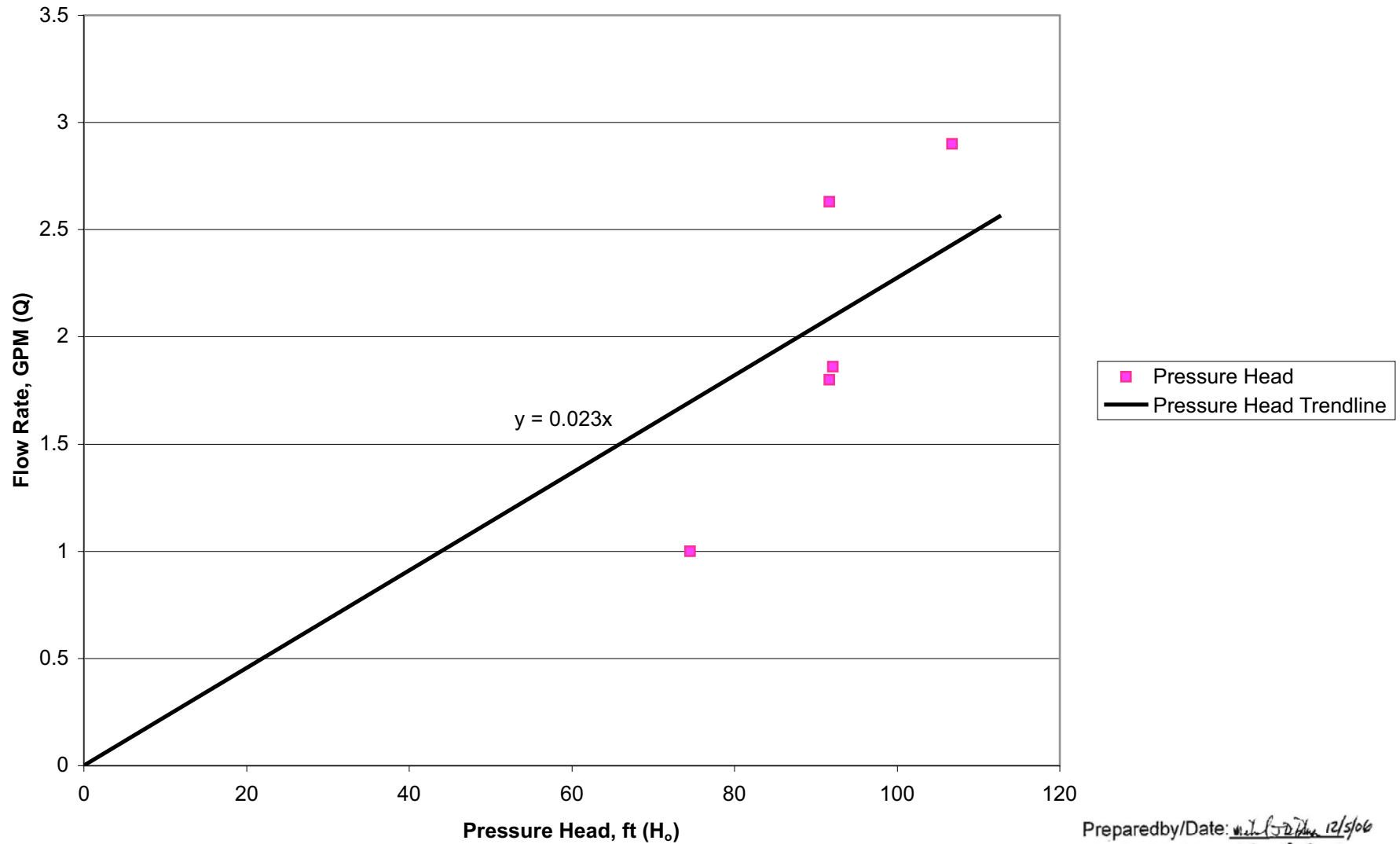
Pressure Head vs. Flow Rate, MW-1201 Interval 87-97 ft. bls



Pressure Head vs. Flow Rate, MW-1201 Interval 117-127



Pressure Head Vs. Flow Rate, MW-1201 Interval 127-137



Prepared by/Date: W. J. D. 12/5/06
 Checked by/Date: CEJ 12-5-06

**MW-1210 Packer Test Data
Cherokee COL Site
MACTEC Project 6234-06-3389**

Given Parameters

Test Section Length $_$, ft: 10
Radius of Borehole r_o , ft: 0.125
GW Elevation, ft: 16.5

Interval: 96-106

Test ID	Q, GPM	P _g , psi	P _f , psi	P _g - P _f , psi	h_f , ft	H _g , ft	H _o , ft
T1	27.5	17	6.06	10.94	13.98	20.5	45.75
T2	12.9	8	2.04	5.96	4.71	20.5	34.25
T3	4	9	0.99	8.01	2.28	20.5	38.98
							Q/H _o , GPM/ft
							0.388
							K _e , ft/year
							1,902

Interval: 105-115

Test ID	Q, GPM	P _g , psi	P _f , psi	P _g - P _f , psi	h_f , ft	H _g , ft	H _o , ft
T1	28	18	6.6	11.4	15.23	21.5	47.81
T2	17.8	9	3.85	5.15	8.88	21.5	33.38
T3	11.4	5	1.76	3.24	4.06	21.5	28.98
T4	6.3	19	1.06	17.94	2.44	21.5	62.91
							Q/H _o , GPM/ft
							0.534
							K _e , ft/year
							2,618

Notes:

Q = flow rate

Test ID, flow rate (GPM) and gauge pressure taken from field measurements. Head loss due to pipe taken from USBR Figure 17.4, confirmed based on field measurement.

P_g is equal to gauge pressure, P_f is equal to pressure loss due to pipe friction (psi), h_f is equal to head loss due to pipe friction (ft)

H_{gravity} is equal to depth to water + height of surface pressure gauge above the datum (excess pressure due to weight of water in flowpipe)

$H_o = (P_g / _w) + H_{gravity} - h_f$

$K_e = ((Q/H_o) * (1/_)) * 1/2\pi * \ln(R/r_o) * (525,600 \text{ min/year}) * (.1337 \text{ ft}^3/\text{gal})$

R is equal to total length between packers, $_$

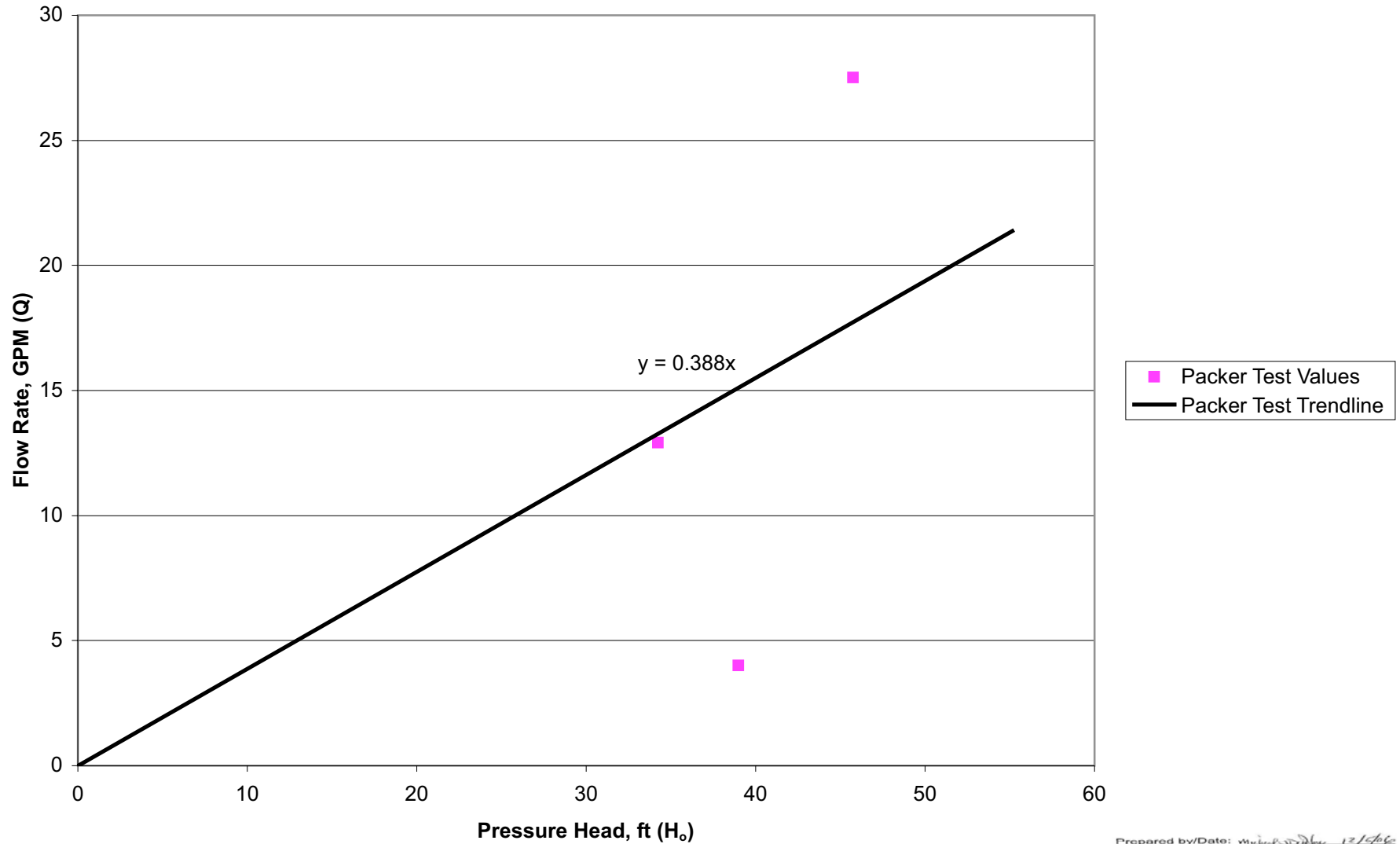
Radius of borehole (r_o) taken from outside diameter of core bit, 3 inches

Q/H_o is equal to the slope of the linear trendline of H_o (x-axis) and Q (y-axis)

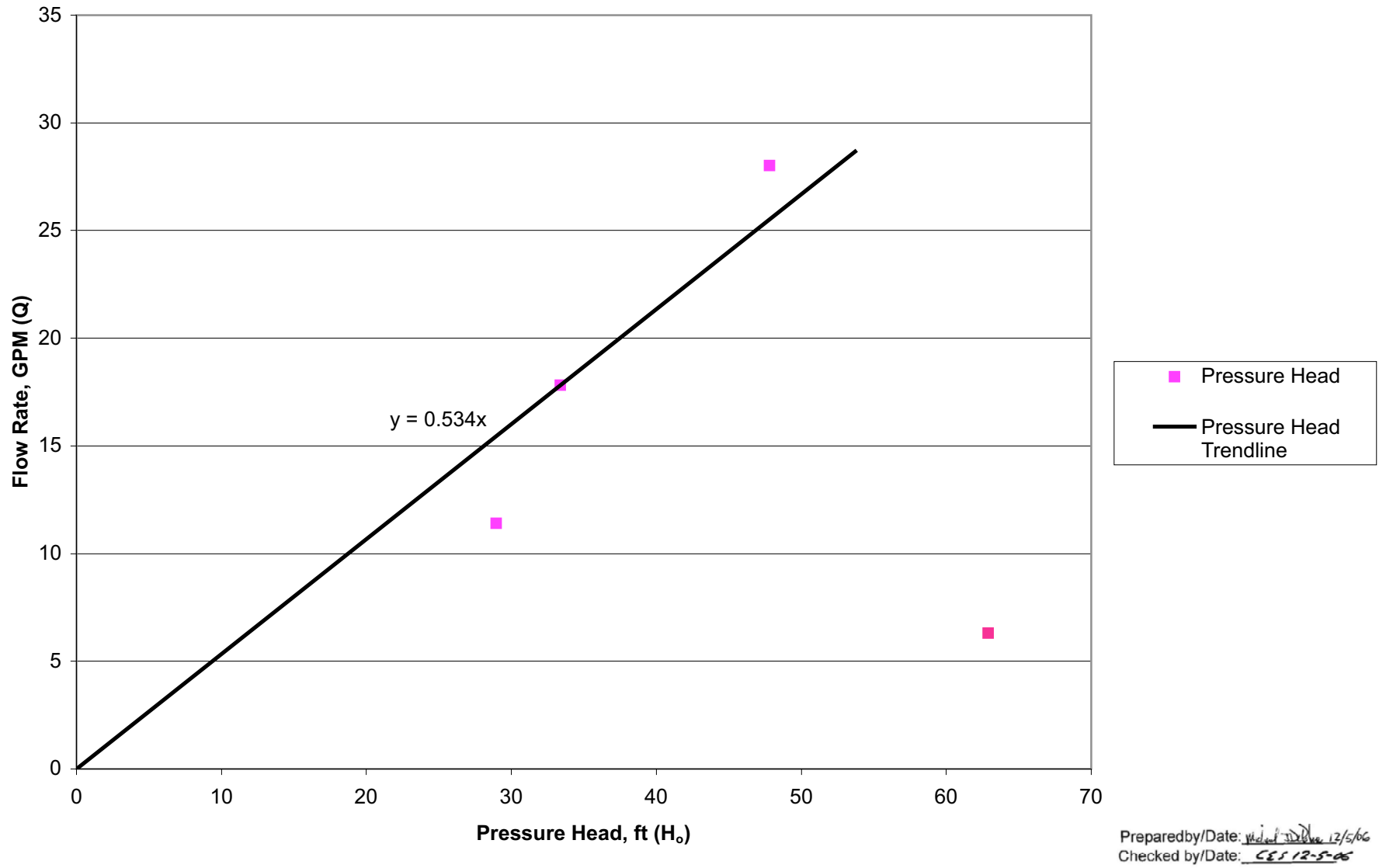
Boring depth had caved to approximately 115 ft. bls prior to packer testing

Prepared by/Date: Michael D. Dineen 12/5/06
Checked by/Date: CE 12-5-06

Pressure Head vs. Flow Rate, MW-1210 Interval 96-106



Pressure Head vs. Flow Rate, MW-1210 Interval 105-115



APPENDIX 2AA
ATTACHMENT 5 – LEE NUCLEAR STATION CONE PENETROMETER
TEST (CPT) RESULTS

This attachment contains Cone Penetrometer Test (CPT) results from the Lee Nuclear Site. CPT tests were attempted at 29 locations. Seismic CPT tests were also attempted at 10 of these locations. Results are also included for Pore Pressure Dissipation Tests performed at 12 CPT locations. Tests were conducted by GREGG In Situ, Inc.

WLS COL 2.5-1



GREGG IN SITU, INC.

GEOTECHNICAL AND ENVIRONMENTAL INVESTIGATION SERVICES

Cone Penetration Test Sounding Summary

-Table 1-

CPT Sounding Identification	File Name	Date	Termination Depth (Feet)	Depth of Soil Samples (Feet)	Depth of Pore Pressure Dissipation Tests (Feet)
CPT-1300	061c00	5/12/06	30	-	18.5, 30.0
CPT-1301	061c01	5/11/06	30	-	-
CPT-1302	061c02	5/12/06	80	-	34.9, 80.1
CPT-1303	061c03	5/13/06	90	-	65.9, 80.2
CPT-1304	061c04	5/12/06	74	-	74.0
CPT-1305	061c05	5/12/06	34	-	-
CPT-1306	061c06	5/12/06	19	-	-
CPT-1306a	061c6a	5/12/06	21	-	-
CPT-1307	061c07	5/16/06	20	-	-
CPT-1308	061c08	5/13/06	8	-	-
CPT-1308a	061c08a	5/14/06	41	-	41.2
CPT-1308b	061c08b	5/16/06	39.5	-	-
CPT-1309	061c09	5/14/06	85	-	60.0, 85.1
CPT-1314	061c14	5/15/06	6	-	-
CPT-1315	061c15	5/15/06	40	-	-
CPT-1316	061c16	5/15/06	57.6	-	-
CPT-1317	061c17	5/15/06	8.7	-	-
CPT-1317a	061c17a	5/15/06	19.5	-	-
CPT-1317b	061c17b	5/16/06	20.7	-	-
CPT-1318	061c18	5/15/06	16	-	-
CPT-1319	061c19	5/15/06	47.6	-	-
CPT-1320	094c1320	8/20/06	32.3	-	32.2
CPT-1321	094c1321	8/20/06	43.3	-	43.3

1112 Pasture Lane • Columbia, South Carolina 29201 • (803) 253-7633 • FAX (803) 253-7634

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GREGG IN SITU, INC.

GEOTECHNICAL AND ENVIRONMENTAL INVESTIGATION SERVICES

CPT-1322	094c1322	8/20/06	48.1	-	48.1
CPT-1323	094c1323	8/19/06	84.2	-	81.0, 84.2
CPT-1324	094c1324	8/19/06	3.1	-	-
CPT-1324b	094c1324b	8/19/06	77.3	-	77.3
CPT-1325	094c1325	8/19/06	40.0	-	-
CPT-1325a	094c1325a	8/19/06	55.1	-	55.1



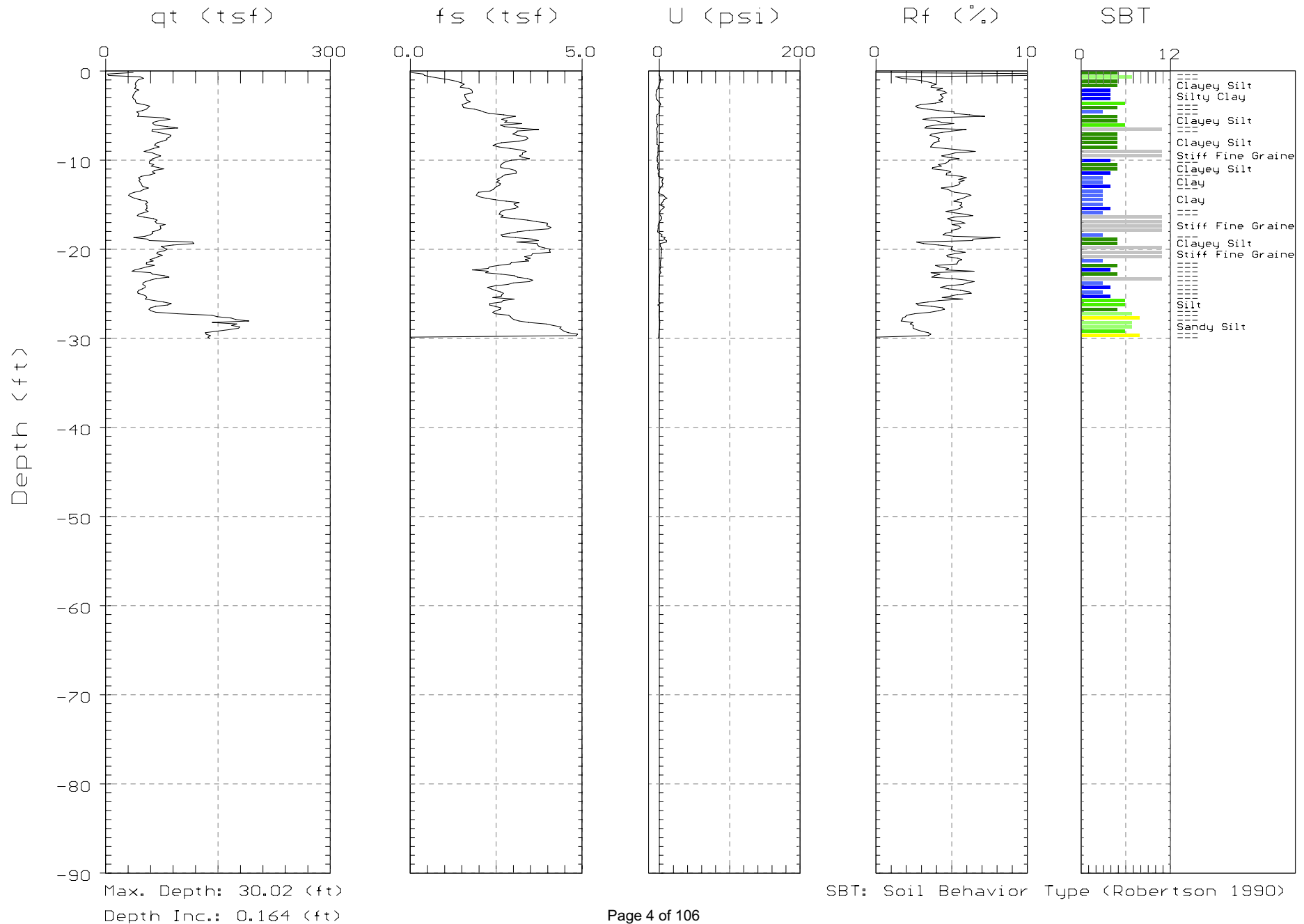
MACTEC

Site: N=1165285.875E=1845003.07

Engineer: C.SAMS

Location: CPT-1300L=609.2

Date: 05:12:06 06:35



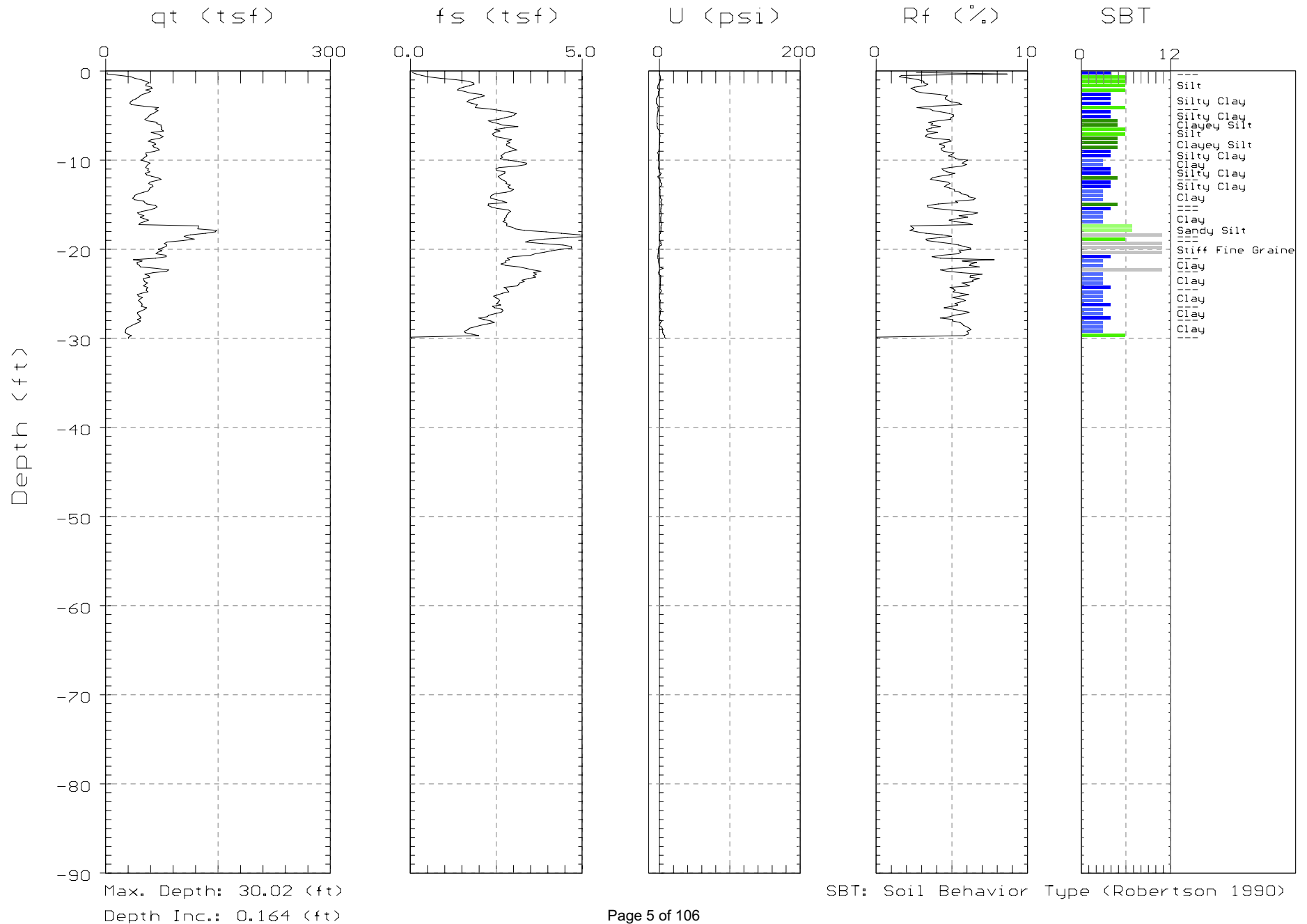


MACTEC

Site: N=1164894.228E=1845085.762 Engineer: C.SAMS

Location: CPT-1301L=609.8

Date: 05/11/06 14:37



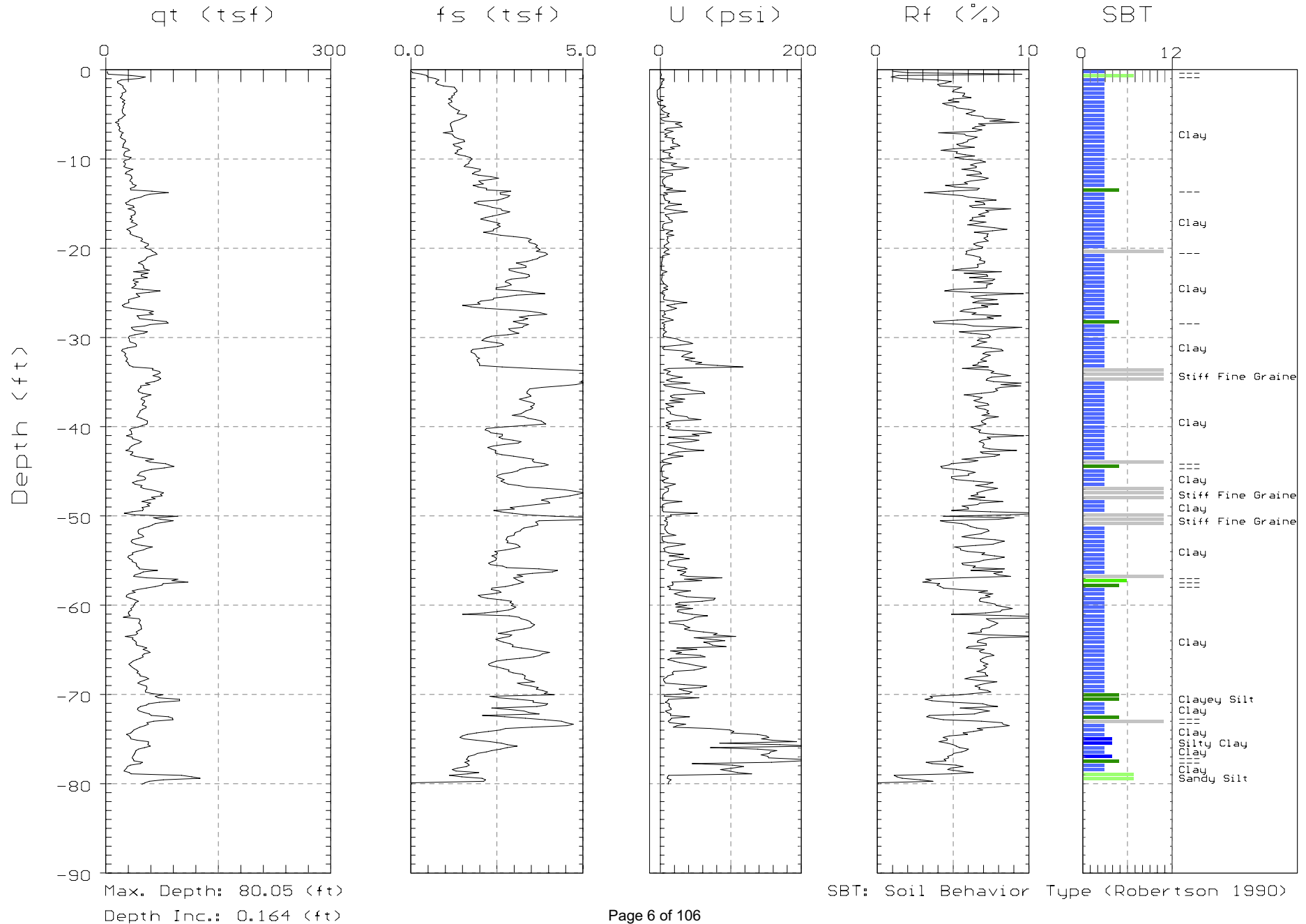


MACTEC

Site: N=1166124.625E=1848040.224 Engineer: C.SAMS

Location: CPT-1302L=609.3

Date: 05/12/06 11:13



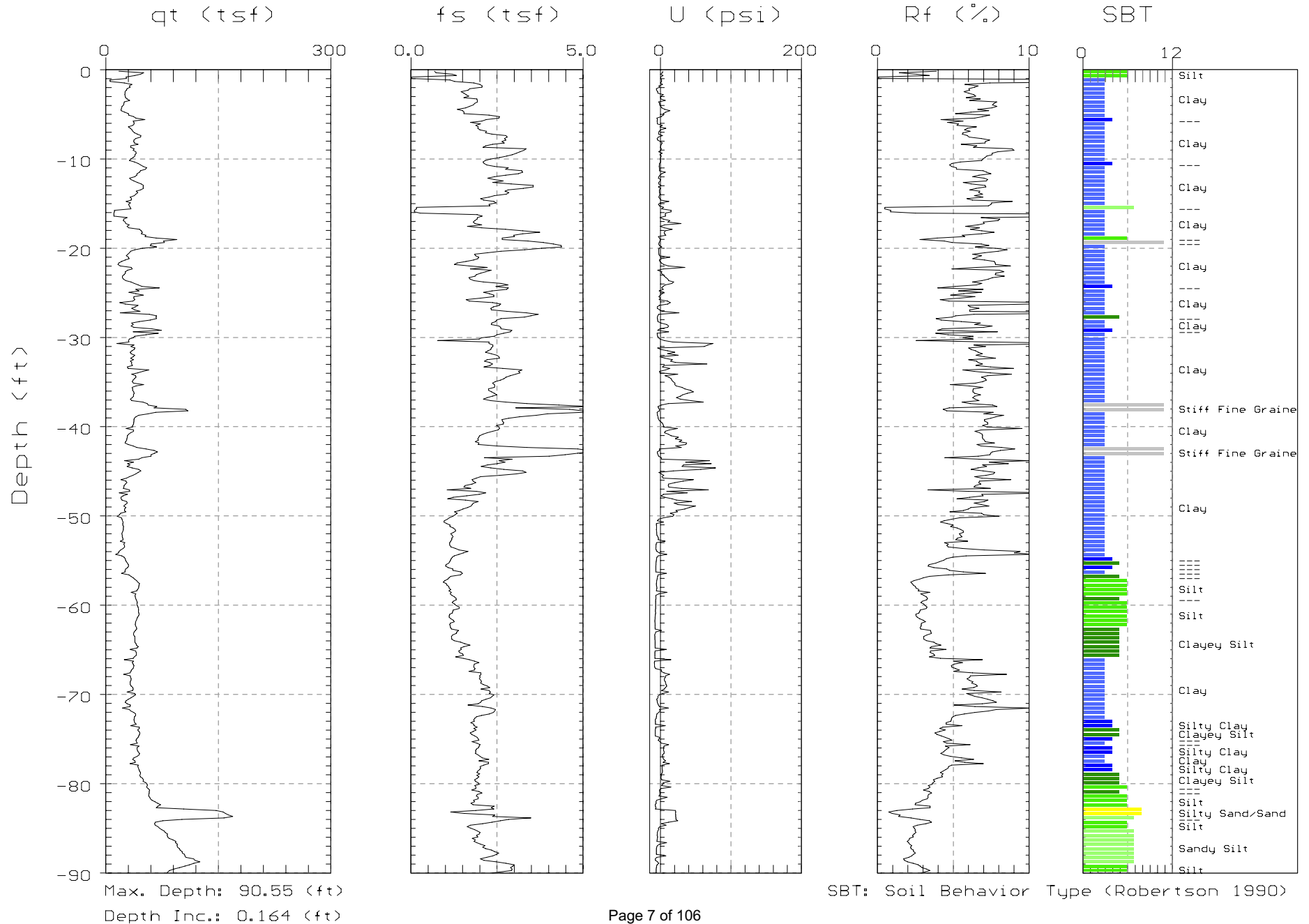


MACTEC

Site: N=1165582.495E=1848103.244 Engineer: C.SAMS

Location: CPT-1303L=609.6

Date: 05/13/06 08:30



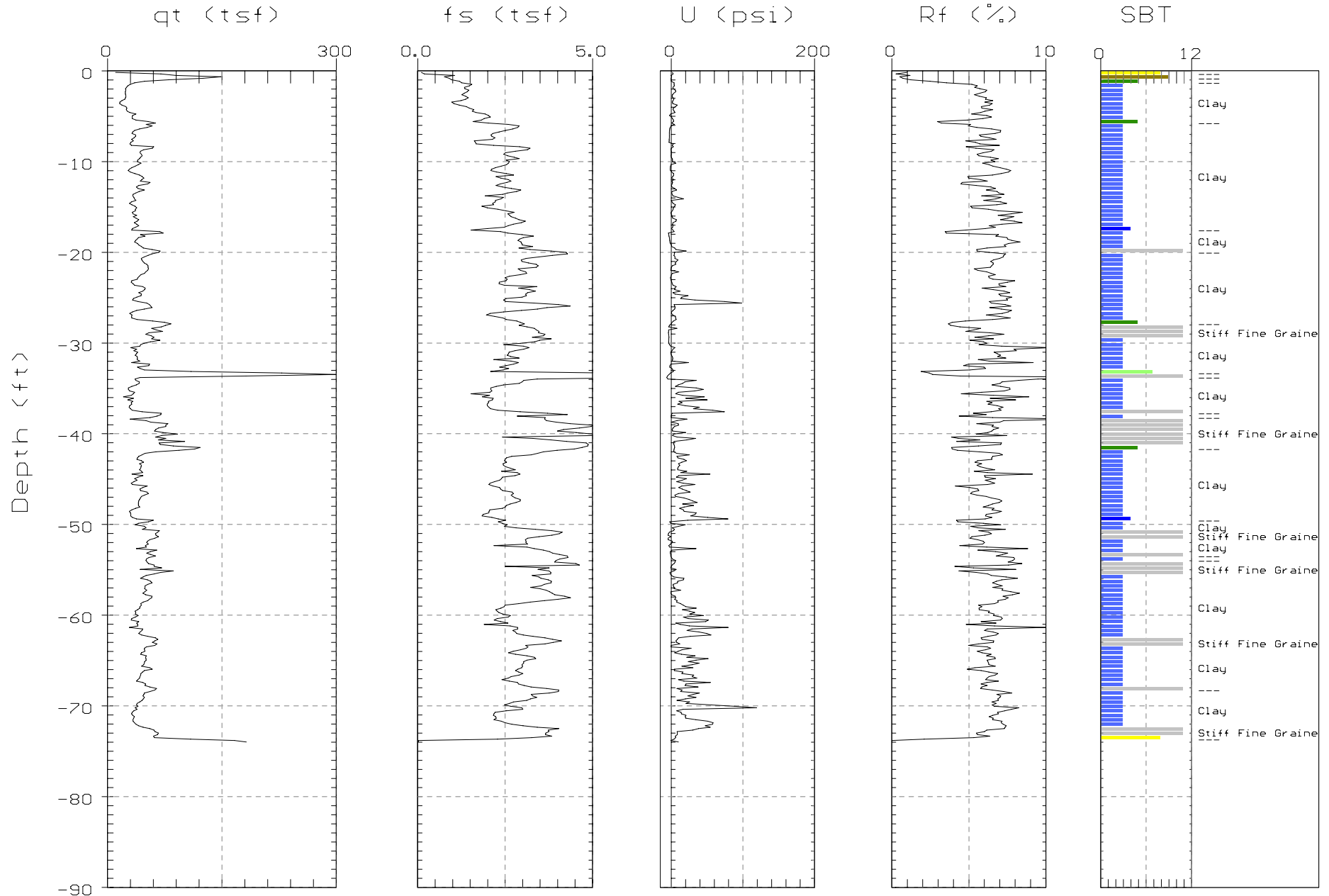


MACTEC

Site: N=1165892.587E=1848181.888 Engineer: C.SAMS

Location: CPT-1304L=609.8

Date: 05/12/06 13:23



Max. Depth: 73.98 (ft)
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

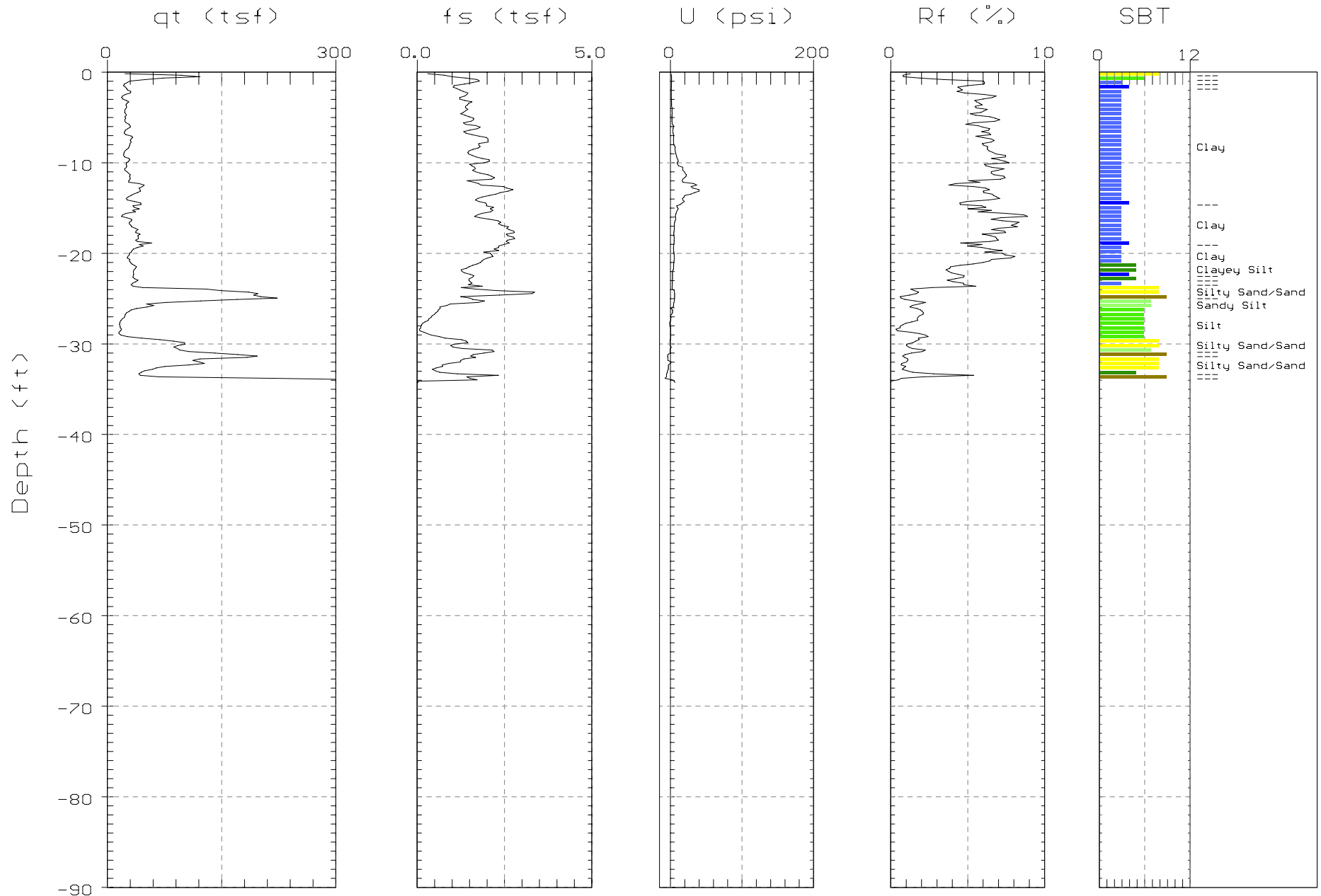


MACTEC

Site: N=1164732.401 E=1847452.326 Engineer: C.SAMS

Location: CPT-1305 L=603.7

Date: 05/12/06 08:29



Max. Depth: 34.28 (ft)
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

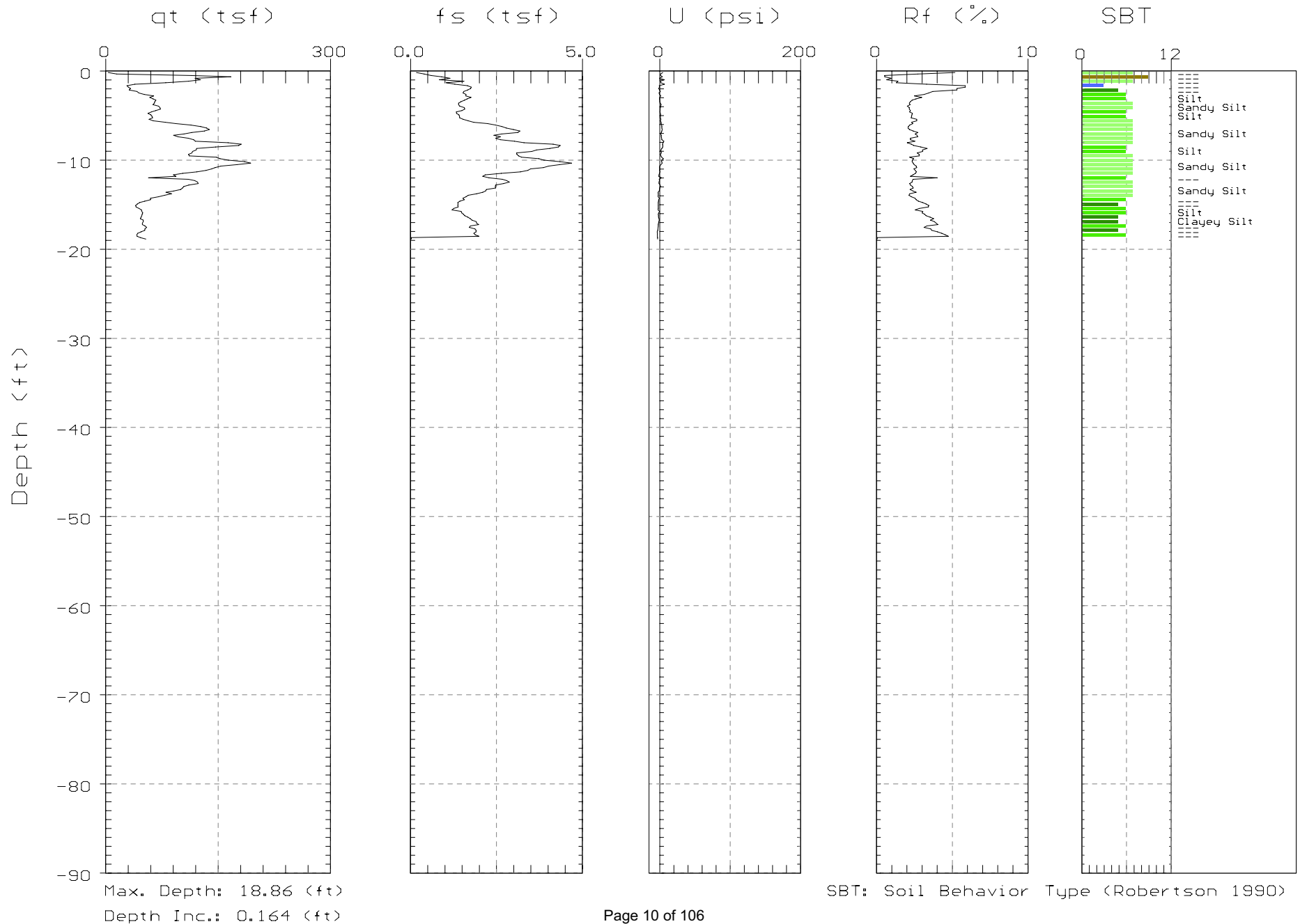


MACTEC

Site: N=1164174.233E=1847132.668 Engineer: C.SAMS

Location: CPT-1306L=604.3

Date: 05/12/06 09:37



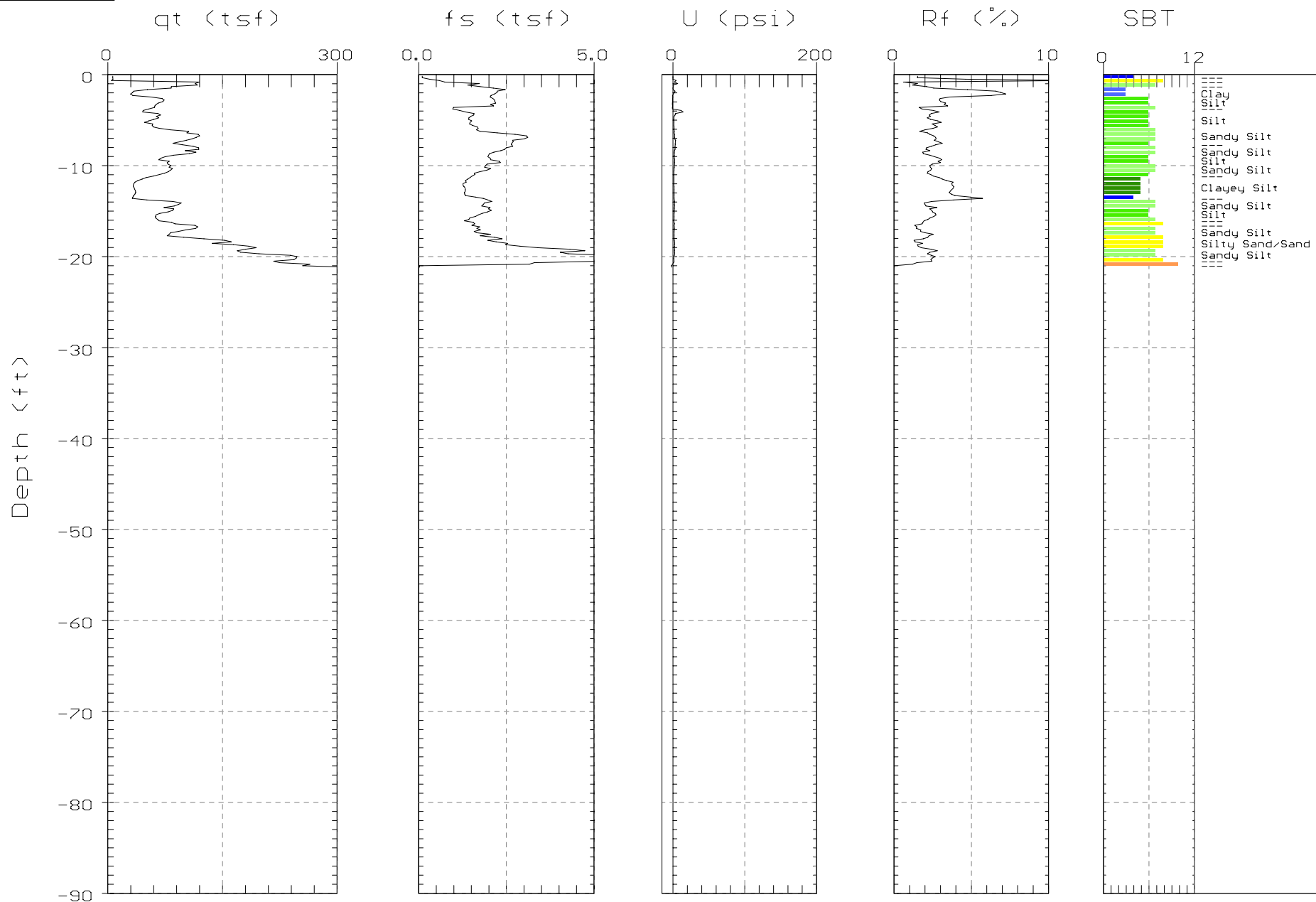


MACTEC

Site: N=1164172.987E=1847128.893 Engineer: C.SAMS

Location: CPT-1306AL=604.3

Date: 05/12/06 10:09



Max. Depth: 21.16 (ft)
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

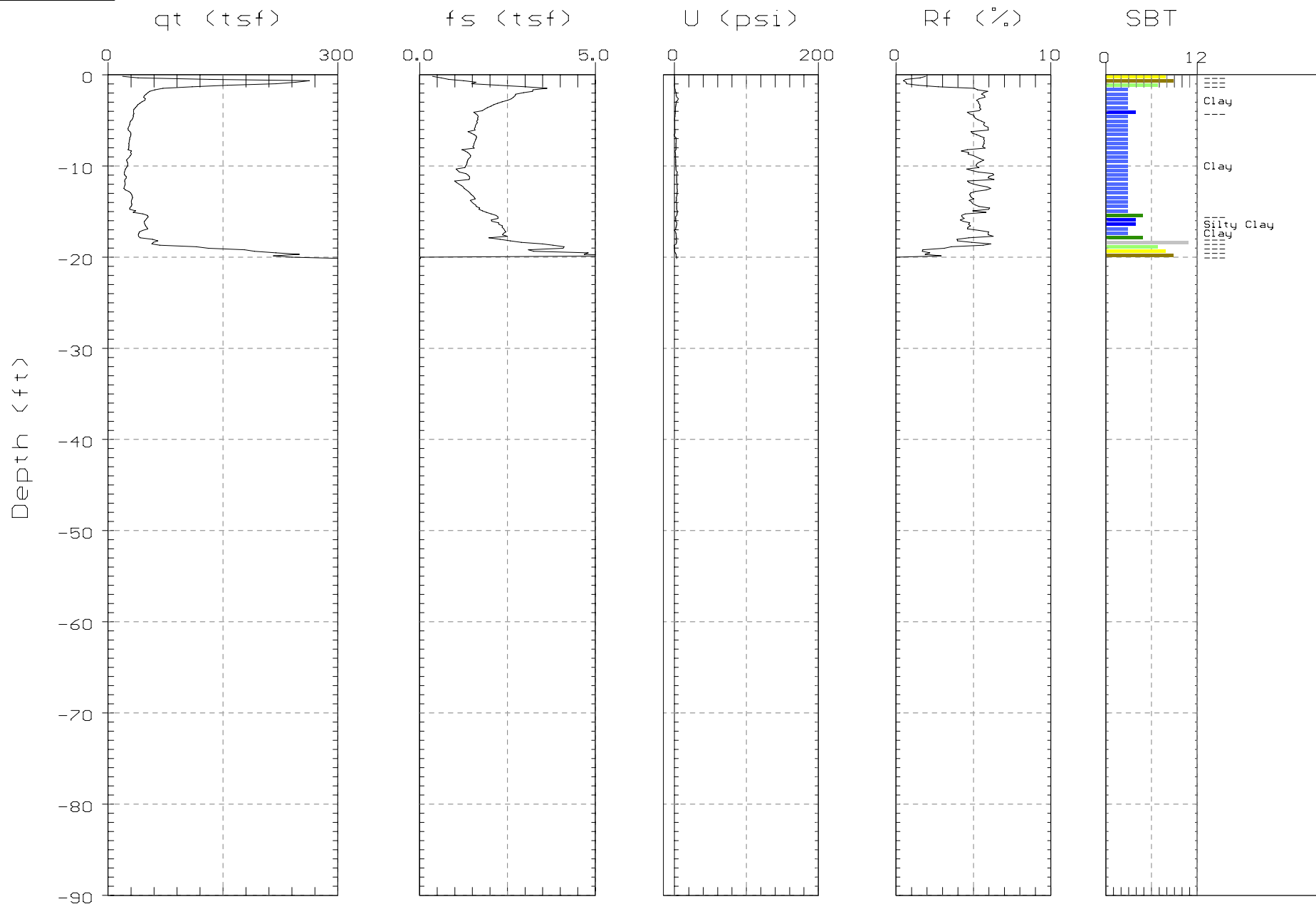


MACTEC

Site: N=1166393.067E=1847138.502 Engineer: C.SAMS

Location: CPT-1307L=589.8

Date: 05/16/06 08:51



Max. Depth: 20.18 (ft)
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)



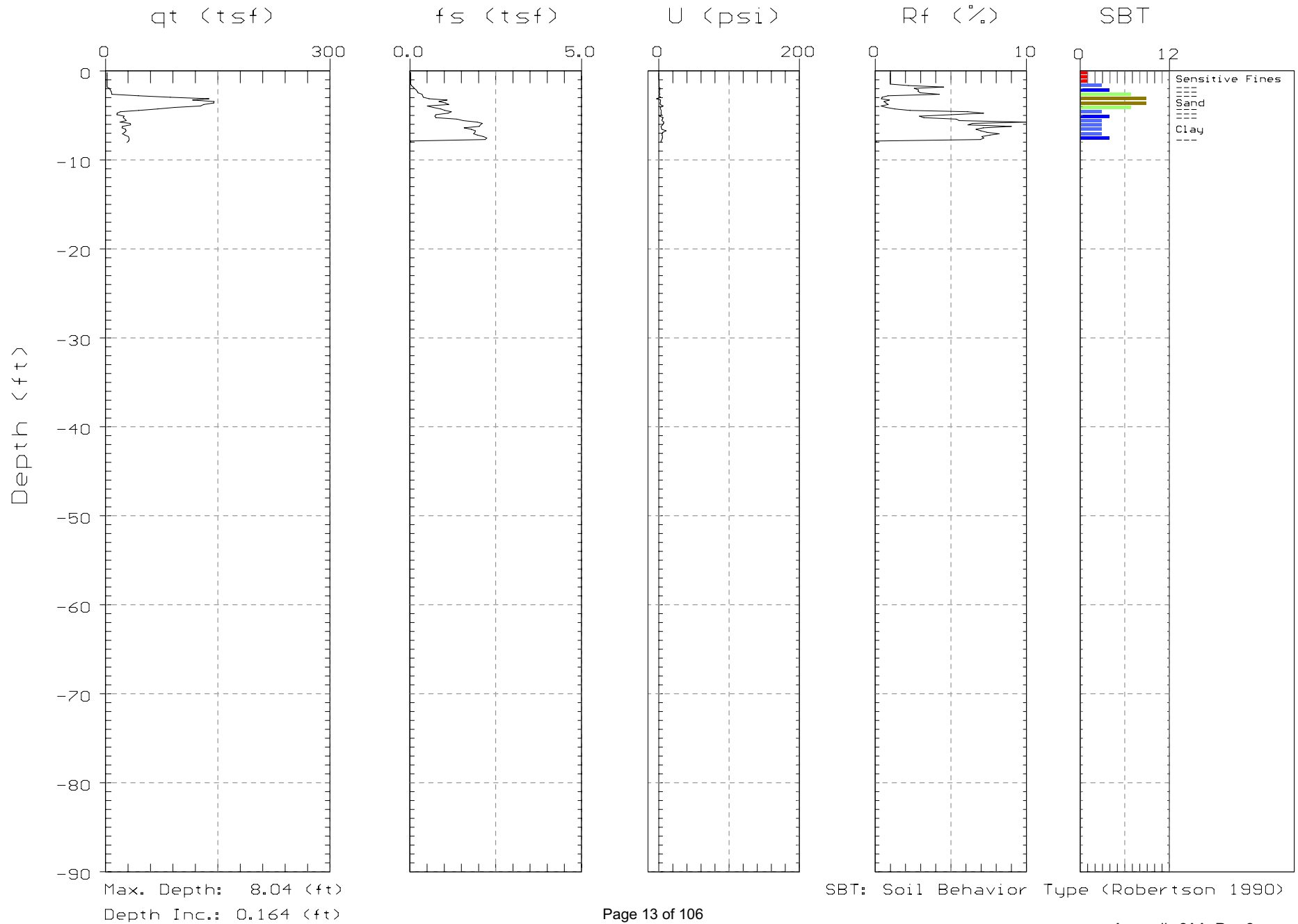
MACTEC

Site: N=1166994.842E=1844214.37

Engineer: C.SAMS

Location: CPT-1308L=538.0

Date: 05/13/06 11:57



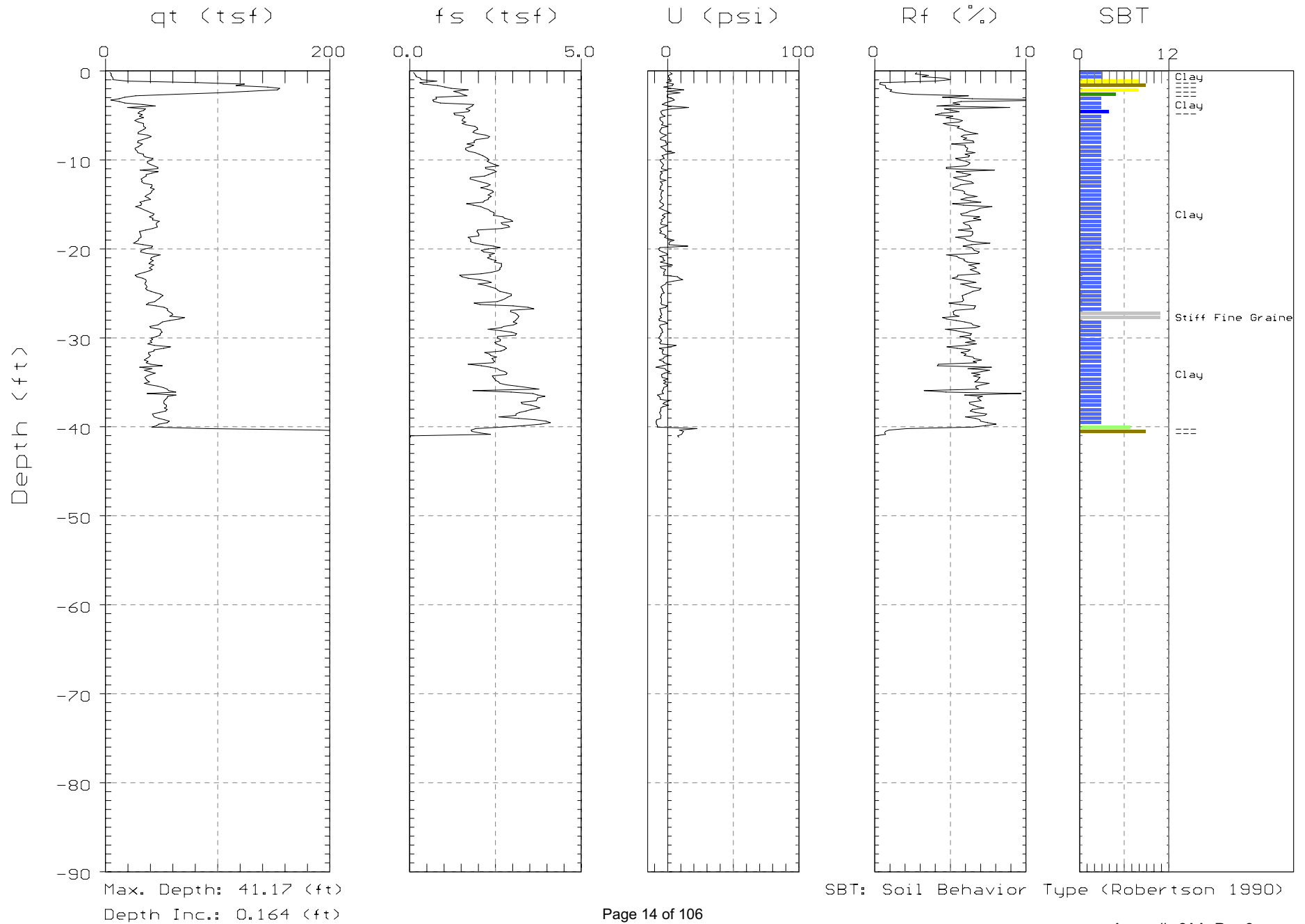


MACTEC

Site: N=1167001.502E=1844206.906 Engineer: C.SAMS

Location: CPT-1308AL=538.0

Date: 05/14/06 05:56





Location: CPT-1308BL=538.0

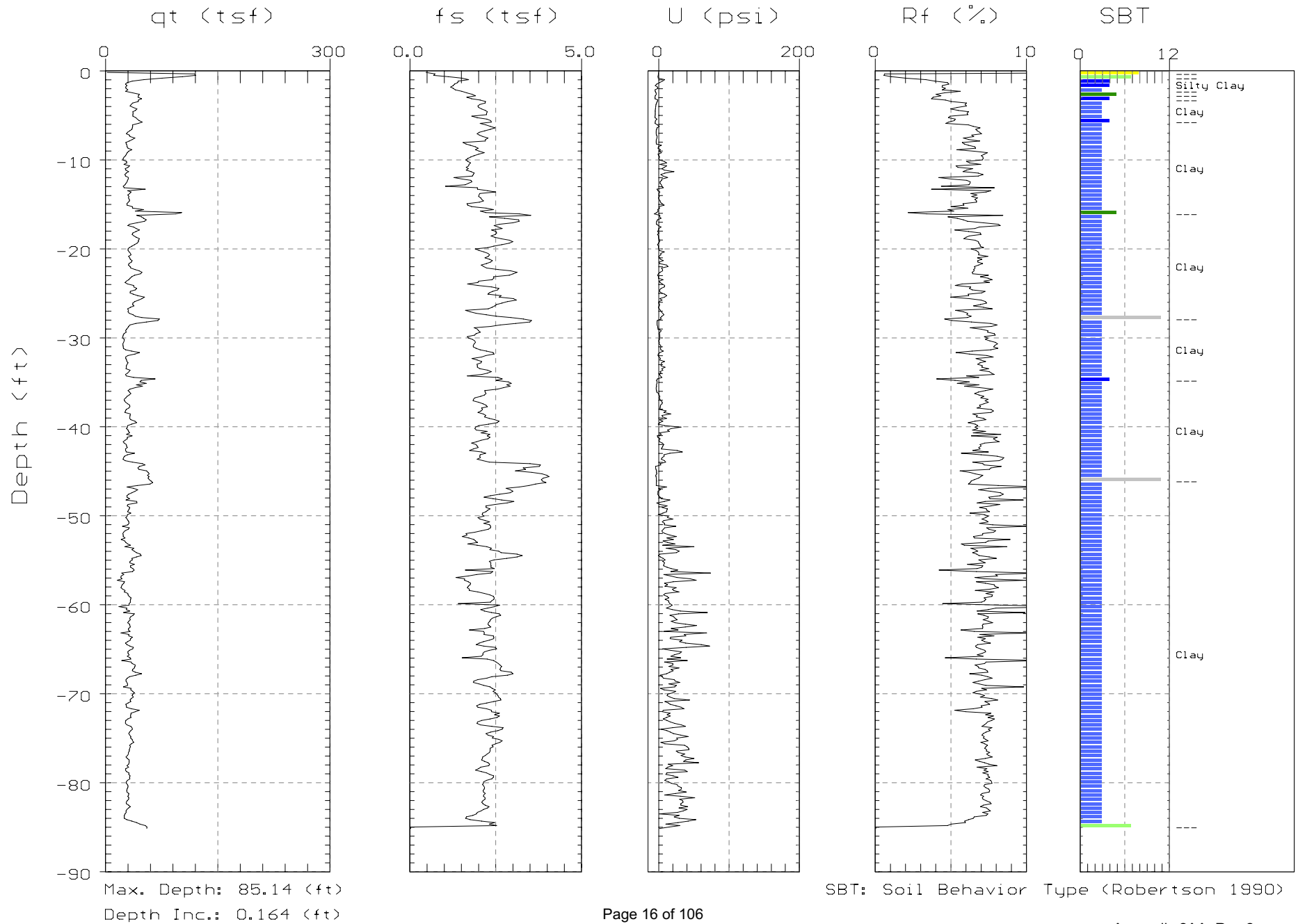
Date: 05/16/06 06:35





MACTEC

Site: N=1166860.56 E=1844074.211 Engineer: C.SAMS
Location: CPT-1309L=591.0 Date: 05/14/06 10:04



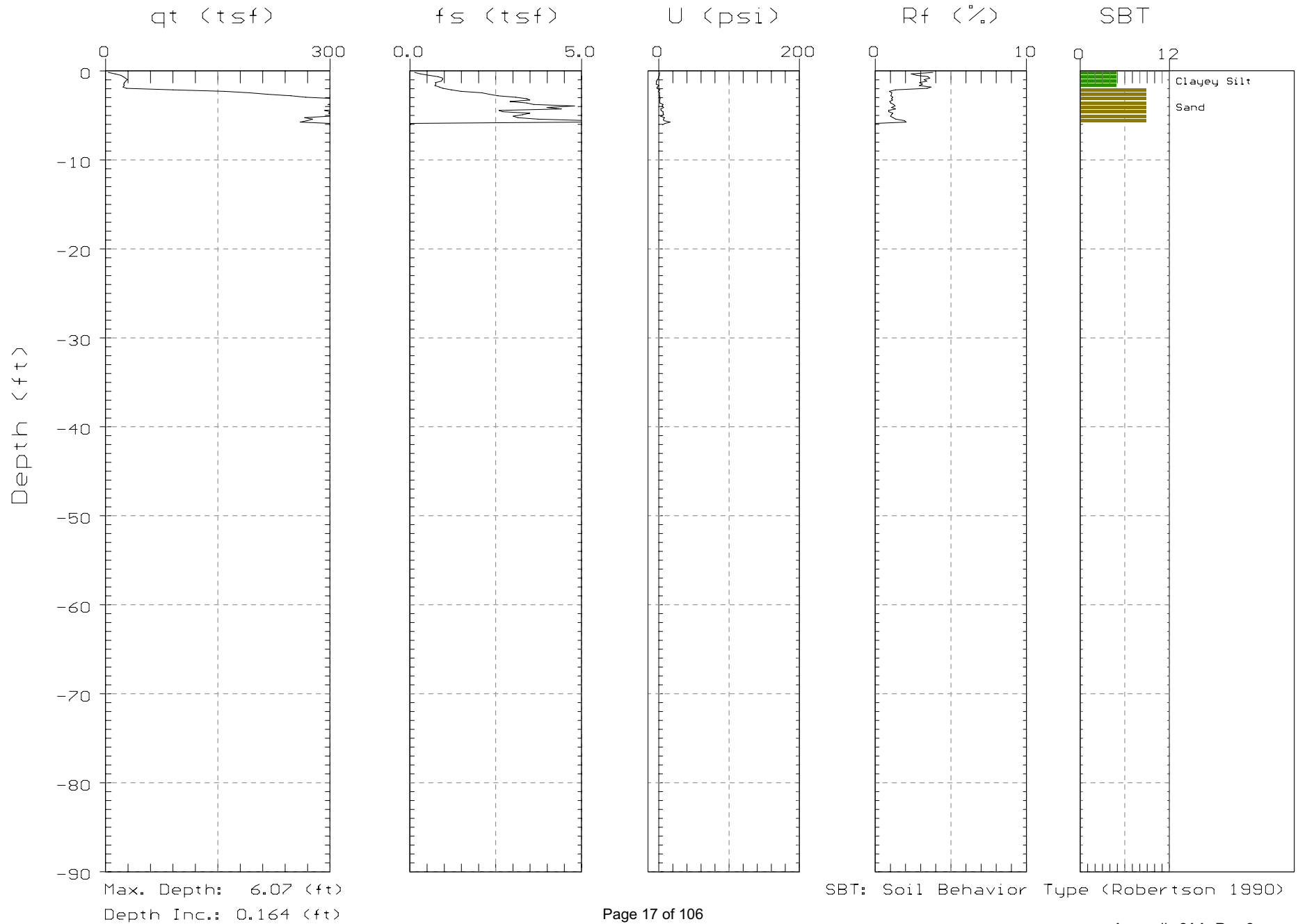


MACTEC

Site: N=1164932.132E=1846220.577 Engineer: C.SAMS

Location: CPT-1314L=590.0

Date: 05/15/06 13:37



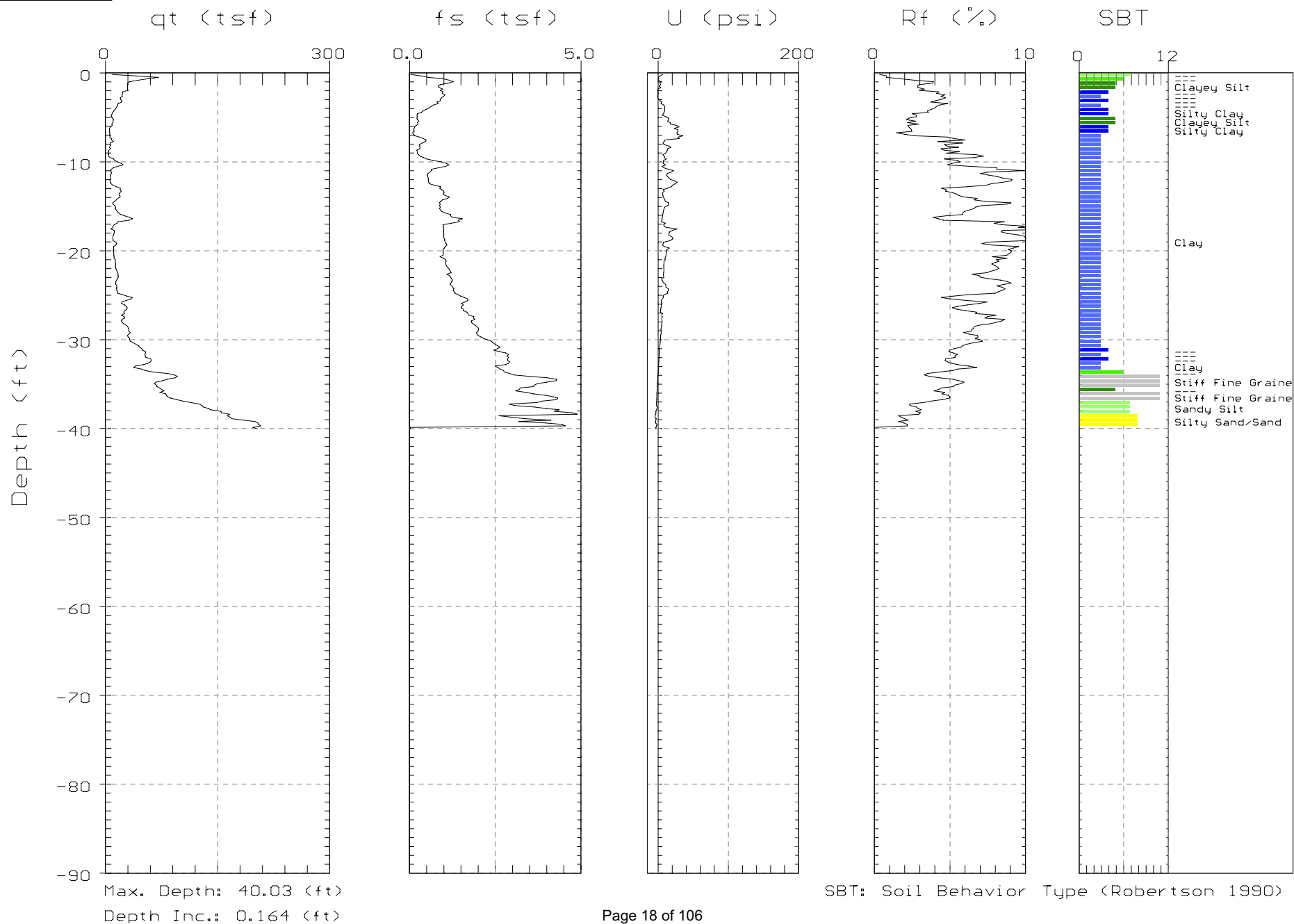


MACTEC

Site: N=1165032.071E=1846589.827 Engineer: C.SAMS

Location: CPT-1315L=586.9

Date: 05/15/06 12:48



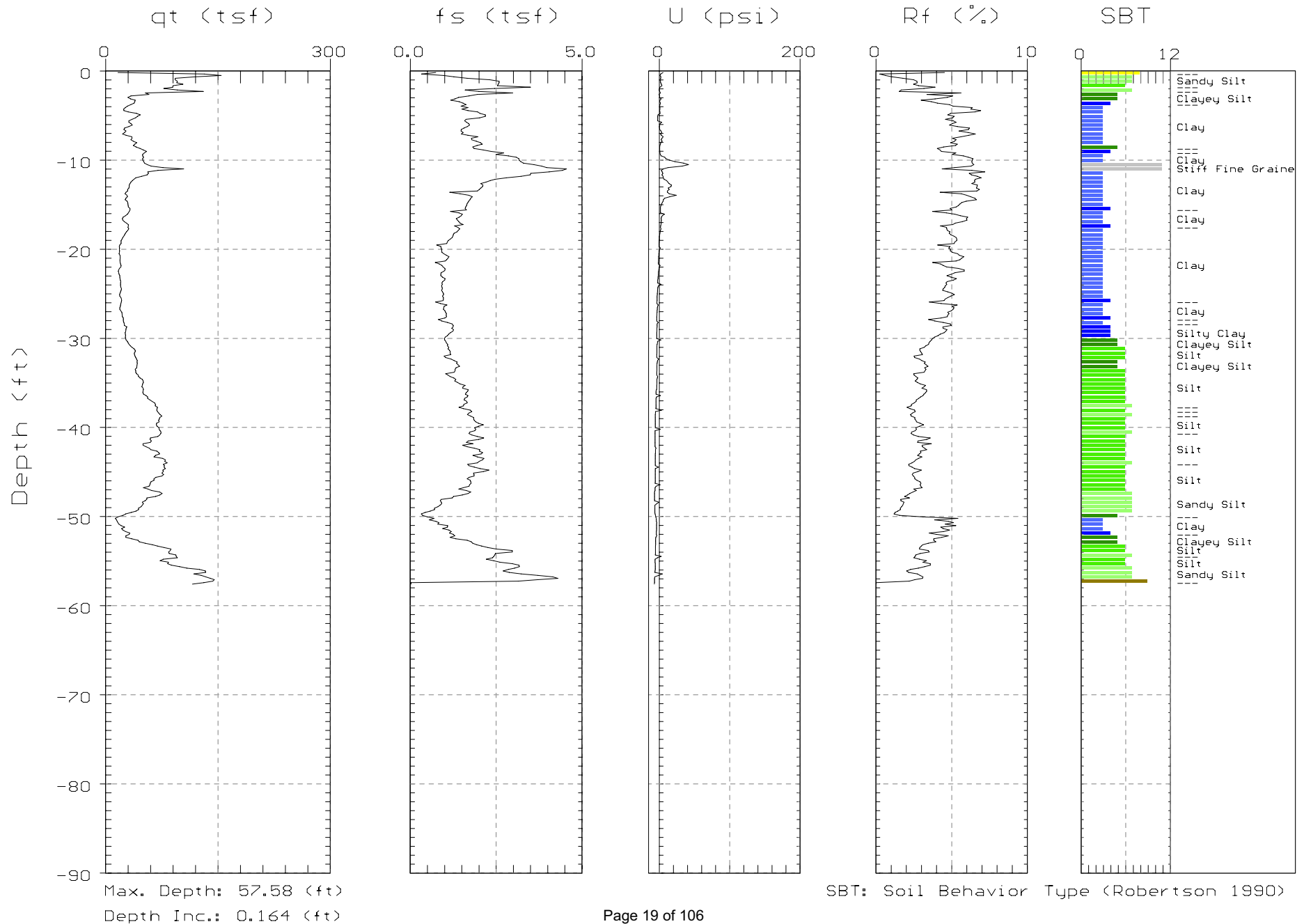


MACTEC

Site: N=1165442.267E=1847364.975 Engineer: C.SAMS

Location: CPT-1316L=589.6

Date: 05/15/06 11:15



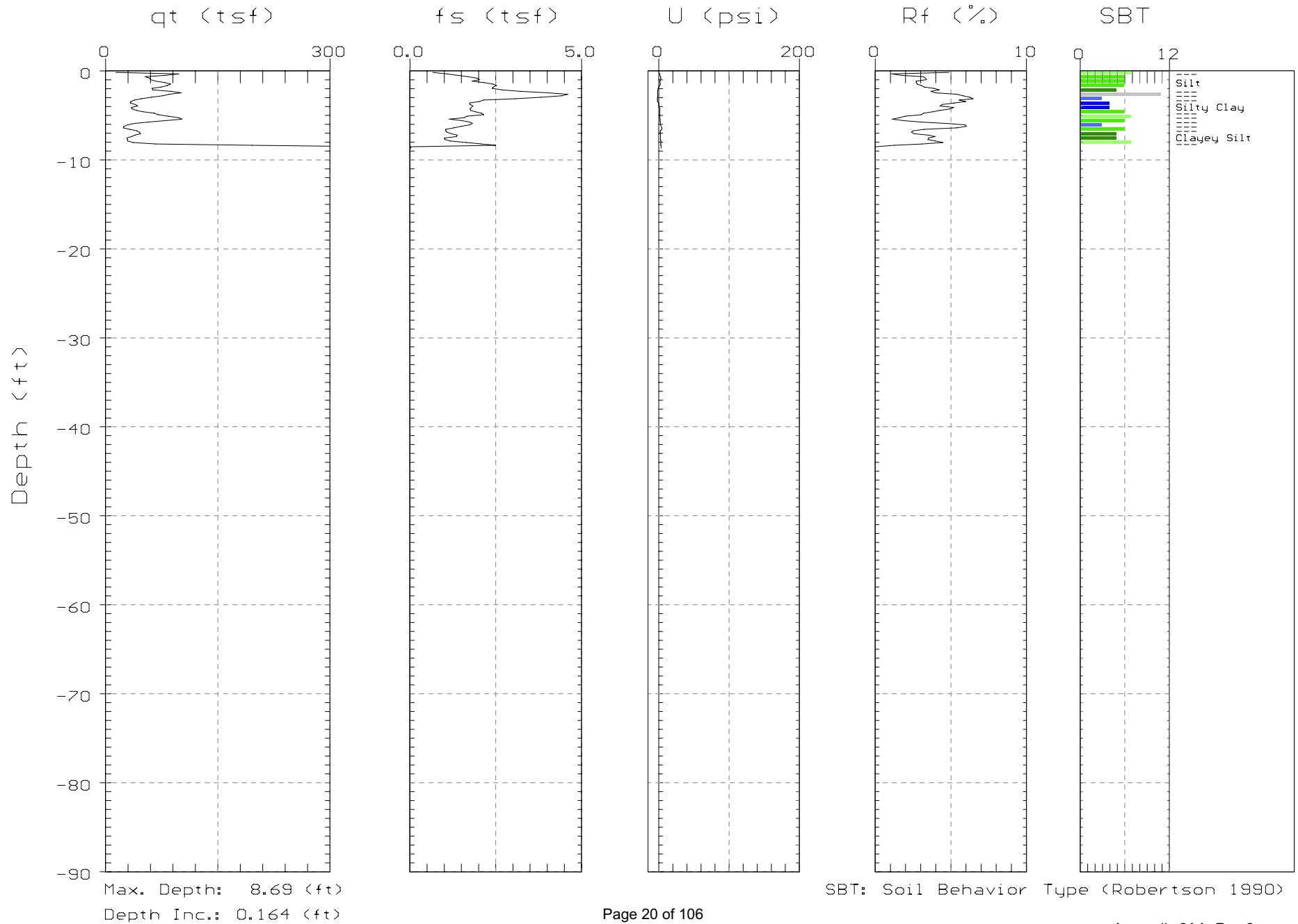


MACTEC

Site: N=1165480.571E=1847652.112 Engineer: C.SAMS

Location: CPT-1317L=588.7

Date: 05/15/06 10:04



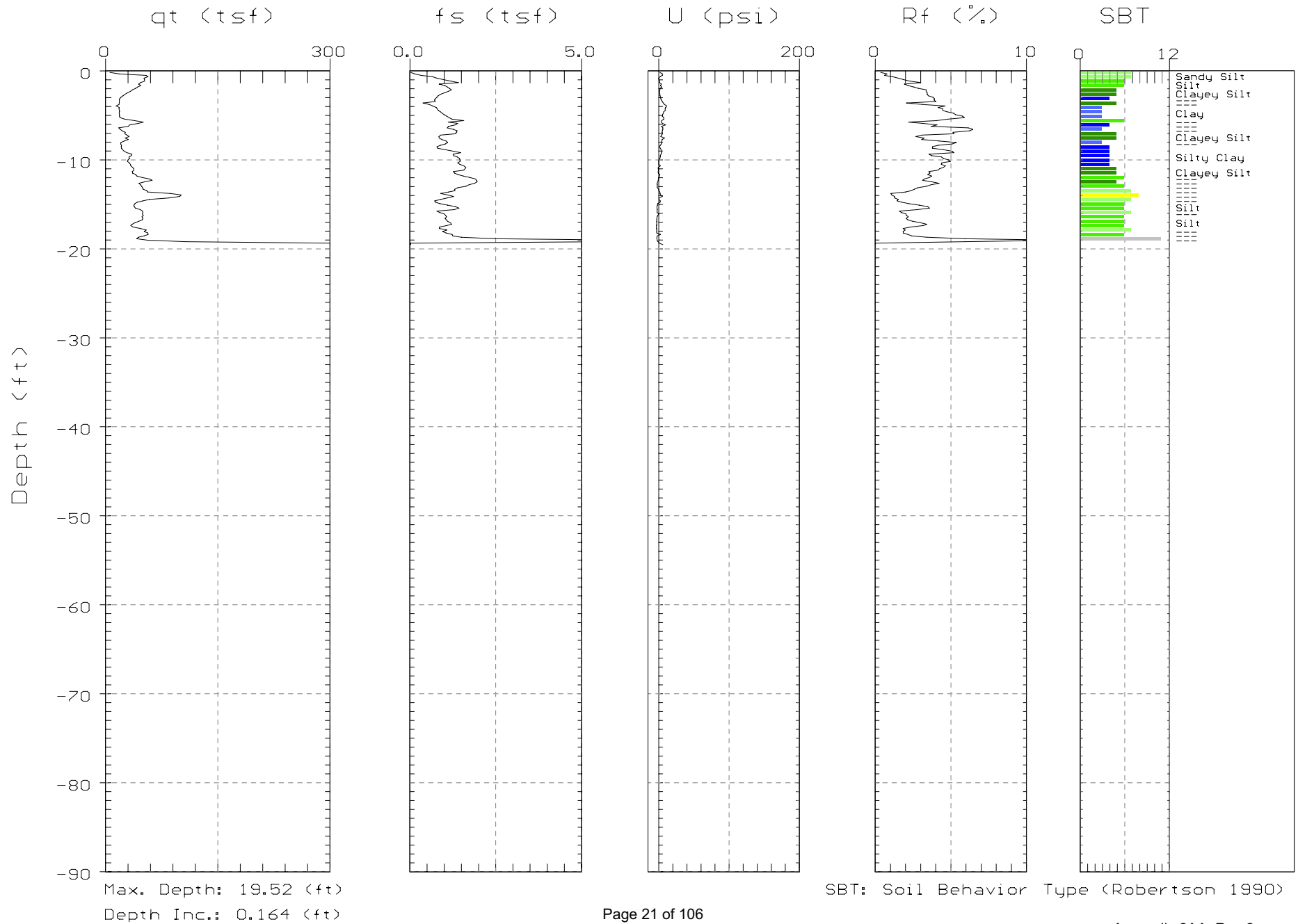


MACTEC

Site: N=1165481.237E=1847632.773 Engineer: C.SAMS

Location: CPT-1317aL=588.6

Date: 05/15/06 10:36



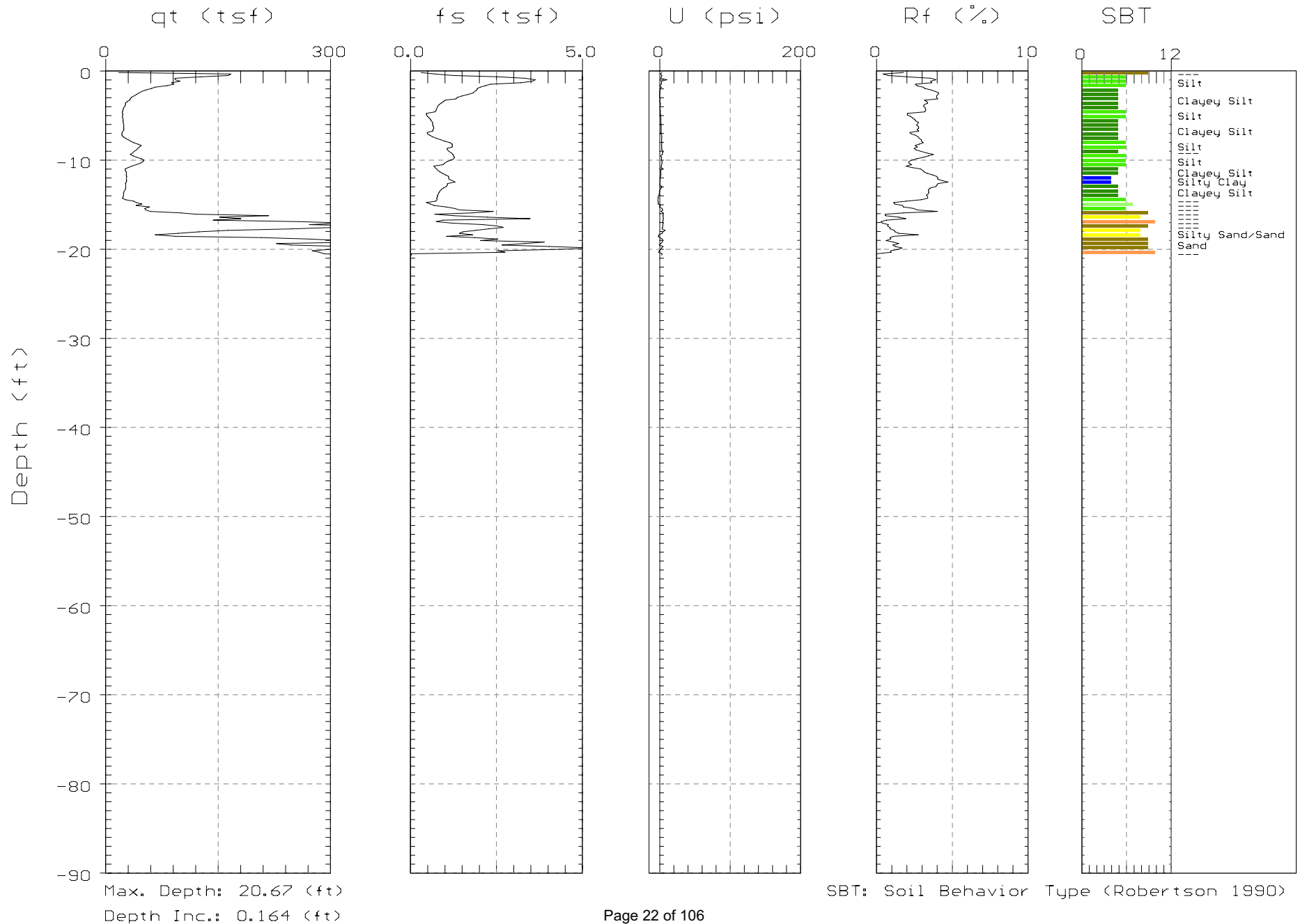


MACTEC

Site: N=1165497.097 E=1847636.907 Engineer: C.SAMS

Location: CPT-1317b L=588.8

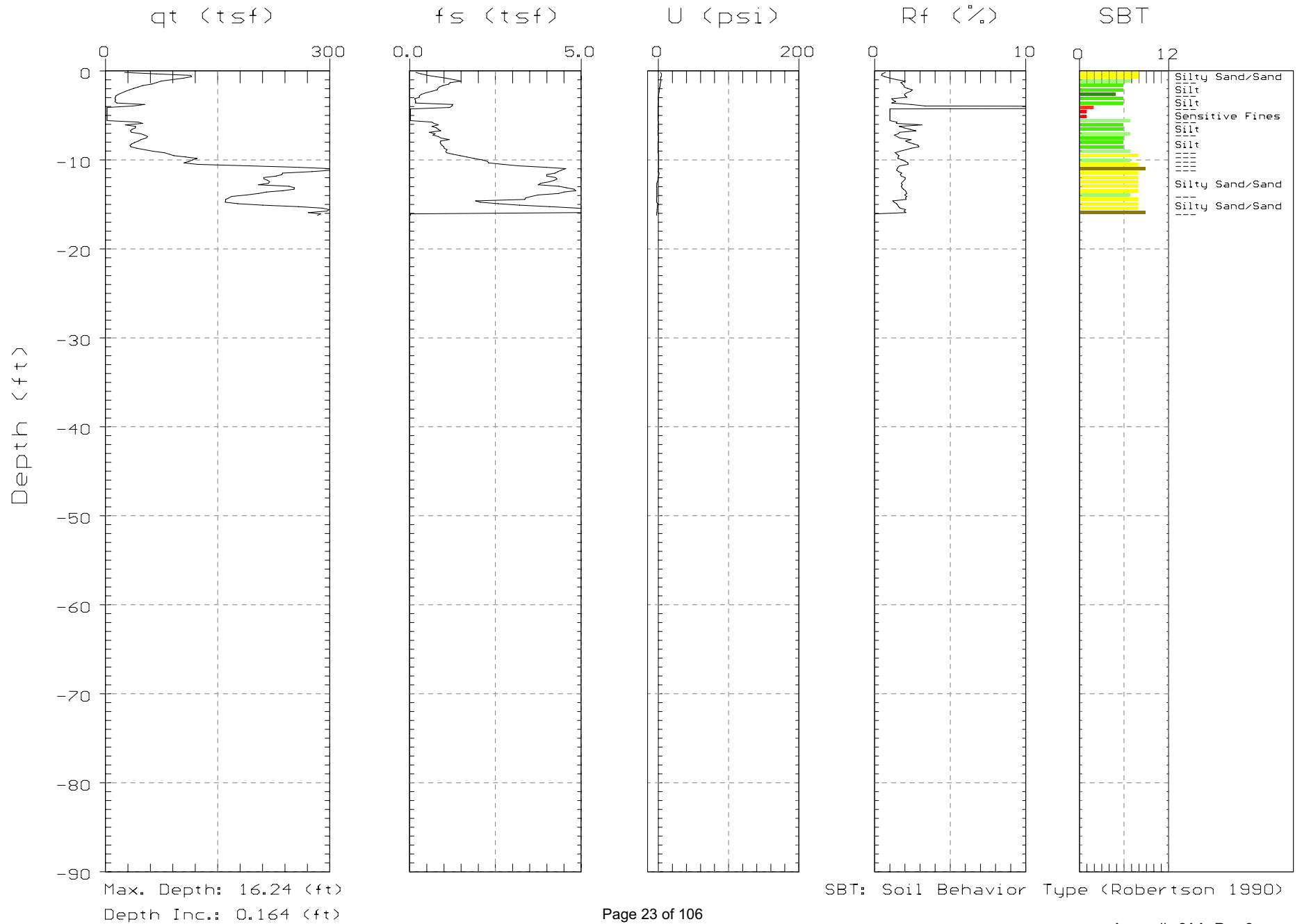
Date: 05/16/06 09:30





MACTEC

Site: N=1167614.444E=1847587.31 Engineer: C.SAMS
Location: CPT-1318L=586.4 Date: 05/15/06 08:10



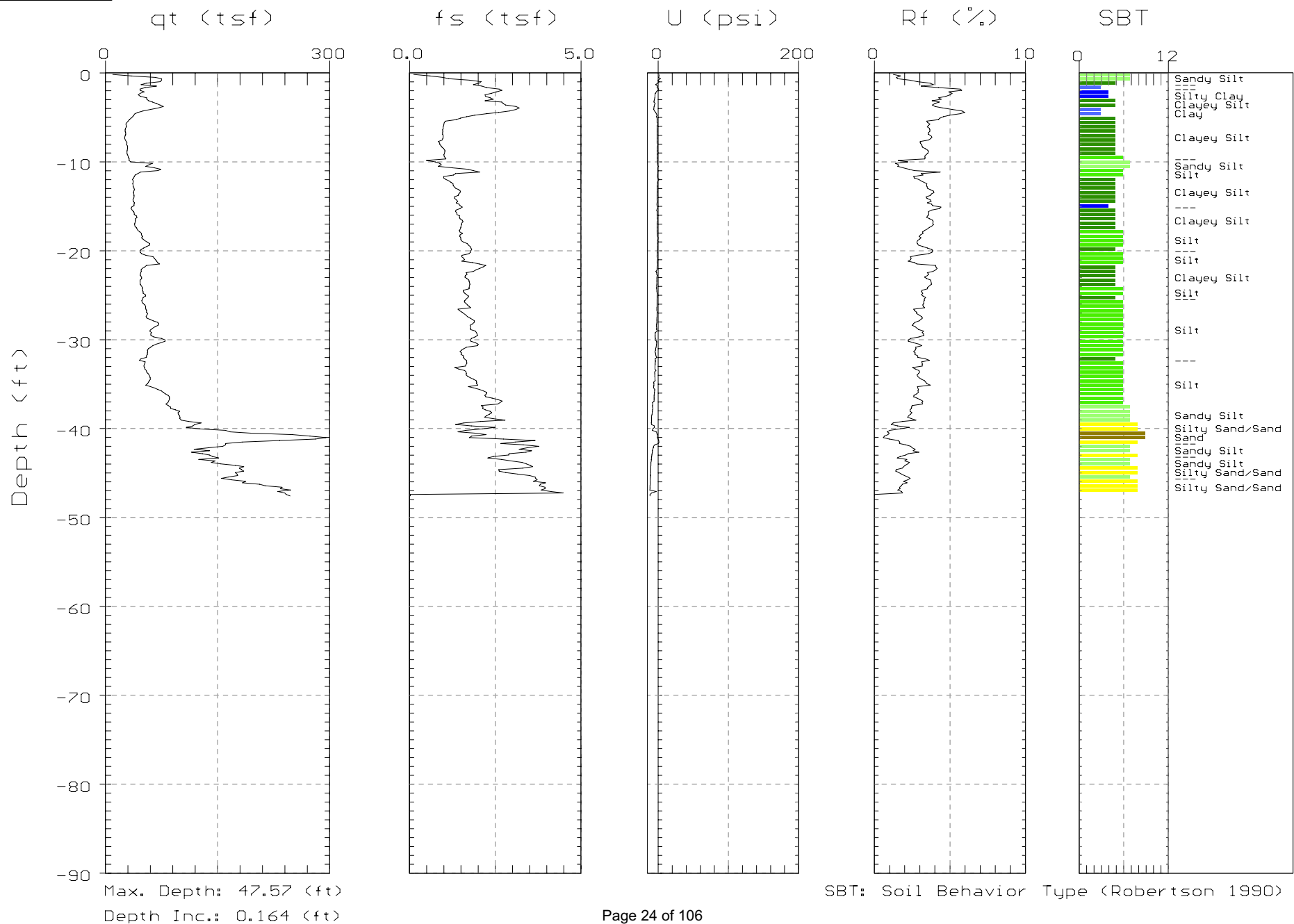


MACTEC

Site: N=1167695.014E=1847778.705 Engineer: C.SAMS

Location: CPT-1319L=587.9

Date: 05/15/06 05:50



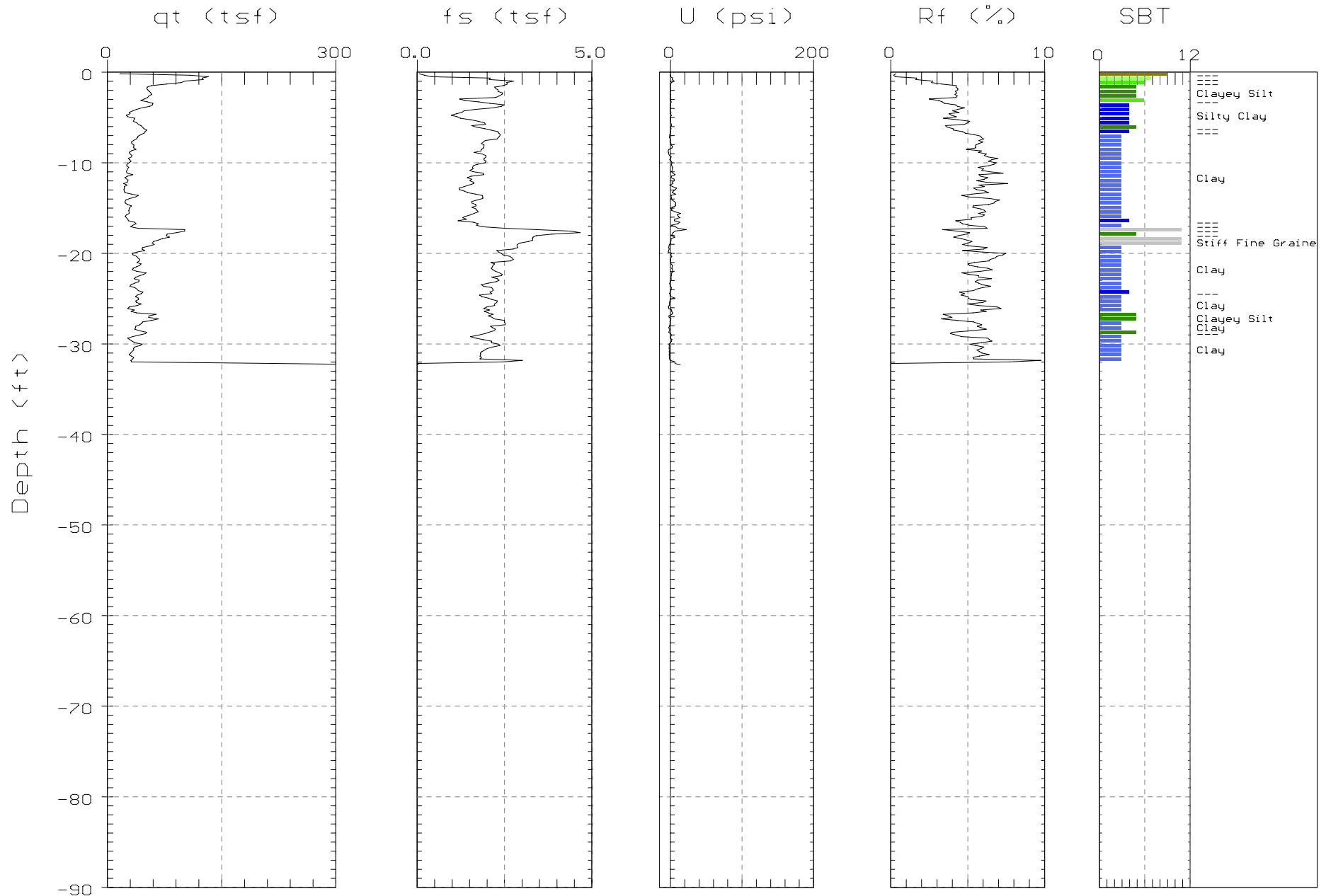


MACTEC

Site: N=1164809.635E=1847497.262 Engineer: C.SAMS

Location: CPT-1320L=604.9

Date: 08/20/06 08:56



Max. Depth: 32.32 (ft)
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

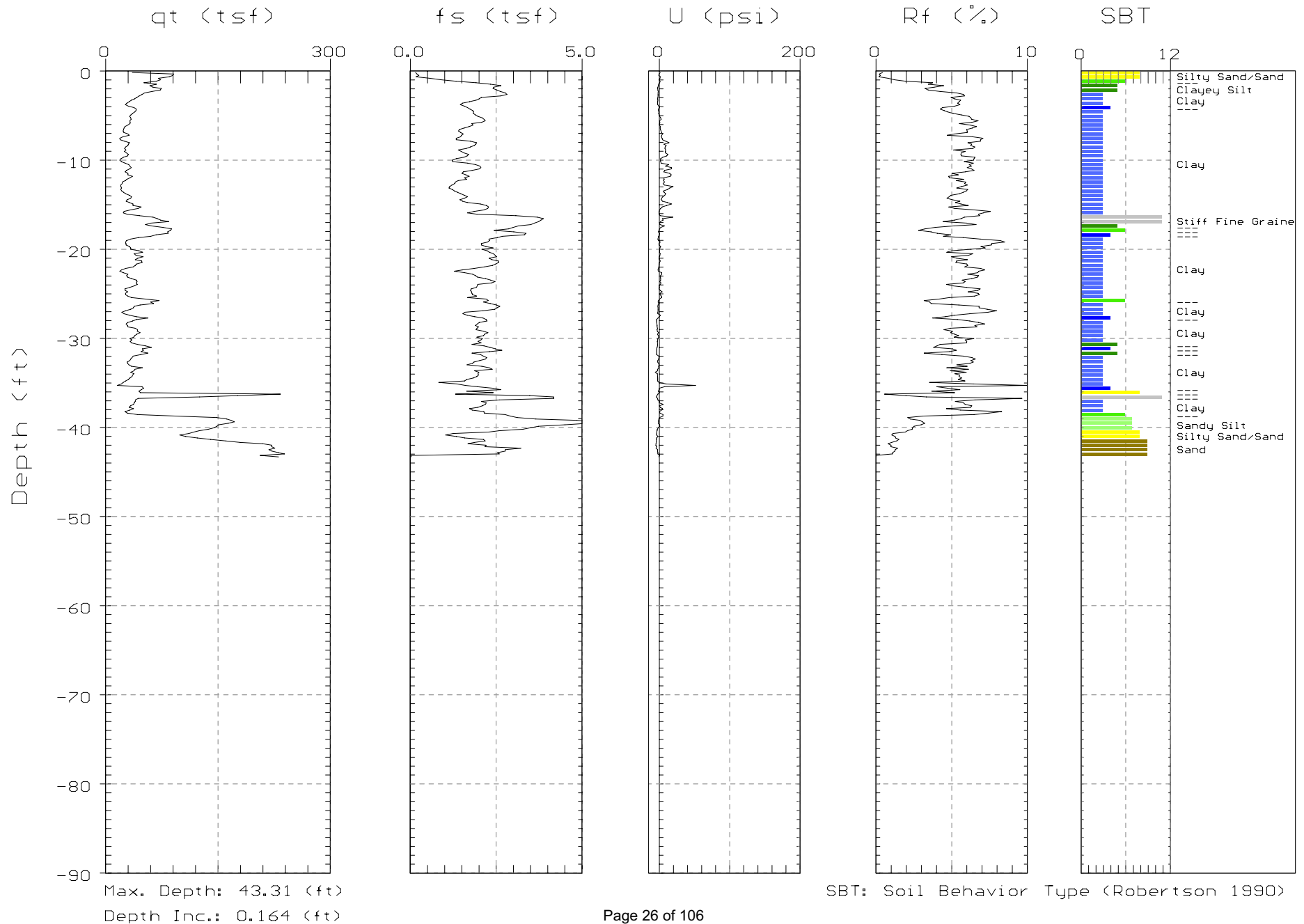


MACTEC

Site: N=1164802.258E=1847460.695 Engineer: C.SAMS

Location: CPT-1321L=604.9

Date: 08/20/06 10:17





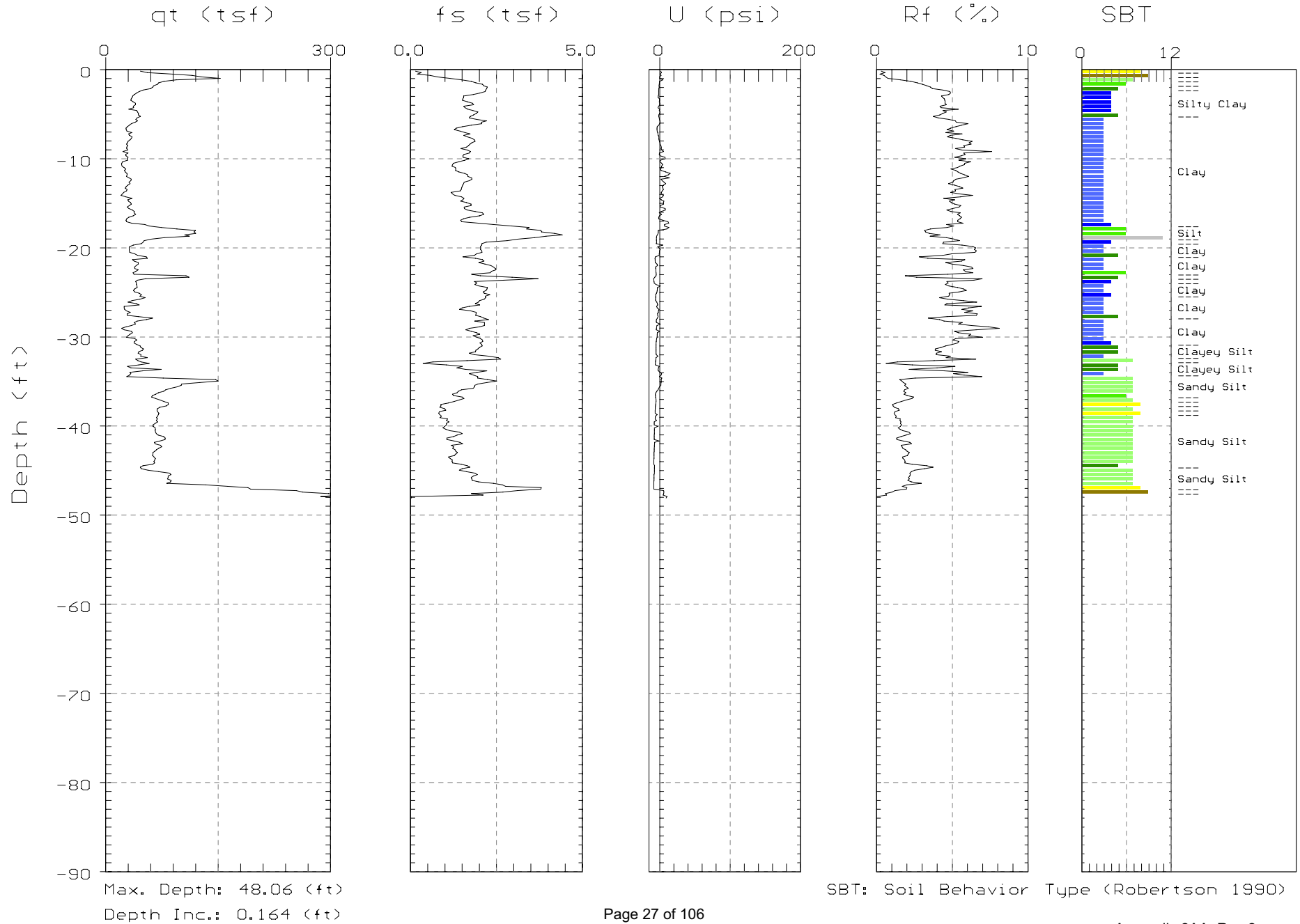
MACTEC

Site: N=1164794.98 E=1847472.657

Engineer: C.SAMS

Location: CPT-1322L=605.2

Date: 08/20/06 07:01



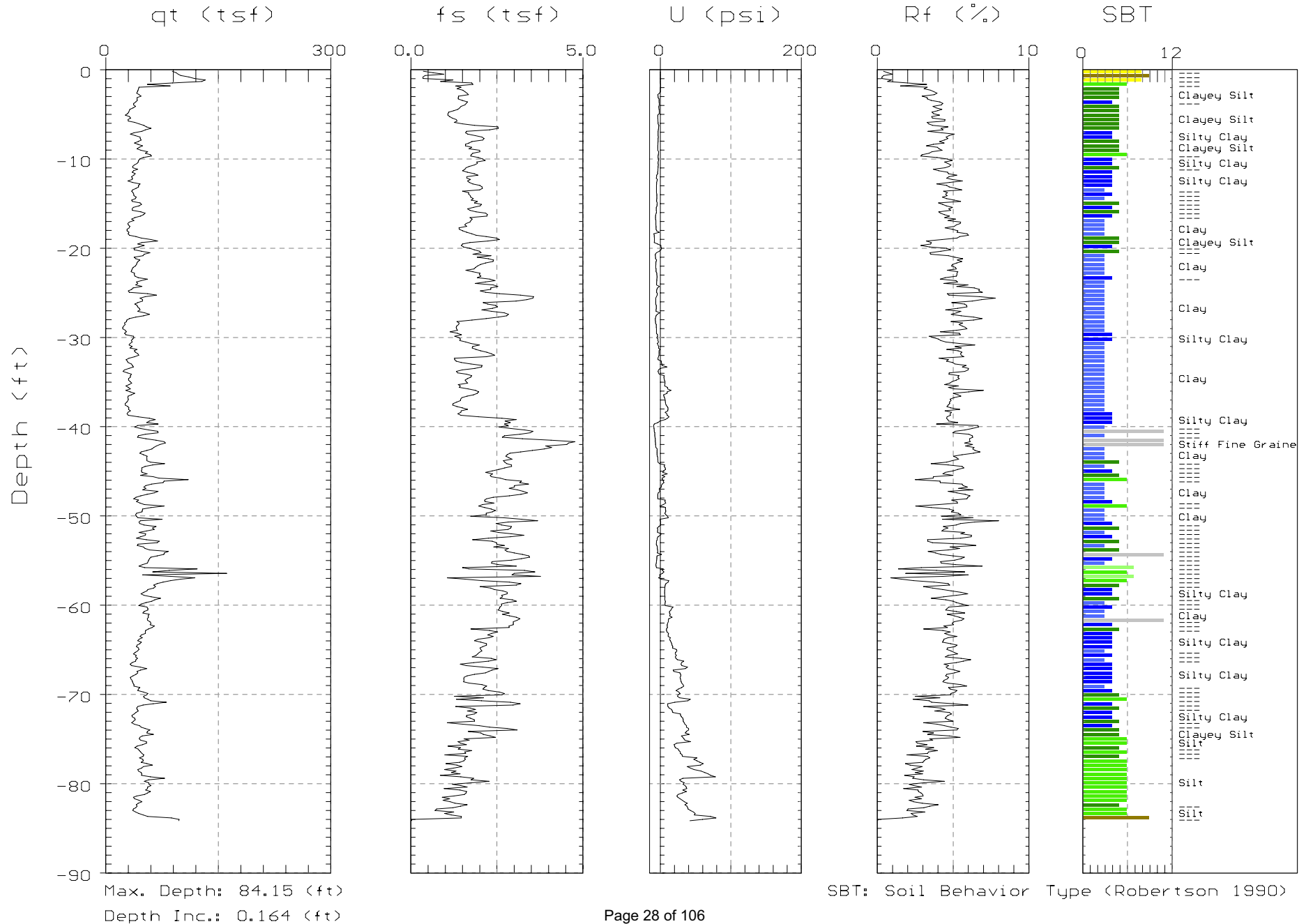


MACTEC

Site: N=1165679.211 E=1848305.418 Engineer: C.SAMS

Location: CPT-1323 L=610.5

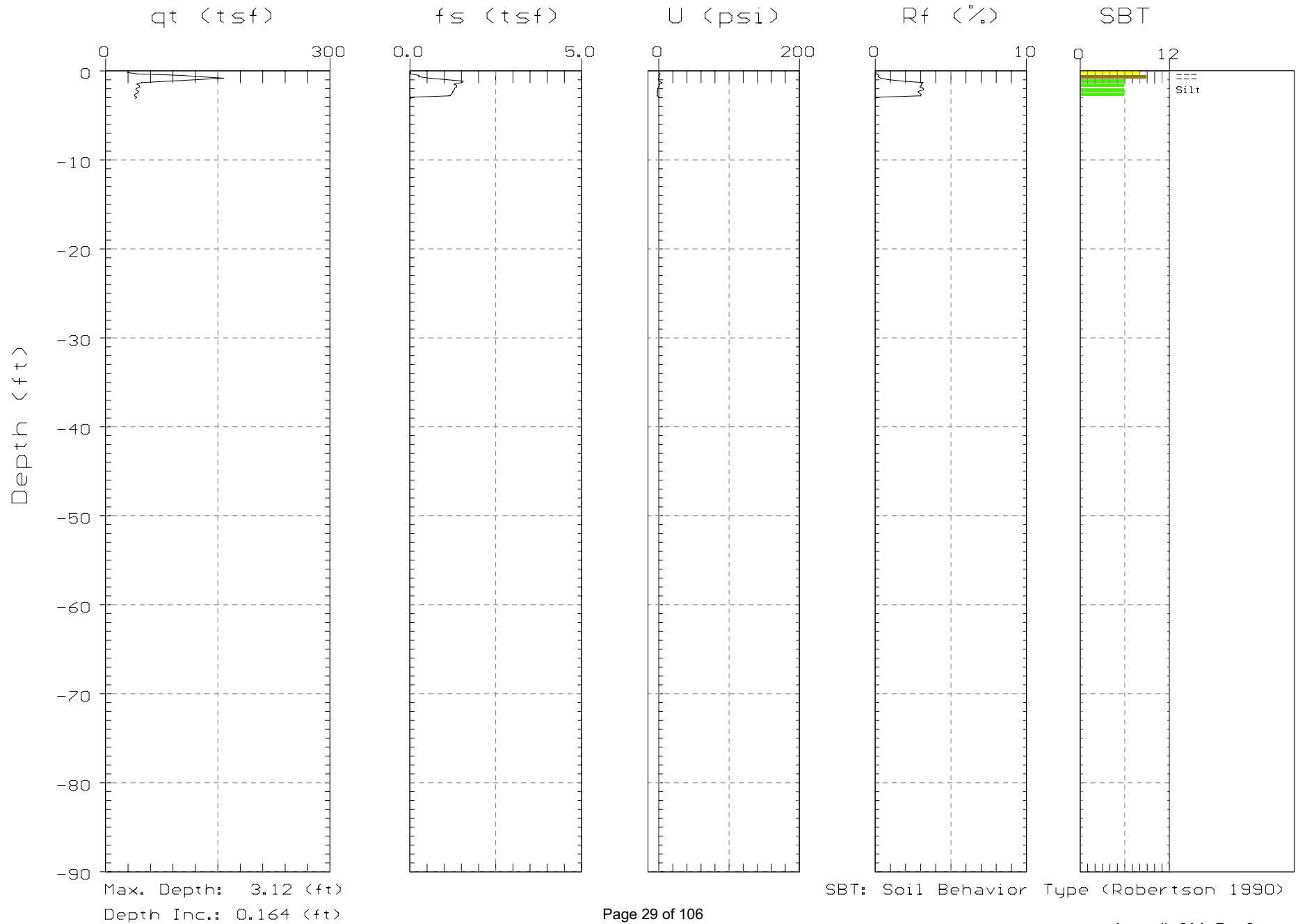
Date: 08/19/06 05:19





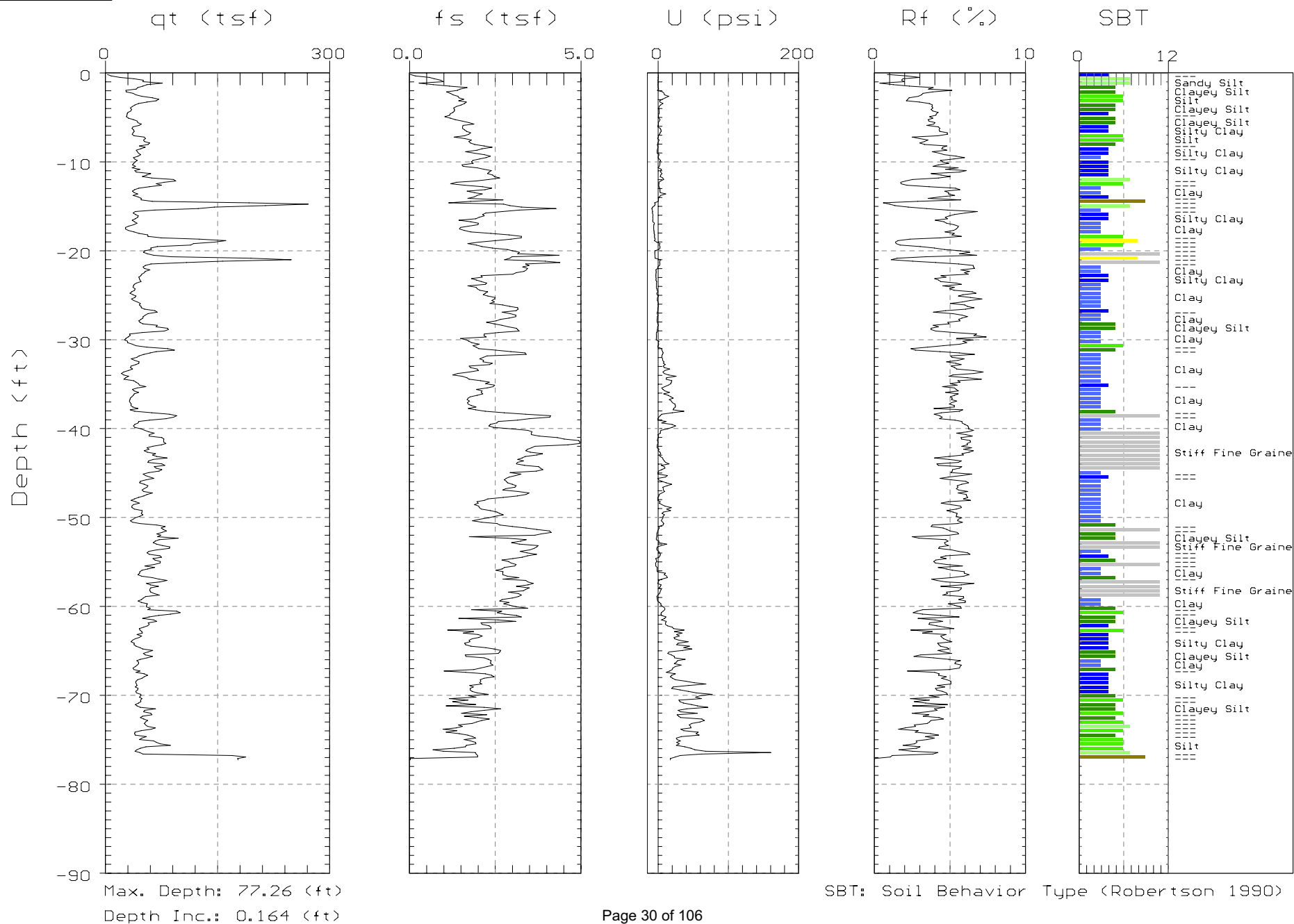
MACTEC

Site: N=1165733.296E=1848334.24 Engineer: C.SAMS
Location: CPT-1324L=610.2 Date: 08/19/06 08:43





Site: N=1165733.296 E=1848334.24 Engineer: C.SAMS
Location: CPT-1324BL=610.2 Date: 08/19/06 09:02



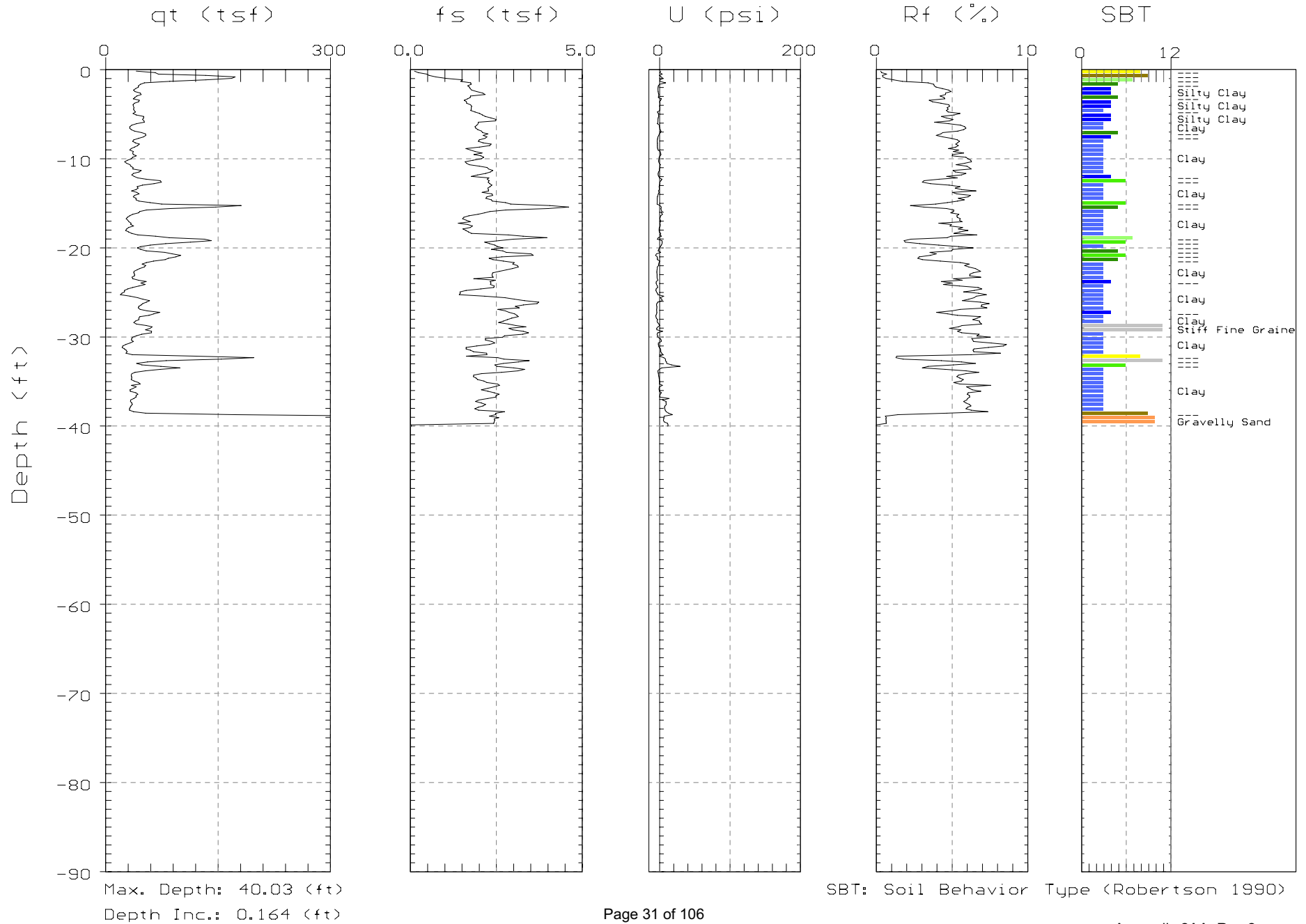


MACTEC

Site: N=1165730.729E=1848273.937 Engineer: C.SAMS

Location: CPT-1325L=610.3

Date: 08/19/06 11:35



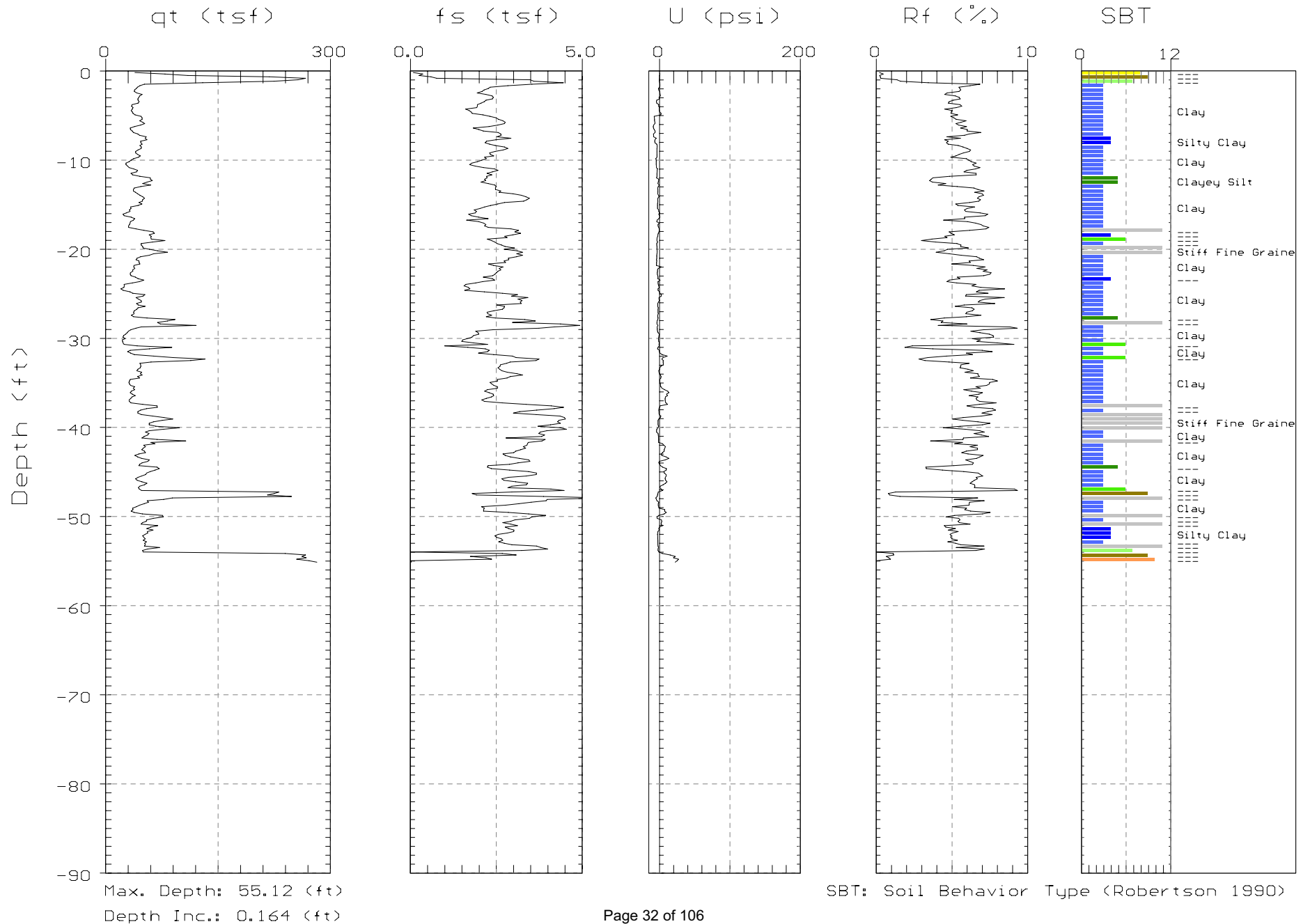


MACTEC

Site: N=1165728.968 E=1848272.952 Engineer: C.SAMS

Location: CPT-1325AL=610.1

Date: 08/19/06 12:39





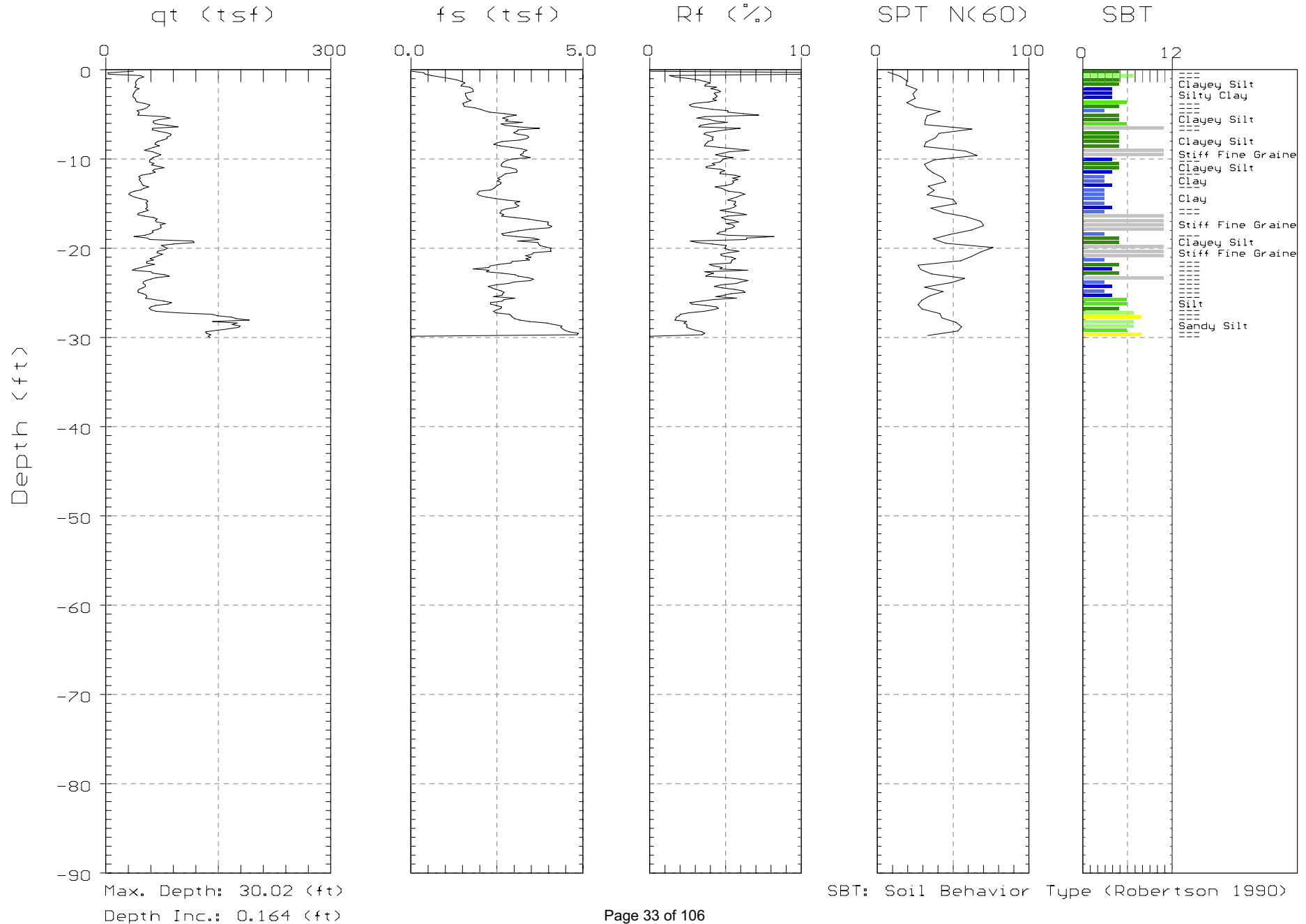
MACTEC

Site: N=1165285.875E=1845003.07

Engineer: C.SAMS

Location: CPT-1300L=609.2

Date: 05:12:06 06:35



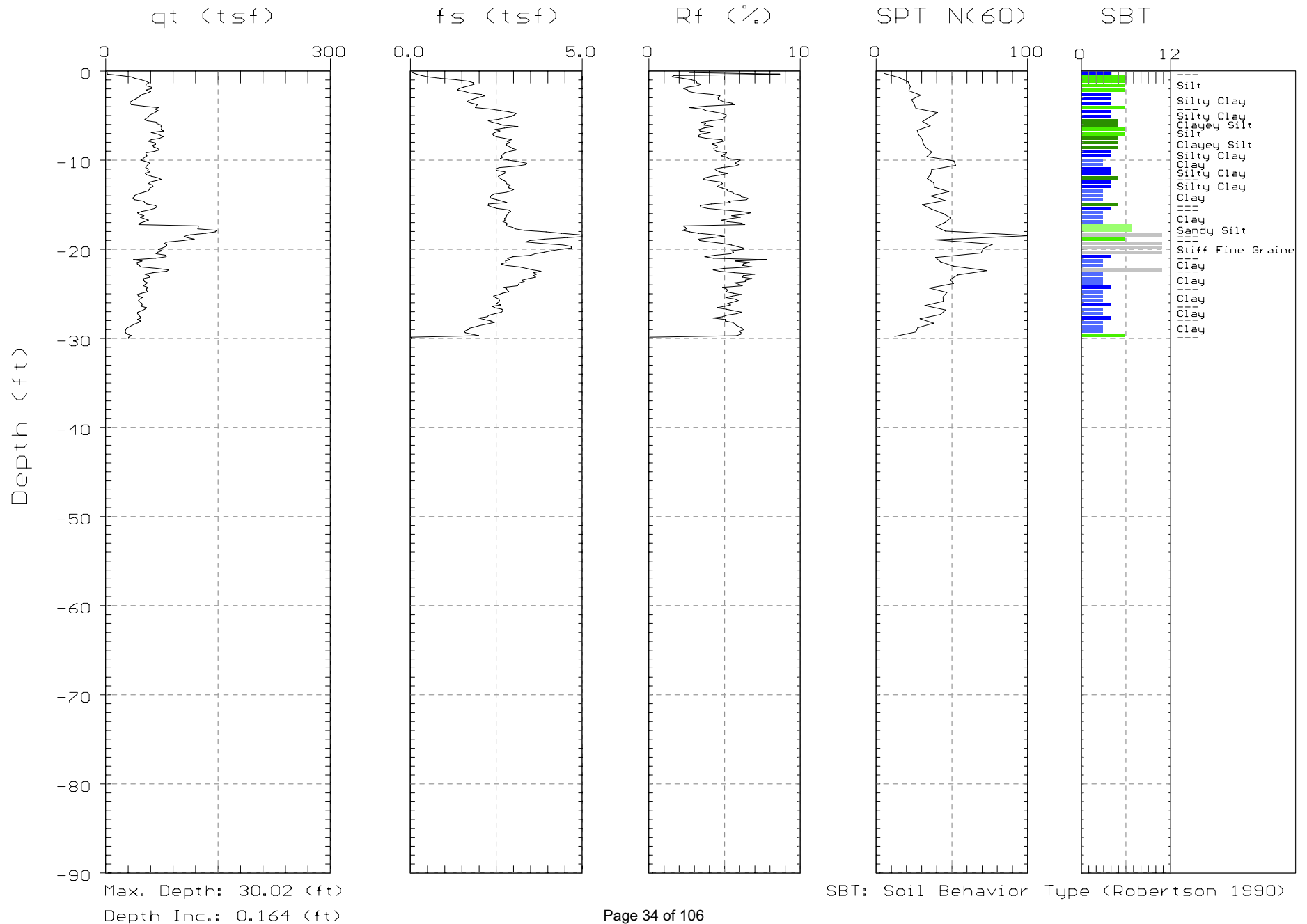


MACTEC

Site: N=1164894.228E=1845085.762 Engineer: C.SAMS

Location: CPT-1301L=609.8

Date: 05/11/06 14:37



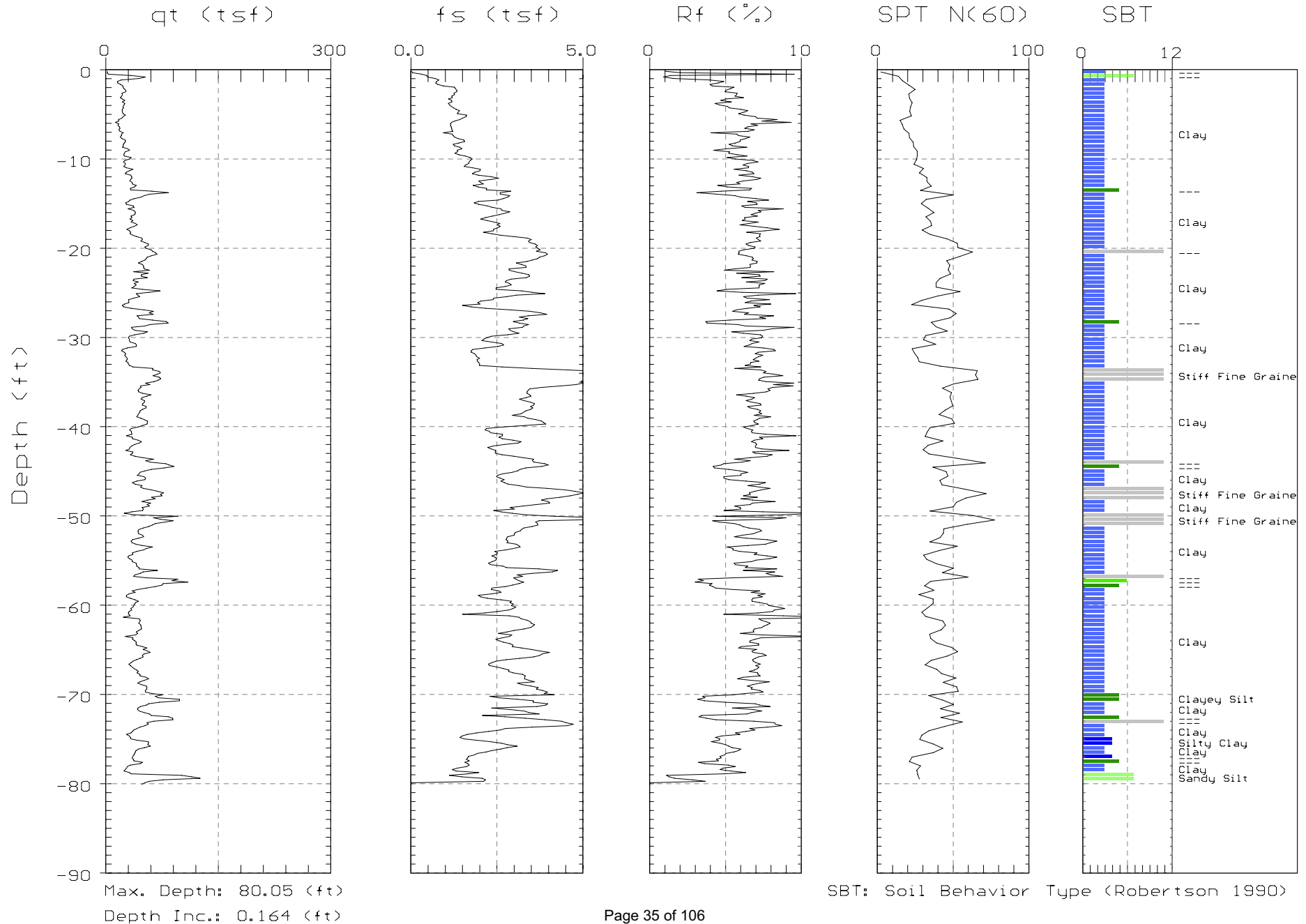


MACTEC

Site: N=1166124.625E=1848040.224 Engineer: C.SAMS

Location: CPT-1302L=609.3

Date: 05/12/06 11:13



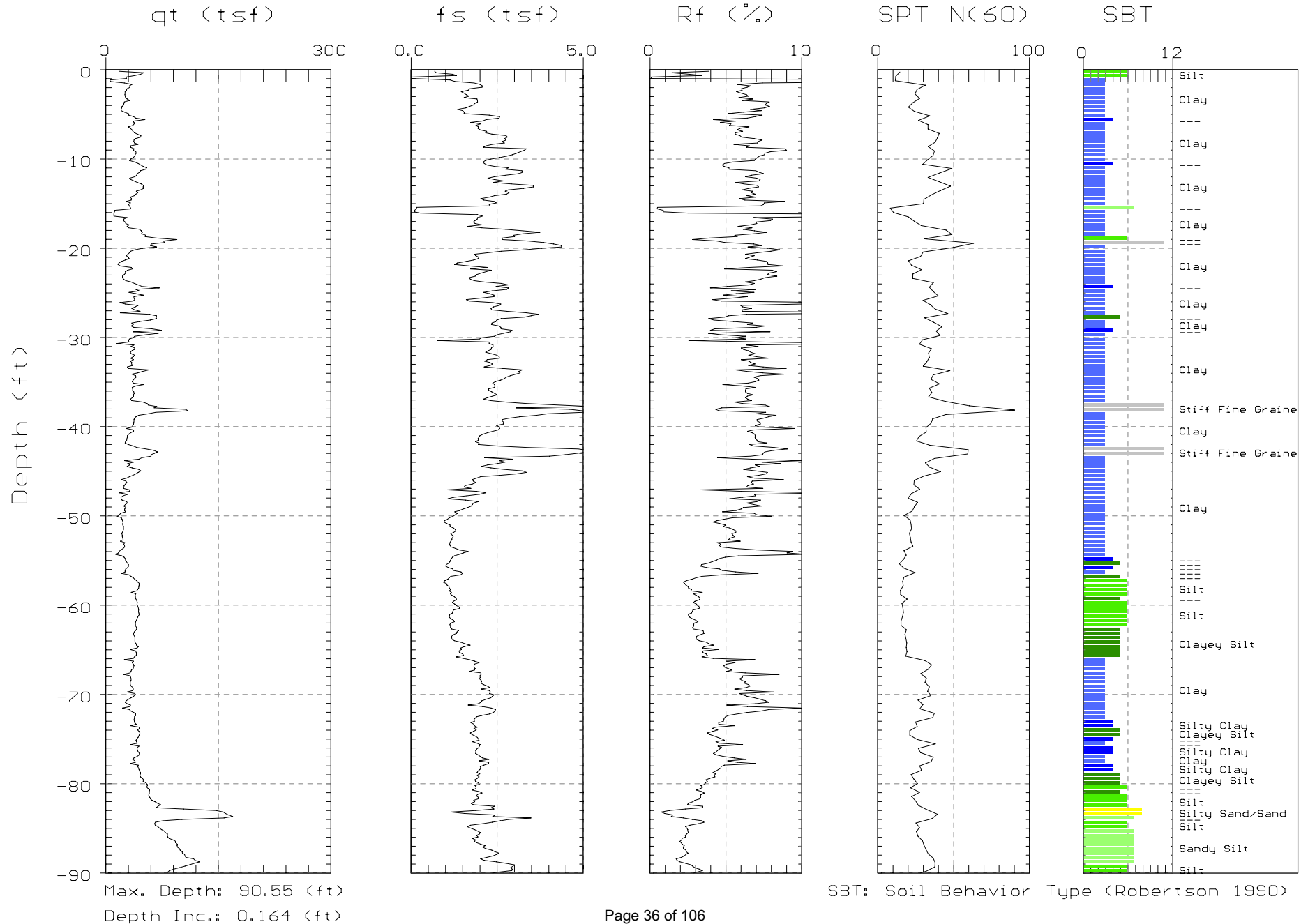


MACTEC

Site: N=1165582.495E=1848103.244 Engineer: C.SAMS

Location: CPT-1303L=609.6

Date: 05/13/06 08:30



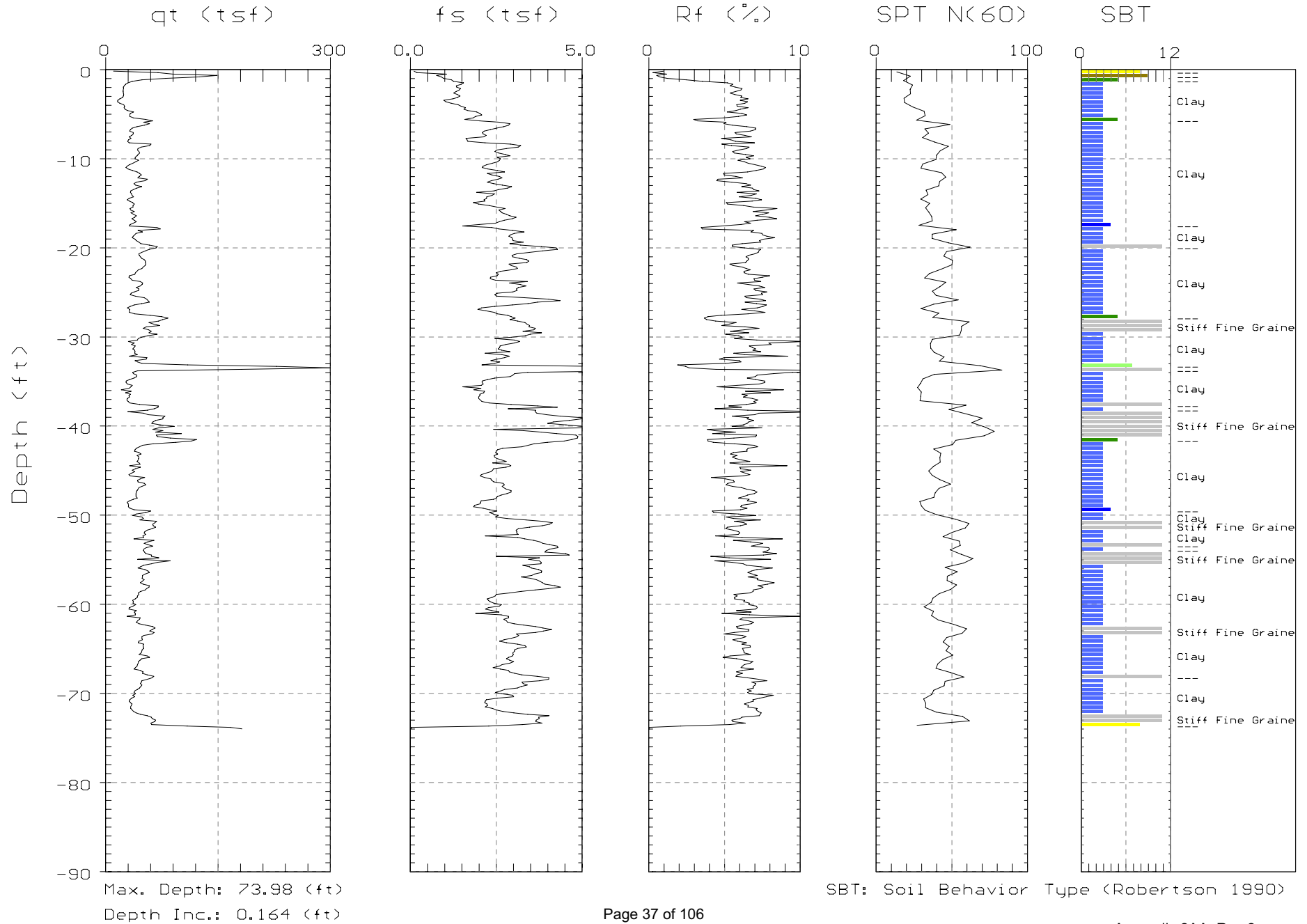


MACTEC

Site: N=1165892.587E=1848181.888 Engineer: C.SAMS

Location: CPT-1304L=609.8

Date: 05/12/06 13:23



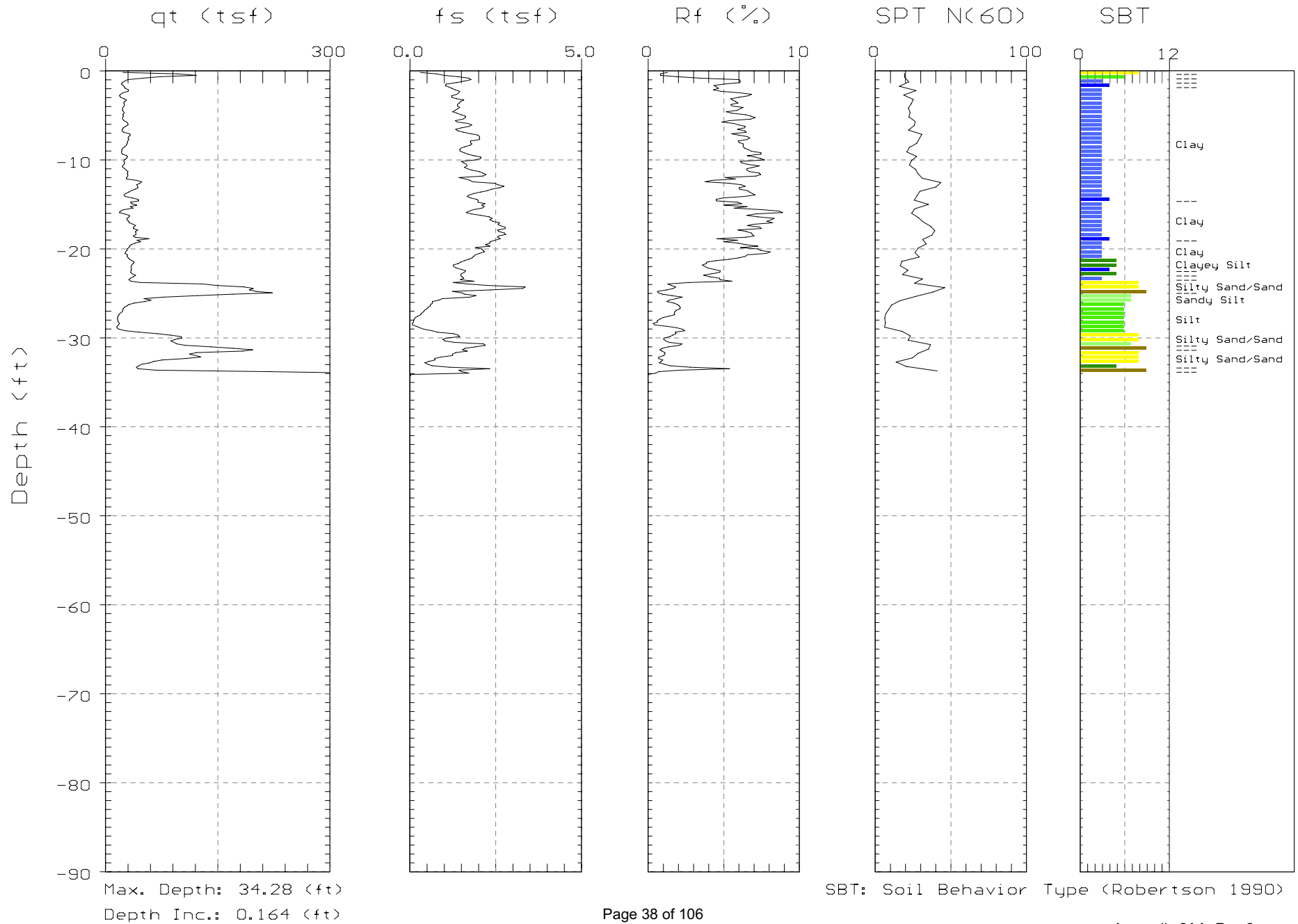


MACTEC

Site: N=1164732.401 E=1847452.326 Engineer: C.SAMS

Location: CPT-1305 L=603.7

Date: 05/12/06 08:29



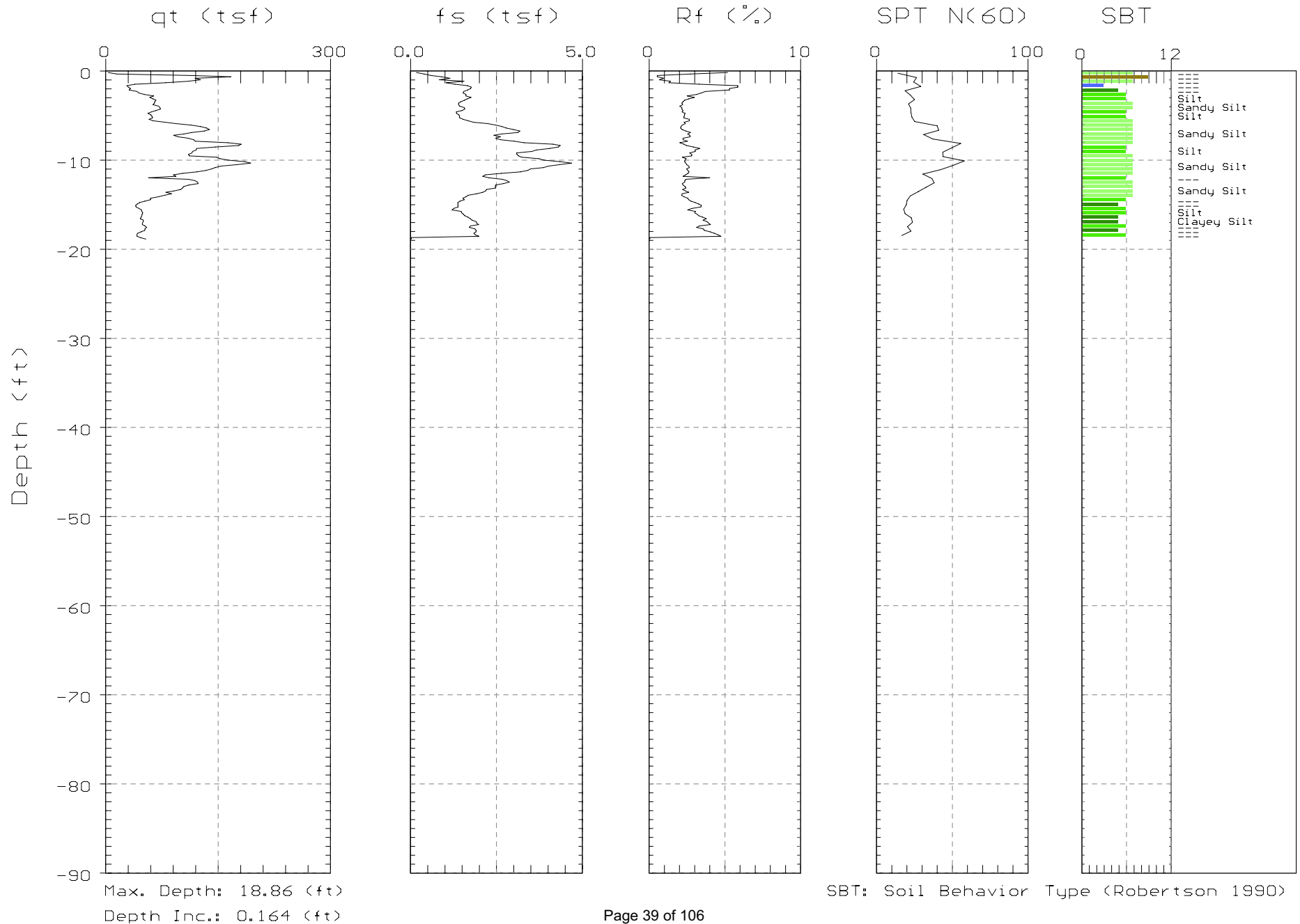


MACTEC

Site: N=1164174.233E=1847132.668 Engineer: C.SAMS

Location: CPT-1306L=604.3

Date: 05/12/06 09:37



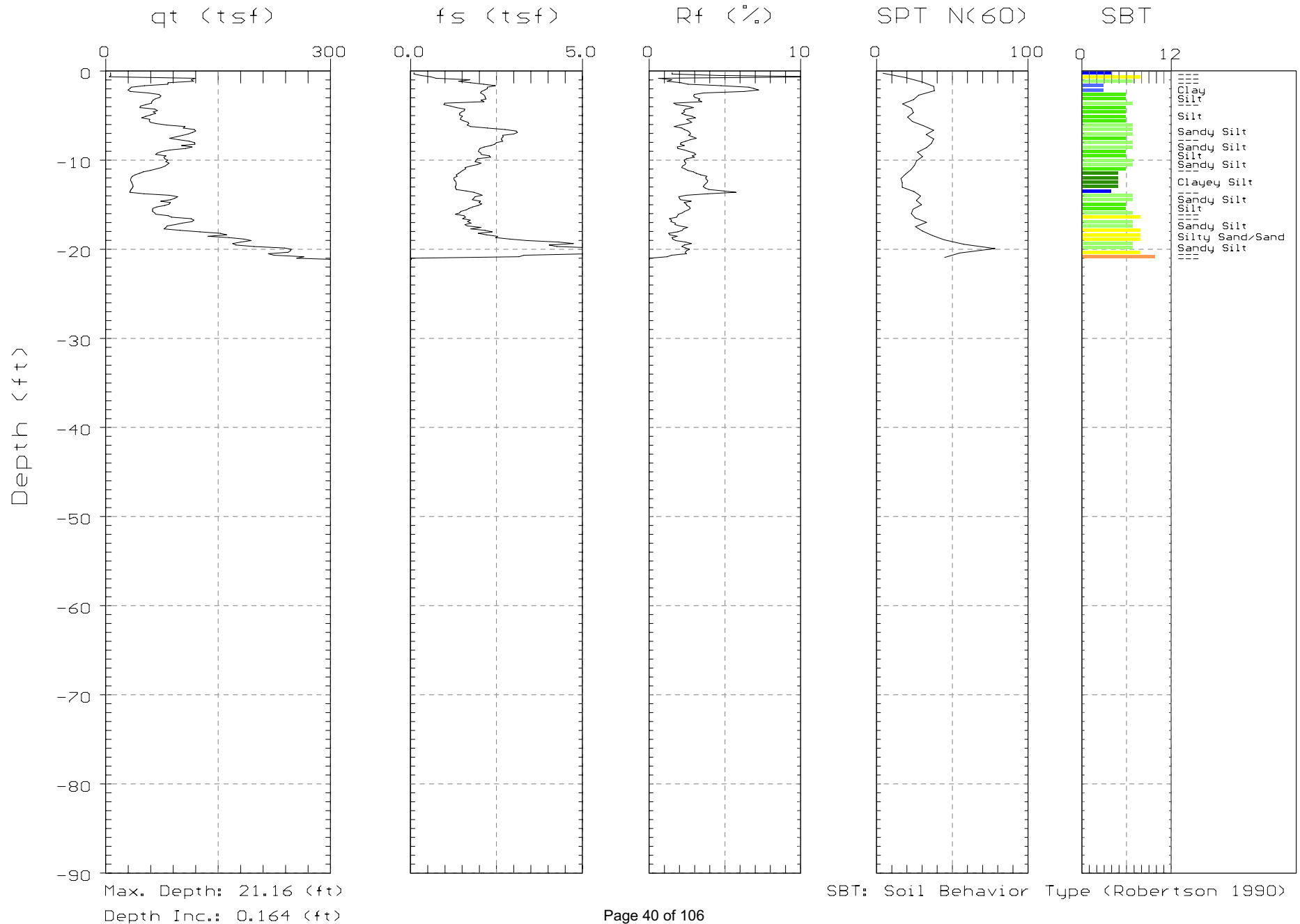


MACTEC

Site: N=1164172.987E=1847128.893 Engineer: C.SAMS

Location: CPT-1306AL=604.3

Date: 05/12/06 10:09



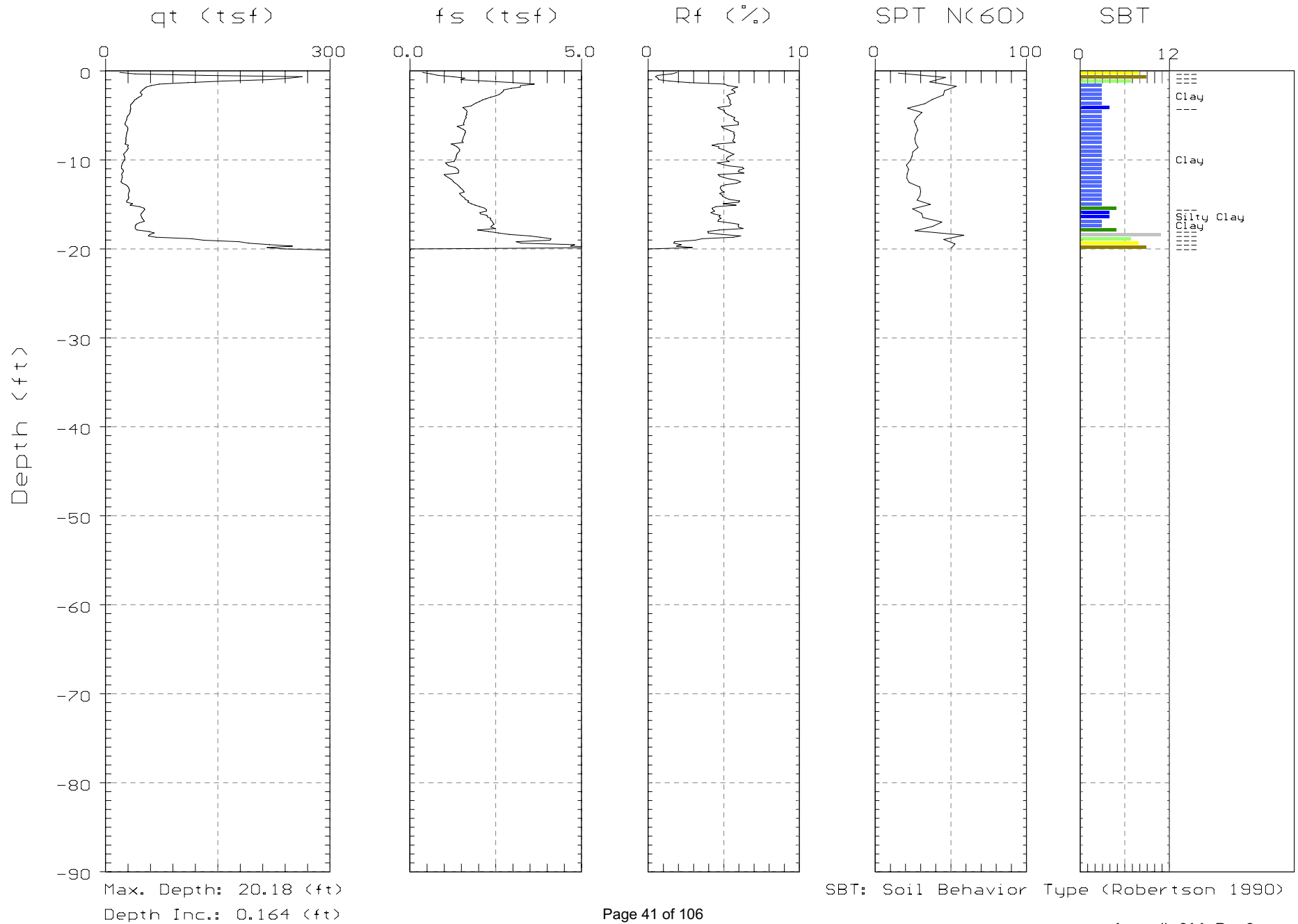


MACTEC

Site: N=1166393.067E=1847138.502 Engineer: C.SAMS

Location: CPT-1307L=589.8

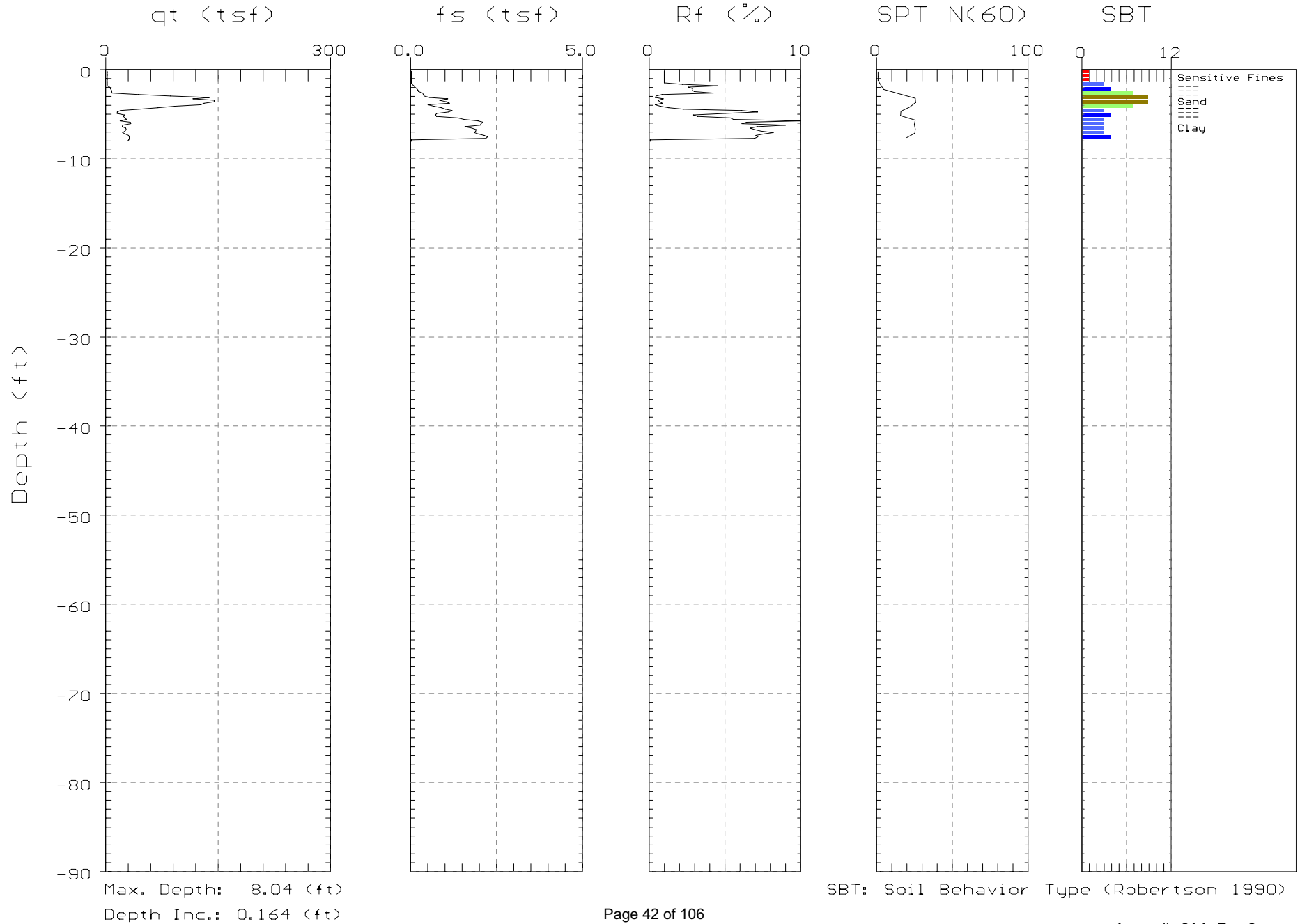
Date: 05/16/06 08:51





MACTEC

Site: N=1166994.842E=1844214.37 Engineer: C.SAMS
Location: CPT-1308L=538.0 Date: 05/13/06 11:57



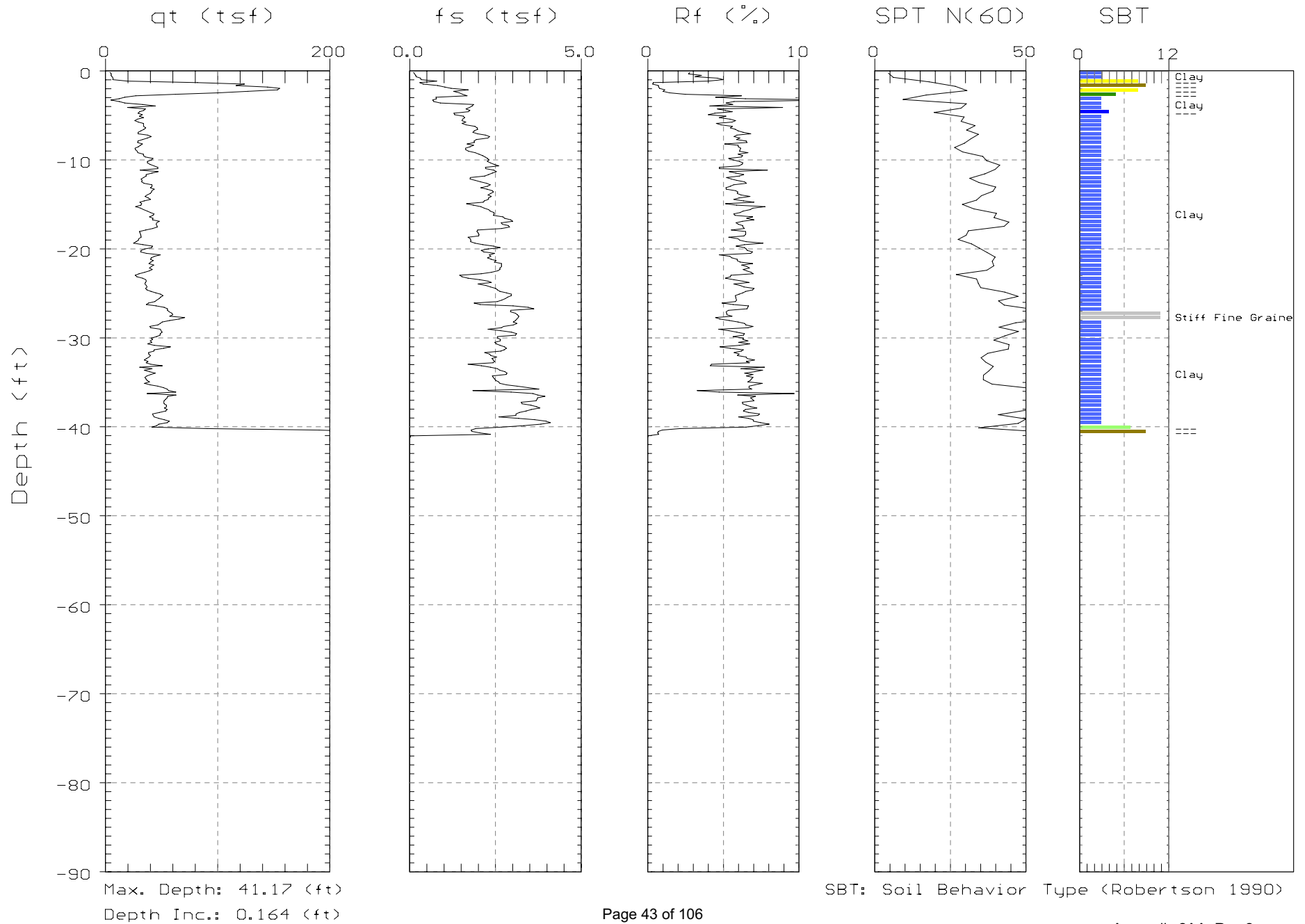


MACTEC

Site: N=1167001.502E=1844206.906 Engineer: C.SAMS

Location: CPT-1308AL=538.0

Date: 05/14/06 05:56



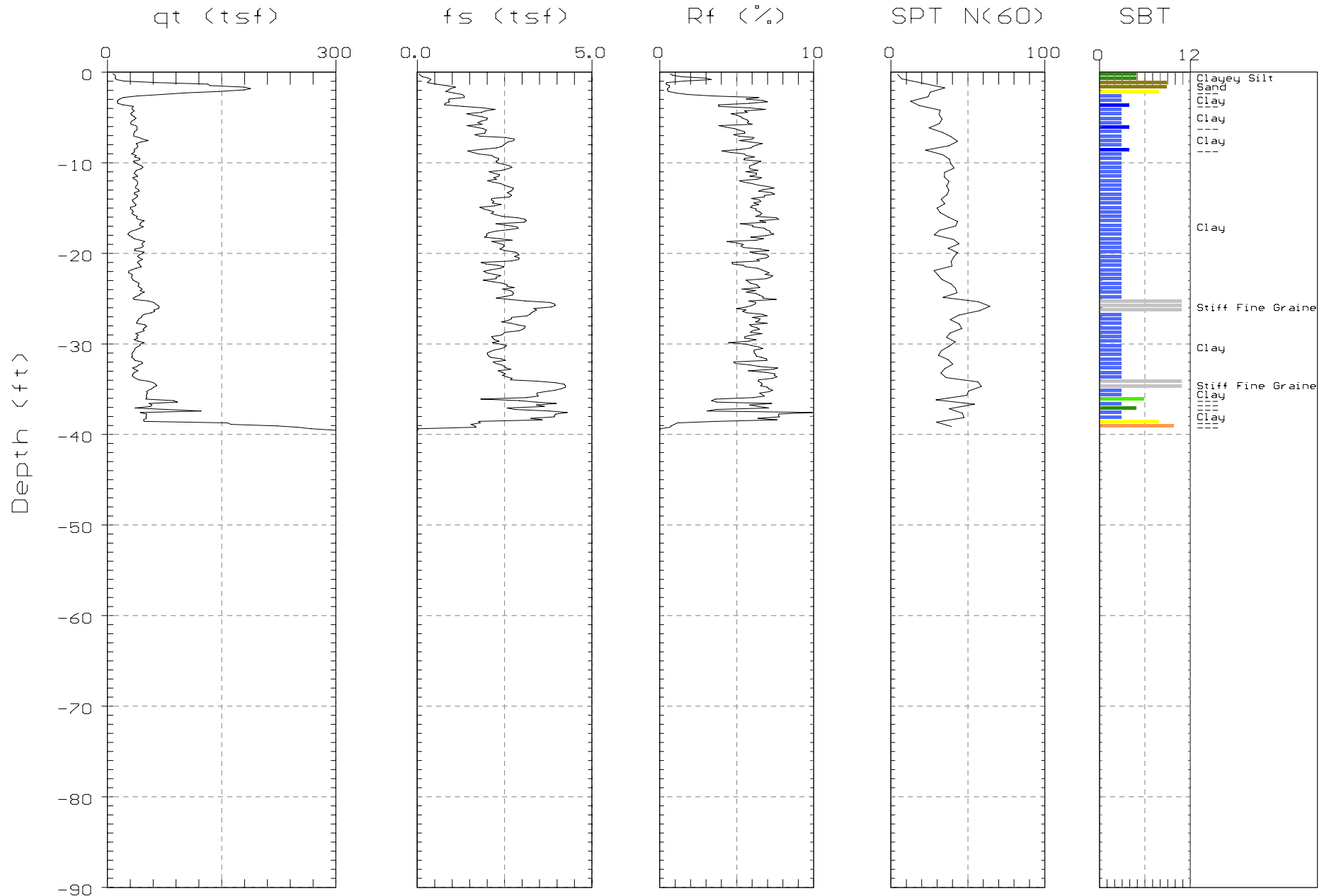


MACTEC

Site: N=1167008.152E=1844199.436 Engineer: C.SAMS

Location: CPT-1308BL=538.0

Date: 05/16/06 06:35



Max. Depth: 39.53 (ft)
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

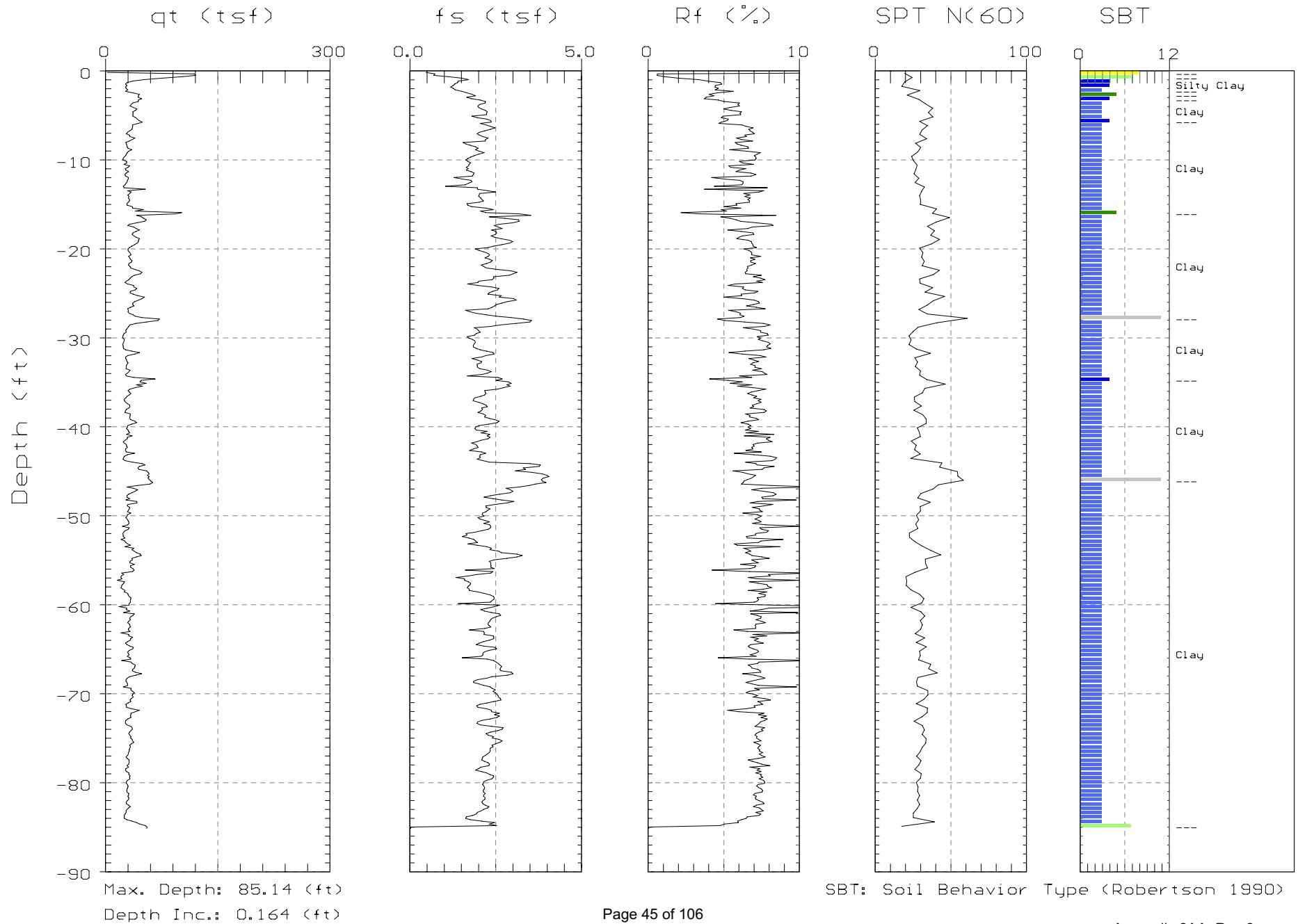


MACTEC

Site: N=1166860.56 E=1844074.211 Engineer: C.SAMS

Location: CPT-1309L=591.0

Date: 05/14/06 10:04



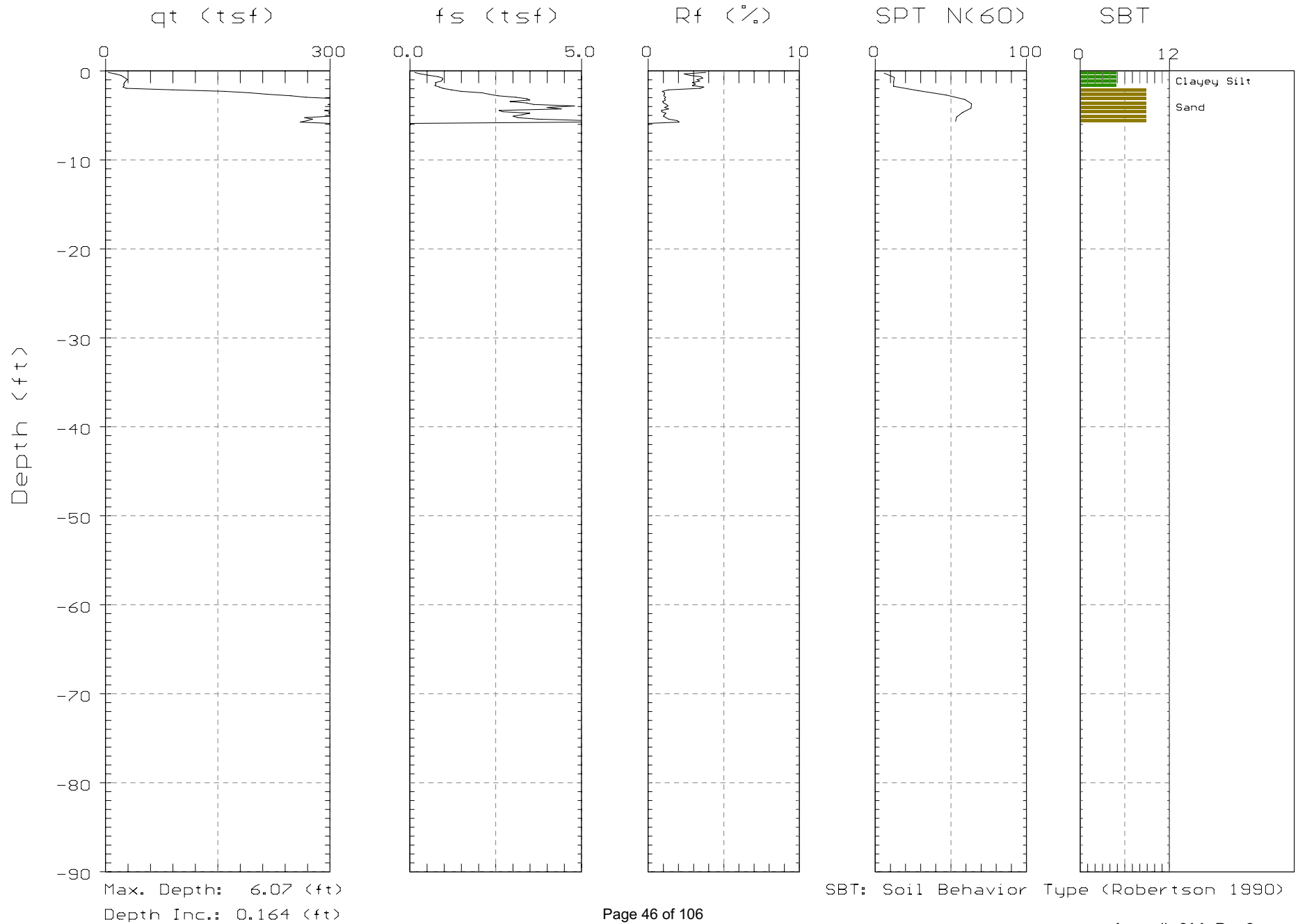


MACTEC

Site: N=1164932.132E=1846220.577 Engineer: C.SAMS

Location: CPT-1314L=590.0

Date: 05/15/06 13:37



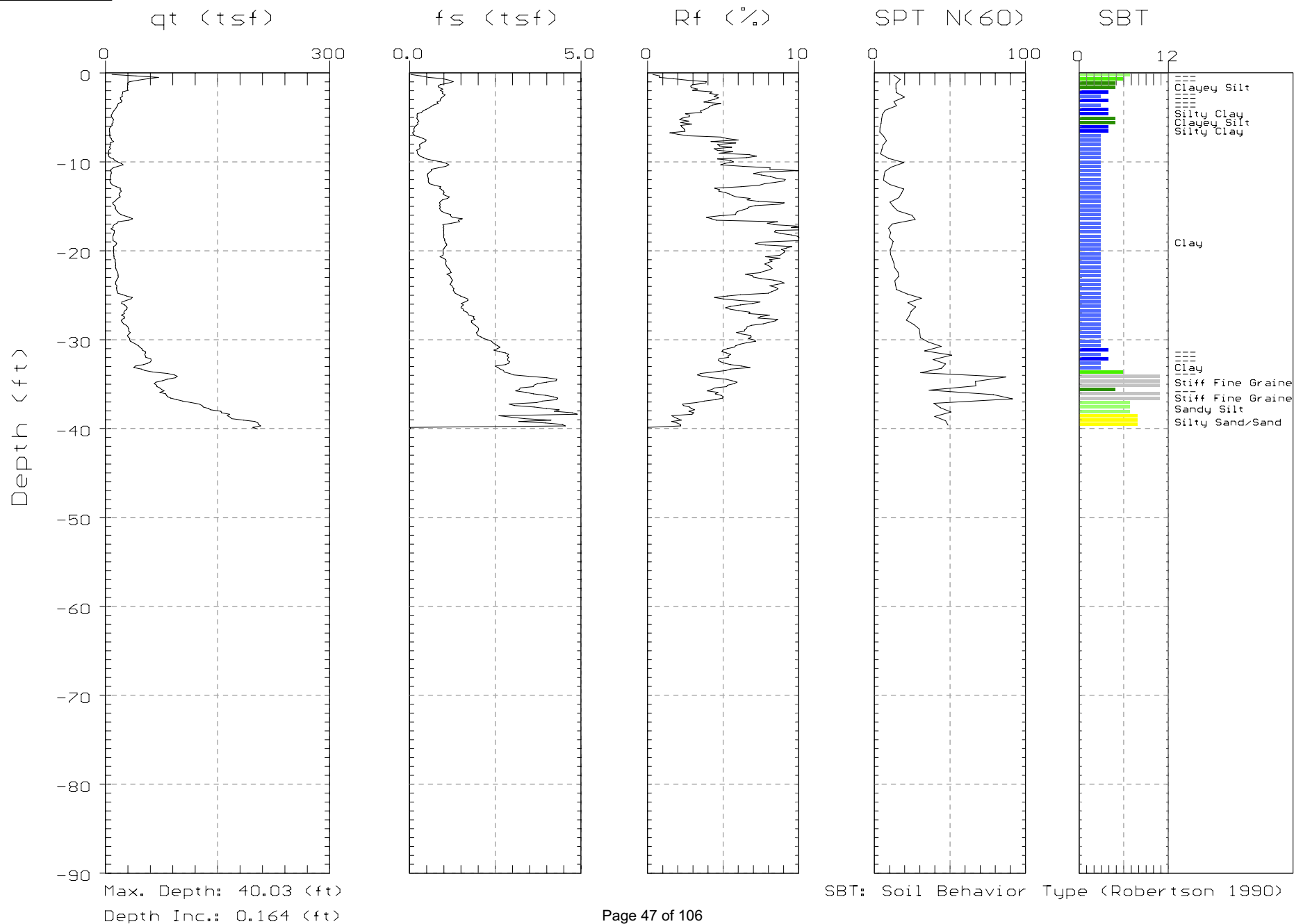


MACTEC

Site: N=1165032.071E=1846589.827 Engineer: C.SAMS

Location: CPT-1315L=586.9

Date: 05/15/06 12:48



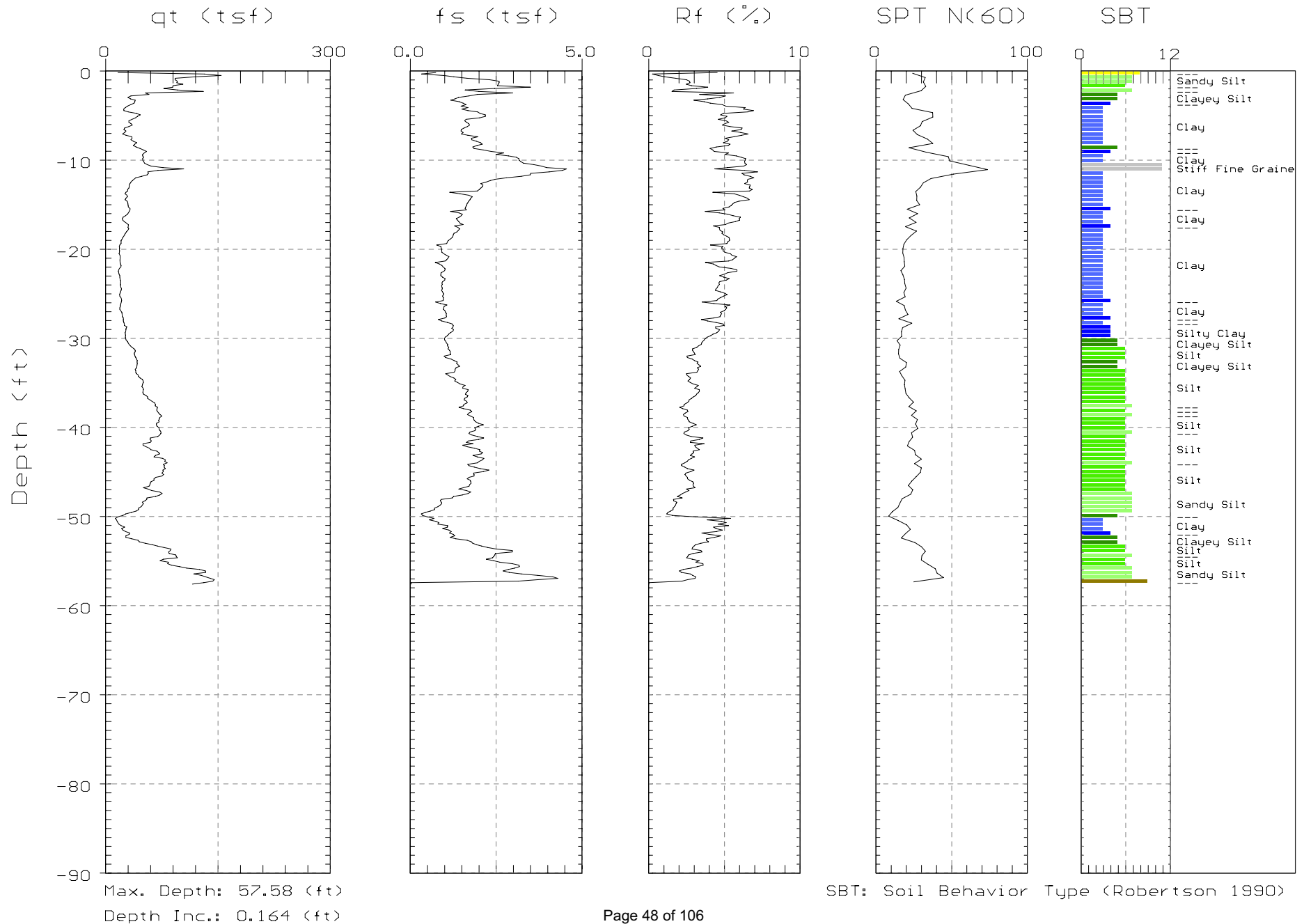


MACTEC

Site: N=1165442.267E=1847364.975 Engineer: C.SAMS

Location: CPT-1316L=589.6

Date: 05/15/06 11:15



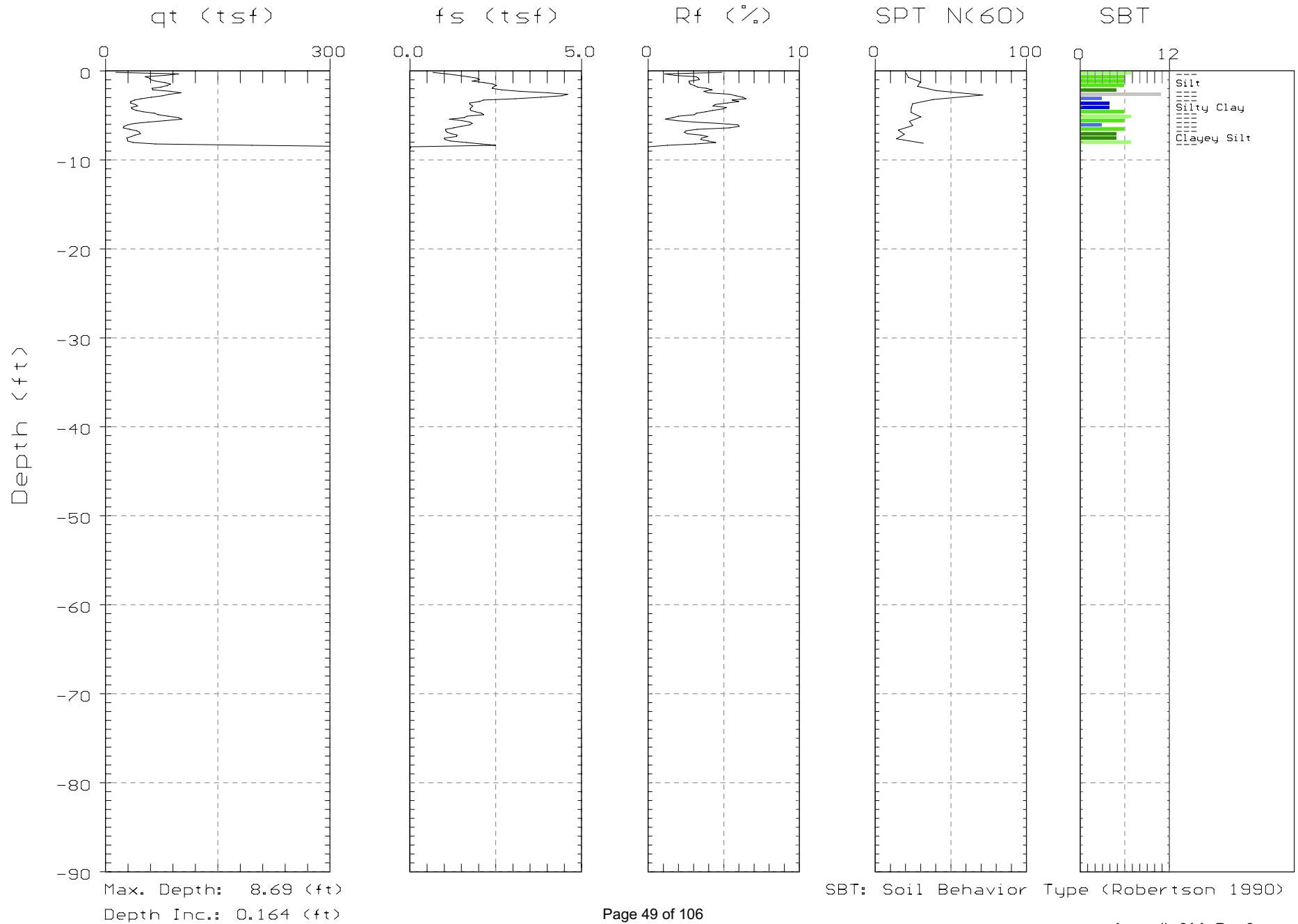


MACTEC

Site: N=1165480.571E=1847652.112 Engineer: C.SAMS

Location: CPT-1317L=588.7

Date: 05/15/06 10:04



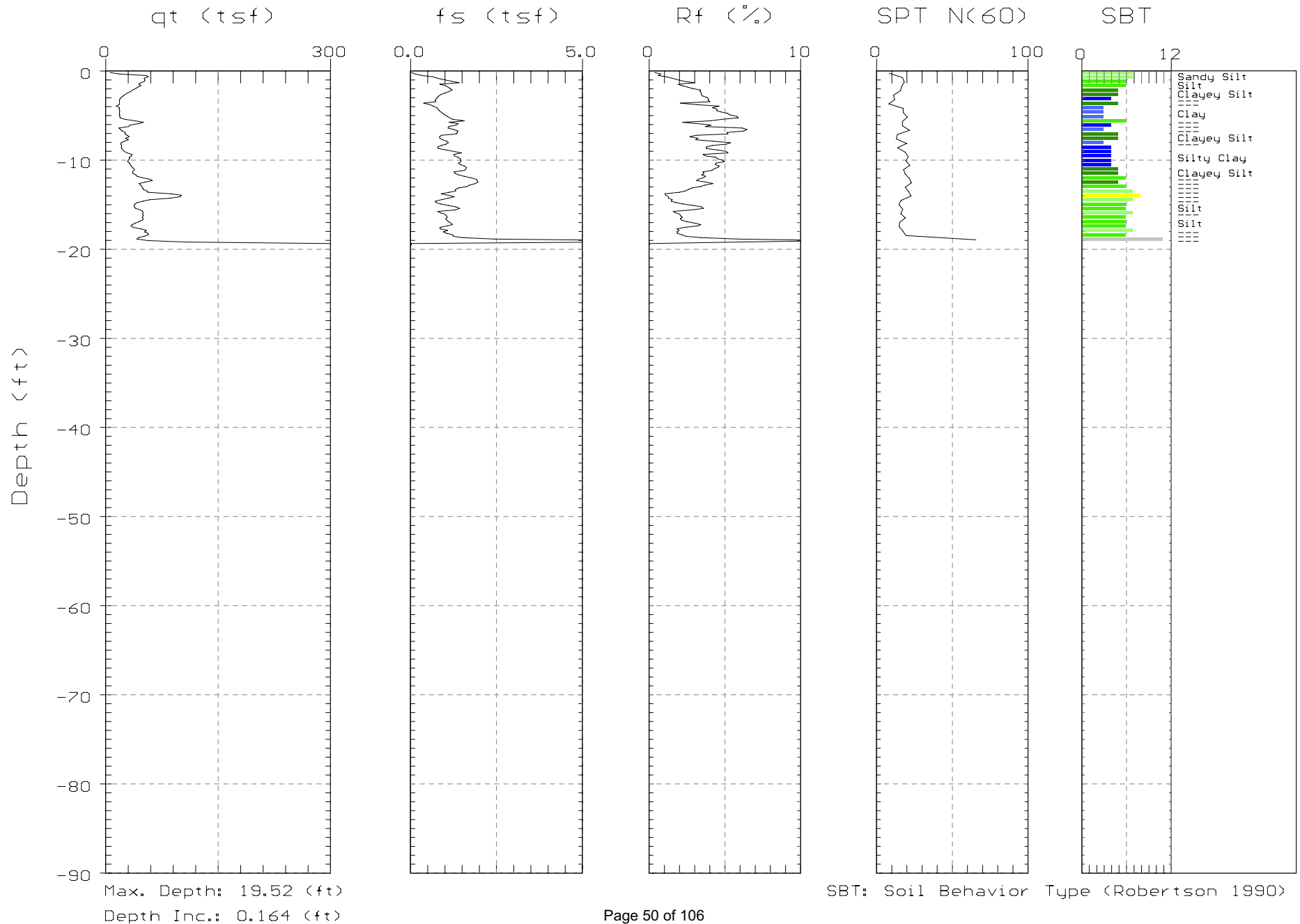


MACTEC

Site: N=1165481.237E=1847632.773 Engineer: C.SAMS

Location: CPT-1317aL=588.6

Date: 05/15/06 10:36



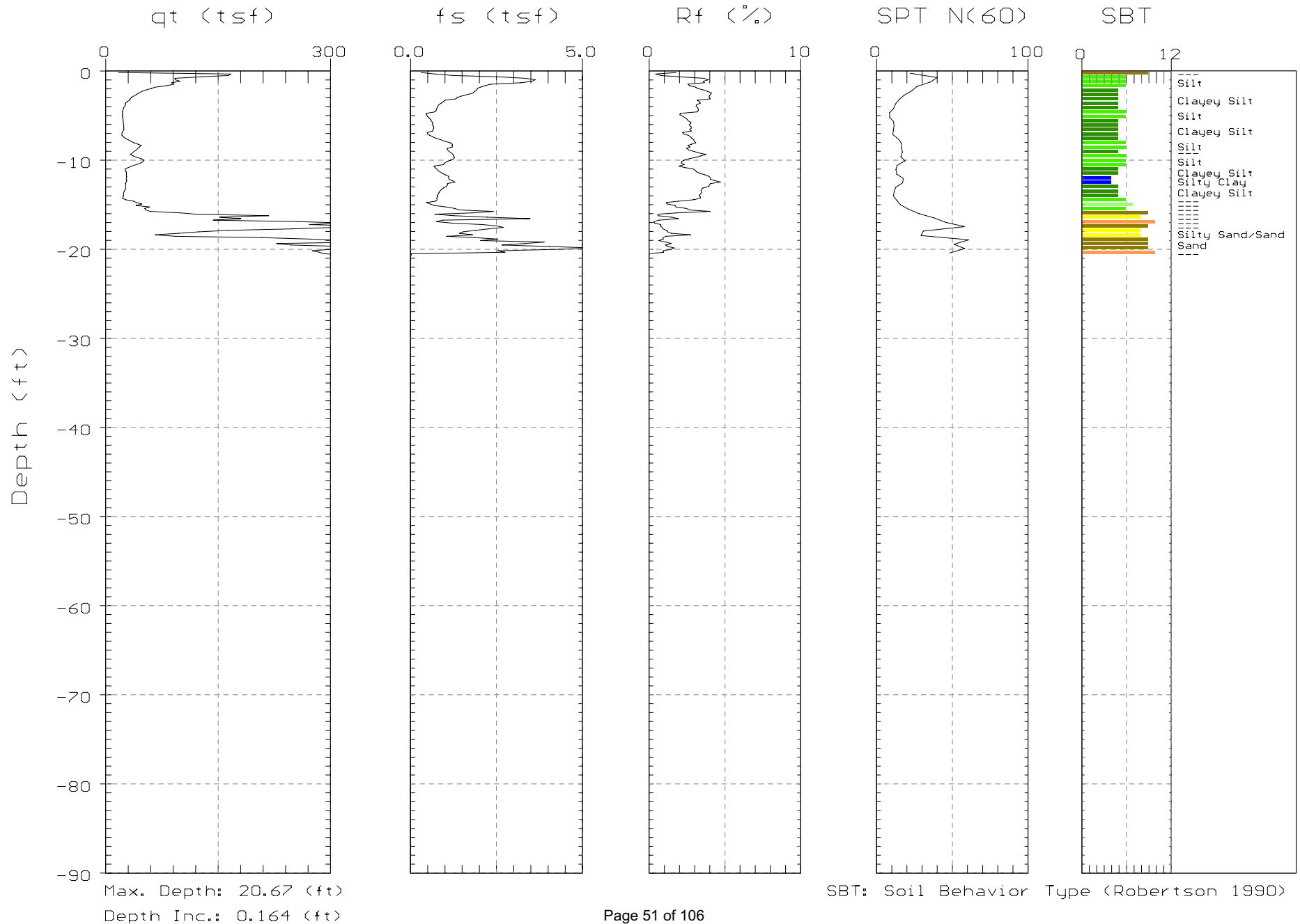


MACTEC

Site: N=1165497.097 E=1847636.907 Engineer: C.SAMS

Location: CPT-1317b L=588.8

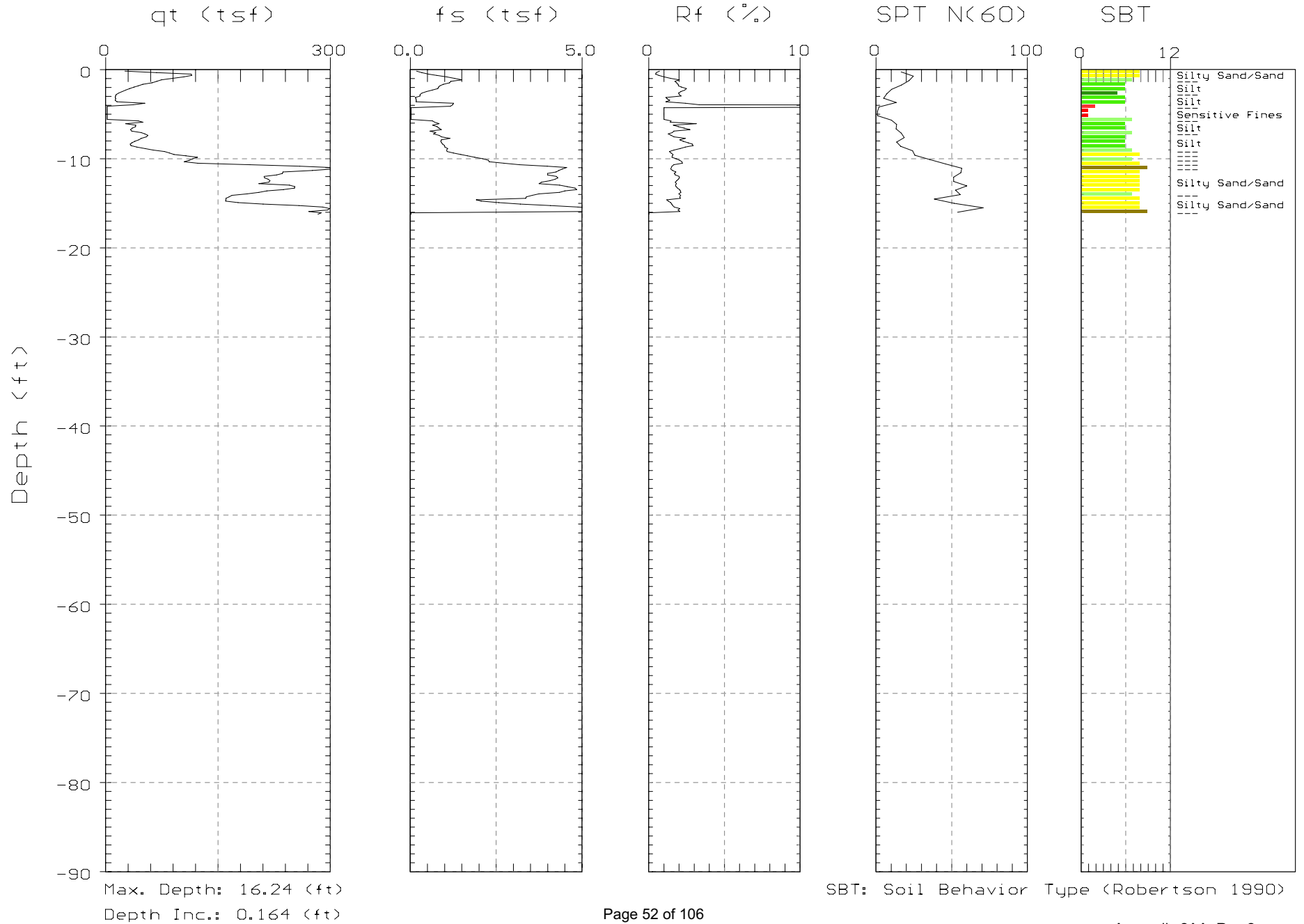
Date: 05/16/06 09:30





MACTEC

Site: N=1167614.444E=1847587.31 Engineer: C.SAMS
Location: CPT-1318L=586.4 Date: 05/15/06 08:10



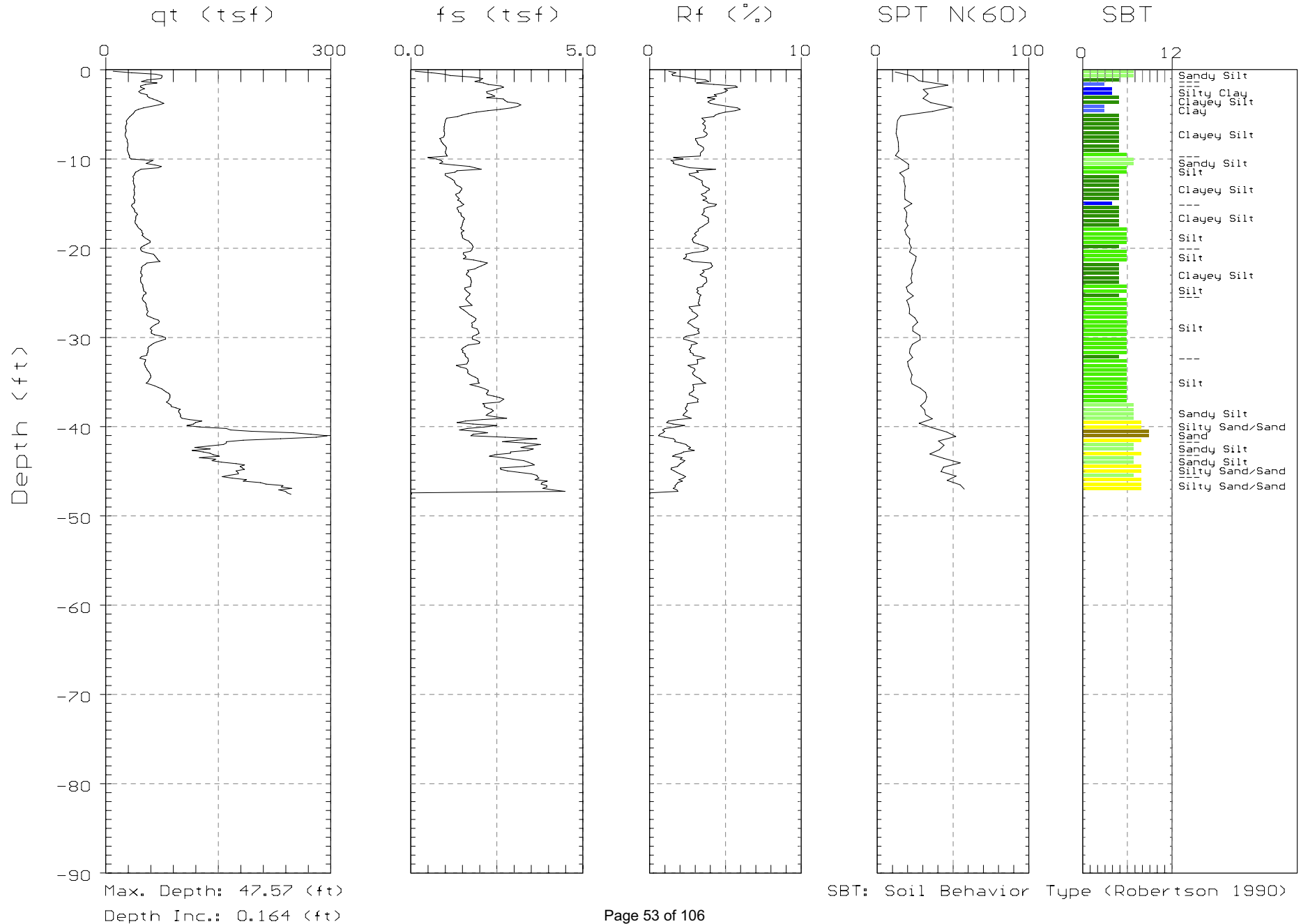


MACTEC

Site: N=1167695.014E=1847778.705 Engineer: C.SAMS

Location: CPT-1319L=587.9

Date: 05/15/06 05:50



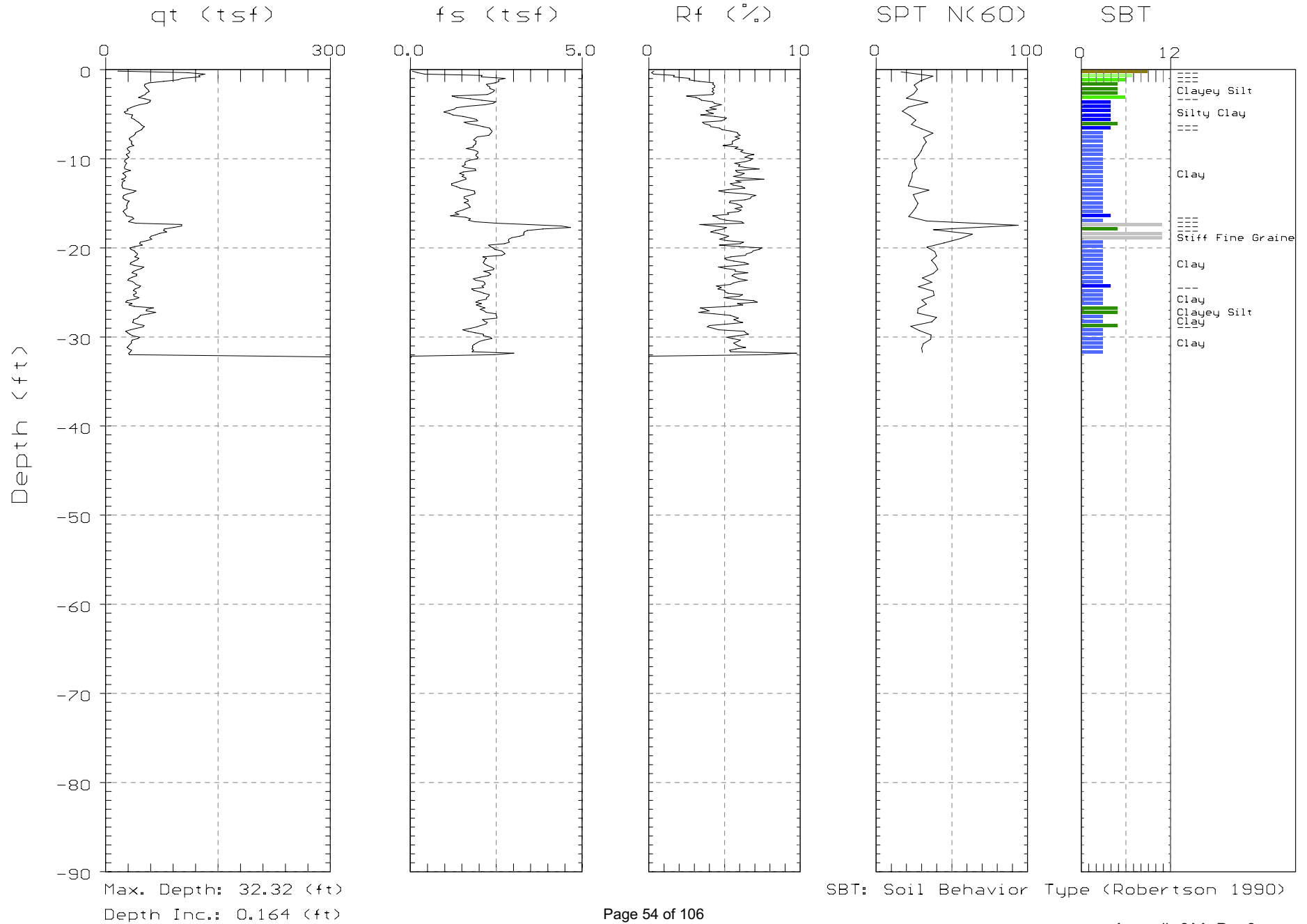


MACTEC

Site: N=1164809.635E=1847497.262 Engineer: C.SAMS

Location: CPT-1320L=604.9

Date: 08/20/06 08:56



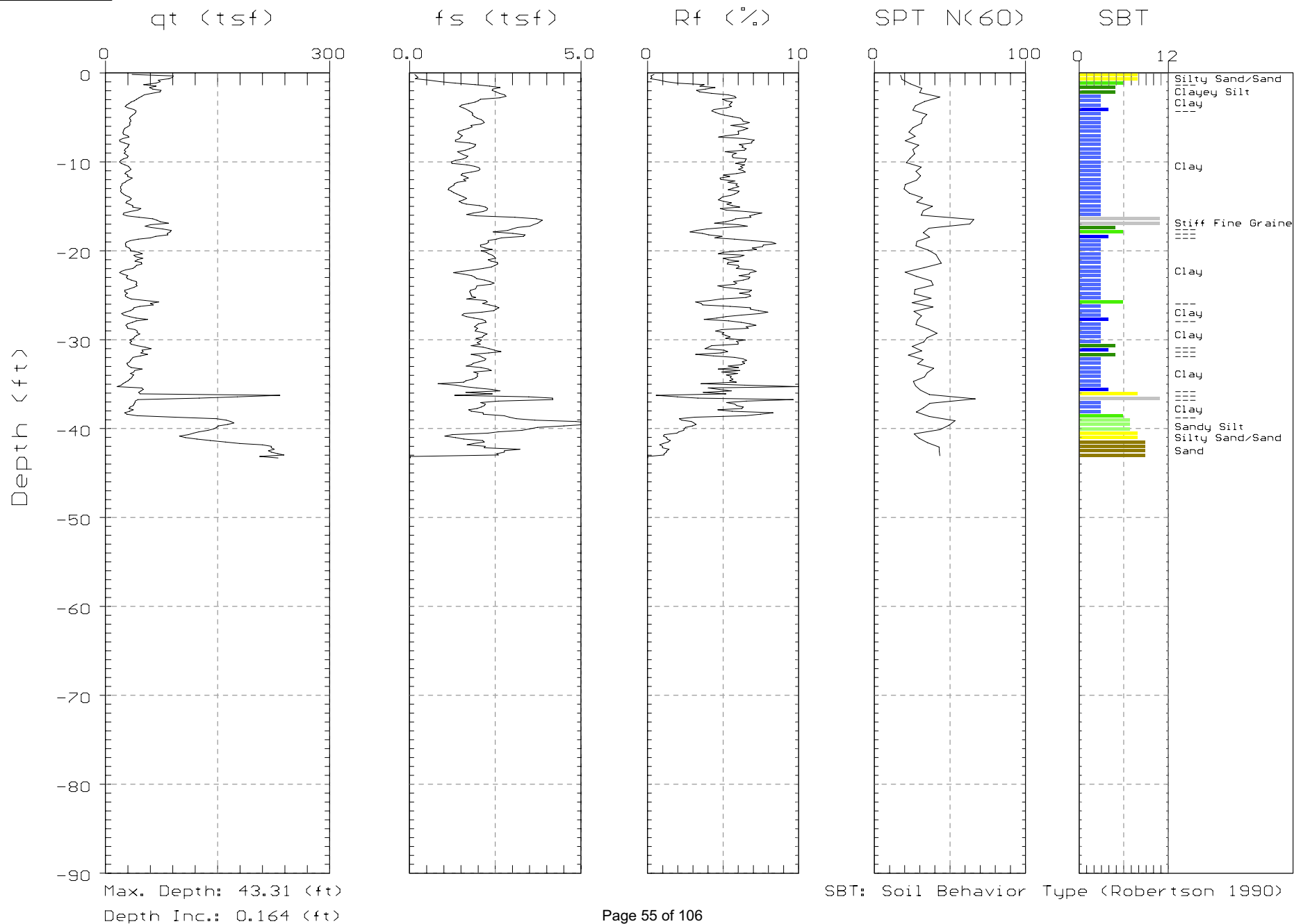


MACTEC

Site: N=1164802.258 E=1847460.695 Engineer: C.SAMS

Location: CPT-1321 L=604.9

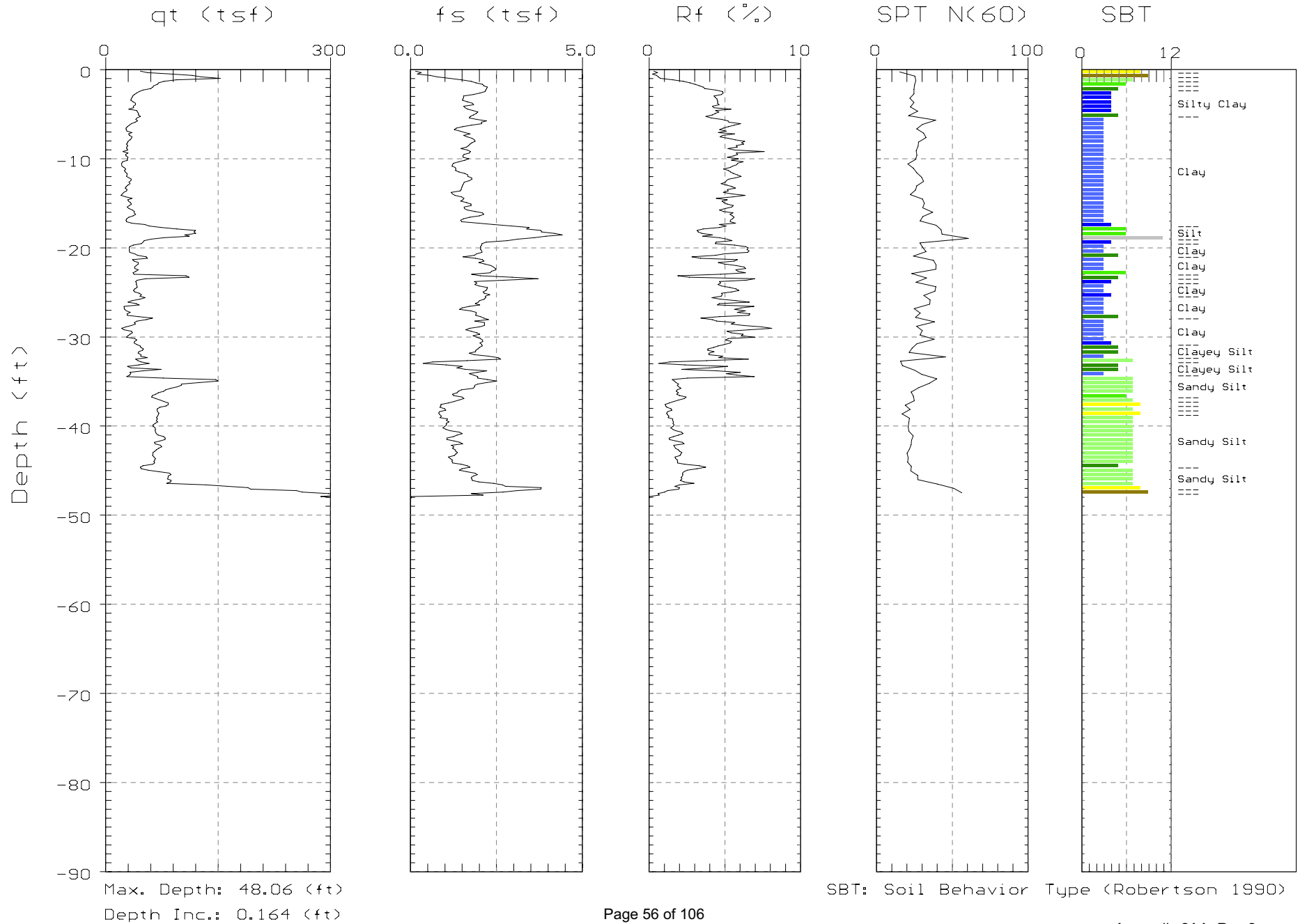
Date: 08/20/06 10:17





MACTEC

Site: N=1164794.98E=1847472.657 Engineer: C.SAMS
Location: CPT-1322L=605.2 Date: 08/20/06 07:01



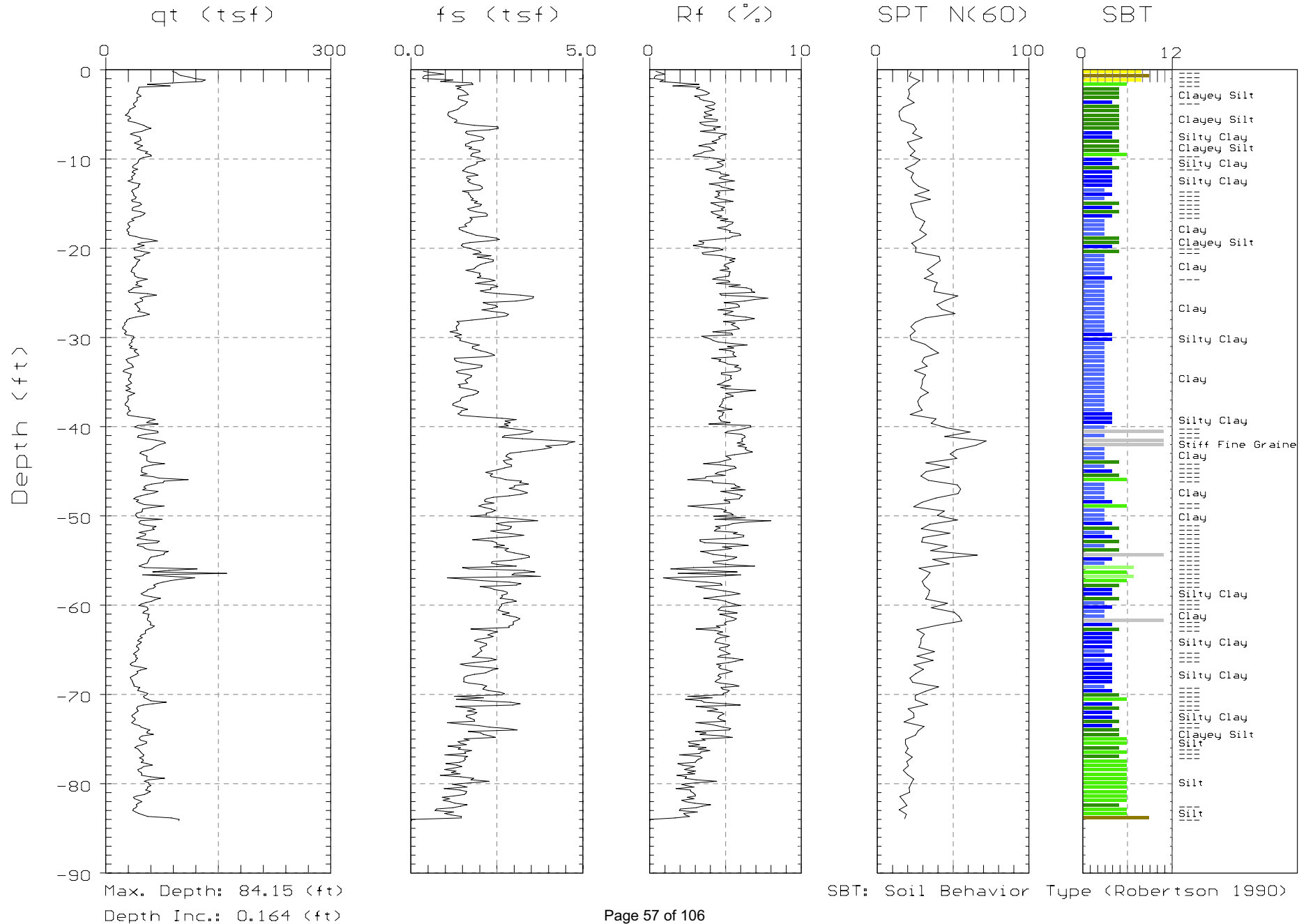


MACTEC

Site: N=1165679.211E=1848305.418 Engineer: C.SAMS

Location: CPT-1323L=610.5

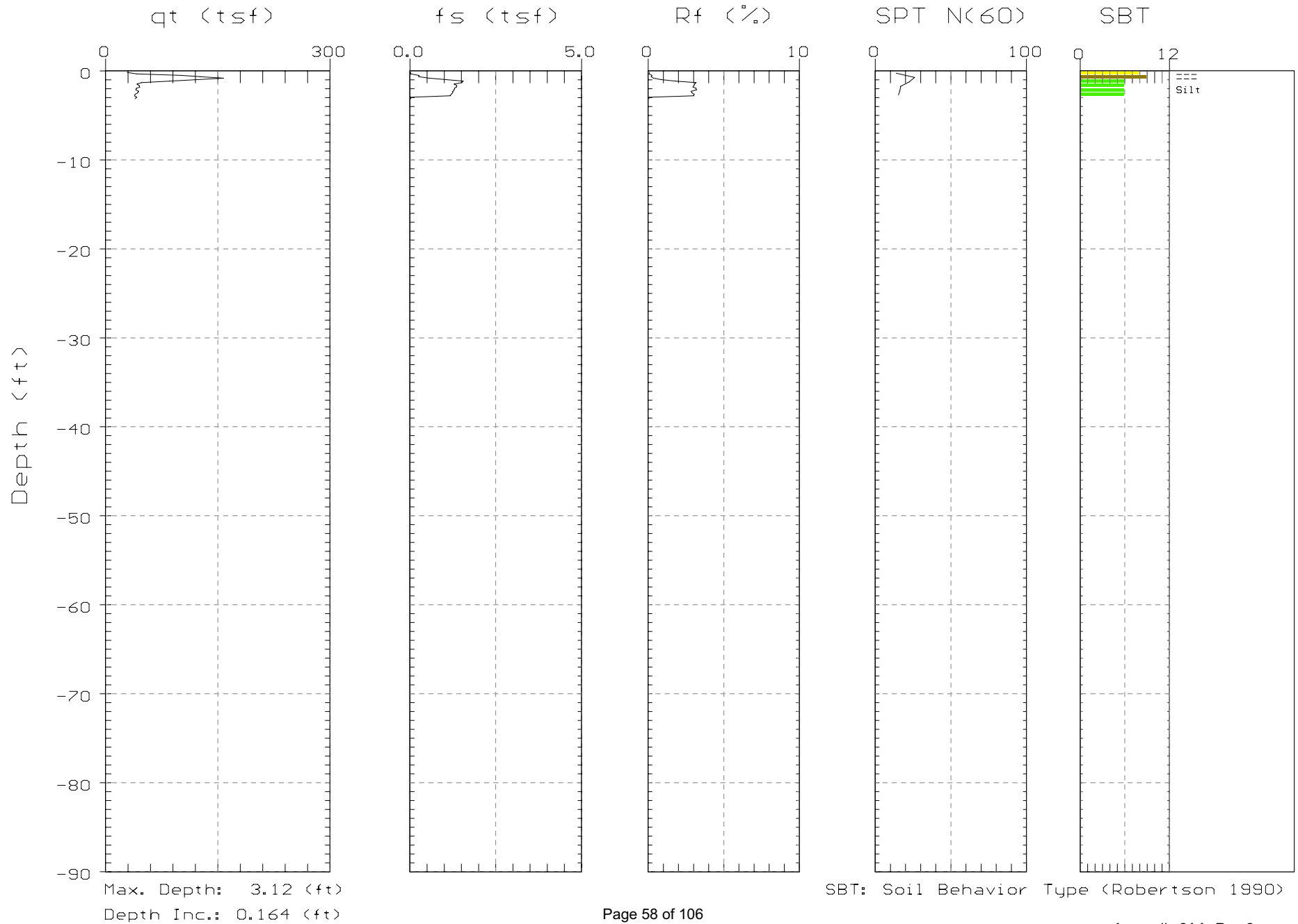
Date: 08/19/06 05:19





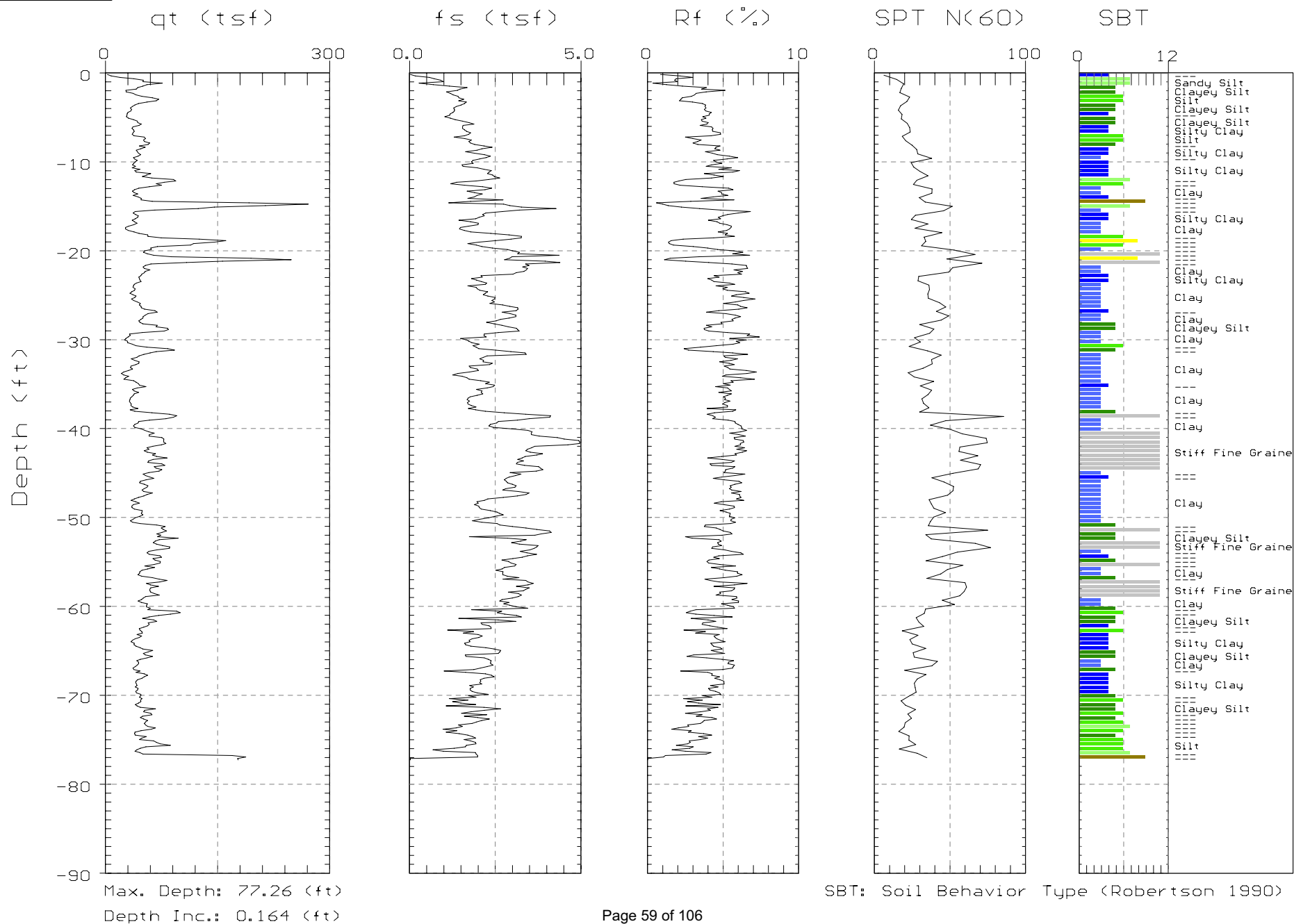
MACTEC

Site: N=1165733.296E=1848334.24 Engineer: C.SAMS
Location: CPT-1324L=610.2 Date: 08/19/06 08:43





Site: N=1165733.296 E=1848334.24 Engineer: C.SAMS
Location: CPT-1324BL=610.2 Date: 08/19/06 09:02



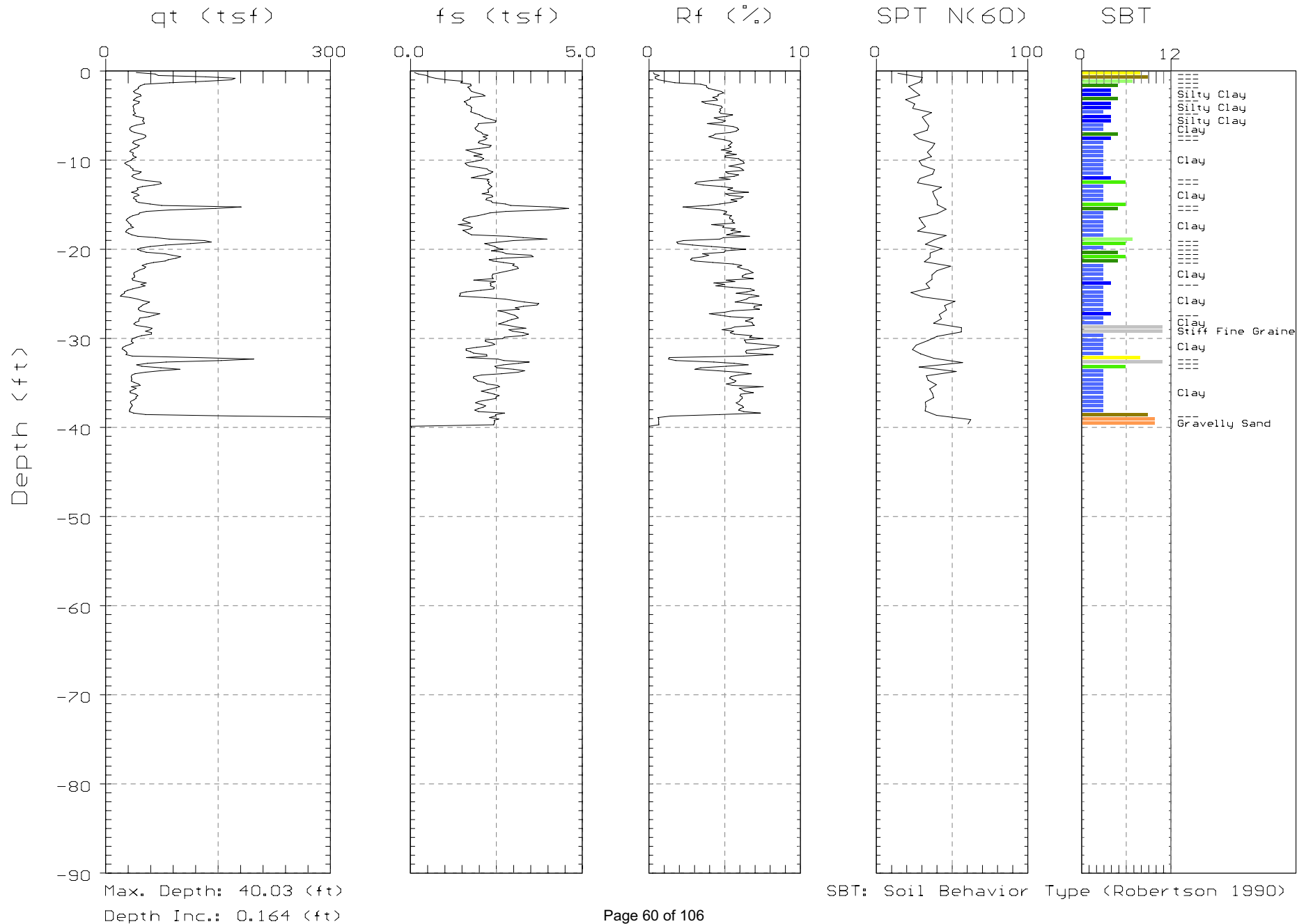


MACTEC

Site: N=1165730.729E=1848273.937 Engineer: C.SAMS

Location: CPT-1325L=610.3

Date: 08/19/06 11:35



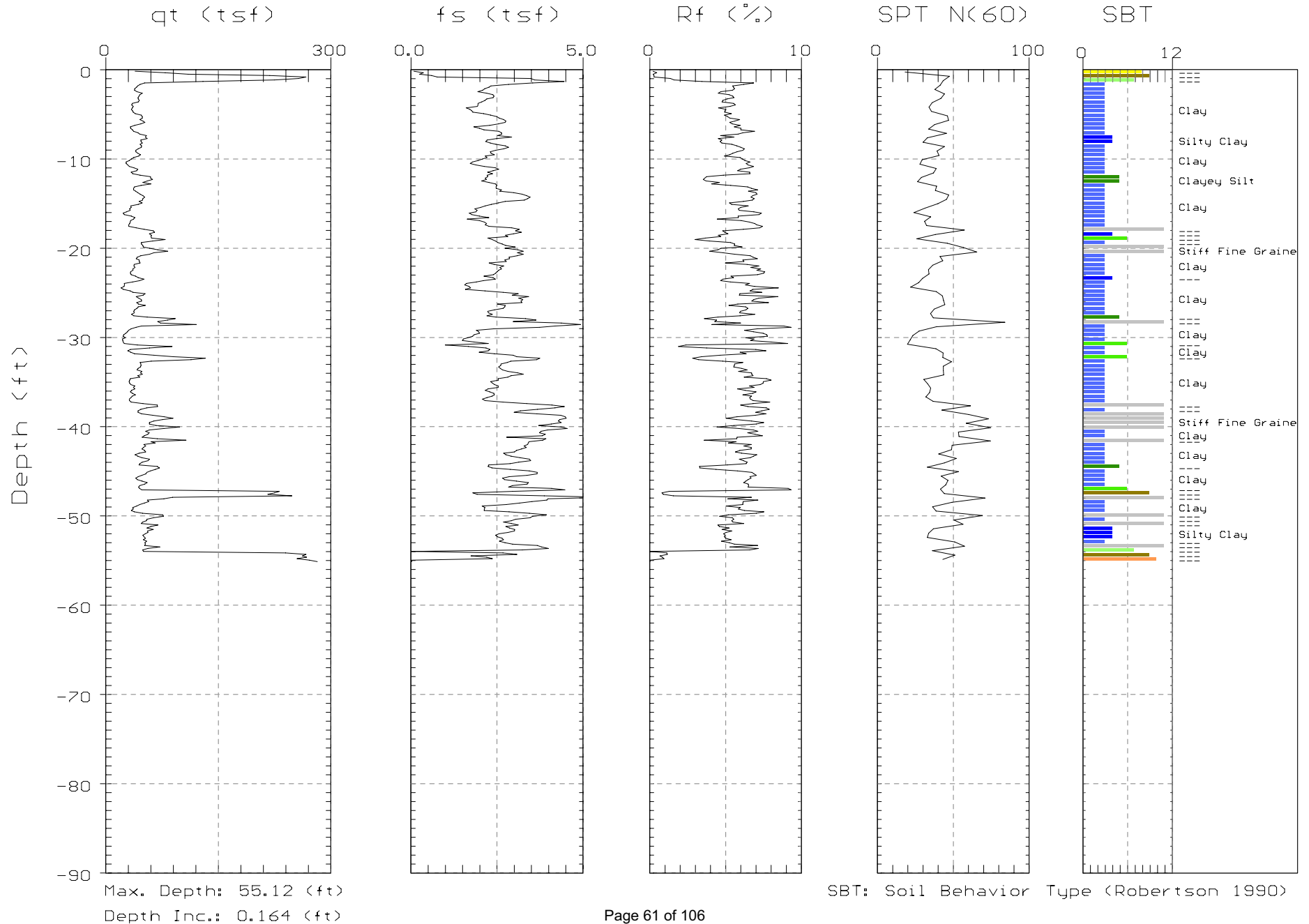


MACTEC

Site: N=1165728.968E=1848272.952 Engineer: C.SAMS

Location: CPT-1325AL=610.1

Date: 08/19/06 12:39



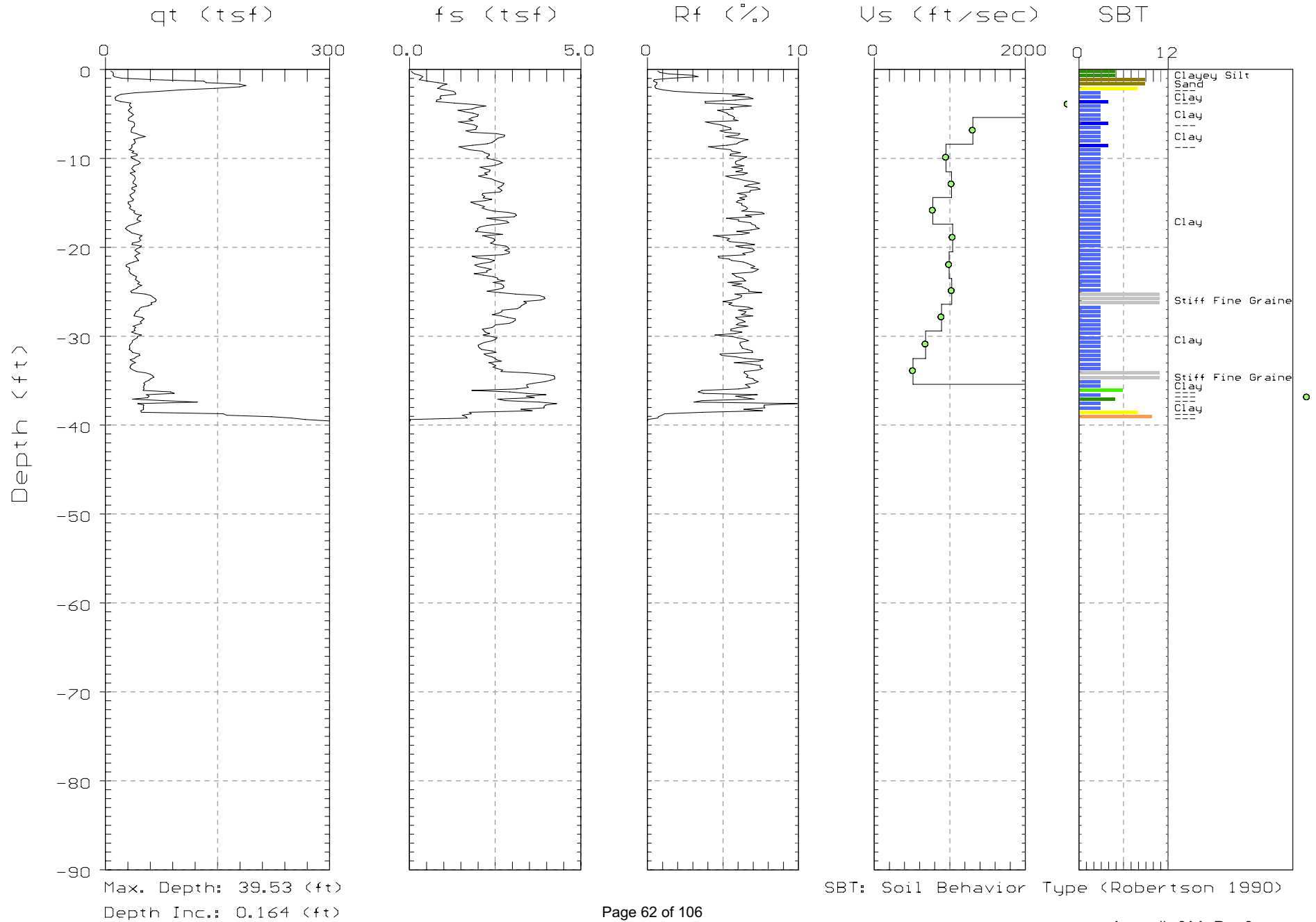


MACTEC

Site: N=1167001.502E=1844206.906 Engineer: C.SAMS

Location: CPT-1308AL=538.0

Date: 05/14/06 05:56



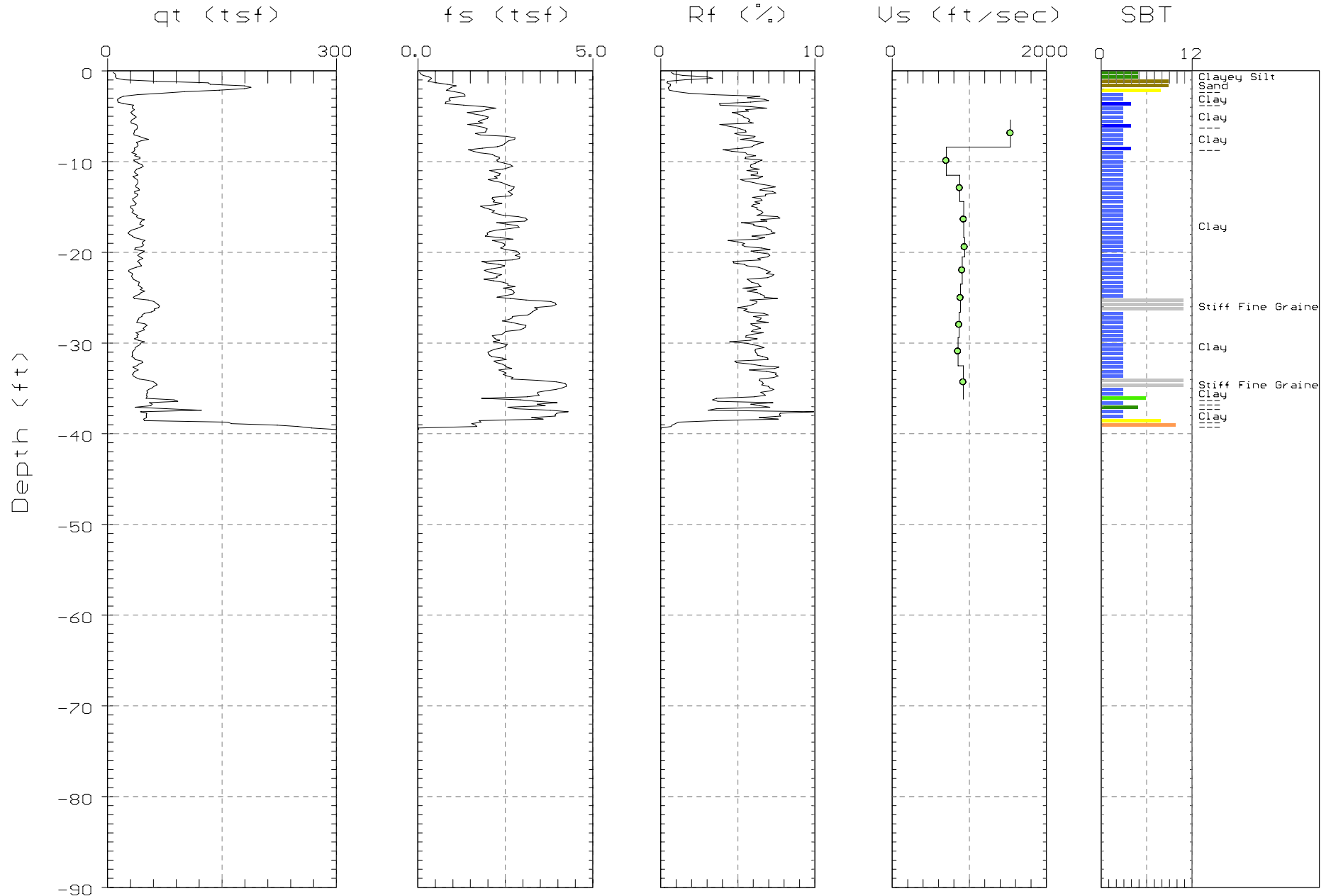


MACTEC

Site: N=1167008.152E=1844199.436 Engineer: C.SAMS

Location: CPT-1308BL=538.0

Date: 05/16/06 06:35



Max. Depth: 39.53 (ft)
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

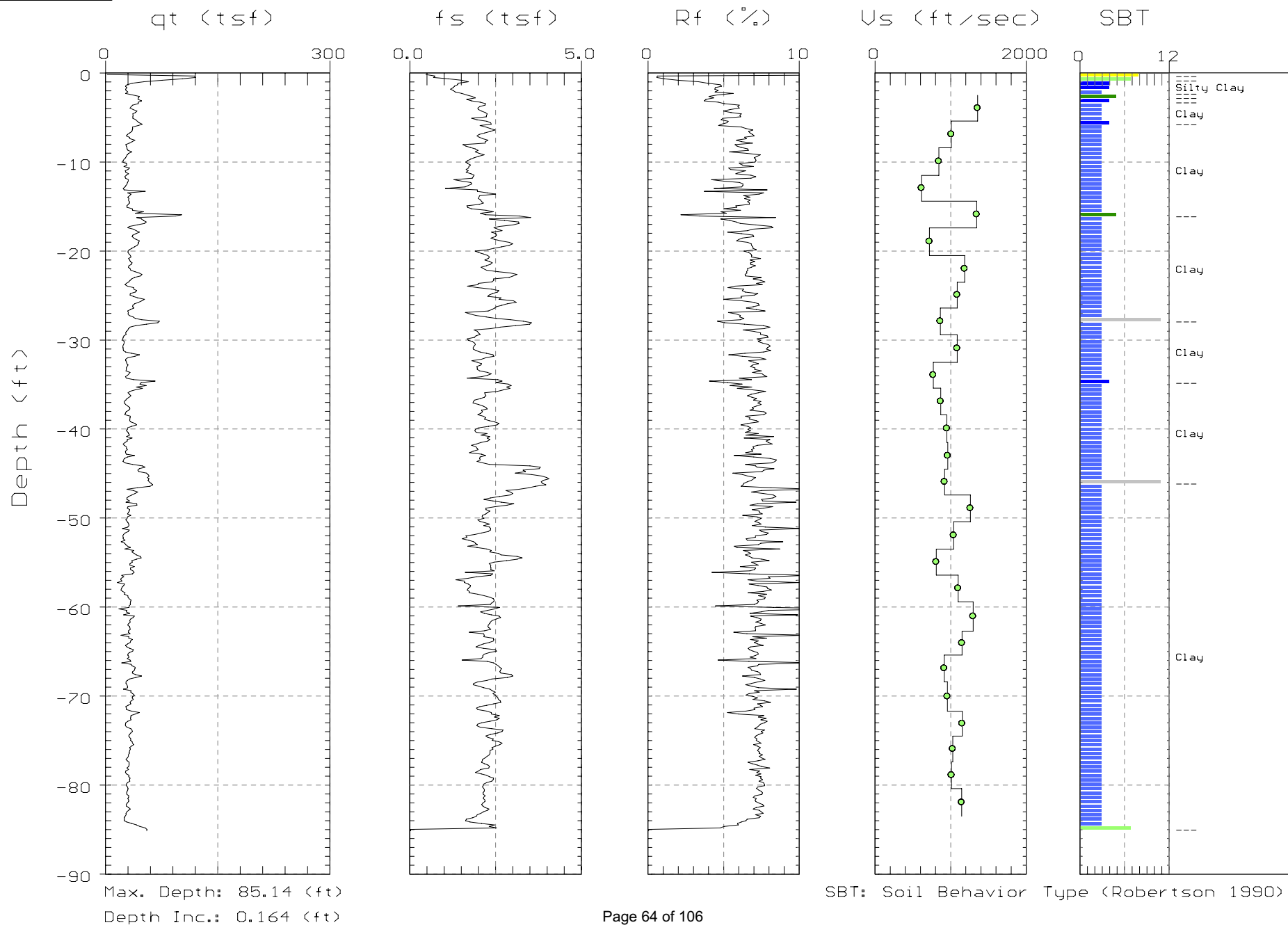


MACTEC

Site: N=1166860.56 E=1844074.211 Engineer: C.SAMS

Location: CPT-1309L=591.0

Date: 05/14/06 10:04



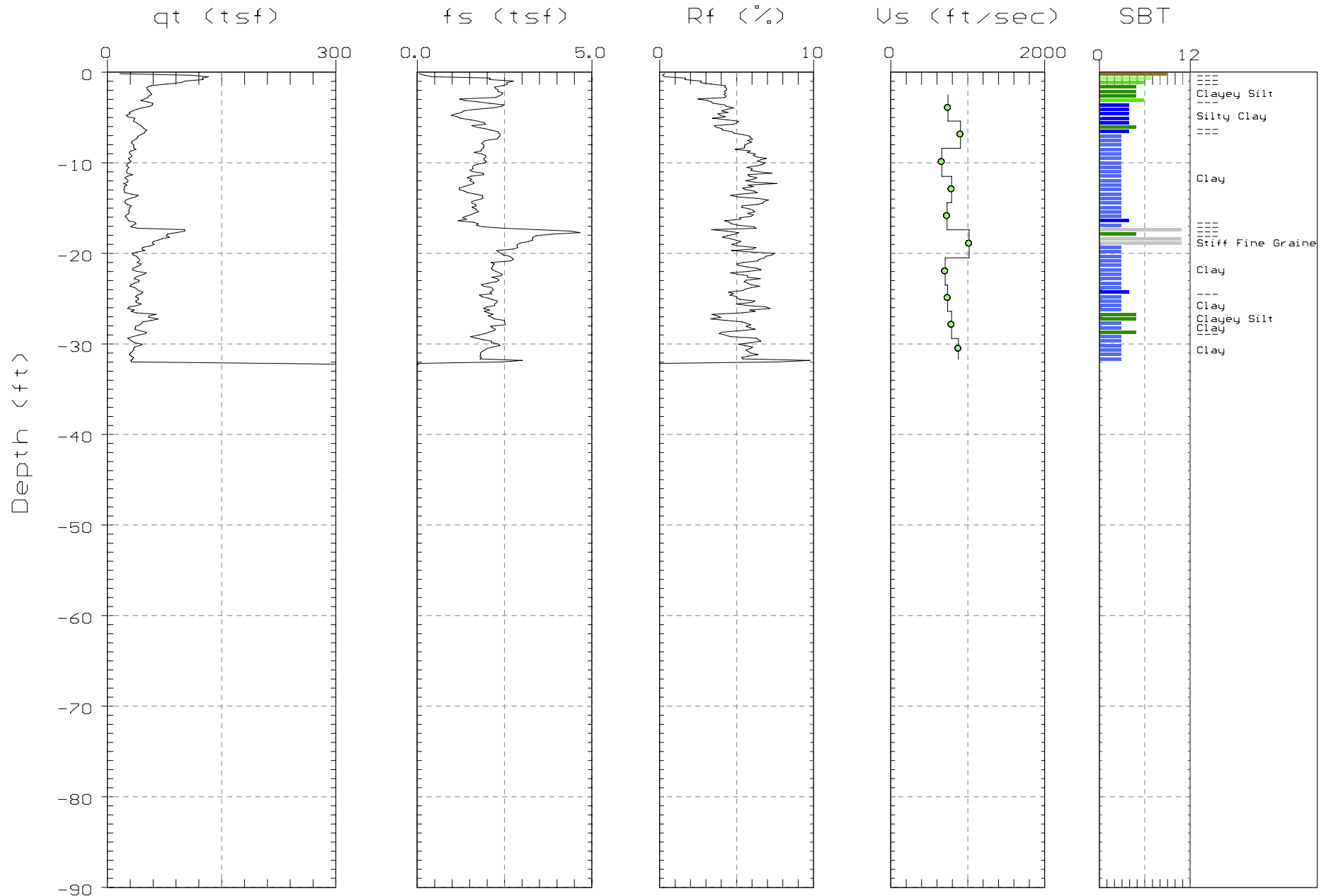


MACTEC

Site: N=1164809.635E=1847497.262 Engineer: C.SAMS

Location: CPT-1320L=604.9

Date: 08/20/06 08:56



Max. Depth: 32.32 (ft)
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

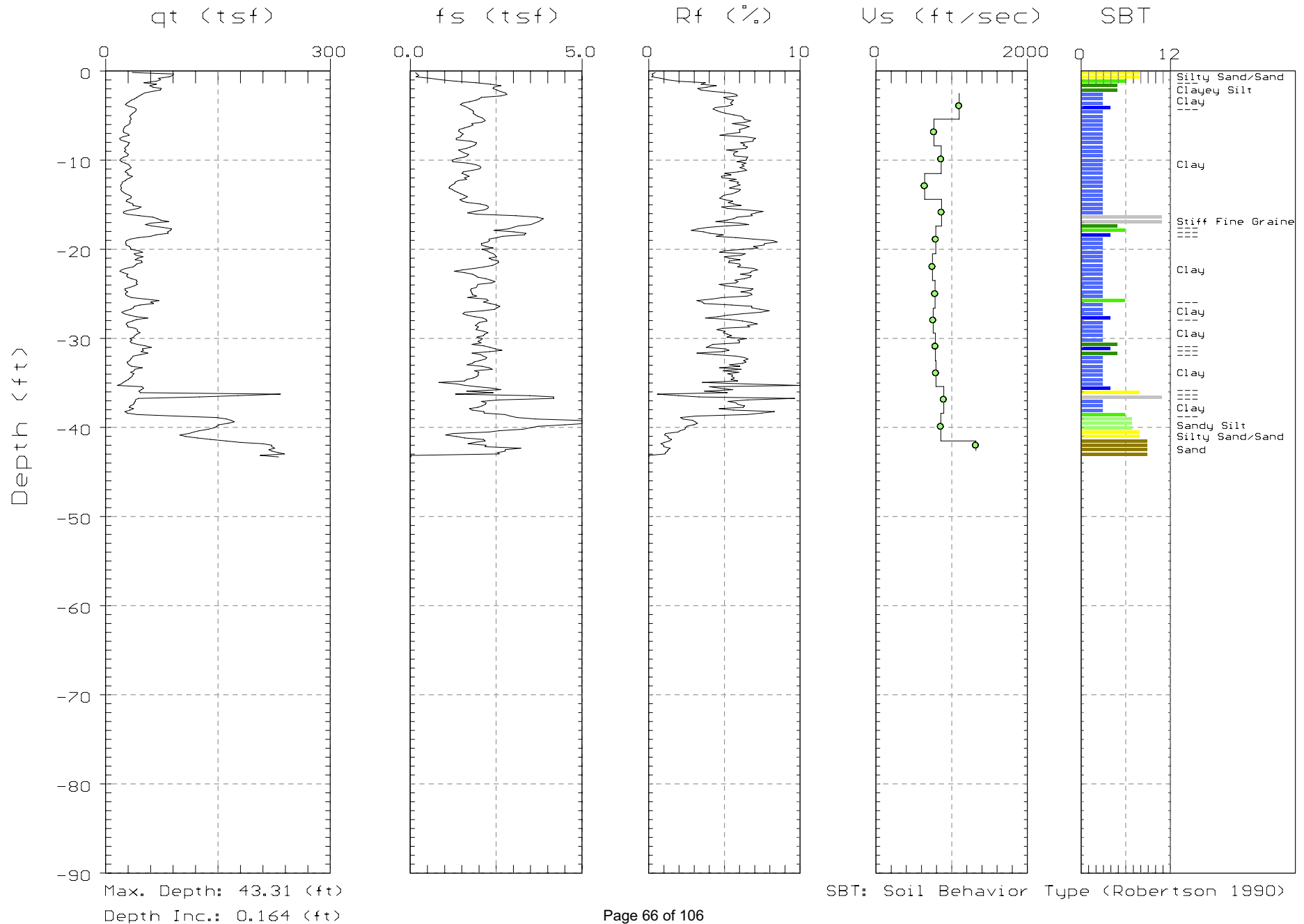


MACTEC

Site: N=1164802.258E=1847460.695 Engineer: C.SAMS

Location: CPT-1321L=604.9

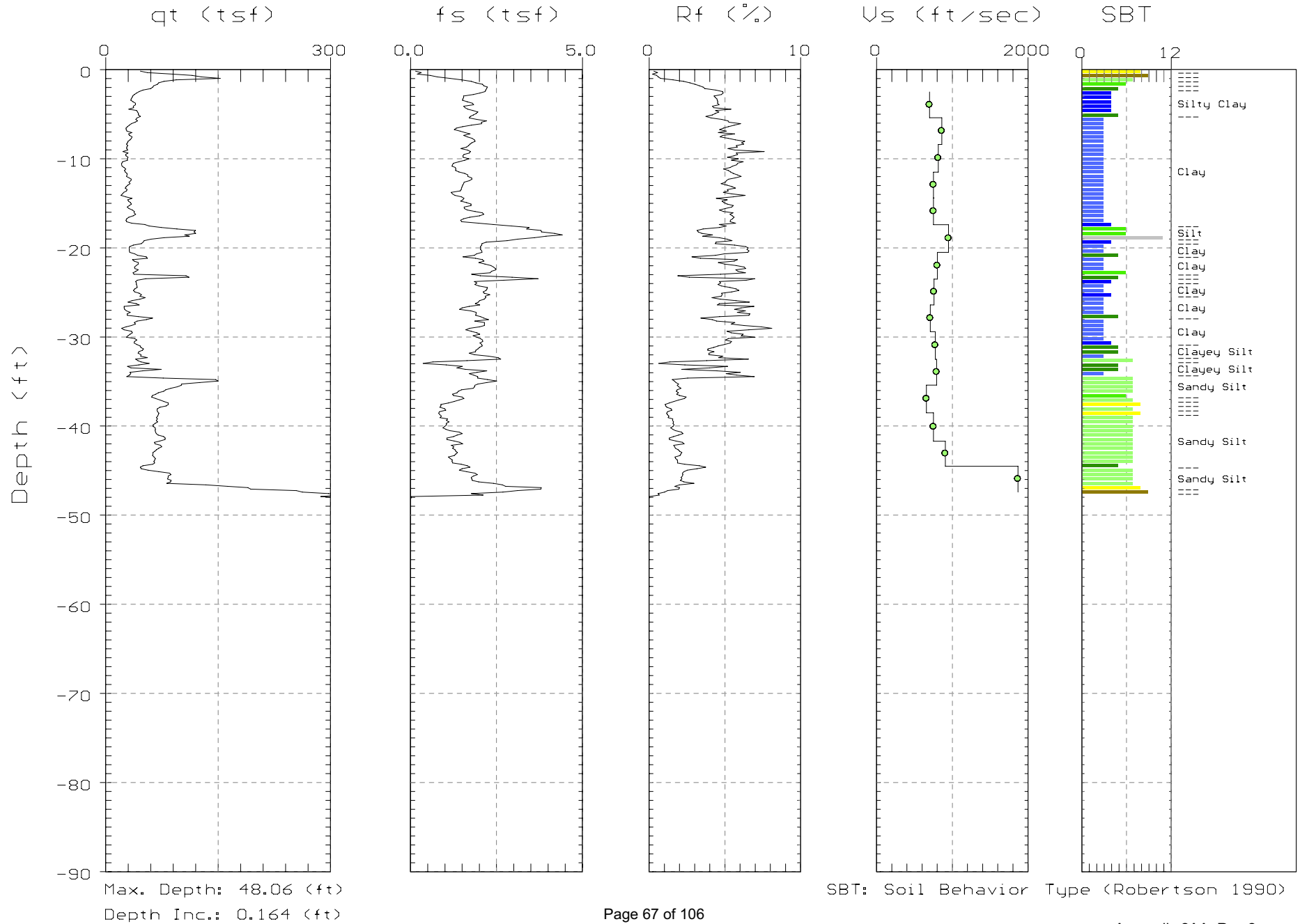
Date: 08/20/06 10:17





MACTEC

Site: N=1164794.98E=1847472.657 Engineer: C.SAMS
Location: CPT-1322L=605.2 Date: 08/20/06 07:01



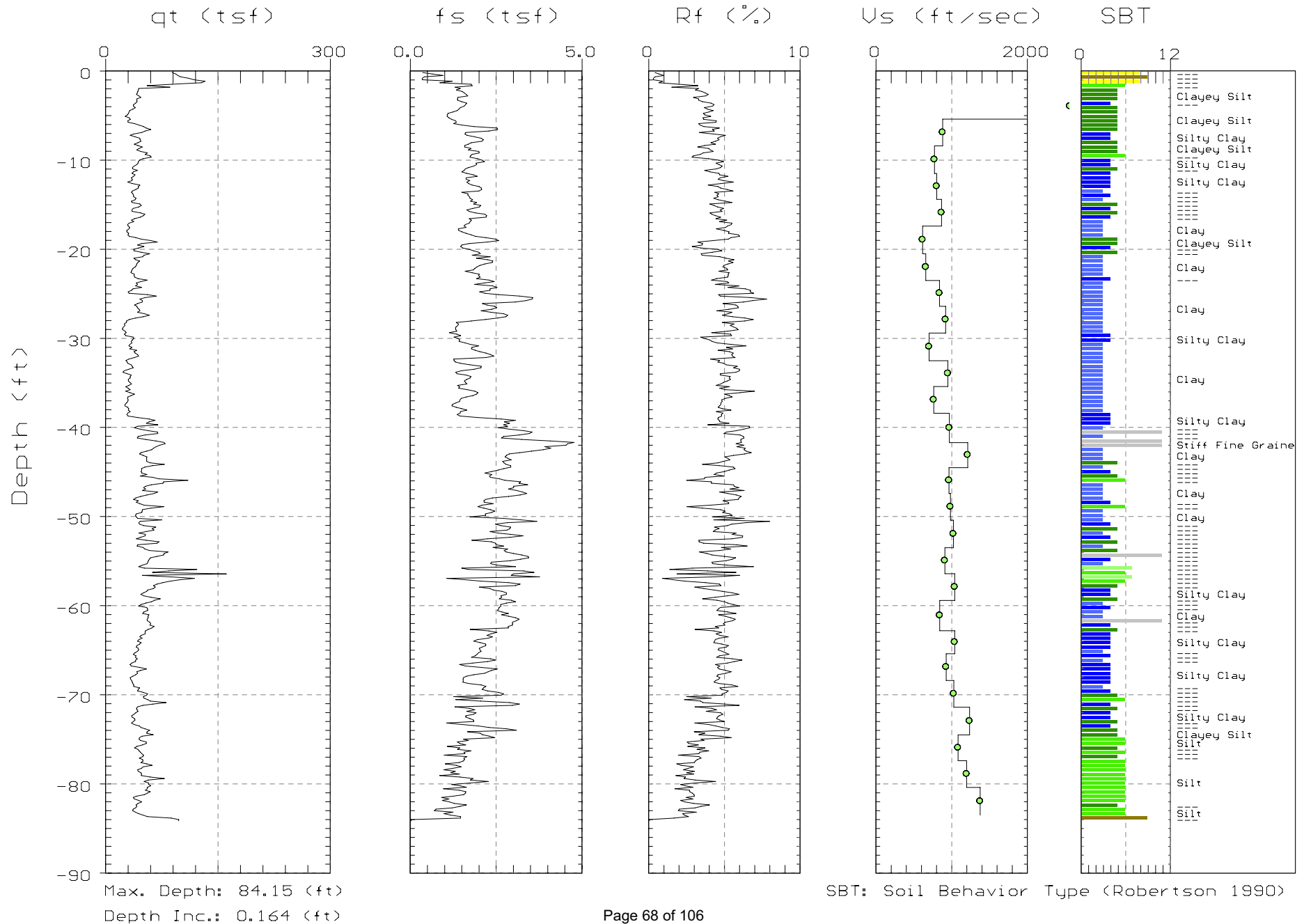


MACTEC

Site: N=1165679.211E=1848305.418 Engineer: C.SAMS

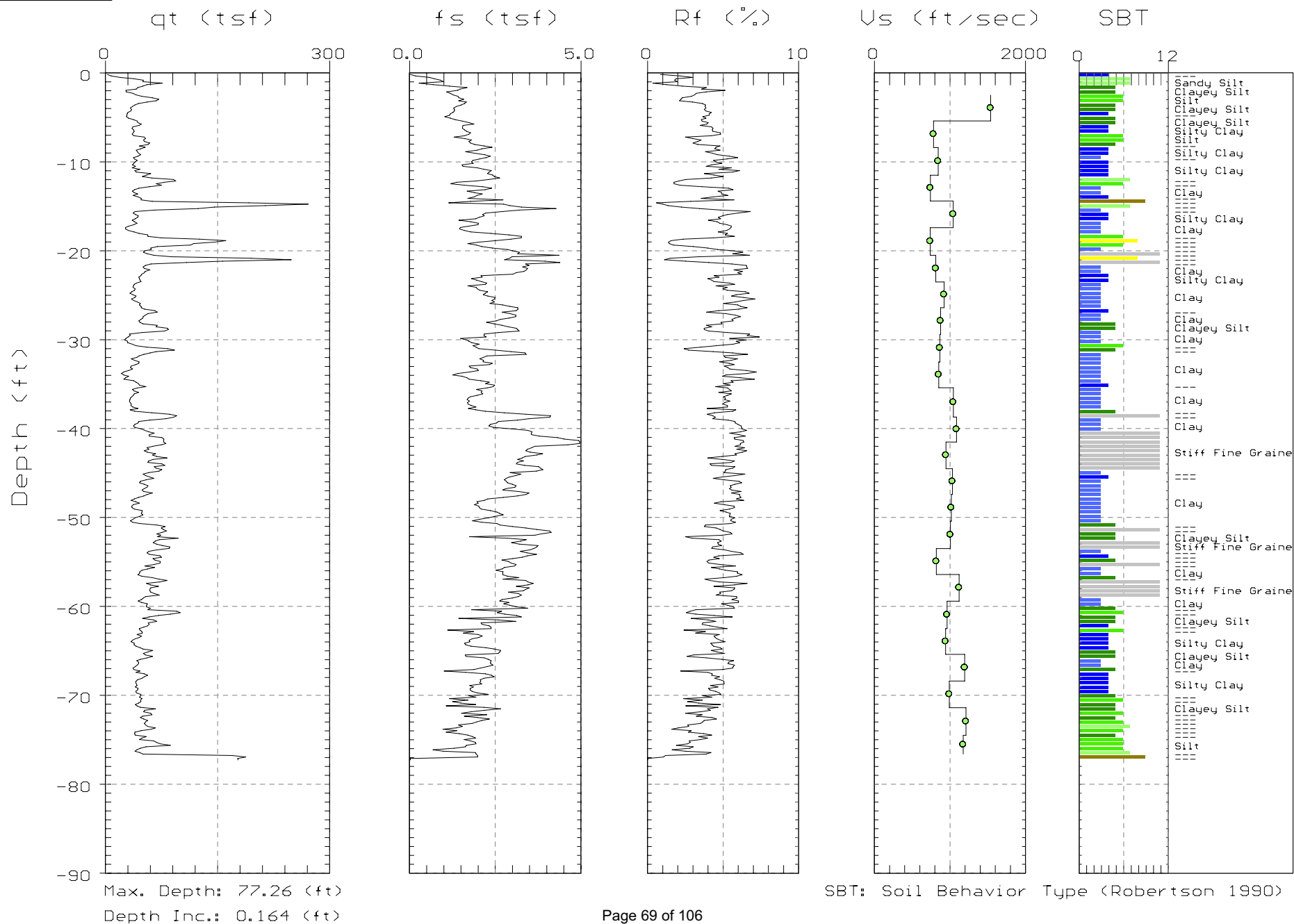
Location: CPT-1323L=610.5

Date: 08/19/06 05:19





Site: N=1165733.296 E=1848334.24 Engineer: C.SAMS
Location: CPT-1324BL=610.2 Date: 08/19/06 09:02



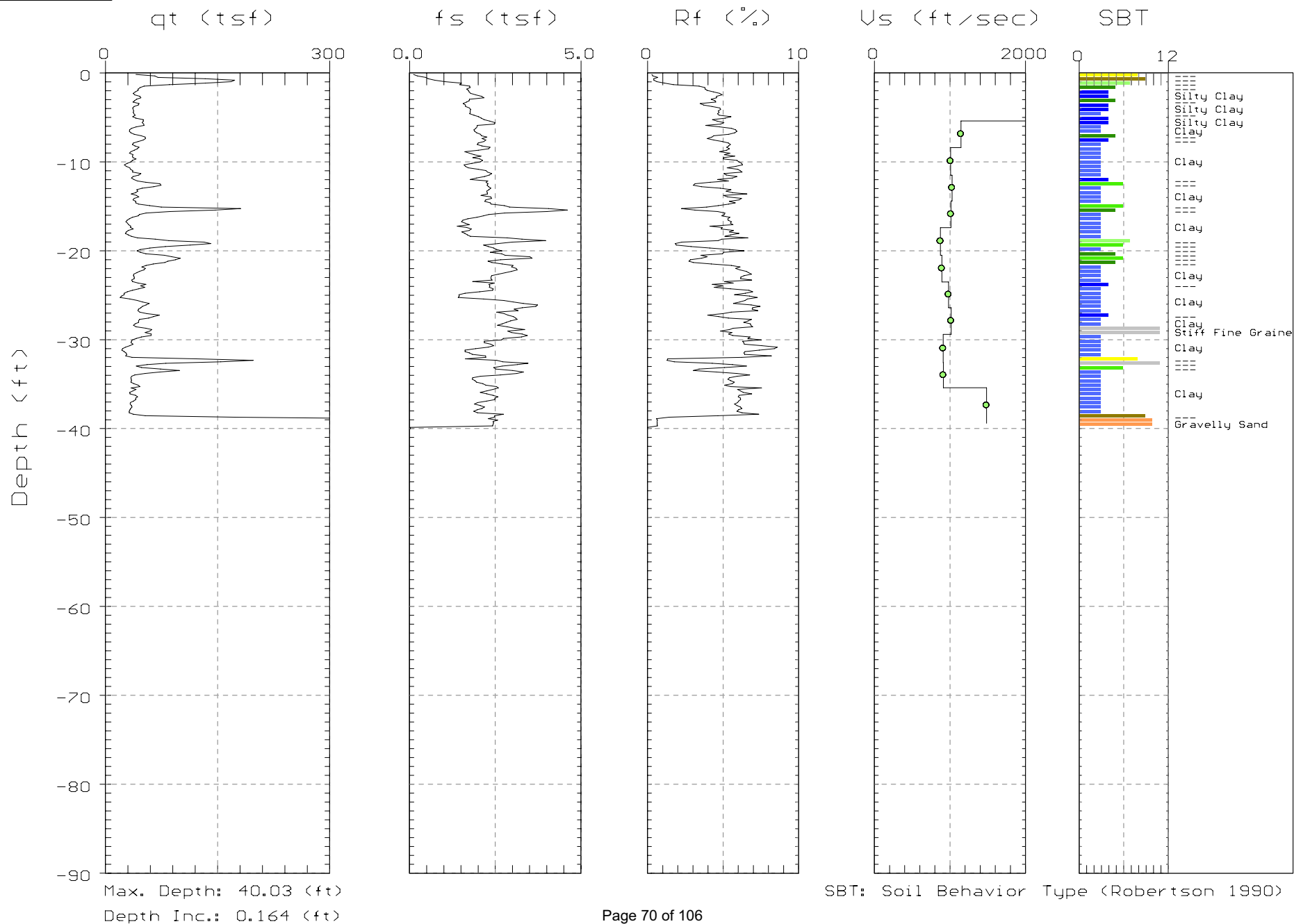


MACTEC

Site: N=1165730.729E=1848273.937 Engineer: C.SAMS

Location: CPT-1325L=610.3

Date: 08/19/06 11:35



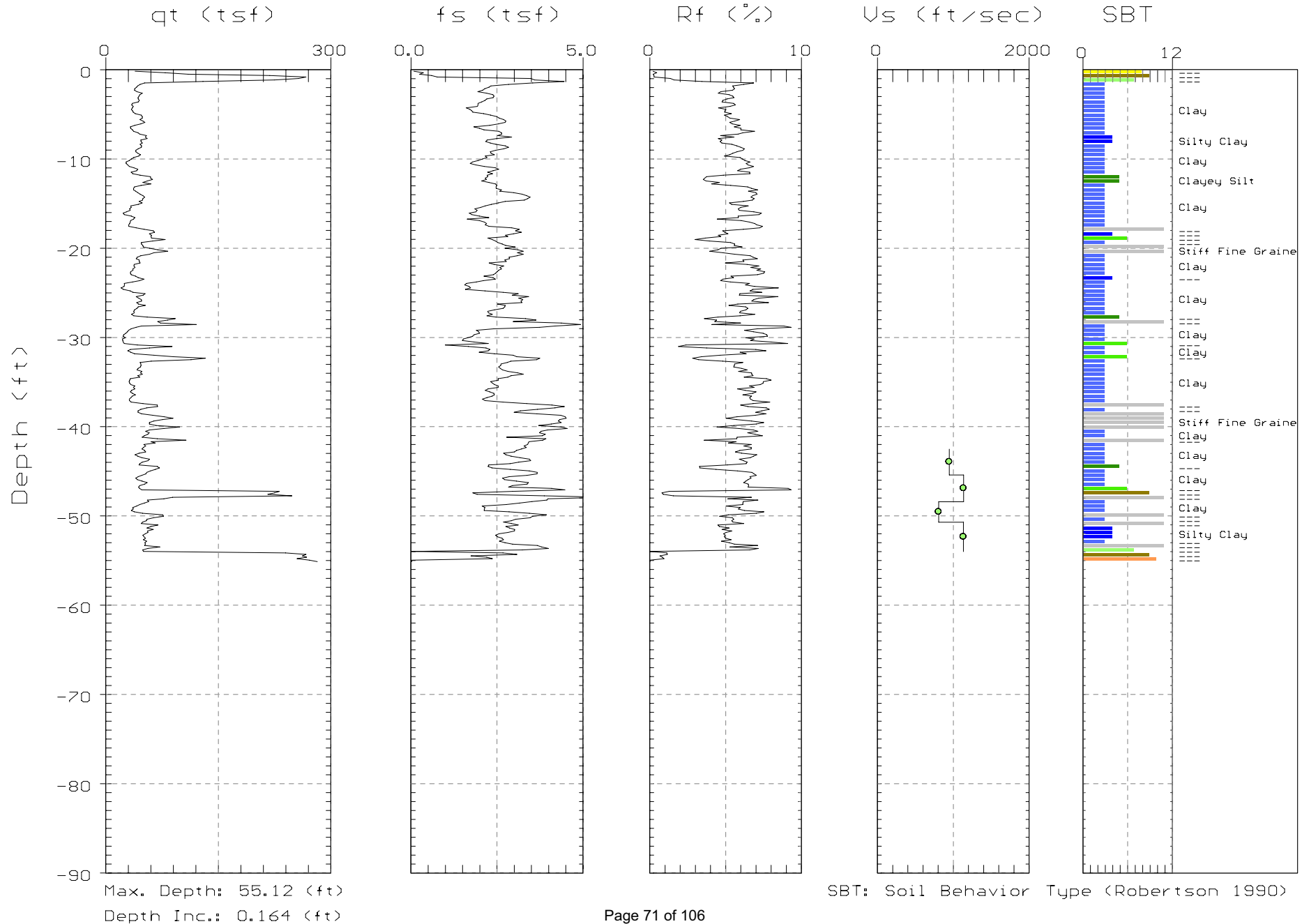


MACTEC

Site: N=1165728.968 E=1848272.952 Engineer: C.SAMS

Location: CPT-1325AL=610.1

Date: 08/19/06 12:39

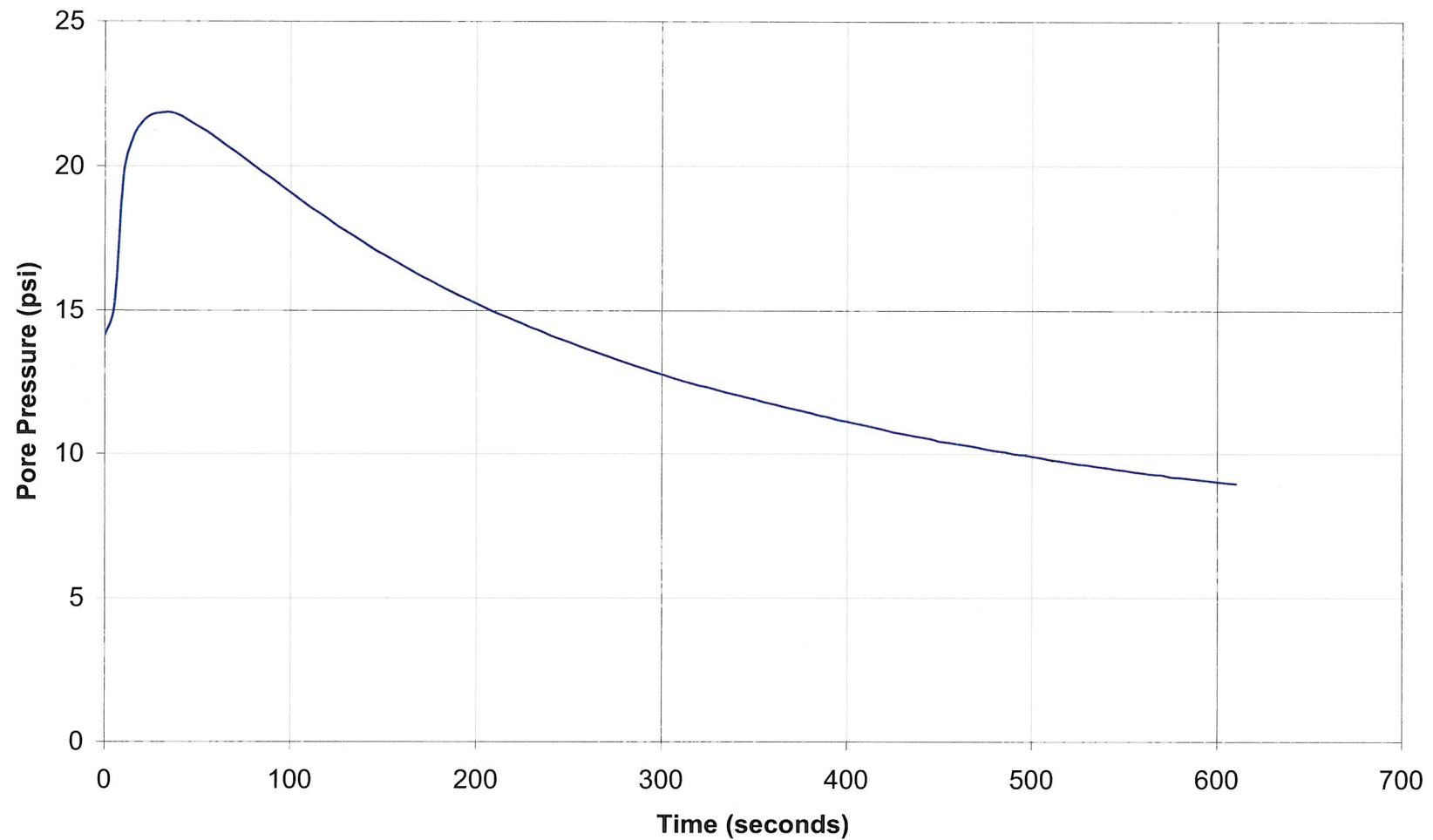




GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

Sounding: cpt-1300
Depth: 18.537
Site: Duke Power
Engineer: C.Sams

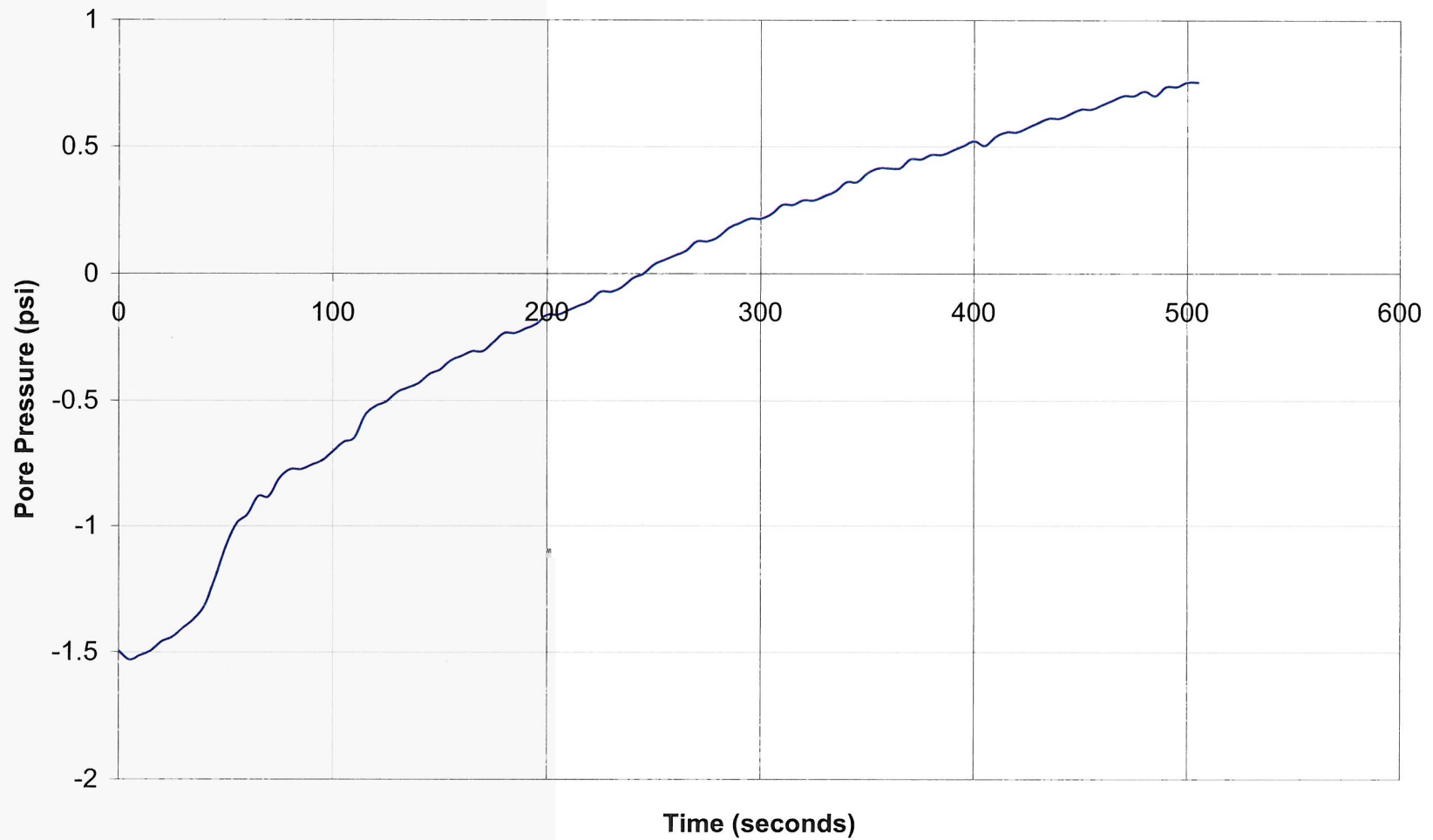




GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

Sounding: cpt-1300
Depth: 30.02
Site: Duke Power
Engineer: C.Sams

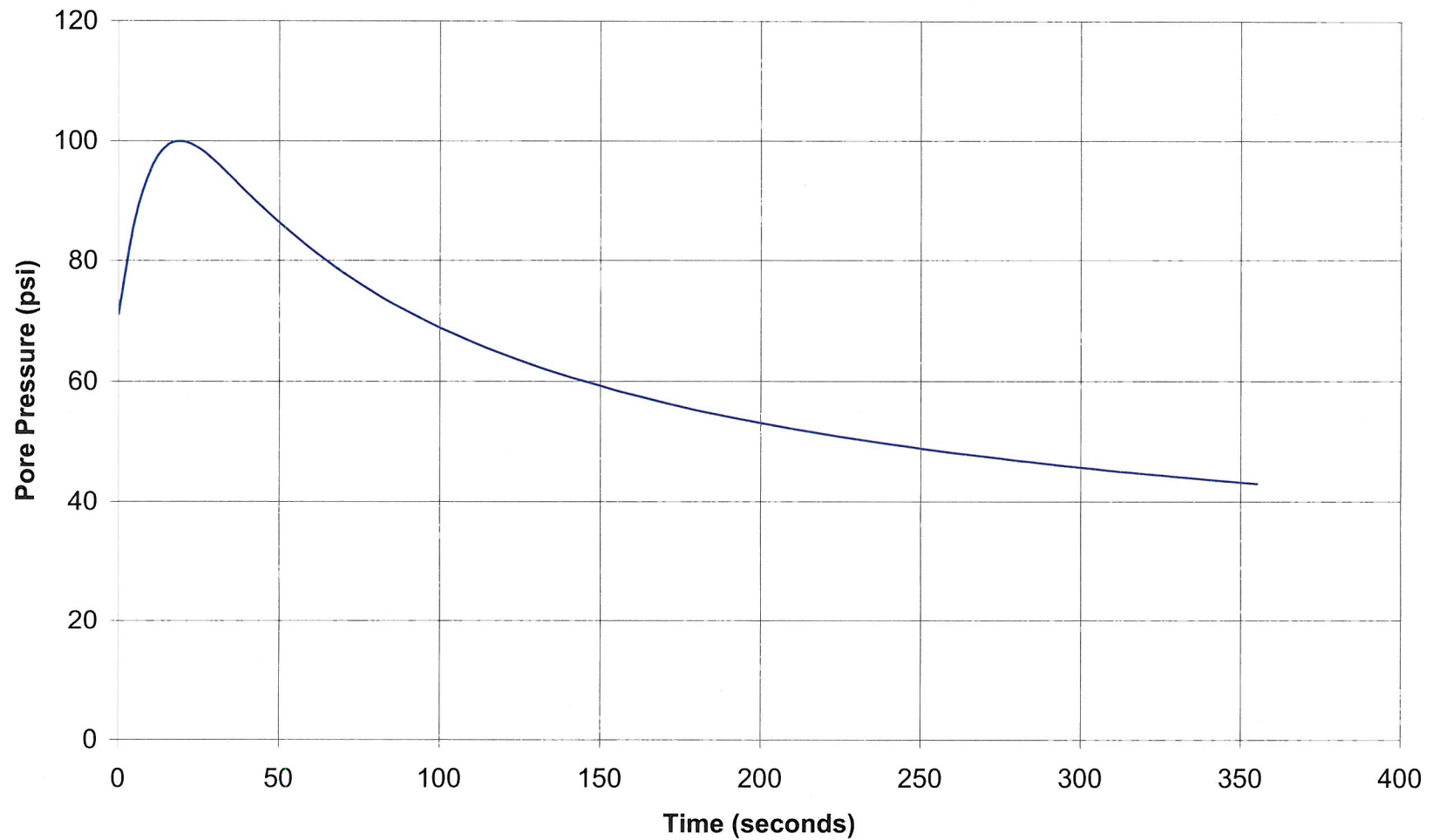




GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

Sounding: cpt-1302
Depth: 34.941
Site: Duke Power
Engineer: C.Sams

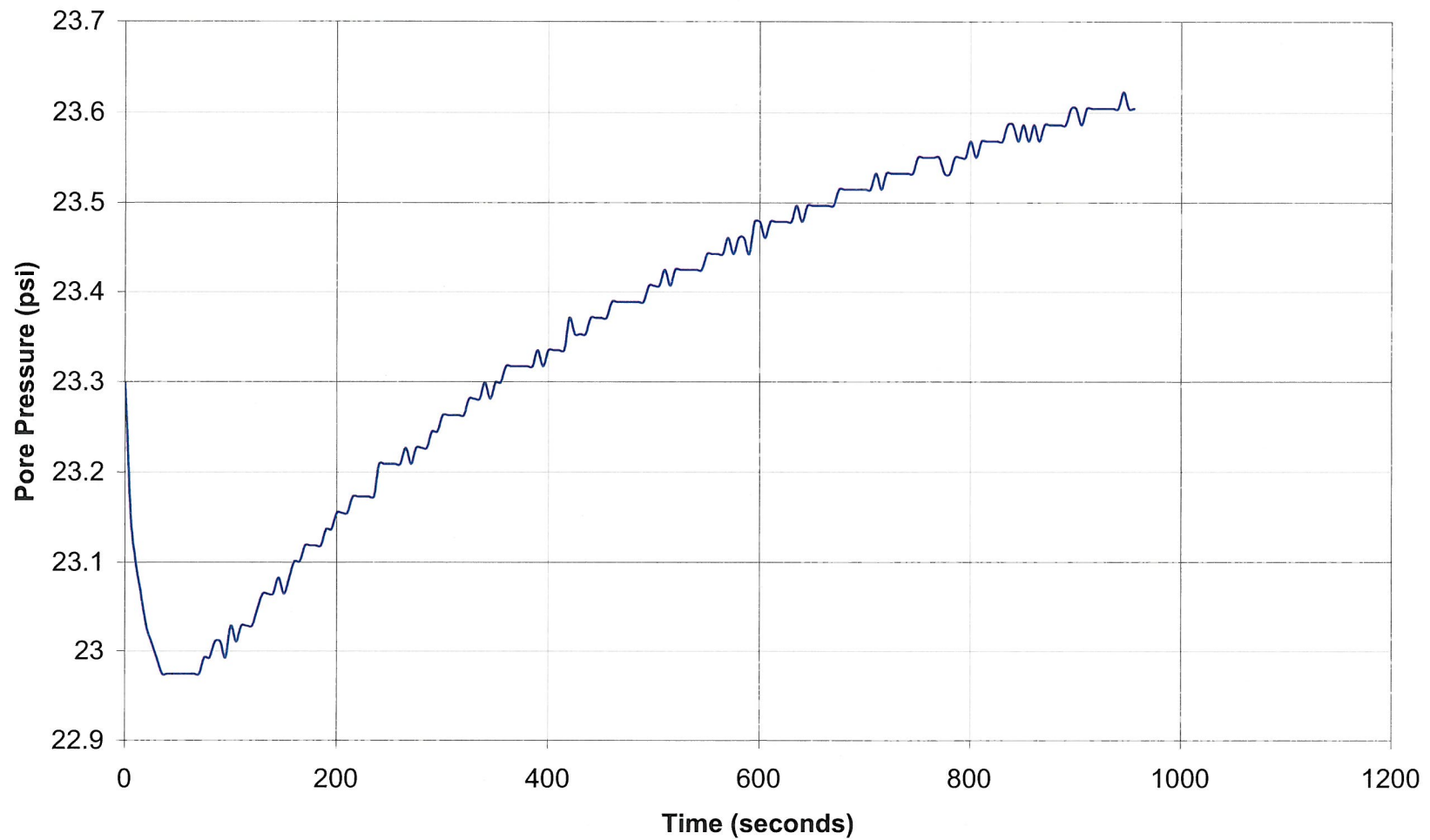




GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

Sounding: cpt-1302
Depth: 80.052
Site: Duke Power
Engineer: C.Sams

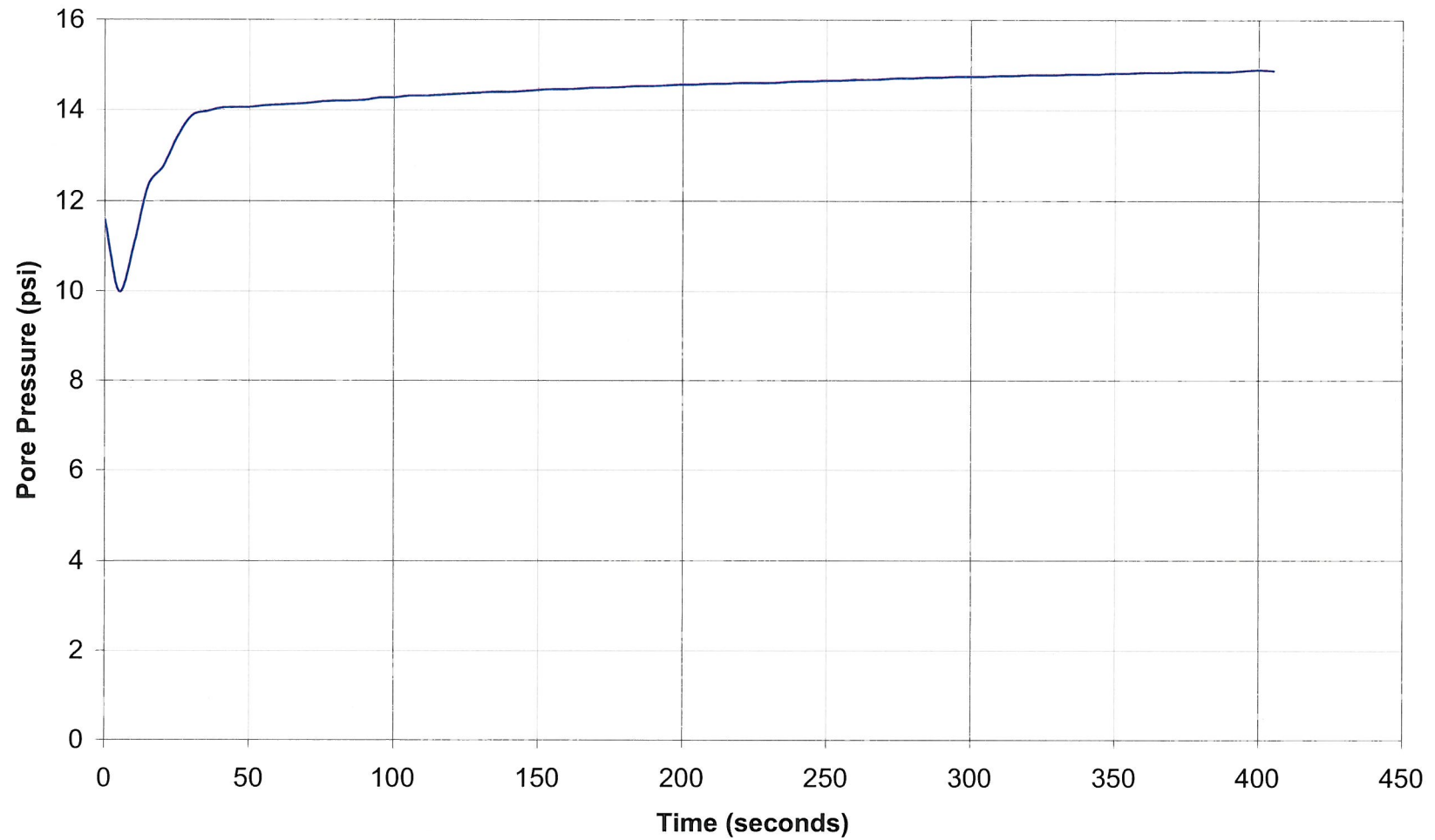




GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

Sounding: cpt-1303
Depth: 65.945
Site: Duke Power
Engineer: C.Sams

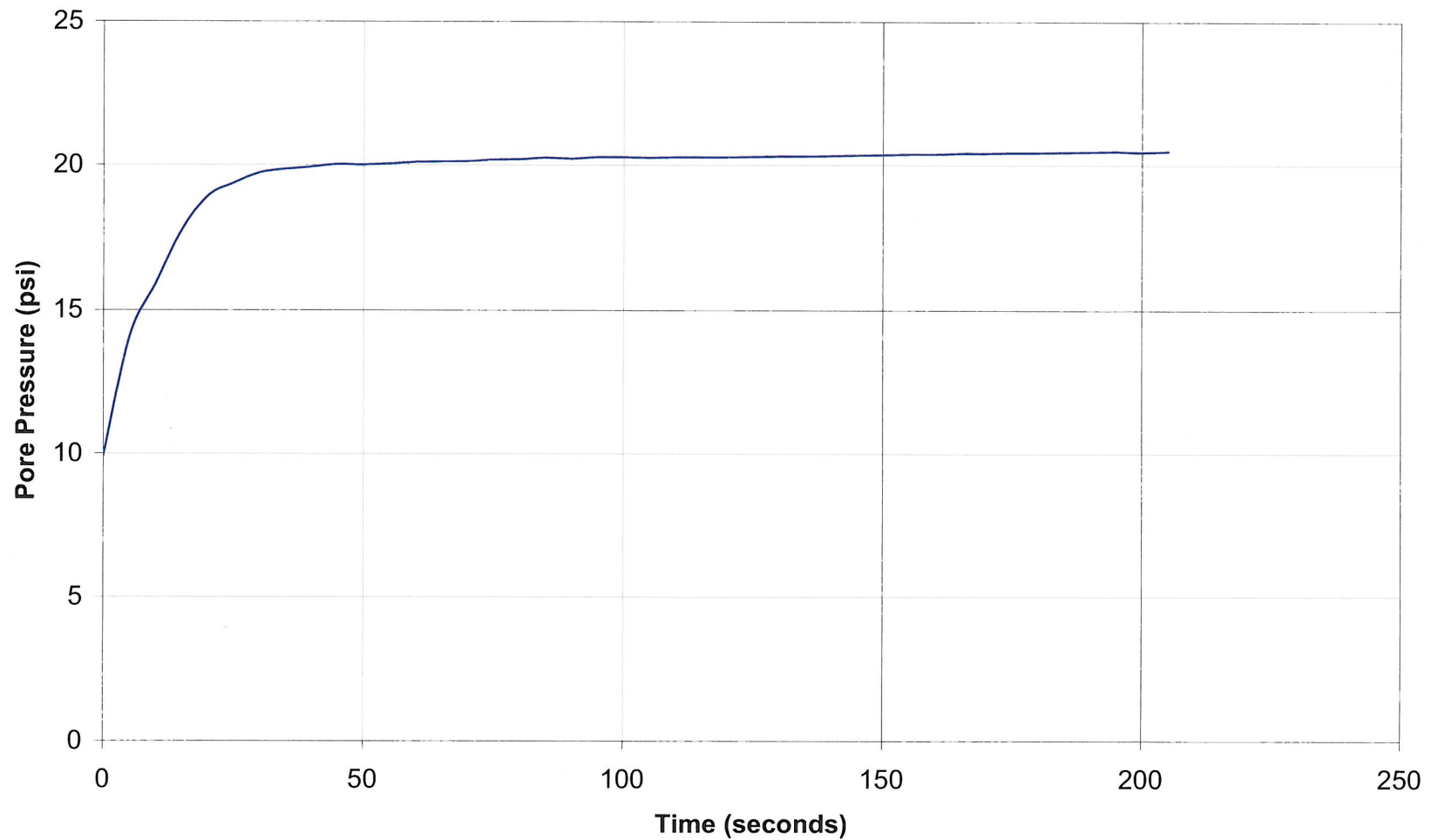




GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

Sounding: cpt-1303
Depth: 80.216
Site: Duke Power
Engineer: C.Sams

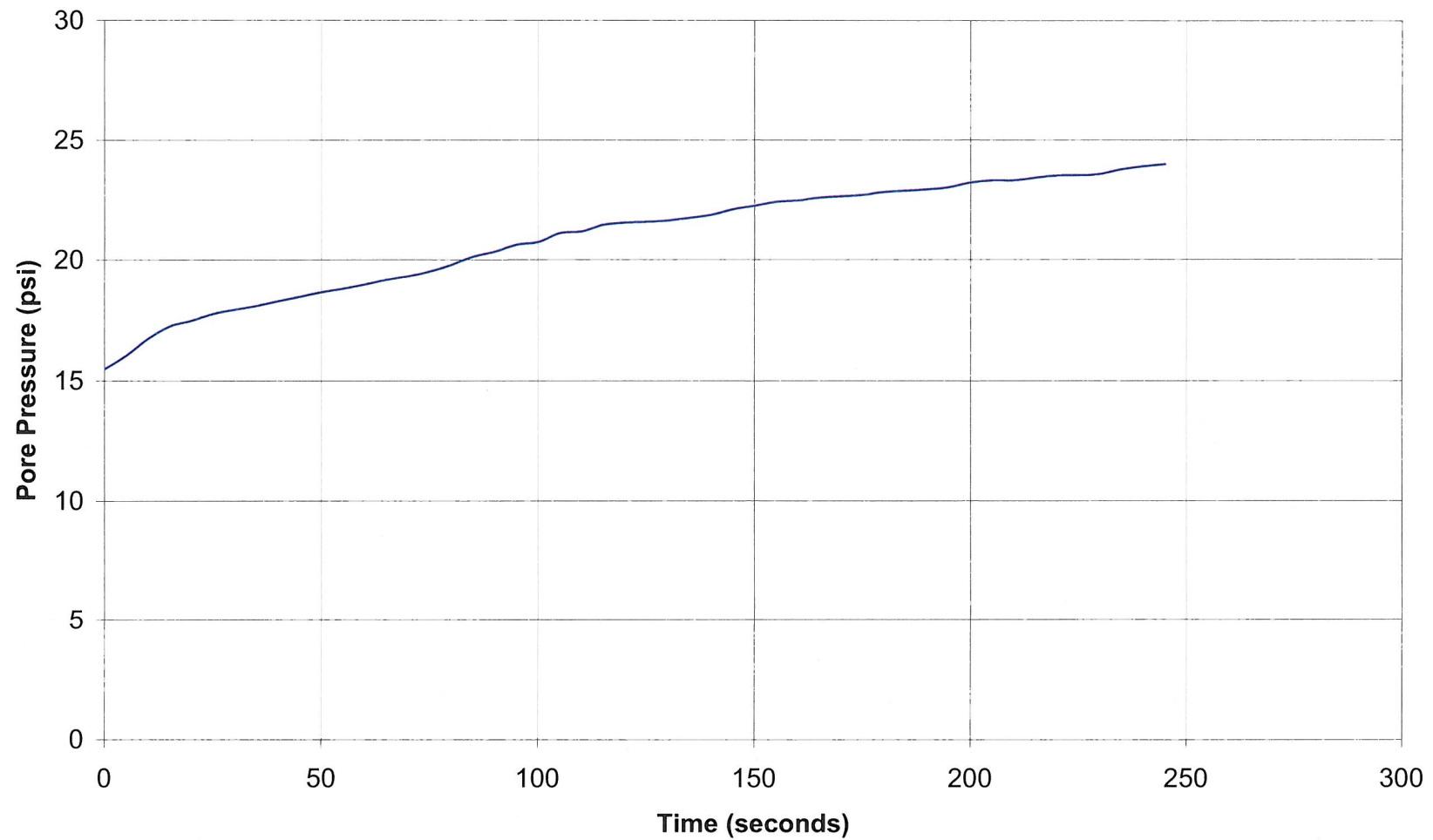




GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

Sounding: cpt-1304
Depth: 73.983
Site: Duke Power
Engineer: C.Sams

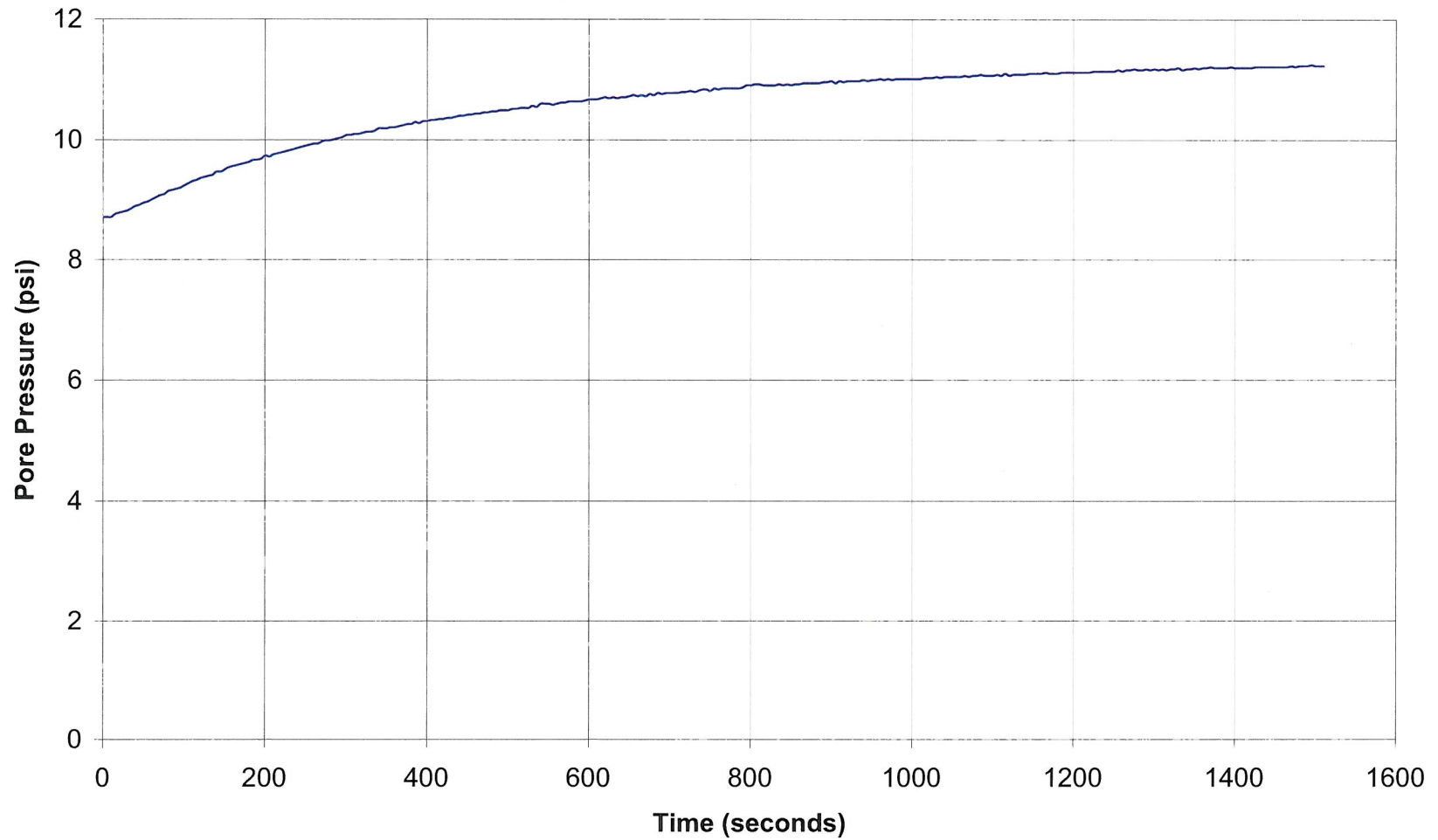




GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

Sounding: cpt-1308a
Depth: 41.174
Site: Duke Power
Engineer: C.Sams

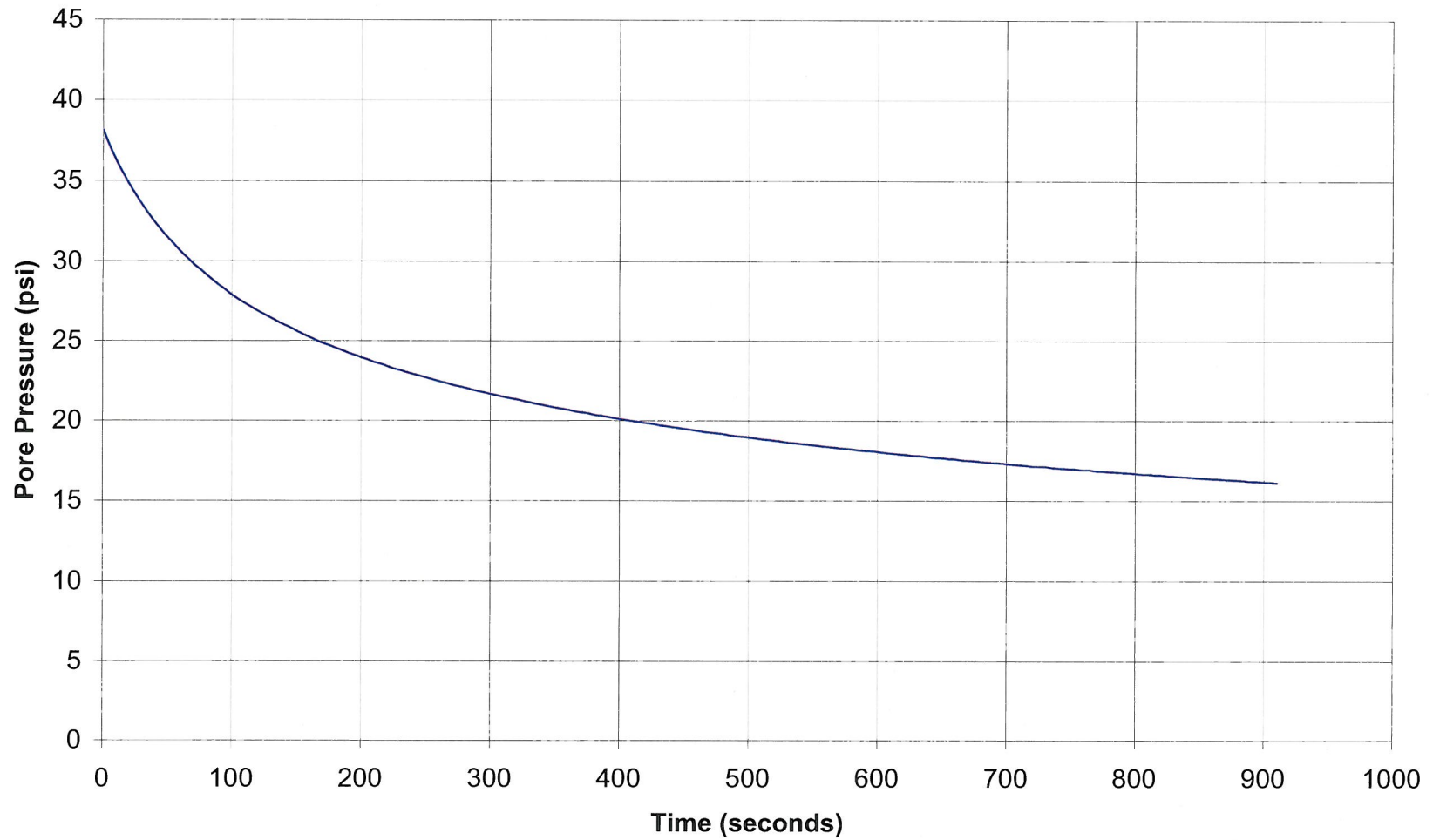




GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

Sounding: cpt-1309
Depth: 60.039
Site: Duke Power
Engineer: C.Sams

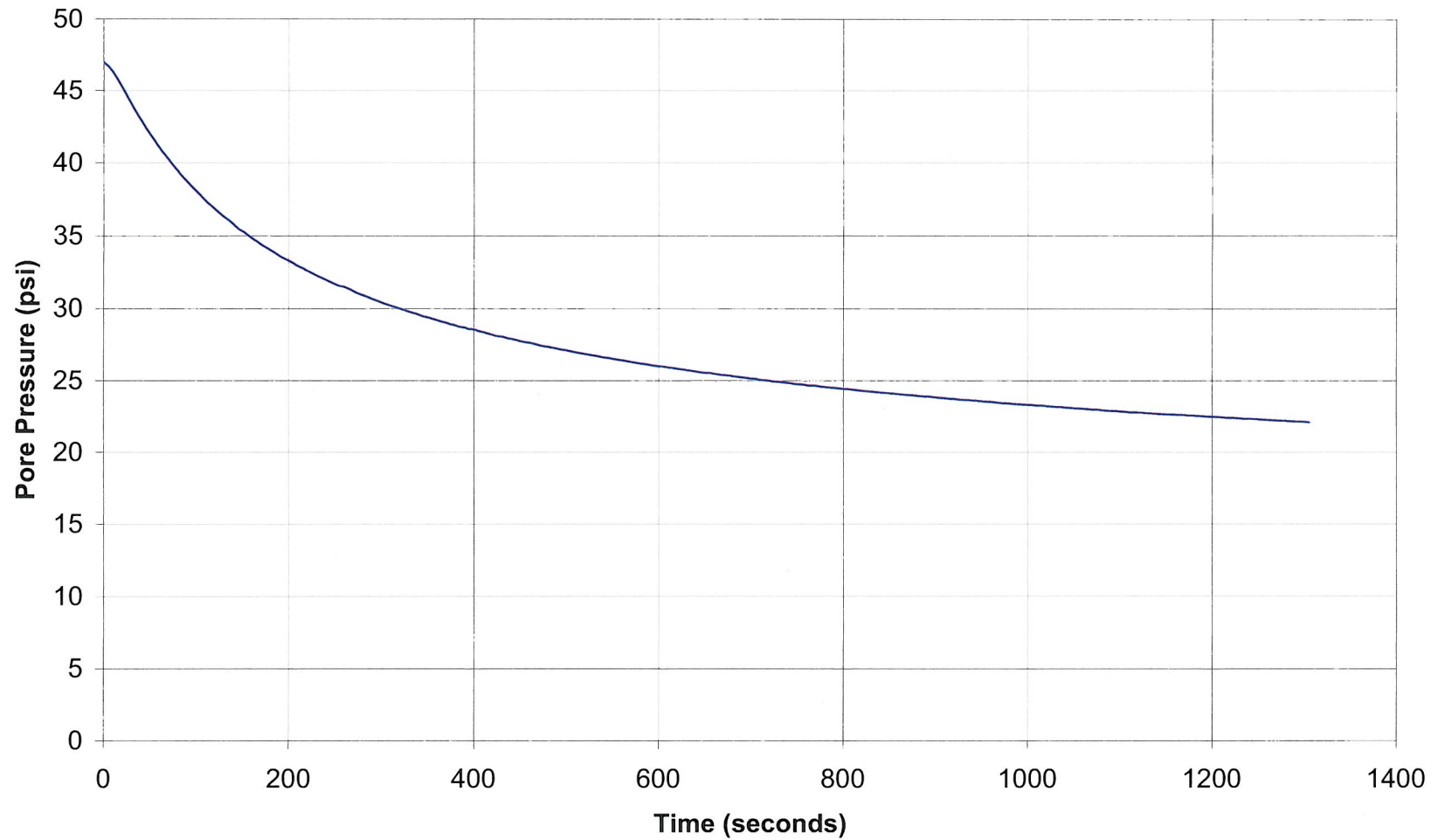




GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

Sounding: cpt-1309
Depth: 85.138
Site: Duke Power
Engineer: C.Sams

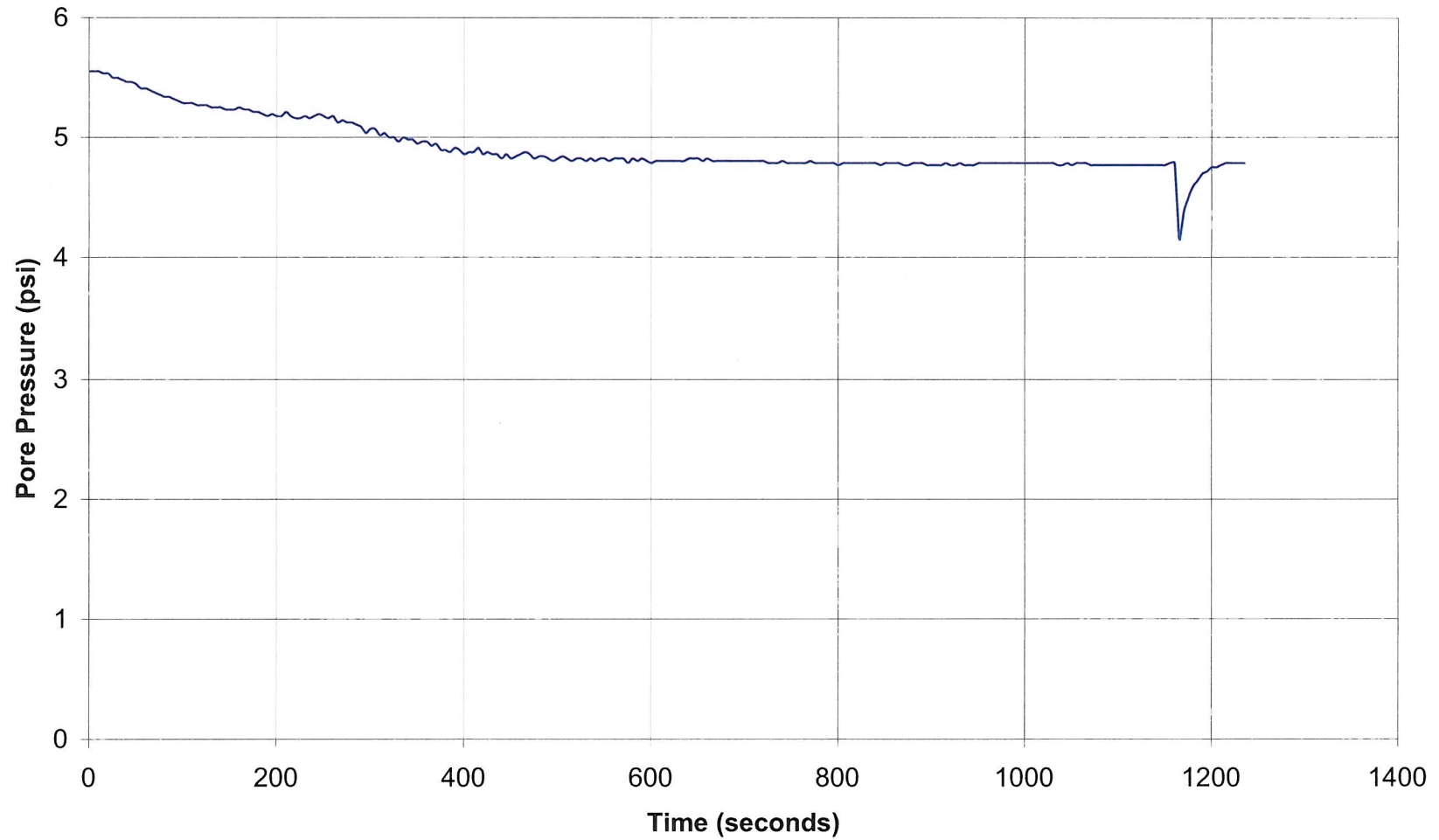




GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

Sounding: cpt-1320
Depth: 32.316
Site: DUKE POWER
Engineer: C.SAMS

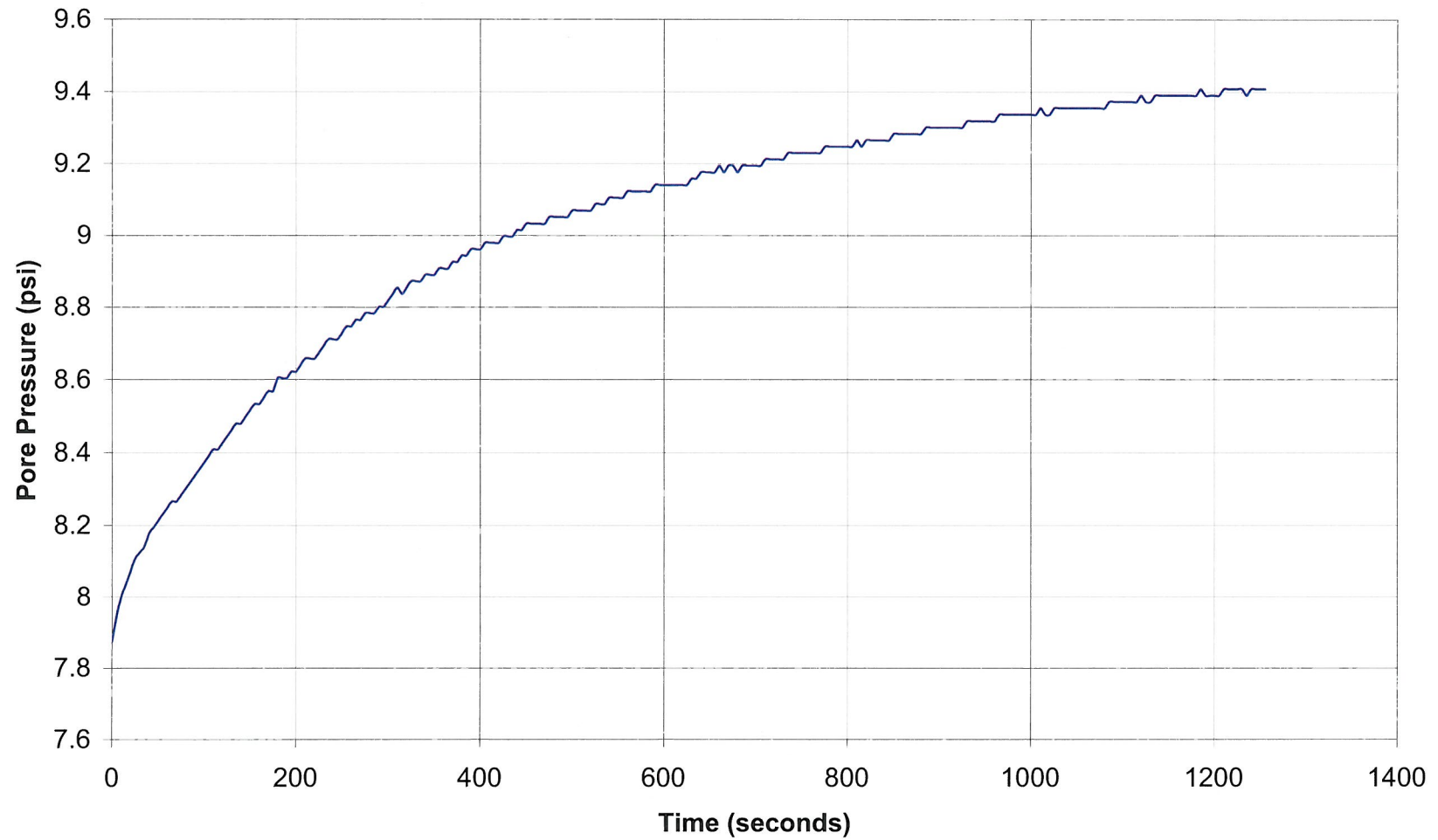




GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

Sounding: cpt-1321
Depth: 43.307
Site: DUKE POWER
Engineer: C.SAMS

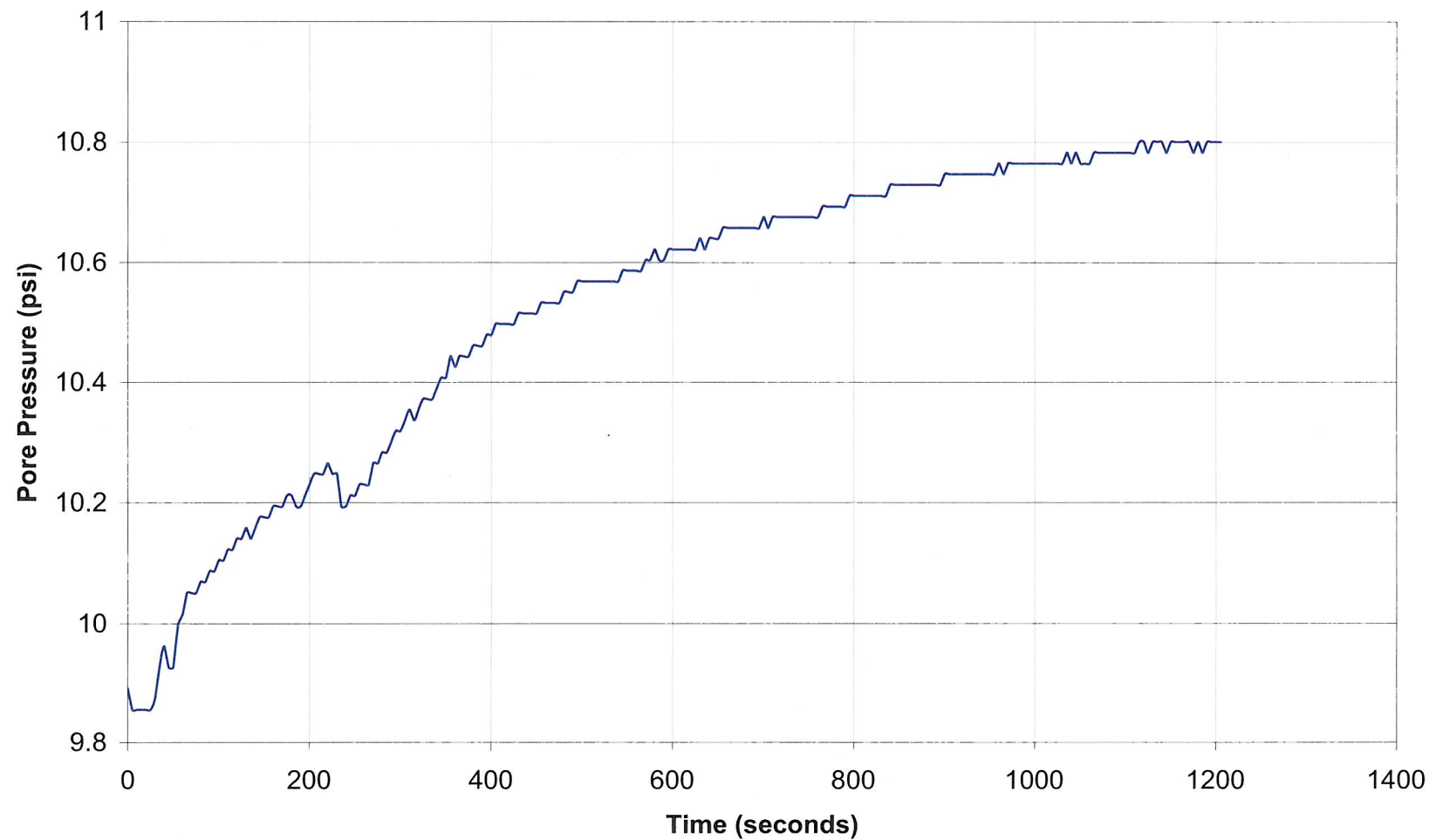




GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

Sounding: cpt-1322
Depth: 48.064
Site: DUKE POWER
Engineer: C.SAMS

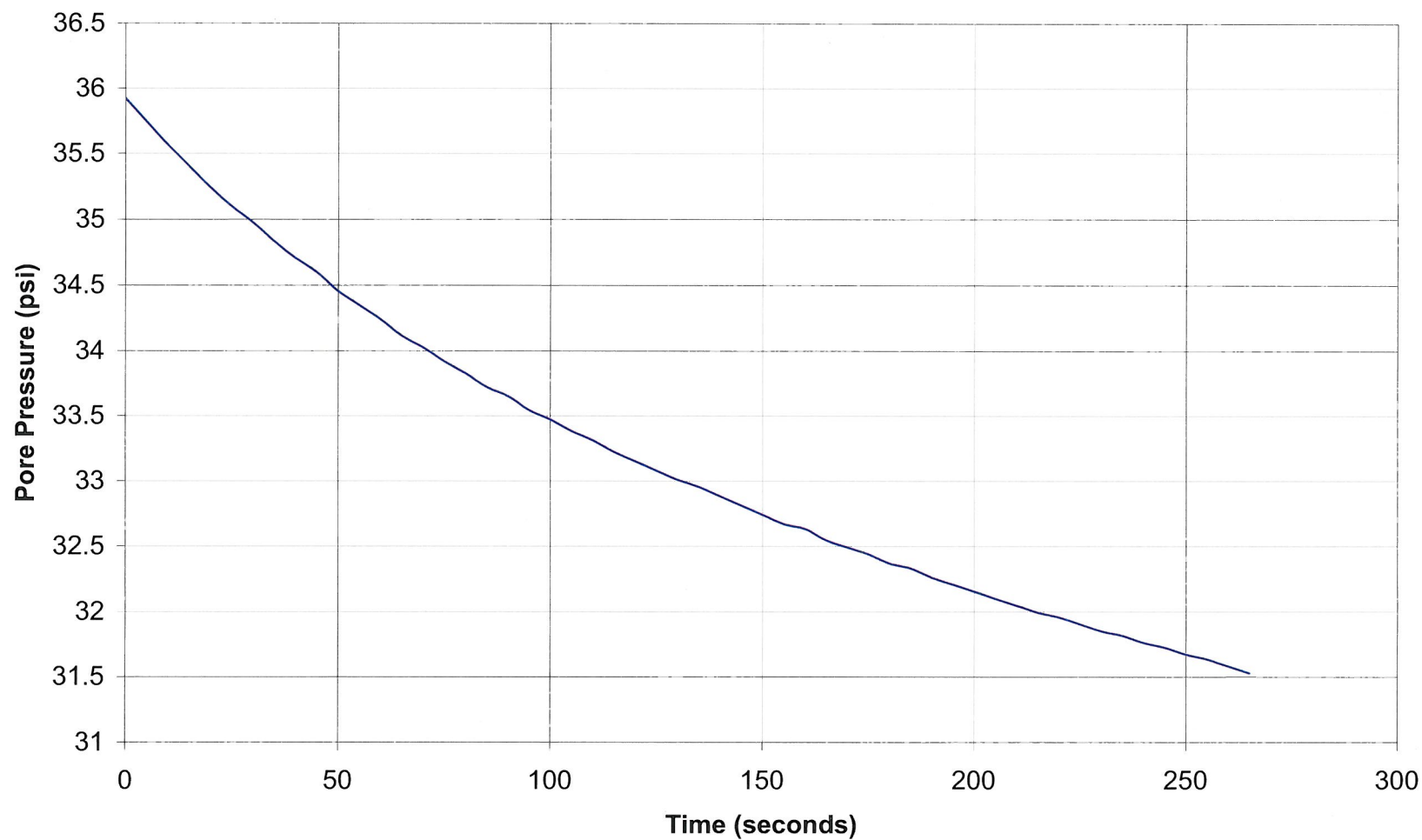




GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

Sounding: cpt-1323
Depth: 81.037
Site: DUKE POWER
Engineer: C.SAMS





GREGG DRILLING & TESTING

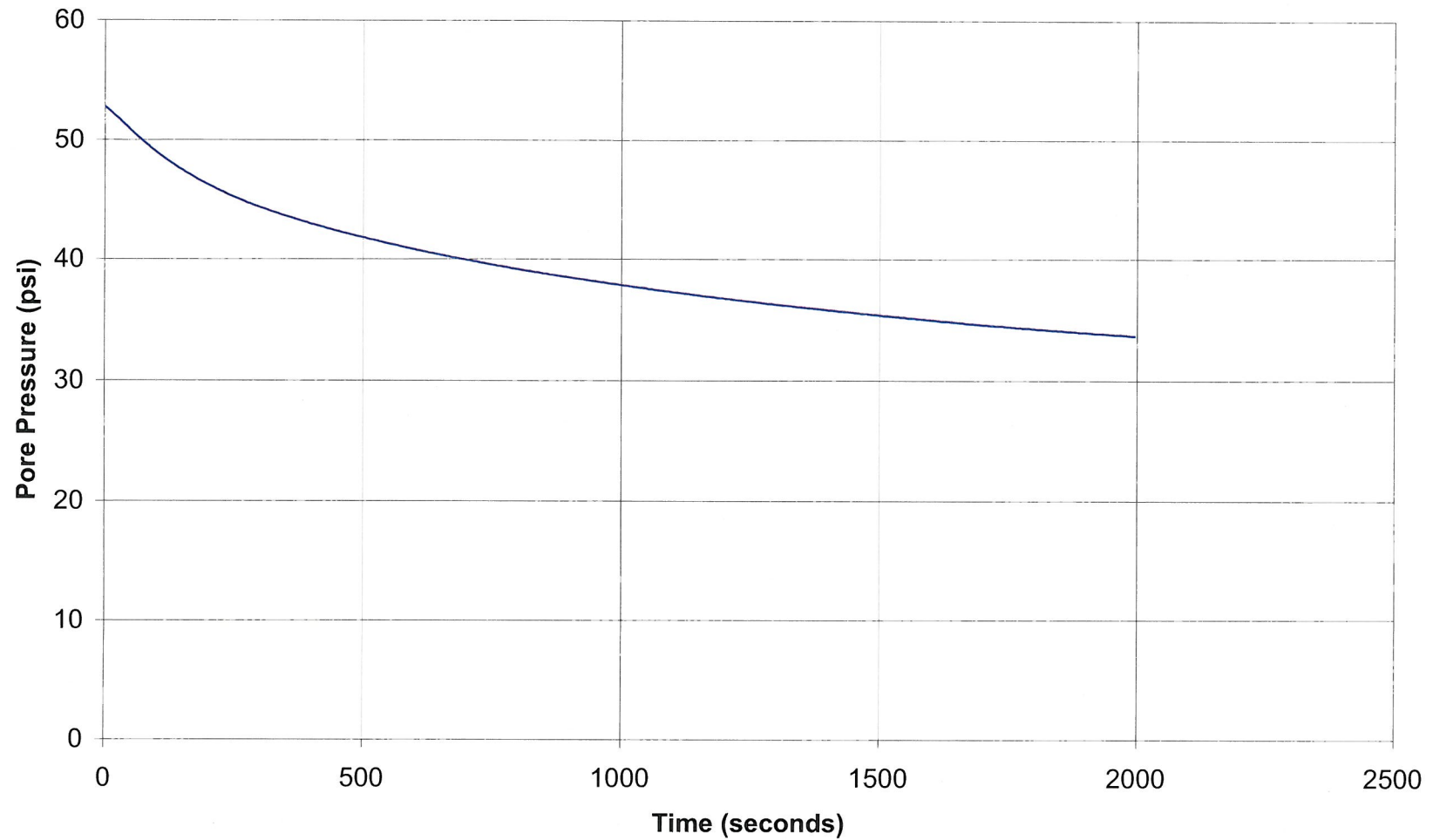
Pore Pressure Dissipation Test

Sounding: cpt-1323

Depth: 84.153

Site: DUKE POWER

Engineer: C.SAMS

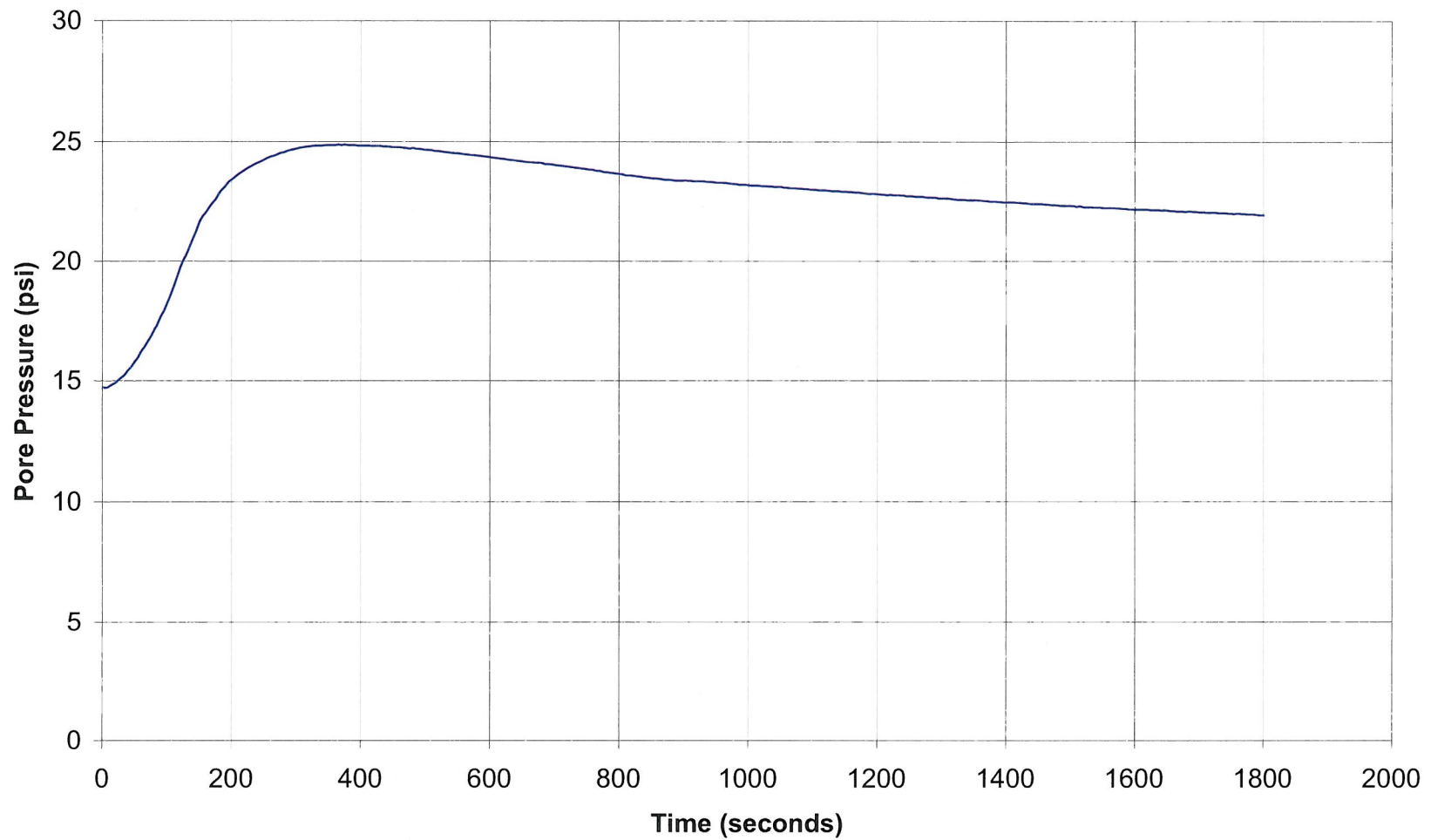




GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

Sounding: cpt-1324b
Depth: 77.264
Site: DUKE POWER
Engineer: C.SAMS

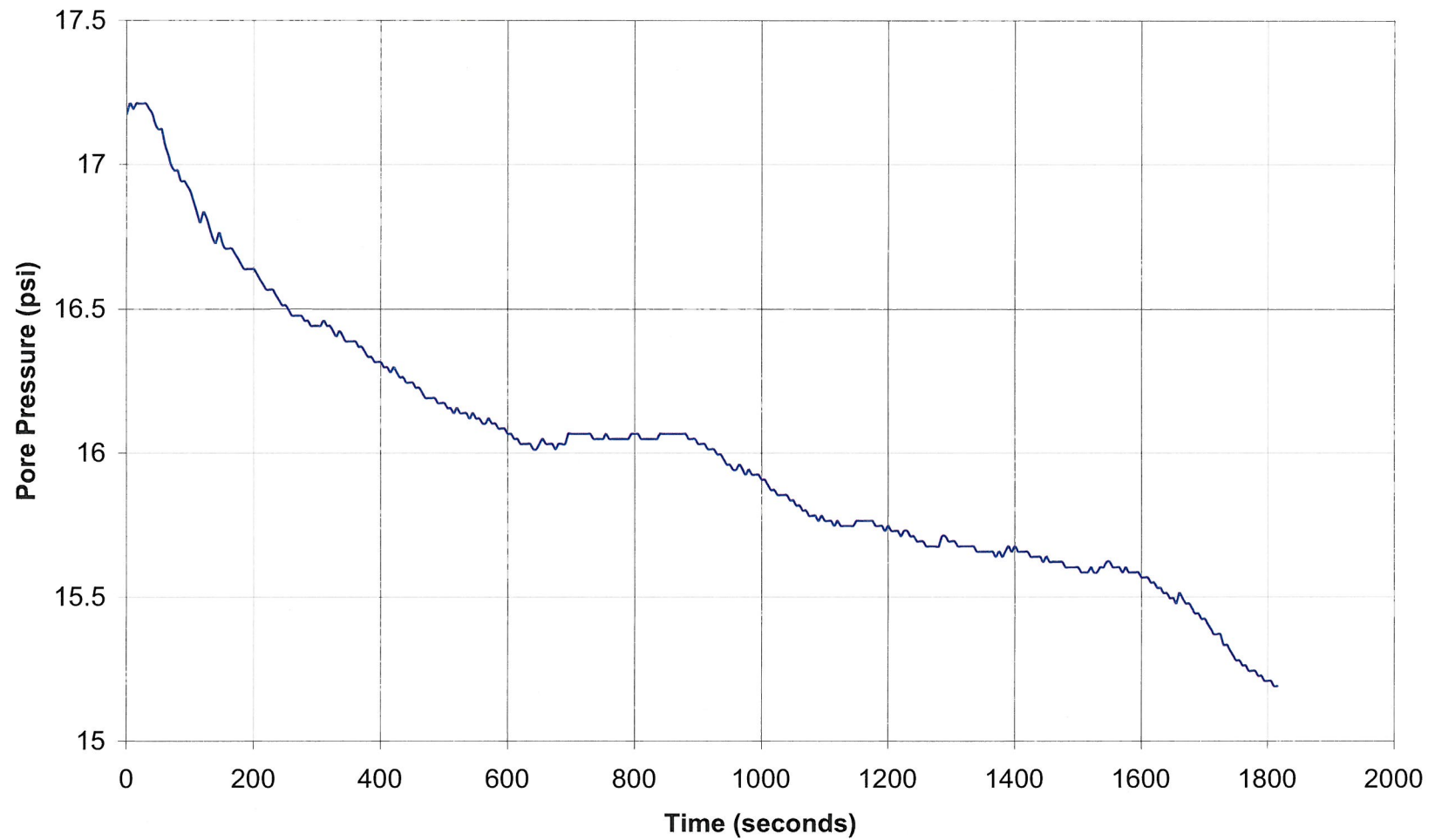




GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

Sounding: cpt-1325a
Depth: 55.118
Site: DUKE POWER
Engineer: C.SAMS





Shear Wave Velocity Calculations

Duke Power/Cherokee

Mactec

Geophone Offset: 0.66 Feet
Source Offset: 9.17 Feet

5/16/2006 06-061sc
CPT-1308b

Test Depth (Feet)	Geophone Depth (Feet)	Waveform Ray Path (Feet)	Incremental Distance (Feet)	Characteristic Arrival Time (ms)	Incremental Time Interval (ms)	Interval Velocity (Ft/Sec)	Interval Depth (Feet)
3.12	2.46	9.49	9.49				
6.07	5.41	10.65	1.15	21.3500			3.93
9.02	8.36	12.41	1.76	22.5000	1.1500	1533.6	6.89
12.14	11.48	14.69	2.28	25.7500	3.2500	702.1	9.92
15.09	14.43	17.10	2.41	28.5000	2.7500	875.1	12.96
19.03	18.37	20.53	3.43	32.2000	3.7000	927.5	16.40
21.16	20.50	22.46	1.93	34.2500	2.0500	940.6	19.44
24.11	23.45	25.18	2.72	37.2500	3.0000	908.1	21.98
27.23	26.57	28.11	2.93	40.5500	3.3000	886.6	25.01
30.02	29.36	30.76	2.65	43.6000	3.0500	868.7	27.97
33.14	32.48	33.75	2.99	47.1000	3.5000	853.7	30.92
36.91	36.25	37.39	3.65	51.0500	3.9500	922.8	34.36



Shear Wave Velocity Calculations

Duke Power/Cherokee

Mactec

Geophone Offset: 0.66 Feet
Source Offset: 9.17 Feet

5/14/2006 06-061sc
CPT-1309

Test Depth (Feet)	Geophone Depth (Feet)	Waveform Ray Path (Feet)	Incremental Distance (Feet)	Characteristic Arrival Time (ms)	Incremental Time Interval (ms)	Interval Velocity (Ft/Sec)	Interval Depth (Feet)
3.12	2.46	9.49	9.49	16.1500			
6.07	5.41	10.65	1.15	17.0000	0.8500	1356.8	3.93
9.02	8.36	12.41	1.76	18.7500	1.7500	1007.8	6.89
12.14	11.48	14.69	2.28	21.4500	2.7000	845.1	9.92
15.09	14.43	17.10	2.41	25.3500	3.9000	617.1	12.96
18.04	17.38	19.65	2.56	27.2500	1.9000	1345.3	15.91
21.16	20.50	22.46	2.80	31.1500	3.9000	718.9	18.94
24.11	23.45	25.18	2.72	33.4500	2.3000	1184.5	21.98
27.07	26.41	27.95	2.77	36.0000	2.5500	1086.6	24.93
30.02	29.36	30.76	2.80	39.2500	3.2500	863.0	27.88
33.14	32.48	33.75	2.99	42.0000	2.7500	1086.5	30.92
36.09	35.43	36.60	2.85	45.7000	3.7000	770.4	33.95
39.04	38.38	39.46	2.87	49.0000	3.3000	868.3	36.91
42.16	41.50	42.50	3.04	52.2000	3.2000	949.3	39.94
45.11	44.45	45.39	2.89	55.2000	3.0000	962.6	42.98
48.06	47.40	48.28	2.90	58.3500	3.1500	919.2	45.93
51.02	50.36	51.19	2.90	60.6500	2.3000	1261.8	48.88
54.13	53.47	54.25	3.07	63.6000	2.9500	1040.4	51.92
57.09	56.43	57.17	2.91	67.2000	3.6000	809.0	54.95
60.04	59.38	60.08	2.92	69.8500	2.6500	1100.5	57.90
63.32	62.66	63.33	3.24	72.3500	2.5000	1297.7	61.02
66.11	65.45	66.09	2.76	74.7500	2.4000	1150.2	64.05
69.06	68.40	69.01	2.93	77.9500	3.2000	914.2	66.93
72.34	71.68	72.27	3.25	81.3500	3.4000	956.8	70.04
75.13	74.47	75.03	2.77	83.7500	2.4000	1152.9	73.08
78.08	77.42	77.96	2.93	86.6000	2.8500	1028.6	75.95
81.04	80.38	80.90	2.93	89.5000	2.9000	1011.4	78.90
84.15	83.49	84.00	3.10	92.2000	2.7000	1147.2	81.93



Shear Wave Velocity Calculations

DUKE POWER/CHEROKEE

MACTEC

Geophone Offset: 0.66 Feet
Source Offset: 9.17 Feet

06-094sc
cpt-1320

Test Depth (Feet)	Geophone Depth (Feet)	Waveform Ray Path (Feet)	Incremental Distance (Feet)	Characteristic Arrival Time (ms)	Incremental Time Interval (ms)	Interval Velocity (Ft/Sec)	Interval Depth (Feet)
3.12	2.46	9.49	9.49	15.9000			
6.07	5.41	10.65	1.15	17.4500	1.5500	744.1	3.93
9.02	8.36	12.41	1.76	19.4000	1.9500	904.4	6.89
12.14	11.48	14.69	2.28	22.8500	3.4500	661.4	9.92
15.09	14.43	17.10	2.41	25.9000	3.0500	789.1	12.96
18.04	17.38	19.65	2.56	29.4000	3.5000	730.3	15.91
21.16	20.50	22.46	2.80	32.1500	2.7500	1019.6	18.94
24.11	23.45	25.18	2.72	36.0000	3.8500	707.6	21.98
27.07	26.41	27.95	2.77	39.7500	3.7500	738.9	24.93
30.02	29.36	30.76	2.80	43.3000	3.5500	790.0	27.88
32.32	31.66	32.96	2.20	45.8000	2.5000	879.7	30.51



Shear Wave Velocity Calculations

DUKE POWER/CHEROKEE

MACTEC

Geophone Offset: 0.66 Feet

Source Offset: 9.17 Feet

06-094sc

cpt-1321

Test Depth (Feet)	Geophone Depth (Feet)	Waveform Ray Path (Feet)	Incremental Distance (Feet)	Characteristic Arrival Time (ms)	Incremental Time Interval (ms)	Interval Velocity (Ft/Sec)	Interval Depth (Feet)
3.12	2.46	9.49	9.49	17.9000			
6.07	5.41	10.65	1.15	18.9500	1.0500	1098.4	3.93
9.02	8.36	12.41	1.76	21.2500	2.3000	766.8	6.89
12.14	11.48	14.69	2.28	23.9000	2.6500	861.0	9.92
15.09	14.43	17.10	2.41	27.6500	3.7500	641.8	12.96
18.04	17.38	19.65	2.56	30.6000	2.9500	866.5	15.91
21.16	20.50	22.46	2.80	34.1500	3.5500	789.8	18.94
24.11	23.45	25.18	2.72	37.8000	3.6500	746.4	21.98
27.23	26.57	28.11	2.93	41.5500	3.7500	780.2	25.01
30.02	29.36	30.76	2.65	45.0500	3.5000	757.0	27.97
33.14	32.48	33.75	2.99	48.8500	3.8000	786.3	30.92
36.09	35.43	36.60	2.85	52.4500	3.6000	791.8	33.95
39.04	38.38	39.46	2.87	55.6500	3.2000	895.5	36.91
42.16	41.50	42.50	3.04	59.2000	3.5500	855.7	39.94
43.31	42.65	43.62	1.12	60.0500	0.8500	1319.9	42.07



Shear Wave Velocity Calculations

DUKE POWER/CHEROKEE

MACTEC

Geophone Offset: 0.66 Feet
Source Offset: 9.17 Feet

06-094sc
cpt-1322

Test Depth (Feet)	Geophone Depth (Feet)	Waveform Ray Path (Feet)	Incremental Distance (Feet)	Characteristic Arrival Time (ms)	Incremental Time Interval (ms)	Interval Velocity (Ft/Sec)	Interval Depth (Feet)
3.12	2.46	9.49	9.49	15.9500			
6.07	5.41	10.65	1.15	17.6000	1.6500	699.0	3.93
9.02	8.36	12.41	1.76	19.6500	2.0500	860.3	6.89
12.14	11.48	14.69	2.28	22.4500	2.8000	814.9	9.92
15.09	14.43	17.10	2.41	25.6500	3.2000	752.1	12.96
18.04	17.38	19.65	2.56	29.0500	3.4000	751.8	15.91
21.16	20.50	22.46	2.80	32.0000	2.9500	950.5	18.94
24.11	23.45	25.18	2.72	35.4000	3.4000	801.3	21.98
27.07	26.41	27.95	2.77	39.0500	3.6500	759.1	24.93
30.02	29.36	30.76	2.80	43.0000	3.9500	710.0	27.88
33.14	32.48	33.75	2.99	46.8500	3.8500	776.1	30.92
36.09	35.43	36.60	2.85	50.4500	3.6000	791.8	33.95
39.21	38.55	39.62	3.03	55.0500	4.6000	657.6	36.99
42.32	41.66	42.66	3.04	59.1000	4.0500	750.2	40.10
45.11	44.45	45.39	2.73	62.1000	3.0000	909.2	43.06
48.06	47.40	48.28	2.90	63.6500	1.5500	1868.1	45.93



Shear Wave Velocity Calculations

DUKE POWER/CHEROKEE

MACTEC

Geophone Offset: 0.66 Feet
Source Offset: 9.17 Feet

06-094sc
cpt-1323

Test Depth (Feet)	Geophone Depth (Feet)	Waveform Ray Path (Feet)	Incremental Distance (Feet)	Characteristic Arrival Time (ms)	Incremental Time Interval (ms)	Interval Velocity (Ft/Sec)	Interval Depth (Feet)
3.12	2.46	9.49	9.49	17.3500			
6.07	5.41	10.65	1.15	17.8000	0.4500	2562.9	3.93
9.02	8.36	12.41	1.76	19.8000	2.0000	881.8	6.89
12.14	11.48	14.69	2.28	22.7500	2.9500	773.5	9.92
15.09	14.43	17.10	2.41	25.7500	3.0000	802.2	12.96
18.04	17.38	19.65	2.56	28.7000	2.9500	866.5	15.91
21.16	20.50	22.46	2.80	33.2500	4.5500	616.2	18.94
24.11	23.45	25.18	2.72	37.4000	4.1500	656.5	21.98
27.07	26.41	27.95	2.77	40.7000	3.3000	839.6	24.93
30.02	29.36	30.76	2.80	43.7500	3.0500	919.5	27.88
33.14	32.48	33.75	2.99	48.0000	4.2500	703.0	30.92
36.09	35.43	36.60	2.85	51.0000	3.0000	950.1	33.95
39.04	38.38	39.46	2.87	54.7500	3.7500	764.1	36.91
42.32	41.66	42.66	3.20	58.0500	3.3000	969.0	40.02
45.11	44.45	45.39	2.73	60.3000	2.2500	1212.2	43.06
48.06	47.40	48.28	2.90	63.3000	3.0000	965.2	45.93
51.02	50.36	51.19	2.90	66.2500	2.9500	983.8	48.88
54.13	53.47	54.25	3.07	69.2500	3.0000	1023.1	51.92
57.09	56.43	57.17	2.91	72.4500	3.2000	910.1	54.95
60.04	59.38	60.08	2.92	75.2500	2.8000	1041.6	57.90
63.48	62.82	63.49	3.41	79.3000	4.0500	841.2	61.10
66.11	65.45	66.09	2.60	81.8000	2.5000	1039.3	64.14
69.06	68.40	69.01	2.93	84.9500	3.1500	928.7	66.93
72.01	71.35	71.94	2.93	87.8000	2.8500	1027.2	69.88
75.13	74.47	75.03	3.09	90.3000	2.5000	1237.0	72.91
78.08	77.42	77.96	2.93	93.0000	2.7000	1085.7	75.95
81.04	80.38	80.90	2.93	95.4500	2.4500	1197.1	78.90
84.15	83.49	84.00	3.10	97.7000	2.2500	1376.6	81.93



Shear Wave Velocity Calculations

DUKE POWER/CHEROKEE

MACTEC

Geophone Offset: 0.66 Feet
Source Offset: 9.17 Feet

06-094sc
cpt-1324b

Test Depth (Feet)	Geophone Depth (Feet)	Waveform Ray Path (Feet)	Incremental Distance (Feet)	Characteristic Arrival Time (ms)	Incremental Time Interval (ms)	Interval Velocity (Ft/Sec)	Interval Depth (Feet)
3.12	2.46	9.49	9.49	17.4500			
6.07	5.41	10.65	1.15	18.2000	0.7500	1537.7	3.93
9.02	8.36	12.41	1.76	20.4500	2.2500	783.8	6.89
12.14	11.48	14.69	2.28	23.1500	2.7000	845.1	9.92
15.09	14.43	17.10	2.41	26.4000	3.2500	740.5	12.96
18.04	17.38	19.65	2.56	28.8500	2.4500	1043.3	15.91
21.16	20.50	22.46	2.80	32.6500	3.8000	737.9	18.94
24.11	23.45	25.18	2.72	36.0000	3.3500	813.2	21.98
27.07	26.41	27.95	2.77	39.0000	3.0000	923.6	24.93
30.02	29.36	30.76	2.80	42.2000	3.2000	876.4	27.88
33.14	32.48	33.75	2.99	45.6500	3.4500	866.0	30.92
36.09	35.43	36.60	2.85	49.0000	3.3500	850.9	33.95
39.37	38.71	39.78	3.18	52.0500	3.0500	1044.2	37.07
42.16	41.50	42.50	2.72	54.5500	2.5000	1087.4	40.10
45.11	44.45	45.39	2.89	57.6000	3.0500	946.8	42.98
48.06	47.40	48.28	2.90	60.4000	2.8000	1034.1	45.93
51.02	50.36	51.19	2.90	63.2500	2.8500	1018.3	48.88
54.13	53.47	54.25	3.07	66.3000	3.0500	1006.3	51.92
57.09	56.43	57.17	2.91	69.8500	3.5500	820.4	54.95
60.04	59.38	60.08	2.92	72.4500	2.6000	1121.7	57.90
63.16	62.50	63.17	3.08	75.6500	3.2000	963.1	60.94
66.11	65.45	66.09	2.92	78.7500	3.1000	942.9	63.97
69.06	68.40	69.01	2.93	81.2000	2.4500	1194.0	66.93
72.01	71.35	71.94	2.93	84.1500	2.9500	992.4	69.88
75.13	74.47	75.03	3.09	86.7000	2.5500	1212.7	72.91
77.26	76.60	77.15	2.12	88.5000	1.8000	1176.1	75.54



Shear Wave Velocity Calculations

DUKE POWER/CHEROKEE

MACTEC

Geophone Offset: 0.66 Feet
Source Offset: 1.67 Feet

06-094sc
cpt-1325

Test Depth (Feet)	Geophone Depth (Feet)	Waveform Ray Path (Feet)	Incremental Distance (Feet)	Characteristic Arrival Time (ms)	Incremental Time Interval (ms)	Interval Velocity (Ft/Sec)	Interval Depth (Feet)
3.12	2.46	2.97	2.97	15.8500			
6.07	5.41	5.66	2.69	16.7500	0.9000	2989.8	3.93
9.02	8.36	8.53	2.87	19.2500	2.5000	1146.4	6.89
12.14	11.48	11.60	3.07	22.3000	3.0500	1007.4	9.92
15.09	14.43	14.53	2.93	25.1500	2.8500	1027.4	12.96
18.04	17.38	17.46	2.94	28.0500	2.9000	1012.6	15.91
21.16	20.50	20.57	3.10	31.6000	3.5500	874.6	18.94
24.11	23.45	23.51	2.94	34.9000	3.3000	892.2	21.98
27.07	26.41	26.46	2.95	37.9000	3.0000	982.0	24.93
30.02	29.36	29.41	2.95	40.8000	2.9000	1016.4	27.88
33.30	32.64	32.68	3.28	44.4000	3.6000	910.0	31.00
36.09	35.43	35.47	2.79	47.4500	3.0500	913.2	34.03
40.03	39.37	39.40	3.93	50.1000	2.6500	1484.2	37.40



Shear Wave Velocity Calculations

DUKE POWER/CHEROKEE

MACTEC

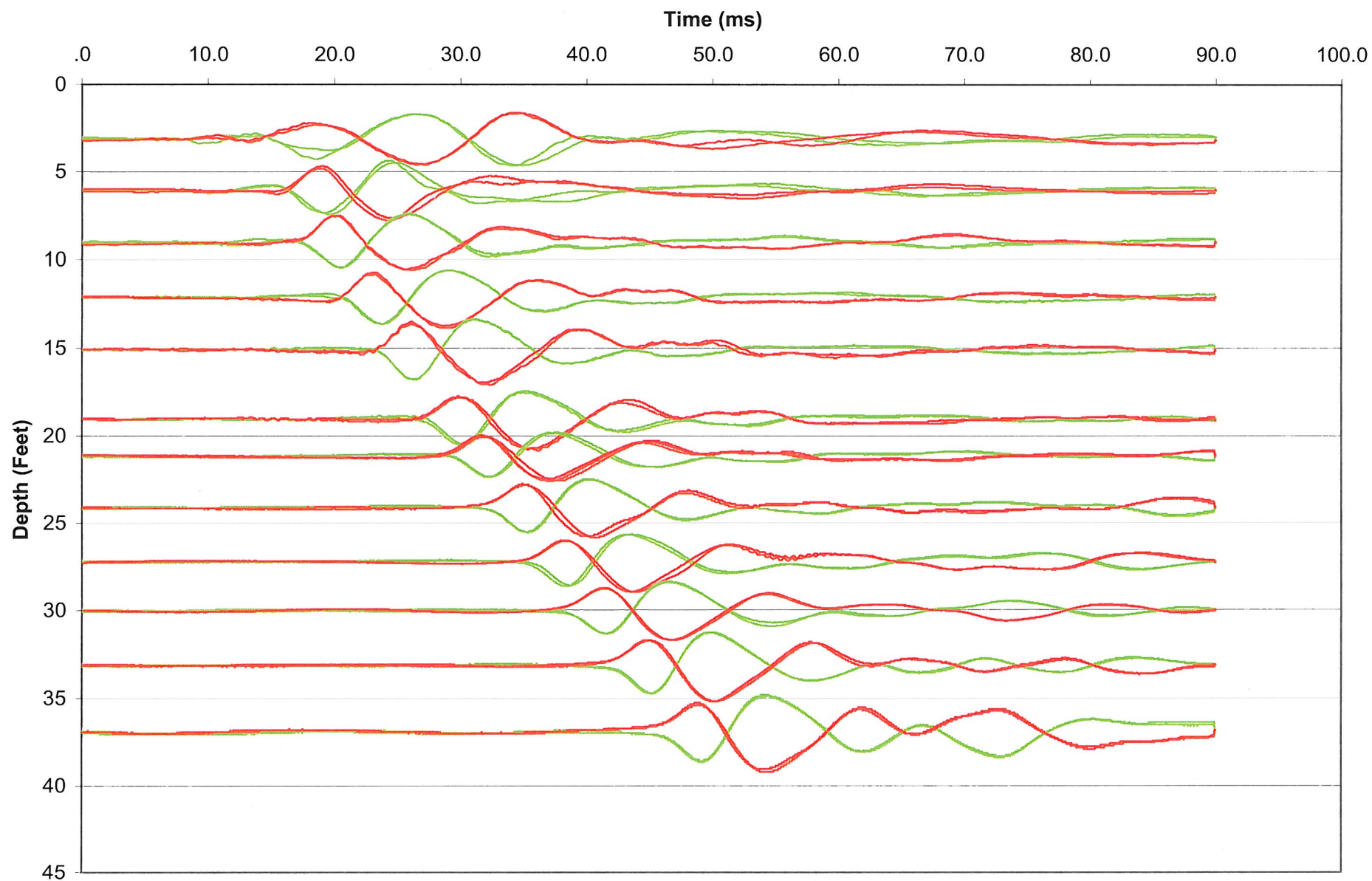
Geophone Offset: 0.66 Feet
Source Offset: 9.17 Feet

06-094sc
cpt-1325a

Test Depth (Feet)	Geophone Depth (Feet)	Waveform Ray Path (Feet)	Incremental Distance (Feet)	Characteristic Arrival Time (ms)	Incremental Time Interval (ms)	Interval Velocity (Ft/Sec)	Interval Depth (Feet)
43.14	42.48	43.46	43.46	56.3000			
46.10	45.44	46.35	2.89	59.3500	3.0500	947.7	43.96
49.05	48.39	49.25	2.90	61.9000	2.5500	1136.4	46.91
51.34	50.68	51.51	2.26	64.7000	2.8000	806.5	49.54
54.63	53.97	54.74	3.23	67.5500	2.8500	1133.9	52.33
55.12	54.46	55.22	0.49				54.21

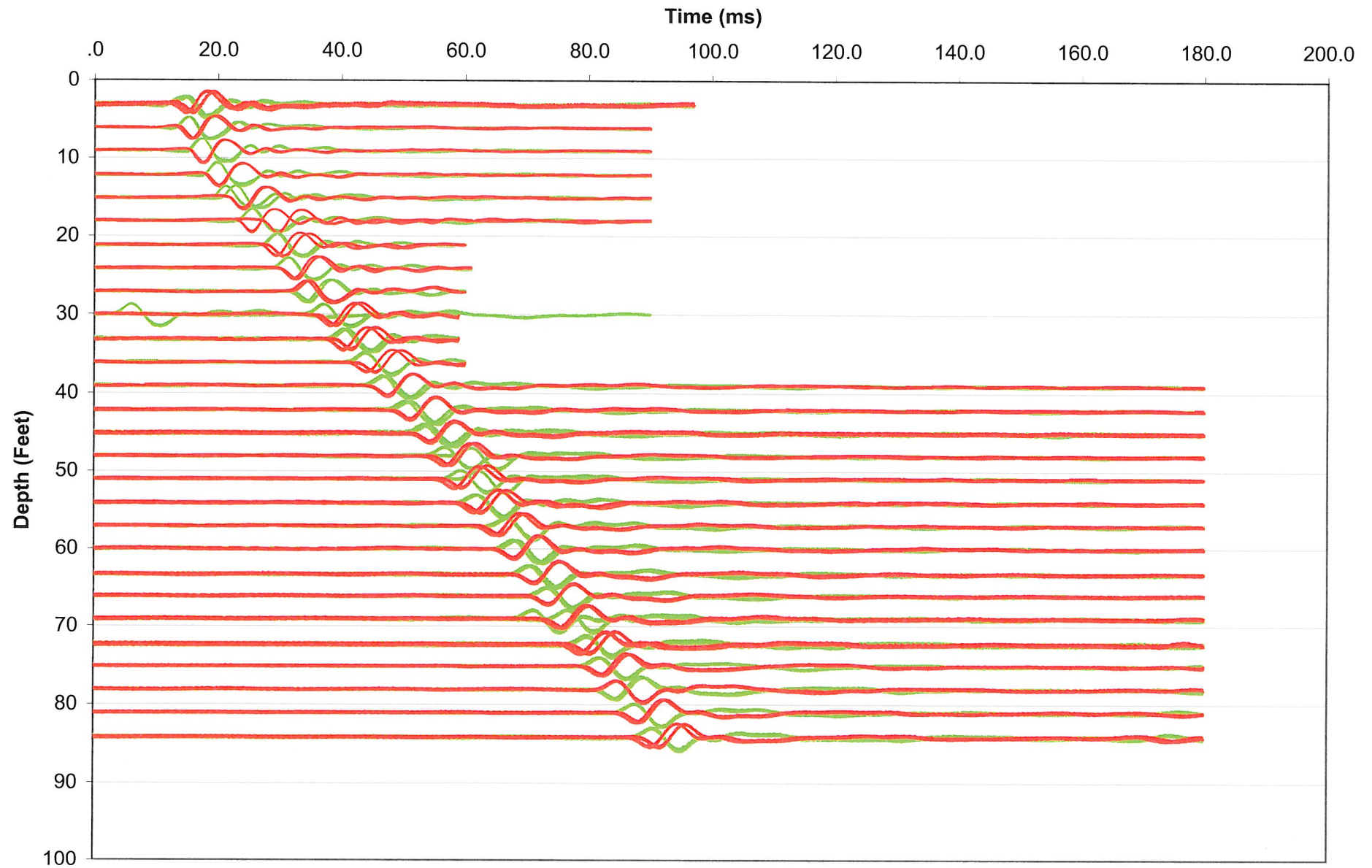


Waveforms for sounding cpt-1308b



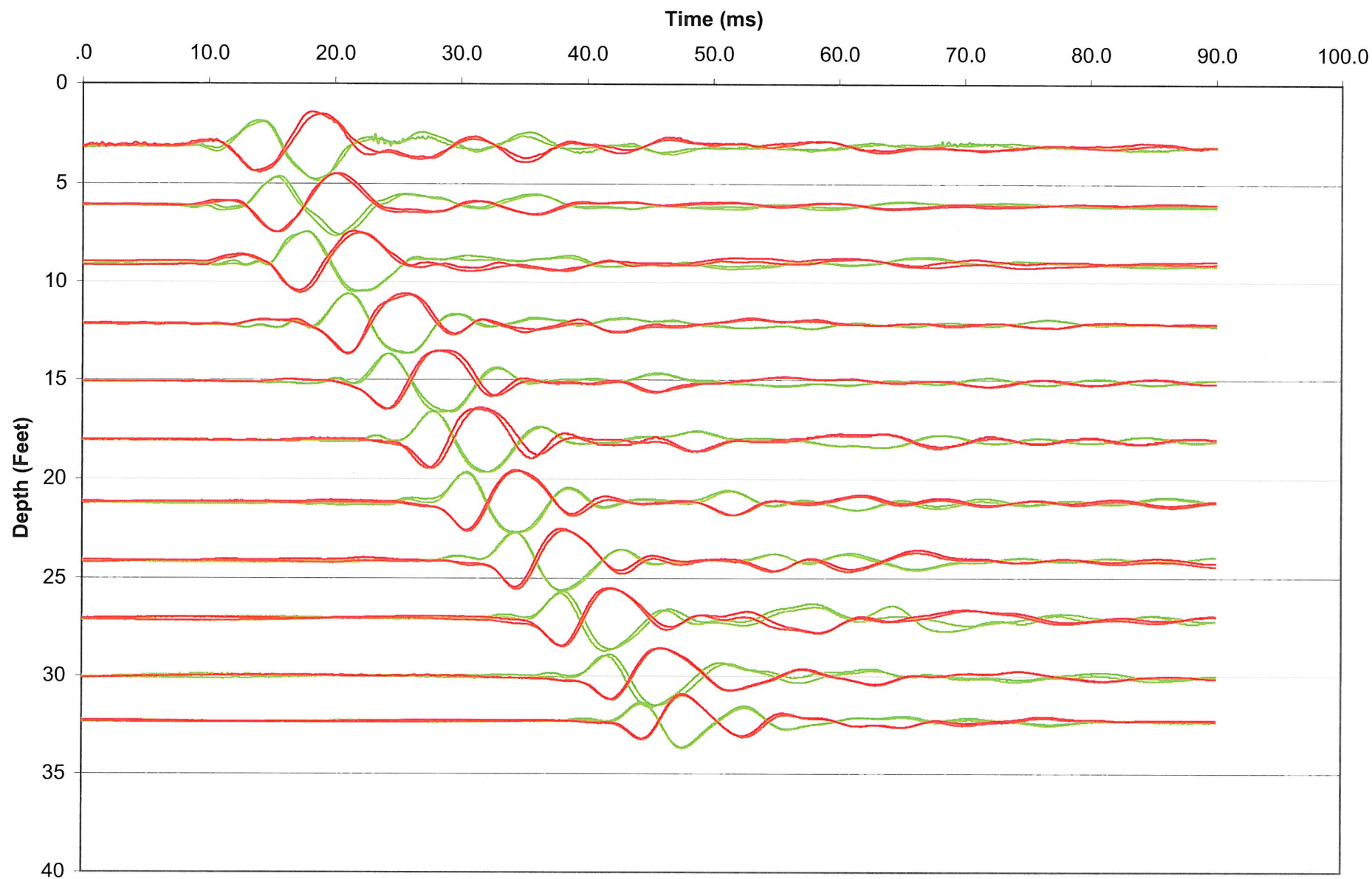


Waveforms for sounding cpt-1309



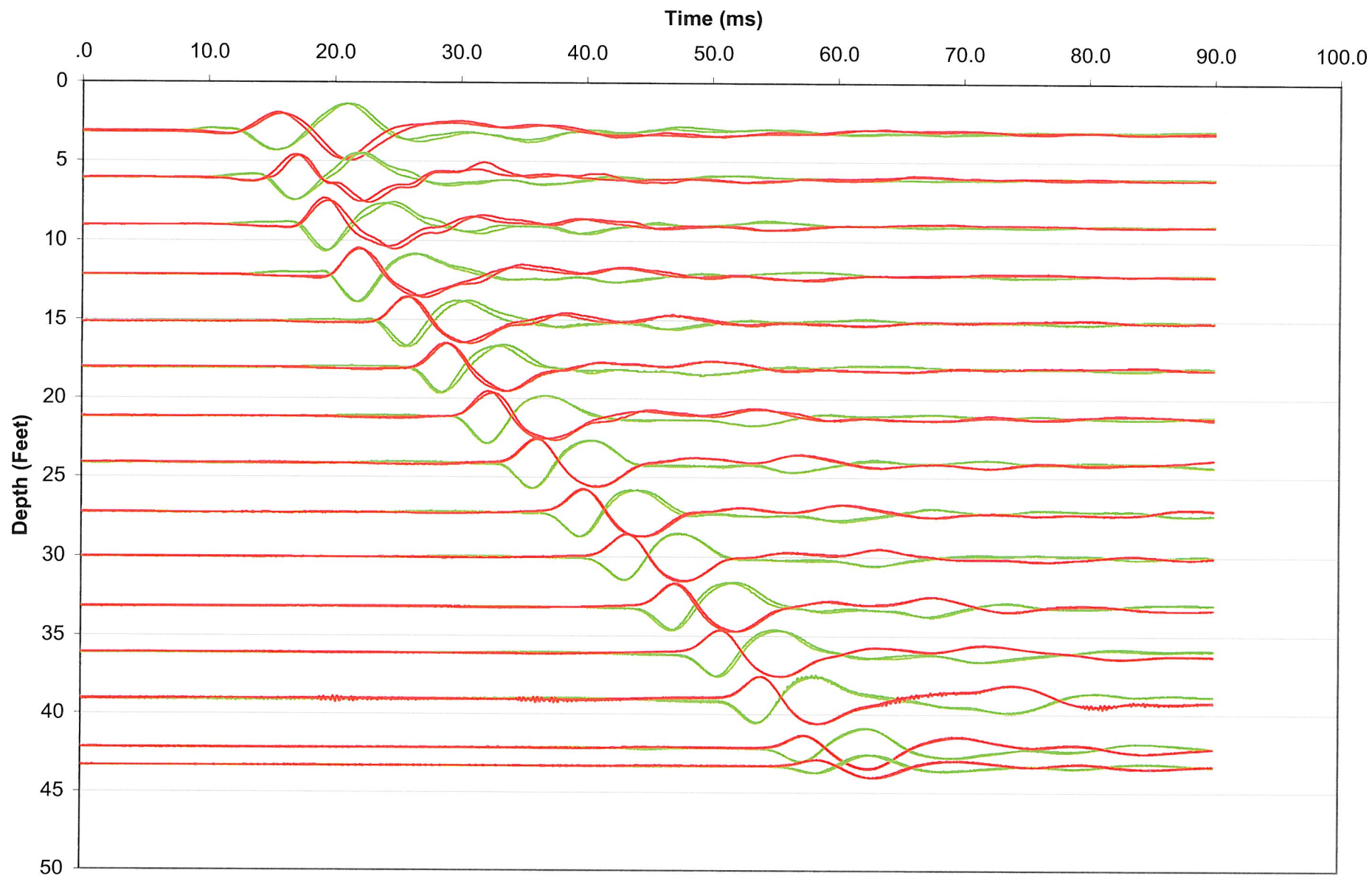


Waveforms for sounding cpt-1320



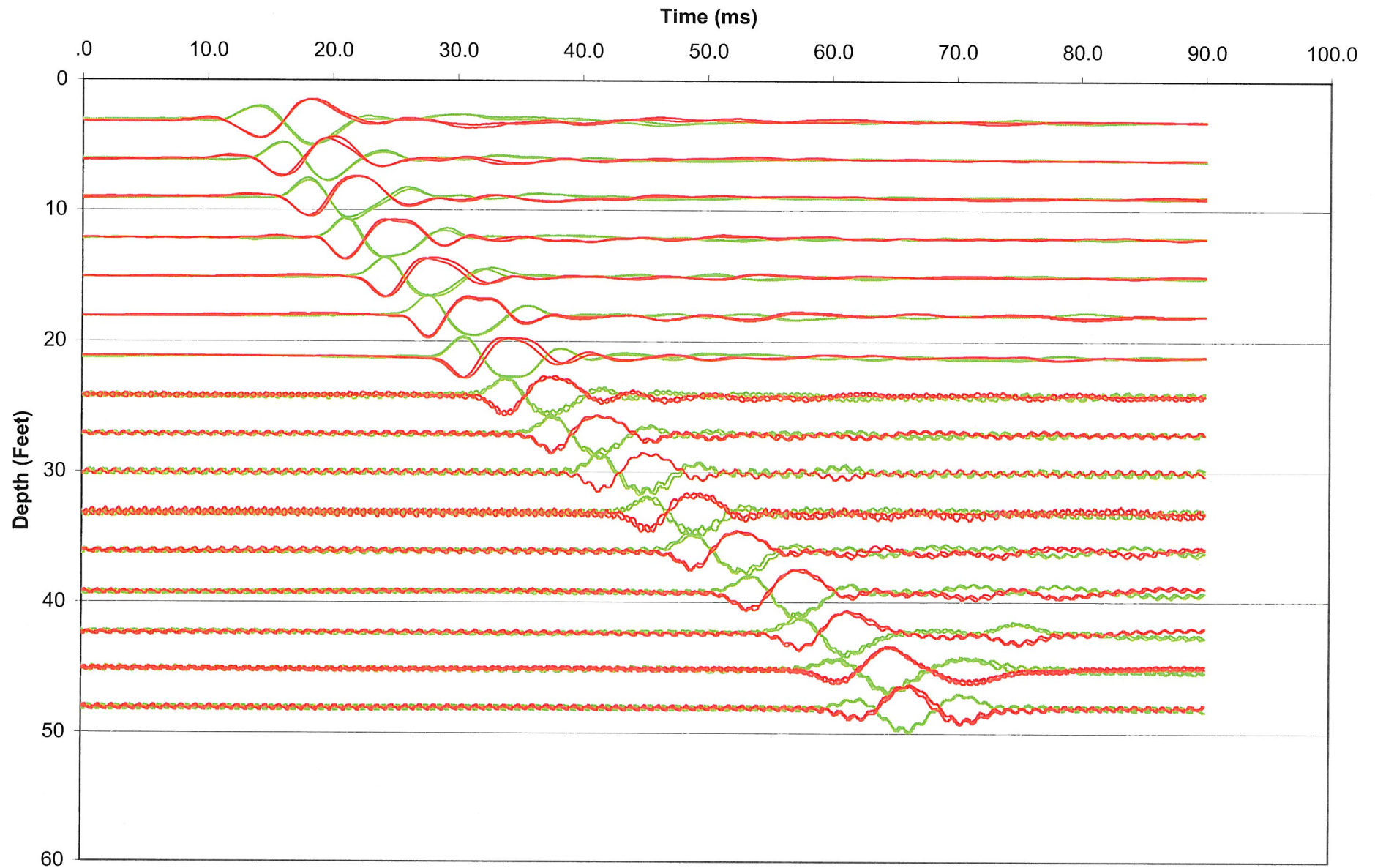


Waveforms for sounding cpt-1321



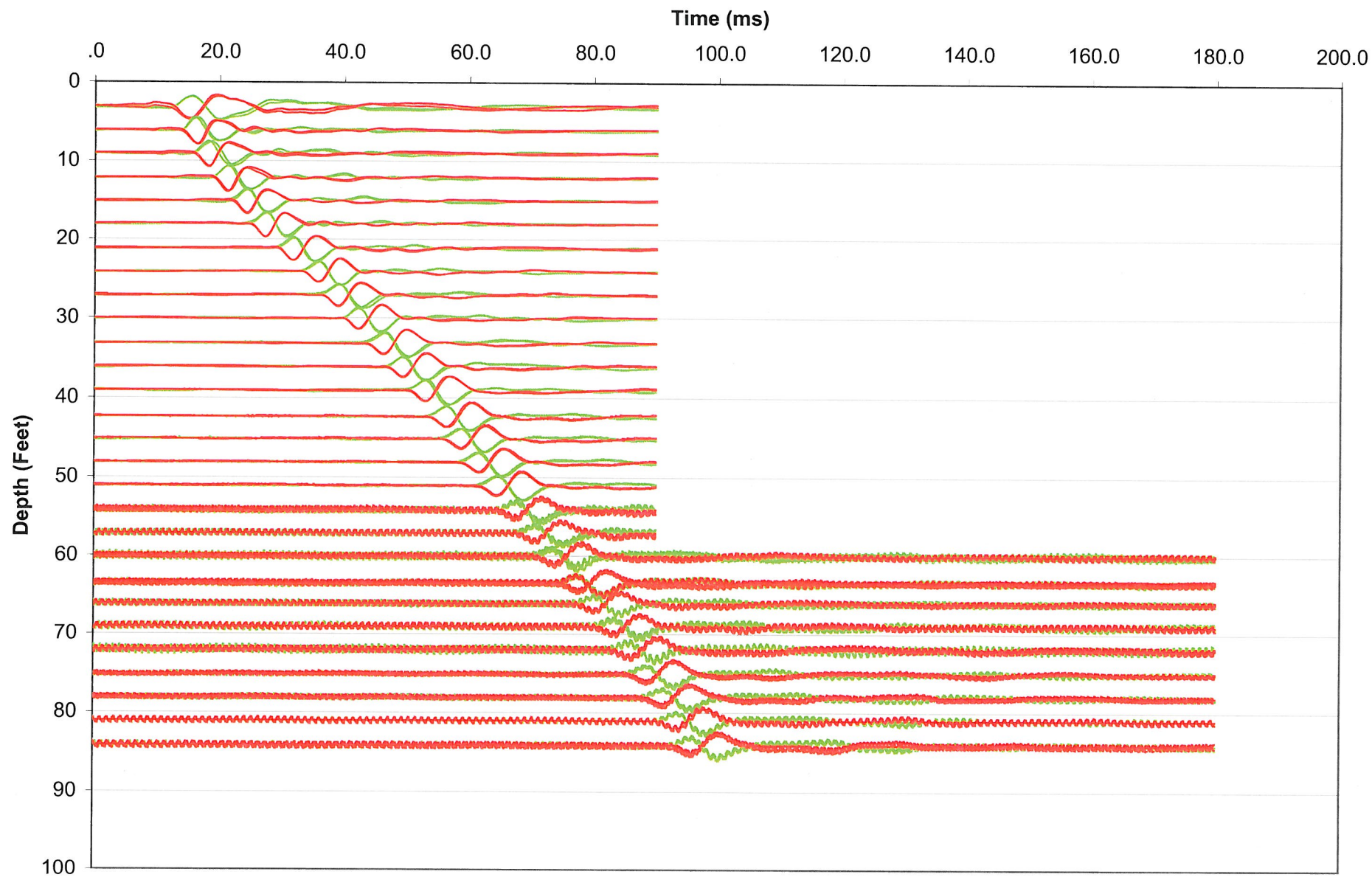


Waveforms for sounding cpt-1322



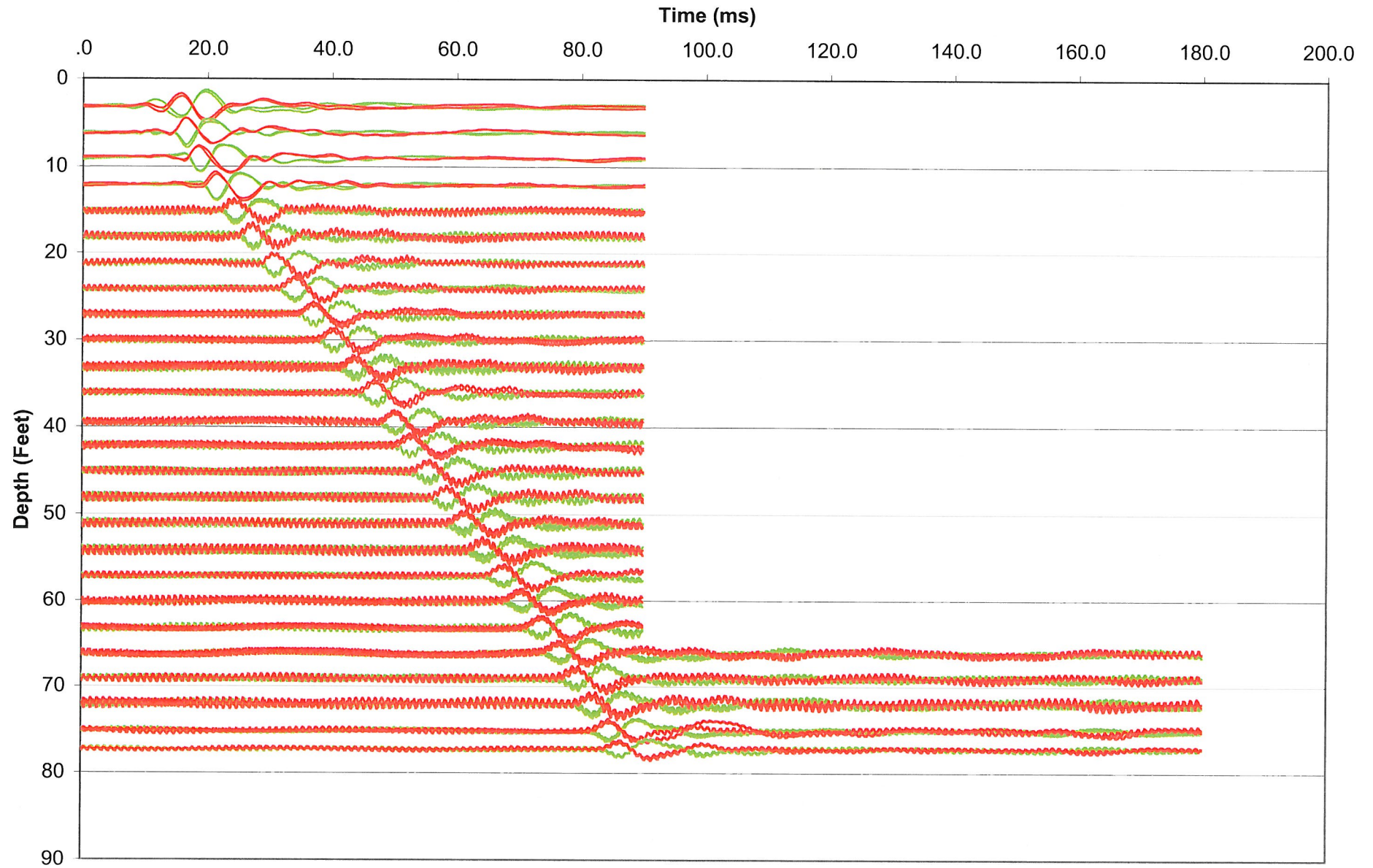


Waveforms for sounding cpt-1323



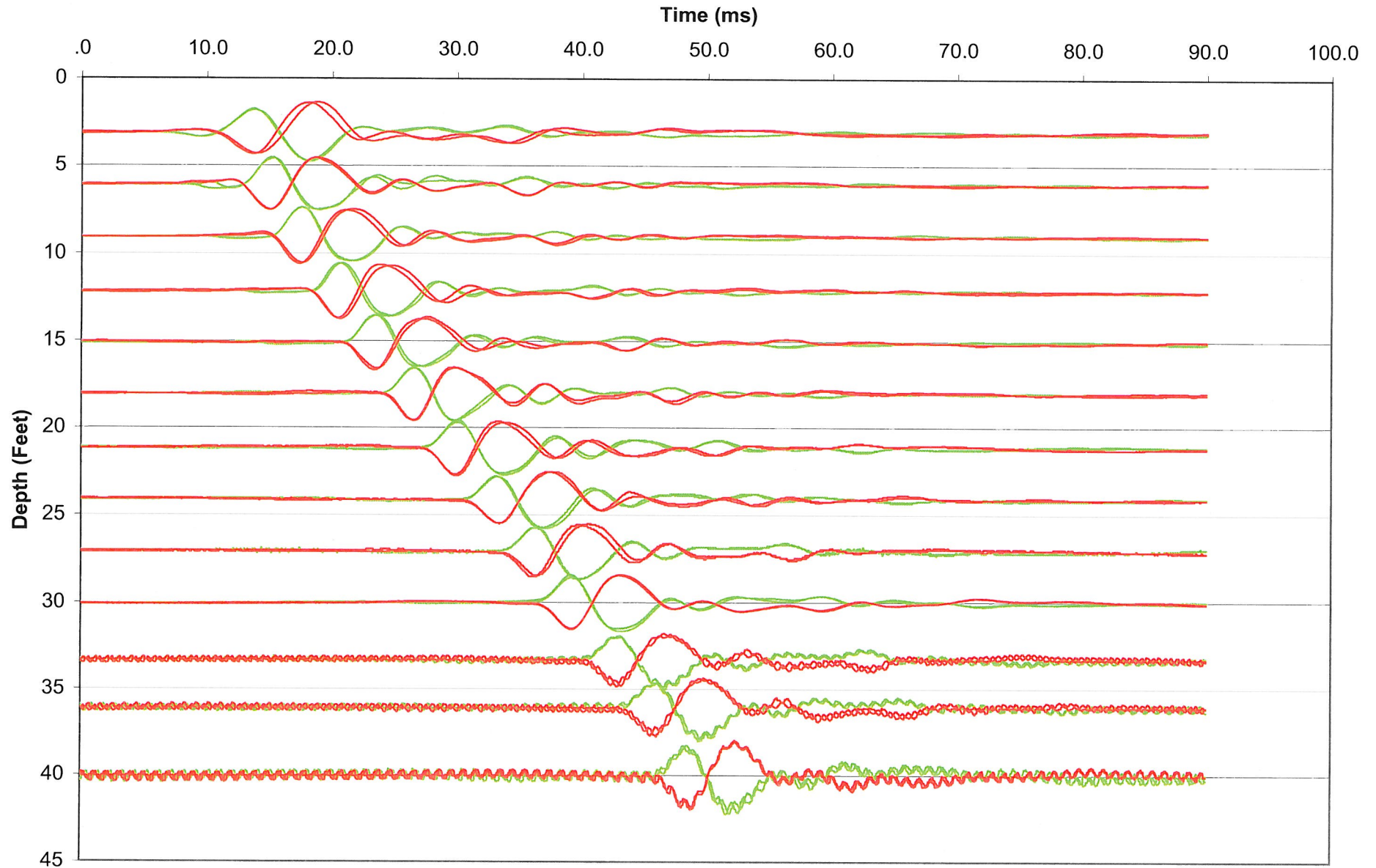


Waveforms for sounding cpt-1324b





Waveforms for sounding cpt-1325





Waveforms for sounding cpt-1325a

