APPENDIX B1.3

ANALYTICAL TEST RESULTS VALIDATION REPORT

CHURCH ROCK MILL SITE

MWH

APPENDIX B1.3

DATA VERIFICATION
SOIL 2013 SOIL SAMPLING

Introduction. Soil samples were collected at the Church Rock Mill Site November 12 through December 12, 2013. The following paragraphs summarize the results of the data verification. Radium-226 and Uranium analyses had 10% Level IV verification performed. All other analytes had Level II or III verification.

Analytical Procedures and Detection Limits. All samples were analyzed in accordance with the methodology, detection limits, and quality control (QC) criteria specified in the project *Quality Assurance Project Plan,* United Nuclear Corporation, Northeast Church Rock Mine Site Removal Action (QAPP; MWH, 2013). Energy Laboratories of Casper, Wyoming provided the analytical services.

A summary of qualified data is presented in Table B1.3-1. None of the data were non-conforming (QC outside acceptance criteria).

Holding times were evaluated. All holding times met method criteria.

Initial calibration, initial calibration verification (ICV), and continuing calibration criteria were evaluated for uranium. All calibration criteria were met. Calibration data were reproducible for uranium. There is no calibration for EPA method 901.1 for radium-226.

All metals ICV, interference check samples and serial dilutions met acceptance criteria.

Laboratory control samples (LCS) and laboratory fortified blank samples (LFB) (where applicable) met acceptance criteria.

Method blanks met acceptance criteria.

Field duplicate (FD) samples were collected. All FD met the acceptance criteria with the exceptions listed in Table B1.4-1 with “FD” as the QC type.

Laboratory selected batch replicates and matrix spike (MS) and or MS/matrix spike duplicate (MSD) analyses met acceptance criteria.

All uranium and radium-226 results were reproducible and matched the laboratory report.

Conclusions. Based on the results of the data verification, the data are considered precise, accurate, and representative, as qualified. Analytical completeness for this sampling round is 100 percent.

TABLE B1.3-1
SUMMARY OF QUALIFIED DATA
NORTHEAST CHURCH SITE
(Page 1 of 1)

Location Identification	Field Identification	Sample Date	Analysis	Analyte	Sample Result	Sample Units	QC Type	QC Result	Qualifier	Bias	Comment
TOPSOIL STOCKPILE	Topsoil Stockpile	21-Nov-13	E901.1	Radium-226	1	pci/g	FD	35%	J	None	Datum is estimated; bias unknown.

pCi/g	picocurries per gram
FD	field duplicate
QC	quality control
J	datum estimated

APPENDIX B2

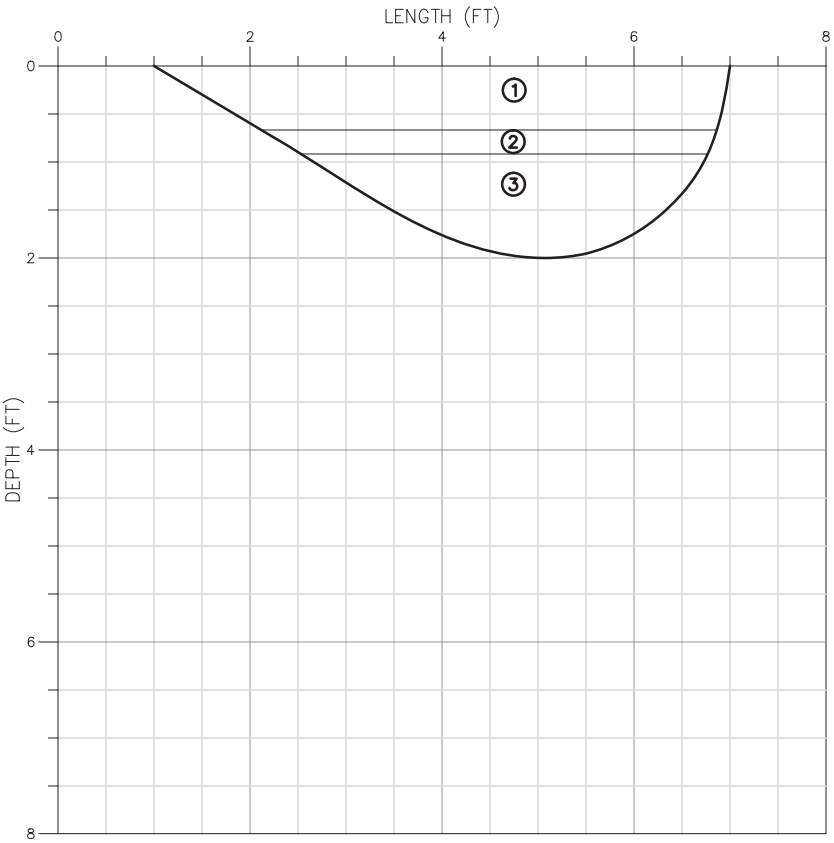
FIELD LOGS AND PHOTOGRAPHS

APPENDIX B2.1

TAILINGS IMPOUNDMENT COVER TEST PIT LOGS

TEST PIT LOG

PROJECT: NECR PRE-DESIGN	DATE: 11/12/13	TEST PIT NO: CS-1
GENERAL LOCATION: TAILINGS IMPOUNDMENT	FIELD ENGINEER: R. SCHAUT	
PIT TREND: N-S	EXCAVATOR: RICK SPITZ	
PIT FACED LOGGED: E	CONTRACTOR: AMEC	



LEGEND

CONTACT

GROUNDWATER LEVEL

SAMPLE No.	DEPTH	TYPE
TI-CS01-01	0-8"	BAG
TI-CS01-02A,B	0-11"	BUCKETS
TI-CS01-03	11-24"	BAG
TI-CS01-04A,B	11-24"	BUCKETS

PIT WIDTH: 2.5'
PIT LENGTH: ~6'
PIT DEPTH: 2'

SOIL UNIT	SOIL DESCRIPTION AND EXCAVATION NOTES
① (0-8")	SANDY CLAY - LIGHT BROWN, FIRM, SLIGHTLY MOIST TO MOIST SANDY CLAY, SILTY, SAND IS VERY FINE-GRAINED, SOME ROOTS.
② (8-11")	ROCK - CRUSHED BASALT, 1/2" TO 3" SIZE, SANDY CLAY IN VOIDS.
③ (11-24")	SANDY CLAY - DARK BROWN, HARD, MOIST SANDY CLAY, SILTY, SAND IS VERY FINE-GRAINED.

SPECIAL NOTES:

LOCATED ADJACENT TO CPT-2.

MWH

CHURCH ROCK MILL SITE

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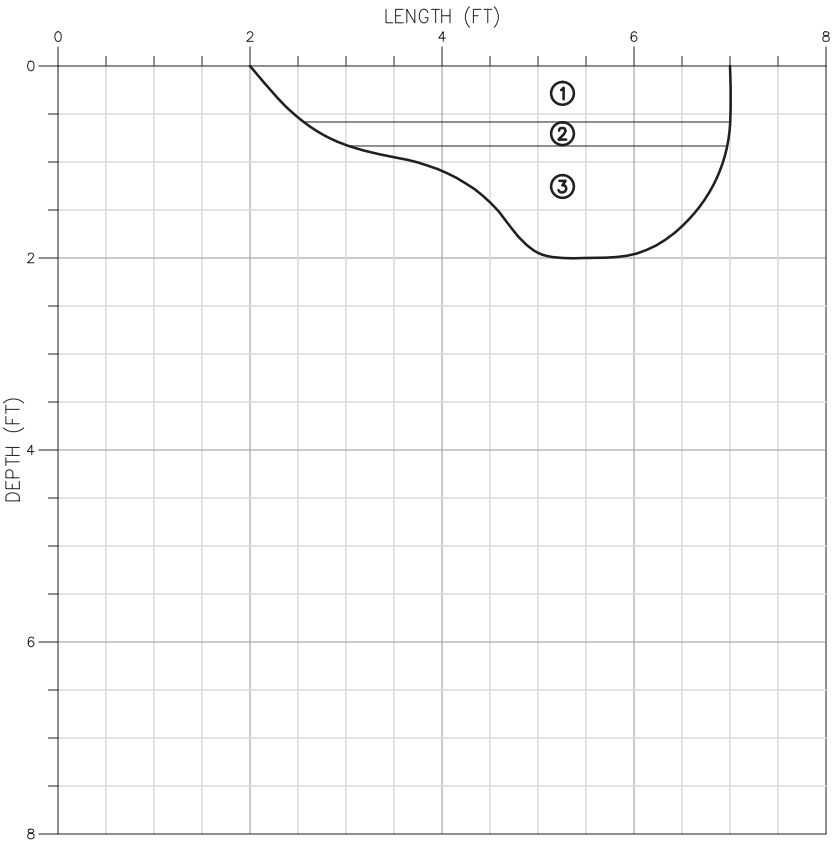
TEST PIT LOG

PROJECT: NECR PRE-DESIGN
GENERAL LOCATION: TAILINGS IMPOUNDMENT
PIT TREND: N-S
PIT FACED LOGGED: E

DATE: 11/12/13
FIELD ENGINEER: R. SCHAUT
EXCAVATOR: RICK SPITZ
CONTRACTOR: AMEC

TEST PIT NO: CS-2



LEGEND

CONTACT

GROUNDWATER LEVEL

SAMPLE No.	DEPTH	TYPE
TI-CS02-01	0-7"	BAG
TI-CS02-02A,B	0-10"	BUCKETS
TI-CS02-03	10-24"	BAG
TI-CS02-04A,B	10-24"	BUCKETS

PIT WIDTH: 2.5'
PIT LENGTH: ~6'
PIT DEPTH: 2'

SOIL UNIT	SOIL DESCRIPTION AND EXCAVATION NOTES
1 (0-7")	SANDY CLAY - LIGHT BROWN, SOFT TO FIRM, SLIGHTLY MOIST TO MOIST SANDY CLAY, SILTY, SAND IS VERY FINE-GRAINED, SOME ROOTS.
2 (7-10")	ROCK - CRUSHED BASALT, 1/2" TO 3" SIZE, SANDY CLAY IN VOIDS.
3 (10-24")	SANDY CLAY - BROWN, HARD, MOIST SANDY CLAY, SILTY, SAND IS VERY FINE-GRAINED.

SPECIAL NOTES:

LOCATED ADJACENT TO CPT-23.

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CHURCH ROCK MILL SITE

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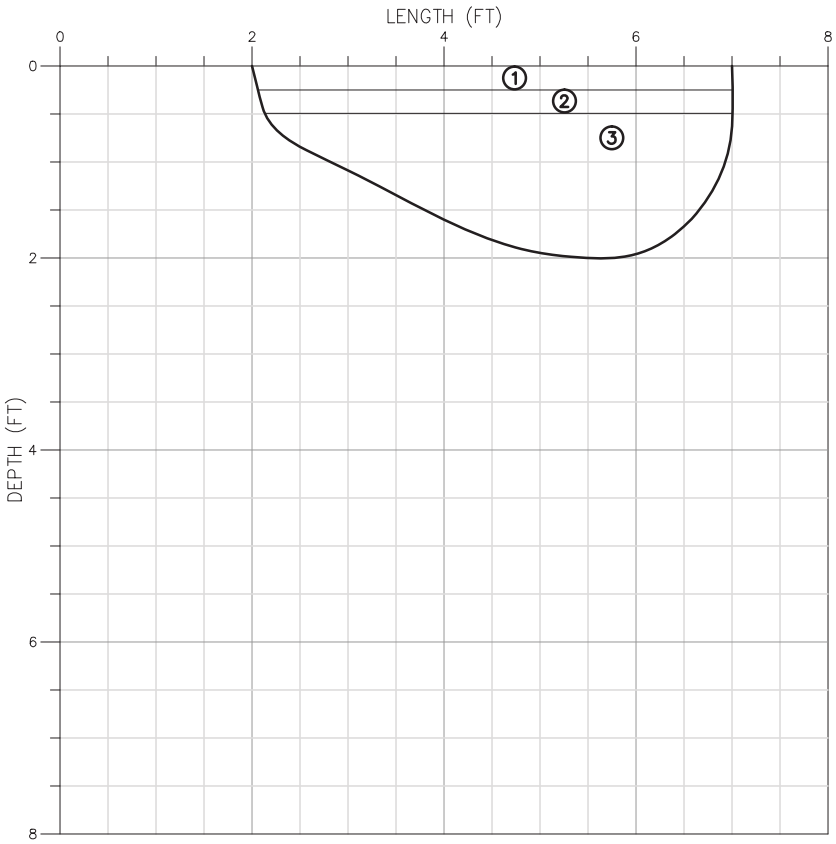
TEST PIT LOG

PROJECT: NECR PRE-DESIGN
GENERAL LOCATION: TAILINGS IMPOUNDMENT
PIT TREND: N-S
PIT FACED LOGGED: E

DATE: 11/12/13
FIELD ENGINEER: R. SCHAUT
EXCAVATOR: RICK SPITZ
CONTRACTOR: AMEC

TEST PIT NO: CS-3



LEGEND

CONTACT

GROUNDWATER LEVEL

SAMPLE No.	DEPTH	TYPE
TI-CS03-01	0-3"	BAG
TI-CS03-02A,B	0-6"	BUCKETS
TI-CS03-03	6-24"	BAG
TI-CS03-04A,B	6-24"	BUCKETS

PIT WIDTH: 2.5'
PIT LENGTH: ~5'
PIT DEPTH: 2'

SOIL UNIT	SOIL DESCRIPTION AND EXCAVATION NOTES
1 (0-3")	SANDY CLAY – BROWN, SOFT TO FIRM, SLIGHTLY MOIST SANDY CLAY, SILTY, SAND IS VERY FINE-GRAINED, ROOTS.
2 (3-6")	ROCK – CRUSHED BASALT, 1/2" TO 3" SIZE, SANDY CLAY IN VOIDS.
3 (6-24")	SANDY CLAY – BROWN, FIRM TO HARD, DRY SANDY CLAY, SILTY, SAND IS VERY FINE TO FINE-GRAINED.

SPECIAL NOTES:

LOCATED ADJACENT TO CPT-4.

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CHURCH ROCK MILL SITE

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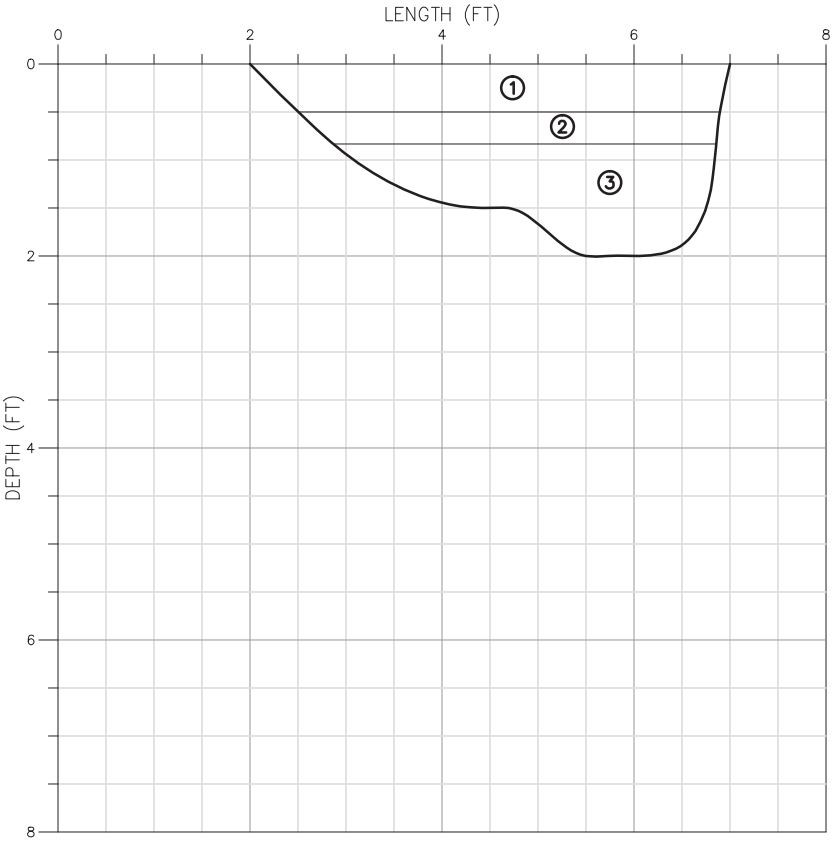
TEST PIT LOG

PROJECT: NECR PRE-DESIGN
GENERAL LOCATION: TAILINGS IMPOUNDMENT
PIT TREND: N-S
PIT FACED LOGGED: E

DATE: 11/12/13
FIELD ENGINEER: R. SCHAUT
EXCAVATOR: RICK SPITZ
CONTRACTOR: AMEC

TEST PIT NO: CS-4



LEGEND

CONTACT

GROUNDWATER LEVEL

SAMPLE No.	DEPTH	TYPE
TI-CS04-01	0-6"	BAG
TI-CS04-02A,B	0-10"	BUCKETS
TI-CS04-03	10-24"	BAG
TI-CS04-04A,B	10-24"	BUCKETS

PIT WIDTH: 2.5'
PIT LENGTH: ~5'
PIT DEPTH: 2'

SOIL UNIT	SOIL DESCRIPTION AND EXCAVATION NOTES
① (0-6")	SANDY CLAY – BROWN, SOFT, SLIGHTLY MOIST SANDY CLAY, SILTY, SAND IS VERY FINE-GRAINED, ROOTS.
② (6-10")	ROCK – CRUSHED BASALT, 1/2" TO 3" SIZE, SANDY CLAY IN VOIDS.
③ (10-24")	SANDY CLAY – DARK BROWN, FIRM, MOIST TO VERY MOIST SANDY CLAY, SILTY, SAND IS VERY FINE-GRAINED.

SPECIAL NOTES:

LOCATED ADJACENT TO CPT-7.

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CHURCH ROCK MILL SITE

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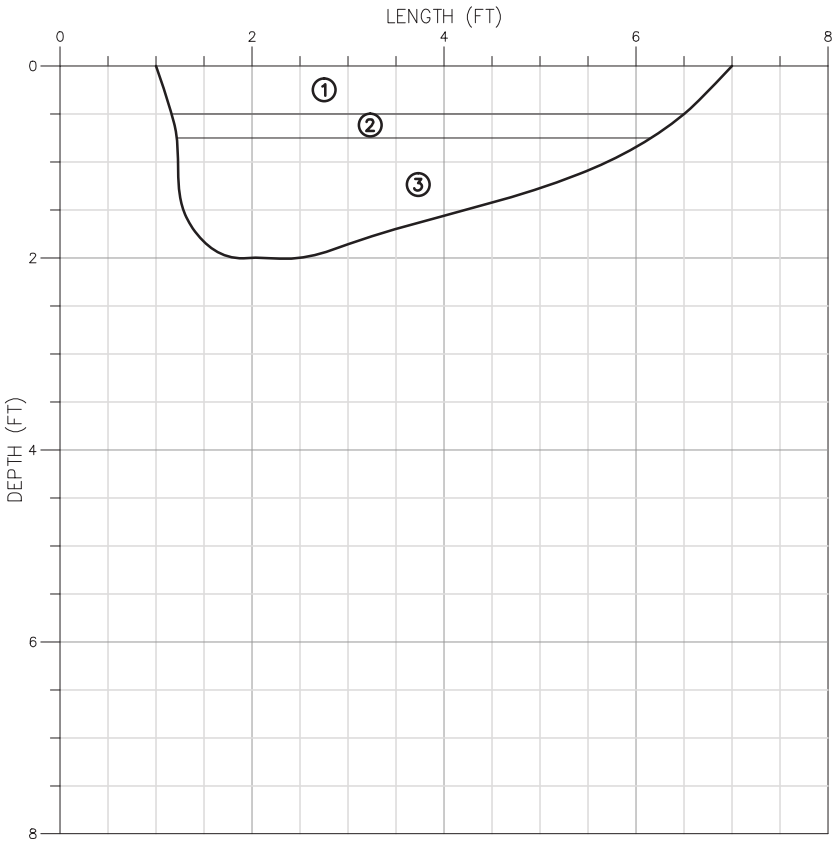
TEST PIT LOG

PROJECT: NECR PRE-DESIGN
GENERAL LOCATION: TAILINGS IMPOUNDMENT
PIT TREND: N-S
PIT FACED LOGGED: W

DATE: 11/12/13
FIELD ENGINEER: R. SCHAUT
EXCAVATOR: RICK SPITZ
CONTRACTOR: AMEC

TEST PIT NO: CS-5



LEGEND

CONTACT

GROUNDWATER LEVEL

SAMPLE No.	DEPTH	TYPE
TI-CS05-01	0-6"	BAG
TI-CS05-02A,B	0-9"	BUCKETS
TI-CS05-03	9-24"	BAG
TI-CS05-04A,B	9-24"	BUCKETS

PIT WIDTH: 2.5'
PIT LENGTH: ~6'
PIT DEPTH: 2'

SOIL UNIT	SOIL DESCRIPTION AND EXCAVATION NOTES
1 (0-6")	SANDY CLAY - BROWN, SOFT, MOIST SANDY CLAY, SILTY, SAND IS VERY FINE-GRAINED, ROOTS.
2 (6-9")	ROCK - CRUSHED BASALT, 1/2" TO 3" SIZE.
3 (9-24")	SANDY CLAY - BROWN, HARD, MOIST SANDY CLAY, SILTY, SAND IS VERY FINE-GRAINED.

SPECIAL NOTES:

LOCATED ADJACENT TO CPT-15.

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CHURCH ROCK MILL SITE

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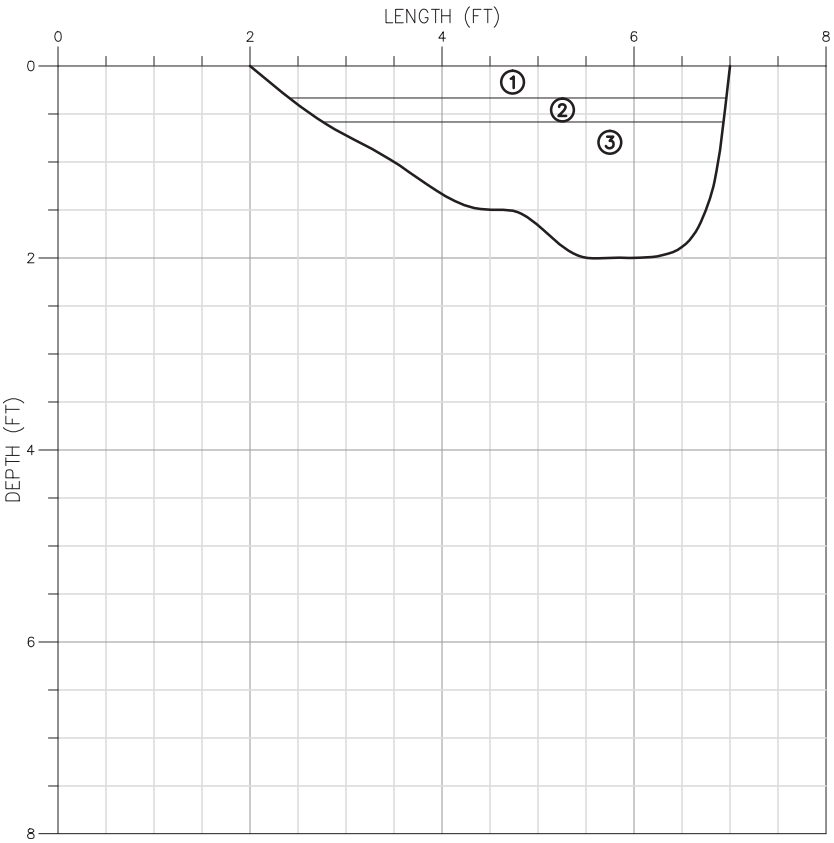
TEST PIT LOG

PROJECT: NECR PRE-DESIGN
GENERAL LOCATION: TAILINGS IMPOUNDMENT
PIT TREND: N-S
PIT FACED LOGGED: E

DATE: 11/13/13
FIELD ENGINEER: R. SCHAUT
EXCAVATOR: RICK SPITZ
CONTRACTOR: AMEC

TEST PIT NO: CS-6



LEGEND

CONTACT

GROUNDWATER LEVEL

SAMPLE No.	DEPTH	TYPE
TI-CS06-01	0-4"	BAG
TI-CS06-02A,B	0-7"	BUCKETS
TI-CS06-03	7-24"	BAG
TI-CS06-04A,B	7-24"	BUCKETS

PIT WIDTH: 2.5'
PIT LENGTH: ~5'
PIT DEPTH: 2'

SOIL UNIT	SOIL DESCRIPTION AND EXCAVATION NOTES
1 (0-4")	SANDY CLAY – BROWN, SOFT TO FIRM, MOIST SANDY CLAY, SILTY, SAND IS VERY FINE TO FINE-GRAINED, SOME ROOTS.
2 (4-7")	ROCK – CRUSHED BASALT, 1/2" TO 3" SIZE, SANDY CLAY IN VOIDS.
3 (7-24")	SANDY CLAY – DARK BROWN, HARD, MOIST SANDY CLAY, SILTY, SAND IS VERY FINE TO FINE-GRAINED, OCCASIONAL COARSE SAND.

SPECIAL NOTES:

LOCATED ADJACENT TO CPT-21.

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CHURCH ROCK MILL SITE

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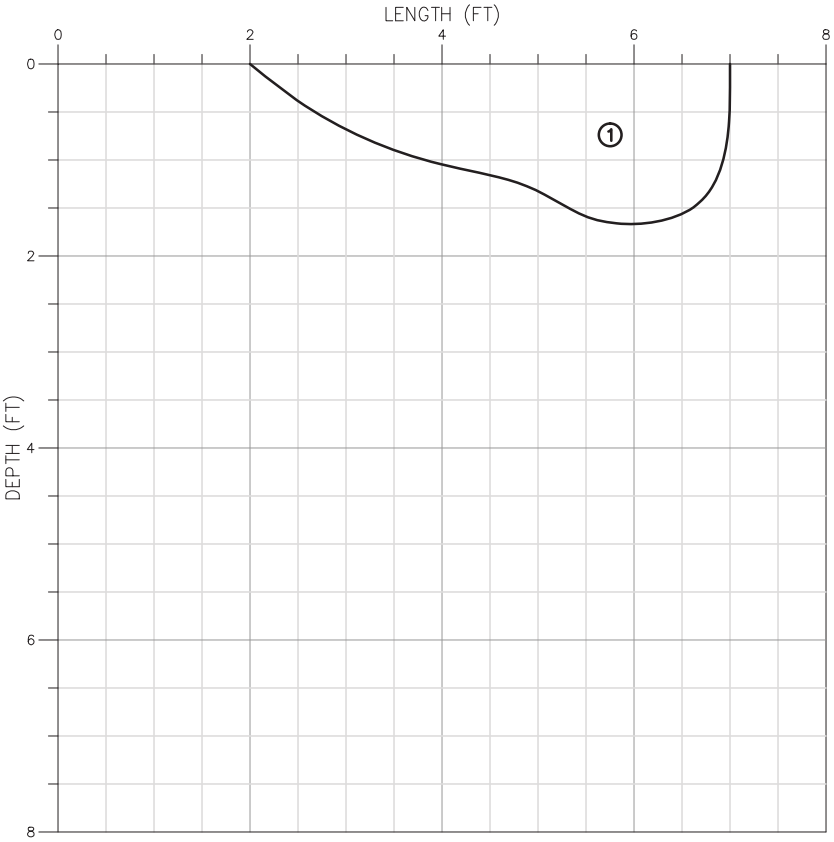
TEST PIT LOG

PROJECT: NECR PRE-DESIGN
GENERAL LOCATION: TAILINGS IMPOUNDMENT
PIT TREND: N-S
PIT FACED LOGGED: E

DATE: 11/13/13
FIELD ENGINEER: R. SCHAUT
EXCAVATOR: RICK SPITZ
CONTRACTOR: AMEC

TEST PIT NO: CS-7



LEGEND

CONTACT

GROUNDWATER LEVEL

SAMPLE No.	DEPTH	TYPE
TI-CS07-01	0-6"	BAG
TI-CS07-02A,B	0-20"	BUCKETS

PIT WIDTH: 2.5'
PIT LENGTH: ~5'
PIT DEPTH: 20"

SOIL UNIT	SOIL DESCRIPTION AND EXCAVATION NOTES
1 (0-20")	SANDY CLAY – BROWN, SOFT TO FIRM (0-6"), HARD (6-20"), MOIST SANDY CLAY, SILTY, SAND IS VERY FINE-GRAINED, ROOTS FROM 0-6". (APPEARS TO BE UNDISTURBED NATURAL GROUND.)

SPECIAL NOTES:

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CHURCH ROCK MILL SITE

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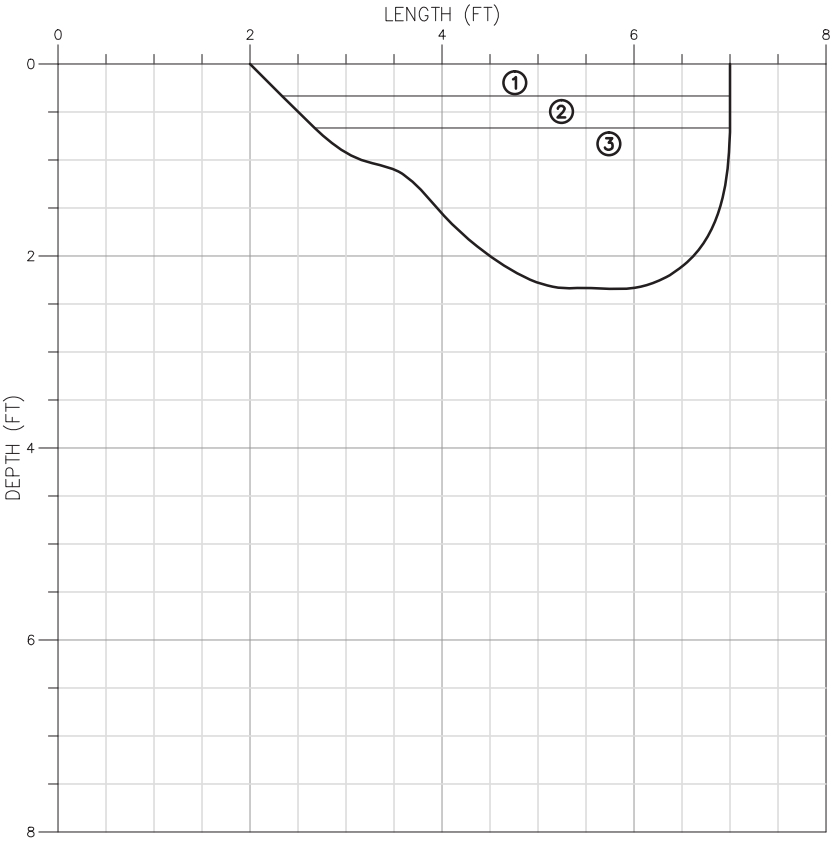
TEST PIT LOG

PROJECT: NECR PRE-DESIGN
GENERAL LOCATION: TAILINGS IMPOUNDMENT
PIT TREND: E-W
PIT FACED LOGGED: S

DATE: 11/13/13
FIELD ENGINEER: R. SCHAUT
EXCAVATOR: RICK SPITZ
CONTRACTOR: AMEC

TEST PIT NO: CS-8



LEGEND

CONTACT

GROUNDWATER LEVEL

SAMPLE No.	DEPTH	TYPE
TI-CS08-01	0-4"	BAG
TI-CS08-02A,B	0-8"	BUCKETS
TI-CS08-03	8-28"	BAG
TI-CS08-04A,B	8-28"	BUCKETS

PIT WIDTH: 2.5'
PIT LENGTH: 5'
PIT DEPTH: 28"

SOIL UNIT	SOIL DESCRIPTION AND EXCAVATION NOTES
1 (0-4")	SANDY CLAY – BROWN, SOFT TO FIRM, SLIGHTLY MOIST TO MOIST SANDY CLAY, SILTY, SAND IS VERY FINE TO FINE-GRAINED, ROOTS.
2 (4-8")	ROCK – CRUSHED BASALT, 1/2" TO 3" SIZE, SANDY CLAY IN VOIDS.
3 (8-28")	SANDY CLAY – DARK BROWN, HARD, MOIST SANDY CLAY, SILTY, SAND IS VERY FINE-GRAINED, OCCASIONAL COARSE SAND.

SPECIAL NOTES:

LOCATED ADJACENT TO CPT-12.

MWH

CHURCH ROCK MILL SITE

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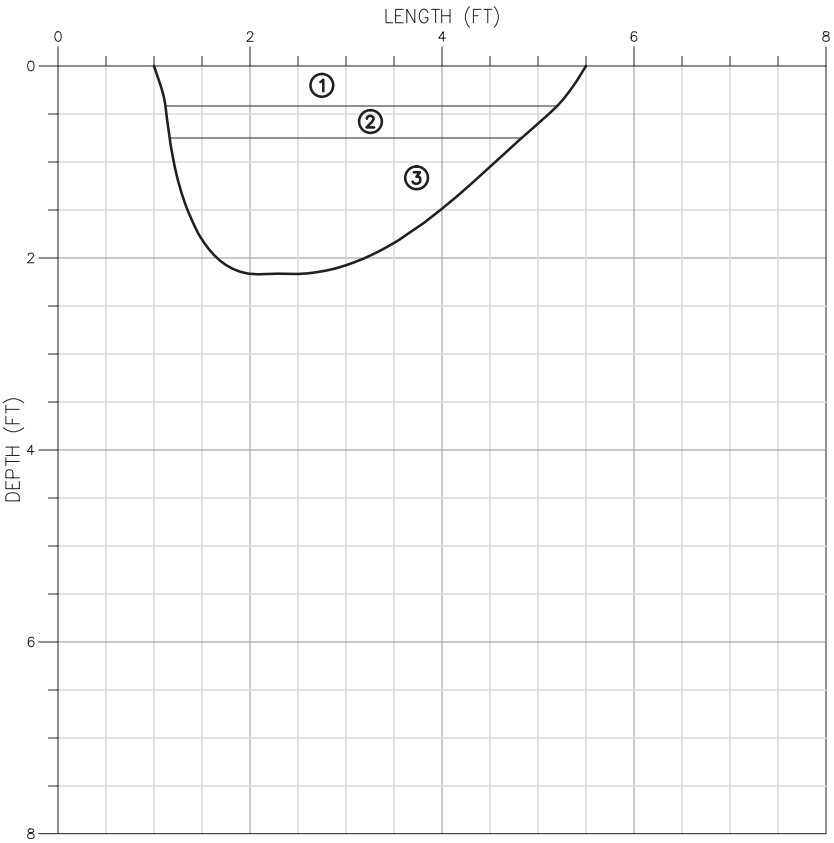
TEST PIT LOG

PROJECT: NECR PRE-DESIGN
GENERAL LOCATION: TAILINGS IMPOUNDMENT
PIT TREND: N-S
PIT FACED LOGGED: E

DATE: 11/13/13
FIELD ENGINEER: R. SCHAUT
EXCAVATOR: RICK SPITZ
CONTRACTOR: AMEC

TEST PIT NO: CS-9



LEGEND

CONTACT

GROUNDWATER LEVEL

SAMPLE No.	DEPTH	TYPE
TI-CS09-01	0-5"	BAG
TI-CS09-02A,B	0-9"	BUCKETS
TI-CS09-03	9-26"	BAG
TI-CS09-04A,B	9-26"	BUCKETS

PIT WIDTH: 2.5'
PIT LENGTH: ~4.5'
PIT DEPTH: 26"

SOIL UNIT	SOIL DESCRIPTION AND EXCAVATION NOTES
① (0-5")	SANDY CLAY – BROWN, SOFT TO FIRM, SLIGHTLY MOIST TO MOIST SANDY CLAY, SILTY, SAND IS FINE-GRAINED, OCCASIONAL COARSE SAND, ROOTS.
② (5-9")	ROCK – CRUSHED BASALT, 1/2" TO 3" SIZE.
③ (9-26")	SANDY CLAY – BROWN, HARD TO VERY HARD, SLIGHTLY MOIST SANDY CLAY, SILTY, SAND IS VERY FINE-GRAINED, OCCASIONAL COARSE SAND TO FINE GRAVEL.

SPECIAL NOTES:

LOCATED ADJACENT TO CPT-9.

MWH

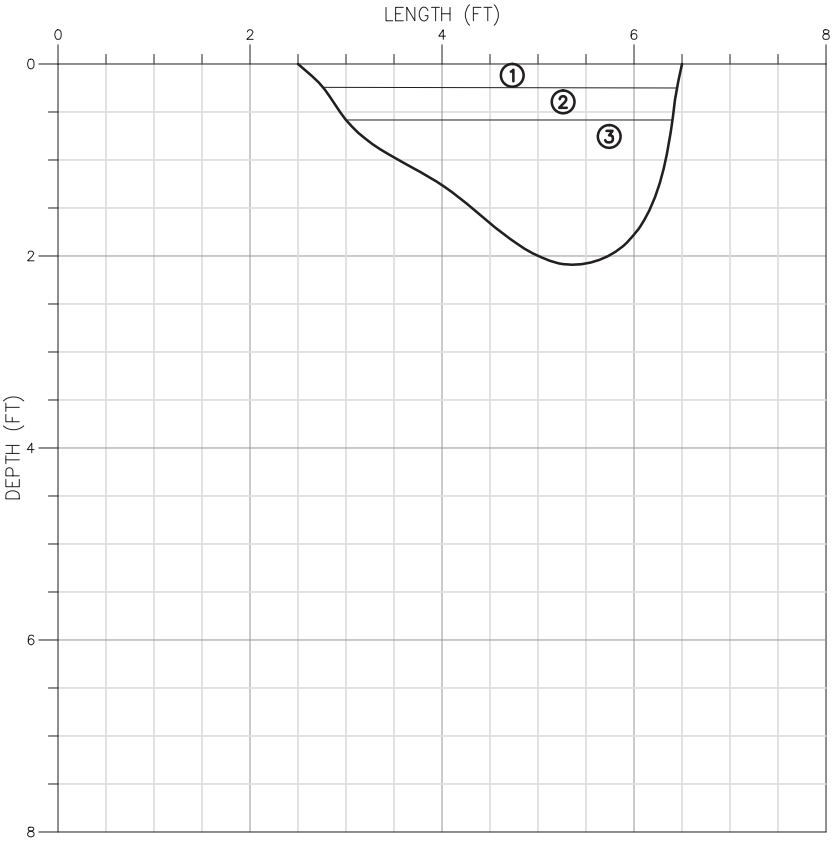
CHURCH ROCK MILL SITE

TEST PIT LOG

PROJECT: NECR PRE-DESIGN
GENERAL LOCATION: TAILINGS IMPOUNDMENT
PIT TREND: NW-SE
PIT FACED LOGGED: NE

DATE: 11/13/13
FIELD ENGINEER: R. SCHAUT
EXCAVATOR: RICK SPITZ
CONTRACTOR: AMEC

TEST PIT NO: CS-10



LEGEND

CONTACT

GROUNDWATER LEVEL

SAMPLE No.	DEPTH	TYPE
TI-CS10-01	0-3"	BAG
TI-CS10-02A,B	0-7"	BUCKETS
TI-CS10-03	7-25"	BAG
TI-CS10-04A,B	7-25"	BUCKETS

PIT WIDTH: 2.5'
PIT LENGTH: ~4'
PIT DEPTH: 25"

SOIL UNIT	SOIL DESCRIPTION AND EXCAVATION NOTES
1 (0-3")	SANDY CLAY – BROWN, FIRM, SLIGHTLY MOIST TO MOIST SANDY CLAY, SILTY, SAND IS VERY FINE-GRAINED, OCCASIONAL FINE TO COARSE SAND, ROOTS.
2 (3-7")	ROCK – CRUSHED BASALT, 1/2" TO 3" SIZE, SOIL IN VOIDS.
3 (7-25")	SANDY CLAY – DARK BROWN, HARD, SLIGHTLY MOIST SANDY CLAY, SILTY, SAND IS VERY FINE-GRAINED, OCCASIONAL MEDIUM TO COARSE SAND.

SPECIAL NOTES:

LOCATED ADJACENT TO CPT-6.

MWH

CHURCH ROCK MILL SITE

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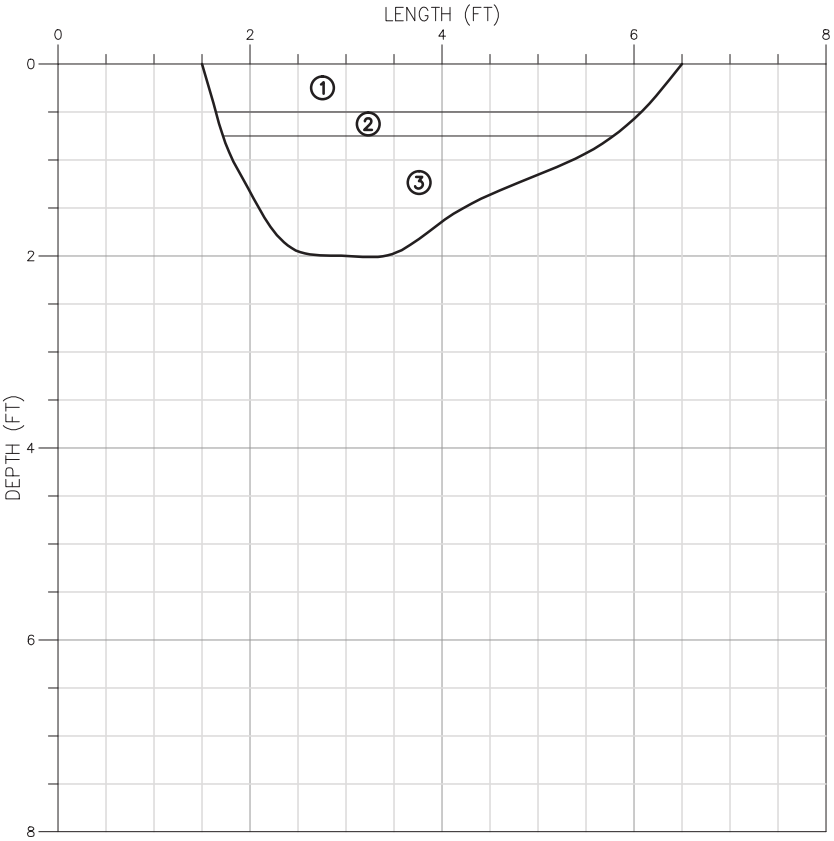
TEST PIT LOG

PROJECT: NECR PRE-DESIGN
GENERAL LOCATION: TAILINGS IMPOUNDMENT
PIT TREND: NW-SE
PIT FACED LOGGED: SW

DATE: 11/13/13
FIELD ENGINEER: R. SCHAUT
EXCAVATOR: RICK SPITZ
CONTRACTOR: AMEC

TEST PIT NO: CS-11



LEGEND

CONTACT

GROUNDWATER LEVEL

SAMPLE No.	DEPTH	TYPE
TI-CS11-01	0-6"	BAG
TI-CS11-02A,B	0-9"	BUCKETS
TI-CS11-03	9-24"	BAG
TI-CS11-04A,B	9-24"	BUCKETS

PIT WIDTH: 2.5'
PIT LENGTH: ~5'
PIT DEPTH: 2'

SOIL UNIT	SOIL DESCRIPTION AND EXCAVATION NOTES
① (0-6")	SANDY CLAY - BROWN, SOFT, SLIGHTLY MOIST SANDY CLAY, SILTY, SAND IS VERY FINE-GRAINED, ROOTS.
② (6-9")	ROCK - CRUSHED BASALT, 1/2" TO 3" SIZE, SANDY CLAY IN VOIDS.
③ (9-24")	SANDY CLAY - DARK BROWN, HARD, SLIGHTLY MOIST TO MOIST SANDY CLAY, SILTY, SAND IS VERY FINE-GRAINED.

SPECIAL NOTES:

LOCATED ADJACENT TO CPT-5.

MWH

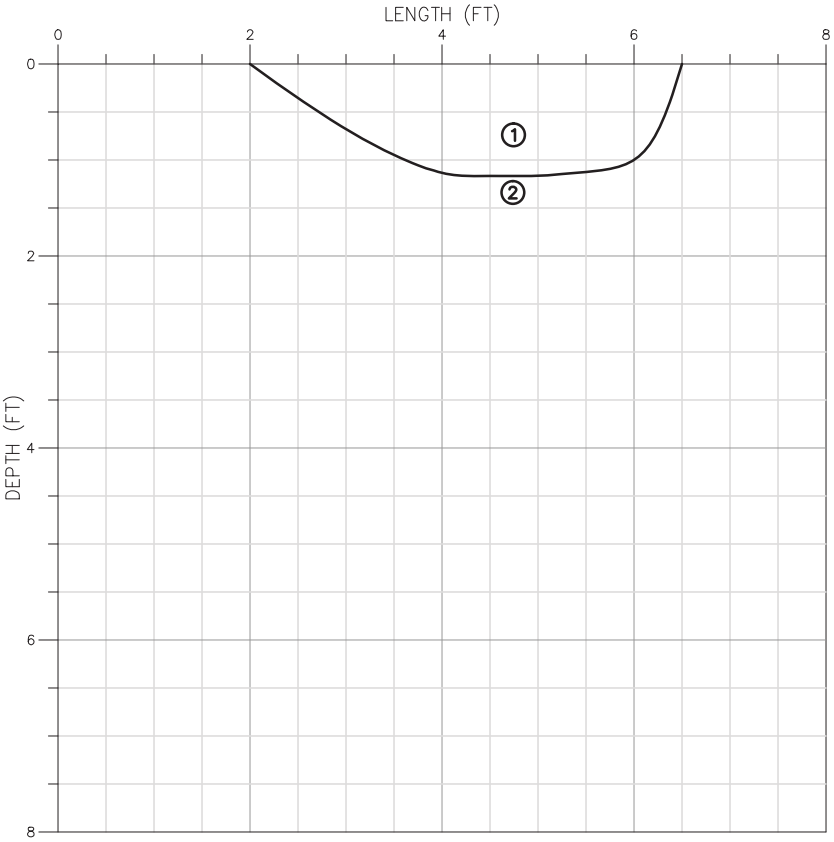
CHURCH ROCK MILL SITE

TEST PIT LOG

PROJECT: NECR PRE-DESIGN
GENERAL LOCATION: TAILINGS IMPOUNDMENT
PIT TREND: NW-SE
PIT FACED LOGGED: NE

DATE: 11/13/13
FIELD ENGINEER: R. SCHAUT
EXCAVATOR: RICK SPITZ
CONTRACTOR: AMEC

TEST PIT NO: CS-12



LEGEND

CONTACT

GROUNDWATER LEVEL

SAMPLE No.	DEPTH	TYPE
TI-CS12-01	0-14"	BAG
TI-CS12-02A,B	0-14"	BUCKETS

PIT WIDTH: 2.5'
PIT LENGTH: ~4.5'
PIT DEPTH: 14"

SOIL UNIT	SOIL DESCRIPTION AND EXCAVATION NOTES
① (0-14")	SANDY CLAY – BROWN, SOFT, SLIGHTLY MOIST SANDY CLAY, SILTY, SAND IS VERY FINE-GRAINED, ROOTS.
② (14" →)	ROCK – UNABLE TO PENETRATE.

SPECIAL NOTES:

LOCATED ADJACENT TO CPT-25.

MWH

CHURCH ROCK MILL SITE

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APPENDIX B2.2

TAILINGS IMPOUNDMENT COVER TEST PIT PHOTOGRAPHS

Typical Test Pit, Before Sampling (CS-2)
11/12/13

Typical Backhoe Excavation (CS-3)
11/12/13

Typical Backfill Compaction (CS-2)
11/12/13

Typical Test Pit, After Sampling (CS-2)
11/12/13

CS-1 Soil Profile
11/12/13

CS-2 Soil Profile
11/12/13

CS-3 Soil Profile
11/12/13

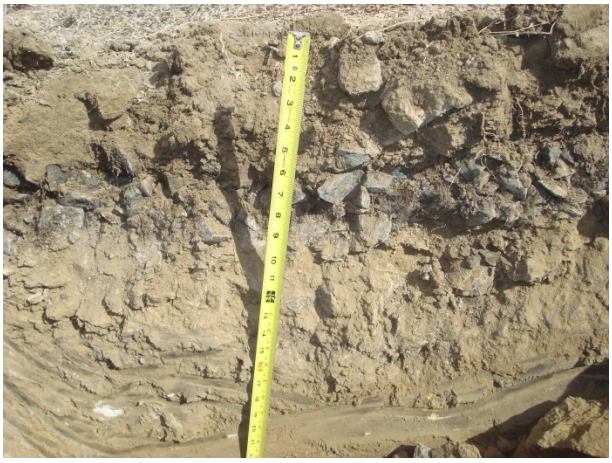
CS-4 Soil Profile
11/12/13

CS-5 Soil Profile
11/12/13

CS-6 Soil Profile
11/13/13

CS-7 Soil Profile
11/13/13

CS-8 Soil Profile
11/13/13



CS-9 Soil Profile
11/13/13

CS-10 Soil Profile
11/13/13

CS-11 Soil Profile
11/13/13

CS-12 Soil Profile
11/13/13

APPENDIX B2.3

TAILINGS IMPOUNDMENT DRILLING LOGS

MWH	CLIENT:	BORING LOG	BOREHOLE ID:
PROJ. LOC.: GALLUP, NM	NECR - PRE DESIGN STUDY INVESTIGATION		**TI-B1**

CONTRACTOR INFORMATION	DRILL RIG INFORMATION		BOREHOLE INFORMATION	
DRILLING COMPANY: NATIONAL	DRILLING RIG: CME 85 HD	BIT TYPE: N/A	CASING DEPTH: N/A	START: 11/21/2013
DRILLER: M. CAIN	DRILLING METHOD: HSA/CC	AUGER O.D.: 8.25"	SURFACE ELEV. (FT): 6969.7	FINISH: 11/21/2013
DRILLER'S HELPER: J. RAMIREZ	HAMMER TYPE: AUTO	HOLE DIAM.: 8.25"	DEPTH TO BEDROCK (FT): N/A	
LOGGED BY: R. SCHAUT	HAMMER WT: 140 lb	CORE DIAM.: 3.0"	TOTAL DEPTH (FT): 70.0	

DEPTH (FT)	FIELD SAMPLE RECOVERY DATA: CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	LABORATORY TEST DATA: WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	14"				NA	(0' - 8") SILTY CLAY (FILL) - Light brown, soft, moist silty clay, trace to few very fine to fine sand.												
1						(8" - 12") ROCK - 1/2" to 3" crushed basalt.												
						(1' - 18.5') SILTY CLAY WITH SAND (FILL) - Dark brown, firm to hard, slightly moist silty clay, little to some very fine to fine sand, occasional coarse sand and gravel (upper ~5' may be compacted radon barrier).												
2																		
3						[0 - 5' Core not retained.]												
4																		
5	24"	CA 18"	1C	8														
			1B	9														
6			1A	11														
		AC	2															
7																		
8																		
9																		
10	30"	CA 18"	3C	10		[Below ~10', occasional elevated rad readings indicating possible sand tailings mixed with silty clay fill.]												
			3B	12														
11			3A	14		(~11' - ~11.5') 1/2" to 1" gravel observed.												
		AC	4															
12																		
13																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Rad levels measured with Ludlum Model 2 meter. Hole backfilled with cement/bentonite grout.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT: NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **TI-B1**

DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	FIELD SAMPLE RECOVERY DATA								LABORATORY TEST DATA									
	30"	AC	4		NA													
14						(~13 - ~14') - Sand Tailings - see description below, slightly elevated rad readings.]												
15	32"	CA 18"	5C	5														
			5B	6														
16			5A	10			CL		16.2	104.7		33/13/20	0.3	27.2	72.5			
		AC	6															
17																		
18																		
						(18.5' - 34.3') SAND TAILINGS - Pale gray, dense, moist, fine to medium sand tailings, slightly elevated rad levels.												
19																		
20	36"	CA 18"	7C	19														
			7B	22					6.1									
21			7A	24					7.5	105.5			0.0	90.7	9.3	3.7E-4		
22		AC	8															
23																		
24																		
25	30"	ST 28"	9															
26																		
27									4.0	97.6	2.67	NP	0.0	92.7	7.3	2.9E-3		34.9
		AC	10															

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
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- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Rad levels measured with Ludlum Model 2 meter. Hole backfilled with cement/bentonite grout.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT: NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **TI-B1**

DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	FIELD SAMPLE RECOVERY DATA								LABORATORY TEST DATA									
28	30"	AC	10		NA													
29						(29.6' - 34.3') Very fine grained sand tailings, abundant clayey zones.												
30	36"	CA 18"	11C	5					13.9									
			11B	5					14.6	91.6						3.0E-7	0.092	
31			11A	4			CL		41.6	76.5	2.69	44/17/27	0.0	30.9	69.1			33.3
32		AC	12				CL		27.8			33/16/17	0.0	46.7	53.3			
33																		
34																		
						(34.3' - ~41') CLAYEY SAND - Loose to medium dense, very moist to wet, very fine-grained clayey sand, increasing clay content with depth.												
35	40"	CA 18"	13C	7														
			13B	20														
36			13A	22		(35' - 36.5') High blow counts due to rock in CA shoe.			21.0	97.3	2.73		0.0	62.5	37.5	1.7E-6	0.059	
		AC	14B															
37																		
		AC	14A															
38																		
39																		
40	42"	CA 18"	15C	3														
			15B	5														
41			15A	5		(~41' - ~45') SANDY CLAY - Very moist to wet sandy clay, sand is very fine-grained.	CL		26.7	98.6		31/15/16	0.0	18.2	81.8	1.2E-7		
42																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Rad levels measured with Ludlum Model 2 meter. Hole backfilled with cement/bentonite grout.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT: NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **TI-B1**

DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	FIELD SAMPLE RECOVERY DATA								LABORATORY TEST DATA									
43	42"	AC	16		NA													
44																		
45	40"	ST 30"	17			(~45' - 54') CLAYEY SAND - Loose to medium dense, very moist to wet, very fine-grained clayey sand, decreasing clay content with depth.			22.0	106.0							.058	34.4
46																		
47																		
48																		
49																		
50	42"	CA 18"	18C	4														
			18B	5														
51			18A	7														
52																		
53																		
54						(54' - 68.2') SILTY CLAY - Dark brown, firm, very moist to wet silty clay, trace to few very fine sand.											
55	60"	CA 18"		6														
			19B	7														
56			19A	10														
57																		

LEGEND:
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- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Rad levels measured with Ludlum Model 2 meter. Hole backfilled with cement/bentonite grout.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT: NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **TI-B1**

DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	FIELD SAMPLE RECOVERY DATA								LABORATORY TEST DATA									
	60"				NA													
58																		
59																		
60	60"	CA 18"	20B	5														
				8														
61			20A	12														
62																		
63																		
64																		
65	60"	CA 18"	21B	5														
				7														
66			21A	11														
67																		
68																		
						(68.2' - E.O.B.) SILTY SAND - Brown, silty, moist very fine to fine sand.											
69																		
70						E.O.B. at 70.0'												
71																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Rad levels measured with Ludlum Model 2 meter. Hole backfilled with cement/bentonite grout.

MWH	CLIENT:	BORING LOG	BOREHOLE ID:
PROJ. LOC.: GALLUP, NM	NECR - PRE DESIGN STUDY INVESTIGATION		**TI-B2**

CONTRACTOR INFORMATION	DRILL RIG INFORMATION		BOREHOLE INFORMATION	
DRILLING COMPANY: NATIONAL	DRILLING RIG: CME 85 HD	BIT TYPE: N/A	CASING DEPTH: N/A	START: 11/20/2013
DRILLER: M. CAIN	DRILLING METHOD: HSA/CC	AUGER O.D.: 8.25"	SURFACE ELEV. (FT): 6959.9	FINISH: 11/21/2013
DRILLER'S HELPER: J. RAMIREZ	HAMMER TYPE: AUTO	HOLE DIAM.: 8.25"	DEPTH TO BEDROCK (FT): 33.5	
LOGGED BY: R. SCHAUT	HAMMER WT: 140 lb	CORE DIAM.: 3.0"	TOTAL DEPTH (FT): 38.7	

FIELD SAMPLE RECOVERY DATA									LABORATORY TEST DATA									
DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	8"					(0" - 3") SILTY CLAY - Brown, soft, silty clay, dry, trace few very fine to fine sand.												
						(3" - 6") ROCK - 1/2" to 3" crushed basalt.												
1		CA 17"	1B	13 11		(6" - ~2.5') SILTY CLAY - Dark brown, hard, slightly moist silty clay, few to little very fine sand, occasional coarse sand.												
2			1A	18		[0' - 5' Core not retained.]												
3						(~2.5' - 7.3') SILTY SAND WITH GRAVEL - Pale yellow, dense, dry to slightly moist silty very fine to medium sand with coarse sand and gravel.												
4																		
5	42"	CA 15"	2B	23 22														
6			2A	18					7.7	100.4	2.68		26.9	29.9	43.2			
7		AC	3															
8		AC	4			(7.3' - 12.8') CLAYEY SAND - Predominantly brown, medium dense, slightly moist to moist clayey fine to medium sand, abundant clay "pockets" throughout. May be sand tailings mixed with site soils.												
9																		
10	40"	CA 18"	5C	6														
			5B	7														
11			5A	7					24.5	75.9	2.73		0.0	65.4	34.6			
12		AC	6															
		AC	7															
13						(12.8' - 15') SAND TAILINGS - Pale gray, moist sand												

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Rad levels measured with Ludlum Model 2 meter. Hole backfilled with cement/bentonite grout.
At 8:30 AM on 11/21/13, water was measured at 38.3' bgs (may be due to overnight precipitation as hole was left open overnight).

MWH

PROJ. LOC.: GALLUP, NM

CLIENT: NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **TI-B2**

DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	40"	AC	7			tailings, very fine silty sand from 12.8' to 13.2', fine to medium sand from 13.2' to 15'.			39.6				0.0	23.1	76.9			
14																		
15	42"	CA 18"	8C	5		(15' - 25.7') SILTY SAND - Brown, medium dense, moist silty very fine to fine sand, occasional roots. Appears to be natural "alluvium." Occasional dark brown clay lenses. Rad levels ~ background.			6.9	90.4	2.68							
			8B	5														
16			8A	7														
		AC	9															
17																		
		AC	10															
18																		
19																		
20	42"	CA 18"	11C	4														
			11B	4														
21			11A	6					7.0	91.4	2.74		0.0	82.9	17.1			
		AC	12															
22																		
		AC	13															
23																		
24																		
25	48"	CA 18"	14C	5														
			14B	6														
26			14A	6		(25.7' - 33.5') SILTY CLAY - Dark brown, moist, firm to hard, silty clay, trace to few very fine to fine sand, occasional coarse sand.	CL		23.5	93.2		34/16/18	0.0	20.9	79.1			
27																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Rad levels measured with Ludlum Model 2 meter. Hole backfilled with cement/bentonite grout.
At 8:30 AM on 11/21/13, water was measured at 38.3' bgs (may be due to overnight precipitation as hole was left open overnight).

MWH

PROJ. LOC.: GALLUP, NM

CLIENT: NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **TI-B2**

DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	FIELD SAMPLE RECOVERY DATA								LABORATORY TEST DATA									
28	48"																	
29																		
30	54"	CA 18"	15C	6														
			15B	11														
31			15A	12														
32						(32' - 33.5') Softer (soft to firm).												
33																		
34						(33.5' - 38.7') WEATHERED SANDSTONE - Mottled pale yellow and reddish orange, moist, fissile, lightly cemented, very fine to fine sand.											
35	48"	NR		50/ 1"														
36																		
37																		
38					16	Bag sample of SS Core.			13.5	X								
39						E.O.B. = 38.7' (Practical Auger Refusal)												
40																		
41																		
42																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Rad levels measured with Ludlum Model 2 meter. Hole backfilled with cement/bentonite grout.
At 8:30 AM on 11/21/13, water was measured at 38.3' bgs (may be due to overnight precipitation as hole was left open overnight).

MWH	CLIENT: NECR - PRE DESIGN STUDY INVESTIGATION	BORING LOG	BOREHOLE ID: TI-B3
PROJ. LOC.: GALLUP, NM			

CONTRACTOR INFORMATION	DRILL RIG INFORMATION		BOREHOLE INFORMATION	
DRILLING COMPANY: NATIONAL	DRILLING RIG: CME 85 HD	BIT TYPE: N/A	CASING DEPTH: N/A	START: 11/19/2013
DRILLER: M. CAIN	DRILLING METHOD: HSA/CC	AUGER O.D.: 8.25"	SURFACE ELEV. (FT): 6968.6	FINISH: 11/19/2013
DRILLER'S HELPER: J. RAMIREZ	HAMMER TYPE: AUTO	HOLE DIAM.: 8.25"	DEPTH TO BEDROCK (FT): N/A	
LOGGED BY: R. SCHAUT	HAMMER WT: 140 lb	CORE DIAM.: 3.0"	TOTAL DEPTH (FT): 70.0	

DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	31"					(0' - 0.8') SANDY CLAY FILL - Brown, hard, slightly moist sandy clay, silty, sand is fine-grained.												
1						(0.8' - 10.8') GRAVELLY SAND FILL - Pale yellow, dense, slightly moist gravelly very fine to medium sand.												
2																		
3																		
4																		
5	33"	CA 7"		18		[Sample loose - not retained.]												
				50/ 6"														
6																		
7																		
8																		
9																		
10	50"	CA 18"	1C	30														
			1B	34														
11			1A	43		(10.8' - 16.8') SILTY SAND FILL - Yellow/orange, dense, moist very fine to fine sand, silty, occasional gravel.			5.1	108.4	2.64		5.4	74.7	19.9			
12																		
13																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cement/bentonite grout. At 7:45 AM on 11/20/14, water was measured at 65.8' bgs.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT: NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **TI-B3**

DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	FIELD SAMPLE RECOVERY DATA								LABORATORY TEST DATA									
	50"																	
14																		
15	38"	CA 18"	2C	18														
			2B	21														
16			2A	28					4.7	105.3								
17						(16.8' - 46.5') SANDY CLAY - Dark brown, firm to hard, moist sandy clay, very fine to fine sand.												
18																		
19																		
20	50"	ST 28.5"	3															
21							CL		16.0	111.1		30/12/18	0.0	32.8	67.2			32.2, 195
22																		
						(22.6' - 26') More sand and gravel.												
23																		
24																		
25	52"	CA 18"	4C	10														
			4B	12														
26			4A	16			CL		12.0	106.8		25/13/12						
27																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cement/bentonite grout. At 7:45 AM on 11/20/14, water was measured at 65.8' bgs.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT:

NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **TI-B3**

DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	FIELD SAMPLE RECOVERY DATA								LABORATORY TEST DATA									
28	52"																	
29																		
30	58"	CA 18"	5C	10														
			5B	10														
31			5A	19					16.1	108.4								
						(31.5' - 36') More sand: Sandy/Silty Clay.												
32																		
33																		
34																		
35	48"	ST 28"	6						10.5									
							SC		14.7	102.2	2.67	23/14/9	2.1	50.2	47.7			33.7, 135
36																		
37																		
38																		
39																		
40	57"	CA 18"	7C	3		(~40') Becomes very moist to wet.												
			7B	7														
41			7A	6					21.5	90.6			0.0	33.8	66.2			
42																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cement/bentonite grout. At 7:45 AM on 11/20/14, water was measured at 65.8' bgs.

MWH	CLIENT: NECR - PRE DESIGN STUDY INVESTIGATION	BORING LOG	BOREHOLE ID: TI-B3
PROJ. LOC.: GALLUP, NM			

DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	FIELD SAMPLE RECOVERY DATA								LABORATORY TEST DATA									
43	57"																	
44																		
45	48"	CA 17"		6														
			8B	7					17.0	110.1								29.3, 293
46			8A	12					18.0	104.8		28/13/15						
						(46.5' - ~55') SILTY/CLAYEY SAND - Brown, loose, very moist to wet, silty/clayey very fine sand.												
47																		
48																		
49																		
50	27"	CA 17"	9C	2		["B" and "C" samples are best.]												
			9B	3														
51			9A	6														
52																		
53																		
54																		
55	30"	ST 24"		10		(~55' - 57.3') SILTY CLAY - Dark brown, firm to hard, wet silty clay, few to little very fine sand.												
56																		
57							CL		22.1	105.3	2.72	43/14/29	0.0	11.7	88.3			22.2, 494

LEGEND:
CA = CALIFORNIA SAMPLE (2-INCH OD)
ST = SHELBY TUBE (3-INCH OD)
AC = ACRYLIC LINER
HSA = HOLLOW-STEM AUGER
CC = CONTINUOUS CORE
NR = NO RECOVERY

NOTES:
Hole backfilled with cement/bentonite grout. At 7:45 AM on 11/20/14, water was measured at 65.8' bgs.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT:

NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **TI-B3**

DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	FIELD SAMPLE RECOVERY DATA								LABORATORY TEST DATA									
	30"					(57.3' - 61.9') SILTY SAND - Brown, loose, wet, silty very fine to fine sand.												
58																		
59																		
60	33"	CA 18"	11C	3														
			11B	5														
61			11A	4					25.8	99.0			0.0	22.0	78.0			
62						(61.9' - E.O.B.) SILTY CLAY - Dark brown, firm to hard, wet silty clay, trace to few very fine to fine sand.												
63																		
64																		
65	32"	ST 28"	12															
66																		
67																		
68																		
69																		
70						E.O.B. at 70'												
71																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cement/bentonite grout. At 7:45 AM on 11/20/14, water was measured at 65.8' bgs.

MWH	CLIENT:	BORING LOG	BOREHOLE ID:
PROJ. LOC.: GALLUP, NM	NECR - PRE DESIGN STUDY INVESTIGATION		**TI-B8**

CONTRACTOR INFORMATION	DRILL RIG INFORMATION		BOREHOLE INFORMATION	
DRILLING COMPANY: NATIONAL	DRILLING RIG: CME 85 HD	BIT TYPE: N/A	CASING DEPTH: N/A	START: 12/3/2013
DRILLER: M. CAIN	DRILLING METHOD: HSA/CC	AUGER O.D.: 8.25"	SURFACE ELEV. (FT): 6976.1	FINISH: 12/4/2013
DRILLER'S HELPER: L. ALDAZ	HAMMER TYPE: AUTO	HOLE DIAM.: 8.25"	DEPTH TO BEDROCK (FT): 60.5	
LOGGED BY: R. SCHAUT	HAMMER WT: 140 lb	CORE DIAM.: 3.0"	TOTAL DEPTH (FT): 65.5	

DEPTH (FT)	FIELD SAMPLE RECOVERY DATA: CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	LABORATORY TEST DATA: WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
						(0' - ~7') SANDY CLAY - Dark brown, slightly moist sandy clay, silty, sand is very fine to fine-grained, occasional coarse sand and fine gravel.												
1						(0' - 20' No sampling. Material descriptions based on cuttings and should be considered approximate.)												
2																		
3																		
4																		
5																		
6																		
7						(~7' - ~18') SAND TAILINGS - Predominantly pale yellowish brown, fine to medium grained, slightly moist, some clayey material.												
8																		
9																		
10																		
11																		
12																		
13																		

LEGEND:
CA = CALIFORNIA SAMPLE (2-INCH OD)
ST = SHELBY TUBE (3-INCH OD)
AC = ACRYLIC LINER
HSA = HOLLOW-STEM AUGER
CC = CONTINUOUS CORE
NR = NO RECOVERY

NOTES:
Hole backfilled with cement/bentonite grout.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT: NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **TI-B8**

DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
						FIELD SAMPLE RECOVERY DATA			LABORATORY TEST DATA									
14																		
15																		
16																		
17																		
18						(~18' - 20.7') SANDY CLAY - Dark brown, firm to hard, slighly moist sandy clay, very fine to fine sand, few to little coarse sand and fine gravel.												
19																		
20	36"					Begin sampling at 20'												
		AC	8			(20.7' - 26.3') SAND TAILINGS - Pale yellow, medium dense, slightly moist to moist, fine to medium sand tailings, silty.												
21																		
22																		
23																		
24																		
25	54"	CA 18"	2C	7					9.0	103.7	2.72							
			2B	7					6.2	99.6			0.0	87.9	12.7	3.6E-4		
26			2A	10			SM		16.8	91.7		NP	0.0	76.0	24.0			
		AC	3B			(26.3' - ~31') FINE TAILINGS - Soft to firm, moist. (26.3' - 28.8') - Pale yellowish brown, few to little very fine sand.												
27		AC	3A															

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cement/bentonite grout.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT: NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **TI-B8**

DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
28	54"	AC	3A															
29						(28.8' - 31') Pale gray, no sand.												
30	24"	ST 23"	4				CH		61.8	62.7		74/25/49	0.0	9.2	90.8		0.43	
31						(~31' - ~32.5') SAND TAILINGS - Pale yellowish brown, medium dense, moist, fine to medium sand, trace silt.			41.4									
32																		
33		AC	5			(~32.5' - 35') FINE TAILINGS WITH SAND - Pale gray, soft, moist, very fine to fine sand.												
34																		
35	30"	ST 28"	6			(35' - 38.6') CLAYEY/SILTY SAND TAILINGS - Pale yellowish gray, soft, moist, very fine to fine sand.			14.3	90.9	2.66							
									16.5	89.6	2.67					1.6E-5		
36																		
37																		
38		AC	7															
39						(38.6' - 44.5') FINE TAILINGS - Pale gray, firm, moist, trace to few very fine sand.												
40	37"	ST 27"	8															
41									39.7	80.4	2.63							
							SC / CL		34.3	83.6		35/16/19	0.0	51.2	48.8	1.3E-7	0.262	
42																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cement/bentonite grout.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT: NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **TI-B8**

DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	FIELD SAMPLE RECOVERY DATA								LABORATORY TEST DATA									
	37"	AC	9			(42.5' - 43.7') More sand (little to some).												
43									29.3	92.3								
44									43.3	74.8			0.0	14.5	85.5	3.0E-8		
						(44.5' - 60.5') SILTY/CLAYEY SAND - Predominantly yellowish brown, medium dense, moist silty/clayey very fine to fine sand with abundant clay zones (as shown), occasional coarse sand throughout.					2.60						
45	48"	CA 18"	10C	6		(44.5' - 47.5') Silty clay with sand.												
			10B	9														
46			10A	10			CL		21.9	95.2	2.72	30/16/14	0.0	27.9	72.1			
47																		
48																		
49						(49' - 50') Reddish brown.												
50	40"	CA 18"		9														
			11B	10														
51			11A	12														
52																		
53						(53.4' - 55') Silty clay with sand.												
54																		
55	42"	CA 18"	12C	8														
			12B	8														
56			12A	8			SM		12.6	97.6	2.70	NP	0.0	57.0	43.0			
57																		

LEGEND:
CA = CALIFORNIA SAMPLE (2-INCH OD)
ST = SHELBY TUBE (3-INCH OD)
AC = ACRYLIC LINER
HSA = HOLLOW-STEM AUGER
CC = CONTINUOUS CORE
NR = NO RECOVERY

NOTES:
Hole backfilled with cement/bentonite grout.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT: NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **TI-B8**

DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	FIELD SAMPLE RECOVERY DATA								LABORATORY TEST DATA									
	42"																	
58																		
59						(58.7' - 59.5') Silty clay with sand.												
						(59.5' - 60') Reddish brown, fine to medium sand.												
60	48"	CA 18"	13C	16														
			13B	22		(60.5' - 61') COAL - sandy.												
61			13A	50/ 4"		(61' - E.O.B.) SHALE - Dark grayish brown, hard to very hard, moist, silty, trace very fine sand.												
62																		
63																		
					14	(bagged core)												
64	12"					At 64' - becomes fissile, very hard, brittle, more sand (few to little).												
65		CA 2"	15	50/ 2"		65.2' E.O.B. (Practical Auger Refusal at 65.0')												
66																		
67																		
68																		
69																		
70																		
71																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cement/bentonite grout.

MWH	CLIENT:	BORING LOG	BOREHOLE ID:
PROJ. LOC.: GALLUP, NM	NECR - PRE DESIGN STUDY INVESTIGATION		**TI-B10**

CONTRACTOR INFORMATION	DRILL RIG INFORMATION		BOREHOLE INFORMATION	
DRILLING COMPANY: NATIONAL	DRILLING RIG: CME 85 HD	BIT TYPE: N/A	CASING DEPTH: N/A	START: 11/26/2013
DRILLER: M. CAIN	DRILLING METHOD: HSA/CC	AUGER O.D.: 8.25"	SURFACE ELEV. (FT): 6973.3	FINISH: 11/27/2013
DRILLER'S HELPER: J. RAMIREZ	HAMMER TYPE: AUTO	HOLE DIAM.: 8.25"	DEPTH TO BEDROCK (FT): 105.0	
LOGGED BY: R. SCHAUT	HAMMER WT: 140 lb	CORE DIAM.: 3.0"	TOTAL DEPTH (FT): 108.2	

DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	FIELD SAMPLE RECOVERY DATA								LABORATORY TEST DATA									
	21"					(0' - 0.6') SANDY CLAY - Light brown, soft, very moist sandy clay, very fine sand, some roots, silty.												
						(0.6' - 0.9') ROCK - 1/2" to 3" crushed basalt.												
1						(0.9' - 6.8') SANDY CLAY - Dark brown, hard, slighly moist to moist sandy clay, very fine to fine sand, occasional coarse sand to fine gravel, silty.												
2																		
3																		
4																		
5	45"	CA 17"		12														
			1B	13														
6			1A	19														
7						(6.8' - 18.9') SILTY SAND TAILINGS - Pale yellowish gray, loose to medium dense, moist, fine to medium, silty sand tailings, occasional more clayey/silty zones.												
8																		
9																		
10	33"	ST 27.5"	2						9.7	110.0	2.63							
									9.0	96.8			0.2	71.9	27.9	4.3E-4	0.094	
11																		
12																		
		AC	3						6.7		2.61							
13									7.5	99.1			0.7	71.5	27.8	6.7E-5		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cement/bentonite grout.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT: NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **TI-B10**

DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
14	33"	AC	3															
15	42"	CA 18"	4C	5					9.3	103.0								
			4B	5														
16			4A	5			SM		6.5	100.0	2.65	NP	2.4	82.3	15.3			
		AC	5B															
17																		
		AC	5A															
18																		
19						(18.9' - 24.4') FINE TAILINGS - Pale gray, soft, moist, trace to few fine to medium sand.													
20	36"	ST 30"	6															
21							CL		26.7	92.9		43/19/24	0.0	43.0	57.0		0.111	
22		AC	7															
23																		
24																		
						(24.4' - 25.7') SAND TAILINGS - Pale yellowish gray, loose, moist to very moist, fine to medium sand.													
25	42"	CA 18"	8C	2														
			8B	2														
26			8A	3		(25.7' - ~31') FINE TAILINGS - Pale gray, soft, moist to very moist, trace to few fine to medium sand.	CH		41.0 57.4	64.3	2.80	74/27/47	0.0	10.0	90.0			
		AC	9B															
27																		
		AC	9A															

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cement/bentonite grout.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT: NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **TI-B10**

DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
28	42"	AC	9A															
29																		
30	42"	ST 27"	10				CH		45.3	73.4	2.78	57/22/35	0.0	24.3	75.7			
31						(~31' - 33.2') SAND TAILINGS - See description for 24.4' - 25.7'.												
32							SM		15.4	100.1	2.67	NP	0.0	83.1	16.9			
		AC	11															
33						(33.2' - 44.6') FINE TAILINGS - Pale gray, soft, moist to very moist.												
34																		
35	48"	CA 18"	12C	2					47.7	72.5								
			12B	2					51.4									
36			12A	2			SC / CL		32.2	87.8	2.72	36/16/20	0.0	50.6	49.4			
		AC	13B			(36.3' - 37.8') Some very fine to fine sand.												
37																		
		AC	13A															
38																		
39																		
40	30"	ST 30"	14						45.7	73.7	2.56							
							CH		47.2	74.5		61/21/40	0.0	20.7	79.3	2.9E-8	0.315	
41																		
42																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cement/bentonite grout.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT: NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **TI-B10**

DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
						FIELD SAMPLE RECOVERY DATA			LABORATORY TEST DATA									
43	30"	ST 30" AC	14 15															
44						(44.3' - 44.6') Appears finer grained (clayey), lighter gray, more moist.												
						(44.6' - 85.5') SILTY SAND - Light brown, medium dense, moist, silty very fine to fine sand, occasional coarse sand and fine gravel.												
45	42"	CA 17"	16B	12 12														
46			16A	14					9.9	95.4	2.74		0.0	65.8	34.2			
47																		
48																		
49																		
50	48"	CA 18"	17B	10														
			17A	11														
51				14														
52																		
53																		
54																		
55	42"	ST 17"	18						14.1	100.8						2.4E-5	0.139	
56						(~56' - 57.5') Gravelly.												
						(Shelby Tube refusal at 56.5')												
57																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cement/bentonite grout.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT: NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **TI-B10**

DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	FIELD SAMPLE RECOVERY DATA								LABORATORY TEST DATA									
58	42"																	
59																		
60	39"	CA 18"		11														
			19B	11														
61			19A	14														
62						(62.5' - 65.2') Weathered Sandstone (?) - Hard, moist, gravelly.												
63																		
64																		
65	48"	CA 18"		14														
			20B	14														
66			20A	15			SM / ML		13.8	94.5		NP	0.0	50.1	49.9			
67																		
68																		
69																		
70	30"	CA 18"		4														
			21B	6		(70.5' - 71.5') Moist to very moist, increased clay.												
71			21A	10					18.1	100.8								

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cement/bentonite grout.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT:

NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **TI-B10**

DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	FIELD SAMPLE RECOVERY DATA								LABORATORY TEST DATA									
72	30"																	
73																		
74																		
75	42"	CA 18"		5														
			22B	7														
76			22A	11														
77																		
78																		
79																		
80	36"	CA 18"		9		(80' - 82') Gravelly (sandstone fragments)												
			23B	14														
81			23A	17														
82						(82' - 85.5') Weathered Sandstone - Mottled red/gray/brown, moist, fine to medium weathered sandstone.												
83																		
84	NA	3"	24	50/3"														
85	50"																	
86						(85.5' - 105') CLAYEY SAND - Dark brown, firm, very moist to wet, fine to medium clayey sand, occasional sandstone fragments.												

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cement/bentonite grout.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT: NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **TI-B10**

DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	FIELD SAMPLE RECOVERY DATA								LABORATORY TEST DATA									
	50"																	
87																		
88																		
89																		
90	40"	CA 18"		7		[CA sampler wet 11/26/13.] [Water measured at approximately 90.2' bgs at 9:30 11/27/13.]												
			25B	12														
91			25A	10					18.6	105.6	2.66							
92																		
						[Core barrel wet 11/27/13.]												
93																		
94																		
95	52"	NR		1														
				5														
96				8														
97																		
						[Core barrel wet.]												
98																		
99																		
100	44"																	
101																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cement/bentonite grout.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT: NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **TI-B10**

DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	FIELD SAMPLE RECOVERY DATA								LABORATORY TEST DATA									
	44"																	
102						[Core barrel wet.]												
103																		
104																		
105	36"					(105' - E.O.B.) WEATHERED SANDSTONE - Pale yellowish brown, very dense, very moist, very fine to fine sandstone, some cemented zones.												
106						[Core barrel wet.]												
107					26	(106.9' - 107.3') Bagged core sample.			14.2	109.1						1.4E-7		
108		1"		50/ 1.5"	27	(107.9' - 108') Bagged core sample. (108') CA sample not retained.												
						E.O.B. = 108.2 ft at 9:00 on 11/27/13 (practical auger refusal)												
109																		
110																		
111																		
112																		
113																		
114																		
115																		

LEGEND:
CA = CALIFORNIA SAMPLE (2-INCH OD)
ST = SHELBY TUBE (3-INCH OD)
AC = ACRYLIC LINER
HSA = HOLLOW-STEM AUGER
CC = CONTINUOUS CORE
NR = NO RECOVERY

NOTES:
Hole backfilled with cement/bentonite grout.

MWH	CLIENT:	BORING LOG	BOREHOLE ID:
PROJ. LOC.: GALLUP, NM	NECR - PRE DESIGN STUDY INVESTIGATION		**TI-B11**

CONTRACTOR INFORMATION	DRILL RIG INFORMATION		BOREHOLE INFORMATION	
DRILLING COMPANY: NATIONAL	DRILLING RIG: CME 85 HD	BIT TYPE: N/A	CASING DEPTH: N/A	START: 12/2/2013
DRILLER: M. CAIN	DRILLING METHOD: HSA/CC	AUGER O.D.: 8.25"	SURFACE ELEV. (FT): 6977.3	FINISH: 12/3/2013
DRILLER'S HELPER: J. RAMIREZ	HAMMER TYPE: AUTO	HOLE DIAM.: 8.25"	DEPTH TO BEDROCK (FT): 96.9	
LOGGED BY: R. SCHAUT	HAMMER WT: 140 lb	CORE DIAM.: 3.0"	TOTAL DEPTH (FT): 103.0	

FIELD SAMPLE RECOVERY DATA									LABORATORY TEST DATA									
DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	19"					(0' - 0.6') SANDY CLAY - Brown, soft, moist to very moist sandy clay, very fine to fine sand, roots, silty.												
1						(0.6' - 0.9') ROCK - 1/2" to 3" crushed basalt, silty clay in voids.												
						(0.9' - 10.3') SANDY CLAY - Dark brown, hard, slightly moist sandy clay, very fine to fine sand, occasional coarse sand and gravel up to 1.5".												
2																		
3																		
4																		
5	30"	CA 17"	1C	12														
			1B	16														
6			1A	15					8.6	93.5								
7																		
8																		
9																		
10	42"	CA 18"	2C	7														
			2B	7		(10.3' - 12') SILTY SAND - Light brown, medium dense, slightly moist, silty very fine to fine sand.												
11			2A	8														
12						(12' - 15') SANDY CLAY - Dark brown, firm to hard, slightly moist sandy clay, very fine to fine sand, occasional gravel up to 3" size.												
13																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cement/bentonite grout.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT: NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **TI-B11**

DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	FIELD SAMPLE RECOVERY DATA								LABORATORY TEST DATA									
14	42"																	
15	45"	ST 13"	3			(15' - 18') CLAYEY SAND - Light yellowish brown, medium dense, slightly moist, fine to medium clayey sand, occasional gravel up to 1".			8.2	110.4	2.67		3.9	57.6	38.5	2.5E-5	0.09	
16																		
17																		
18						(18' - 32.9') SANDY CLAY - Predominantly dark brown, hard, slighly moist sandy clay, silty, very fine to medium sand, few to little coarse sand and gravel up to ~1" size.												
19						(19.2' - 19.4') Sand, very fine to fine.												
20	48"	CA 18"	4C	4														
			4B	7														
21			4A	10					12.3	107.6								
22																		
23																		
24																		
25	56"	CA 18"	5C	7														
			5B	8														
26			5A	13														
27																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cement/bentonite grout.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT: NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **TI-B11**

DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	FIELD SAMPLE RECOVERY DATA								LABORATORY TEST DATA									
28	56"																	
29																		
30	47"	ST 21"	6				CL		13.7	112.4		30/13/17	7.1	41.3	51.6	9.0E-7	0.06	
31																		
32																		
33						(32.9' - 34') SAND (TAILINGS?) - Pale yellowish gray, slightly moist, fine to medium sand.													
34	NA					(34' - 45.5') SANDY CLAY WITH GRAVEL - Dark brown, firm to hard, moist sandy clay with very fine to coarse sand and gravel up to ~3", some metallic and fibrous debris.												
35						[34' - 38' Drilling through metallic debris (appers to be metal siding). Center bit required to penetrate debris. No core collected. CA sample attempted at 34' and 35' - no penetration or recovery.]												
36																		
37																		
38																		
39																		
40	51"	CA 3"		25		[Metallic debris in CA shoe - no sample.]												
				27														
41				22														
42																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cement/bentonite grout.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT:

NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **TI-B11**

DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	FIELD SAMPLE RECOVERY DATA								LABORATORY TEST DATA									
43	51"																	
44																		
45	60"	CA 18"	7C	7		(Photo 310 at 46'.)												
			7B	7		(45.5' - 53.9') FINE TAILINGS - Mottled orange and dark greenish gray (to 50'), pale yellowish gray (50' - 53.9'), firm, moist tailings.			88.7									
46			7A	8		[Photo 311 at 46.5'.]												
47																		
48																		
49																		
50	43"	ST 28"	8															
51							CH		59.9	63.7	2.84	91/30/61	0.0	2.7	97.3	3.1E-8	0.48	
52																		
		AC	9			[Photo 312 at 52.5']												
53																		
54						(53.9' - 55') SILTY CLAY - Dark brown, hard, moist silty clay, trace very fine sand.												
55	48"	ST 25"	10			(55' - 77.5') SILTY SAND - Yellowish brown, medium dense, slighly moist to moist, silty, very fine to fine sand.												
56							SM		16.2	77.9	2.64	NP	0.0	60.4	39.6	5.6E-4	0.129	
57																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cement/bentonite grout.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT: NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **TI-B11**

DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	FIELD SAMPLE RECOVERY DATA								LABORATORY TEST DATA									
	48"																	
		AC	11															
58																		
59																		
60	48"	CA 17"		9														
			12B	11														
61			12A	12		(61.1' - 62.1') Sandy clay.			16.0	95.4			0.0	38.7	61.3			
62																		
63						(63.1' - 64') Sandy clay.												
64																		
65	49"	CA 18"	13C	7														
			13B	7														
66			13A	12					14.2	96.2								
67																		
68																		
69																		
70	44"	CA 18"	14C	7														
			14B	9														
71			14A	10														

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cement/bentonite grout.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT: NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **TI-B11**

DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	FIELD SAMPLE RECOVERY DATA								LABORATORY TEST DATA									
72	44"																	
						(71.5' - 73.5') Abundant clayey sand zones.												
73																		
74																		
75	38"	CA 18"	15C	7														
			15B	8														
76			15A	11														
77																		
					16	(77.5' - 78') WEATHERED SANDSTONE - Rusty red, moist, fine to medium grained. (Sample #16 is bagged core.)												
78						(78' - 96.9') GRAVELLY SAND - Mottled rusty red/brown/yellow, dense, moist fine to medium sand, silty throughout, some clayey zones, abundant coarse material from coarse sand up to 3" gravel comprised of cemented sandstone.												
79																		
80	42"	CA 18"	17C	16														
			17B	21														
81			17A	21					11.0	107.6	2.76		12.9	65.6	21.5			
82																		
83																		
84																		
85	36"	CA 17"	18C	18														
			18B	21														
86			18A	19														

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cement/bentonite grout.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT: NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **TI-B11**

DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	FIELD SAMPLE RECOVERY DATA								LABORATORY TEST DATA									
	36"																	
87						(~86.7' - 87.2) Clayey.												
88																		
89																		
90	48"	NR		3		(~90' to 96.9') Becomes very moist to wet.												
				5														
91				6														
92						(92' - 92.5') Clayey.												
						[Core barrel is wet.]												
93																		
94																		
95	55"	CA 14"	19B	13														
			19A	20														
96				18														
97						(96.9' - E.O.B.) WEATHERED SANDSTONE - Pale yellowish brown, very dense, moist to very moist, fissile, fine-grained, weakly cemented.											
98					21	(98' - 98.3') Bagged core sample.												
99																		
100		CA 2"	20A	50/ 2"					21.1	103.9						1.3E-5		
101																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cement/bentonite grout.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT:

NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **TI-B11**

DEPTH (FT)	FIELD SAMPLE RECOVERY DATA: CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	LABORATORY TEST DATA: WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
102						(102.5' - 103') Reddish brown, strongly cemented sandstone.												
103						E.O.B. at 103.0' at 10:00 (practical auger refusal)												
104																		
105																		
106																		
107																		
108																		
109																		
110																		
111																		
112																		
113																		
114																		
115																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cement/bentonite grout.

MWH	CLIENT:	BORING LOG	BOREHOLE ID:
PROJ. LOC.: GALLUP, NM	NECR - PRE DESIGN STUDY INVESTIGATION		**TI-B15**

CONTRACTOR INFORMATION	**DRILL RIG INFORMATION**		**BOREHOLE INFORMATION**	
DRILLING COMPANY: NATIONAL	DRILLING RIG: CME 85 HD	BIT TYPE: N/A	CASING DEPTH: N/A	START: 12/5/2013
DRILLER: M. CAIN	DRILLING METHOD: HSA/CC	AUGER O.D.: 8.25"	SURFACE ELEV. (FT): 6976.8	FINISH: 12/5/2013
DRILLER'S HELPER: L. ALDAZ	HAMMER TYPE: AUTO	HOLE DIAM.: 8.25"	DEPTH TO BEDROCK (FT): N/A	
LOGGED BY: R. SCHAUT	HAMMER WT: 140 lb	CORE DIAM.: 3.0"	TOTAL DEPTH (FT): 71.5	

FIELD SAMPLE RECOVERY DATA									LABORATORY TEST DATA									
DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	18"					(0' - 0.5') SANDY CLAY - Brown, soft, moist to very moist sandy clay, very find sand, roots.												
						(0.5' - 0.8') ROCK - Crushed basalt, up to 3" size, sandy clay in voids.												
1						(0.8' - ~3') SANDY CLAY - Dark yellowish brown, hard, moist sandy clay, very fine to fine sand.												
2																		
3						(~3' - 30') SILTY SAND TAILINGS - Pale yellowish gray, loose to medium dense, moist, fine to medium sand.												
4																		
5	30"	CA 18"	1C	10														
			1B	11														
6			1A	12					5.4	101.1			0.0	87.5	12.5			
		AC	2															
7																		
8																		
9																		
10	30"	CA 18"		3														
			3B	3														
11			3A	3					6.8	93.8								
		AC	4															
12																		
13																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cement/bentonite grout.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT: NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **TI-B15**

DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	30"	AC	4			(13.5' - 13.8') Silty sand tailings.	SM		19.0		2.68	NP	0.0	69.6	30.4			
14																		
15	32"	ST 27"	5				SM		14.2	90.4	2.66	NP	0.0	54.9	15.1	8.3E-4	0.126	
16																		
17																		
		AC	6															
18																		
19																		
						(~19.5' to ~25') Becomes slightly finer grained (very fine to medium sand), slightly clayey.											
20	28"	CA 18"	7C	3														
			7B	2														
21			7A	4			SM		12.7	99.8	2.68	NP	0.0	80.6	19.4			
		AC	8															
22																		
23																		
24																		
25	27"	ST 23"	9															
26																		
27		AC	10			(~27' and below) Becomes clayey.												

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cement/bentonite grout.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT: NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **TI-B15**

DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
28	27"	AC	10			(~28.5' - 30') Very fine to fine sand	SM		19.3		2.66	NP	0.0	65.4	34.6			
29																		
30	36"	CA 18"	11C	6		(30' - ~32') SILTY SAND - Dark brown, medium dense, moist silty sand, very fine to fine sand.												
			11B	7														
31			11A	10			SM		22.3 17.1	101.8	2.71	NP	6.2	51.9	41.9			
32		AC	12			(~32' - 38') SILTY CLAY - Dark brown, firm to hard, moist silty clay, trace to few very fine to fine sand.												
33																		
34																		
35	40"	CA 18"	13C	8														
			13B	12														
36			13A	15														
37																		
38						(38' - 45') CLAYEY SAND - Yellowish brown, medium dense, moist clayey very fine to fine sand, silty, occasional 1-6" sandy clay zones.												
39																		
40	48"	CA 18"		10														
			14B	9														
41			14A	12					11.4	87.1								
42																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cement/bentonite grout.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT: NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **TI-B15**

DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	FIELD SAMPLE RECOVERY DATA								LABORATORY TEST DATA									
43	48"																	
44																		
45	26"	CA 18"	15C	13		(45' - 50') SANDY SILT - Dark yellowish brown, hard, moist, very fine to fine sand, occasional clayey sand zones.												
			15B	25														
46			15A	26					25.8									
									17.3	99.3	2.81	NP	0.0	37.0	63.0			
47																		
48																		
49																		
50	24"	CA 18"	16C	6		(50' - 52') CLAYEY SAND - Yellowish brown, medium dense, moist, very fine to fine sand, silty.												
			16B	8														
51			16A	11														
52						(52' - 65') SILTY CLAY - Dark yellowish brown, firm to hard, moist silty clay, trace to few very fine to fine sand, occasional thin (1-6") clayey sand zones.												
53						(~53' - 55') Very hard, very dense clay.												
54																		
55	18"	CA 18"	17C	10														
			17B	11														
56			17A	12					11.7	104.2								
57																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cement/bentonite grout.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT:

NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **TI-B15**

DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	FIELD SAMPLE RECOVERY DATA								LABORATORY TEST DATA									
	18"																	
58																		
59																		
60	60"	CA 18"	18C	8														
			18B	11														
61			18A	15														
62																		
63																		
64																		
65	40"	CA 18"		6		(65' - E.O.B.) CLAYEY SAND - Yellowish brown, medium dense, moist, very fine to fine clayey sand, silty, occasional 1-3" zones of sandy clay.												
			19B	8														
66			19A	10					12.7	100.7								
67																		
68																		
69																		
70		CA 18"		7														
			20B	6														
71			20A	9														
						E.O.B. 71.5' at 14:30												

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cement/bentonite grout.

MWH	CLIENT:	BORING LOG	BOREHOLE ID:
PROJ. LOC.: GALLUP, NM	NECR - PRE DESIGN STUDY INVESTIGATION		TI-B23

CONTRACTOR INFORMATION	DRILL RIG INFORMATION		BOREHOLE INFORMATION	
DRILLING COMPANY: NATIONAL	DRILLING RIG: CME 85 HD	BIT TYPE: N/A	CASING DEPTH: N/A	START: 12/6/2013
DRILLER: M. CAIN	DRILLING METHOD: HSA/CC	AUGER O.D.: 8.25"	SURFACE ELEV. (FT): 6959.3	FINISH: 12/6/2013
DRILLER'S HELPER: L. ALDAZ	HAMMER TYPE: AUTO	HOLE DIAM.: 8.25"	DEPTH TO BEDROCK (FT): 43.0	
LOGGED BY: R. SCHAUT	HAMMER WT: 140 lb	CORE DIAM.: 3.0"	TOTAL DEPTH (FT): 70.5	

DEPTH (FT)	FIELD SAMPLE RECOVERY DATA: CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	LABORATORY TEST DATA: WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	39"					(0' - 0.6') SANDY CLAY - Light brown, soft, moist, very fine to fine sand, roots.												
1						(0.6' - 0.9') ROCK - Crushed basalt, 1/2" - 3", sandy clay in voids.												
2						(0.9' - 5') SANDY CLAY - Firm to hard, slighly moist to moist, sandy clay, very fine to fine sand, occasional coarse sand and very fine gravel.												
3																		
4																		
5	44"	CA 18"	1C	12		(5' - 7') SILTY SAND WITH GRAVEL - Light brown, medium dense, slightly moist to moist, silty very fine to fine sand with little to some gravel to 2".												
			1B	14														
6			1A	10														
7						(7' - 13.4') SANDY CLAY - See 0.9' to 5' above.												
8																		
9																		
10	42"	CA 16"		5														
			2B	4														
11			2A	6														
12																		
13																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cement/bentonite grout.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT: NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **TI-B23**

DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	42"					(13.4' - 14.2') FINE TAILINGS WITH SAND - Pale gray, soft to firm, moist with very fine to fine sand tailings.												
14						(14.2' - ~16') SILTY SAND TAILINGS - Pale yellowish gray, loose, moist, fine to medium sand.												
15	25"	ST 28"	3						20.7	87.7	2.77		0.0	62.8	37.2			
16						(~16' - 20.3') SANDY CLAY - Dark yellowish brown, firm, moist, very fine to fine sand.												
17									22.5	101.9	2.73		0.0	31.1	68.9			
		AC	4															
18																		
19																		
20	36"	CA 18"	5C	5														
			5B	6		(20.3' - 23') SILTY SAND - Yellowish brown, medium dense, moist, silty very fine to fine sand.												
21			5A	7														
22																		
23						(23' - 38.6') SILTY CLAY - Predominantly dark yellowish brown, firm to hard, moist silty clay with varying amount of sand as shown, occasional coarse sand to very fine gravel throughout.												
24						(23' - 27.5') Trace to few sand.												
25	39"	ST 30"	6															
26							CL		21.6	101.7	2.73	49/18/31	0.0	8.8	91.2		0.05	
27						(27.5' - 30') Little to some sand.												

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cement/bentonite grout.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT: NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **TI-B23**

DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	FIELD SAMPLE RECOVERY DATA								LABORATORY TEST DATA									
28	39"																	
29																		
30	44"	CA 18"		5		(30' - 30.5') Gravelly.												
			7B	6		(30.5' - ~33.5') Little to some sand.												
31			7A	8														
32																		
33																		
						(~33.5' - ~34.3') Clayey sand, very fine to fine.												
34						(~34.3' - 38.6') Few to little sand.												
35	42"	ST 28"	8															
36																		
37																		
38																		
39						(38.6' - 40.3') CLAYEY SAND - Yellowish brown, medium dense, moist, very fine to fine sand, silty.												
40	25"	CA 18"		6														
			9B	9		(40.3' - 43') SILTY CLAY WITH SAND - Dark yellowish brown, firm to hard, moist, silty clay with little to some very fine to fine sand.												
41			9A	12														
42																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cement/bentonite grout.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT: NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **TI-B23**

DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	FIELD SAMPLE RECOVERY DATA								LABORATORY TEST DATA									
	25"																	
43						(43' - 65.5') SANDSTONE - Mostly very pale yellowish gray, moist, mostly non-or weakly cemented very fine to fine sand, some very hard, strongly cemented, fissile zones as shown, some clay zones as shown ("Zone 3"?).												
44						(43' - 43.6') Strongly cemented, fissile.												
						(43.6' - 44') Clay - yellowish brown, firm to hard, moist, slightly silty.												
45	32"	CA 8"	10A	13		(44' - 45.5') strongly cemented, fissile.			13.8	108.7						2.4E-7		
				50/ 3"		(45.5' - 46.2') Clayey sand, yellowish brown.												
46																		
47						(~47' - ~48') Very hard, strongly cemented, fissile.												
	16"																	
48																		
49		CA NR		50/ 4"														
50	29"																	
51																		
52																		
53																		
54																		
55	33"	CA 3"	11A	50/ 5"		(~55' - 63') Coarser (fine to medium).												
56						(~56' - 56.8') Color is reddish yellow.												
57																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cement/bentonite grout.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT: NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **TI-B23**

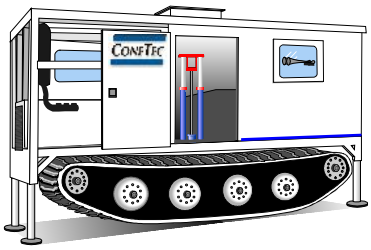
DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	FIELD SAMPLE RECOVERY DATA								LABORATORY TEST DATA									
58	33"																	
59																		
60	24"	CA 3"	12A	50/ 4"														
61																		
62																		
63						(~63 - 65.5') COAL - Black, hard, dry to slightly moist, fissile.												
64																		
65	30"	CA 13"	13B	24														
66			13A	50/ 4.5"		(65.5' - E.O.B.) SHALE - Gray, very hard, slightly moist shale, trace silt, non- to weakly-cemented ("Zone 2"?).			10.2	103.0						9.7E-8		
67																		
68																		
69																		
70		CA 4"	14	50/ 5"														
71						E.O.B. 70.5' @ 13:50												

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cement/bentonite grout.

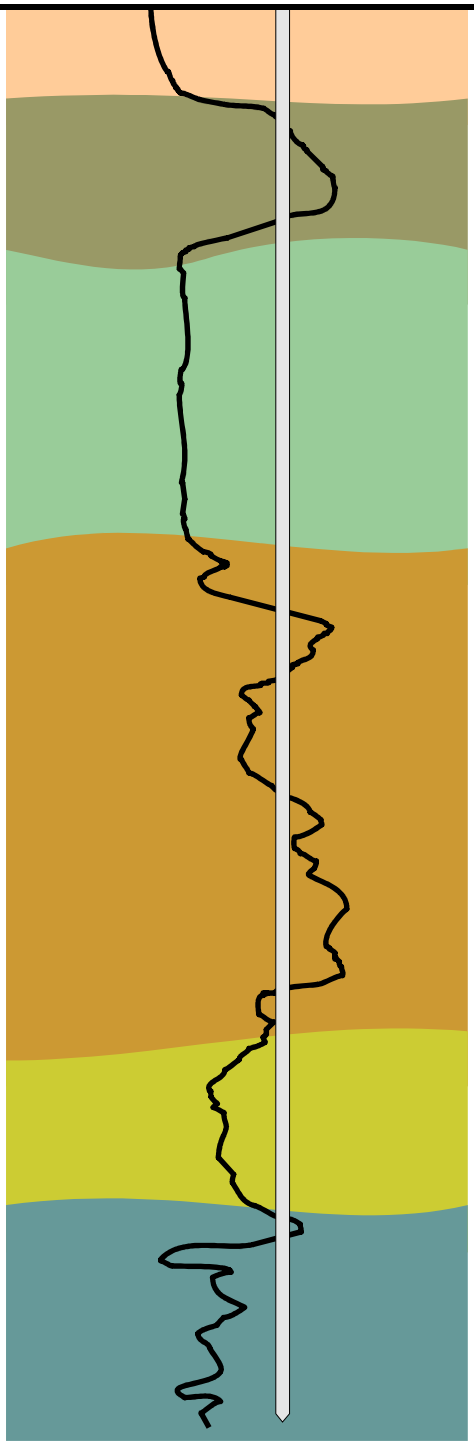
APPENDIX B2.4

TAILINGS IMPOUNDMENT CONE PENETRATION TEST RESULTS



CONETEC

Geotechnical, Environmental and Marine Site Investigation Services



Cone Penetration Test Data

Church Rock Mill Site TSF
Near Gallup, New Mexico

November 5 - 10, 2013

Prepared for:

MWH Americas, Inc.
Ft. Collins, Colorado

- November 15, 2013 -

Salt Lake City, UT • West Berlin, NJ • Richmond, VA • Raleigh, NC
Vancouver, BC • Edmonton, AB • Fort McMurray, AB • Toronto, ON • Lima, Peru

CONE PENETRATION TEST DATA

Church Rock Mill Site TSF
Near Gallup, New Mexico

November 5 - 10, 2013

Prepared for:

MWH Americas, Inc.
3665 JFK Parkway
Suite 206
Ft. Collins, CO 80525

Prepared by:

ConeTec, Inc.
Salt Lake City, Utah

November 15, 2013

ConeTec, Inc.
Geotechnical and Environmental Site Investigation Contractors
3750 West 500 South, Salt Lake City, UT 84104 ● PO Box 22082, Salt Lake City, UT 84122
Tel: (801) 973-3801 ● Fax: (801) 973-3802 ● Web: www.conetec.com ● Email: saltlakecity@conetec.com

November 15, 2013 Job No.: 13-52118

Mr. Jason Cumbers
MWH Americas, Inc.
3665 JFK Parkway
Suite 206
Fort Collins, CO 80525

Tel: (720) 377-9410
Fax: (720) 377-9406
Email: jason.cumbers@mwhglobal.com

Re: CPT Testing Services Report
Church Rock Mill Site TSF
Near Gallup, New Mexico

Dear Jason,

Per your request, we have completed the CPT investigation for the above referenced project. Included with this report are the standard CPT plots, pore pressure dissipation plots, resistivity CPT plots, shear wave velocity calculations and seismic CPT plots in PDF format. Additionally, the CPT data, PPD data and CPT interpretation files are presented in Excel format. The following table outlines the CPT testing services completed at the site.

All CPT testing was performed in accordance with ASTM D5778-12 and industry standard practices. A compression model electronic piezocone penetrometer, with a 15-cm^2 tip and a 225-cm^2 friction sleeve was used for all of the testing. The cone penetrometer is designed with an equal end area friction sleeve and a tip end area ratio of 0.80. At the beginning of the sounding, the cone was outfitted with a vacuum saturated 6-mm thick, porous plastic pore pressure element that is located immediately behind the tip in the u_2 location. Additionally, the coordinates shown on the plots are for location reference only and generally have an accuracy of ±30 feet and are referenced to the WGS84 datum.

Many correlations have been developed for design parameters based on CPT data. The interpretations are presented only as a guide for geotechnical use and should be carefully scrutinized for consideration in any geotechnical design. Assumptions have been made regarding soil unit weights, groundwater level and interpretational methods, which may or may not apply to this site. The apparent water table values used in the CPT interpretations are based on results of the shallowest pore pressure dissipation test performed in each sounding. Additionally, the following table summarizes the values assigned to the specific soil behavior type zones that are used in the interpretations.

Zone	SPT qt/N	Unit Wt. (kN/m^3)	Unit Wt. (pcf)	Drainage Condition	Description
0	1.0	18.46	117.5	Neither	Undefined
1	2.0	17.5	111.4	Undrained	Sensitive Fines
2	1.0	12.5	79.6	Undrained	Organic Soil
3	1.0	17.5	111.4	Undrained	Clay
4	1.5	18.0	114.6	Undrained	Silty Clay
5	2.0	18.0	114.6	Undrained	Clayey Silt
6	2.5	18.0	114.6	Both	Silt
7	3.0	18.5	117.8	Drained	Sandy Silt
8	4.0	19.0	120.9	Drained	Silty Sand/Sand
9	5.0	19.5	124.1	Drained	Sand
10	6.0	20.0	127.3	Drained	Gravelly Sand
11	1.0	20.5	130.5	Drained	Stiff Fine Grained
12	2.0	19.0	120.9	Drained	Cemented Sand

We appreciate the opportunity of providing these services to you. If you have any questions regarding the enclosed material or if, we can be of additional assistance, please contact us.

Sincerely,

ConeTec, Inc.

Shawn Steiner

Shawn D. Steiner, P.E.
Regional Manager

Enclosures

Client: MWH Americas, Inc.
Job No.: 13-52118
Project: Church Rock Mill Site TSF
Location: Near Gallup, New Mexico

CPT Testing Summary

CPT Location	CPT Date	CPT Filename	CPT Depth (ft.)	PPD Depth (ft.)	PPD Duration (sec)	Ueq (ft.)	Apparent Water Table (ft.)	Seismic	Comments
RCPT-01	07-Nov-2013	13-52118_RP01	88.42	35.27	500	3.9	31.4	X	Refusal
				72.51	400	6.6	65.9		
RCPT-02	05-Nov-2013	13-52118_RP02	33.96	26.41	500	1.9	24.5	X	Refusal
				30.02	1200				
				33.63	600	13.9	19.8		
RCPT-03	08-Nov-2013	13-52118_RP03	9.51						Refusal
RCPT-03B	08-Nov-2013	13-52118_RP03B	9.02						Refusal
RCPT-04	05-Nov-2013	13-52118_RP04	27.56	25.59	400	1.4	24.2	X	Refusal
RCPT-05	06-Nov-2013	13-52118_RP05	37.89	12.63	900	21.0	-8.4	X	Refusal
				25.92	600	12.0	13.9		
				37.89	500	1.1	36.8		
RCPT-06	06-Nov-2013	13-52118_RP06	36.25	20.67	2000	10.0	10.7	X	Refusal
				36.25	400	8.2	28.1		
RCPT-07	08-Nov-2013	13-52118_RP07	70.05	29.36	800	1.1	28.2	X	Refusal
				43.63	500	6.0	37.6		
RCPT-08	07-Nov-2013	13-52118_RP08	60.86	31.66	800	19.4	12.2	X	Refusal
				54.63	2010	5.1	49.6		
RCPT-09	06-Nov-2013	13-52118_RP09	69.39	26.57	800	9.6	17.0	X	Refusal
RCPT-10	06-Nov-2013	13-52118_RP10	63.16	21.98	2000	21.3	0.7	X	Refusal
				36.74	2500	31.4	5.3		
RCPT-11	07-Nov-2013	13-52118_RP11	96.78	53.15	3600	3.6	49.5	X	Refusal
				55.61	1000	6.2	49.5		
RCPT-12	07-Nov-2013	13-52118_RP12	52.49	40.52	300	5.6	34.9	X	Refusal
RCPT-13	08-Nov-2013	13-52118_RP013	4.27						Refusal
RCPT-13B	08-Nov-2013	13-52118_RP013B	3.45						Refusal
RCPT-13C	08-Nov-2013	13-52118_RP013C	3.94						Refusal

CPT Location	CPT Date	CPT Filename	CPT Depth (ft.)	PPD Depth (ft.)	PPD Duration (sec)	Ueq (ft.)	Apparent Water Table (ft.)	Seismic	Comments
RCPT-14	08-Nov-2013	13-52118_RP14	35.60	21.98	300	1.0	21.0		Refusal
RCPT-15	06-Nov-2013	13-52118_RP15	55.12	37.89	1200	2.6	35.3	X	Refusal
RCPT-16	08-Nov-2013	13-52118_RP16	55.12	43.80	800	9.7	34.1		Refusal
RCPT-17	09-Nov-2013	13-52118_RP17	48.06						Refusal
RCPT-18	09-Nov-2013	13-52118_RP18	50.03	30.68	500	4.6	26.1		Refusal
				45.93	800	12.3	33.6		
RCPT-19	09-Nov-2013	13-52118_RP19	58.23	39.53	2000	13.3	26.2		Refusal
RCPT-20	09-Nov-2013	13-52118_RP20	46.42						Refusal
RCPT-21	08-Nov-2013	13-52118_RP21	20.67						Refusal
RCPT-22	10-Nov-2013	13-52118_RP22	94.32	41.01	600	10.6	30.4		Refusal
RCPT-23	08-Nov-2013	13-52118_RP23	43.96	34.12	300	3.7	30.5		Refusal
RCPT-24	09-Nov-2013	13-52118_RP24	21.65						Refusal
RCPT-25	09-Nov-2013	13-52118_RP25	2.46						Refusal
RCPT-25B	09-Nov-2013	13-52118_RP25B	2.46						Refusal
RCPT-26	09-Nov-2013	13-52118_RP26	27.72	25.92	1200	15.3	10.7		Refusal
RCPT-27	09-Nov-2013	13-52118_RP27	79.72						Refusal
RCPT-28	10-Nov-2013	13-52118_RP28	83.99	67.91	500	7.4	60.5		Refusal
RCPT-29	10-Nov-2013	13-52118_RP29	103.35						Refusal
RCPT-30	10-Nov-2013	13-52118_RP30	74.80						Refusal
RCPT-31	10-Nov-2013	13-52118_RP31	80.05	54.30	300	4.5	49.8		Refusal
RCPT-32	10-Nov-2013	13-52118_RP32	119.09	54.30	400	12.7	41.6		Refusal

CPT PLOTS

With Non-Normalized SBT Classifications

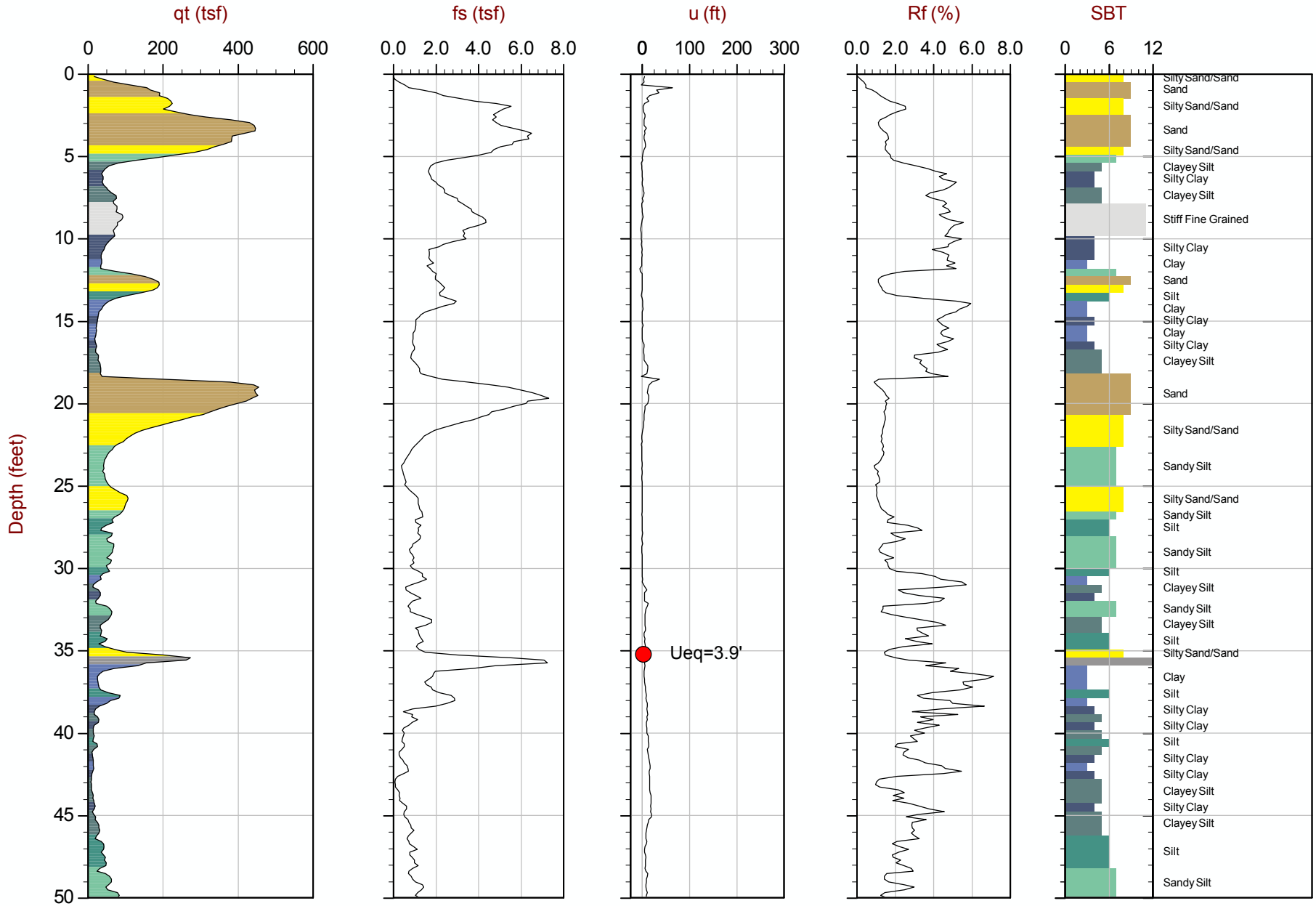
CONETEC

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:07:13 15:36
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-01
Cone: 155:T1500F15U500



Max Depth: 26.950 m / 88.42 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP01.COR
Unit Wt: SBT Chart Soil Zones

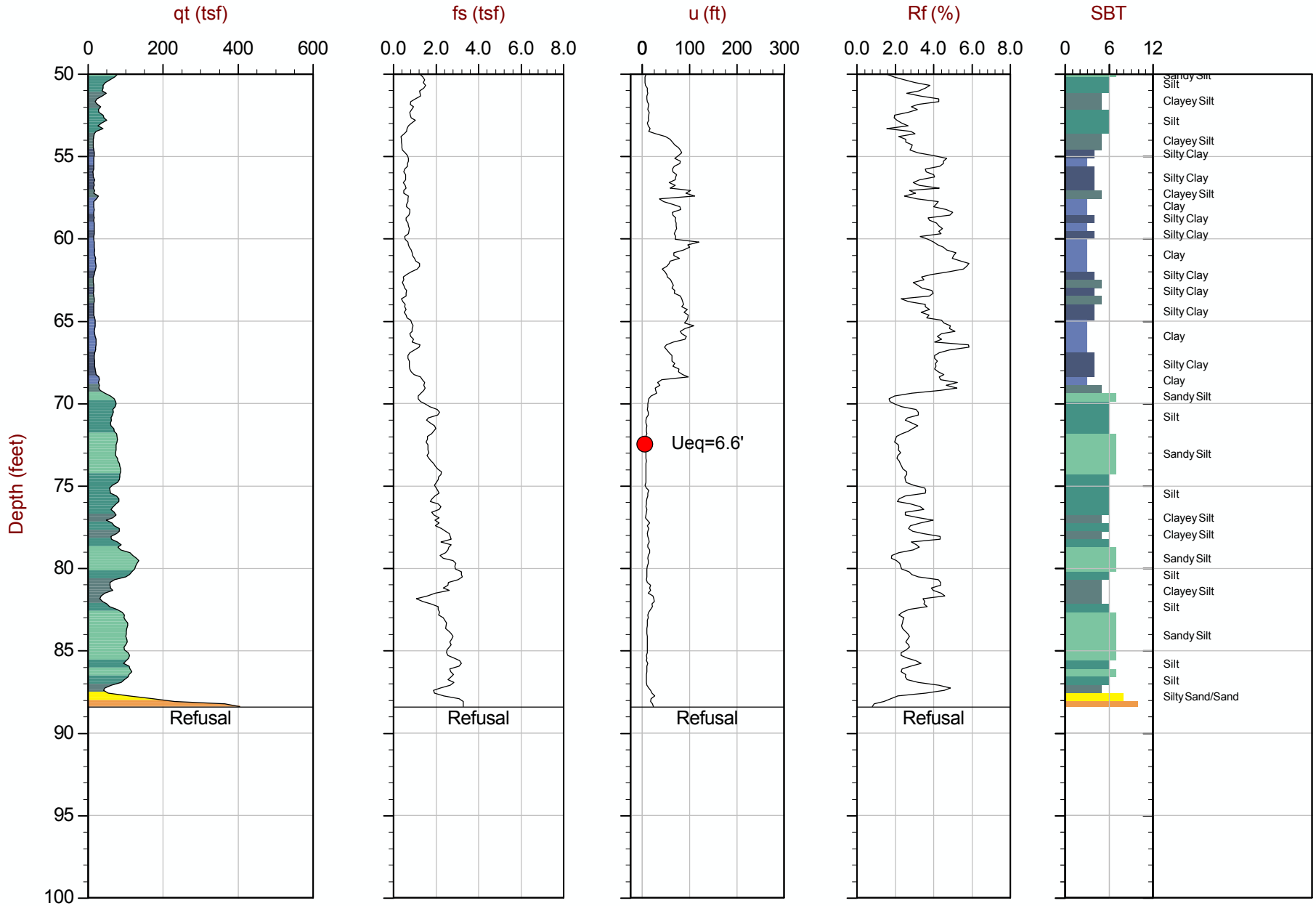
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.649117 Long: -108.501667
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:07:13 15:36
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-01
Cone: 155:T1500F15U500



Max Depth: 26.950 m / 88.42 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP01.COR
Unit Wt: SBT Chart Soil Zones

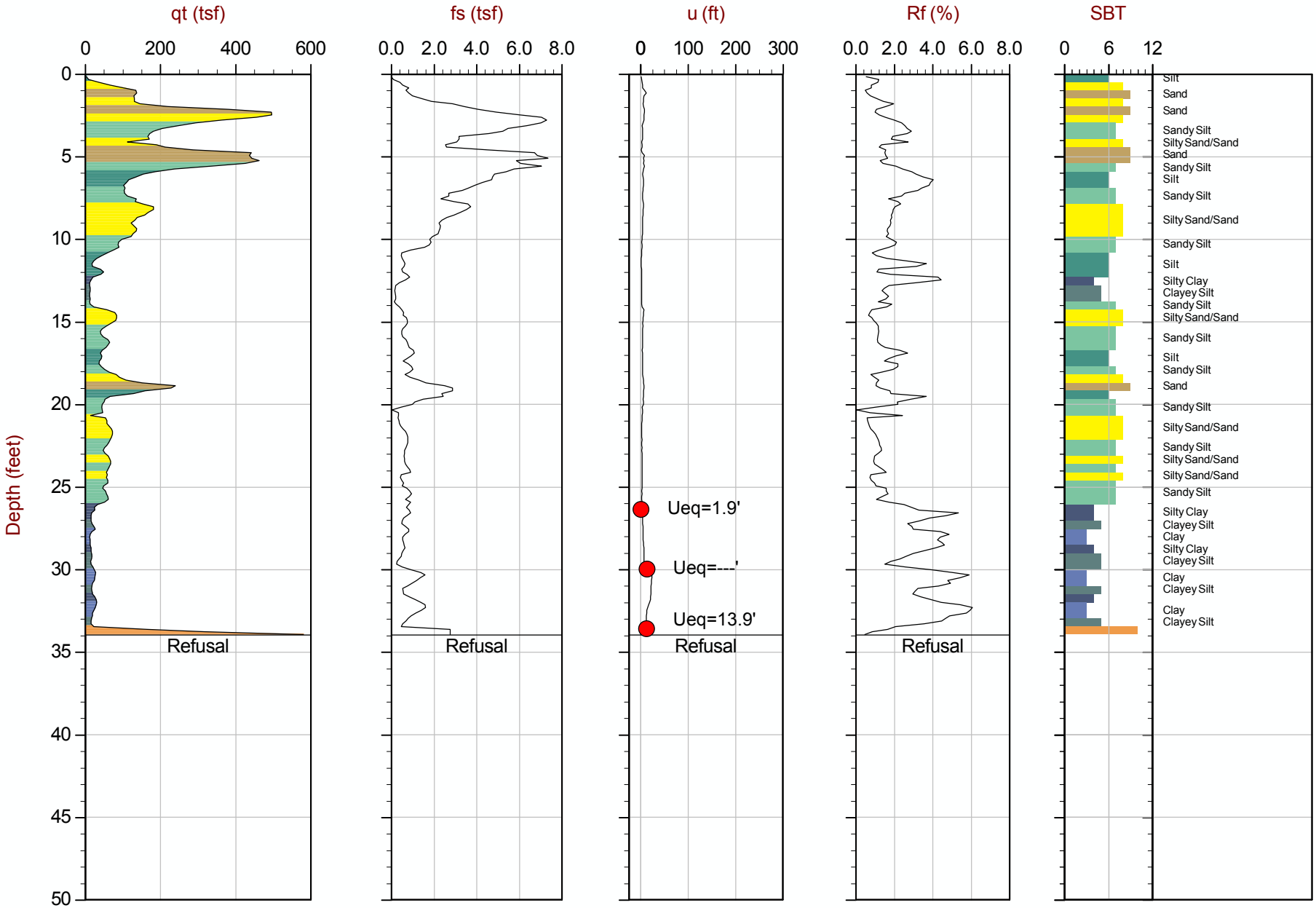
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.649117 Long: -108.501667
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:05:13 13:37
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-02
Cone: 155:T1500F15U500



Max Depth: 10.350 m / 33.96 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP02.COR
Unit Wt: SBT Chart Soil Zones

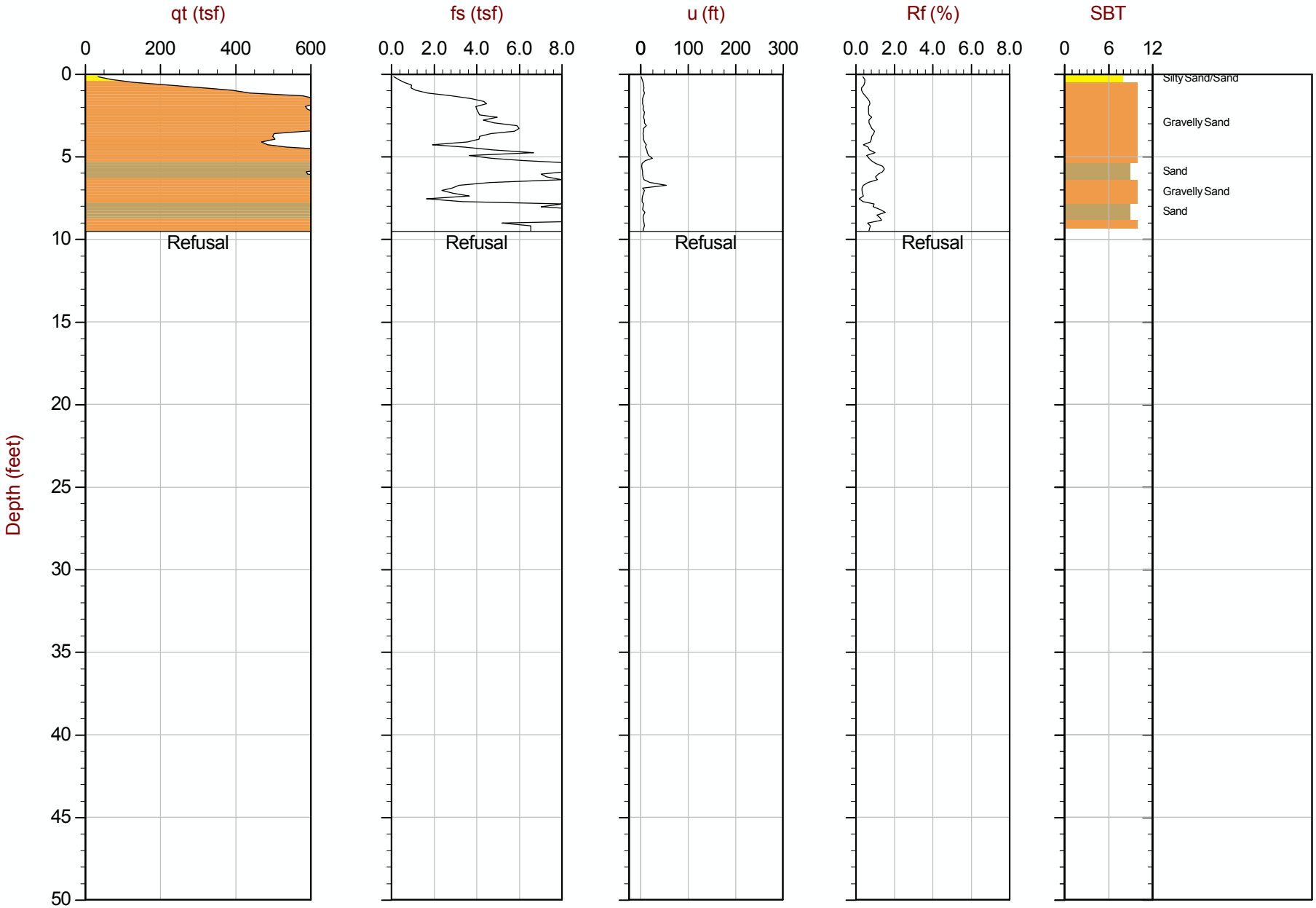
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.650200 Long: -108.499750
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:08:13 07:50
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-03
Cone: 155:T1500F15U500



Max Depth: 2.900 m / 9.51 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP03.COR
Unit Wt: SBT Chart Soil Zones

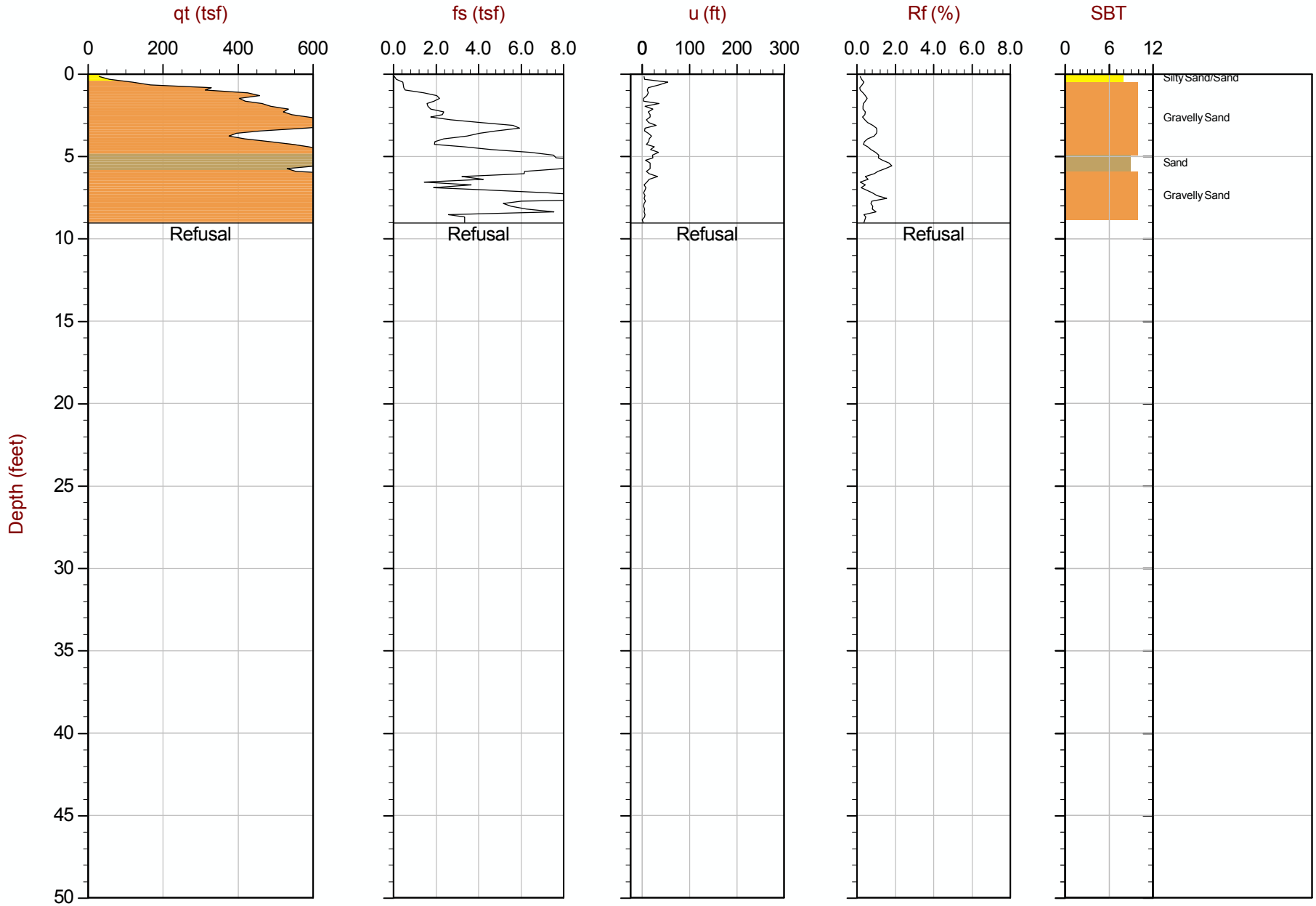
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.649350 Long: -108.502383
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:08:13 08:45
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-03B
Cone: 155:T1500F15U500



Max Depth: 2.750 m / 9.02 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP03B.COR
Unit Wt: SBT Chart Soil Zones

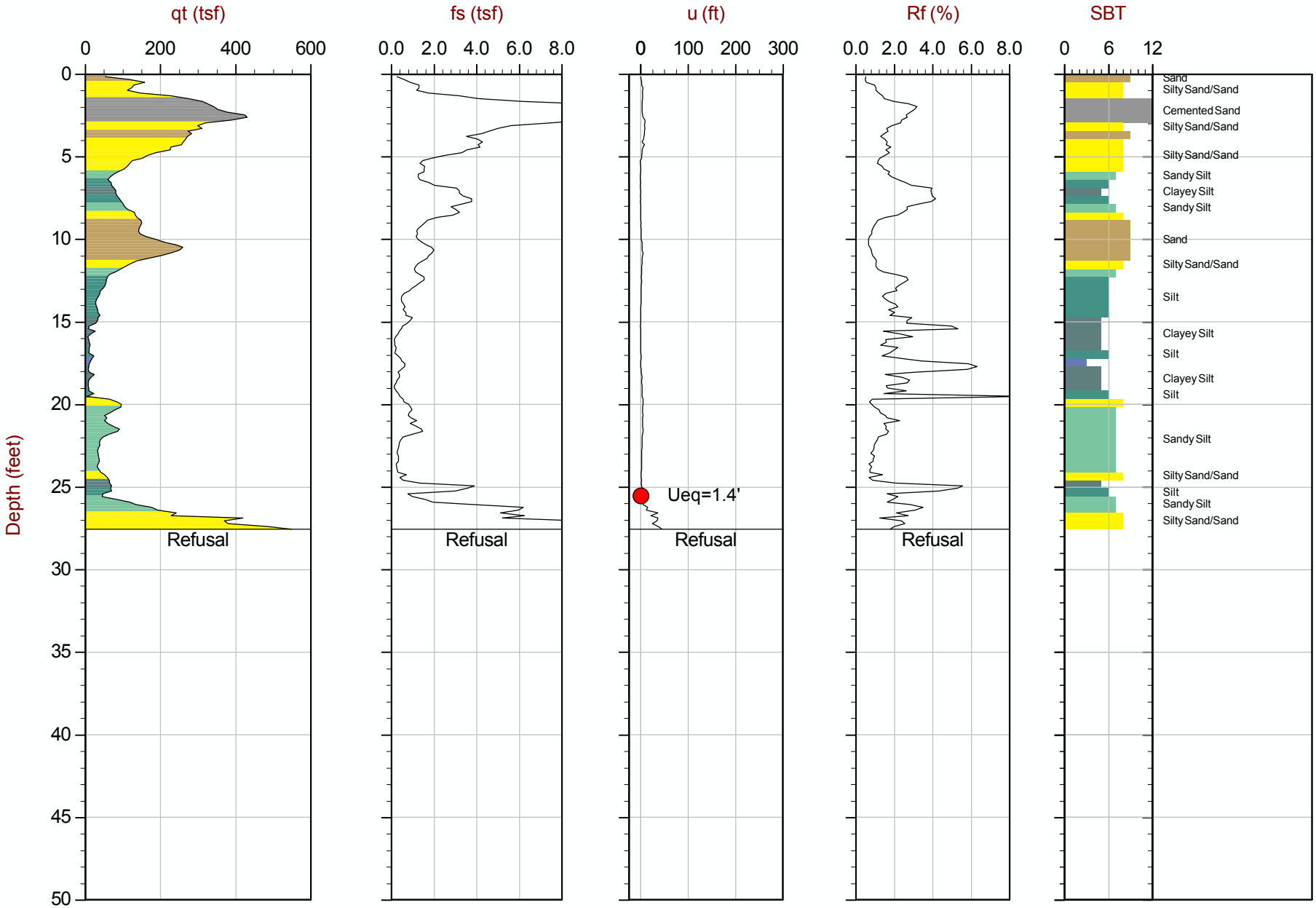
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.649333 Long: -108.502383
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:05:13 13:39
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-04
Cone: 155:T1500F15U500



Max Depth: 8.400 m / 27.56 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP04.COR
Unit Wt: SBT Chart Soil Zones

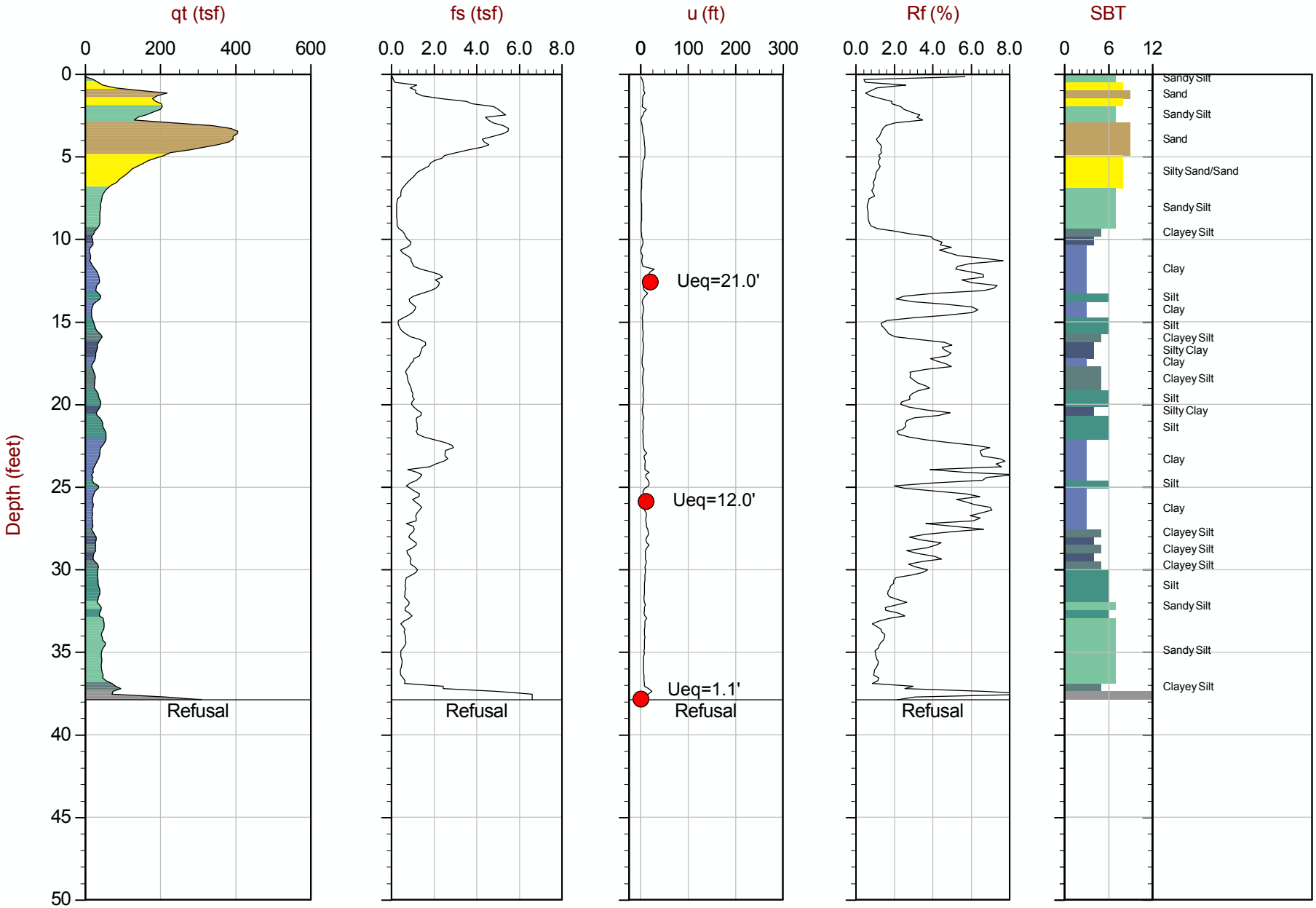
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.649533 Long: -108.500483
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:06:13 08:30
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-05
Cone: 155:T1500F15U500



Max Depth: 11.550 m / 37.89 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP05.COR
Unit Wt: SBT Chart Soil Zones

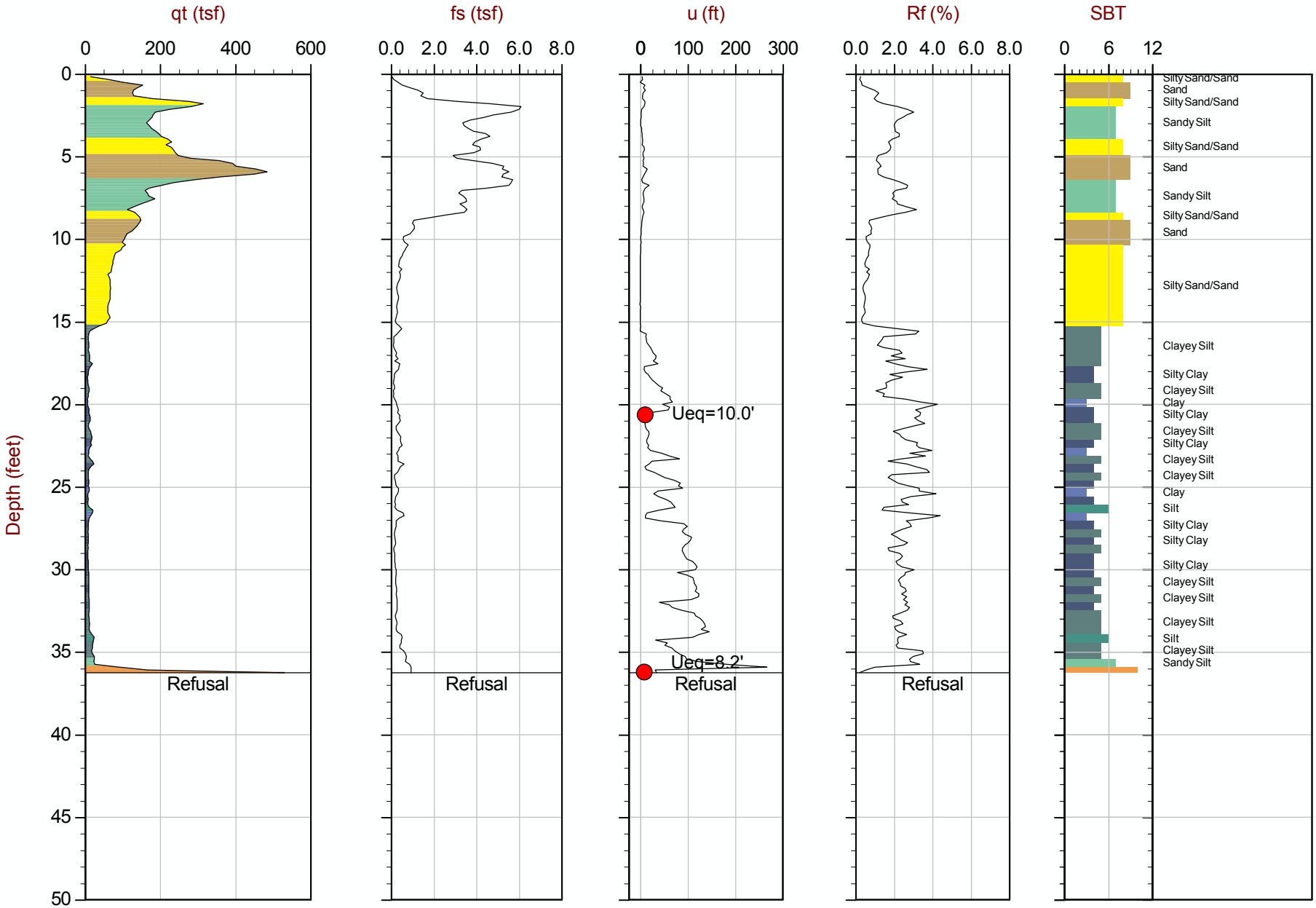
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.648633 Long: -108.498283
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:06:13 13:01
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-06
Cone: 155:T1500F15U500



Max Depth: 11.050 m / 36.25 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP06.COR
Unit Wt: SBT Chart Soil Zones

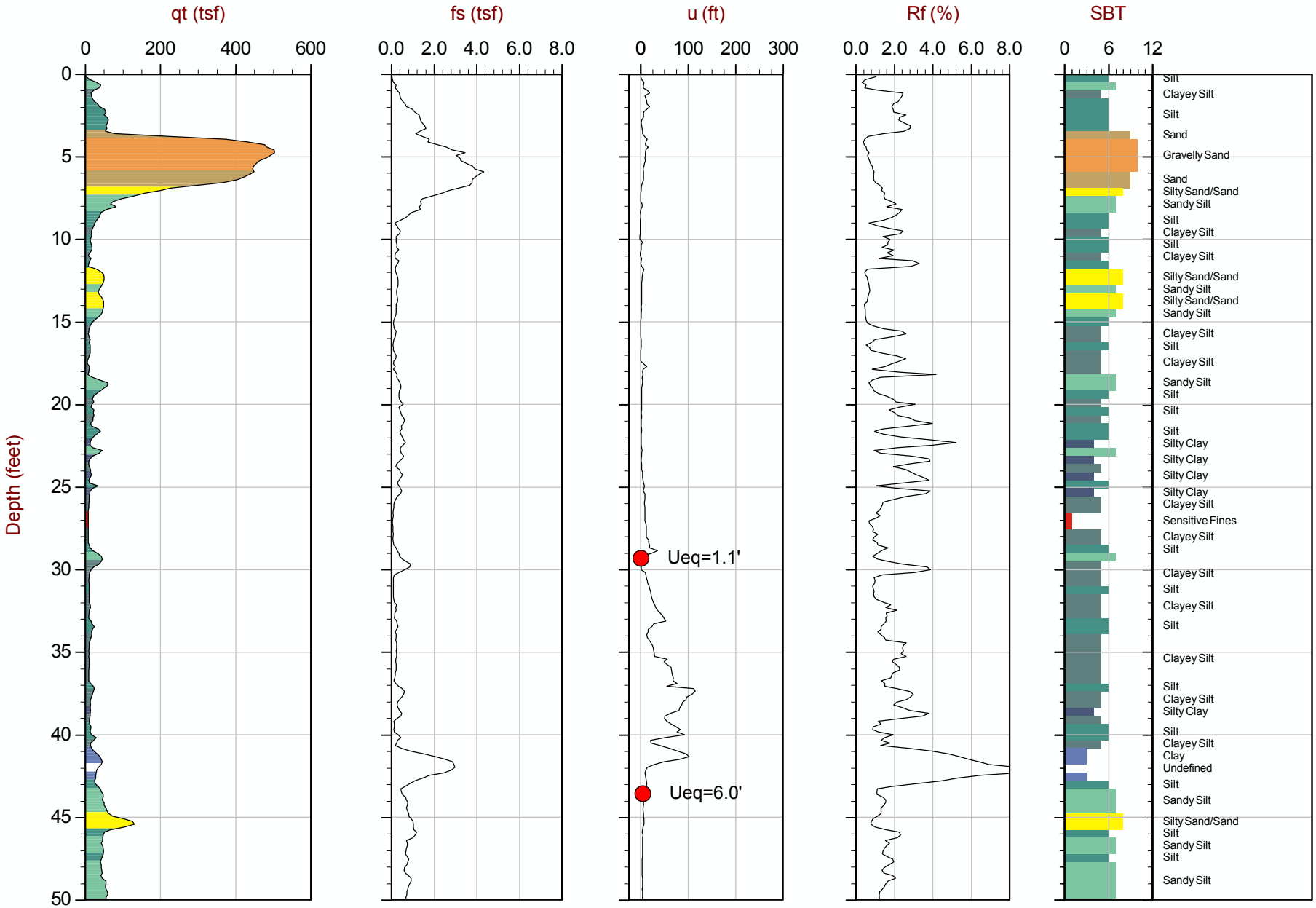
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.648250 Long: -108.497050
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:08:13 11:13
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-07
Cone: 155:T1500F15U500



Max Depth: 21.350 m / 70.05 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP07.COR
Unit Wt: SBT Chart Soil Zones

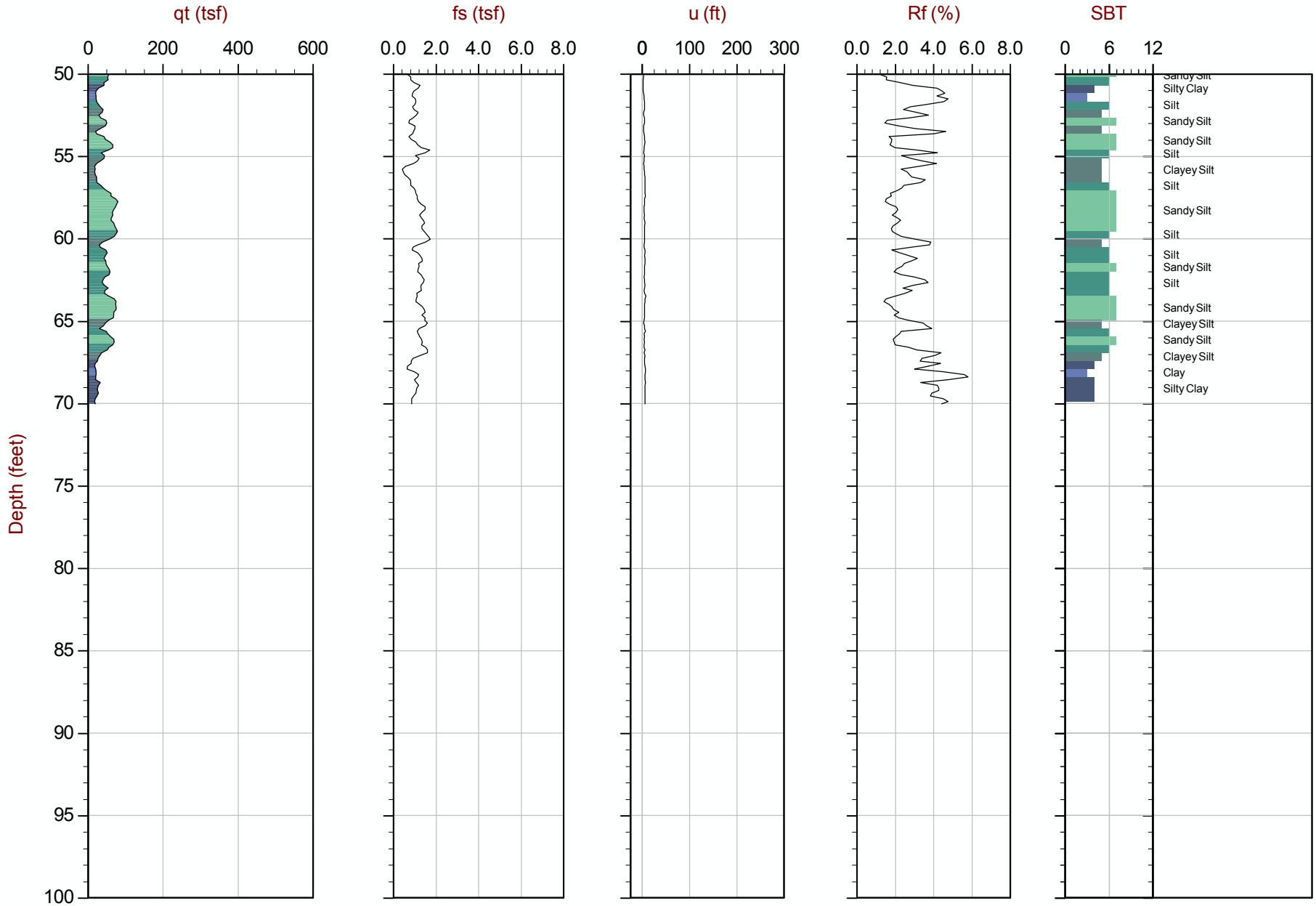
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647600 Long: -108.501200
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:08:13 11:13
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-07
Cone: 155:T1500F15U500



Max Depth: 21.350 m / 70.05 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP07.COR
Unit Wt: SBT Chart Soil Zones

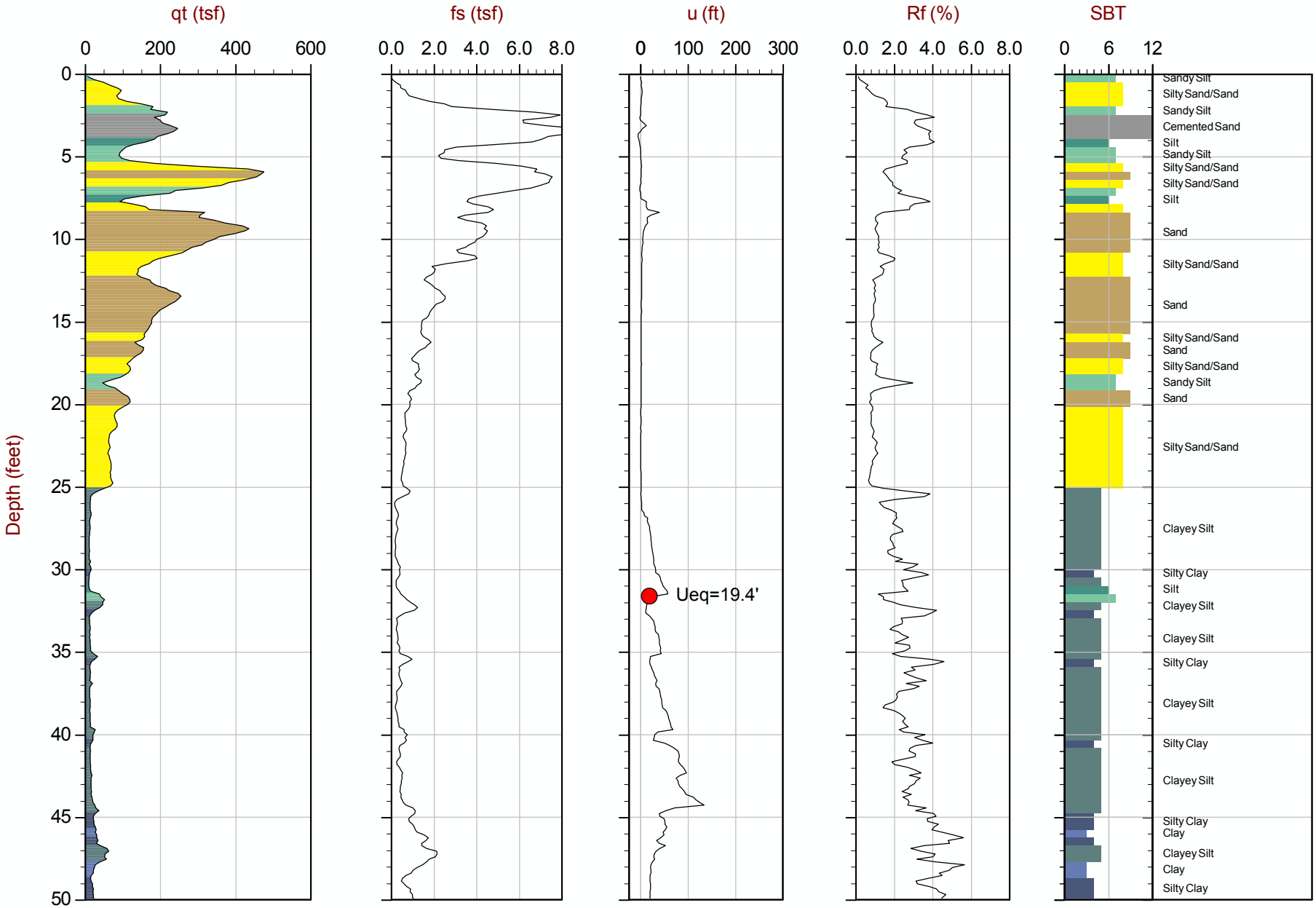
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647600 Long: -108.501200
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:07:13 08:21
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-08
Cone: 155:T1500F15U500



Max Depth: 18.550 m / 60.86 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP08.COR
Unit Wt: SBT Chart Soil Zones

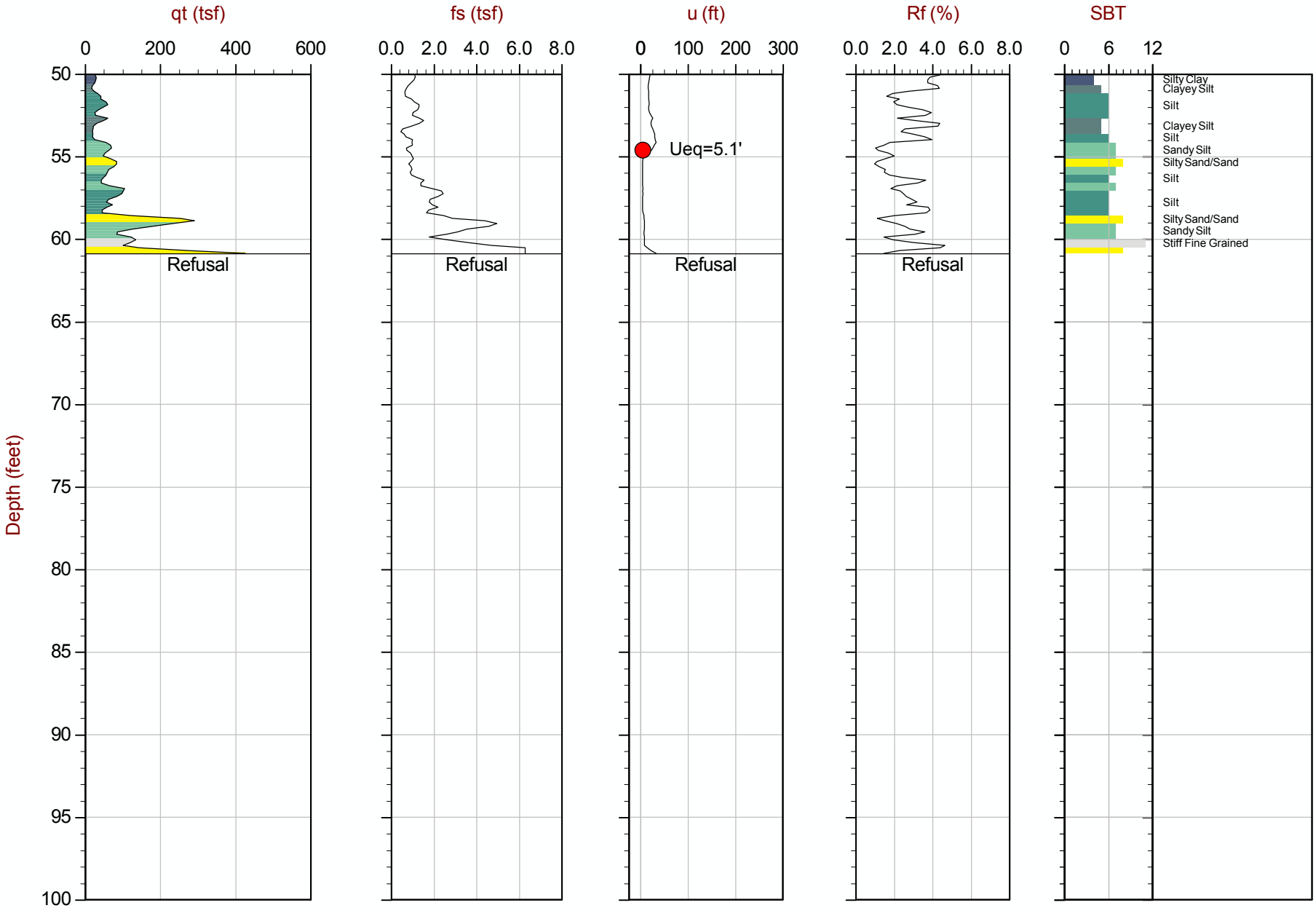
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647250 Long: -108.497250
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:07:13 08:21
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-08
Cone: 155:T1500F15U500



Max Depth: 18.550 m / 60.86 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP08.COR
Unit Wt: SBT Chart Soil Zones

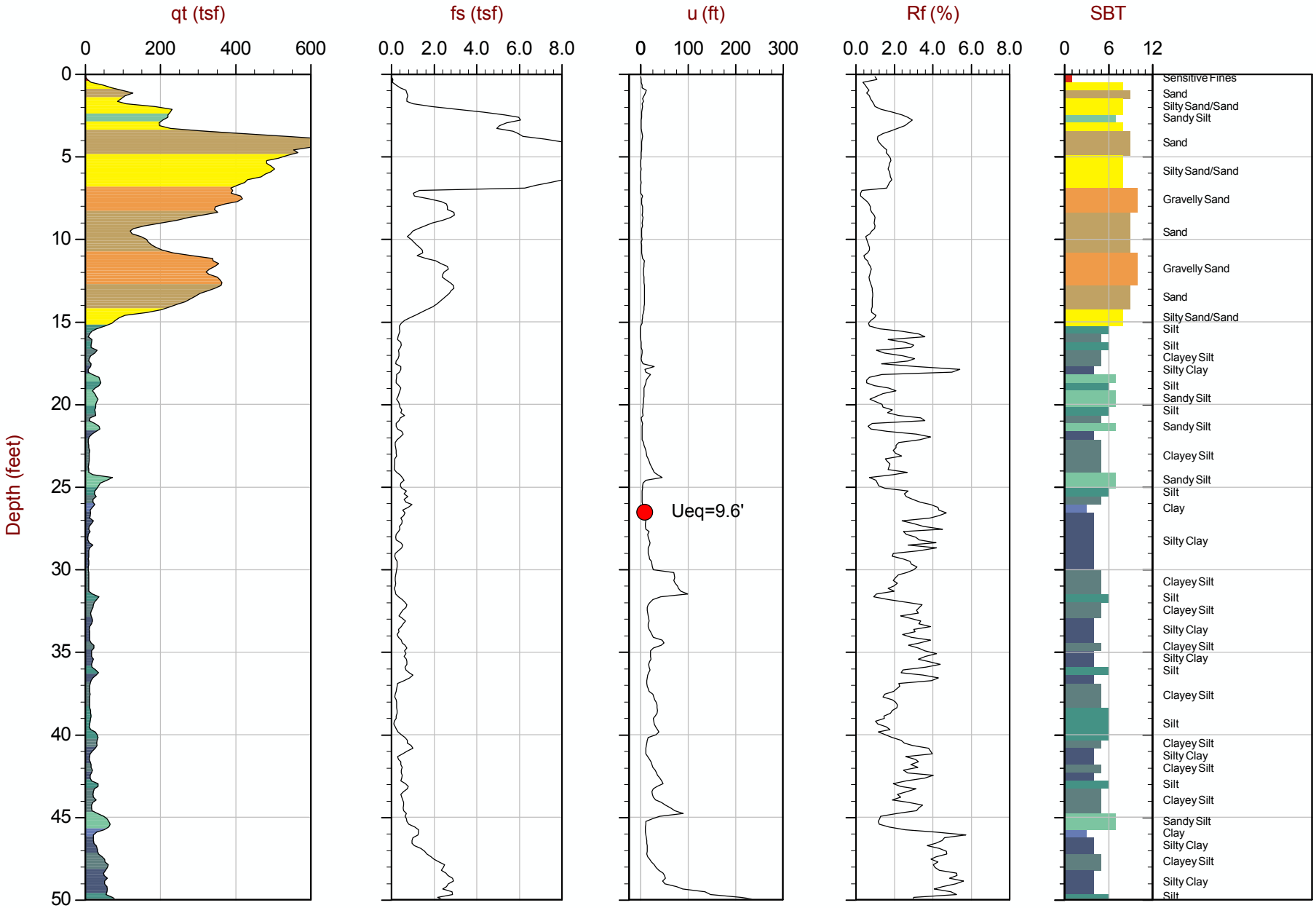
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647250 Long: -108.497250
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:06:13 14:52
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-09
Cone: 155:T1500F15U500



Max Depth: 21.150 m / 69.39 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP09.COR
Unit Wt: SBT Chart Soil Zones

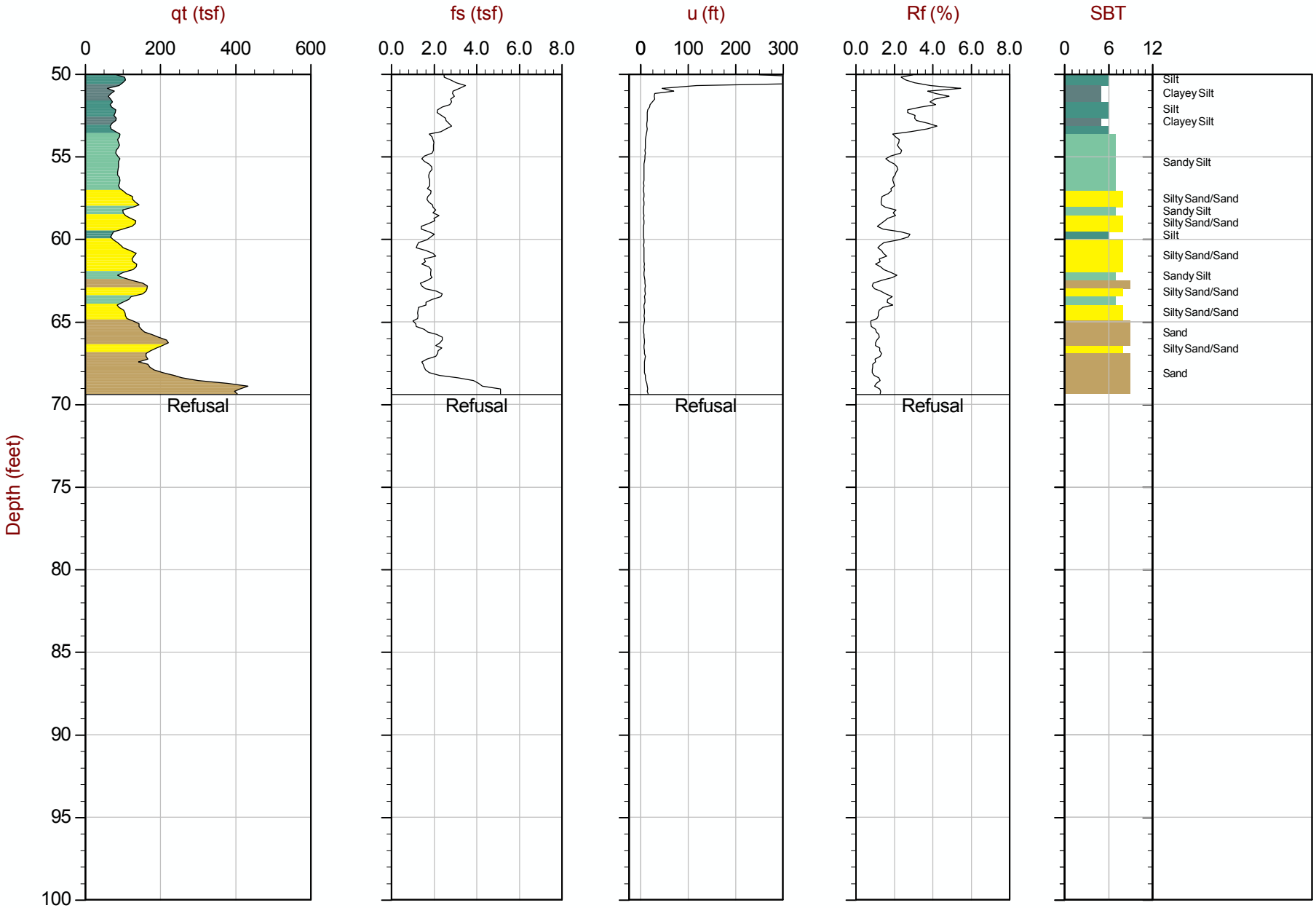
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647750 Long: -108.498150
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:06:13 14:52
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-09
Cone: 155:T1500F15U500



Max Depth: 21.150 m / 69.39 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP09.COR
Unit Wt: SBT Chart Soil Zones

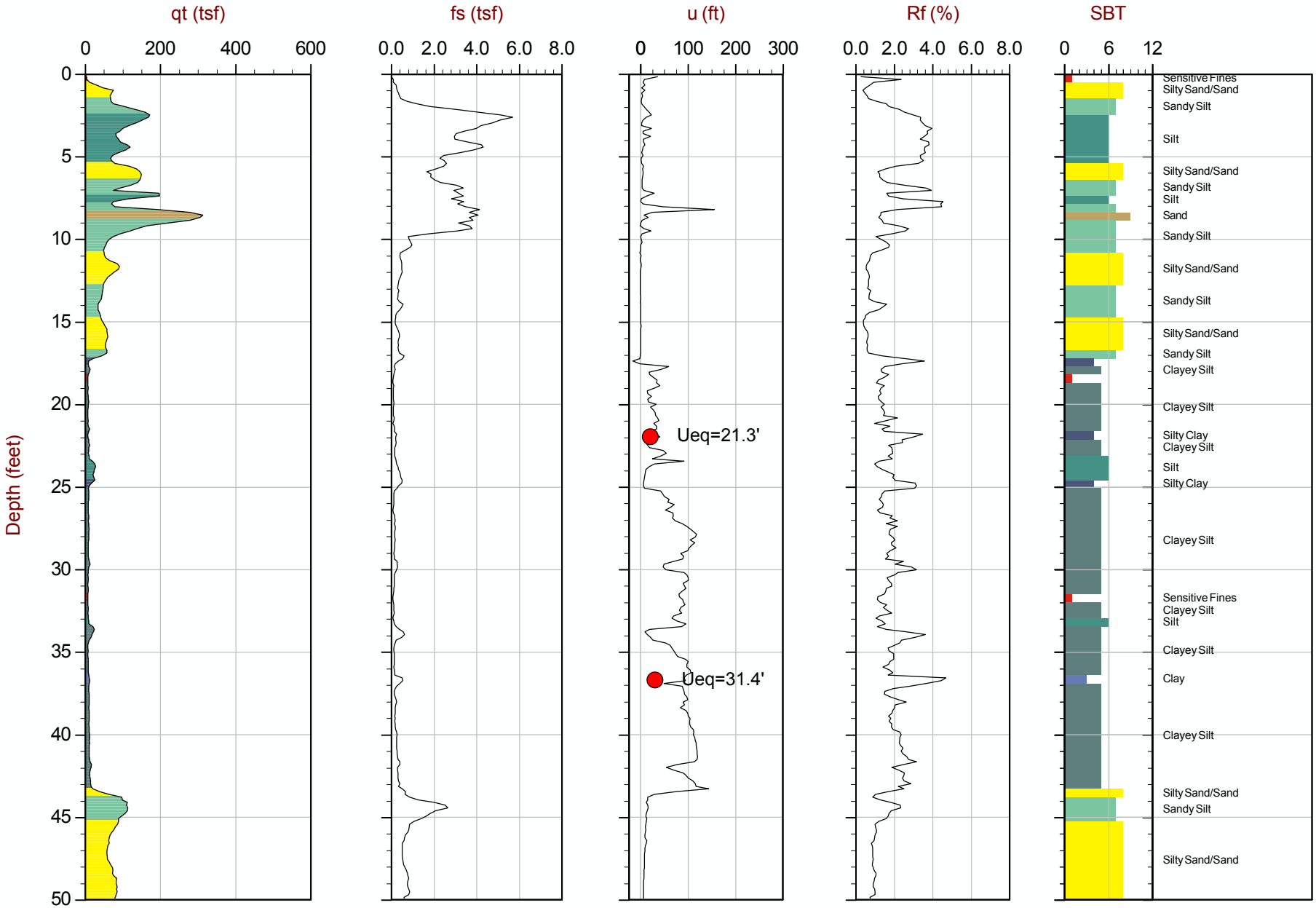
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647750 Long: -108.498150
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:06:13 10:23
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-10
Cone: 155:T1500F15U500



Max Depth: 19.250 m / 63.16 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP10.COR
Unit Wt: SBT Chart Soil Zones

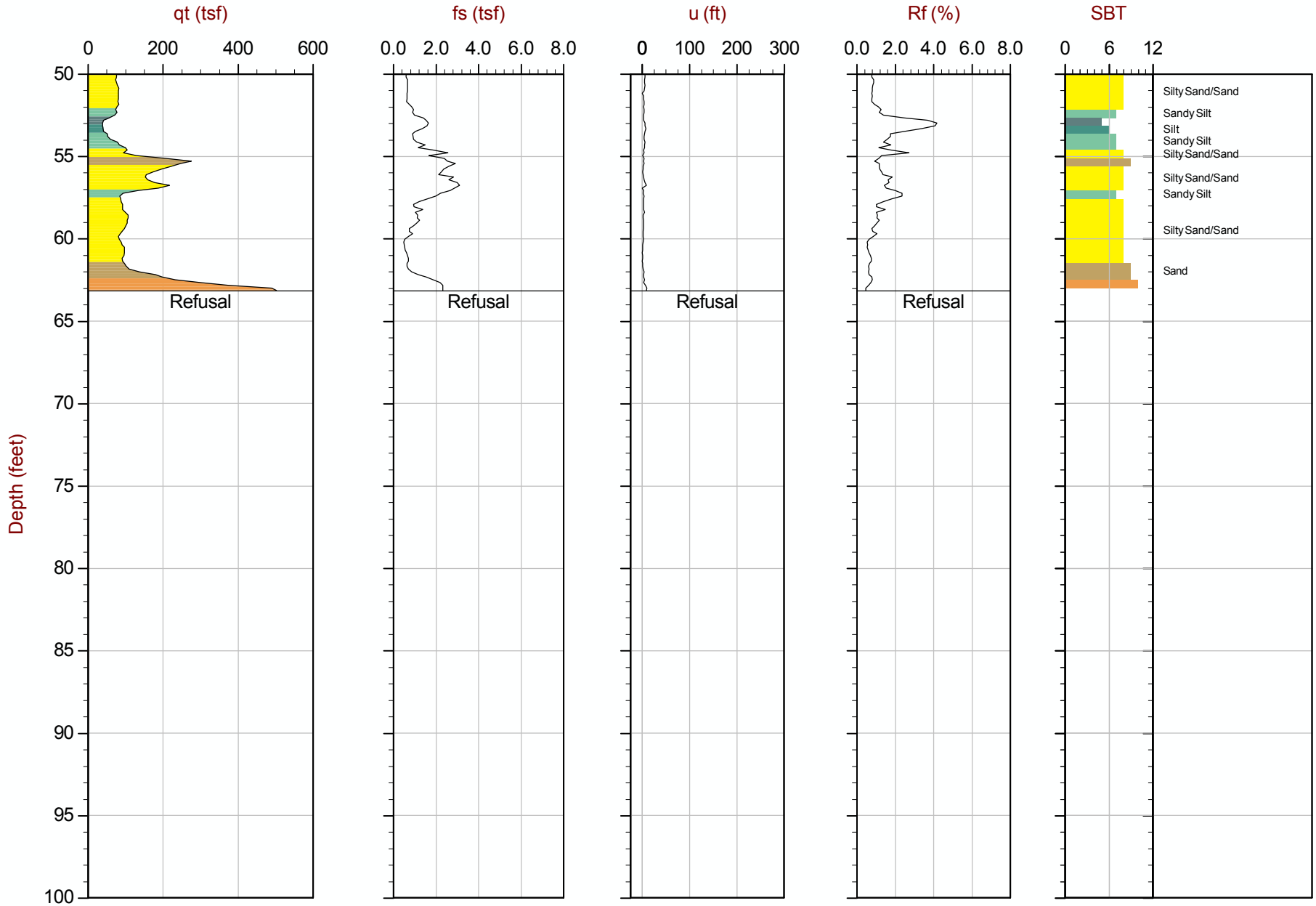
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647833 Long: -108.497217
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:06:13 10:23
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-10
Cone: 155:T1500F15U500



Max Depth: 19.250 m / 63.16 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP10.COR
Unit Wt: SBT Chart Soil Zones

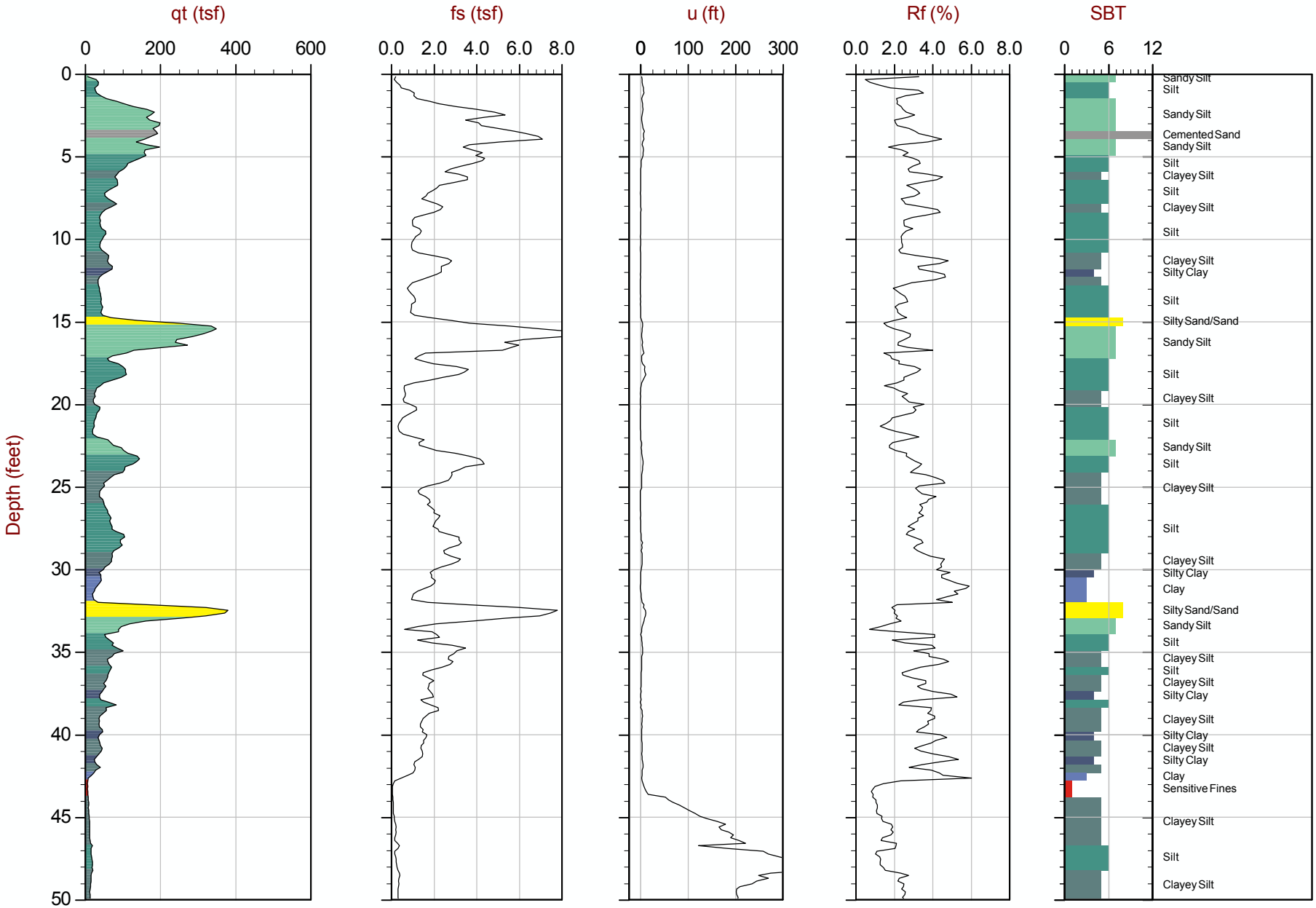
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647833 Long: -108.497217
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:07:13 12:13
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-11
Cone: 155:T1500F15U500



Max Depth: 29.500 m / 96.78 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP11.COR
Unit Wt: SBT Chart Soil Zones

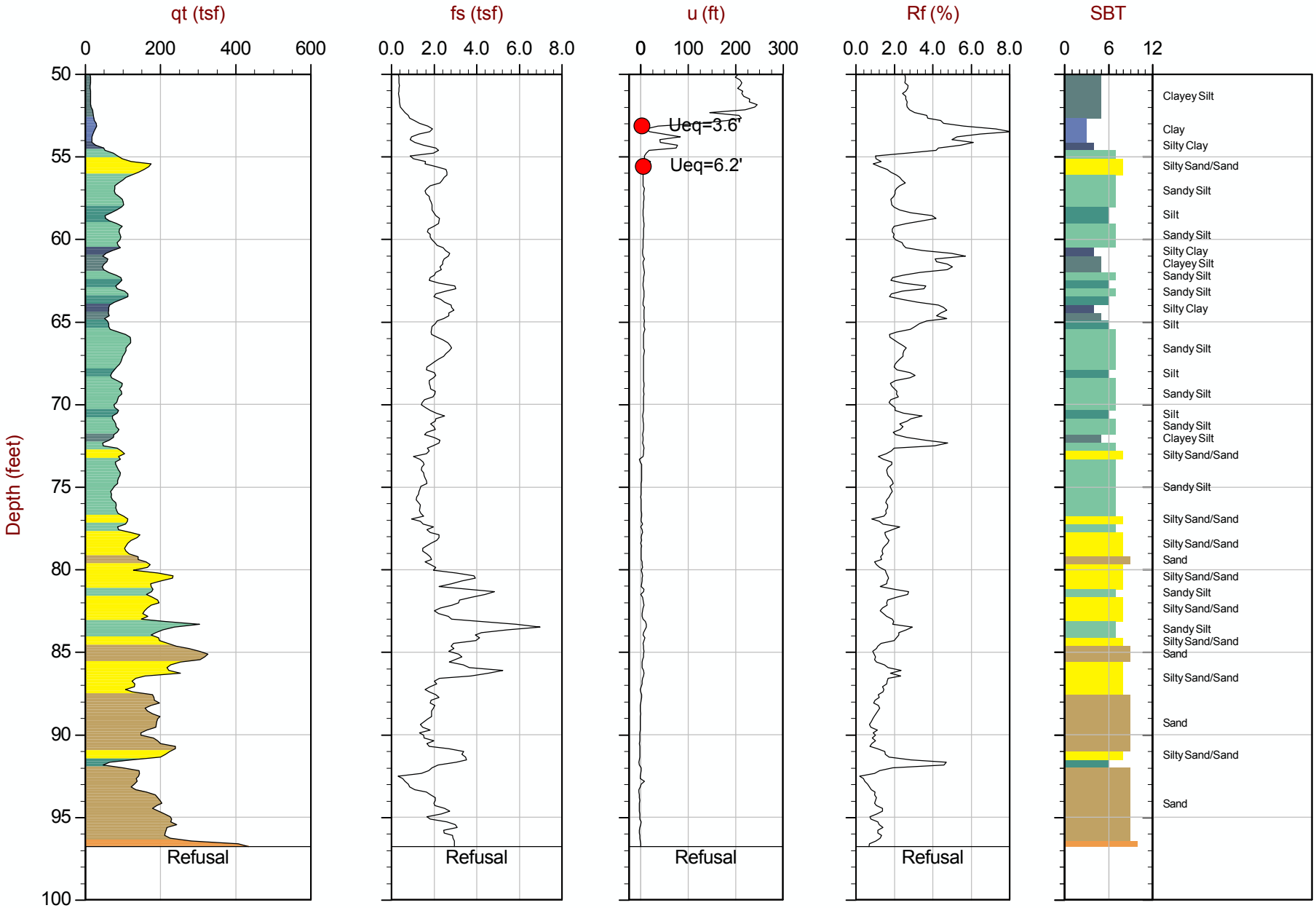
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647650 Long: -108.495850
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:07:13 12:13
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-11
Cone: 155:T1500F15U500



Max Depth: 29.500 m / 96.78 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP11.COR
Unit Wt: SBT Chart Soil Zones

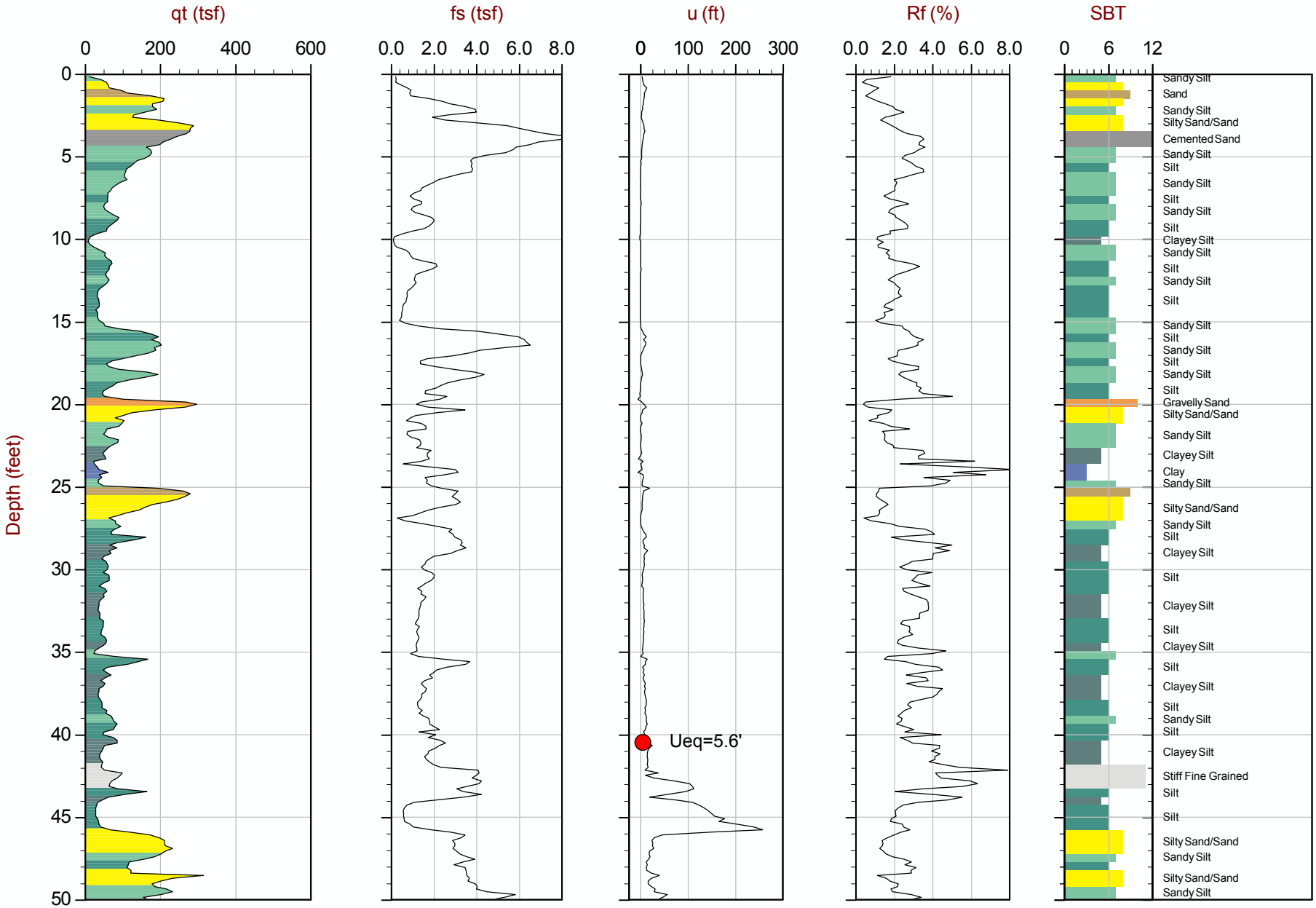
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647650 Long: -108.495850
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:07:13 10:22
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-12
Cone: 155:T1500F15U500



Max Depth: 16.000 m / 52.49 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP12.COR
Unit Wt: SBT Chart Soil Zones

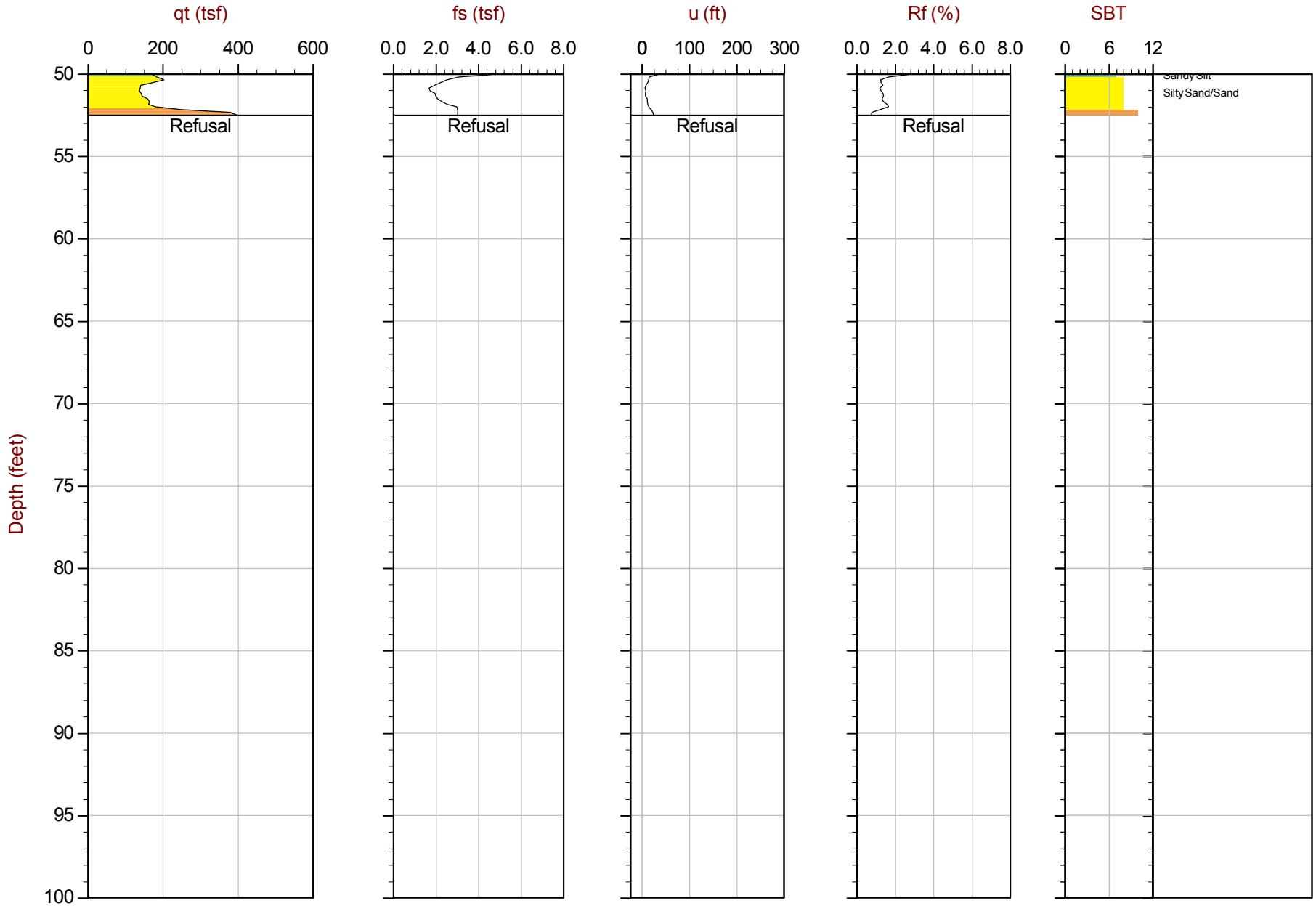
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647150 Long: -108.496000
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:07:13 10:22
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-12
Cone: 155:T1500F15U500



Max Depth: 16.000 m / 52.49 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP12.COR
Unit Wt: SBT Chart Soil Zones

SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647150 Long: -108.496000
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:08:13 09:36
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-13
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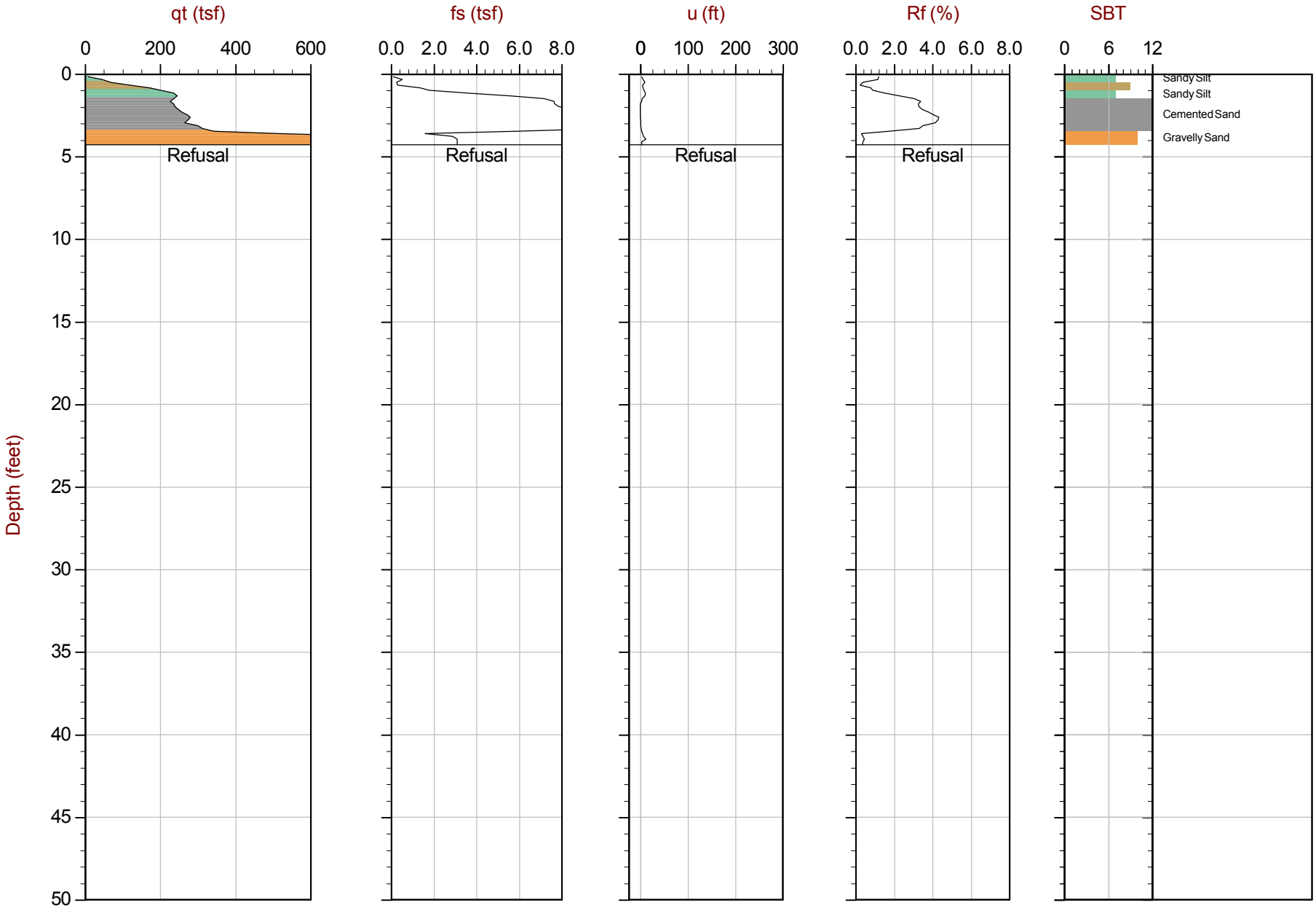


Max Depth: 1.300 m / 4.27 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP13.COR
Unit Wt: SBT Chart Soil Zones

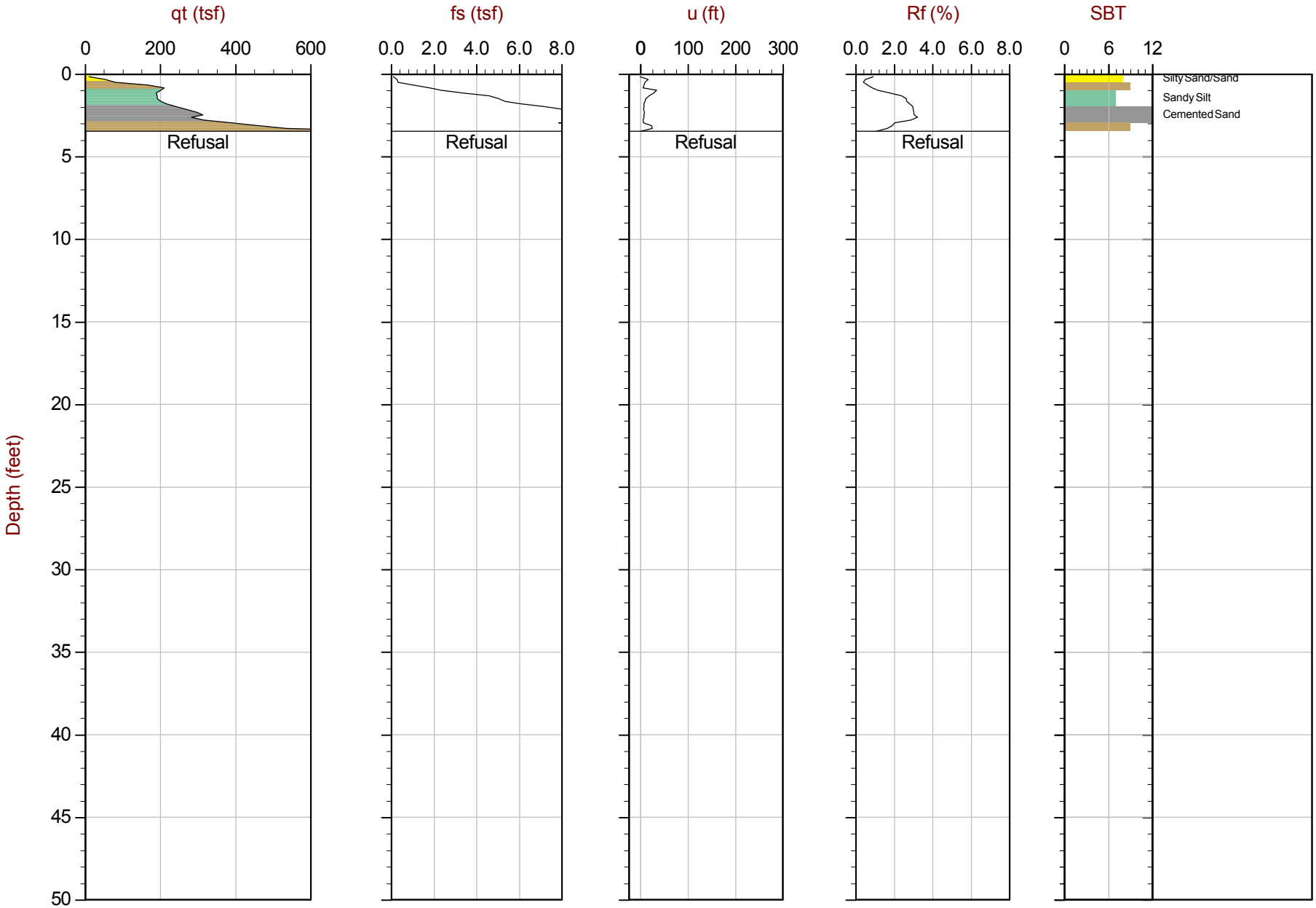
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.649067 Long: -108.499383
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:08:13 10:03
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-13B
Cone: 155:T1500F15U500



Max Depth: 1.050 m / 3.44 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP13B.COR
Unit Wt: SBT Chart Soil Zones

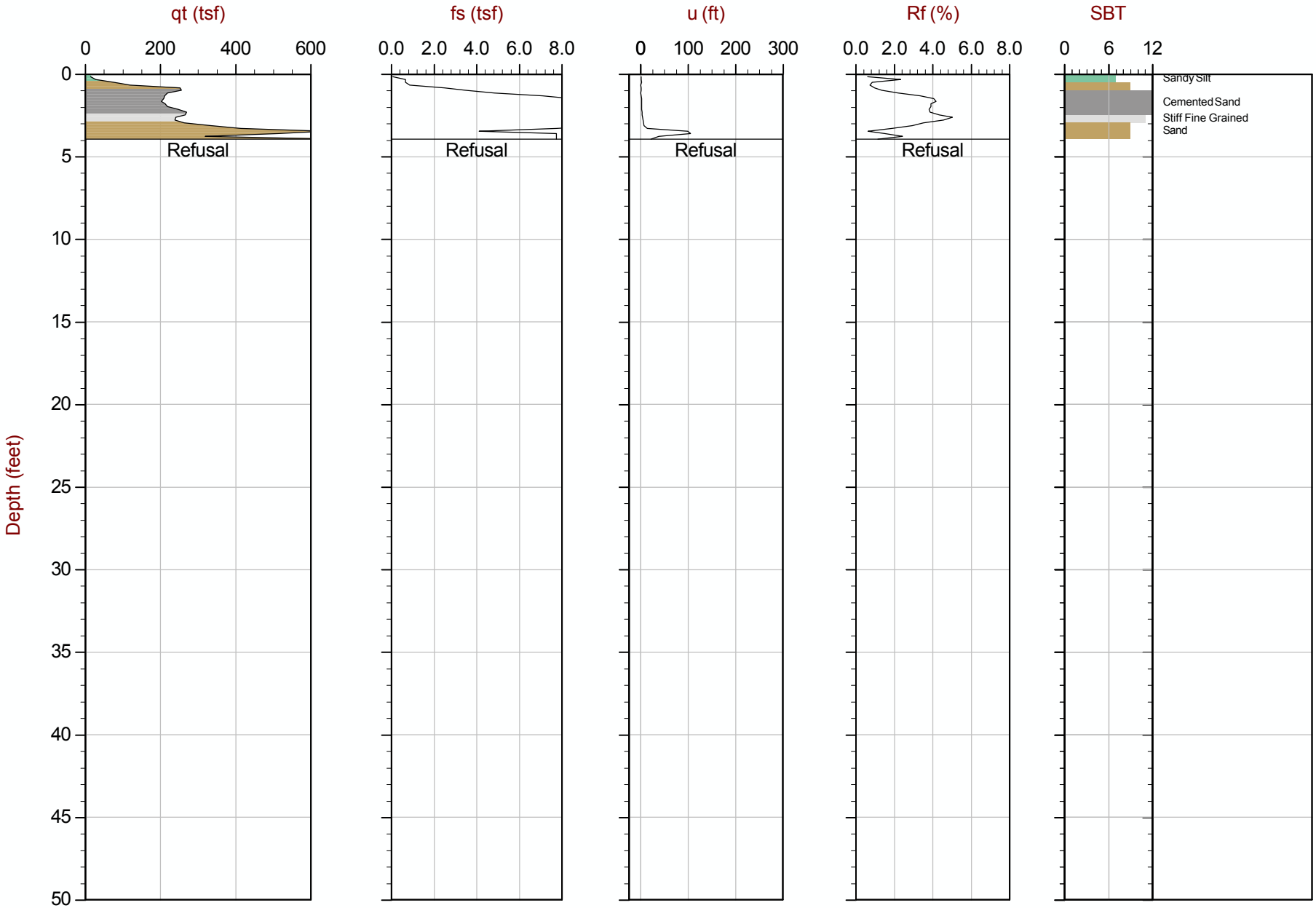
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.649067 Long: -108.499367
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:08:13 10:21
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-13BC
Cone: 155:T1500F15U500



Max Depth: 1.200 m / 3.94 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP13C.COR
Unit Wt: SBT Chart Soil Zones

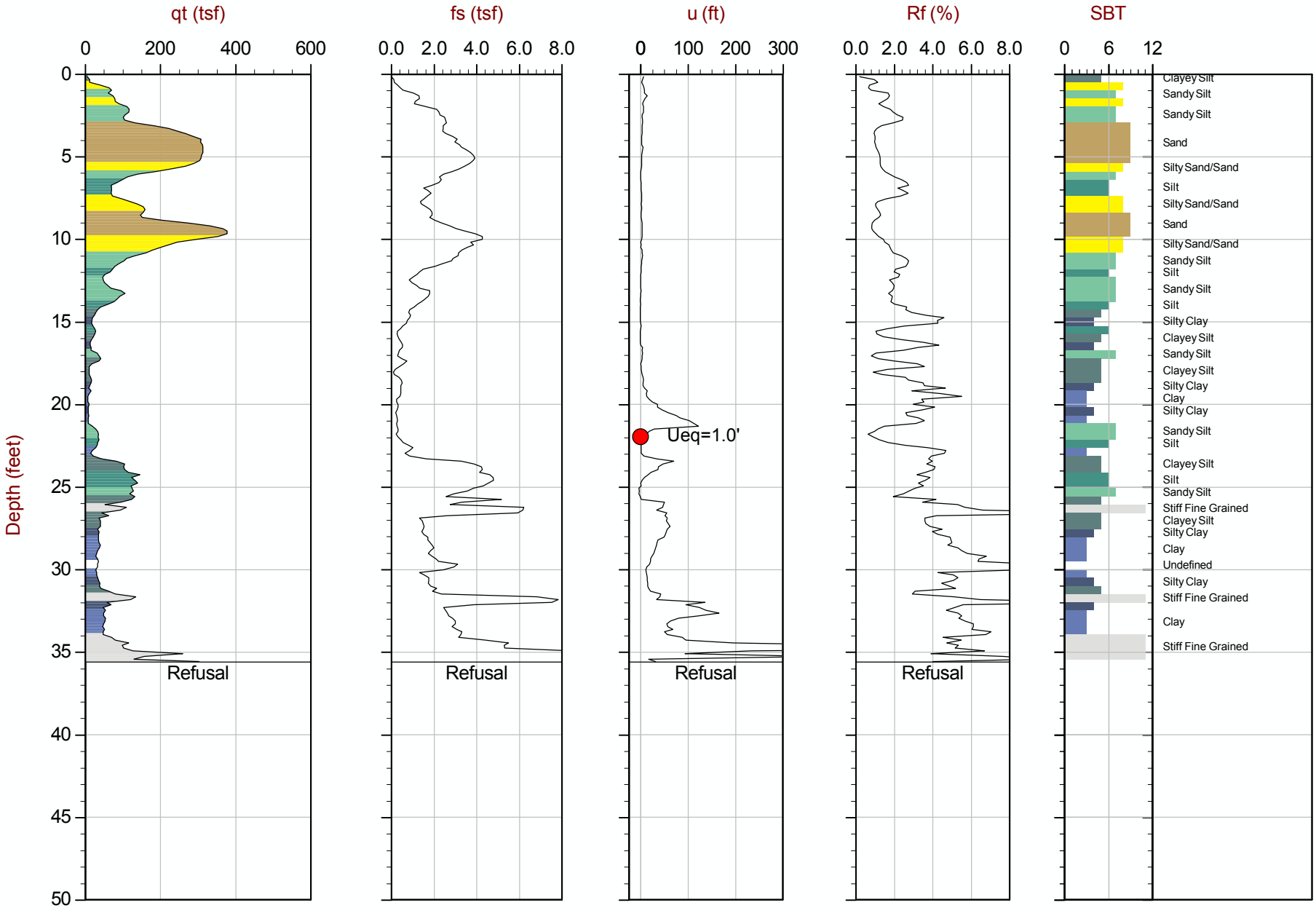
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.649083 Long: -108.499400
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:08:13 14:30
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-14
Cone: 155:T1500F15U500



Max Depth: 10.850 m / 35.60 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP14.COR
Unit Wt: SBT Chart Soil Zones

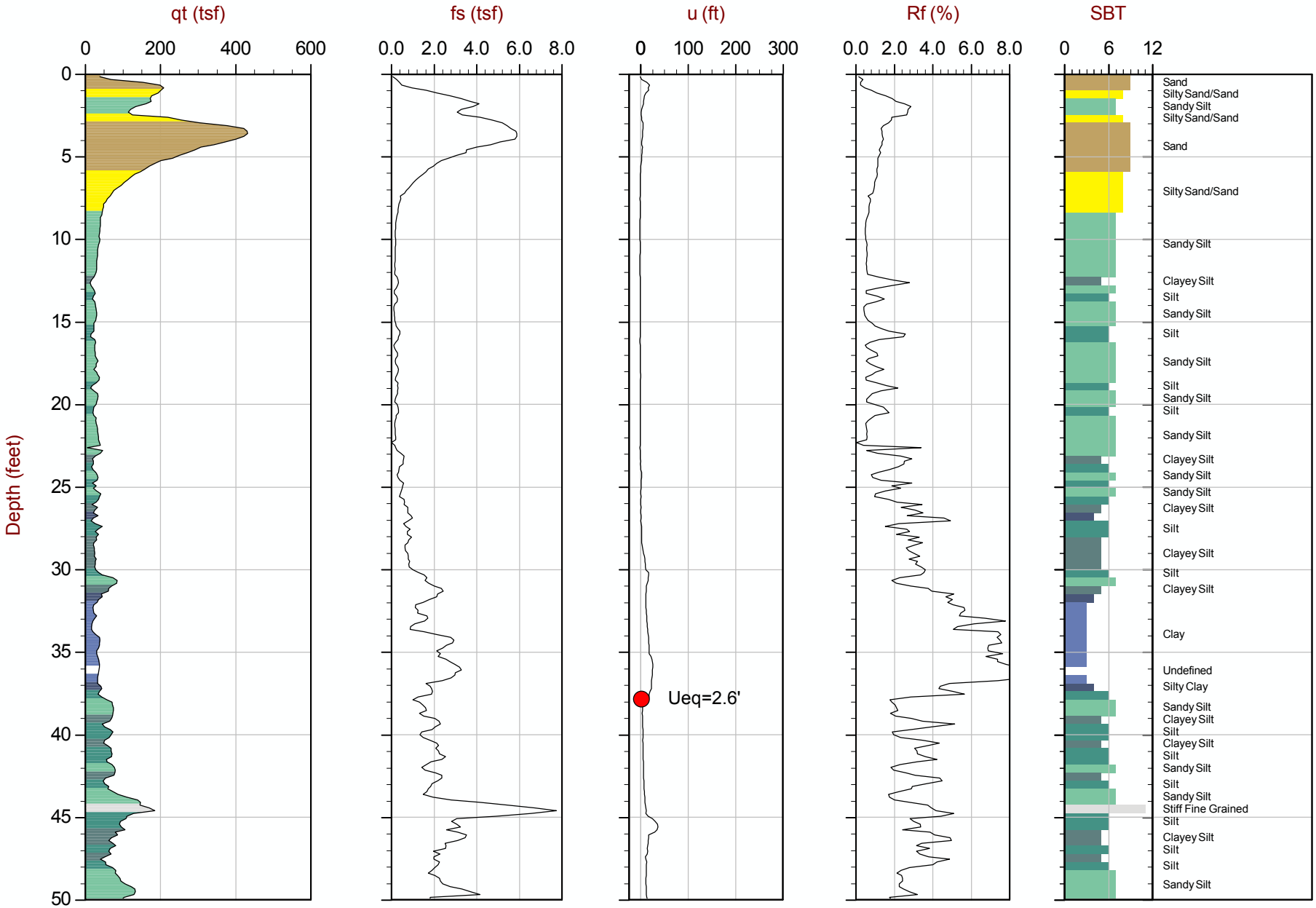
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647233 Long: -108.497867
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:06:13 16:32
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-15
Cone: 155:T1500F15U500



Max Depth: 16.800 m / 55.12 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP15.COR
Unit Wt: SBT Chart Soil Zones

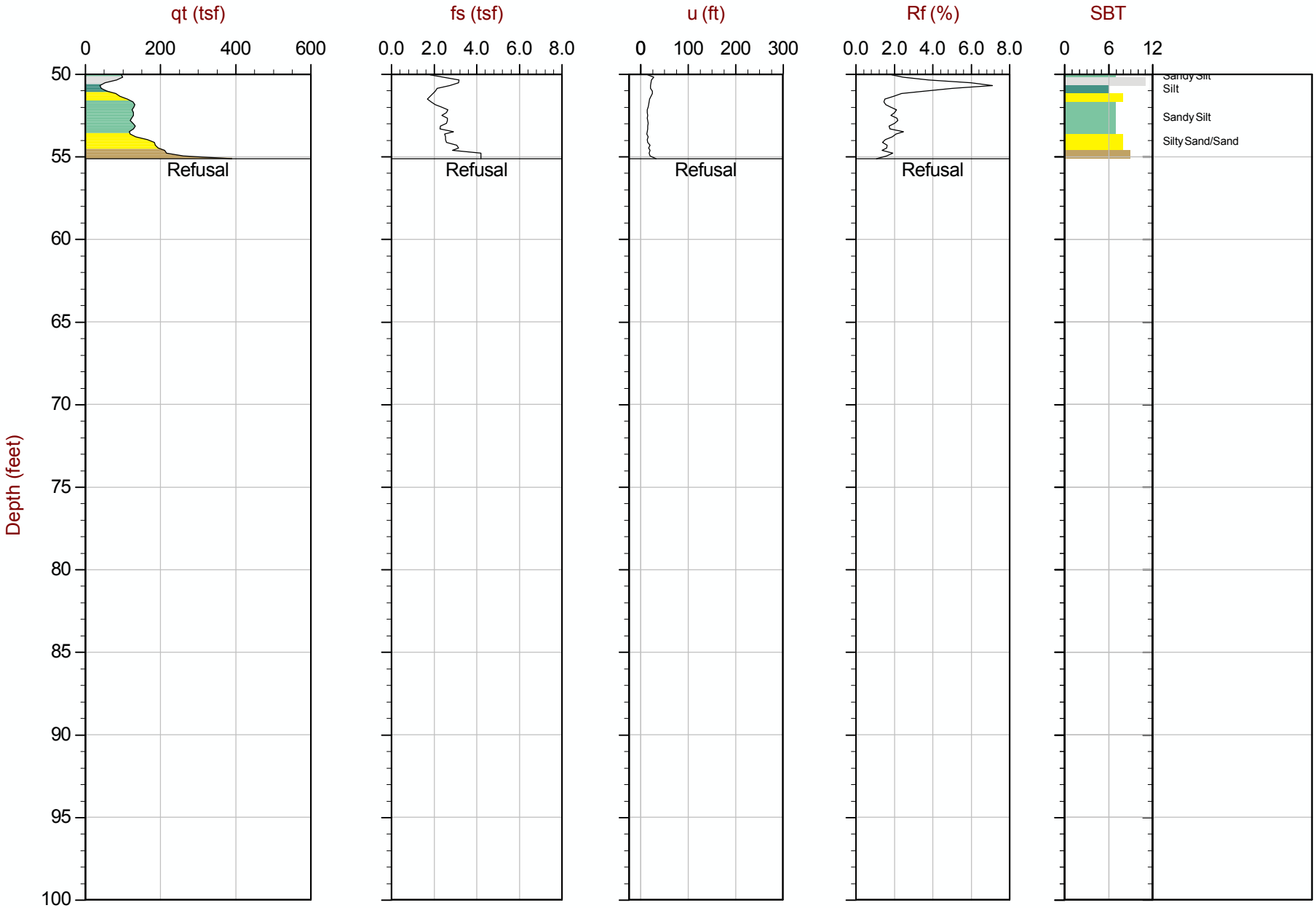
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647583 Long: -108.499800
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:06:13 16:32
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-15
Cone: 155:T1500F15U500



Max Depth: 16.800 m / 55.12 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP15.COR
Unit Wt: SBT Chart Soil Zones

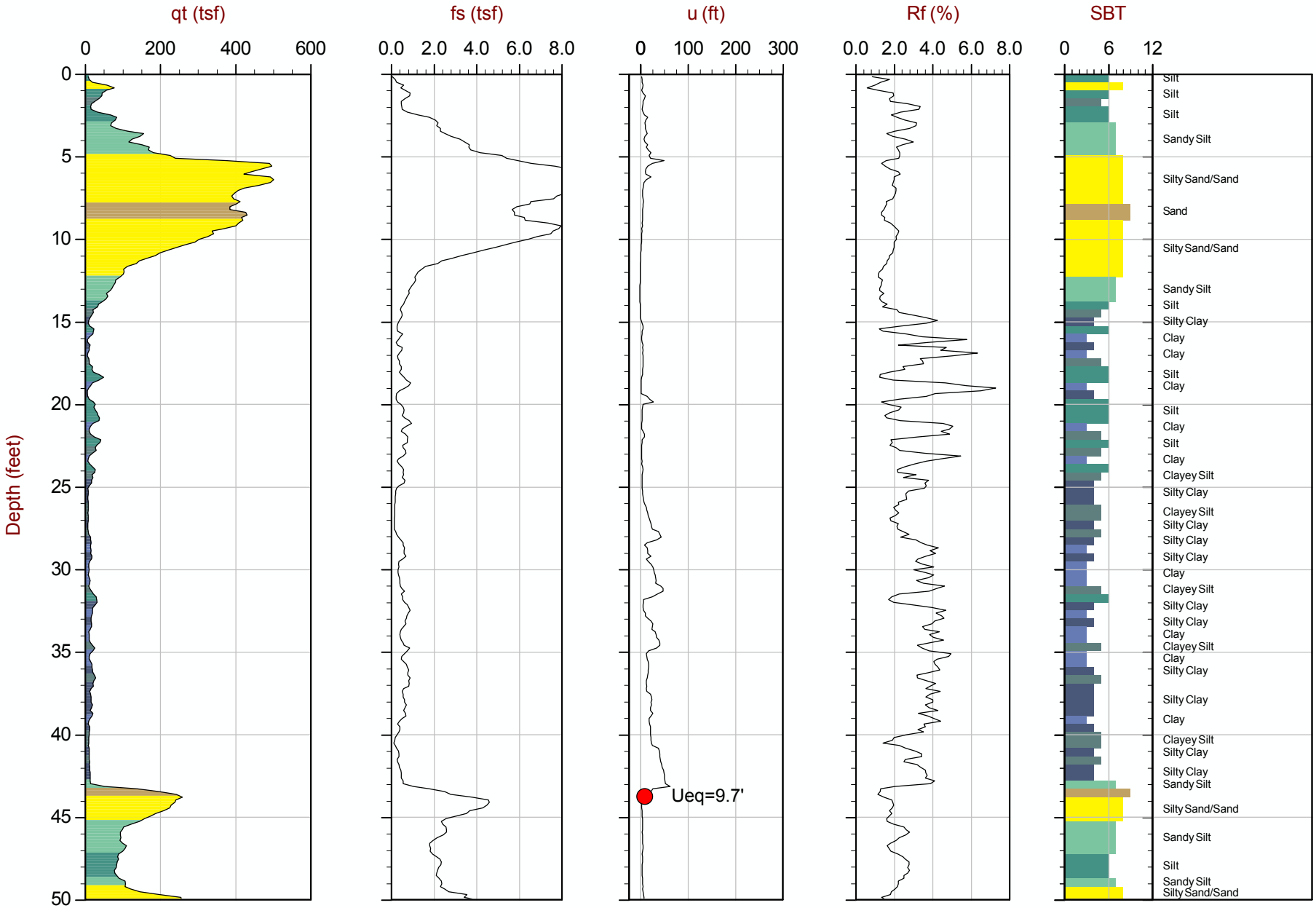
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647583 Long: -108.499800
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:08:13 12:56
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-16
Cone: 155:T1500F15U500



Max Depth: 16.800 m / 55.12 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP16.COR
Unit Wt: SBT Chart Soil Zones

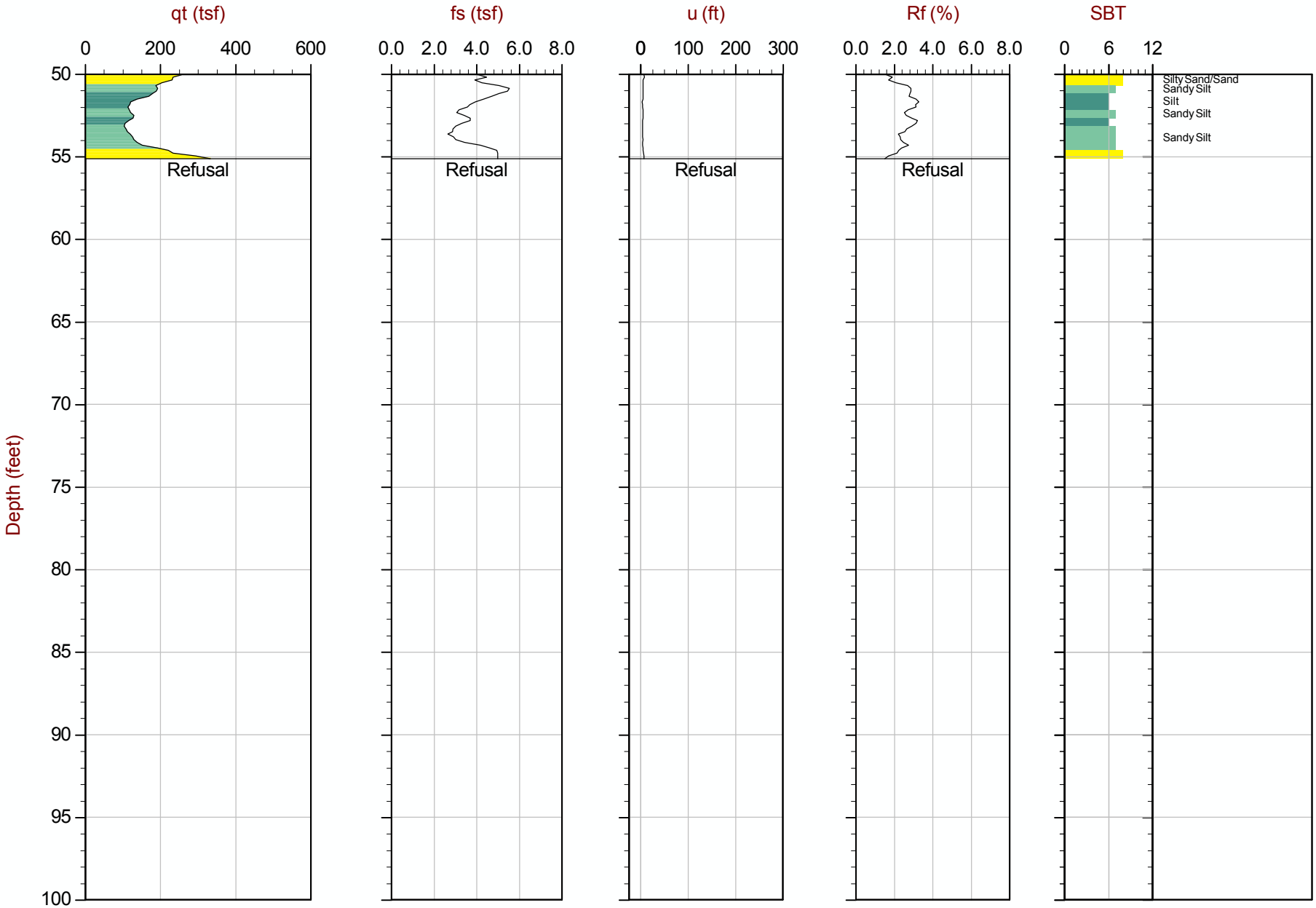
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.648200 Long: -108.497850
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:08:13 12:56
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-16
Cone: 155:T1500F15U500



Max Depth: 16.800 m / 55.12 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP16.COR
Unit Wt: SBT Chart Soil Zones

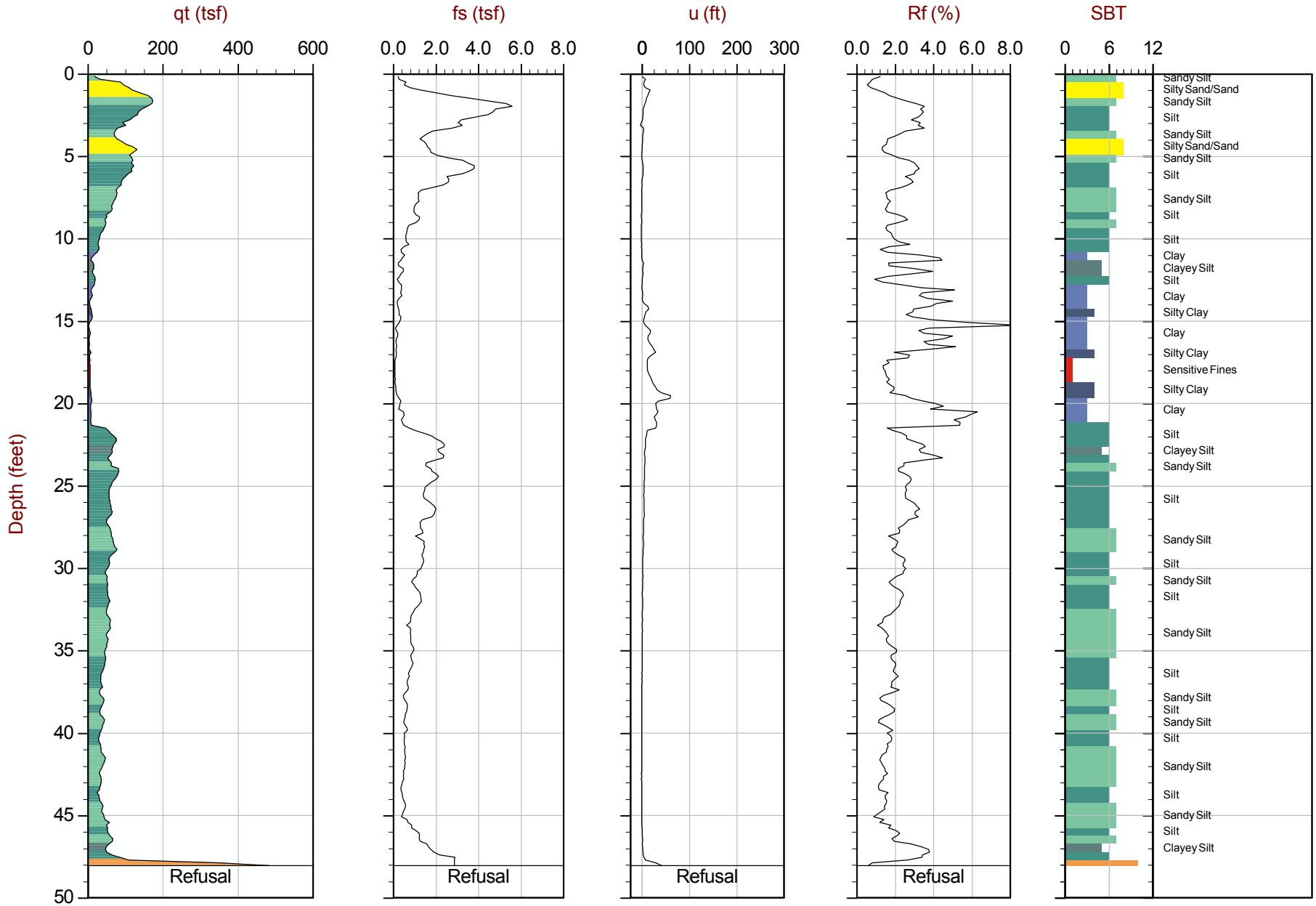
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.648200 Long: -108.497850
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:09:13 14:32
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-17
Cone: 155:T1500F15U500



Max Depth: 14.650 m / 48.06 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP17.COR
Unit Wt: SBT Chart Soil Zones

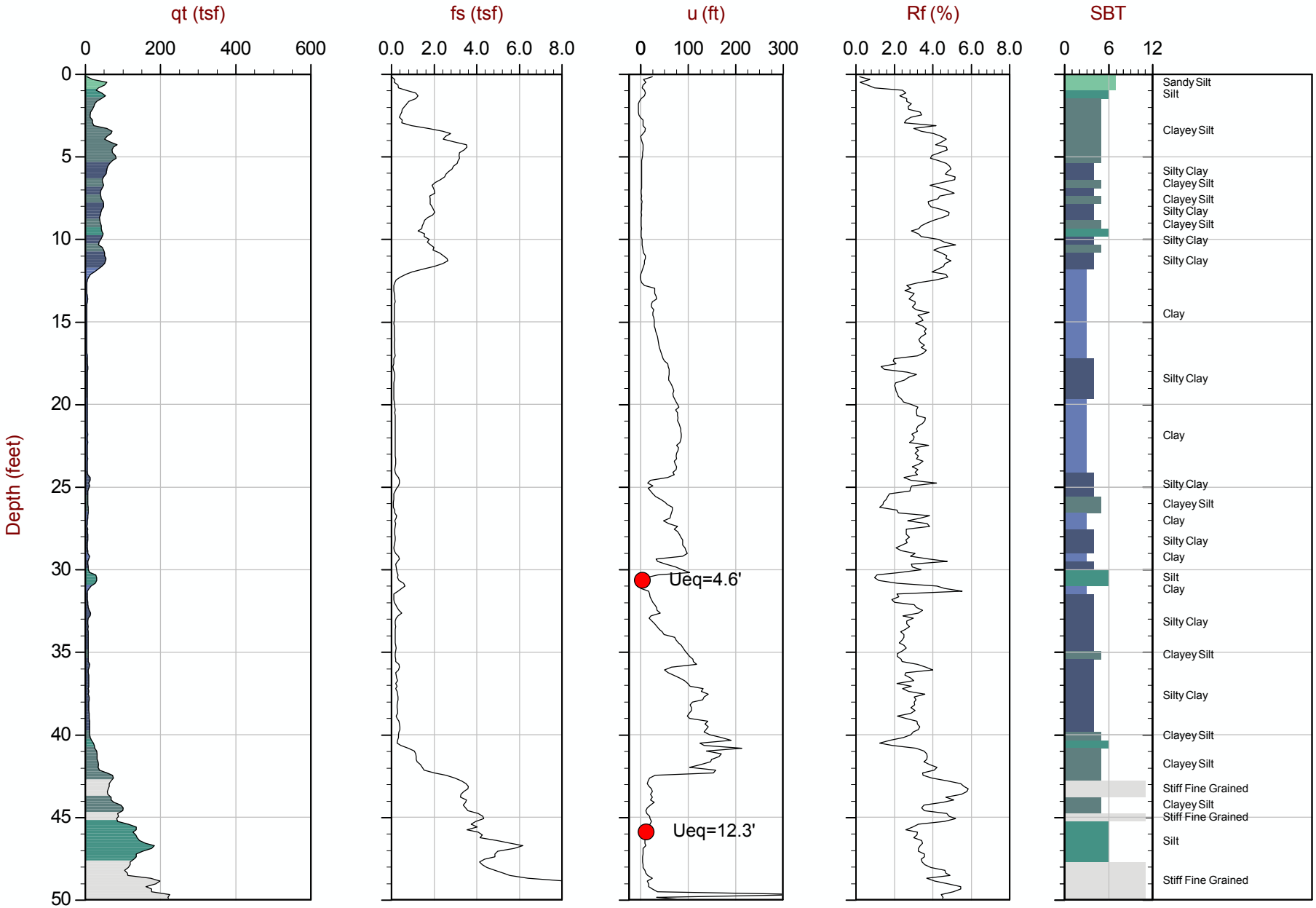
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.648617 Long: -108.496383
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:09:13 10:46
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-18
Cone: 155:T1500F15U500



Max Depth: 15.250 m / 50.03 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP18.COR
Unit Wt: SBT Chart Soil Zones

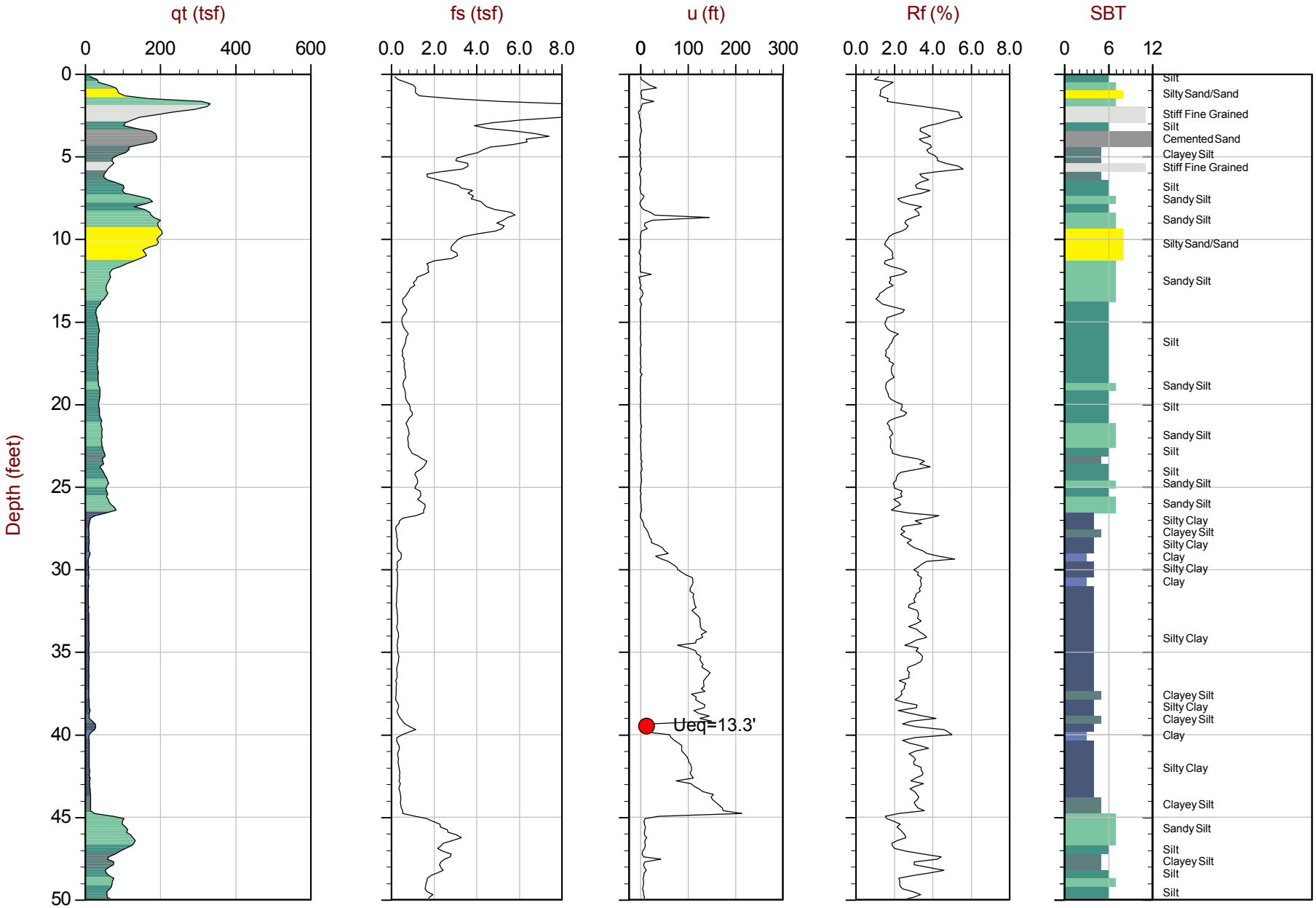
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.648000 Long: -108.496683
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:09:13 11:56
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-19
Cone: 155:T1500F15U500



Max Depth: 17.750 m / 58.23 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP19.COR
Unit Wt: SBT Chart Soil Zones

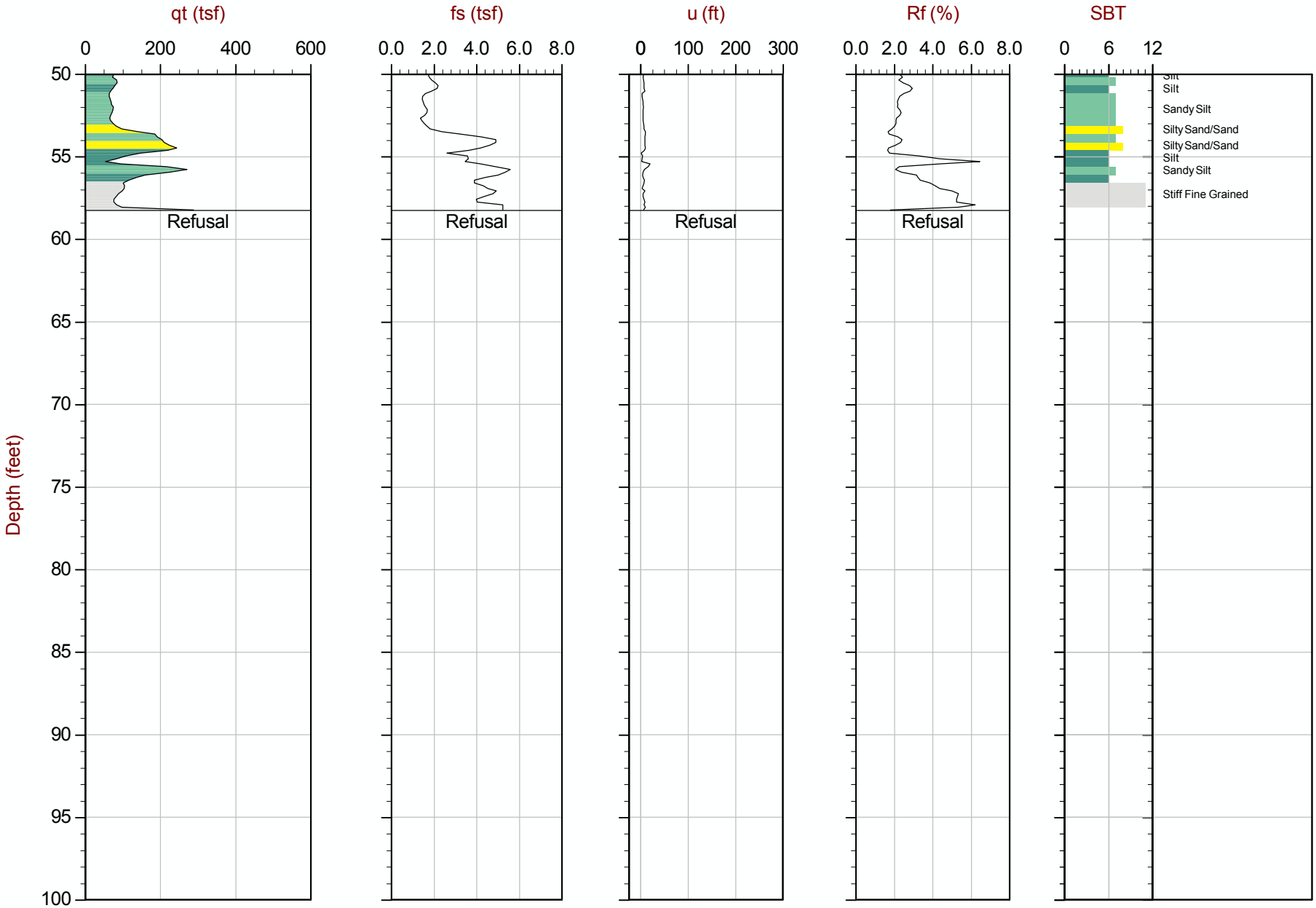
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647450 Long: -108.497000
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:09:13 11:56
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-19
Cone: 155:T1500F15U500



Max Depth: 17.750 m / 58.23 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP19.COR
Unit Wt: SBT Chart Soil Zones

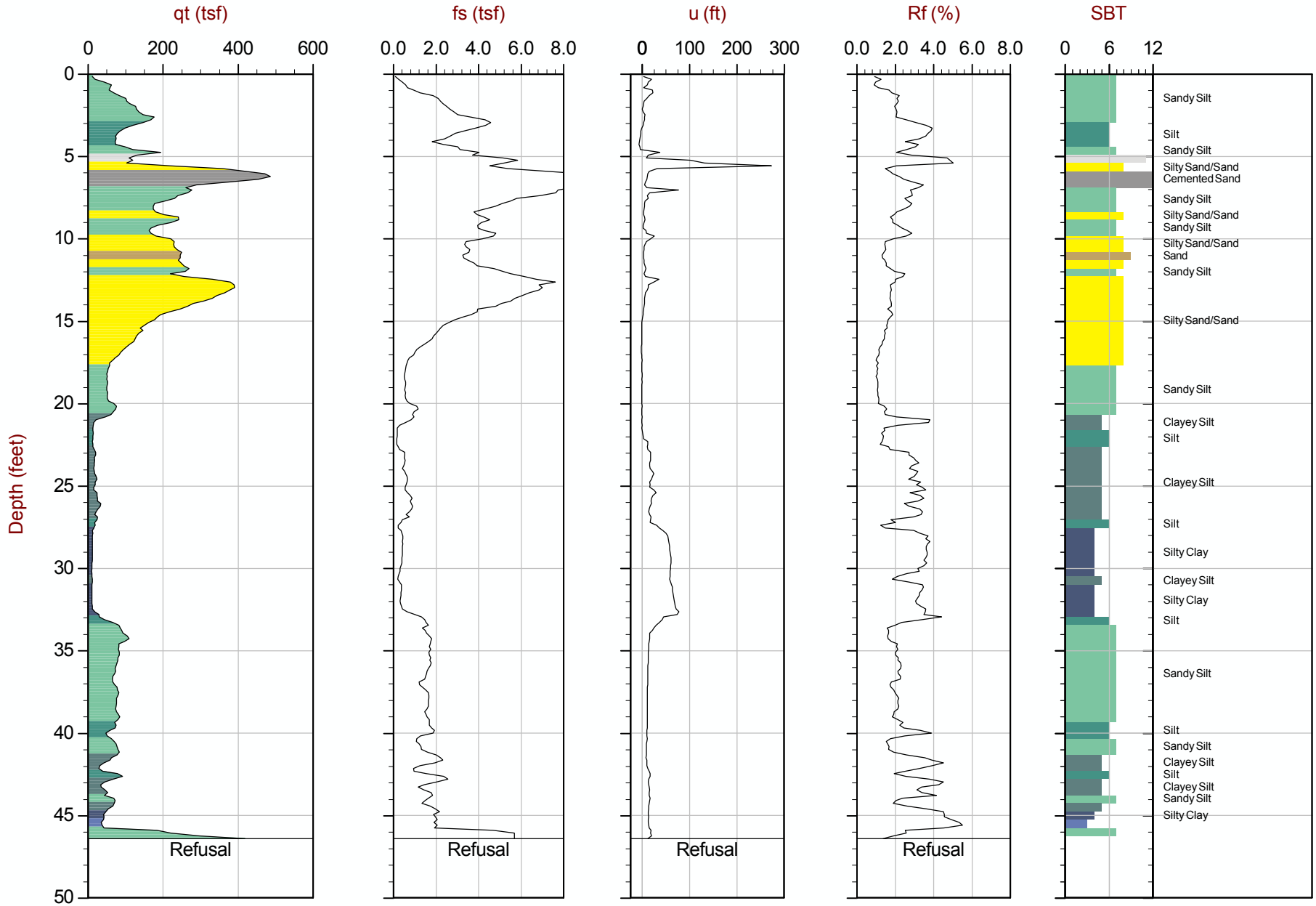
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647450 Long: -108.497000
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:09:13 13:36
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-20
Cone: 155:T1500F15U500



Max Depth: 14.150 m / 46.42 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP20.COR
Unit Wt: SBT Chart Soil Zones

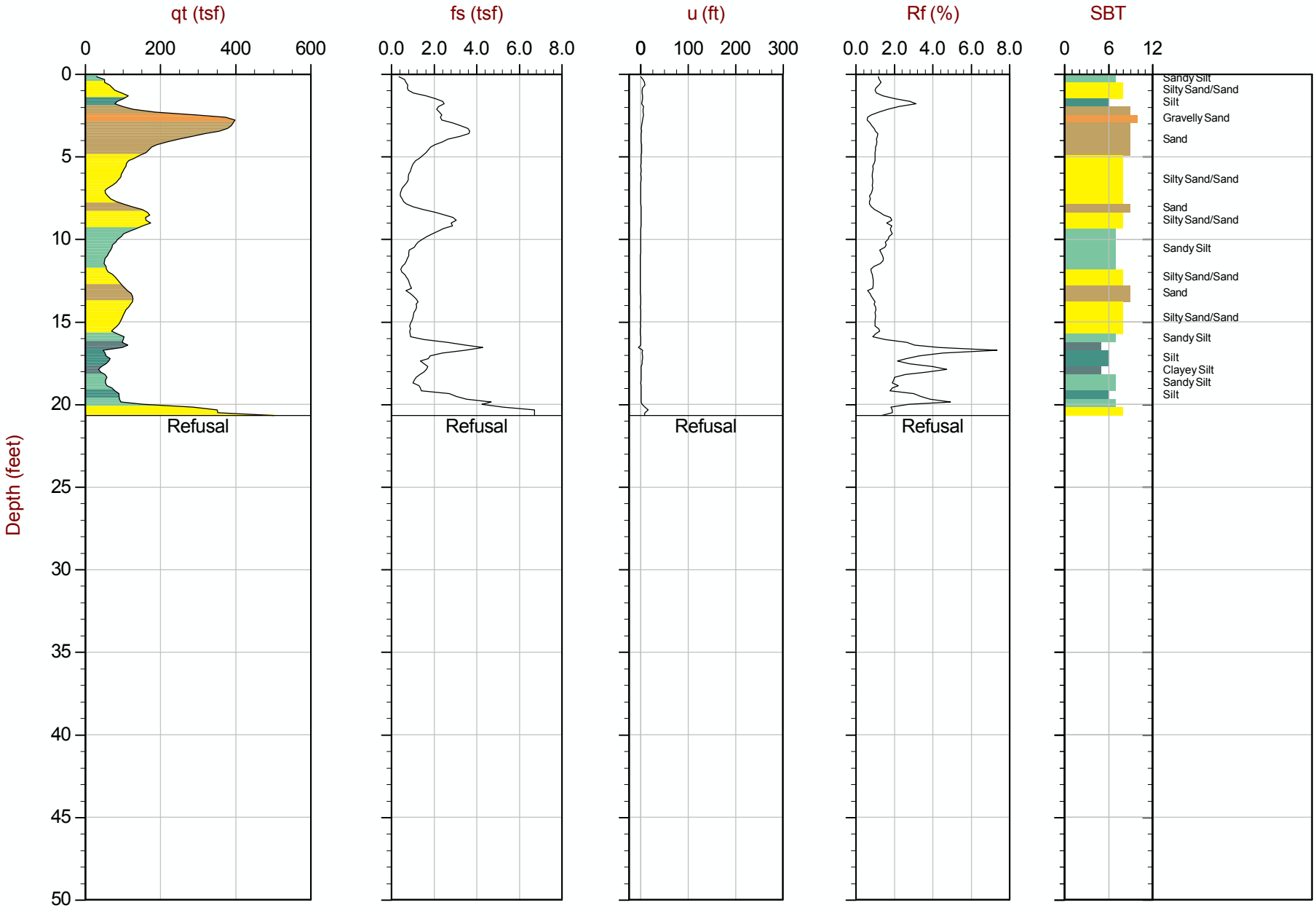
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.646883 Long: -108.497167
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:08:13 15:34
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-21
Cone: 155:T1500F15U500



Max Depth: 6.300 m / 20.67 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP21.COR
Unit Wt: SBT Chart Soil Zones

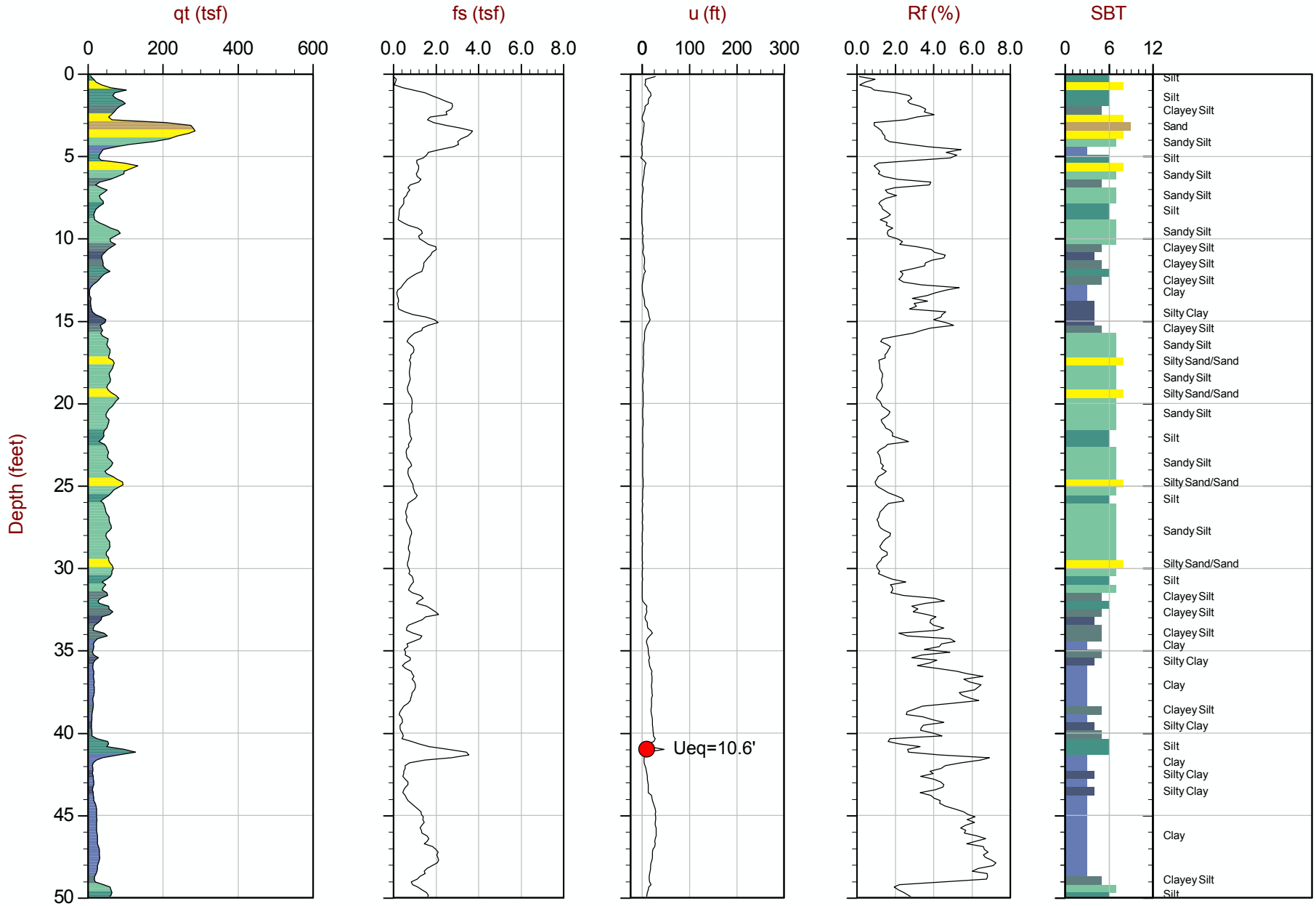
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.646283 Long: -108.501583
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:10:13 11:54
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-22
Cone: 155:T1500F15U500



Max Depth: 28.750 m / 94.32 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP22.COR
Unit Wt: SBT Chart Soil Zones

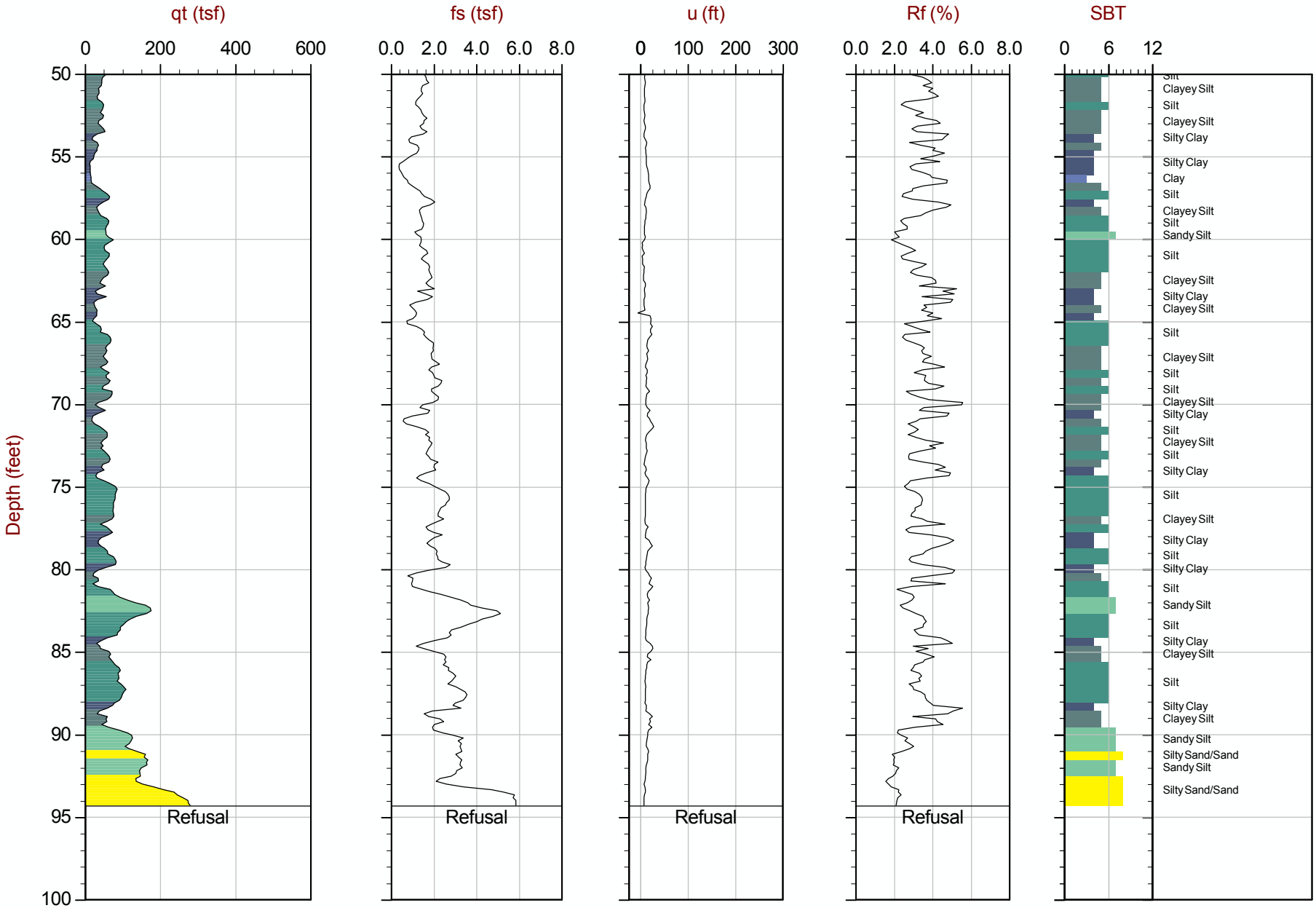
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647950 Long: -108.502917
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:10:13 11:54
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-22
Cone: 155:T1500F15U500



Max Depth: 28.750 m / 94.32 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP22.COR
Unit Wt: SBT Chart Soil Zones

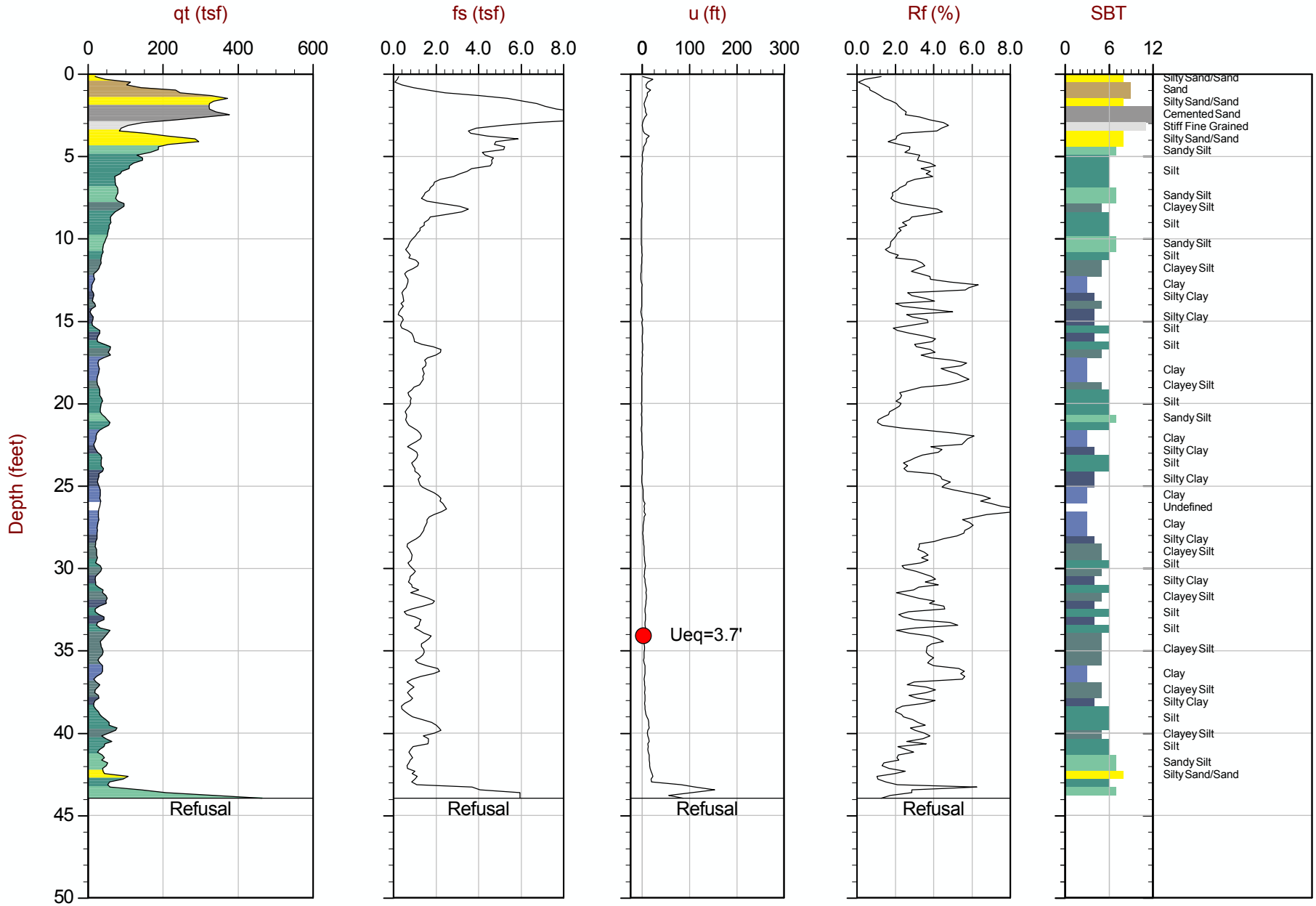
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647950 Long: -108.502917
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:08:13 16:21
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-23
Cone: 155:T1500F15U500



Max Depth: 13.400 m / 43.96 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP23.COR
Unit Wt: SBT Chart Soil Zones

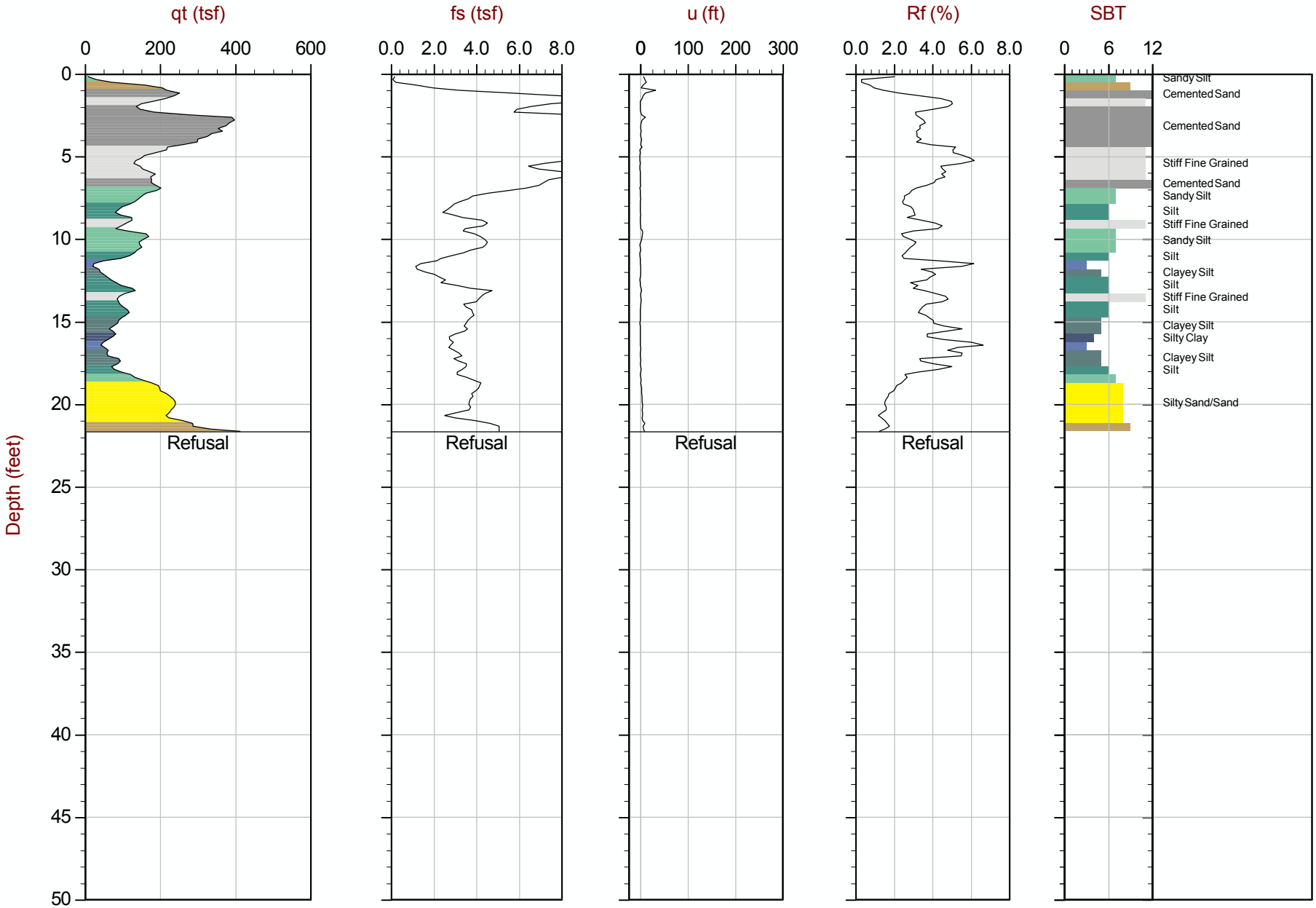
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.650833 Long: -108.497700
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:09:13 16:36
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-24
Cone: 155:T1500F15U500



Max Depth: 6.600 m / 21.65 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP24.COR
Unit Wt: SBT Chart Soil Zones

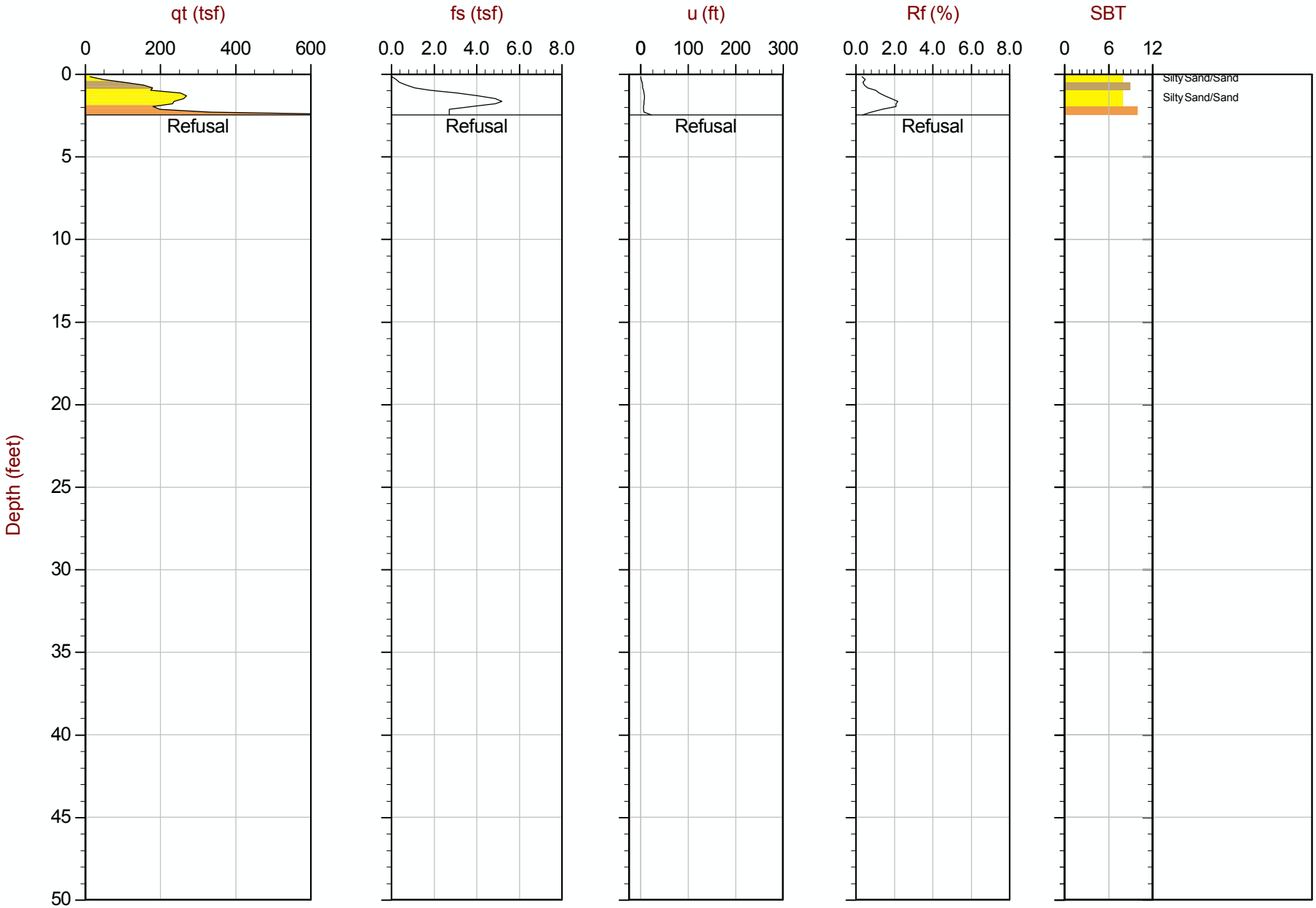
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.650000 Long: -108.498717
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:09:13 08:11
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-25
Cone: 155:T1500F15U500



Max Depth: 0.750 m / 2.46 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP25.COR
Unit Wt: SBT Chart Soil Zones

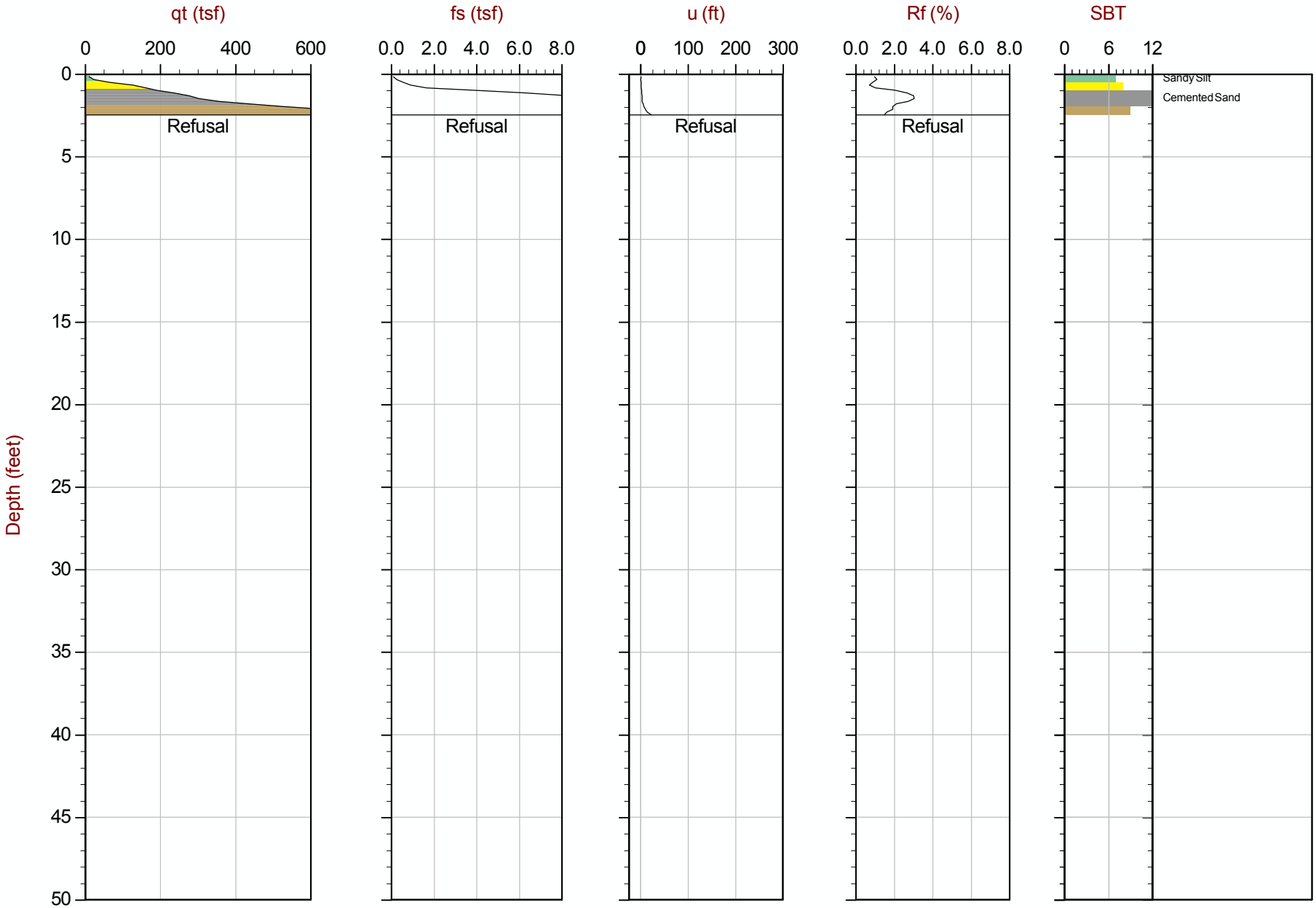
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.649650 Long: -108.497733
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:09:13 08:40
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-25B
Cone: 155:T1500F15U500



Max Depth: 0.750 m / 2.46 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP25B.COR
Unit Wt: SBT Chart Soil Zones

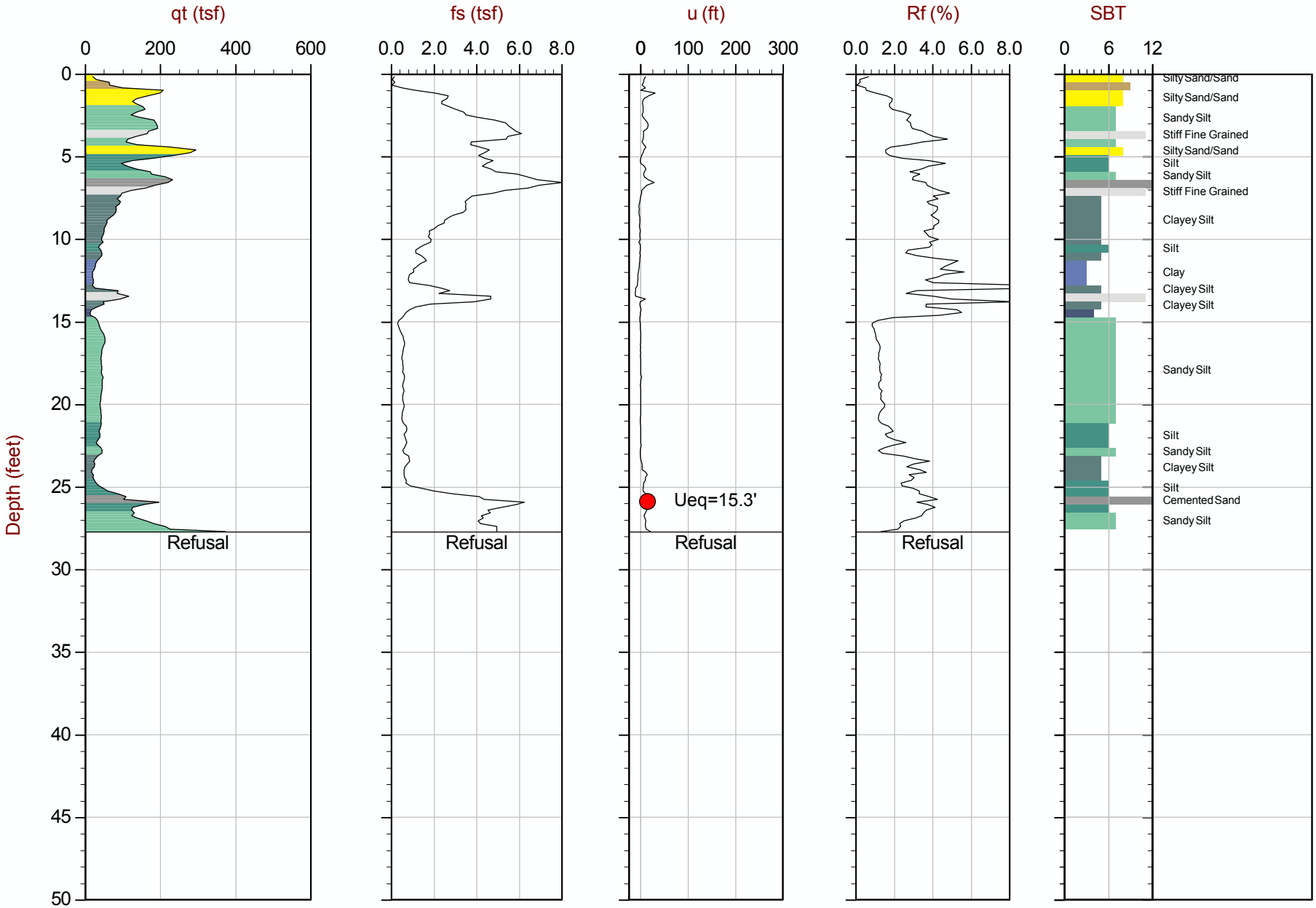
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.649650 Long: -108.497767
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:09:13 09:25
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-26
Cone: 155:T1500F15U500



Max Depth: 8.450 m / 27.72 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP26.COR
Unit Wt: SBT Chart Soil Zones

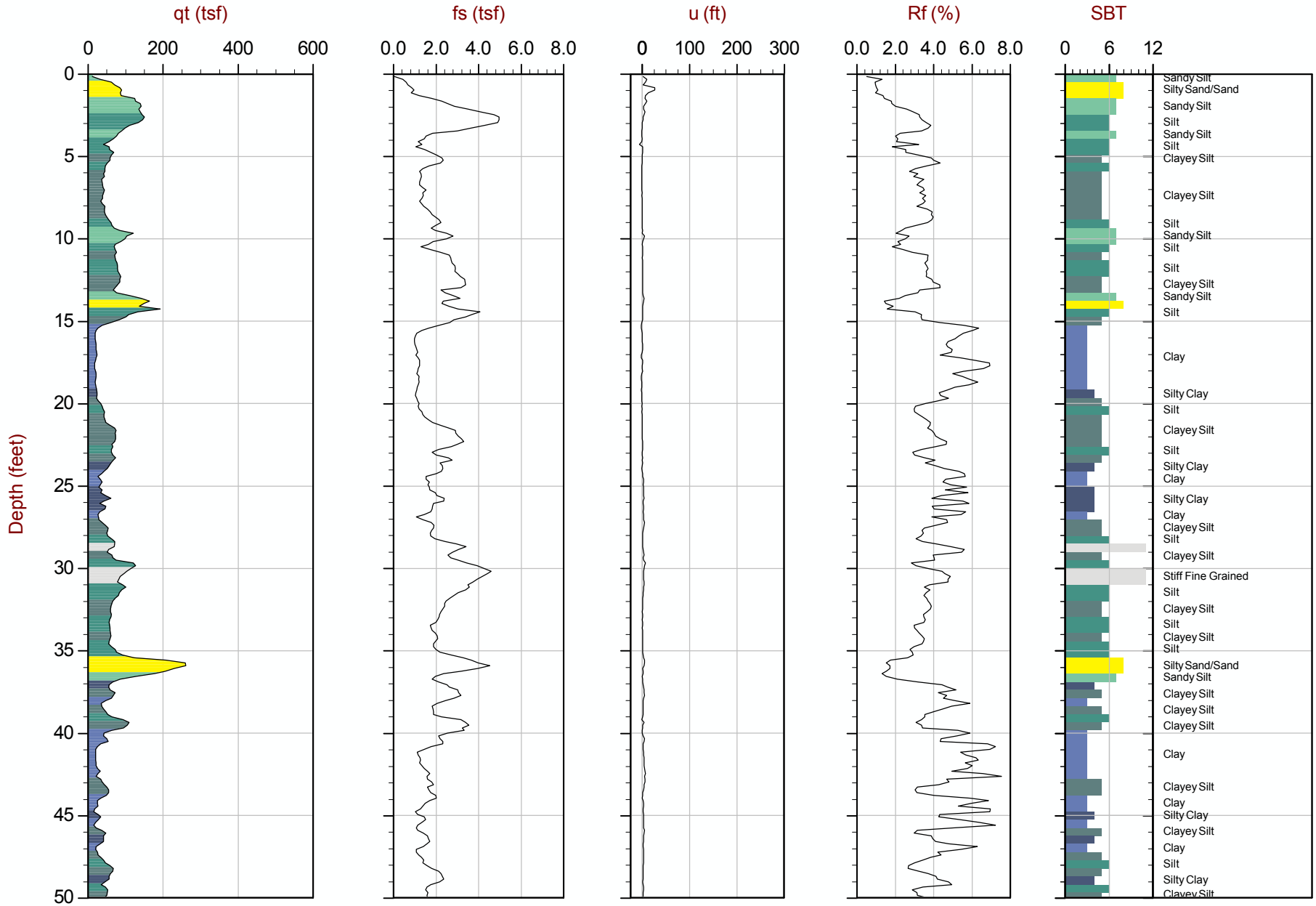
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.648417 Long: -108.500567
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:09:13 15:22
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-27
Cone: 155:T1500F15U500



Max Depth: 24.300 m / 79.72 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP27.COR
Unit Wt: SBT Chart Soil Zones

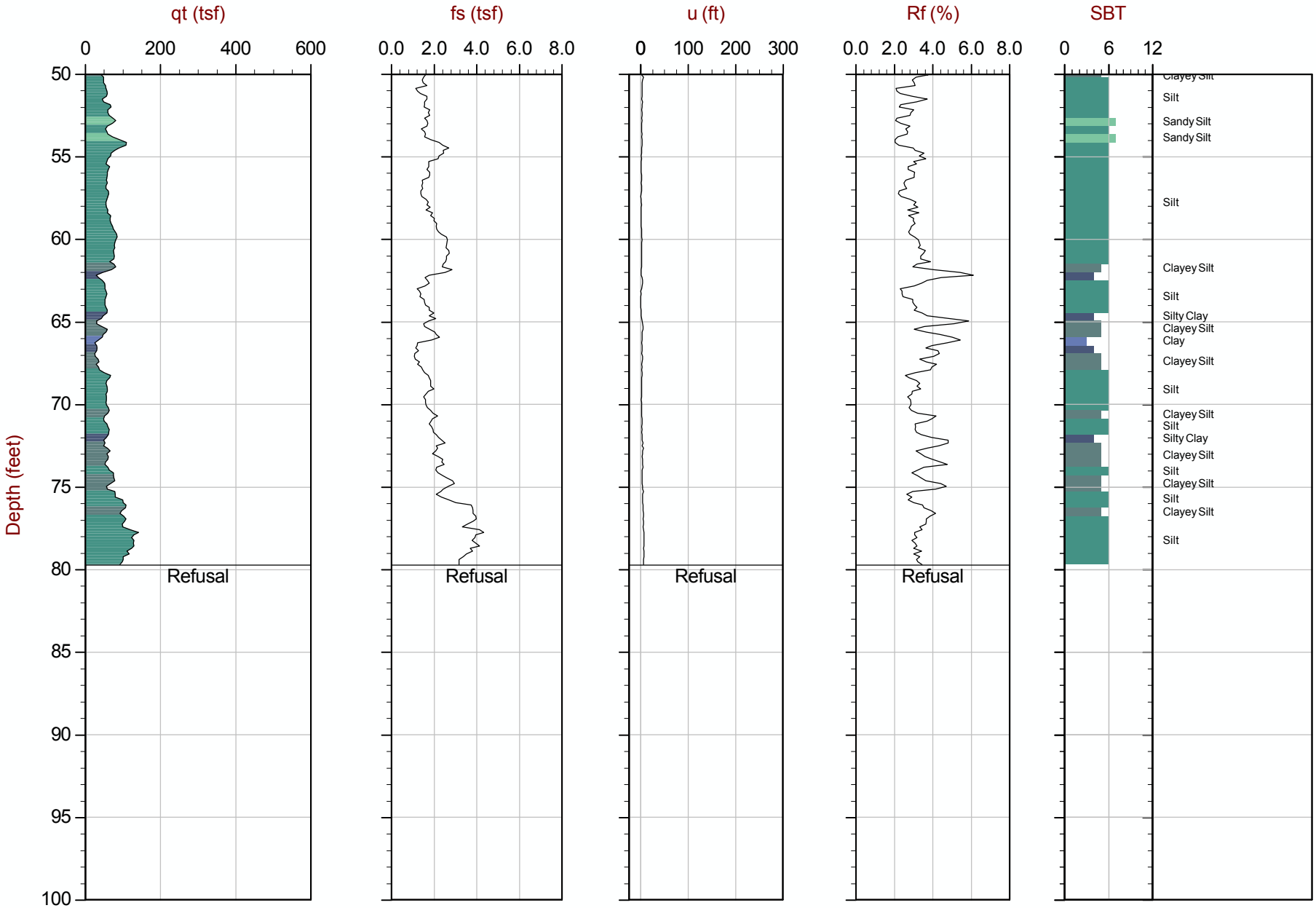
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647583 Long: -108.496367
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:09:13 15:22
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-27
Cone: 155:T1500F15U500



Max Depth: 24.300 m / 79.72 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP27.COR
Unit Wt: SBT Chart Soil Zones

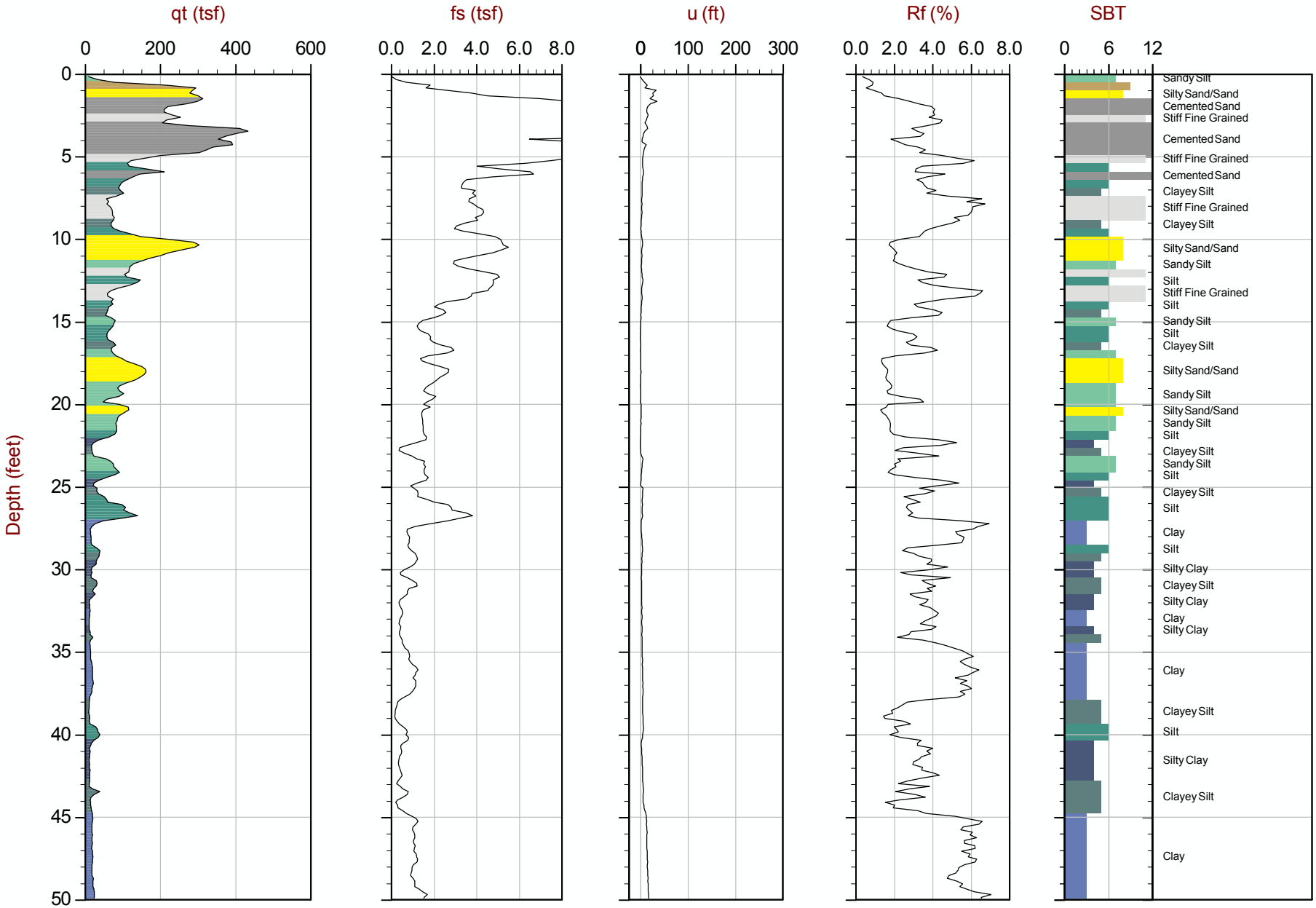
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647583 Long: -108.496367
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:10:13 08:17
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-28
Cone: 155:T1500F15U500



Max Depth: 25.600 m / 83.99 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP28.COR
Unit Wt: SBT Chart Soil Zones

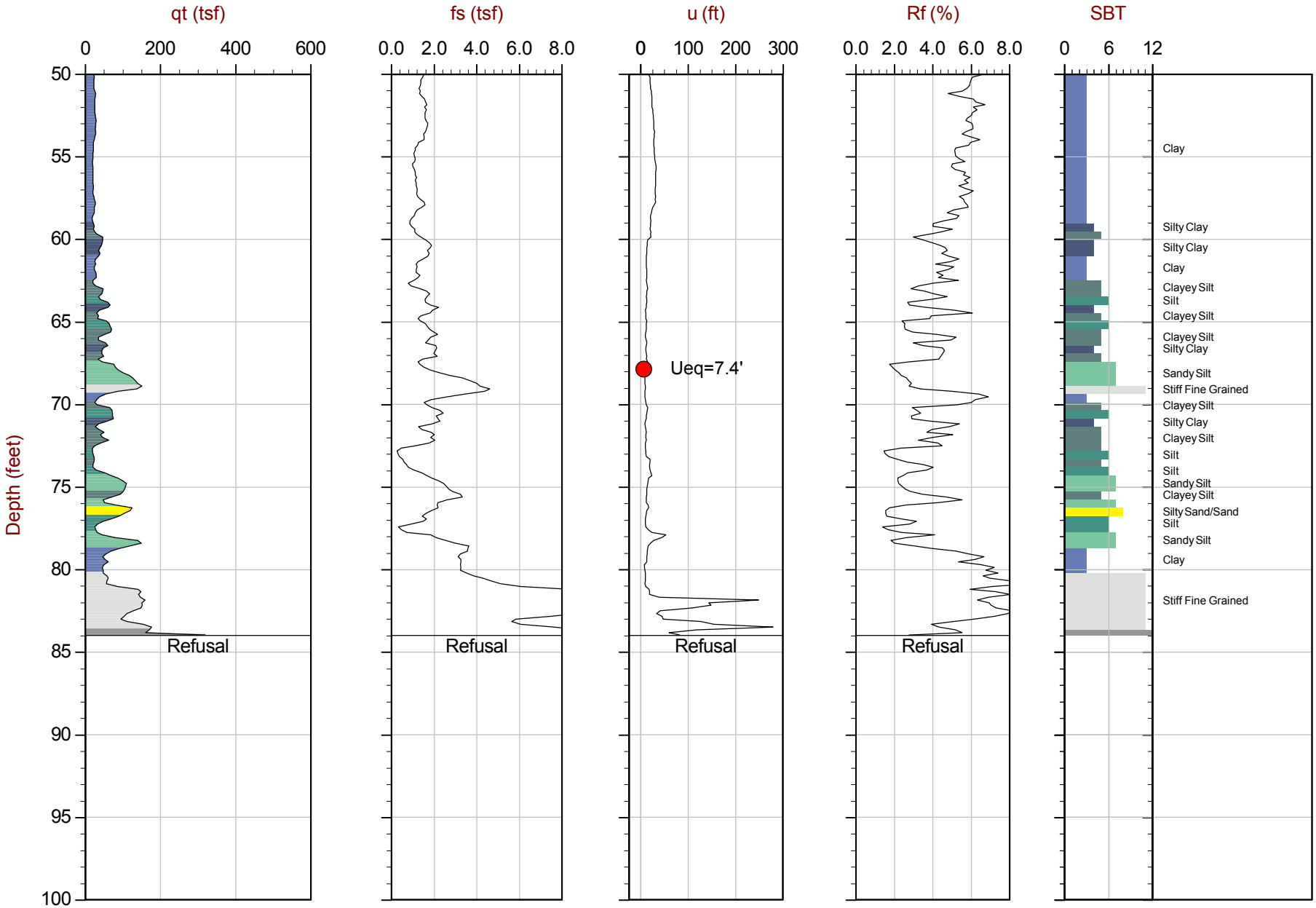
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.649767 Long: -108.501117
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:10:13 08:17
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-28
Cone: 155:T1500F15U500



Max Depth: 25.600 m / 83.99 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP28.COR
Unit Wt: SBT Chart Soil Zones

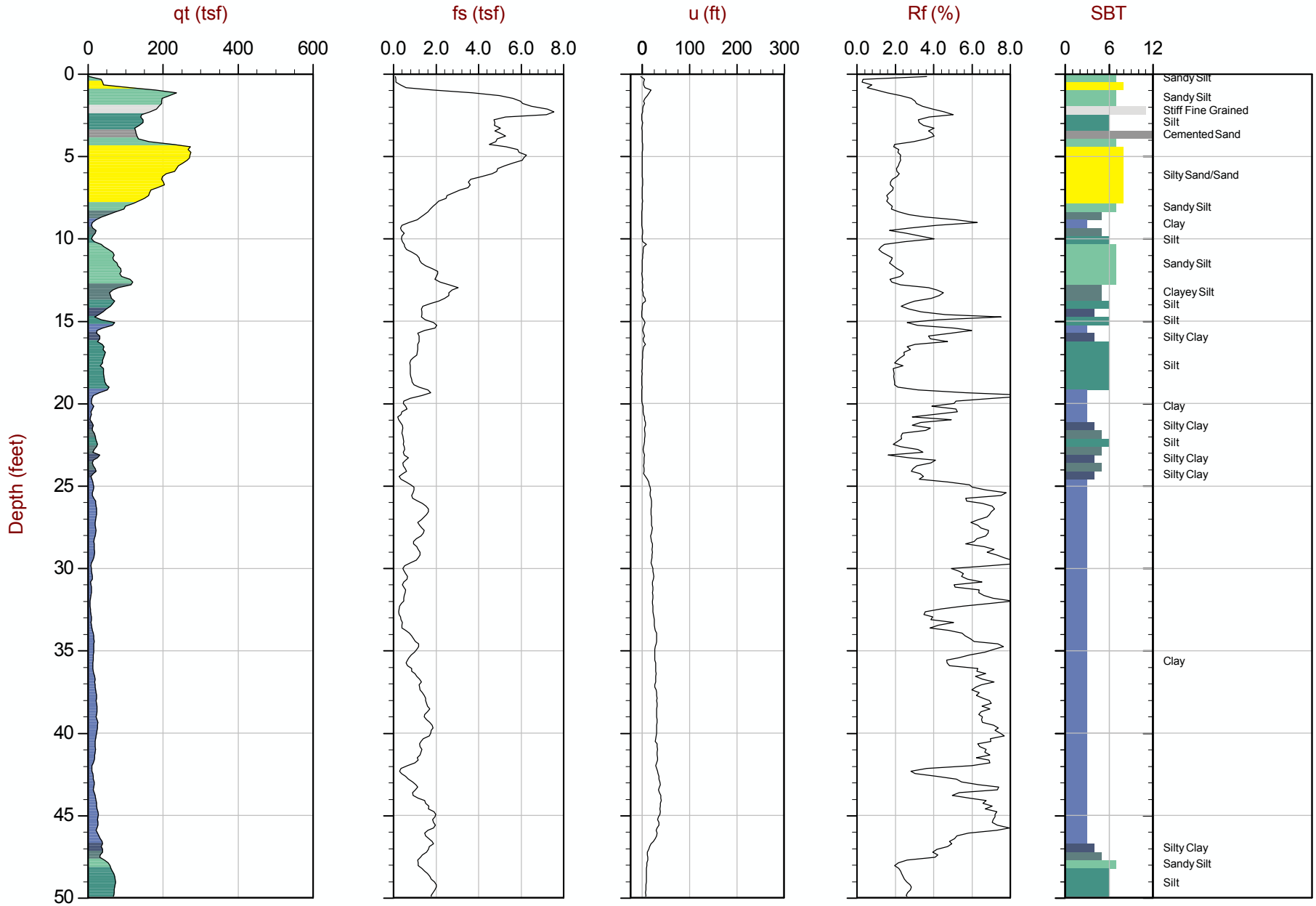
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.649767 Long: -108.501117
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:10:13 09:39
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-29
Cone: 155:T1500F15U500



Max Depth: 31.500 m / 103.35 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP29.COR
Unit Wt: SBT Chart Soil Zones

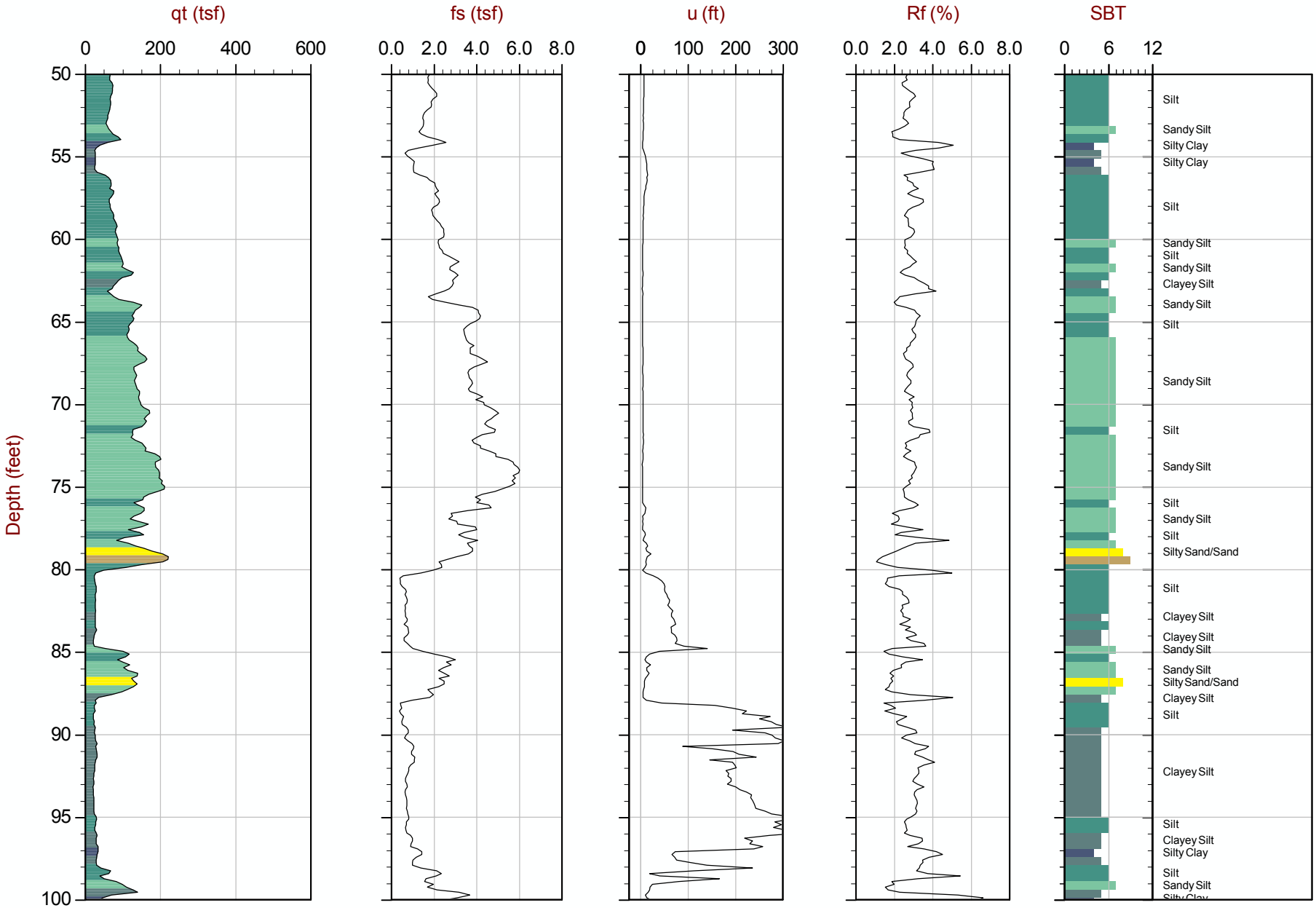
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.651200 Long: -108.499183
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:10:13 09:39
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-29
Cone: 155:T1500F15U500



Max Depth: 31.500 m / 103.35 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP29.COR
Unit Wt: SBT Chart Soil Zones

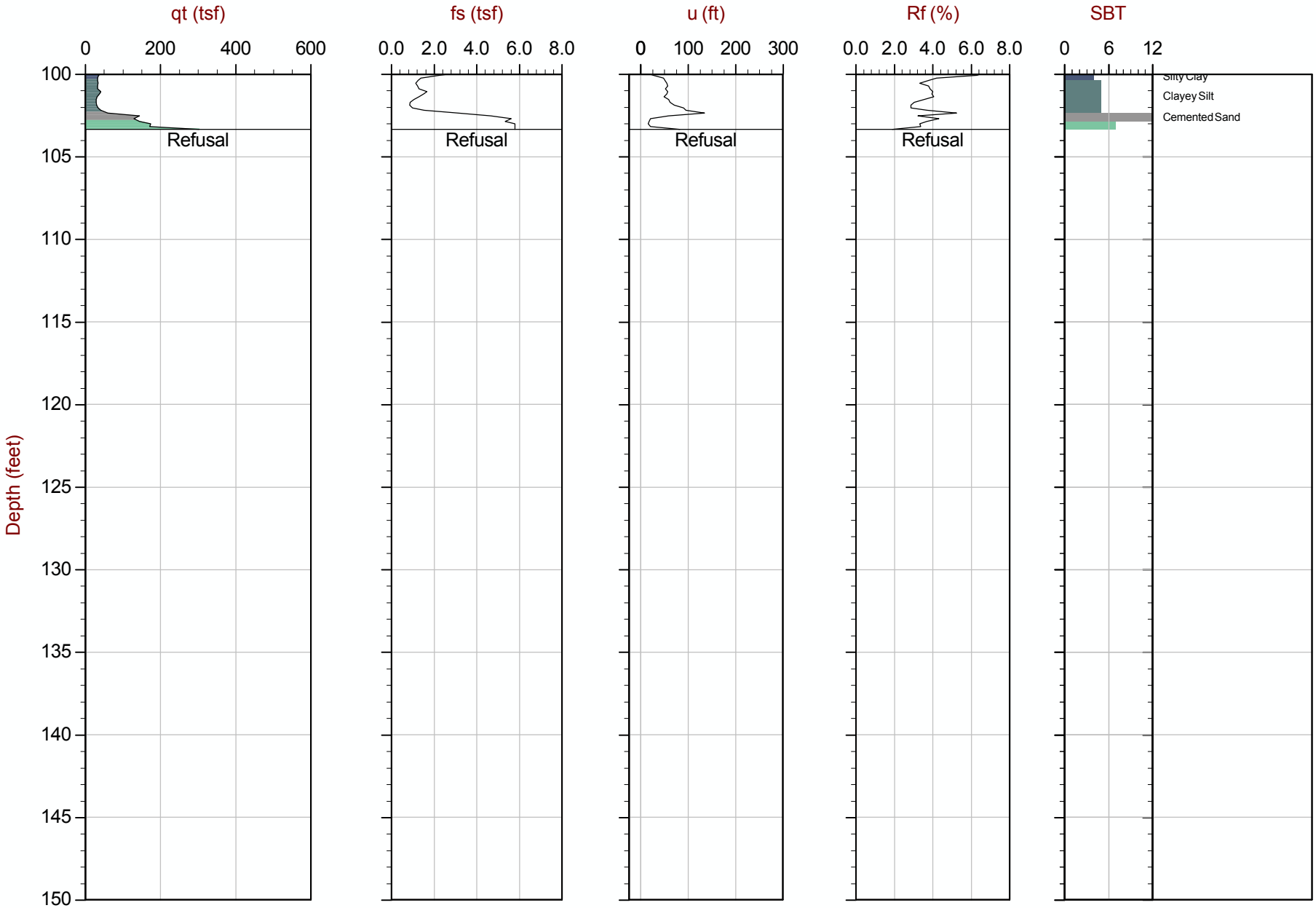
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.651200 Long: -108.499183
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:10:13 09:39
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-29
Cone: 155:T1500F15U500



Max Depth: 31.500 m / 103.35 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP29.COR
Unit Wt: SBT Chart Soil Zones

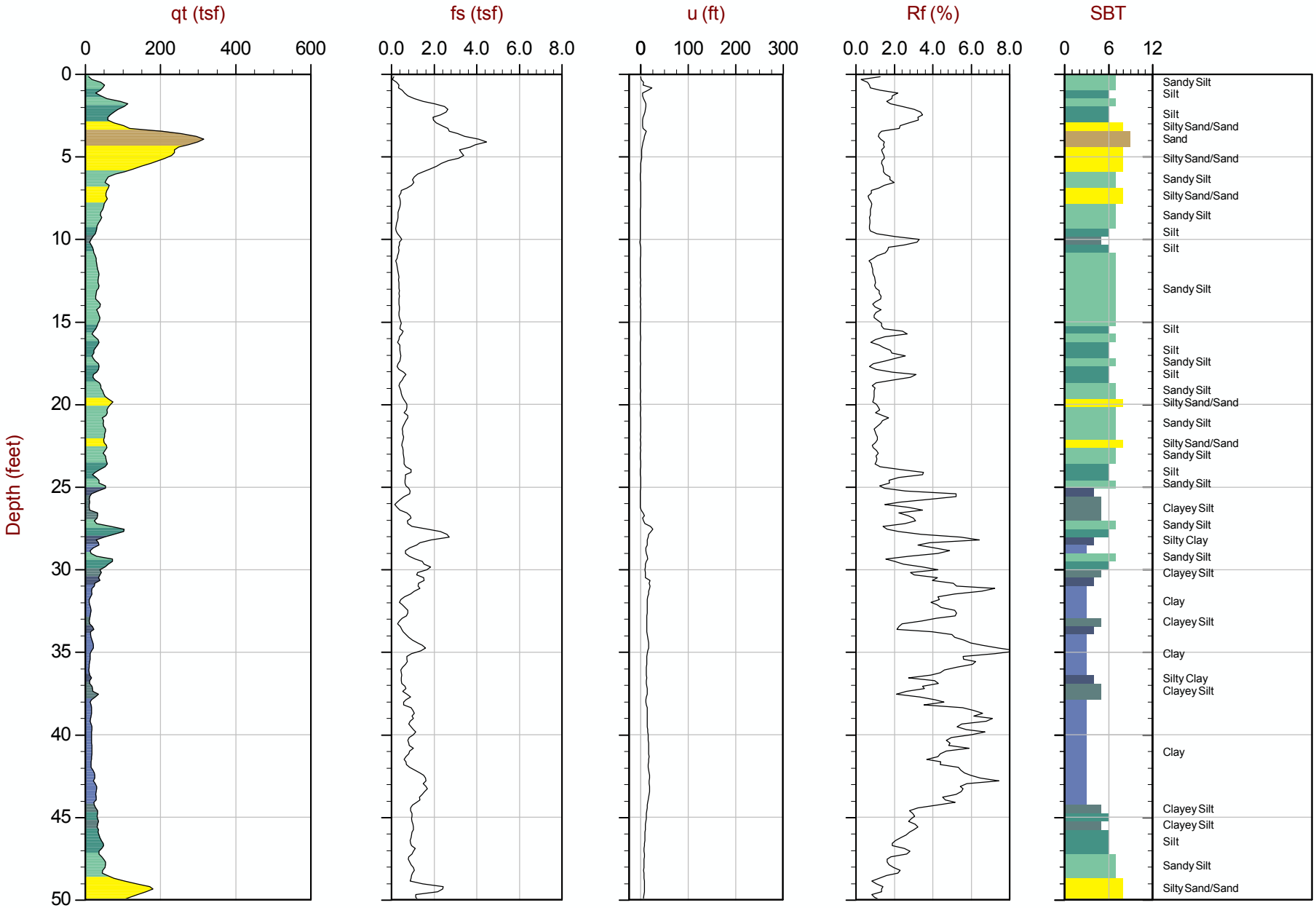
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.651200 Long: -108.499183
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:10:13 10:57
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-30
Cone: 155:T1500F15U500



Max Depth: 22.800 m / 74.80 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP30.COR
Unit Wt: SBT Chart Soil Zones

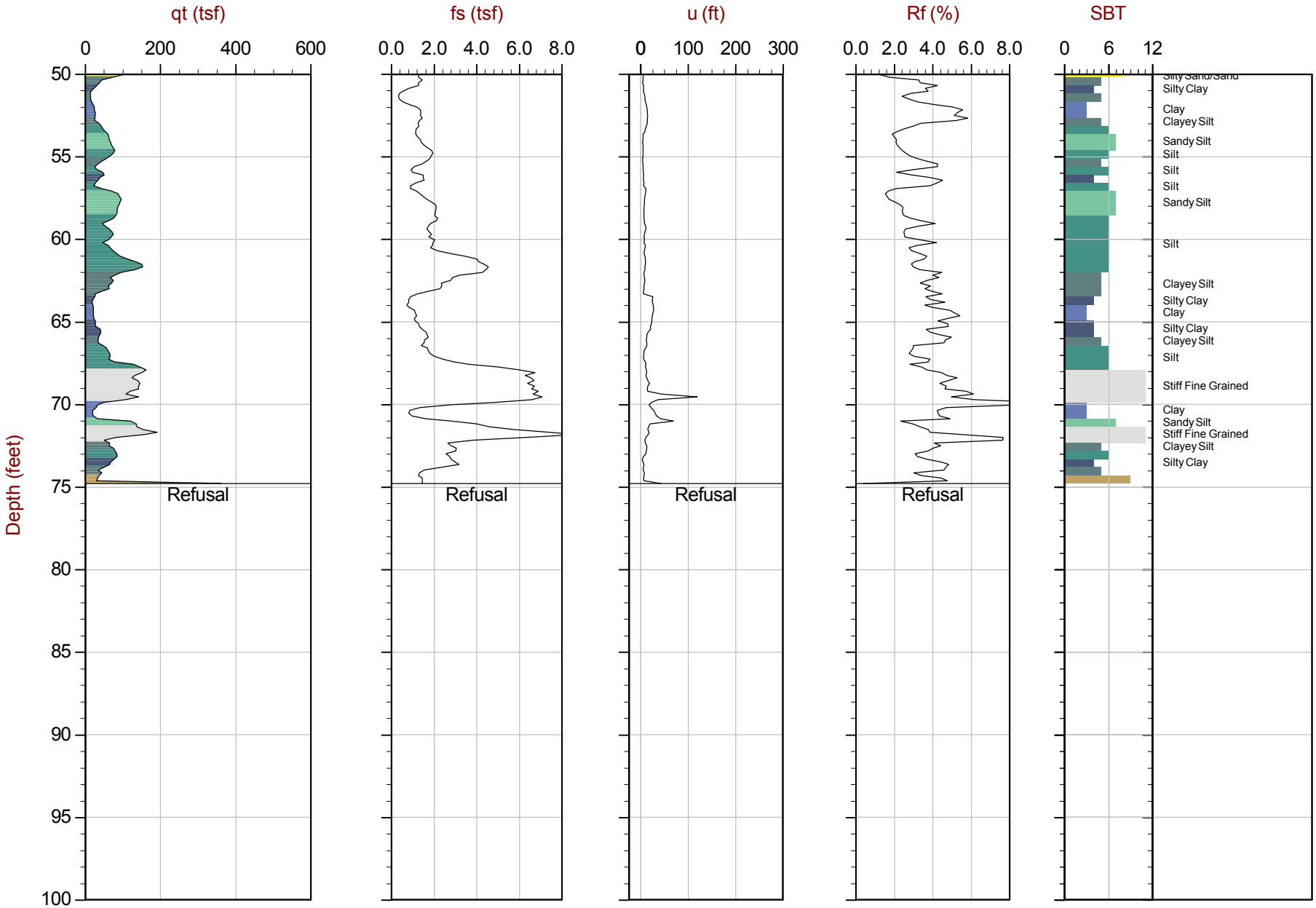
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647250 Long: -108.503350
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:10:13 10:57
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-30
Cone: 155:T1500F15U500



Max Depth: 22.800 m / 74.80 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP30.COR
Unit Wt: SBT Chart Soil Zones

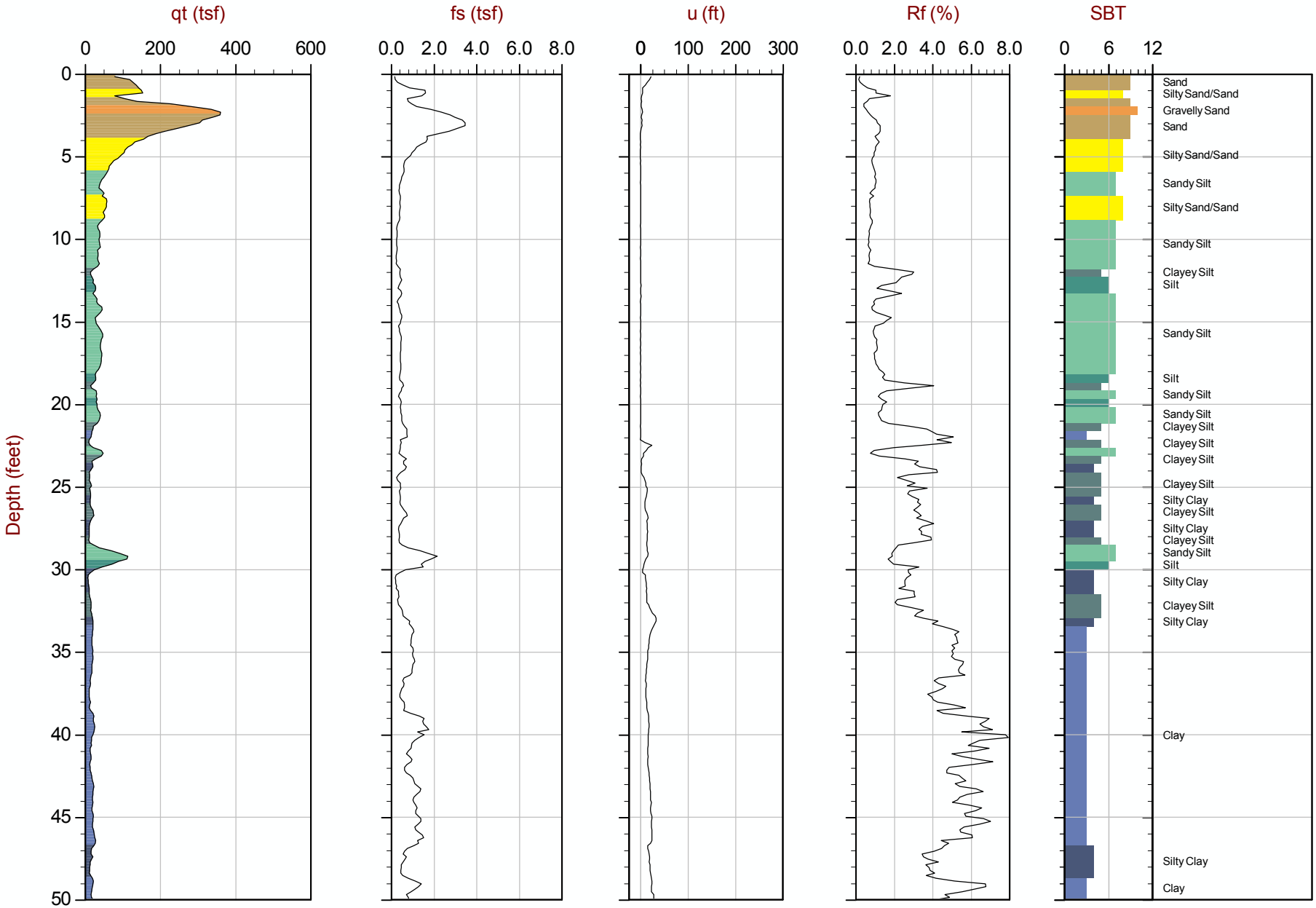
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647250 Long: -108.503350
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:10:13 13:10
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-31
Cone: 155:T1500F15U500



Max Depth: 24.400 m / 80.05 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP31.COR
Unit Wt: SBT Chart Soil Zones

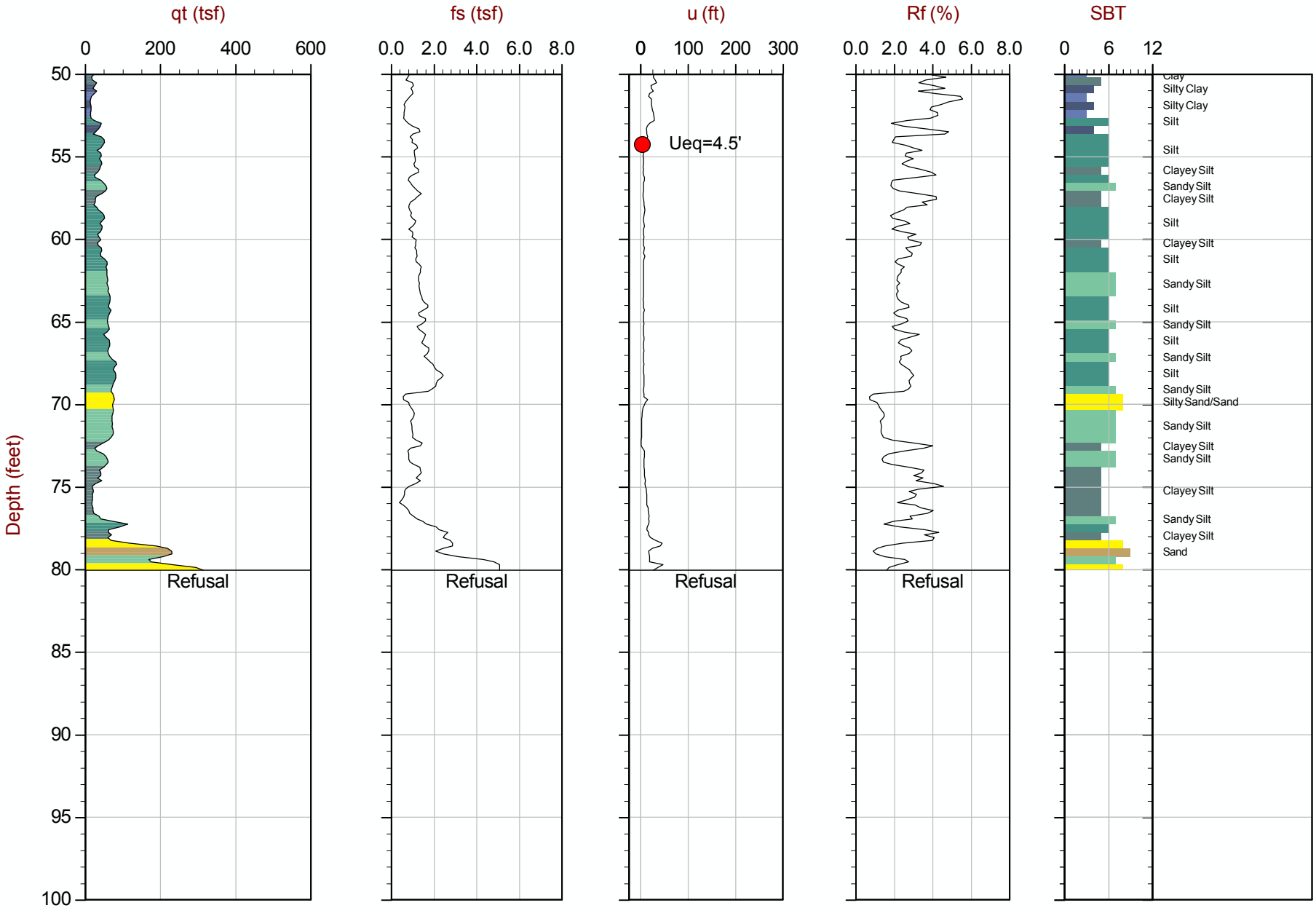
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.646450 Long: -108.504917
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:10:13 13:10
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-31
Cone: 155:T1500F15U500



Max Depth: 24.400 m / 80.05 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP31.COR
Unit Wt: SBT Chart Soil Zones

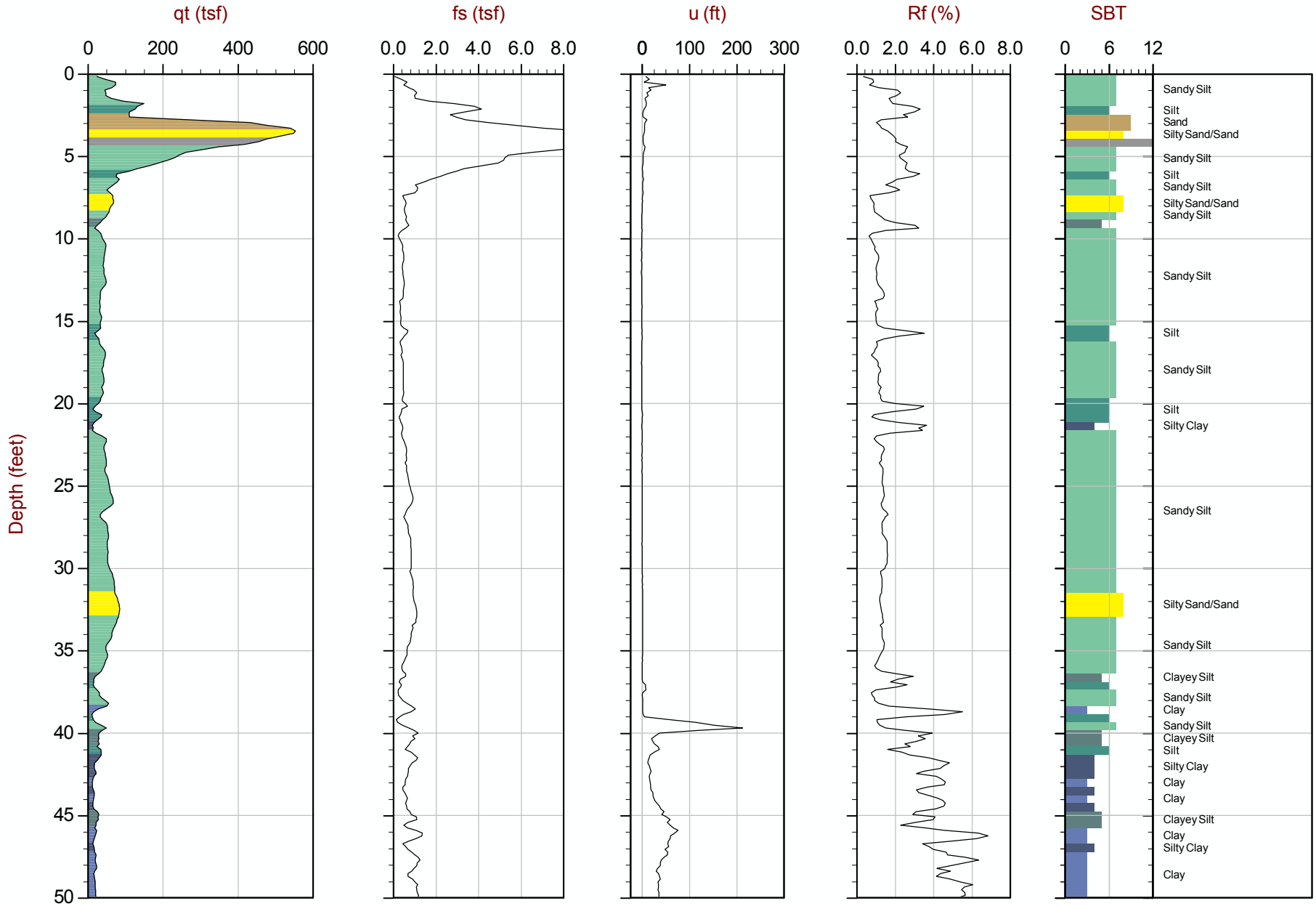
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.646450 Long: -108.504917
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:10:13 14:12
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-32
Cone: 155:T1500F15U500



Max Depth: 36.300 m / 119.09 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP32.COR
Unit Wt: SBT Chart Soil Zones

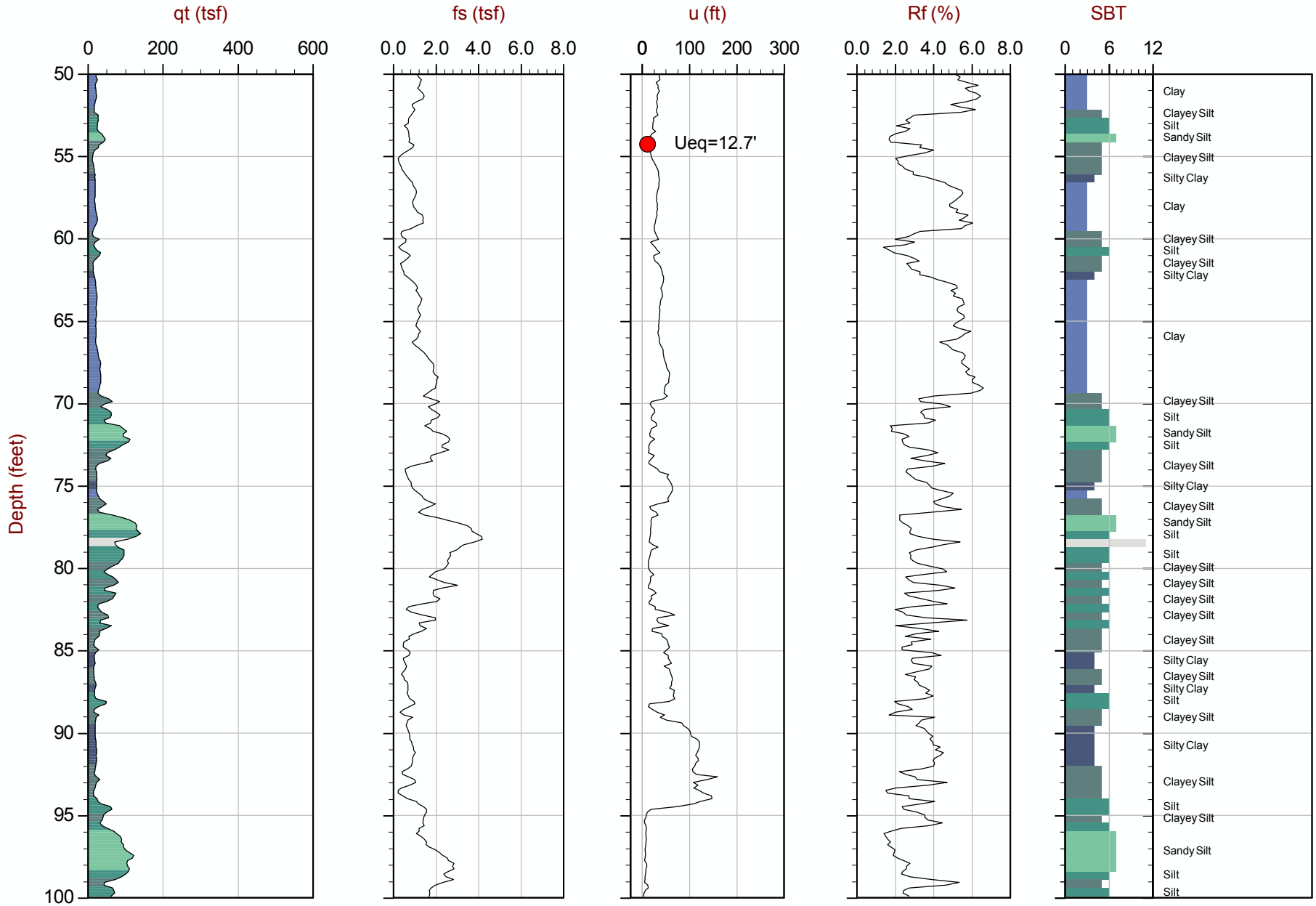
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.645383 Long: -108.505983
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:10:13 14:12
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-32
Cone: 155:T1500F15U500



Max Depth: 36.300 m / 119.09 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP32.COR
Unit Wt: SBT Chart Soil Zones

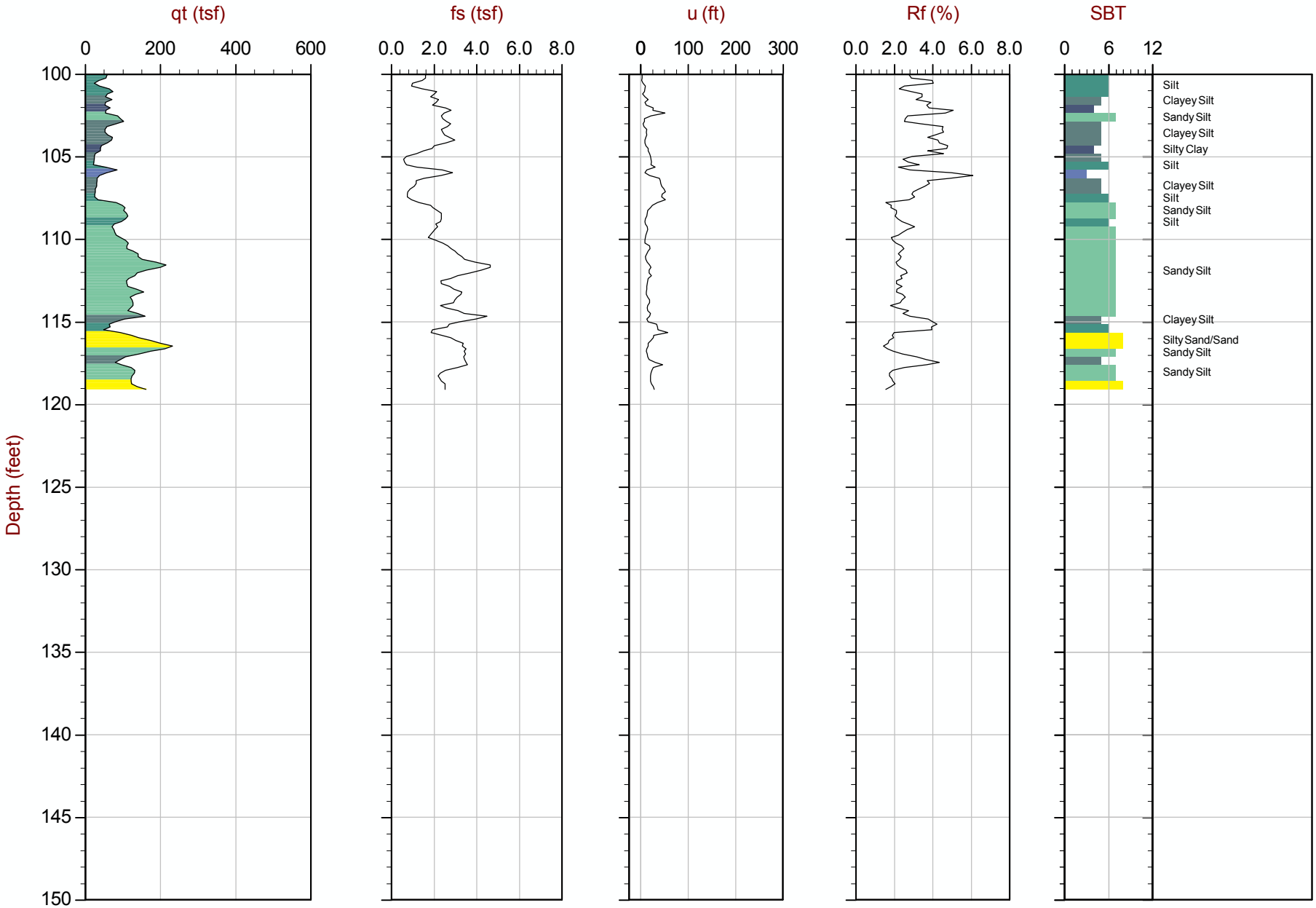
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.645383 Long: -108.505983
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:10:13 14:12
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-32
Cone: 155:T1500F15U500



Max Depth: 36.300 m / 119.09 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP32.COR
Unit Wt: SBT Chart Soil Zones

SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.645383 Long: -108.505983
● Equilibrium Pore Pressure from Dissipation

PPD Plots

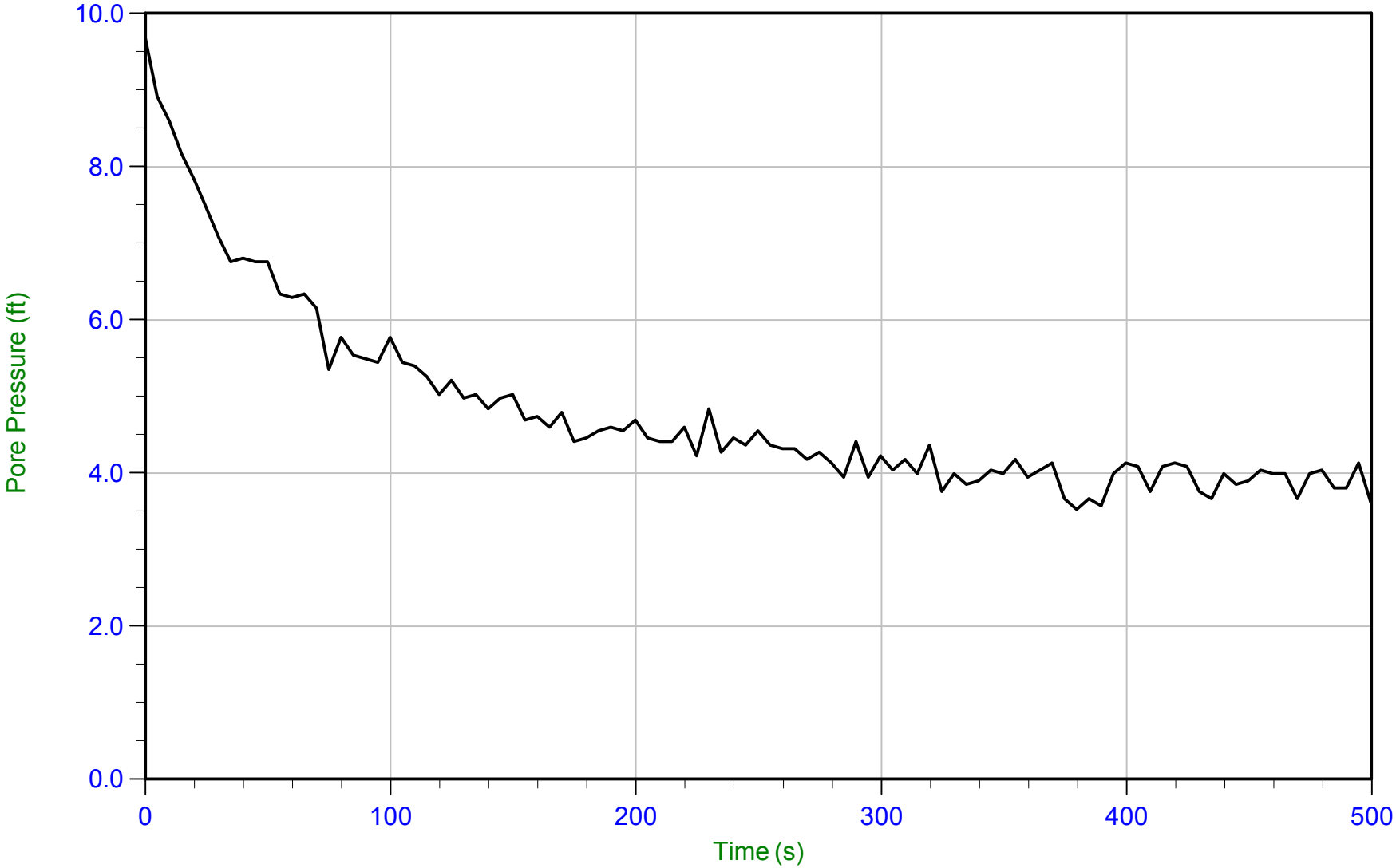
CONETEC

CONETEC

MWH Americas

Job No: 13-52118
Date: 07-Nov-2013 15:36:46
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-01
Cone: 155
Cone Area: 15 sq cm



Trace Summary:

Filename: 13-52118_RP01.PPD
Depth: 10.750 m / 35.269 ft
Duration: 500.0 s

U Min: 3.5 ft
U Max: 9.7 ft

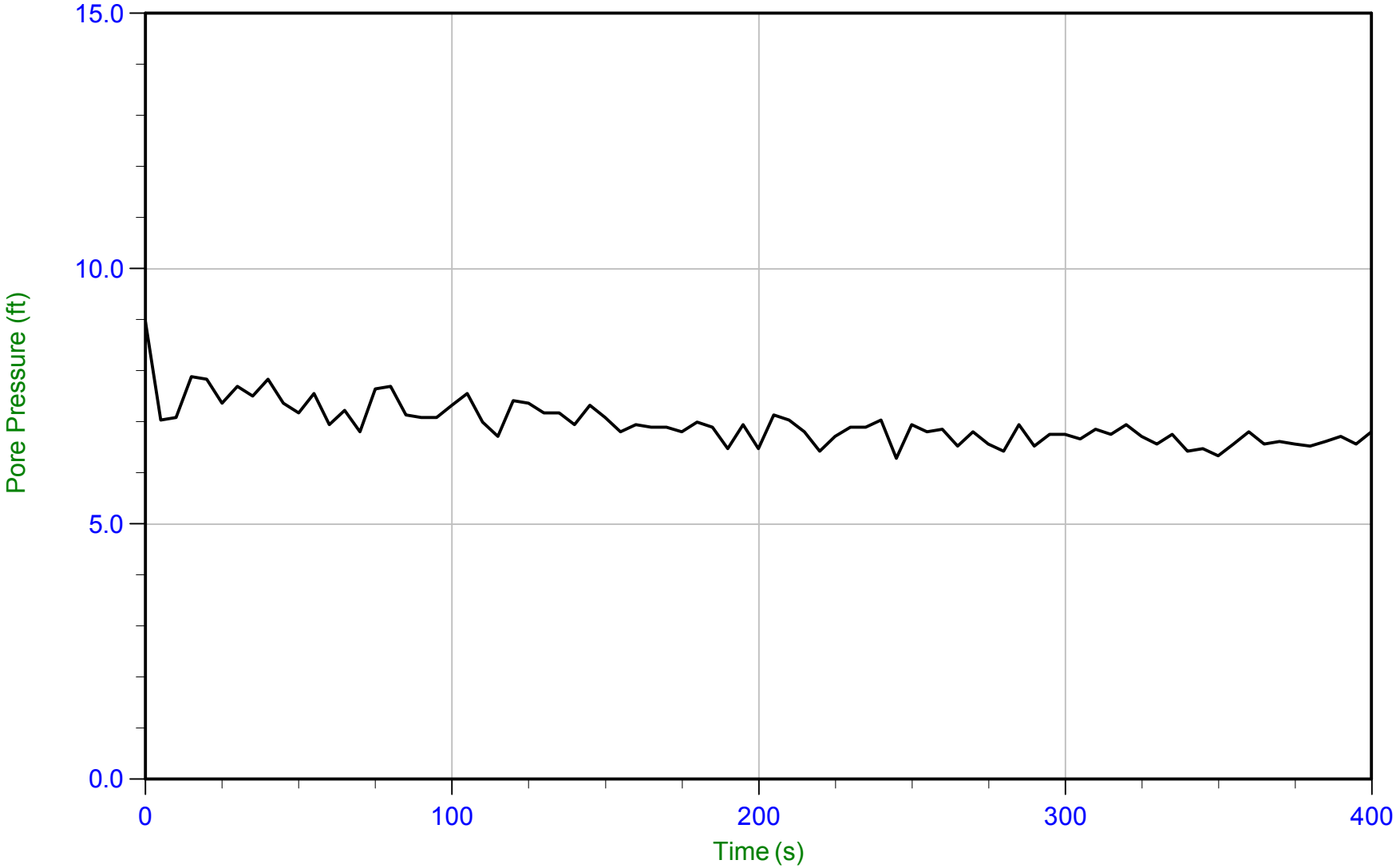
WT: 9.573 m / 31.407 ft
Ueq: 3.9 ft

CONETEC

MWH Americas

Job No: 13-52118
Date: 07-Nov-2013 15:36:46
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-01
Cone: 155
Cone Area: 15 sq cm



Trace Summary:

Filename: 13-52118_RP01.PPD
Depth: 22.100 m / 72.506 ft
Duration: 400.0 s

U Min: 6.3 ft
U Max: 9.0 ft

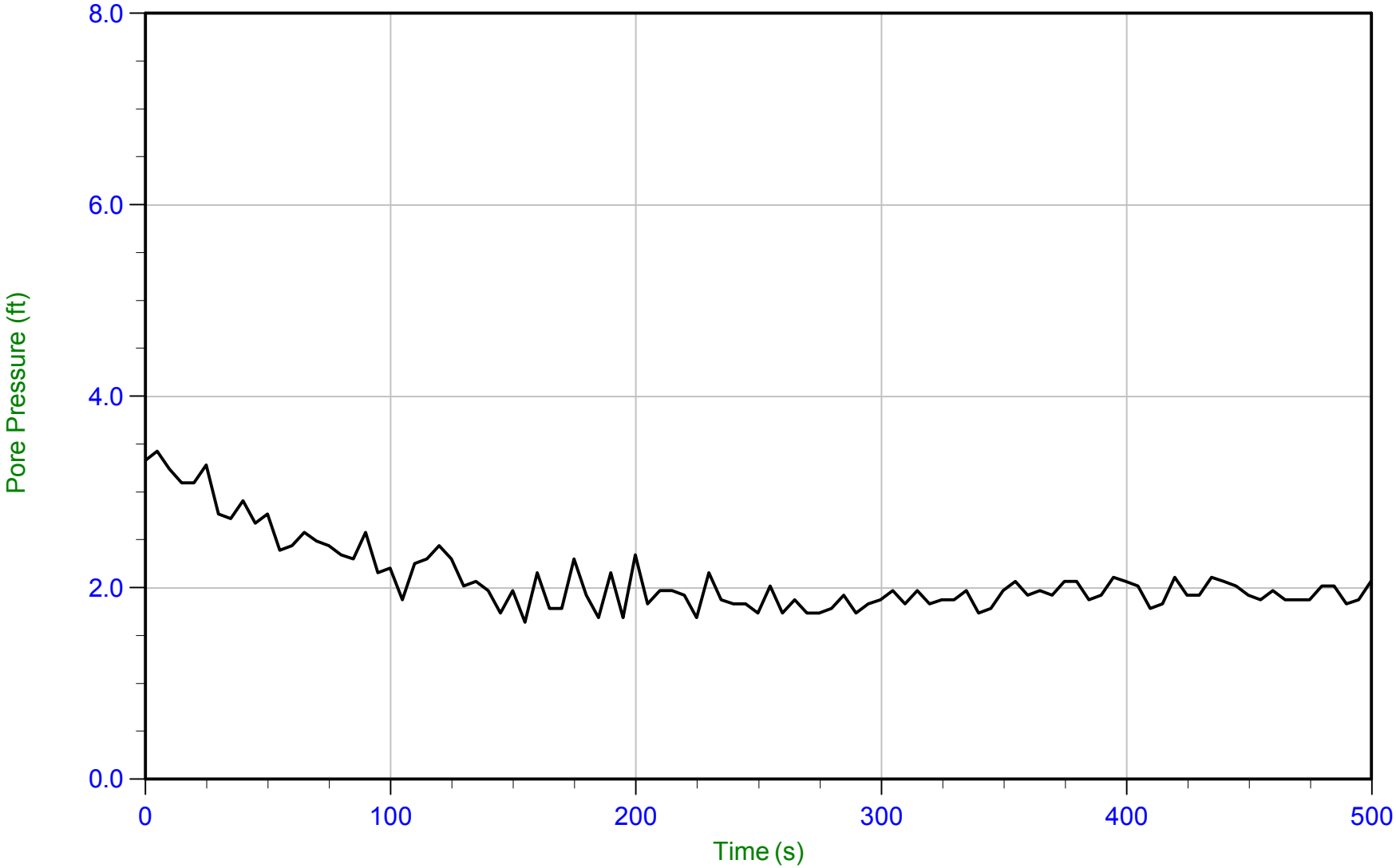
WT: 20.098 m / 65.937 ft
Ueq: 6.6 ft

CONETEC

MWH Americas

Job No: 13-52118
Date: 05-Nov-2013 13:37:58
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-02
Cone: 155
Cone Area: 15 sq cm



Trace Summary:

Filename: 13-52118_RP02.PPD
Depth: 8.050 m / 26.410 ft
Duration: 500.0 s

U Min: 1.6 ft
U Max: 3.4 ft

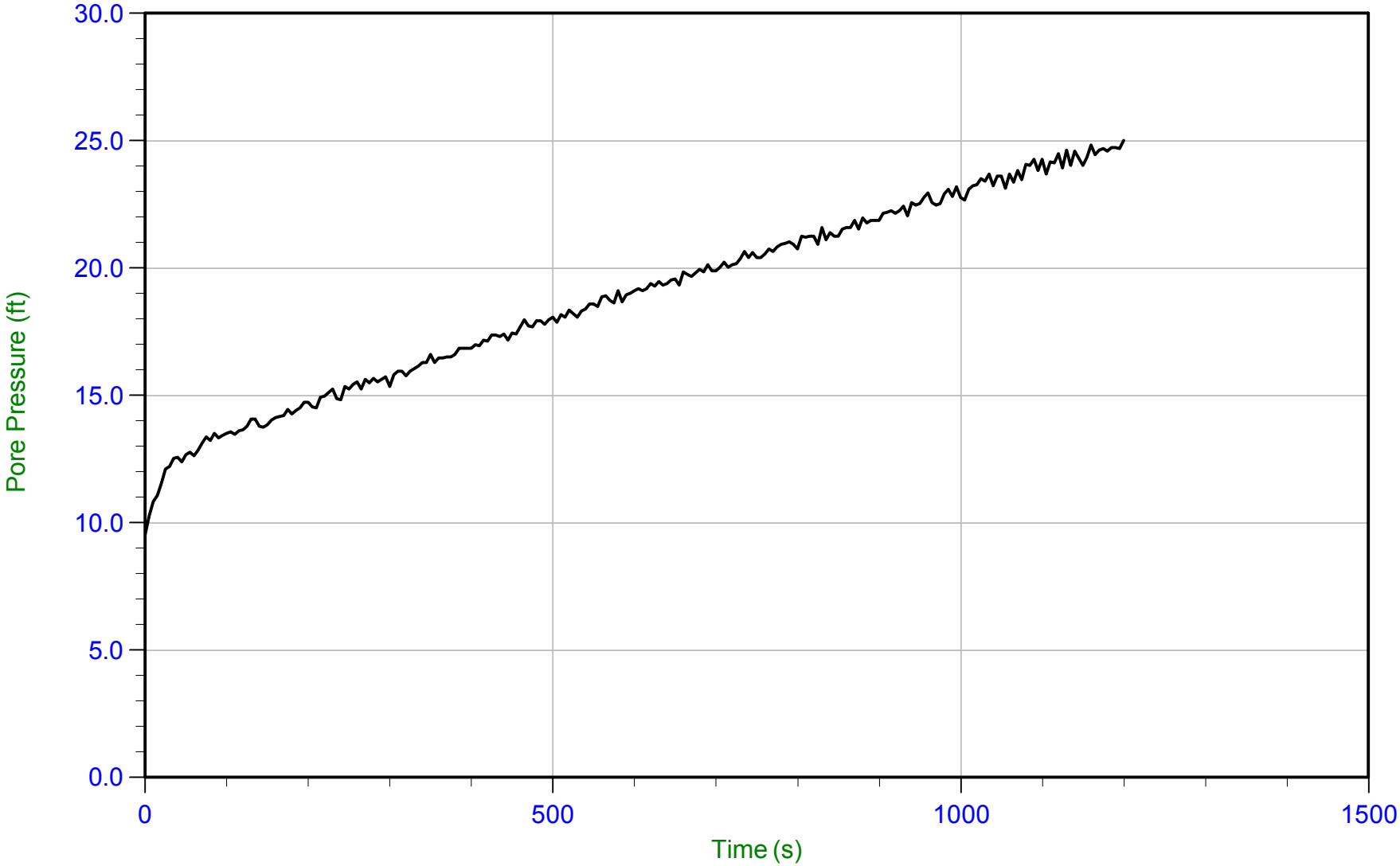
WT: 7.461 m / 24.479 ft
Ueq: 1.9 ft

CONETEC

MWH Americas

Job No: 13-52118
Date: 05-Nov-2013 13:37:58
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-02
Cone: 155
Cone Area: 15 sq cm



Trace Summary:

Filename: 13-52118_RP02.PPD
Depth: 9.150 m / 30.019 ft
Duration: 1200.0 s

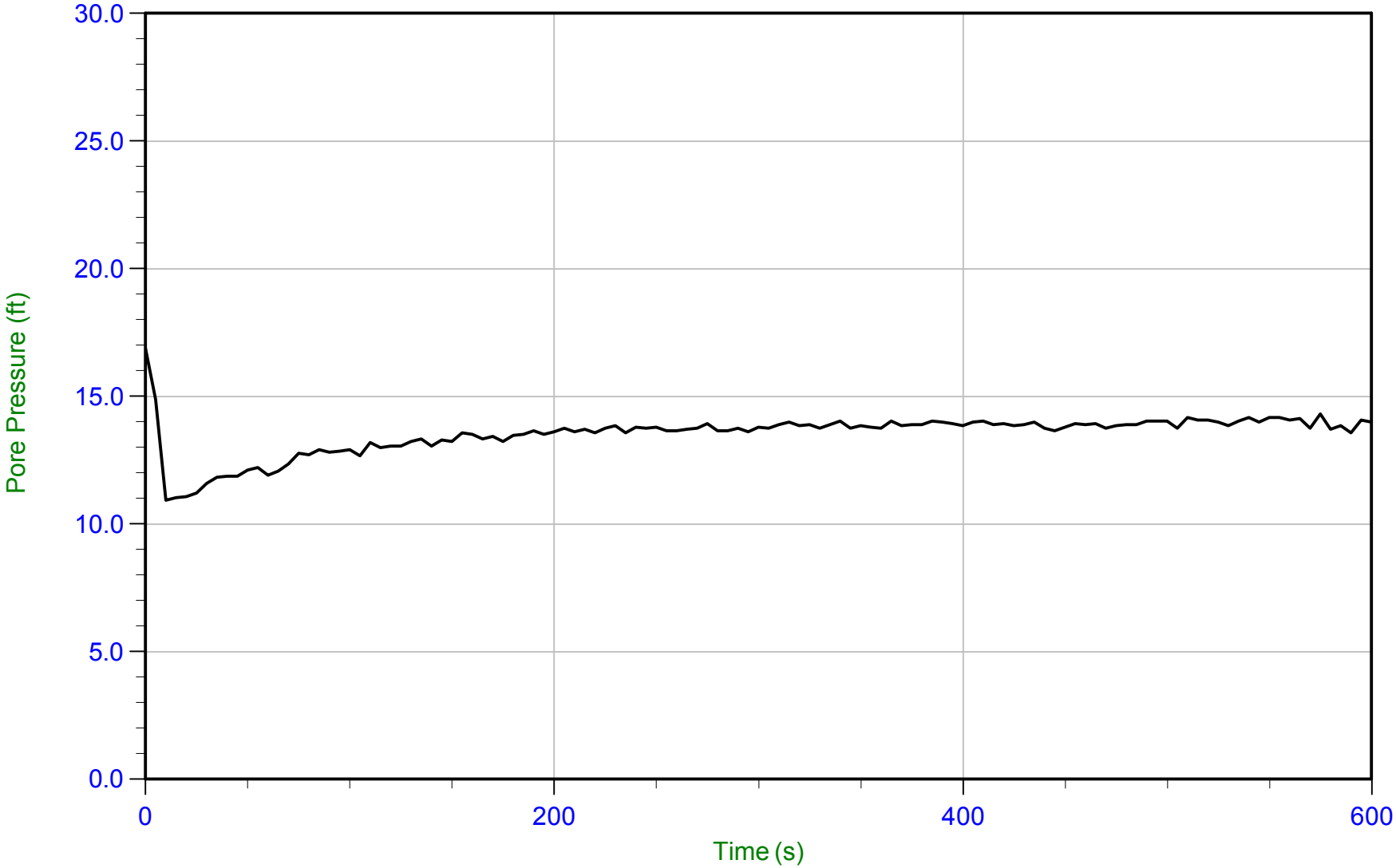
U Min: 9.5 ft
U Max: 25.0 ft

CONETEC

MWH Americas

Job No: 13-52118
Date: 05-Nov-2013 13:37:58
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-02
Cone: 155
Cone Area: 15 sq cm



Trace Summary:

Filename: 13-52118_RP02.PPD
Depth: 10.250 m / 33.628 ft
Duration: 600.0 s

U Min: 10.9 ft
U Max: 16.9 ft

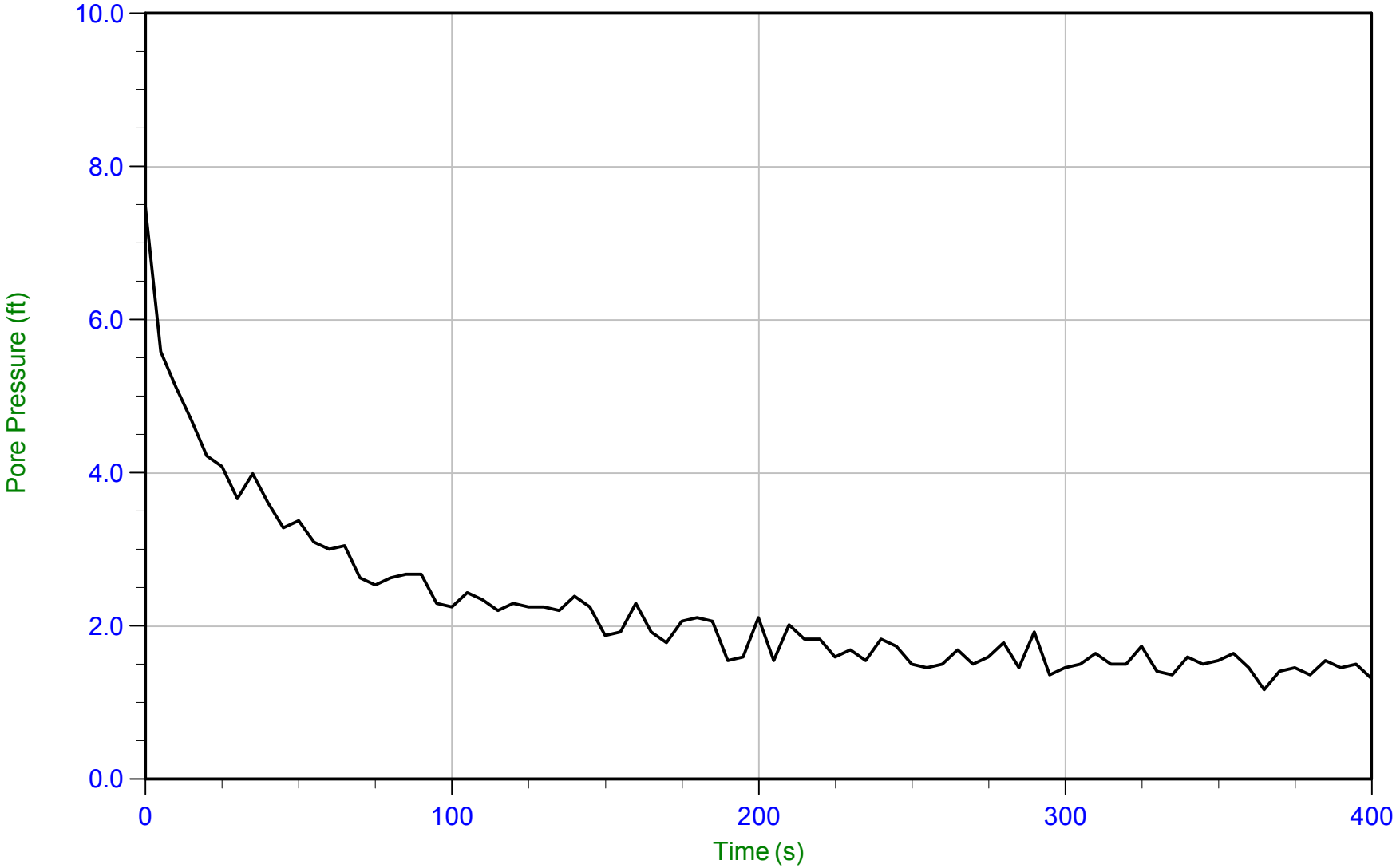
WT: 6.025 m / 19.766 ft
Ueq: 13.9 ft

CONETEC

MWH Americas

Job No: 13-52118
Date: 05-Nov-2013 13:39:58
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-04
Cone: 155
Cone Area: 15 sq cm



Trace Summary:

Filename: 13-52118_RP04.PPD
Depth: 7.800 m / 25.590 ft
Duration: 400.0 s

U Min: 1.2 ft
U Max: 7.5 ft

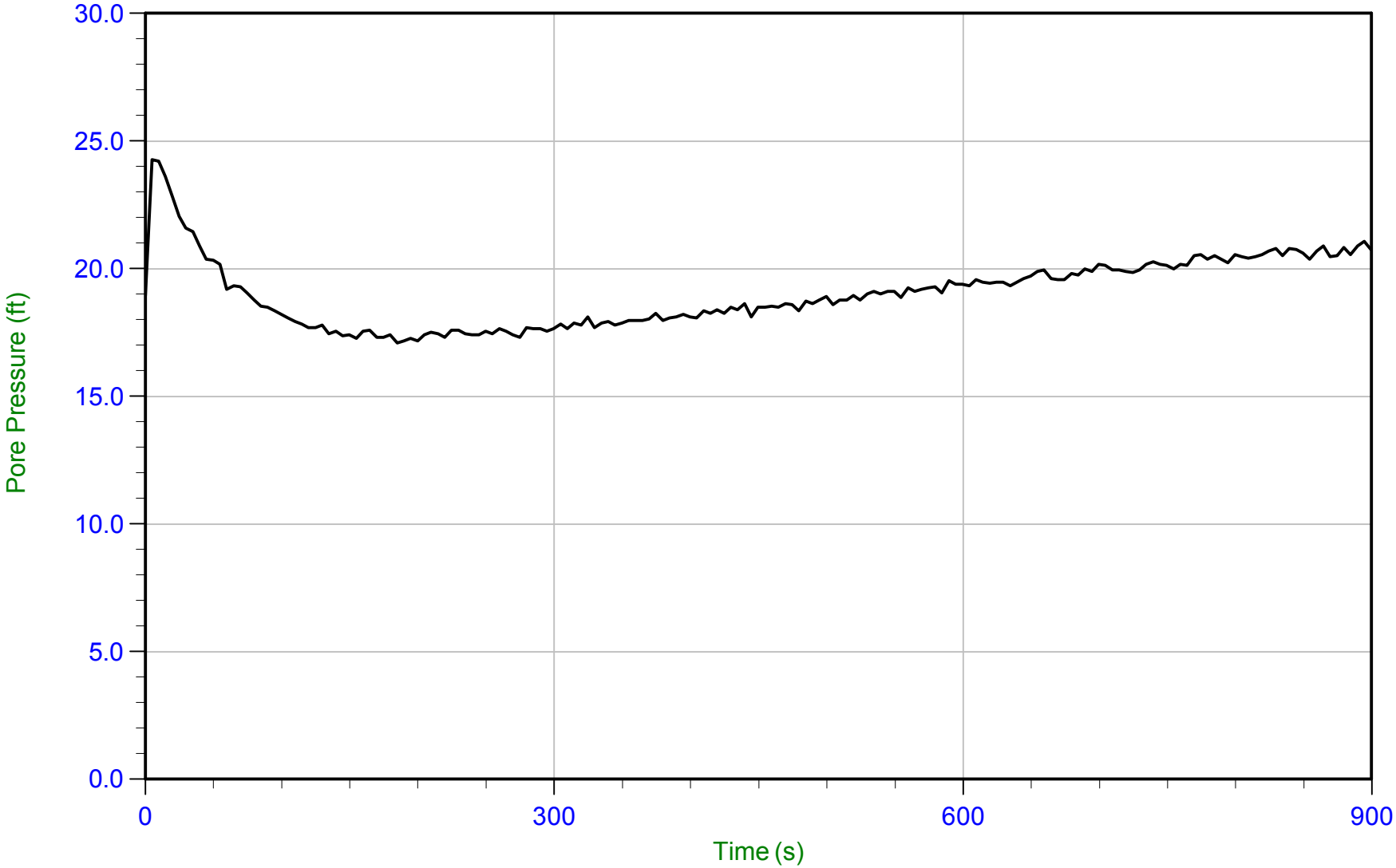
WT: 7.369 m / 24.176 ft
Ueq: 1.4 ft

CONETEC

MWH Americas

Job No: 13-52118
Date: 06-Nov-2013 08:30:57
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-05
Cone: 155
Cone Area: 15 sq cm



Trace Summary:

Filename: 13-52118_RP05.PPD
Depth: 3.850 m / 12.631 ft
Duration: 900.0 s

U Min: 17.1 ft
U Max: 24.3 ft

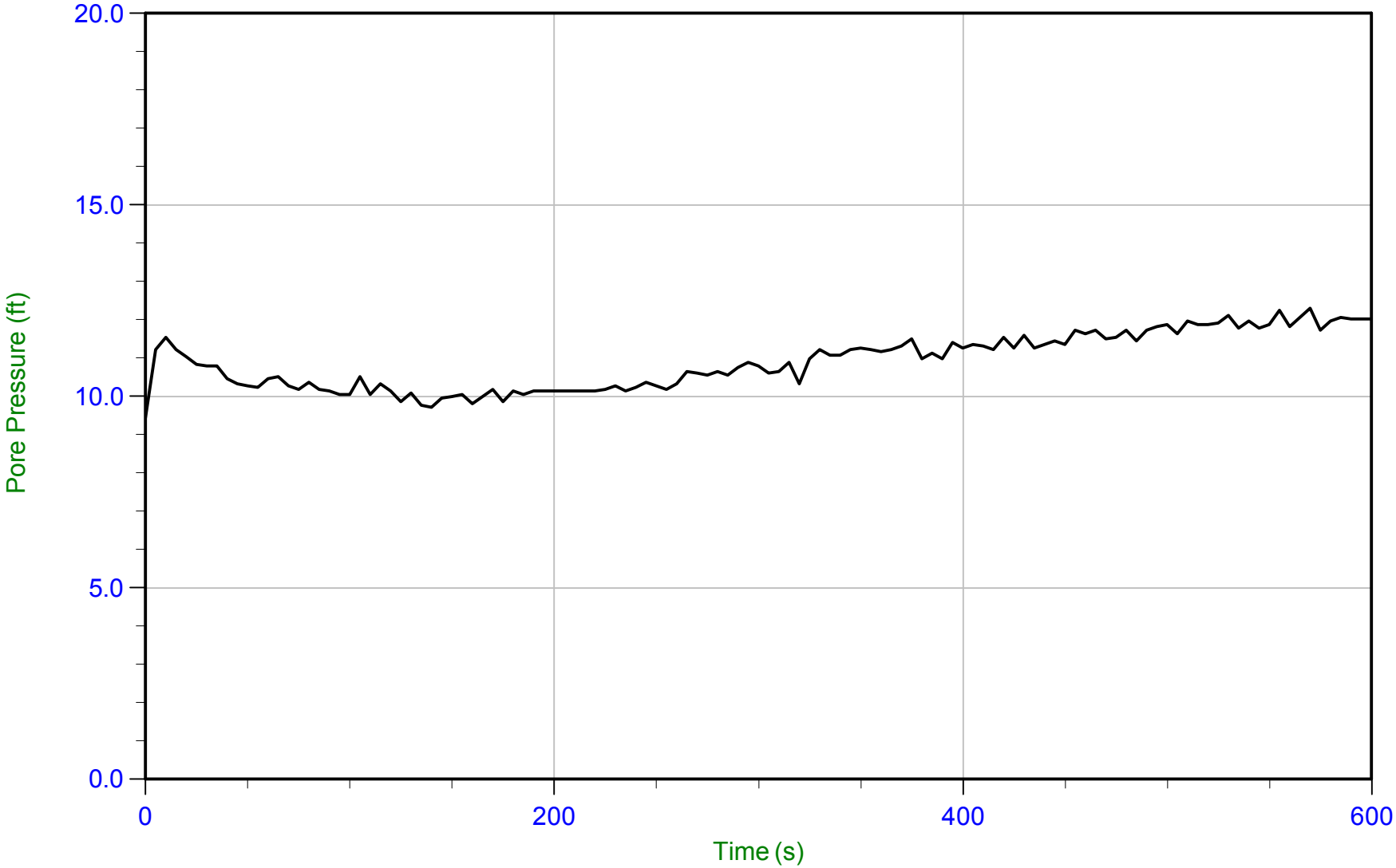
WT: -2.551 m / -8.369 ft
Ueq: 21.0 ft

CONETEC

MWH Americas

Job No: 13-52118
Date: 06-Nov-2013 08:30:57
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-05
Cone: 155
Cone Area: 15 sq cm



Trace Summary:

Filename: 13-52118_RP05.PPD
Depth: 7.900 m / 25.918 ft
Duration: 600.0 s

U Min: 9.4 ft
U Max: 12.3 ft

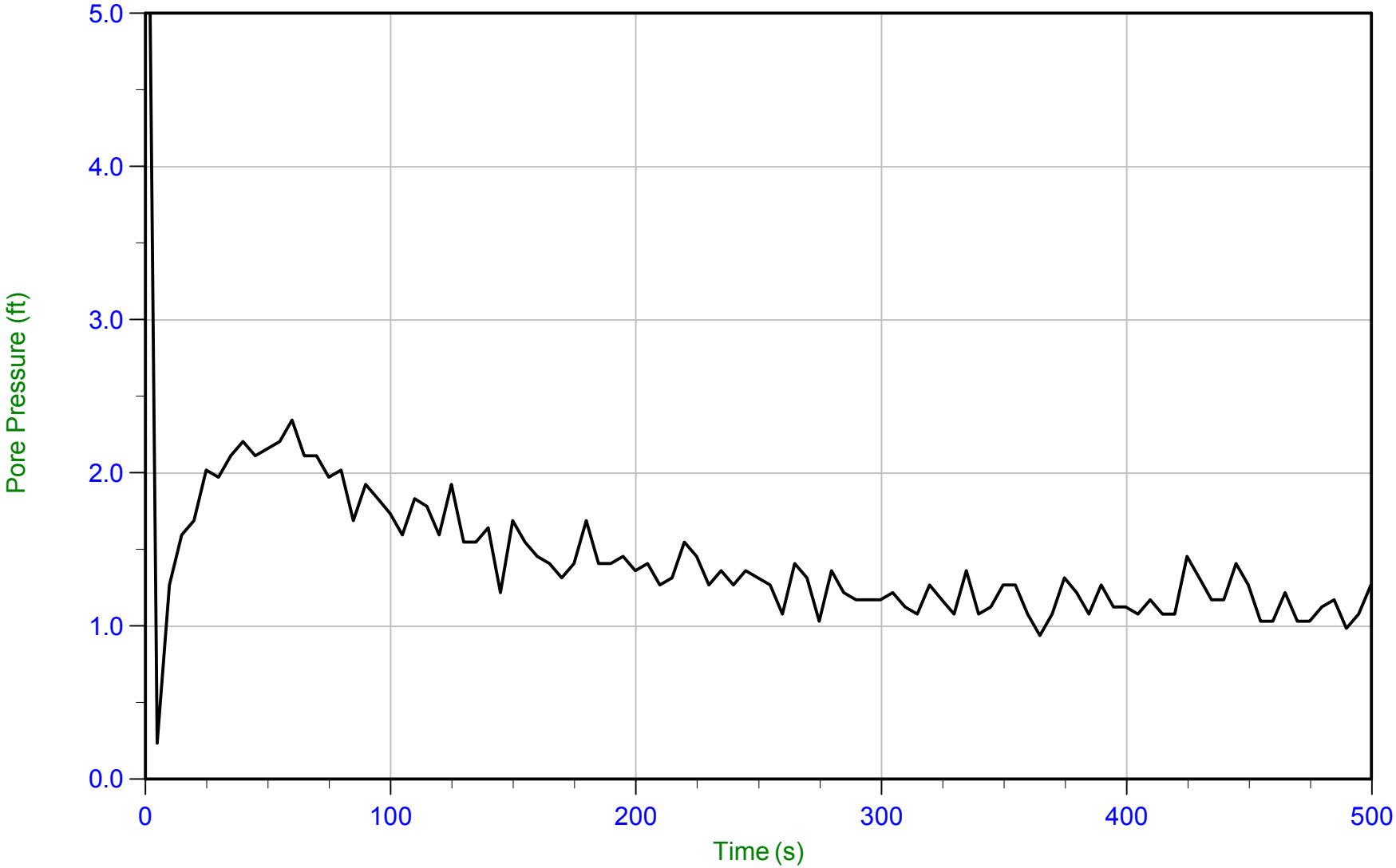
WT: 4.242 m / 13.918 ft
Ueq: 12.0 ft

CONETEC

MWH Americas

Job No: 13-52118
Date: 06-Nov-2013 08:30:57
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-05
Cone: 155
Cone Area: 15 sq cm



Trace Summary:

Filename: 13-52118_RP05.PPD
Depth: 11.550 m / 37.893 ft
Duration: 500.0 s

U Min: 0.2 ft
U Max: 8.2 ft

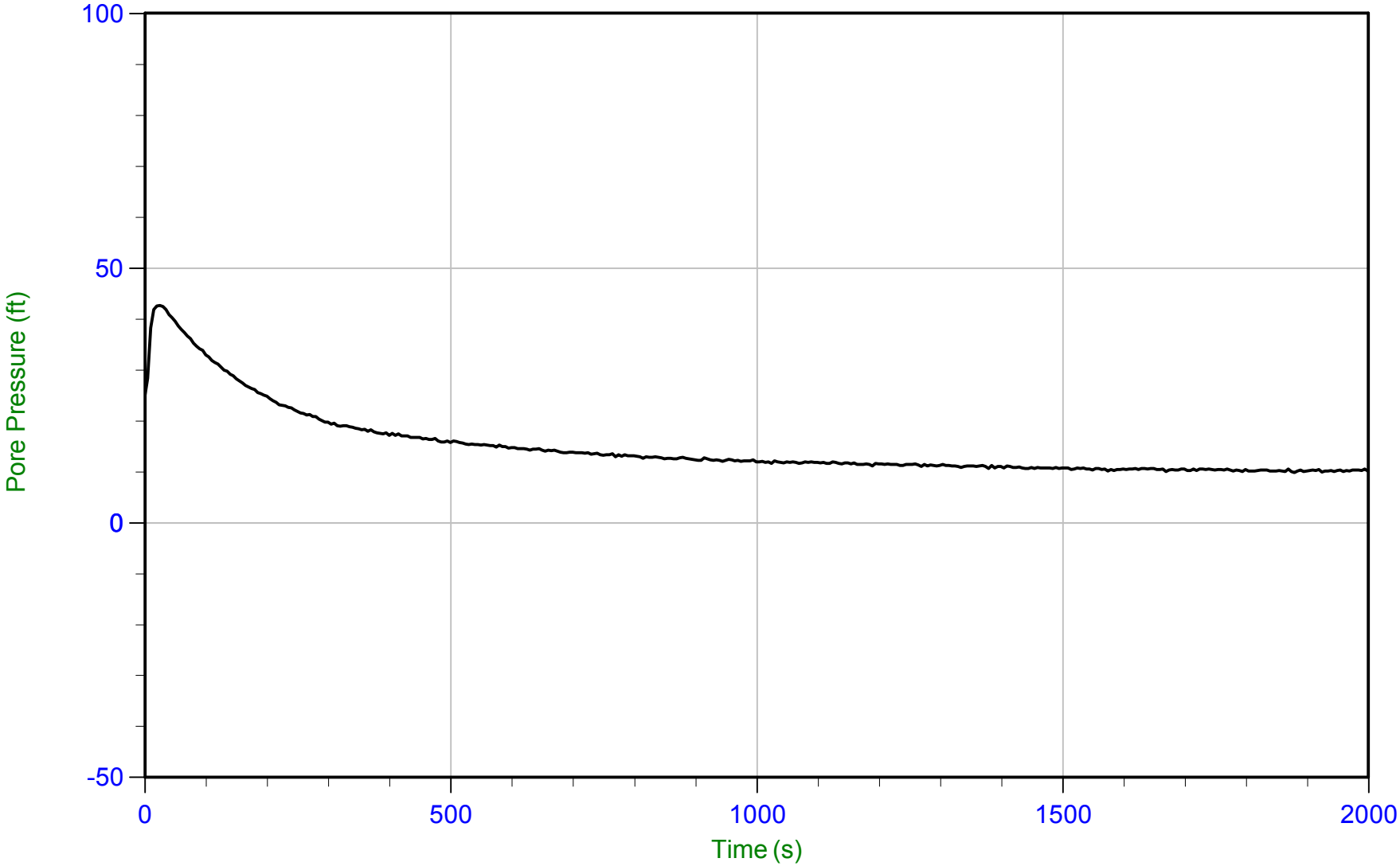
WT: 11.203 m / 36.755 ft
Ueq: 1.1 ft

CONETEC

MWH Americas

Job No: 13-52118
Date: 06-Nov-2013 13:01:16
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-06
Cone: 155
Cone Area: 15 sq cm



Trace Summary:

Filename: 13-52118_RP06.PPD
Depth: 6.300 m / 20.669 ft
Duration: 2000.0 s

U Min: 9.8 ft
U Max: 42.6 ft

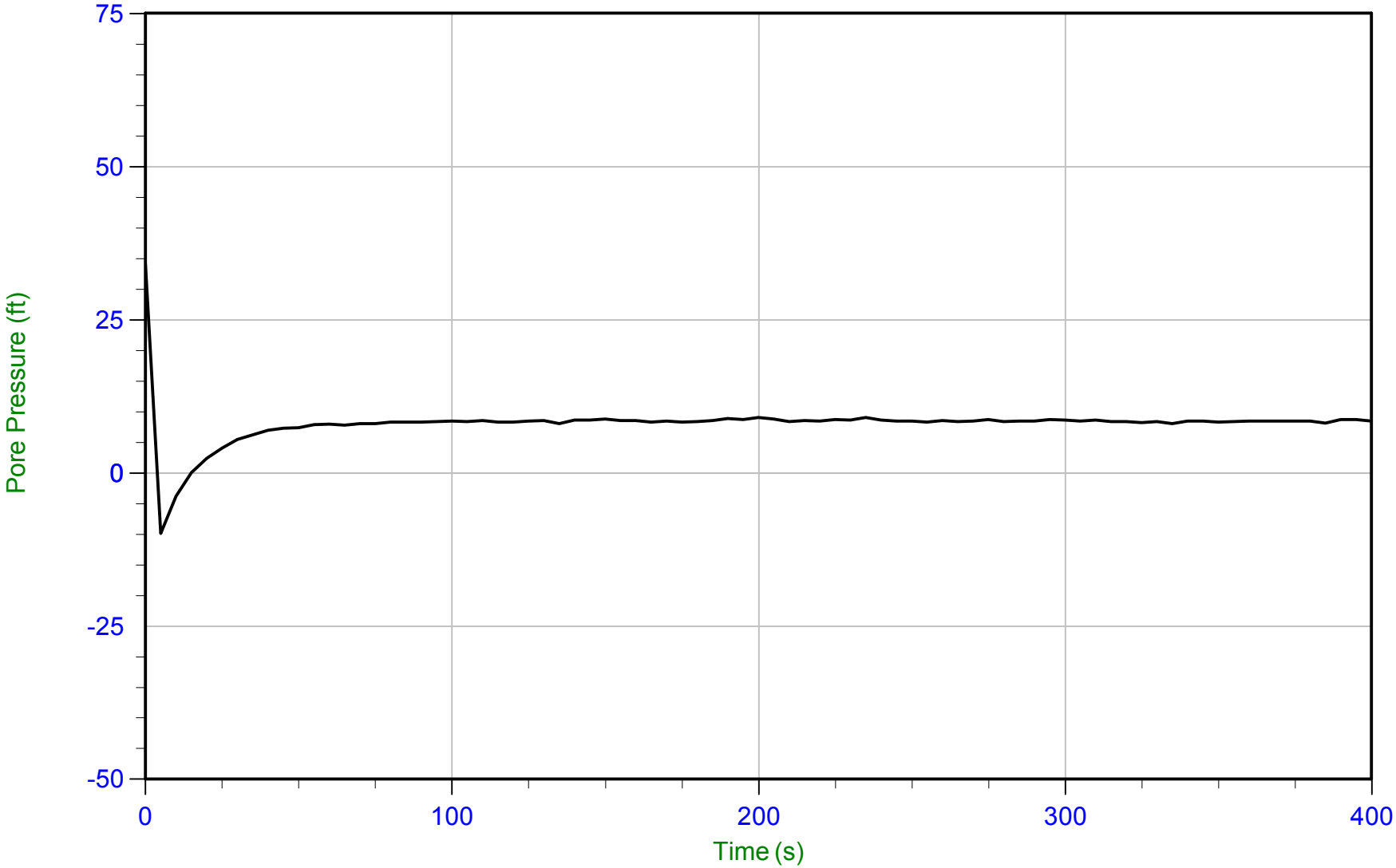
WT: 3.252 m / 10.669 ft
Ueq: 10.0 ft

CONETEC

MWH Americas

Job No: 13-52118
Date: 06-Nov-2013 13:01:16
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-06
Cone: 155
Cone Area: 15 sq cm



Trace Summary:

Filename: 13-52118_RP06.PPD
Depth: 11.050 m / 36.253 ft
Duration: 400.0 s

U Min: -9.9 ft
U Max: 34.1 ft

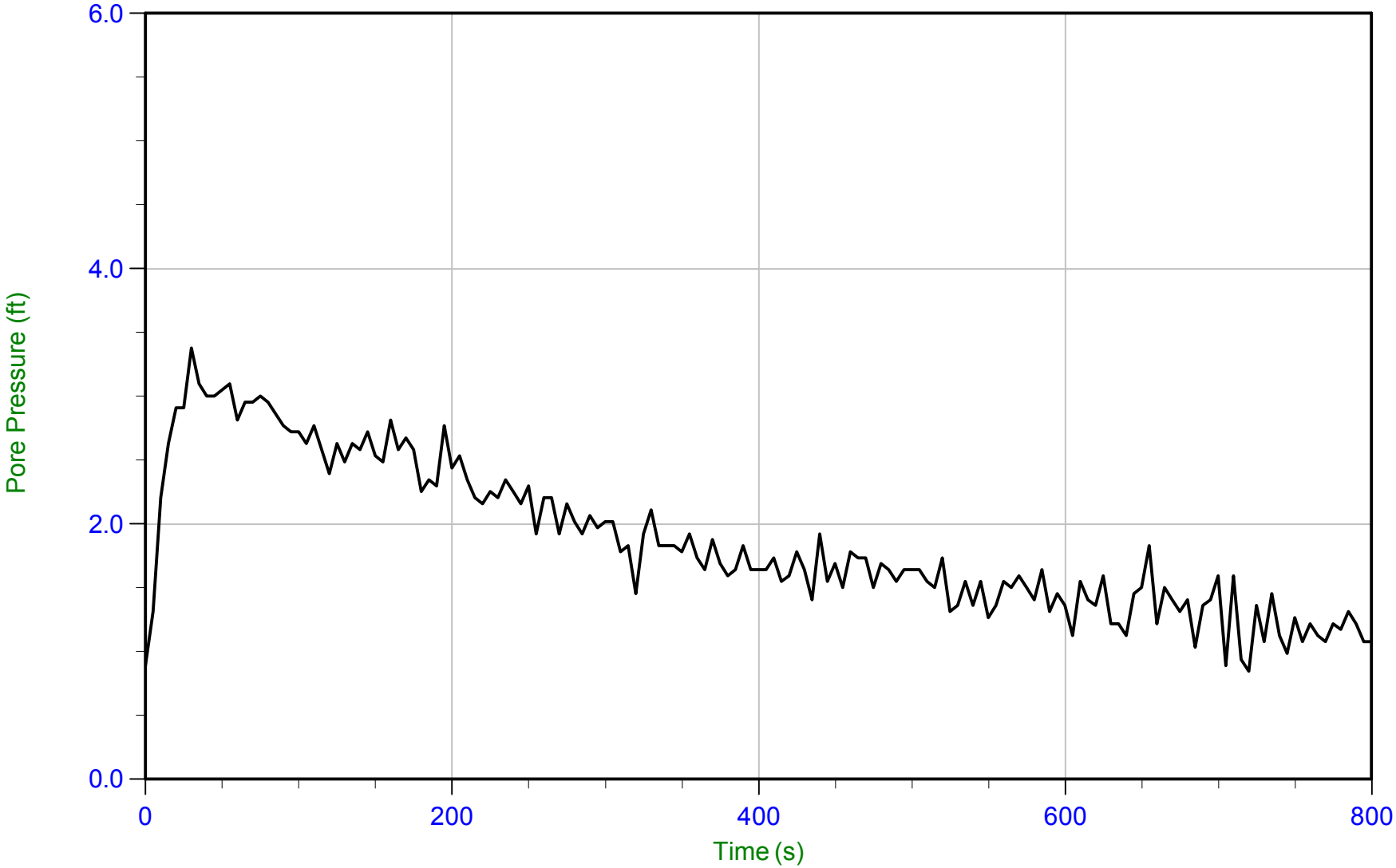
WT: 8.554 m / 28.063 ft
Ueq: 8.2 ft

CONETEC

MWH Americas

Job No: 13-52118
Date: 08-Nov-2013 11:13:46
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-07
Cone: 155
Cone Area: 15 sq cm



Trace Summary:

Filename: 13-52118_RP07.PPD
Depth: 8.950 m / 29.363 ft
Duration: 800.0 s

U Min: 0.8 ft
U Max: 3.4 ft

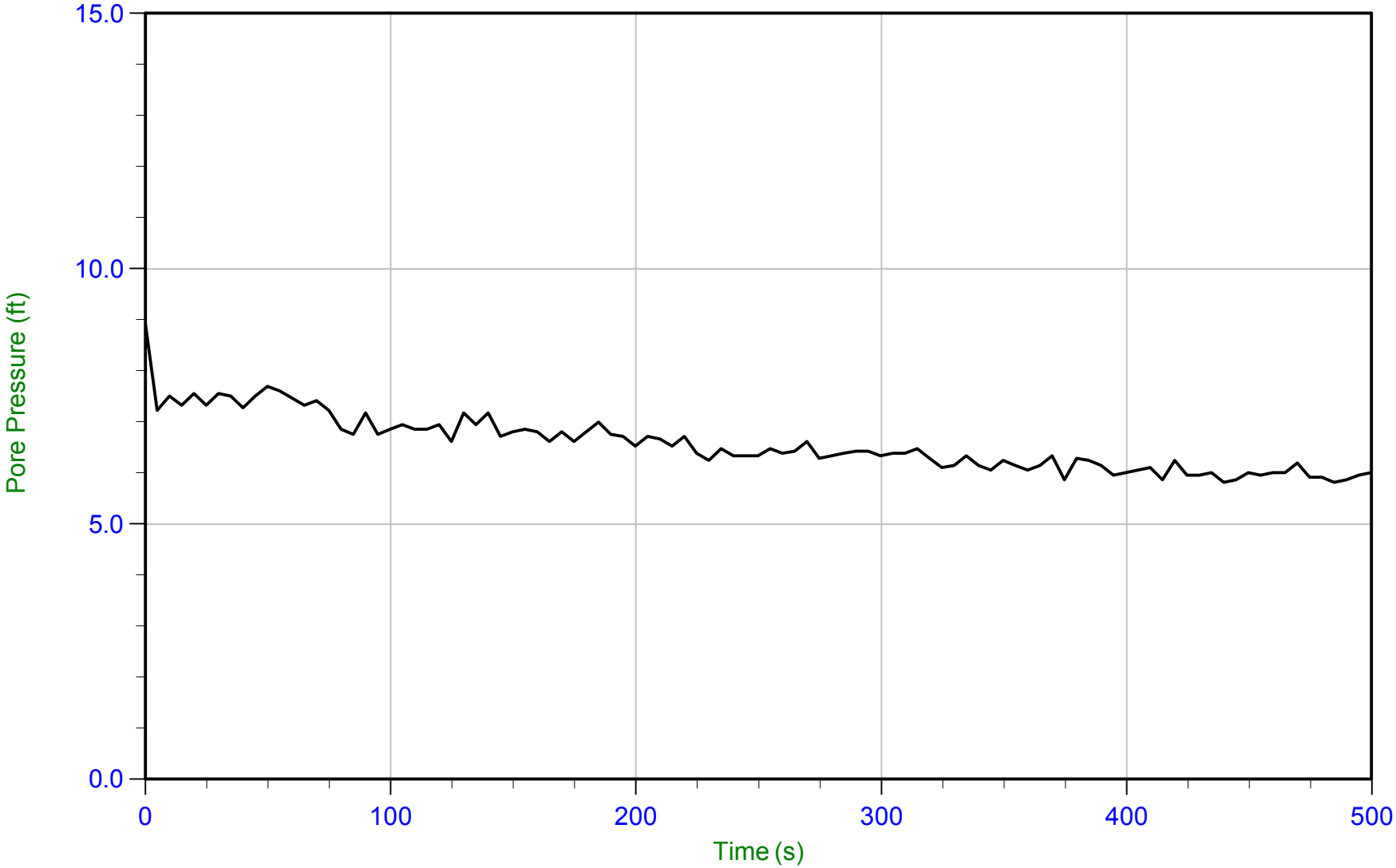
WT: 8.603 m / 28.225 ft
Ueq: 1.1 ft

CONETEC

MWH Americas

Job No: 13-52118
Date: 08-Nov-2013 11:13:46
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-07
Cone: 155
Cone Area: 15 sq cm



Trace Summary:

Filename: 13-52118_RP07.PPD
Depth: 13.300 m / 43.635 ft
Duration: 500.0 s

U Min: 5.8 ft
U Max: 8.9 ft

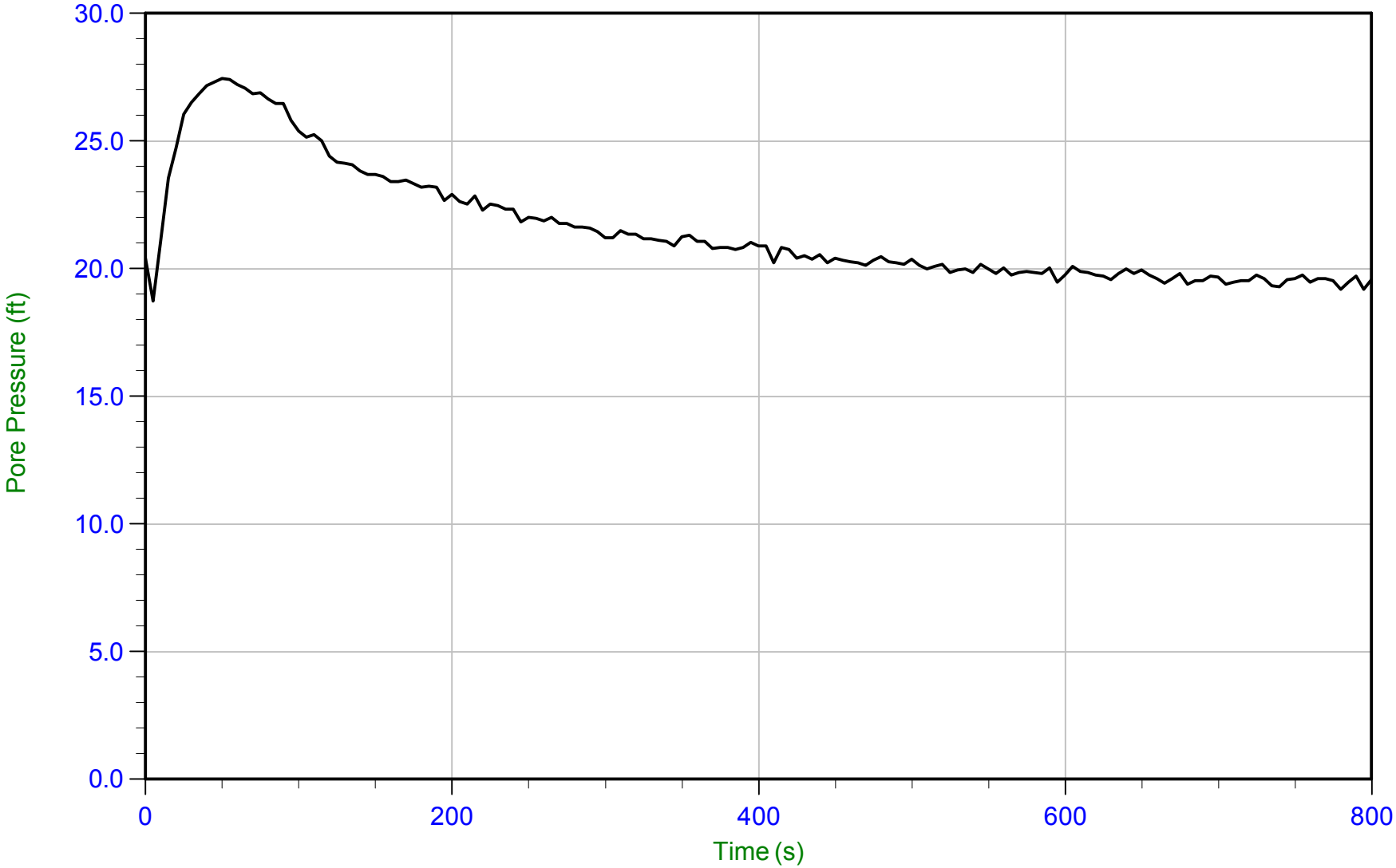
WT: 11.471 m / 37.635 ft
Ueq: 6.0 ft

CONETEC

MWH Americas

Job No: 13-52118
Date: 07-Nov-2013 08:21:49
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-08
Cone: 155
Cone Area: 15 sq cm



Trace Summary:

Filename: 13-52118_RP08.PPD
Depth: 9.650 m / 31.660 ft
Duration: 800.0 s

U Min: 18.7 ft
U Max: 27.5 ft

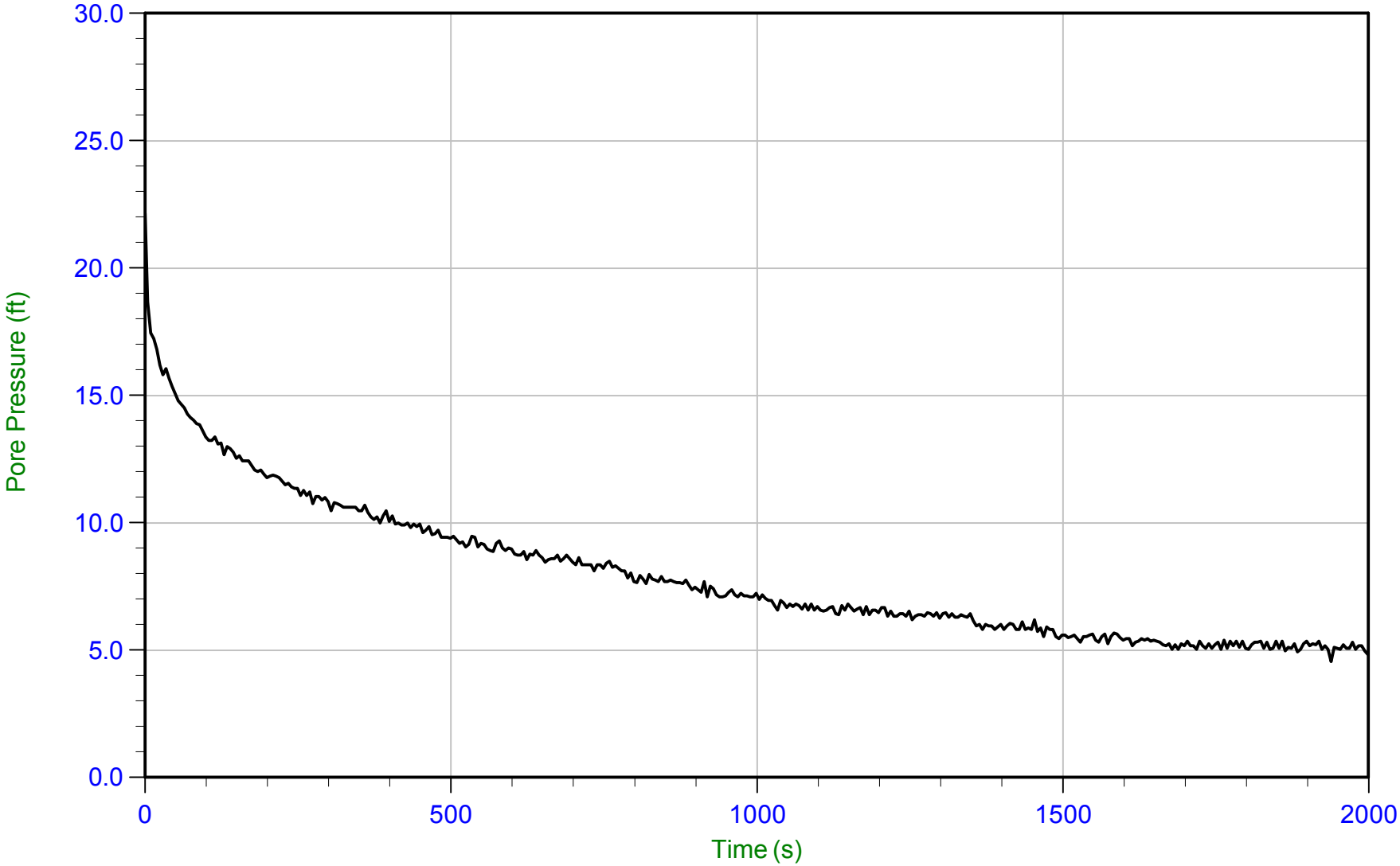
WT: 3.722 m / 12.212 ft
Ueq: 19.4 ft

CONETEC

MWH Americas

Job No: 13-52118
Date: 07-Nov-2013 08:21:49
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-08
Cone: 155
Cone Area: 15 sq cm



Trace Summary:

Filename: 13-52118_RP08.PPD
Depth: 16.650 m / 54.625 ft
Duration: 2010.0 s

U Min: 4.6 ft
U Max: 22.1 ft

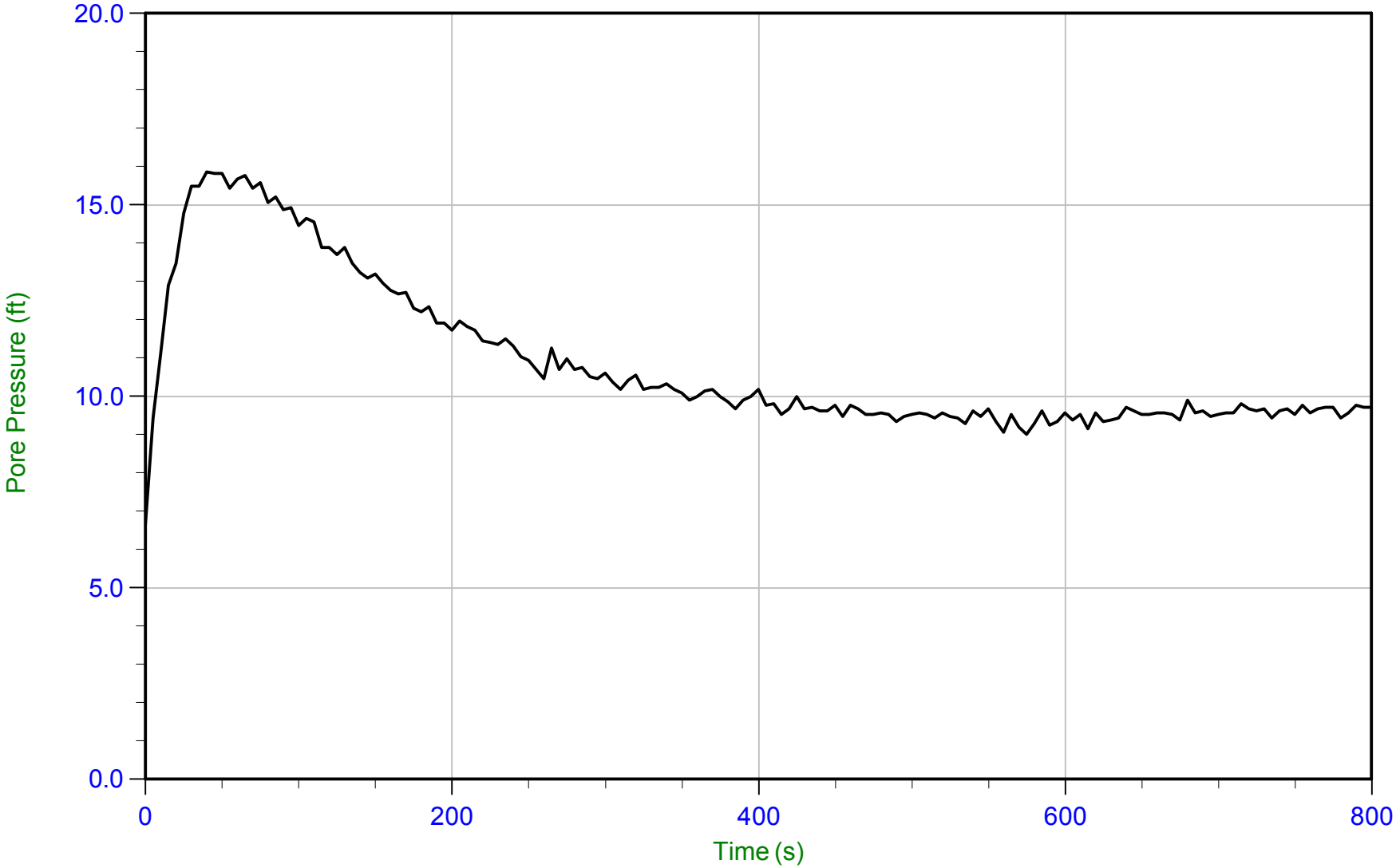
WT: 15.105 m / 49.556 ft
Ueq: 5.1 ft

CONETEC

MWH Americas

Job No: 13-52118
Date: 06-Nov-2013 14:52:26
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-09
Cone: 155
Cone Area: 15 sq cm



Trace Summary:

Filename: 13-52118_RP09.PPD
Depth: 8.100 m / 26.574 ft
Duration: 800.0 s

U Min: 6.7 ft
U Max: 15.9 ft

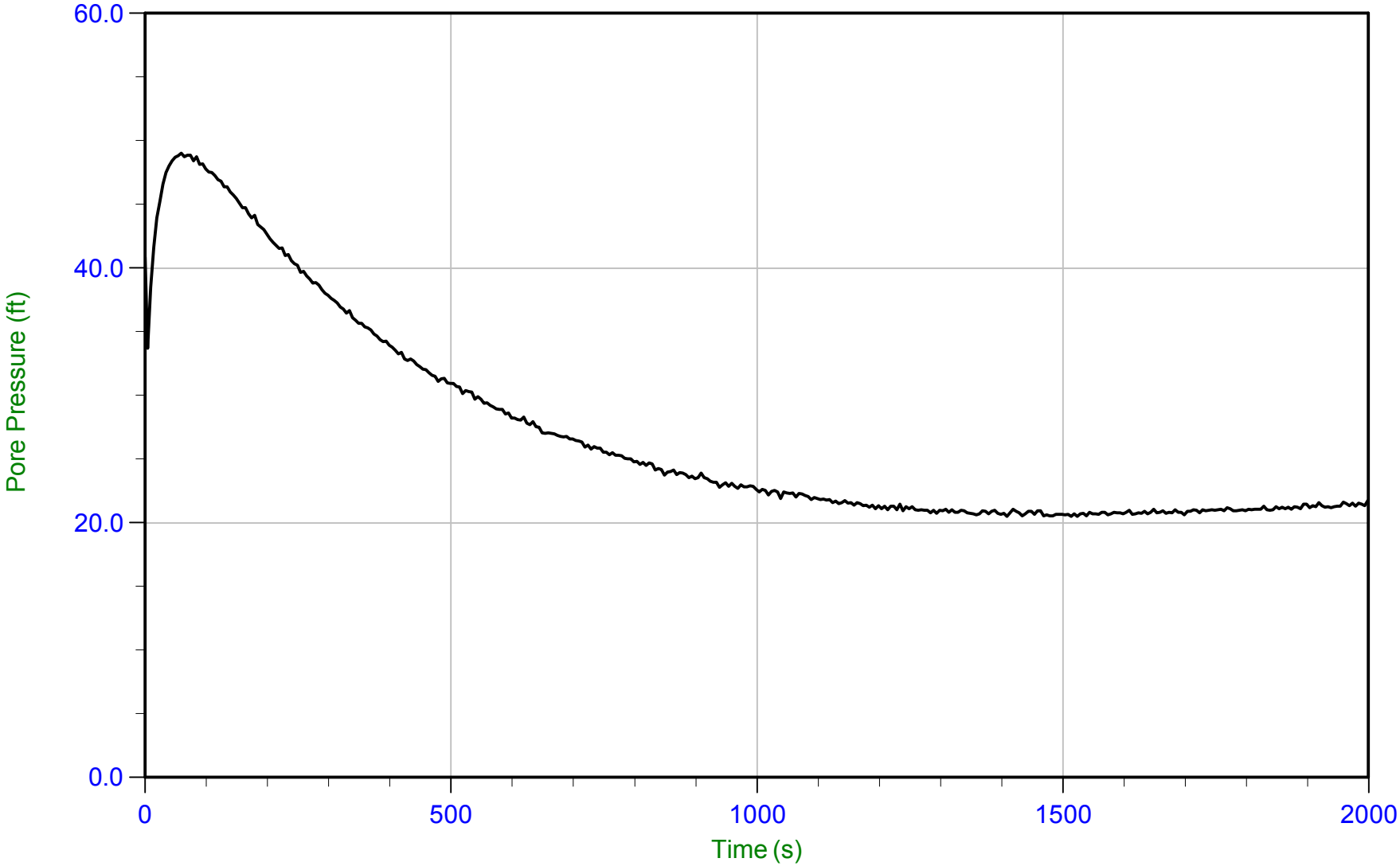
WT: 5.178 m / 16.988 ft
Ueq: 9.6 ft

CONETEC

MWH Americas

Job No: 13-52118
Date: 06-Nov-2013 10:23:48
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-10
Cone: 155
Cone Area: 15 sq cm



Trace Summary:

Filename: 13-52118_RP10.PPD
Depth: 6.700 m / 21.981 ft
Duration: 2000.0 s

U Min: 20.5 ft
U Max: 49.0 ft

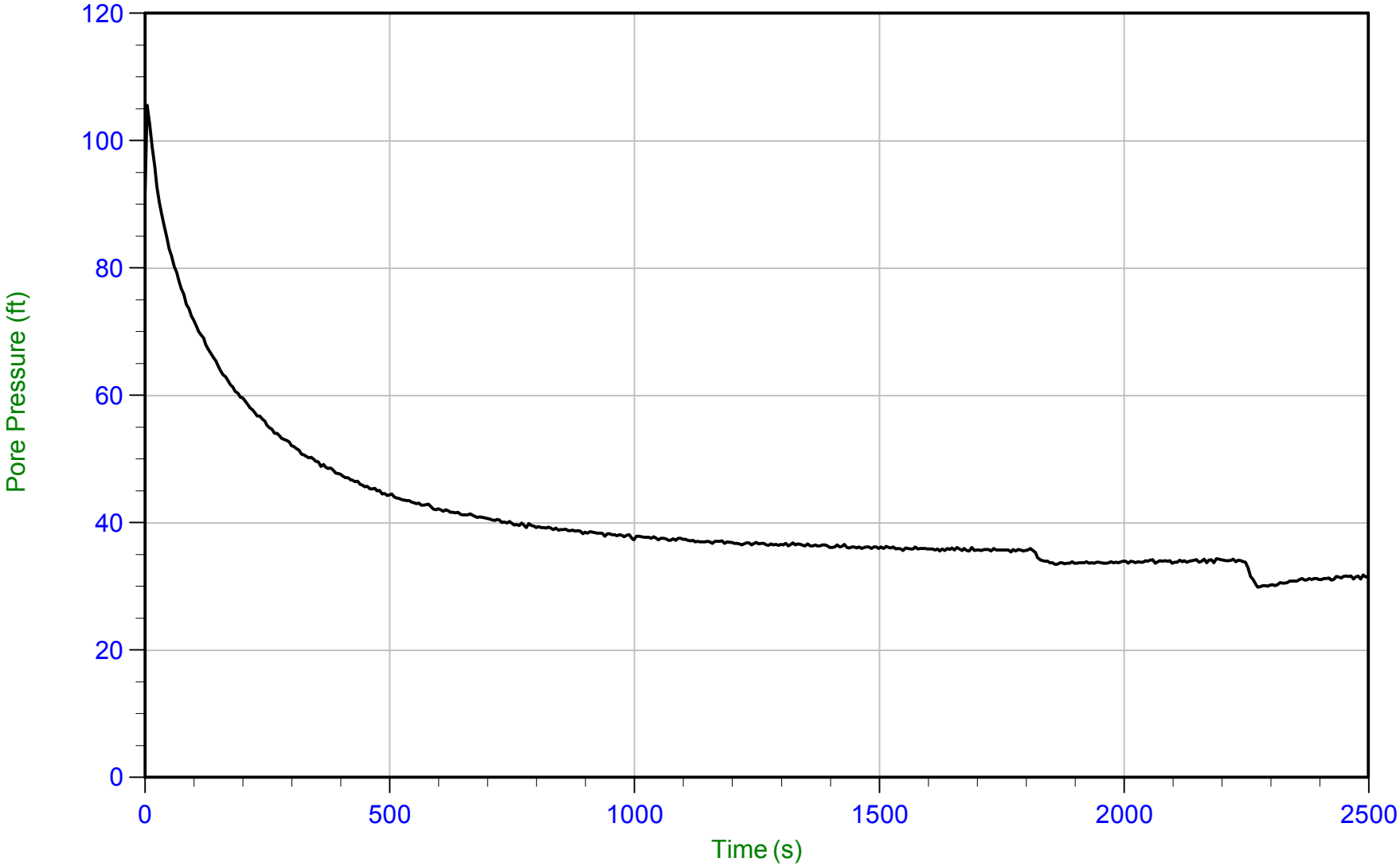
WT: 0.205 m / 0.671 ft
Ueq: 21.3 ft

CONETEC

MWH Americas

Job No: 13-52118
Date: 06-Nov-2013 10:23:48
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-10
Cone: 155
Cone Area: 15 sq cm



Trace Summary:

Filename: 13-52118_RP10.PPD
Depth: 11.200 m / 36.745 ft
Duration: 2500.0 s

U Min: 29.9 ft
U Max: 105.5 ft

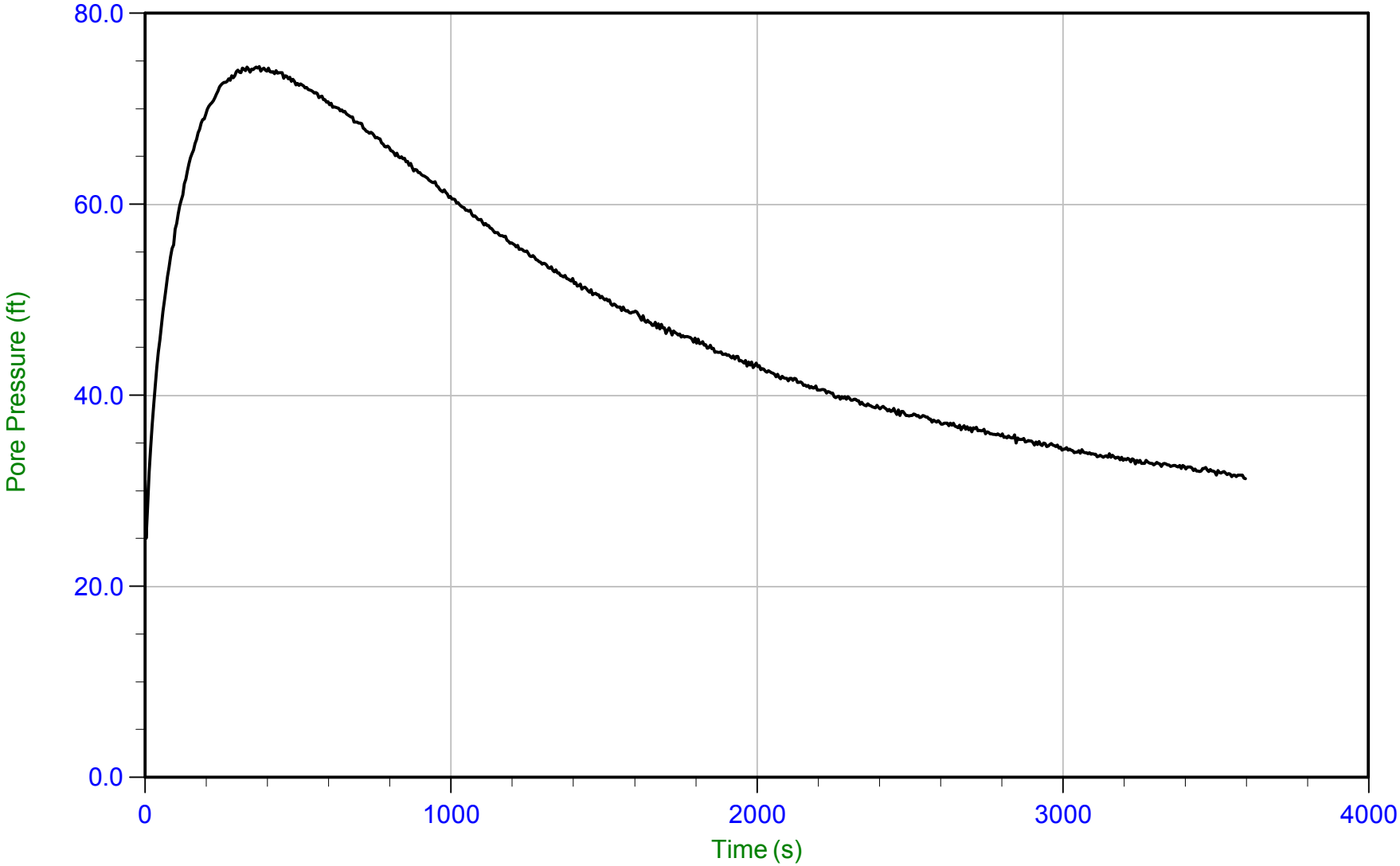
WT: 1.615 m / 5.297 ft
Ueq: 31.4 ft

CONETEC

MWH Americas

Job No: 13-52118
Date: 07-Nov-2013 12:13:16
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-11
Cone: 155
Cone Area: 15 sq cm



Trace Summary:

Filename: 13-52118_RP11.PPD
Depth: 16.200 m / 53.149 ft
Duration: 3600.0 s

U Min: 25.1 ft
U Max: 74.4 ft

WT: 15.088 m / 49.500 ft
Ueq: 3.6 ft
U(50): 39.04 ft

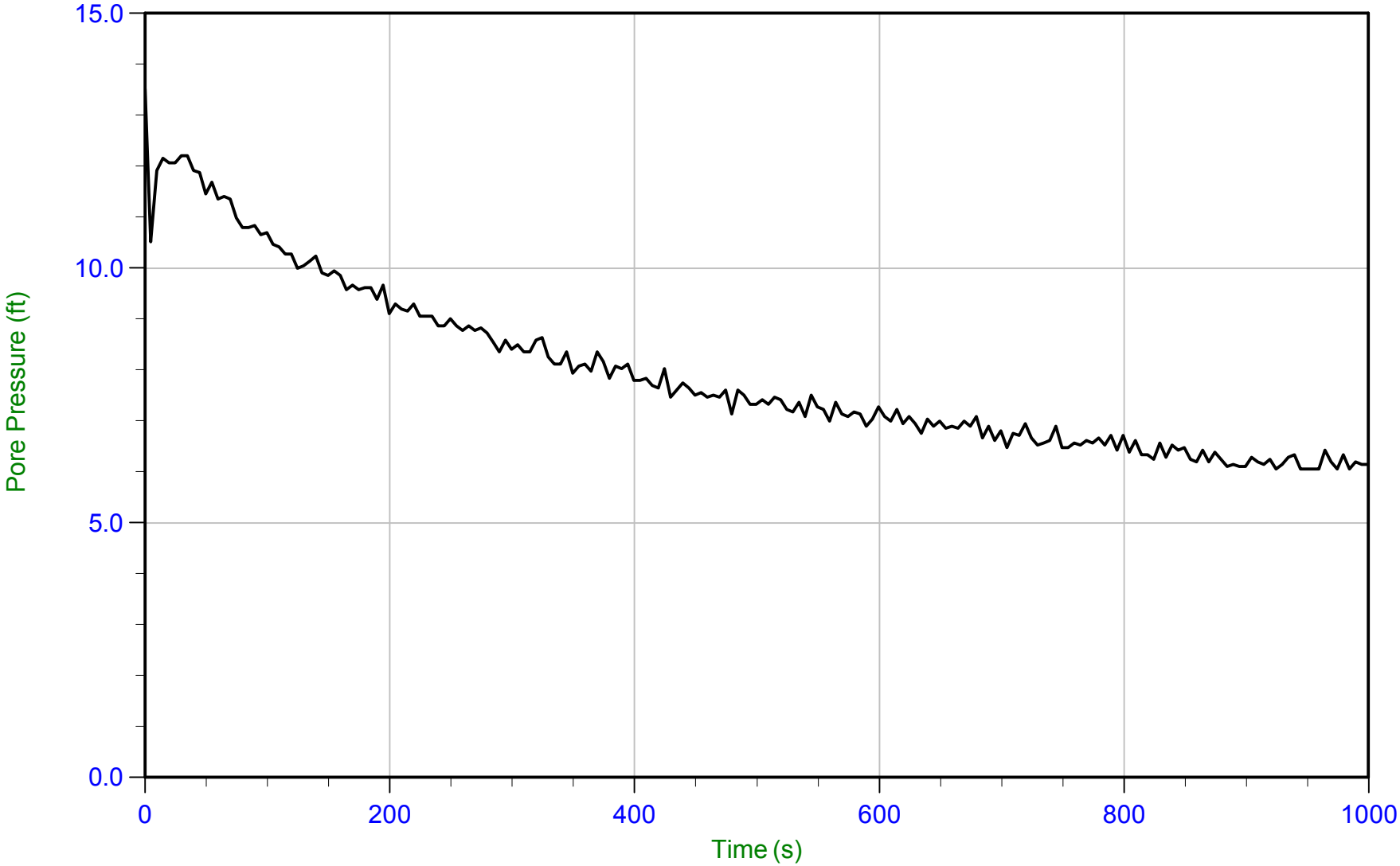
T(50): 1975.3 s

CONETEC

MWH Americas

Job No: 13-52118
Date: 07-Nov-2013 12:13:16
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-11
Cone: 155
Cone Area: 15 sq cm



Trace Summary:

Filename: 13-52118_RP11.PPD
Depth: 16.950 m / 55.610 ft
Duration: 1000.0 s

U Min: 6.1 ft
U Max: 13.5 ft

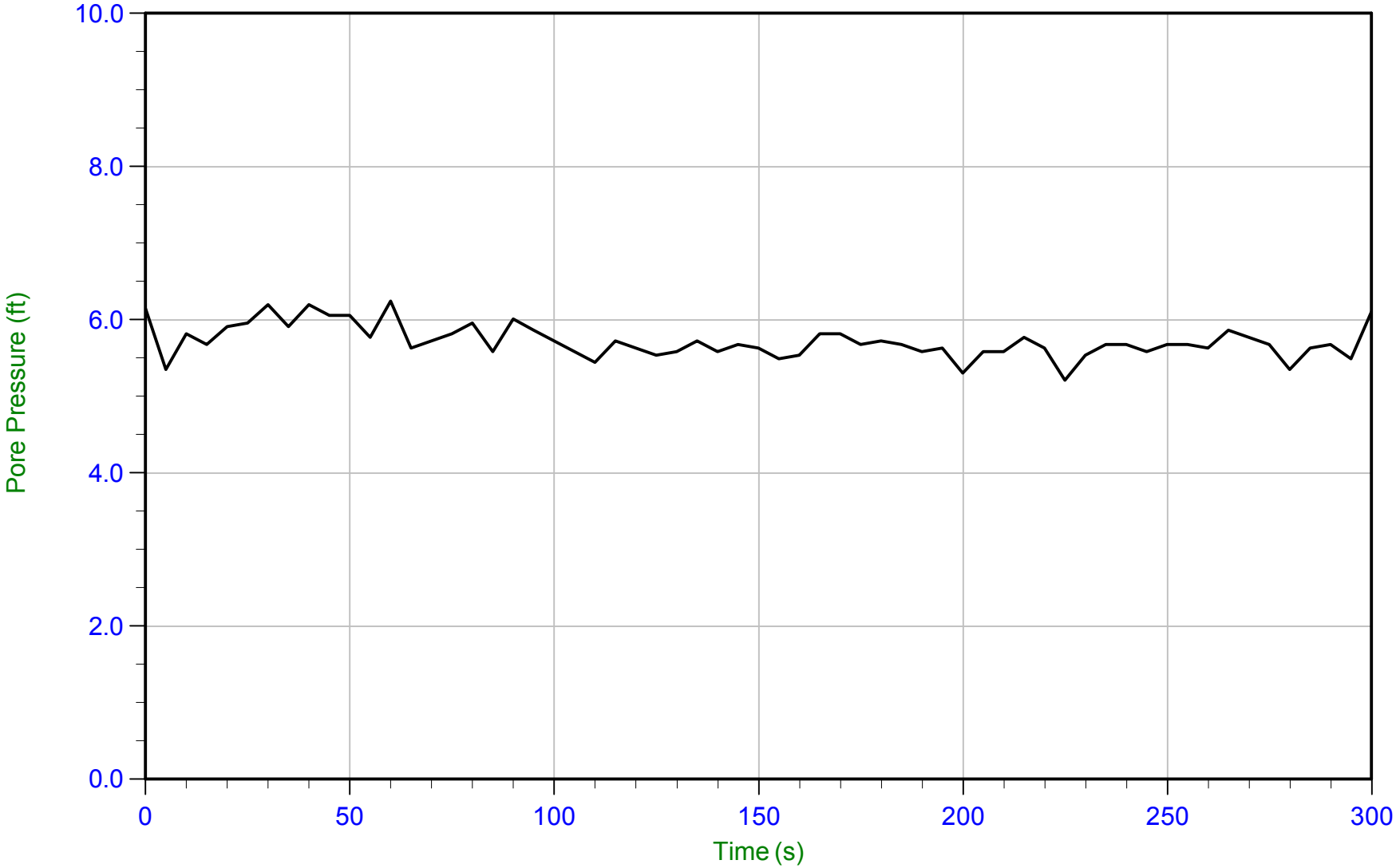
WT: 15.074 m / 49.454 ft
Ueq: 6.2 ft

CONETEC

MWH Americas

Job No: 13-52118
Date: 07-Nov-2013 10:22:20
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-12
Cone: 155
Cone Area: 15 sq cm



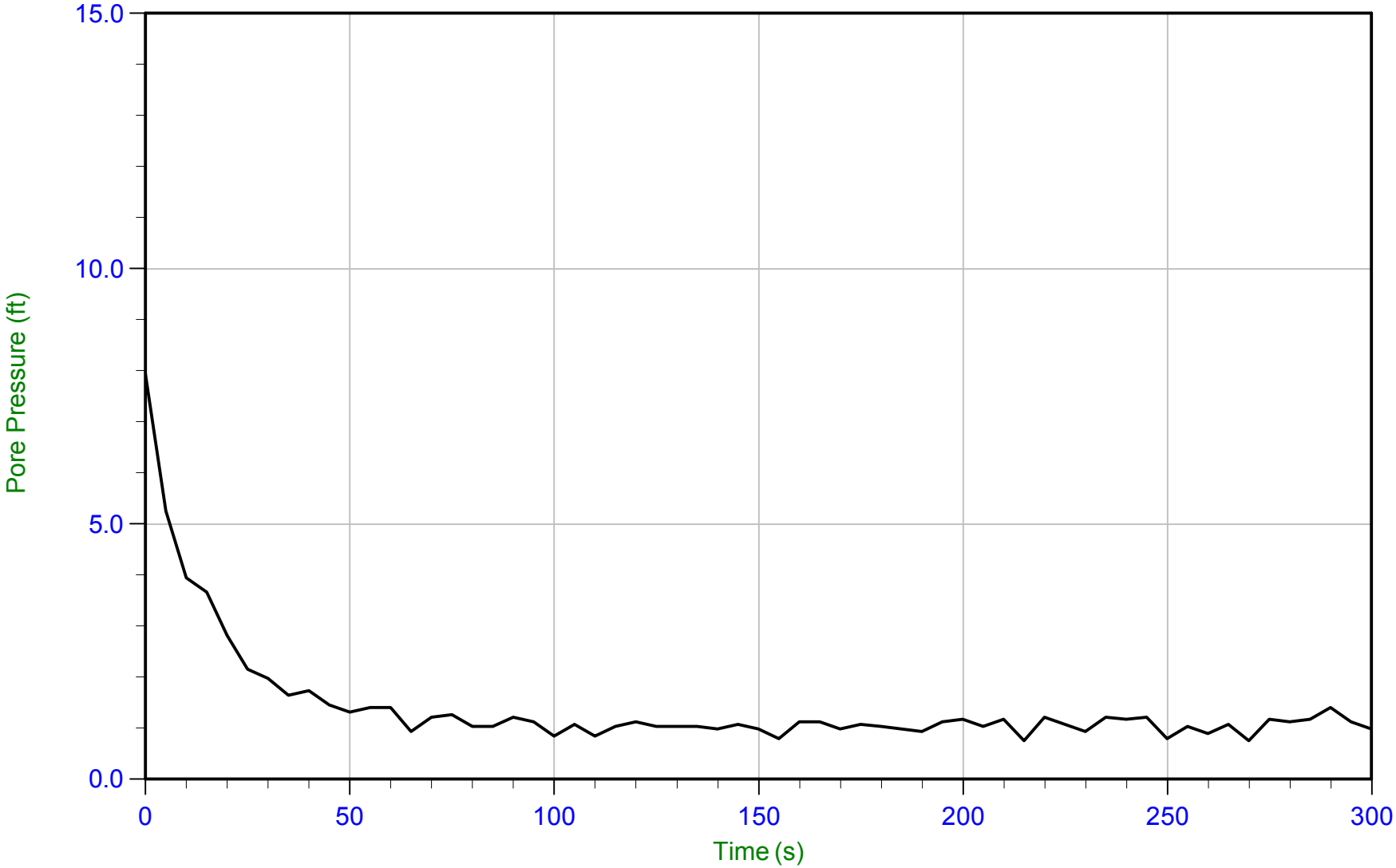
Trace Summary:

Filename: 13-52118_RP12.PPD
Depth: 12.350 m / 40.518 ft
Duration: 300.0 s

U Min: 5.2 ft
U Max: 6.2 ft

WT: 10.647 m / 34.932 ft
Ueq: 5.6 ft

CONETEC	MWH Americas	Job No: 13-52118 Date: 08-Nov-2013 14:30:14 Site: CHURCH ROCK MILL SITE TSF	Sounding: RCPT-14 Cone: 155 Cone Area: 15 sq cm



Trace Summary:

Filename: 13-52118_RP14.PPD
Depth: 6.700 m / 21.981 ft
Duration: 300.0 s

U Min: 0.8 ft
U Max: 7.9 ft

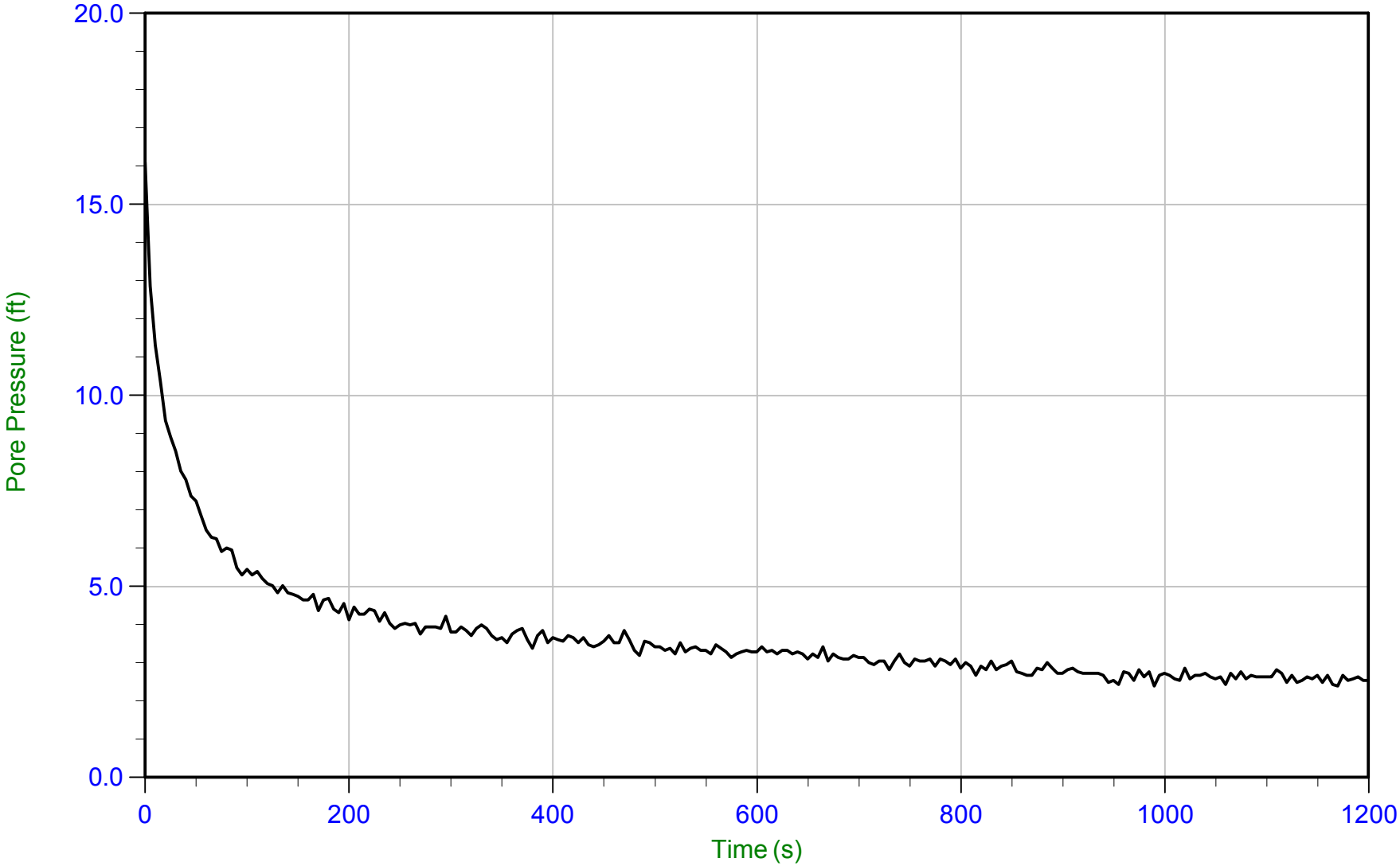
WT: 6.400 m / 20.999 ft
Ueq: 1.0 ft

CONETEC

MWH Americas

Job No: 13-52118
Date: 06-Nov-2013 16:32:17
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-15
Cone: 155
Cone Area: 15 sq cm



Trace Summary:

Filename: 13-52118_RP15.PPD
Depth: 11.550 m / 37.893 ft
Duration: 1200.0 s

U Min: 2.4 ft
U Max: 16.1 ft

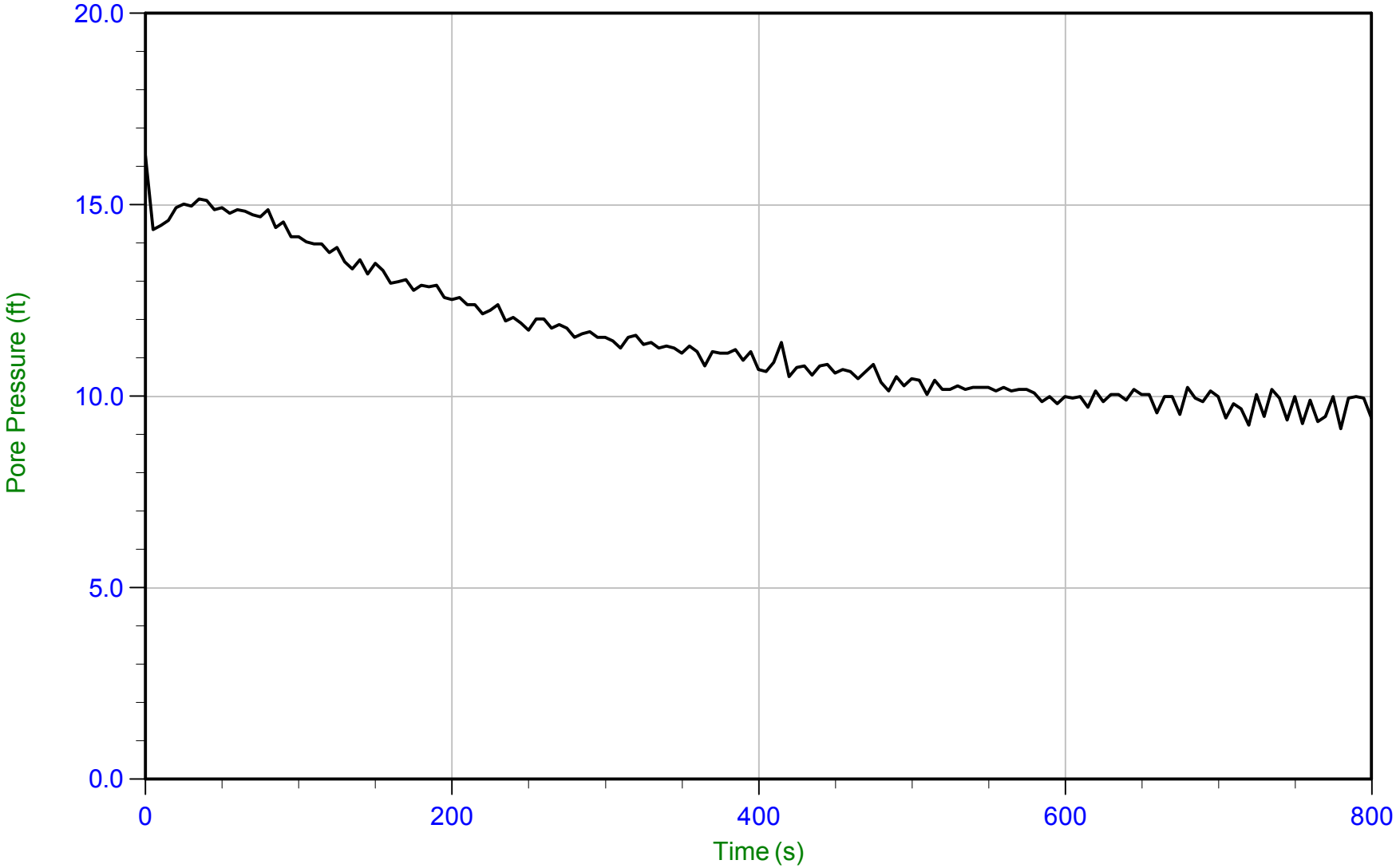
WT: 10.772 m / 35.342 ft
Ueq: 2.6 ft

CONETEC

MWH Americas

Job No: 13-52118
Date: 08-Nov-2013 12:56:11
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-16
Cone: 155
Cone Area: 15 sq cm



Trace Summary:

Filename: 13-52118_RP16.PPD
Depth: 13.350 m / 43.799 ft
Duration: 800.0 s

U Min: 9.2 ft
U Max: 16.3 ft

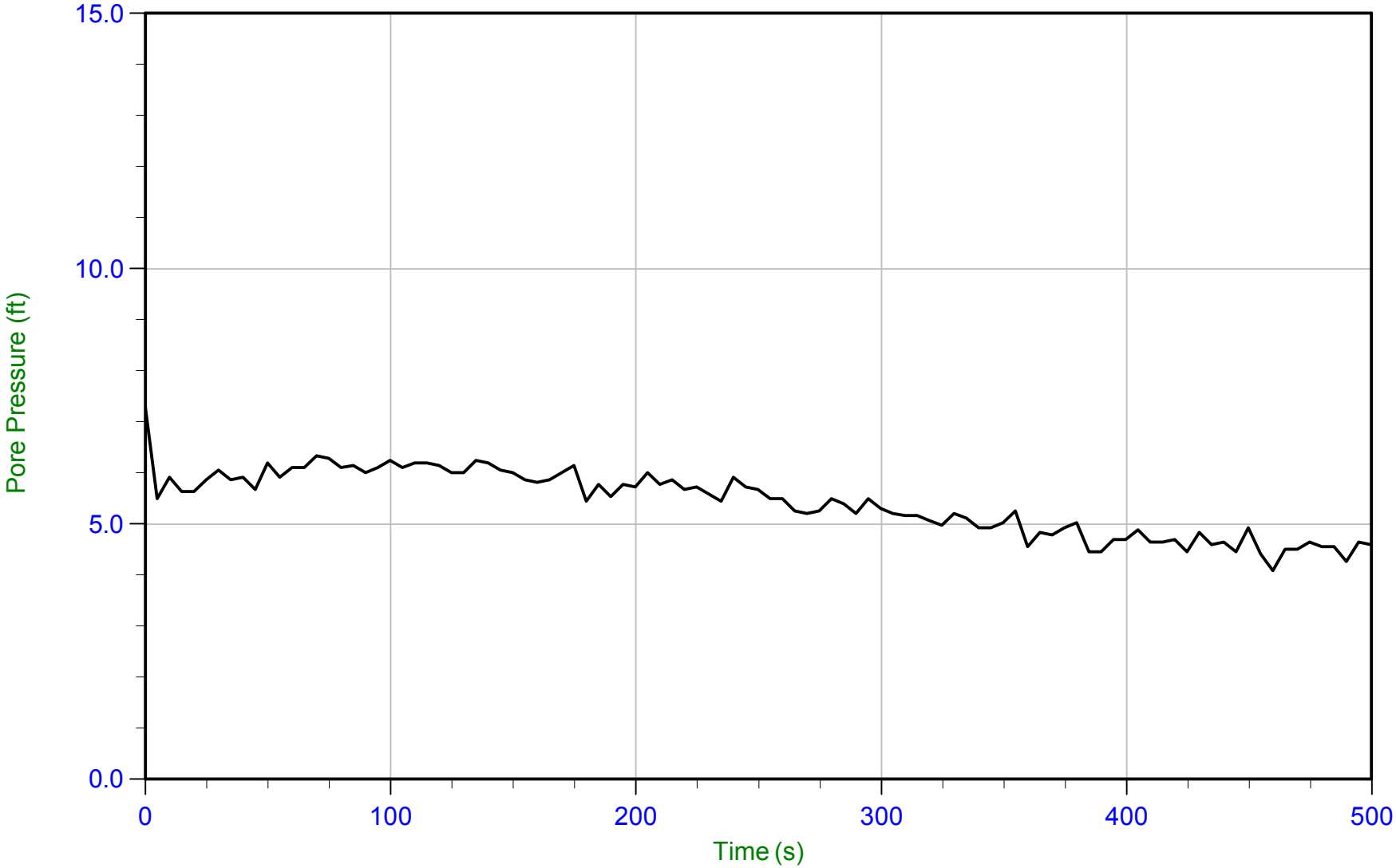
WT: 10.407 m / 34.144 ft
Ueq: 9.7 ft

CONETEC

MWH Americas

Job No: 13-52118
Date: 09-Nov-2013 10:46:19
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-18
Cone: 155
Cone Area: 15 sq cm



Trace Summary:

Filename: 13-52118_RP18.PPD
Depth: 9.350 m / 30.675 ft
Duration: 500.0 s

U Min: 4.1 ft
U Max: 7.3 ft

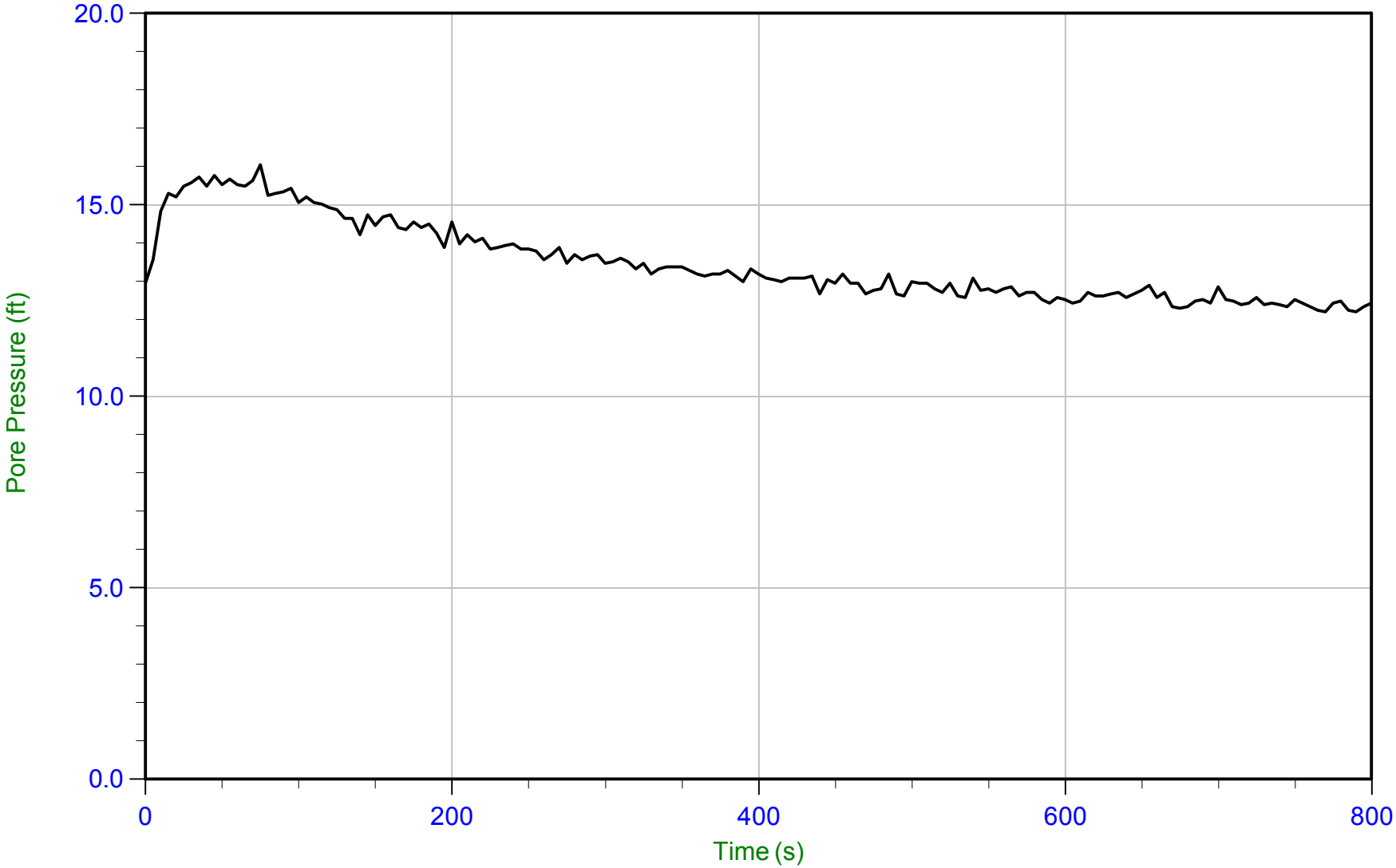
WT: 7.963 m / 26.124 ft
Ueq: 4.6 ft

CONETEC

MWH Americas

Job No: 13-52118
Date: 09-Nov-2013 10:46:19
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-18
Cone: 155
Cone Area: 15 sq cm



Trace Summary:

Filename: 13-52118_RP18.PPD
Depth: 14.000 m / 45.931 ft
Duration: 800.0 s

U Min: 12.2 ft
U Max: 16.1 ft

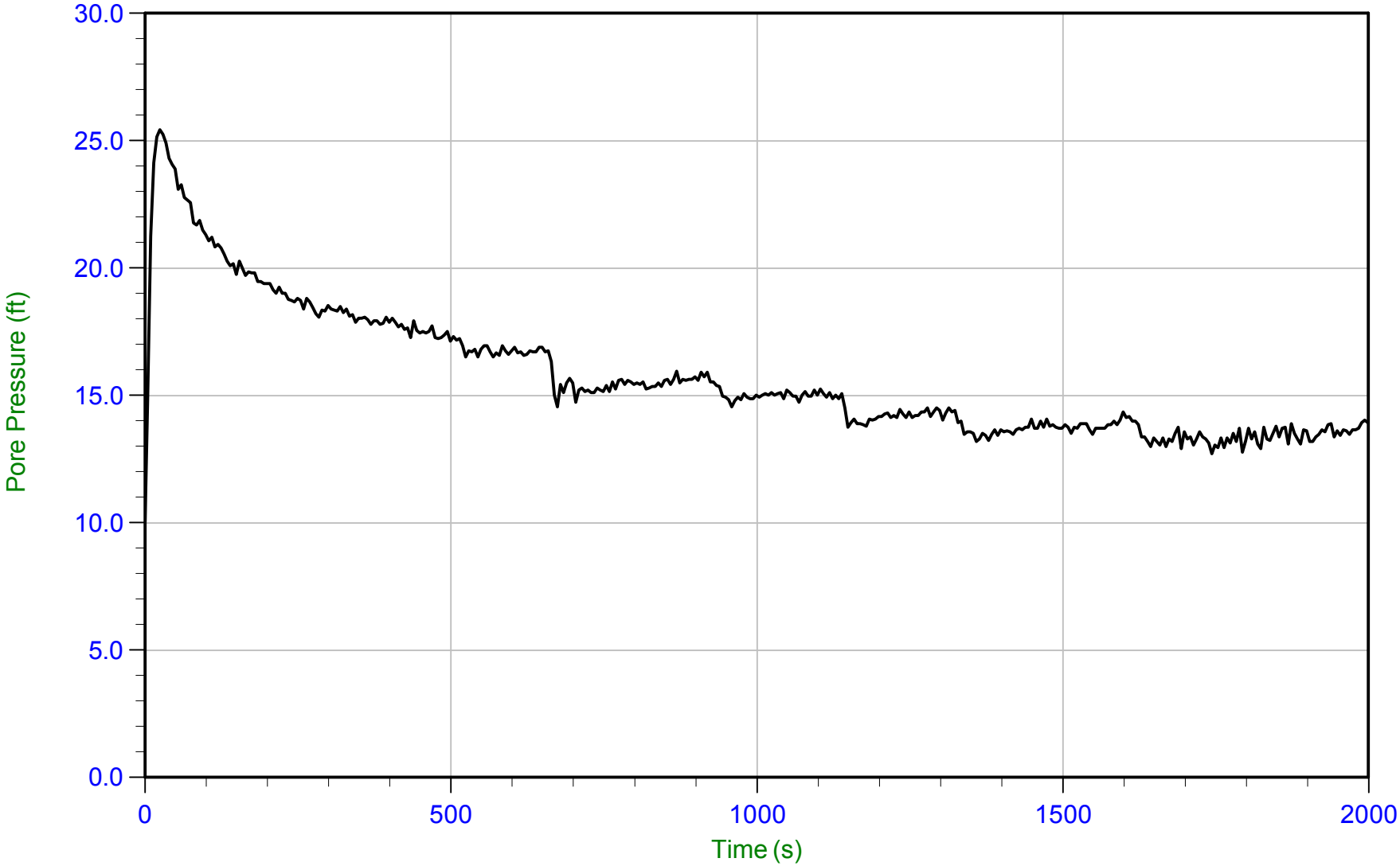
WT: 10.237 m / 33.587 ft
Ueq: 12.3 ft

CONETEC

MWH Americas

Job No: 13-52118
Date: 09-Nov-2013 11:56:27
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-19
Cone: 155
Cone Area: 15 sq cm



Trace Summary:

Filename: 13-52118_RP19.PPD
Depth: 12.050 m / 39.534 ft
Duration: 2000.0 s

U Min: 10.0 ft
U Max: 25.4 ft

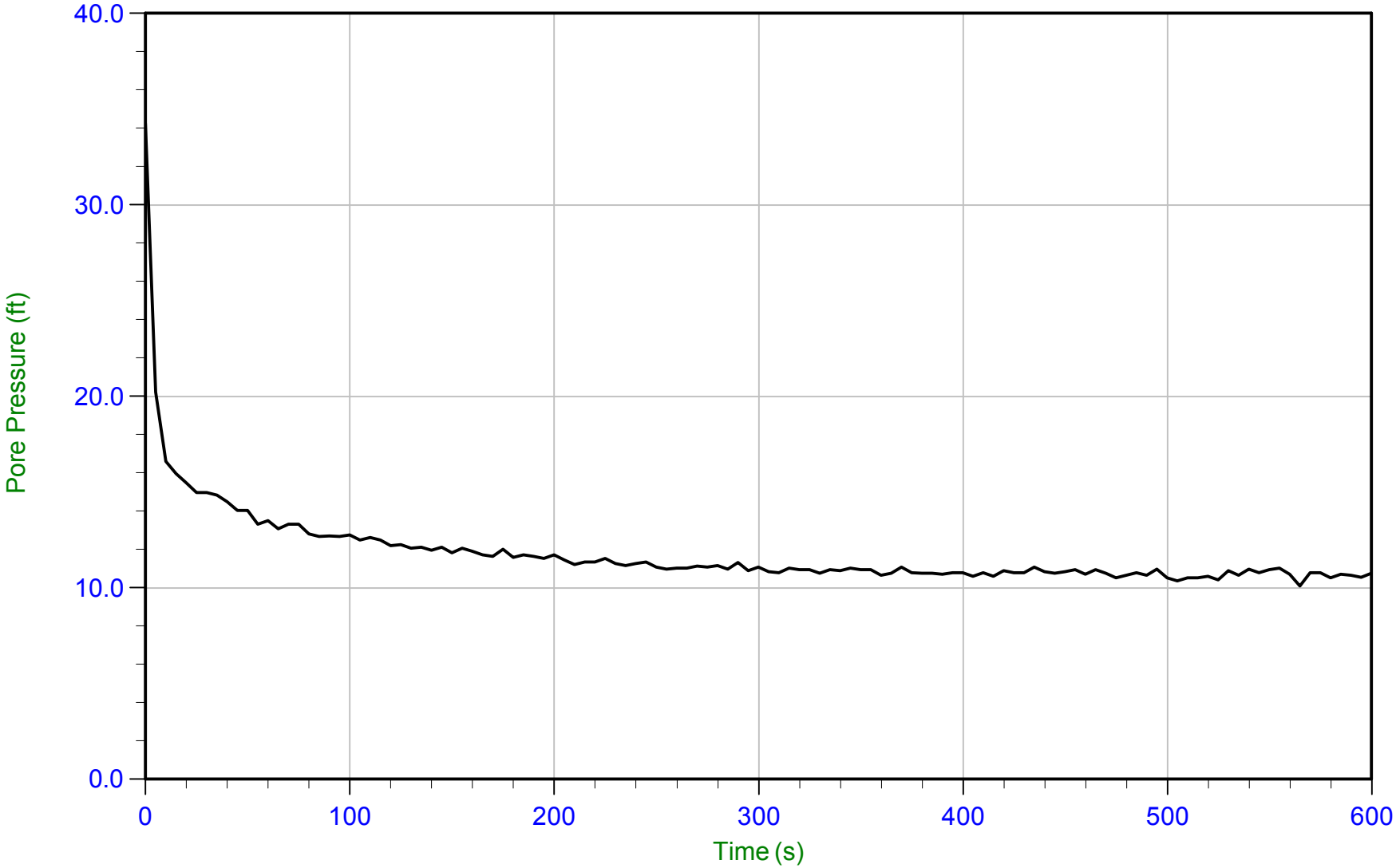
WT: 7.982 m / 26.189 ft
Ueq: 13.3 ft

CONETEC

MWH Americas

Job No: 13-52118
Date: 10-Nov-2013 11:54:14
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-22
Cone: 155
Cone Area: 15 sq cm



Trace Summary:

Filename: 13-52118_RP22.PPD
Depth: 12.500 m / 41.010 ft
Duration: 600.0 s

U Min: 10.1 ft
U Max: 34.3 ft

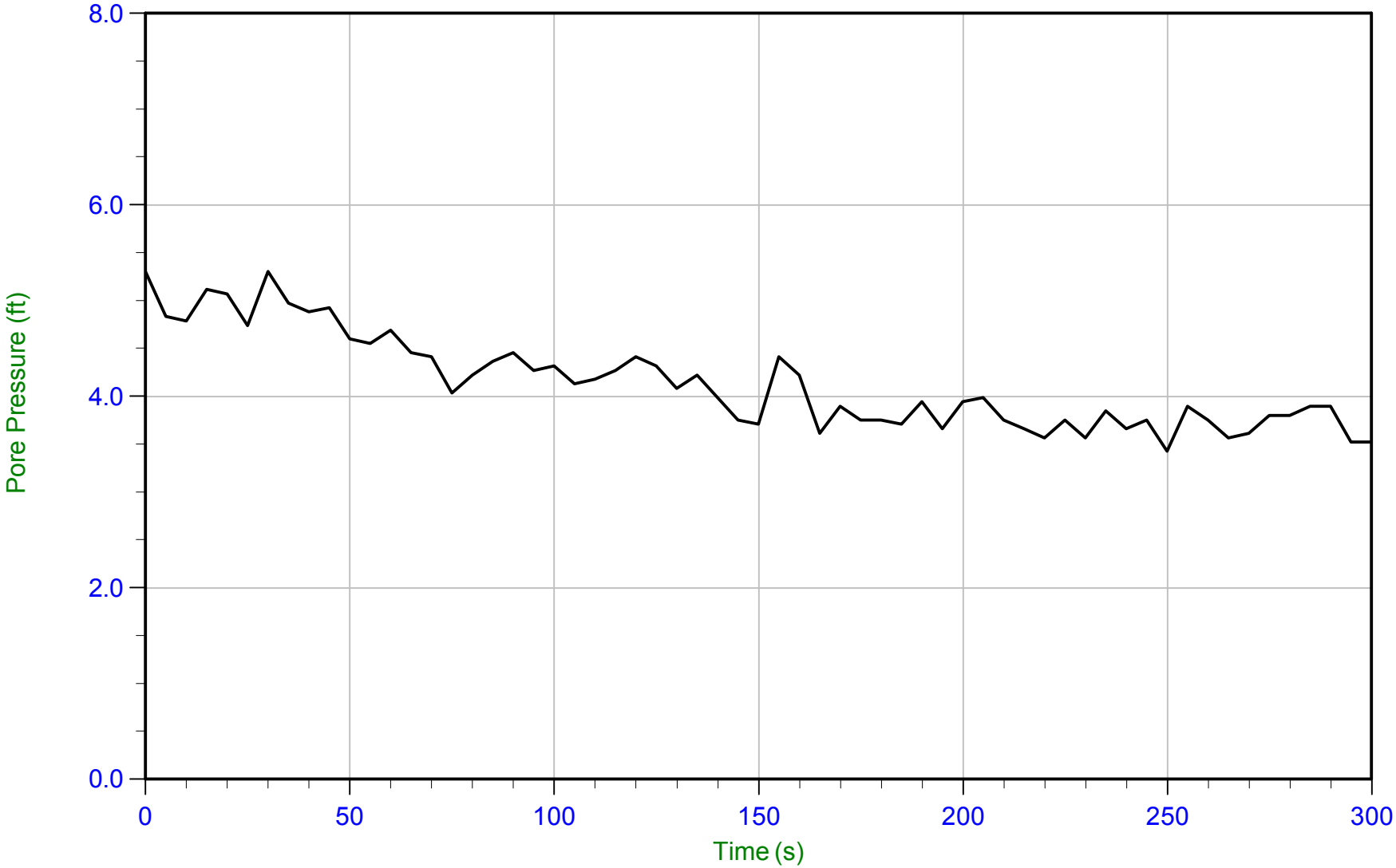
WT: 9.263 m / 30.389 ft
Ueq: 10.6 ft

CONETEC

MWH Americas

Job No: 13-52118
Date: 08-Nov-2013 16:21:35
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-23
Cone: 155
Cone Area: 15 sq cm



Trace Summary:

Filename: 13-52118_RP23.PPD
Depth: 10.400 m / 34.120 ft
Duration: 300.0 s

U Min: 3.4 ft
U Max: 5.3 ft

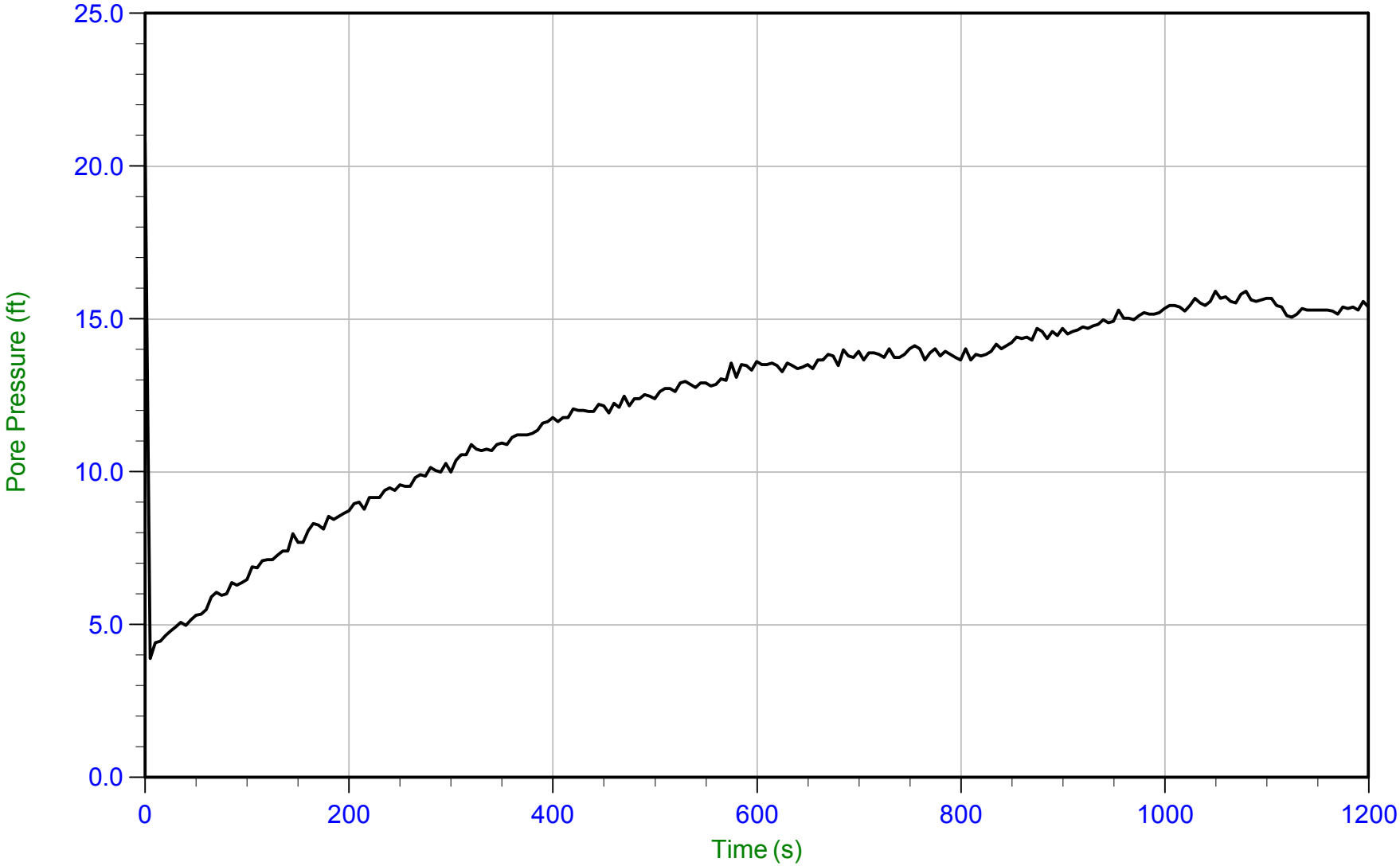
WT: 9.282 m / 30.451 ft
Ueq: 3.7 ft

CONETEC

MWH Americas

Job No: 13-52118
Date: 09-Nov-2013 09:25:08
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-26
Cone: 155
Cone Area: 15 sq cm



Trace Summary:

Filename: 13-52118_RP26.PPD
Depth: 7.900 m / 25.918 ft
Duration: 1200.0 s

U Min: 3.9 ft
U Max: 20.8 ft

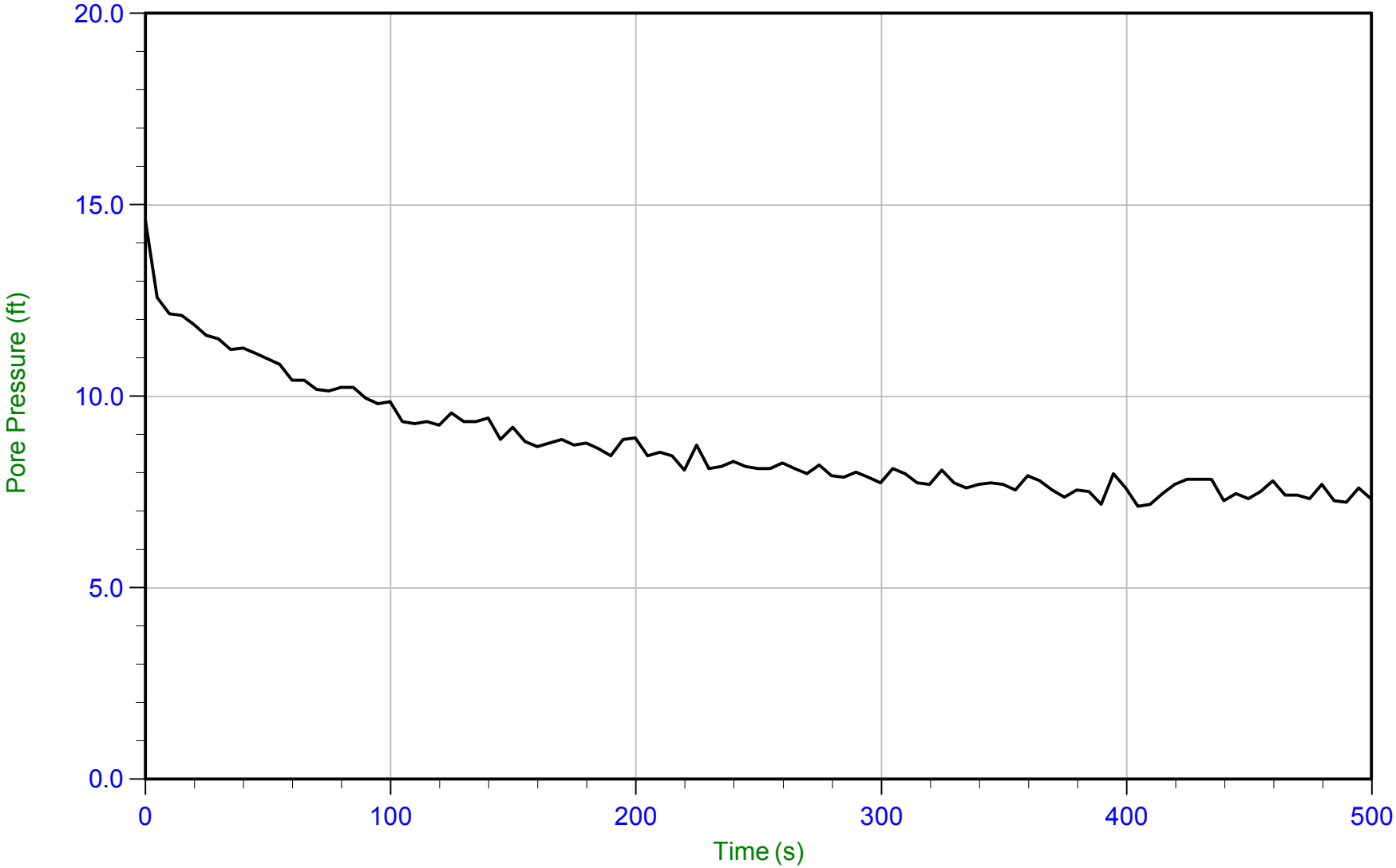
WT: 3.249 m / 10.660 ft
Ueq: 15.3 ft

CONETEC

MWH Americas

Job No: 13-52118
Date: 10-Nov-2013 08:17:14
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-28
Cone: 155
Cone Area: 15 sq cm



Trace Summary:

Filename: 13-52118_RP28.PPD
Depth: 20.700 m / 67.913 ft
Duration: 500.0 s

U Min: 7.1 ft
U Max: 14.6 ft

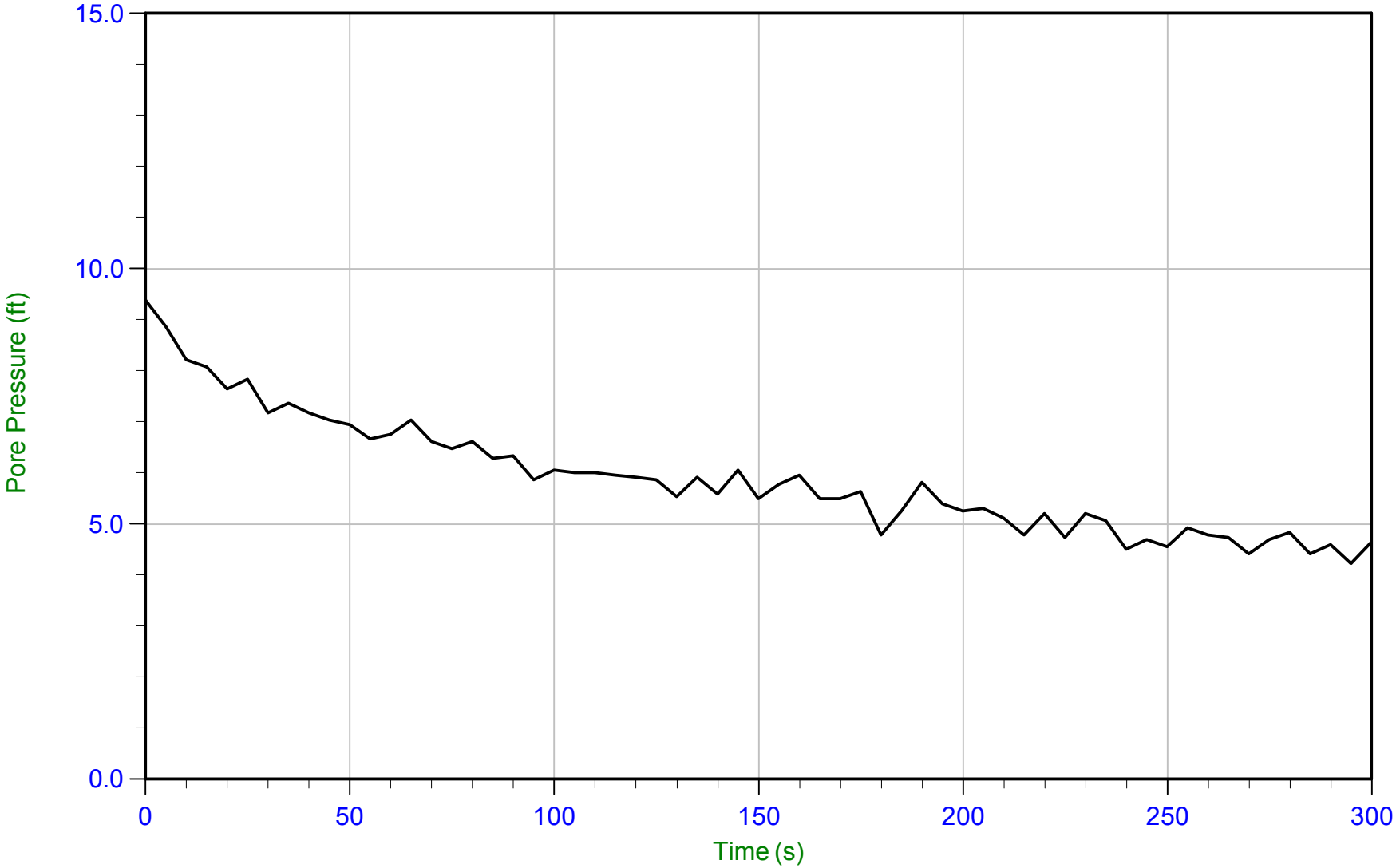
WT: 18.430 m / 60.464 ft
Ueq: 7.4 ft

CONETEC

MWH Americas

Job No: 13-52118
Date: 10-Nov-2013 13:10:58
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-31
Cone: 155
Cone Area: 15 sq cm



Trace Summary:

Filename: 13-52118_RP31.PPD
Depth: 16.550 m / 54.297 ft
Duration: 300.0 s

U Min: 4.2 ft
U Max: 9.4 ft

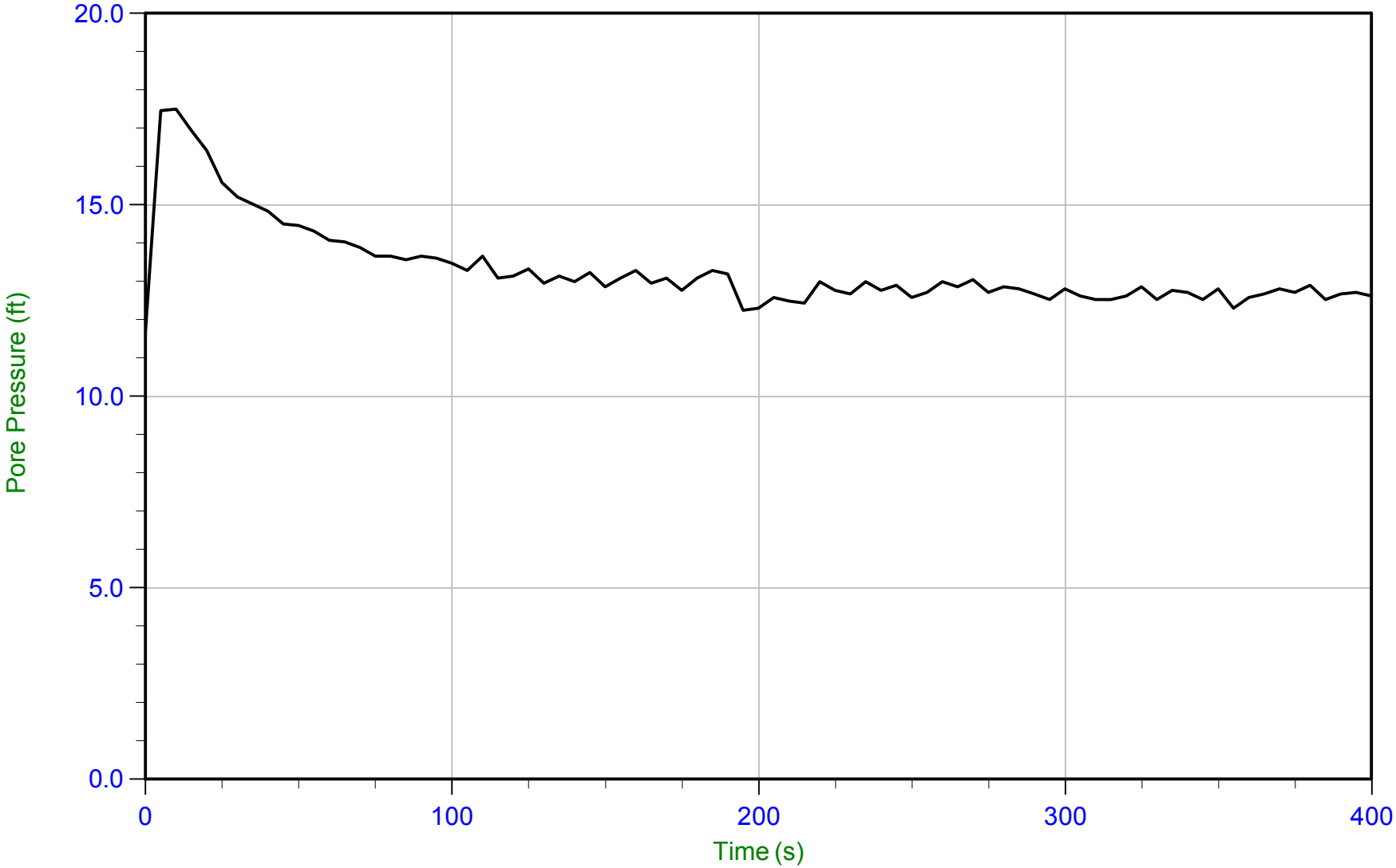
WT: 15.178 m / 49.797 ft
Ueq: 4.5 ft

CONETEC

MWH Americas

Job No: 13-52118
Date: 10-Nov-2013 14:12:13
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-32
Cone: 155
Cone Area: 15 sq cm



Trace Summary:

Filename: 13-52118_RP32.PPD
Depth: 16.550 m / 54.297 ft
Duration: 400.0 s

U Min: 11.7 ft
U Max: 17.5 ft

WT: 12.682 m / 41.608 ft
Ueq: 12.7 ft

CPT Plots with Resistivity Measurements

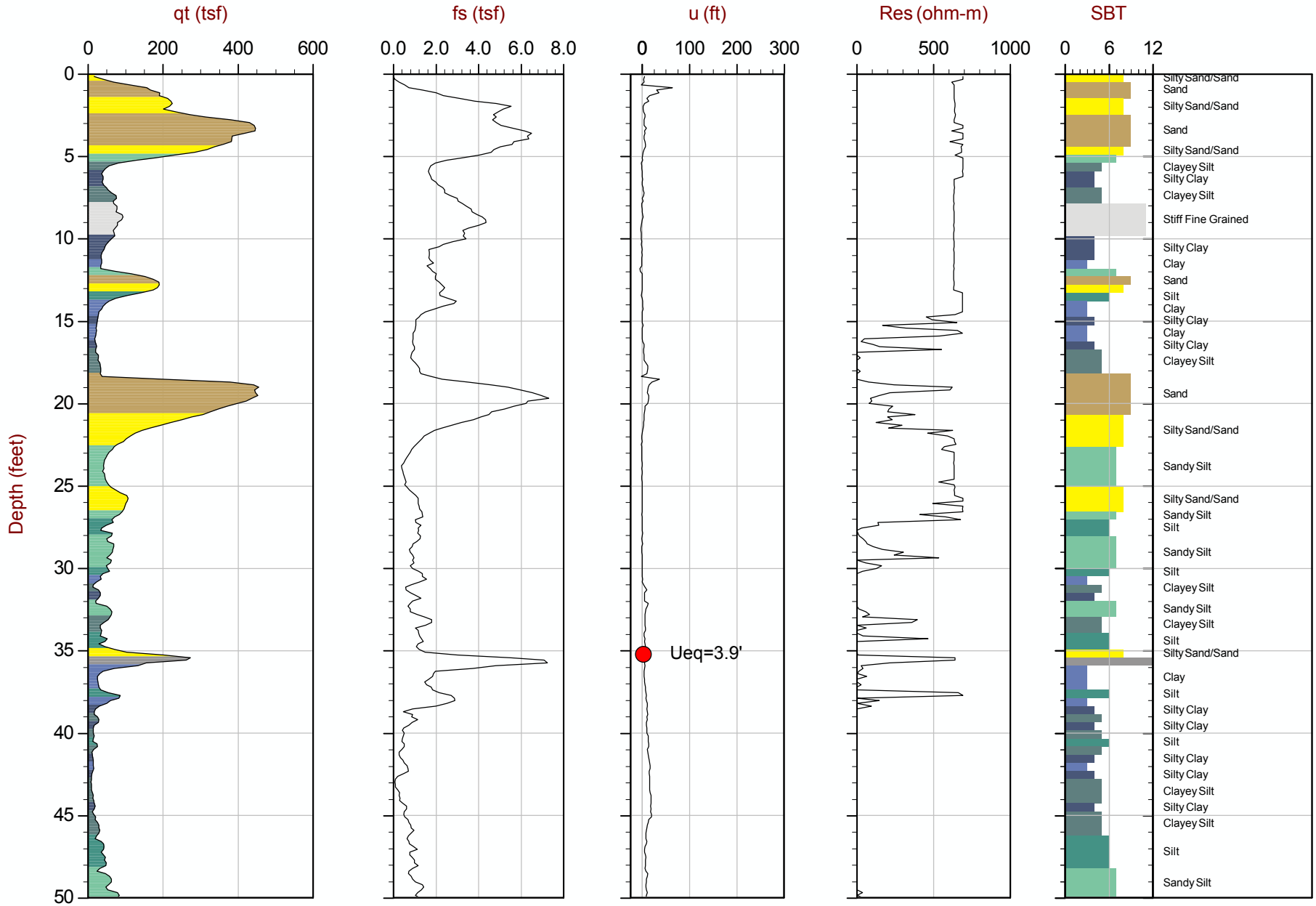
CONETEC

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:07:13 15:36
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-01
Cone: 155:T1500F15U500



Max Depth: 26.950 m / 88.42 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP01.COR
Unit Wt: SBT Chart Soil Zones

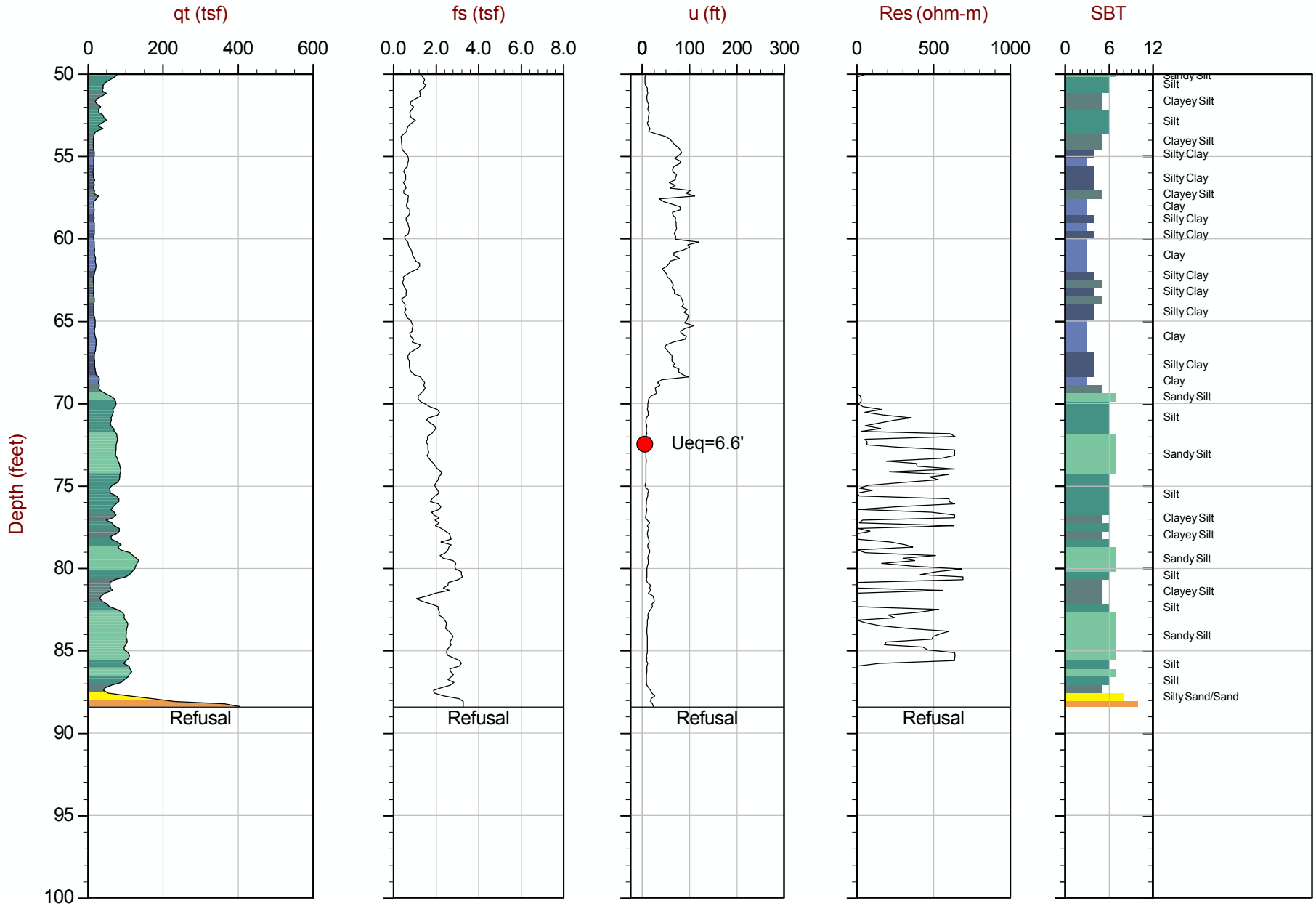
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.649117 Long: -108.501667
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:07:13 15:36
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-01
Cone: 155:T1500F15U500



Max Depth: 26.950 m / 88.42 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP01.COR
Unit Wt: SBT Chart Soil Zones

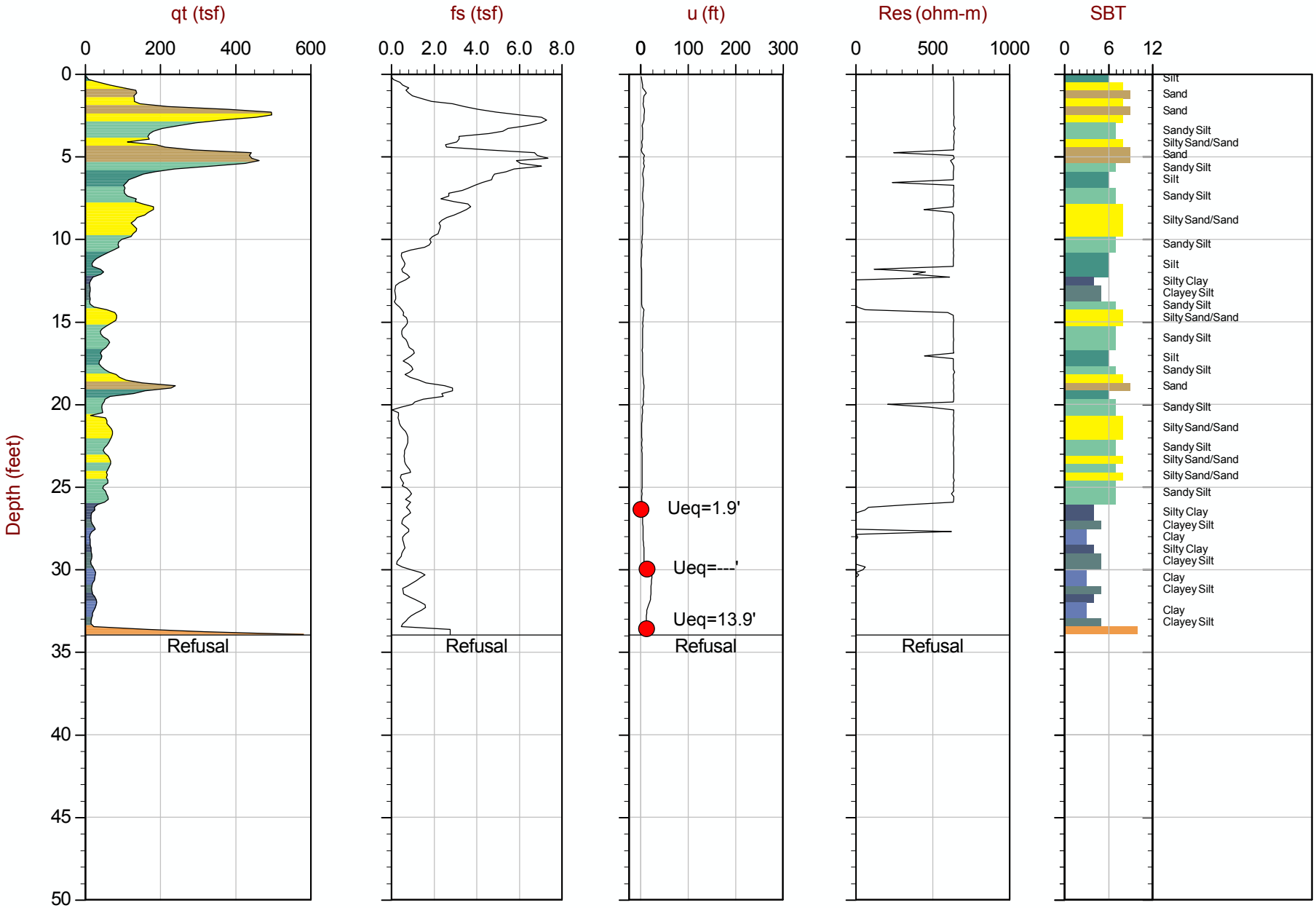
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.649117 Long: -108.501667
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:05:13 13:37
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-02
Cone: 155:T1500F15U500



Max Depth: 10.350 m / 33.96 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP02.COR
Unit Wt: SBT Chart Soil Zones

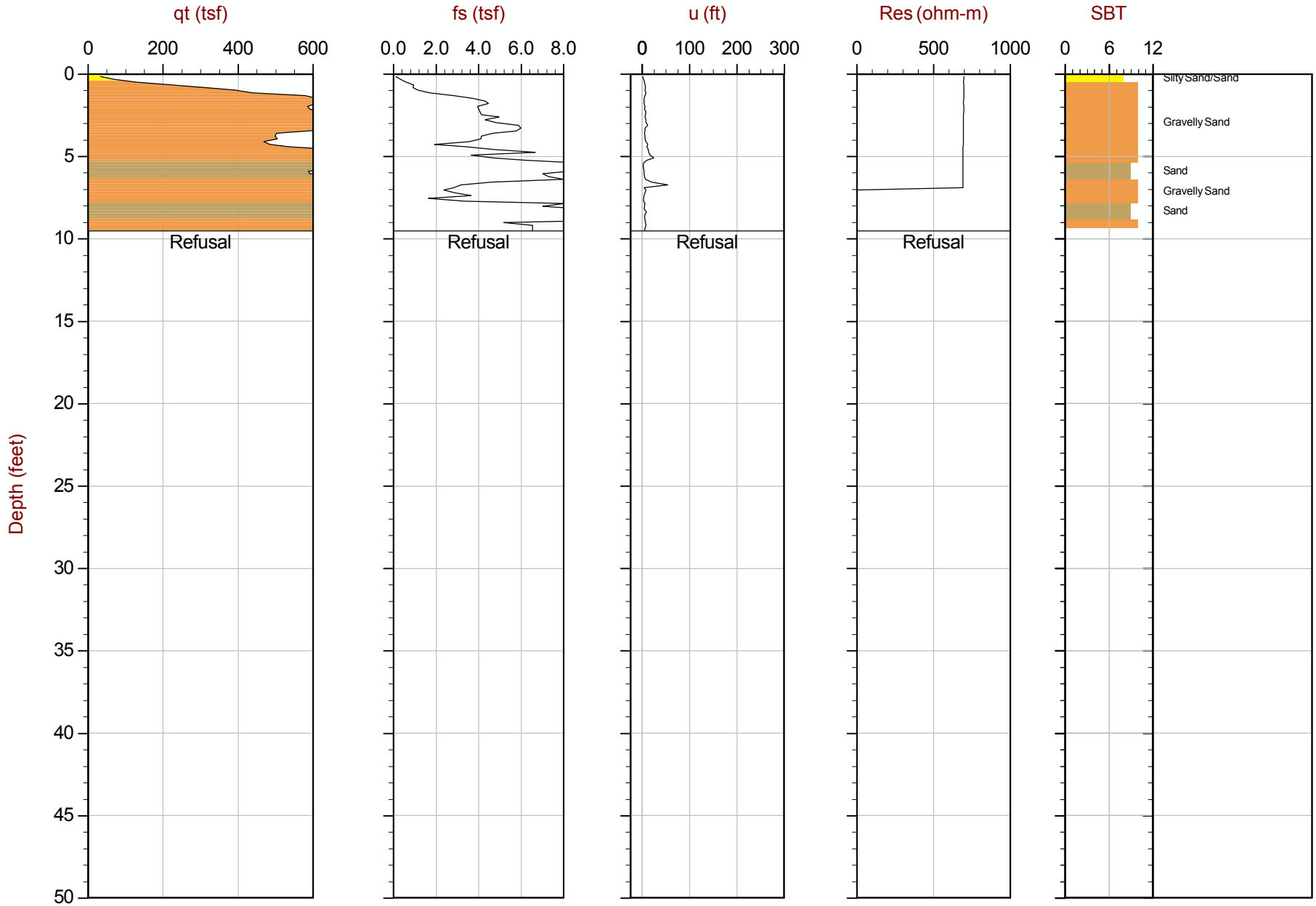
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.650200 Long: -108.499750
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:08:13 07:50
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-03
Cone: 155:T1500F15U500



Max Depth: 2.900 m / 9.51 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP03.COR
Unit Wt: SBT Chart Soil Zones

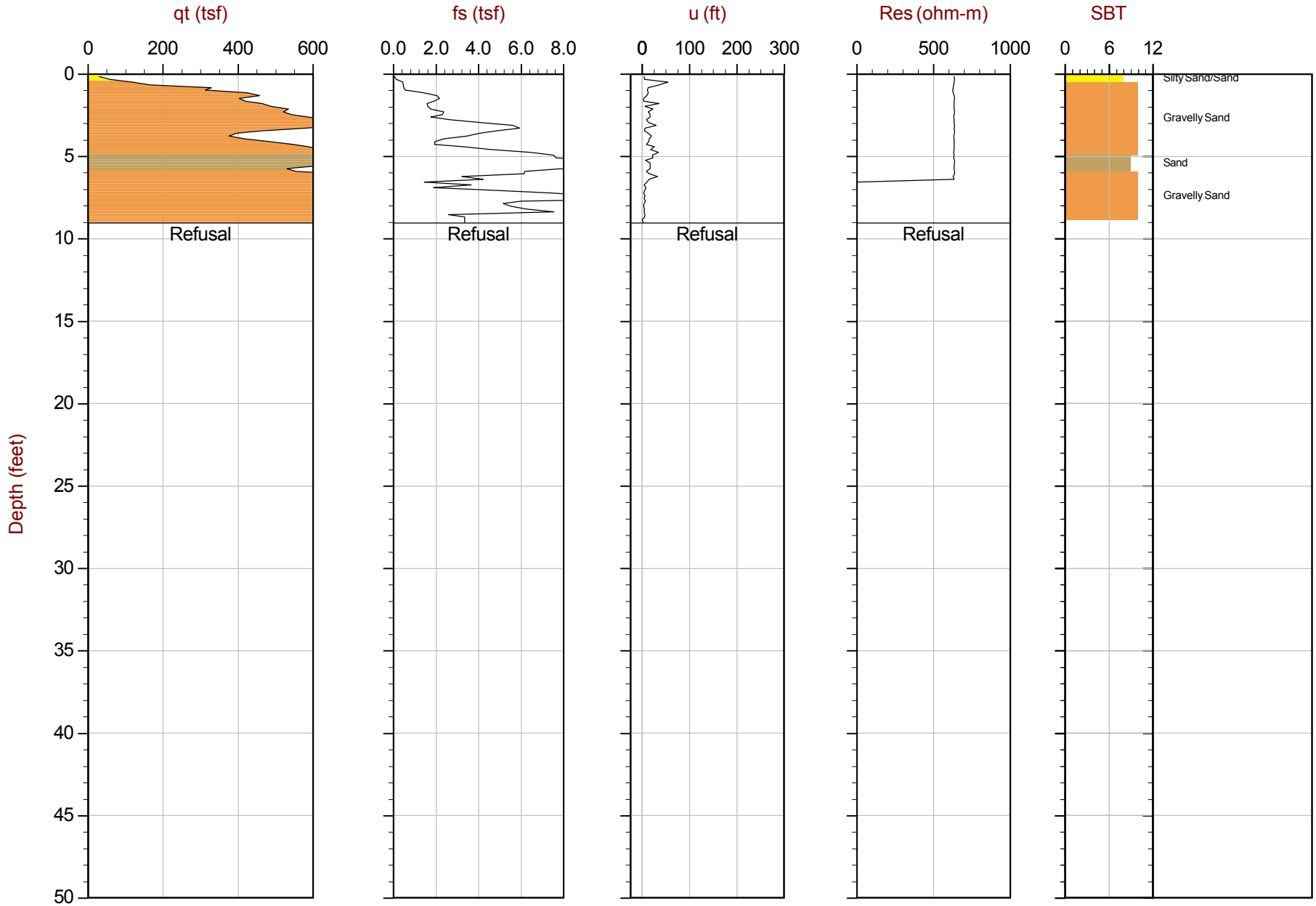
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.649350 Long: -108.502383
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:08:13 08:45
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-03B
Cone: 155:T1500F15U500



Max Depth: 2.750 m / 9.02 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP03B.COR
Unit Wt: SBT Chart Soil Zones

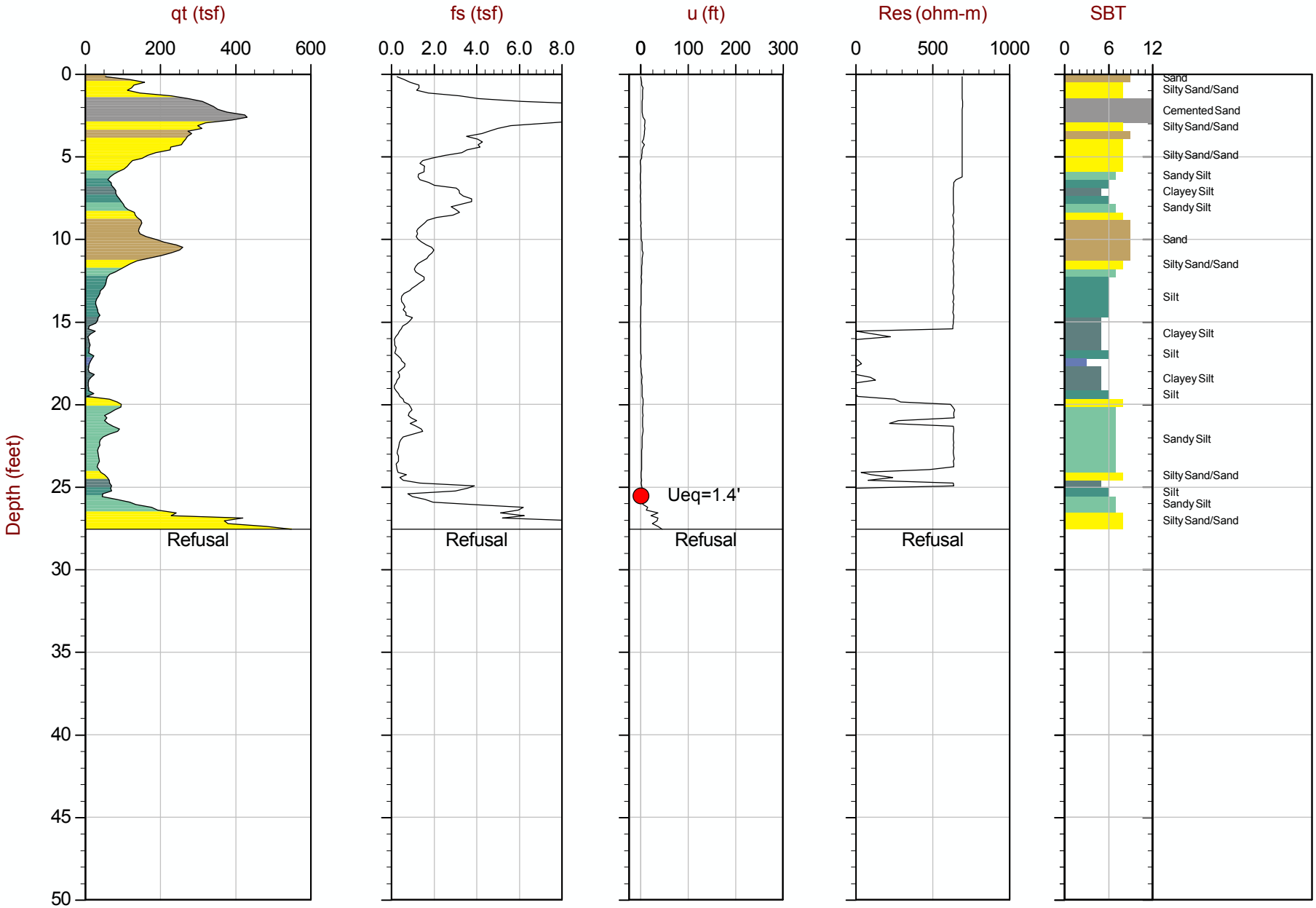
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.649333 Long: -108.502383
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:05:13 13:39
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-04
Cone: 155:T1500F15U500



Max Depth: 8.400 m / 27.56 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP04.COR
Unit Wt: SBT Chart Soil Zones

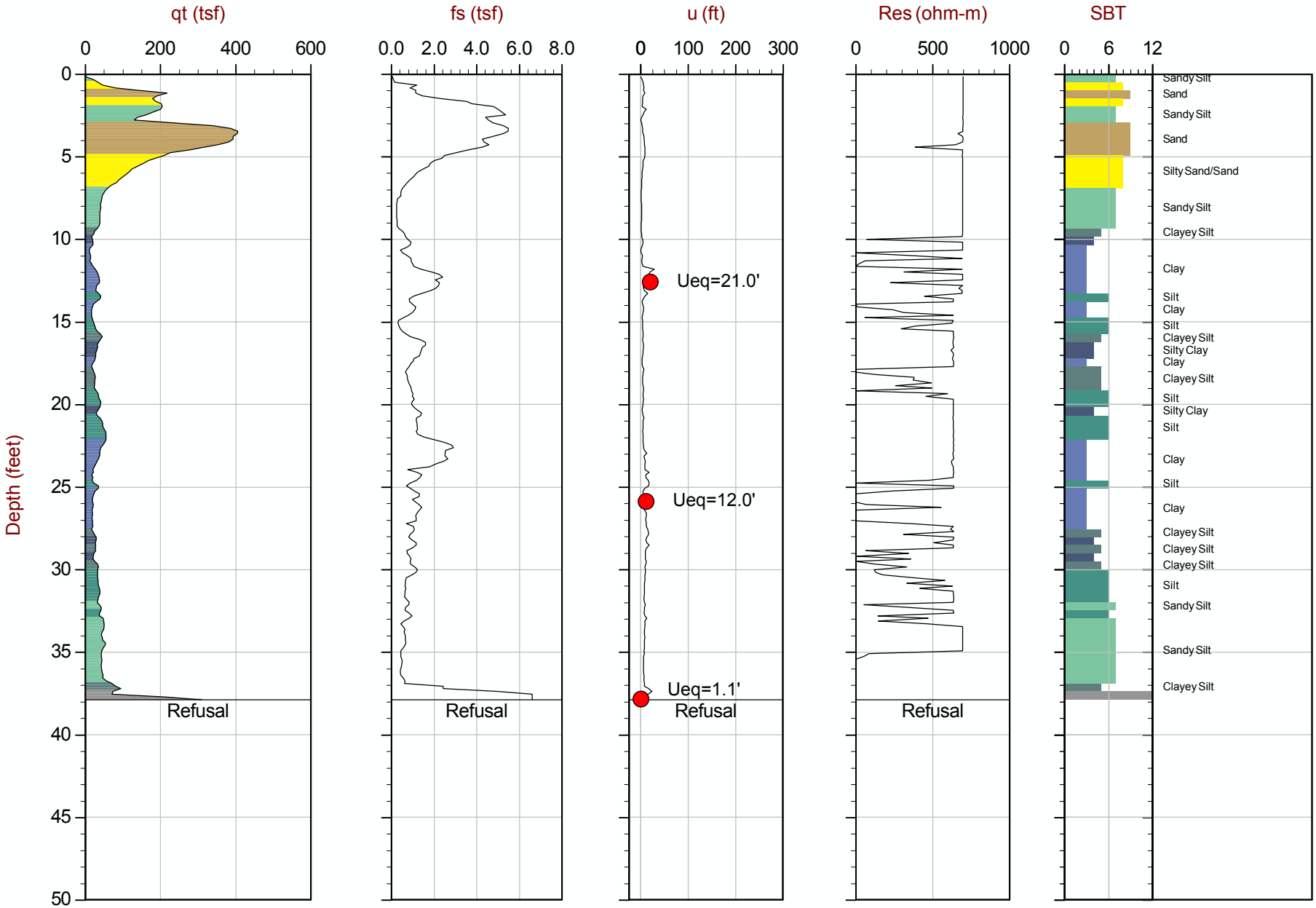
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.649533 Long: -108.500483
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:06:13 08:30
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-05
Cone: 155:T1500F15U500



Max Depth: 11.550 m / 37.89 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP05.COR
Unit Wt: SBT Chart Soil Zones

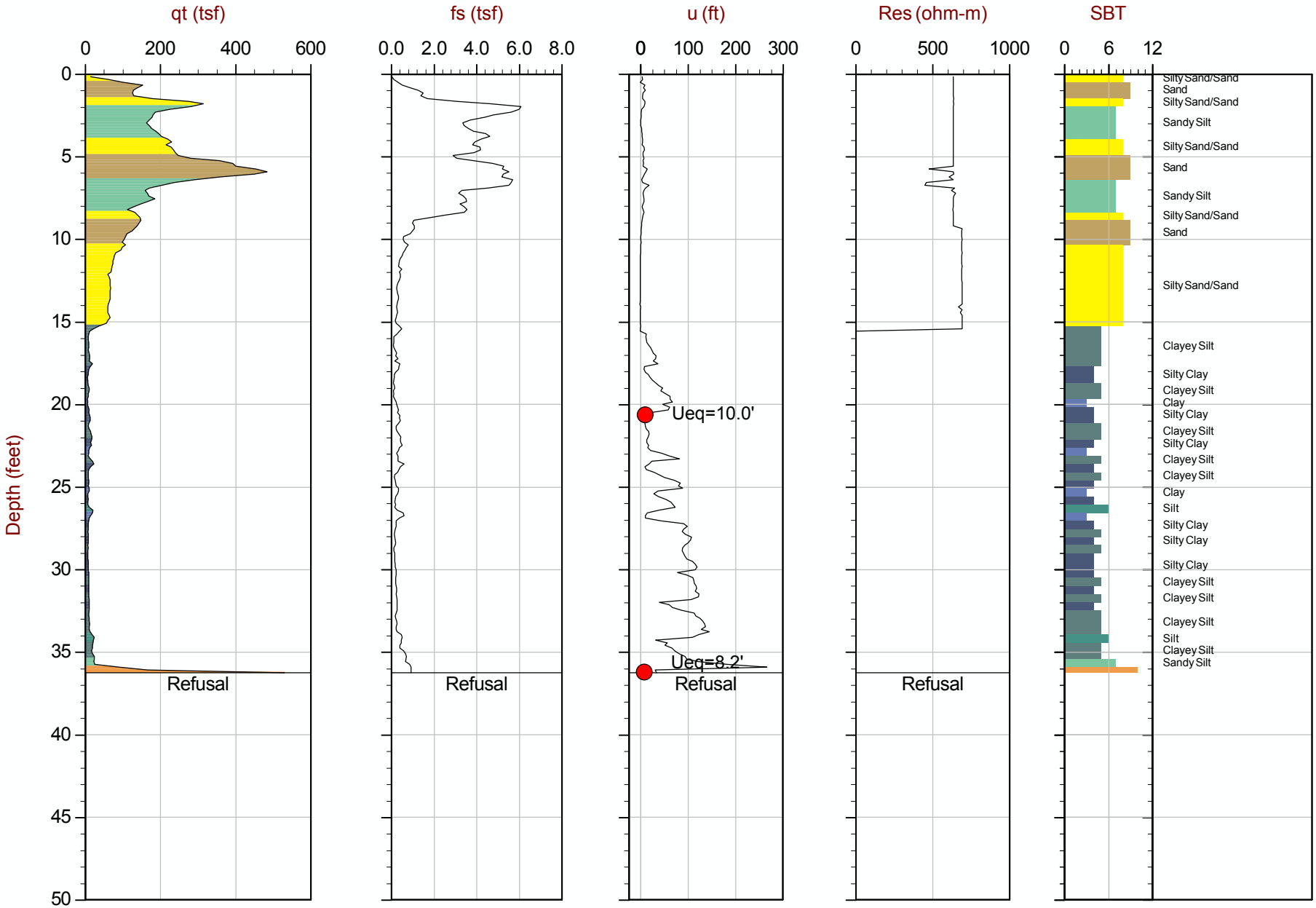
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.648633 Long: -108.498283
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:06:13 13:01
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-06
Cone: 155:T1500F15U500



Max Depth: 11.050 m / 36.25 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP06.COR
Unit Wt: SBT Chart Soil Zones

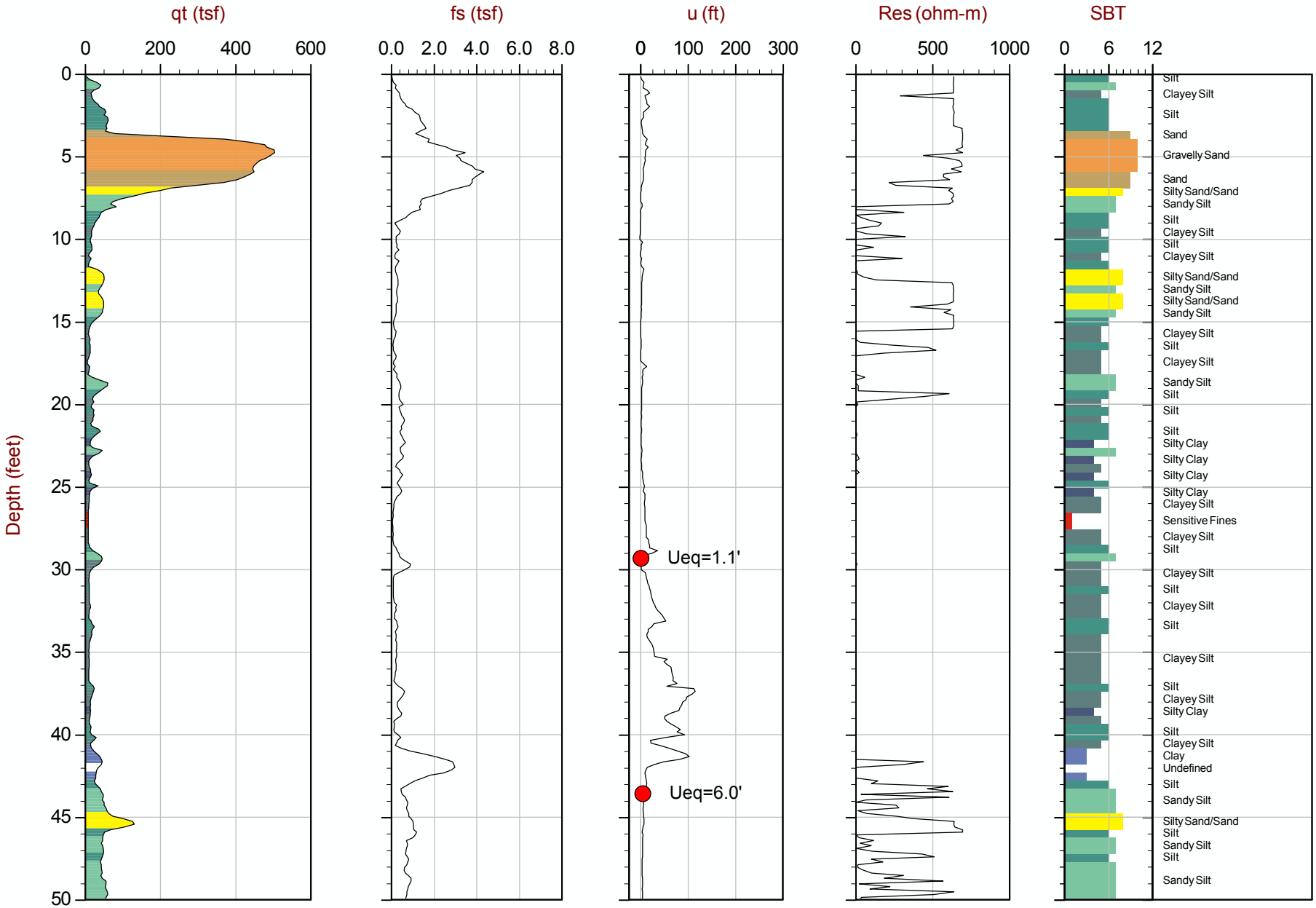
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.648250 Long: -108.497050
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:08:13 11:13
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-07
Cone: 155:T1500F15U500



Max Depth: 21.350 m / 70.05 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP07.COR
Unit Wt: SBT Chart Soil Zones

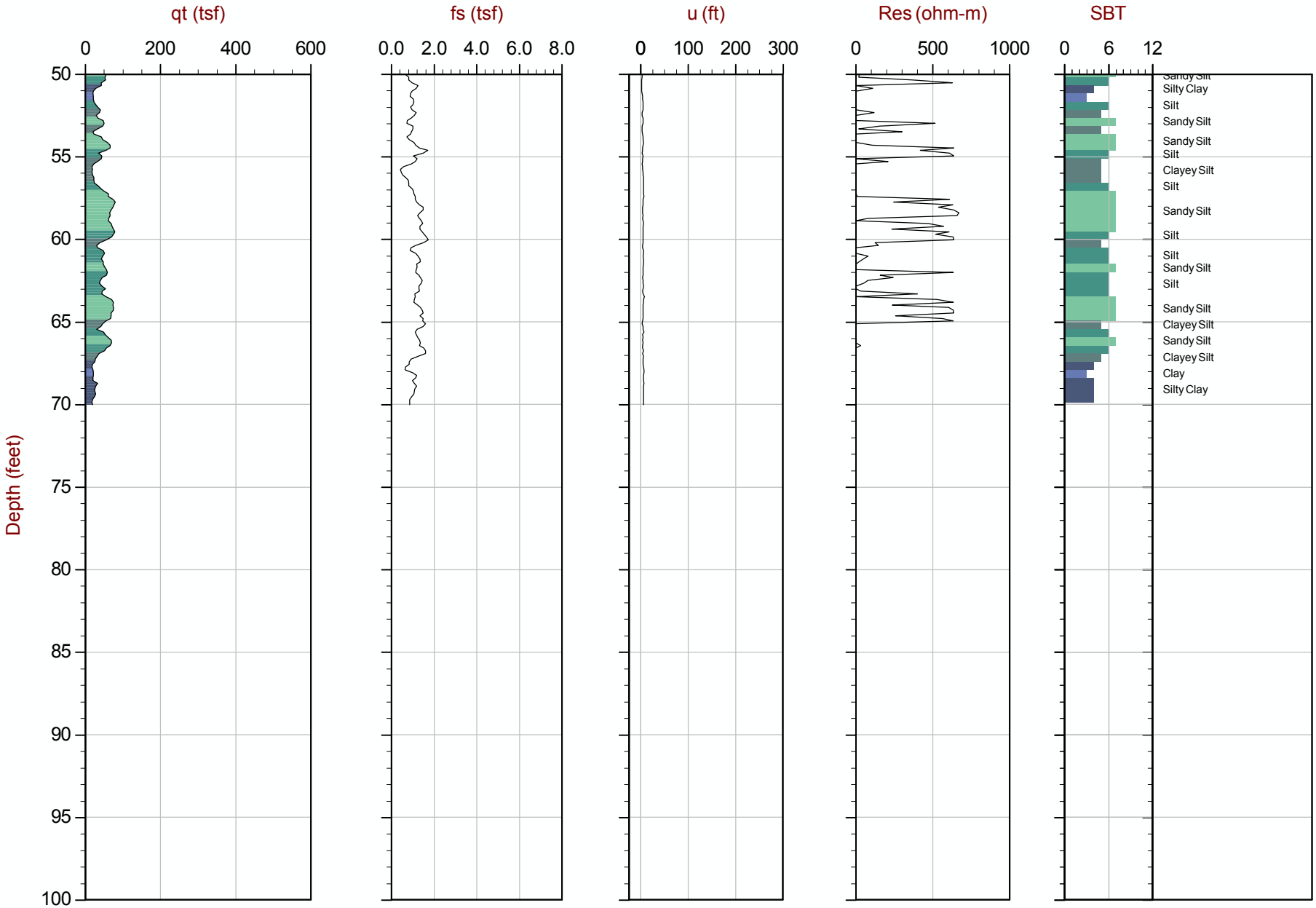
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647600 Long: -108.501200
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:08:13 11:13
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-07
Cone: 155:T1500F15U500



Max Depth: 21.350 m / 70.05 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP07.COR
Unit Wt: SBT Chart Soil Zones

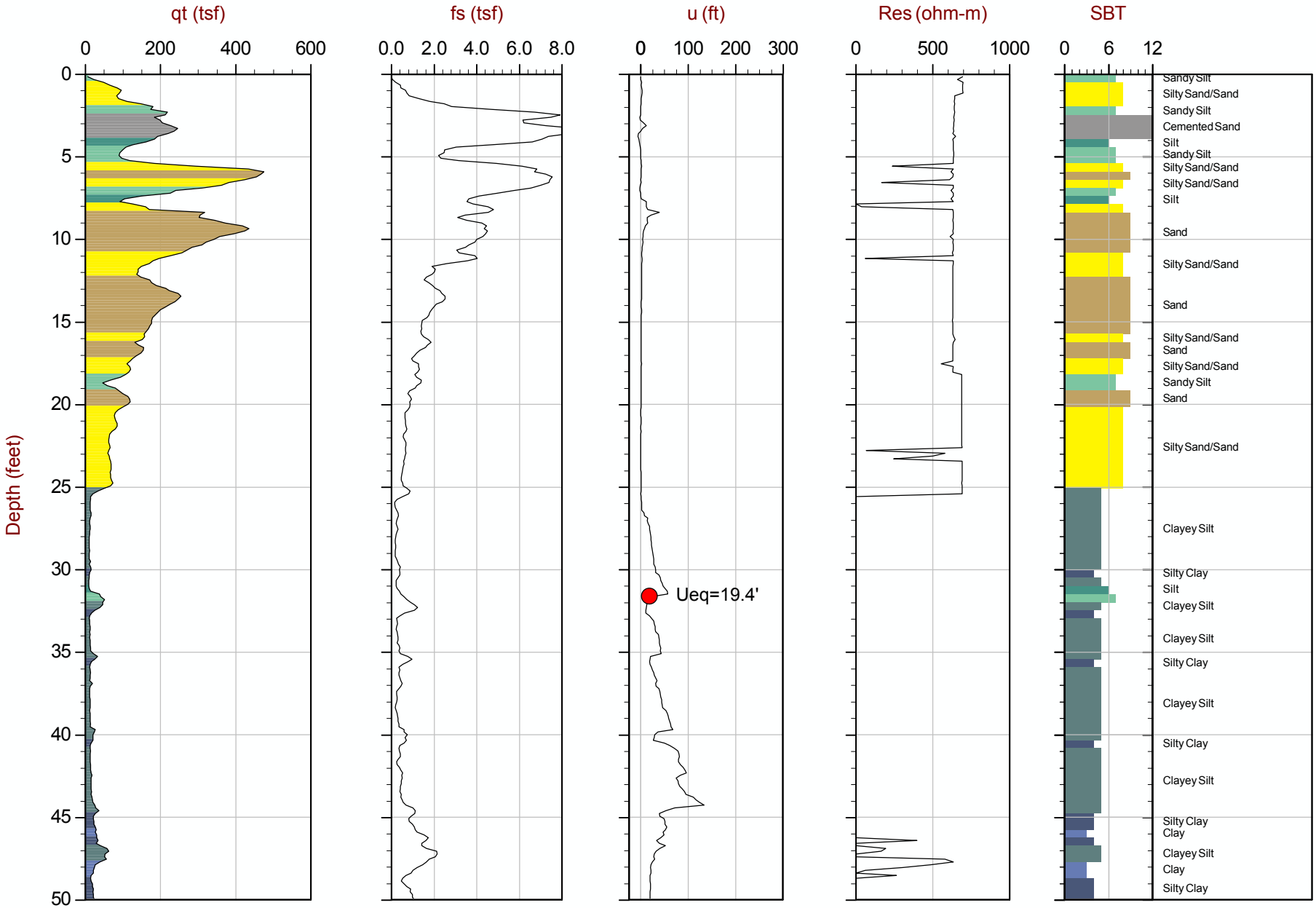
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647600 Long: -108.501200
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:07:13 08:21
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-08
Cone: 155:T1500F15U500



Max Depth: 18.550 m / 60.86 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP08.COR
Unit Wt: SBT Chart Soil Zones

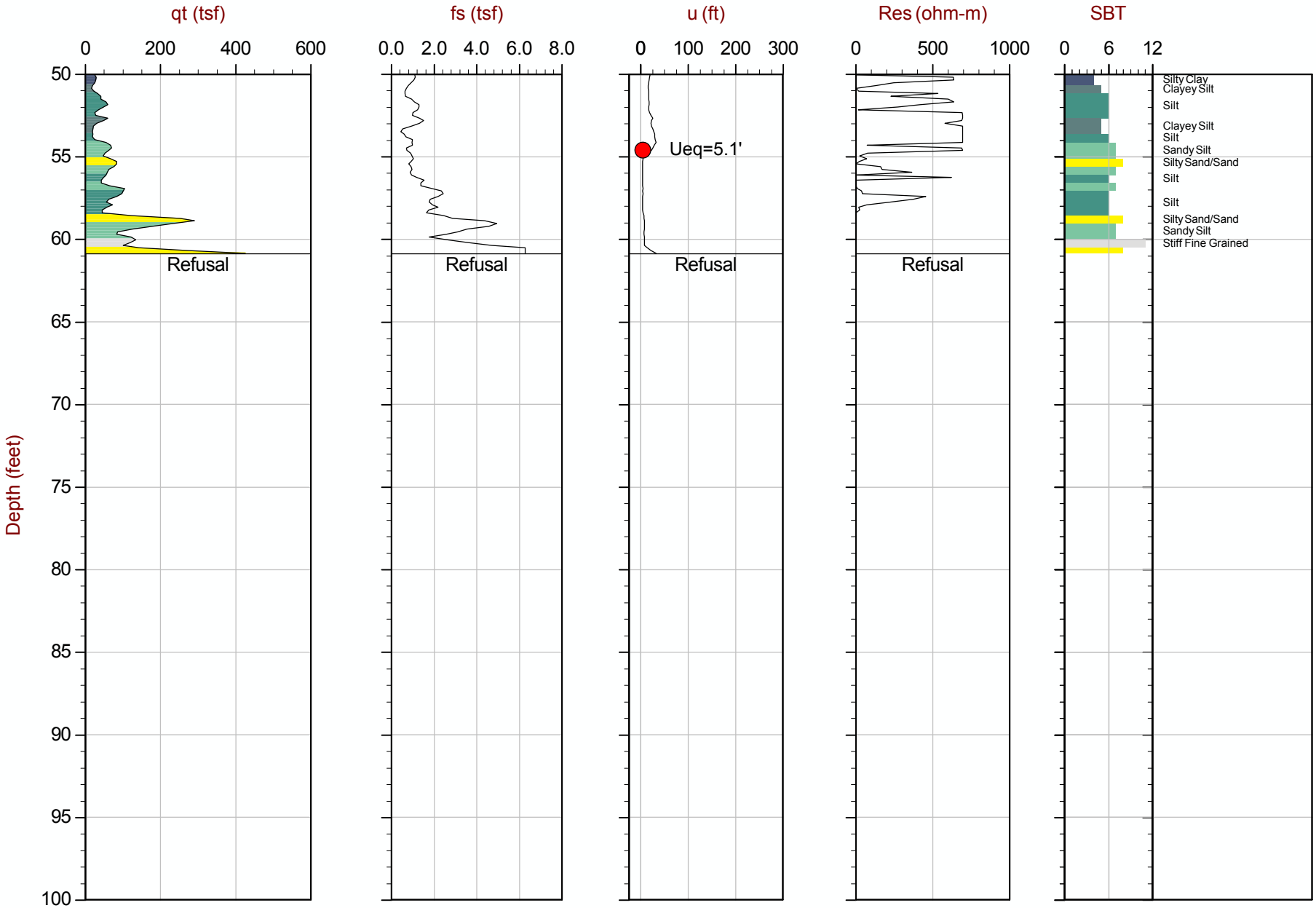
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647250 Long: -108.497250
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:07:13 08:21
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-08
Cone: 155:T1500F15U500



Max Depth: 18.550 m / 60.86 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP08.COR
Unit Wt: SBT Chart Soil Zones

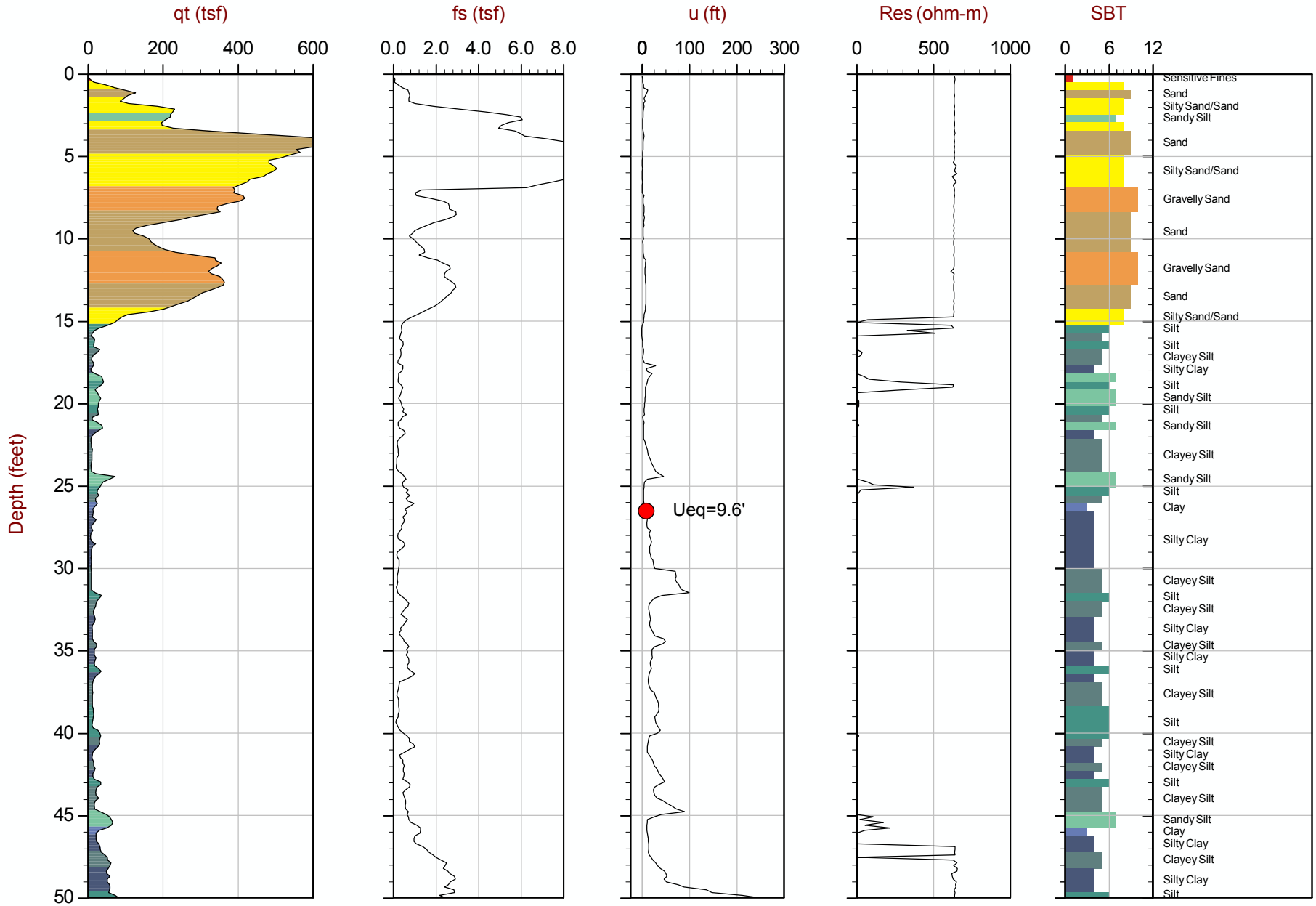
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647250 Long: -108.497250
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:06:13 14:52
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-09
Cone: 155:T1500F15U500



Max Depth: 21.150 m / 69.39 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP09.COR
Unit Wt: SBT Chart Soil Zones

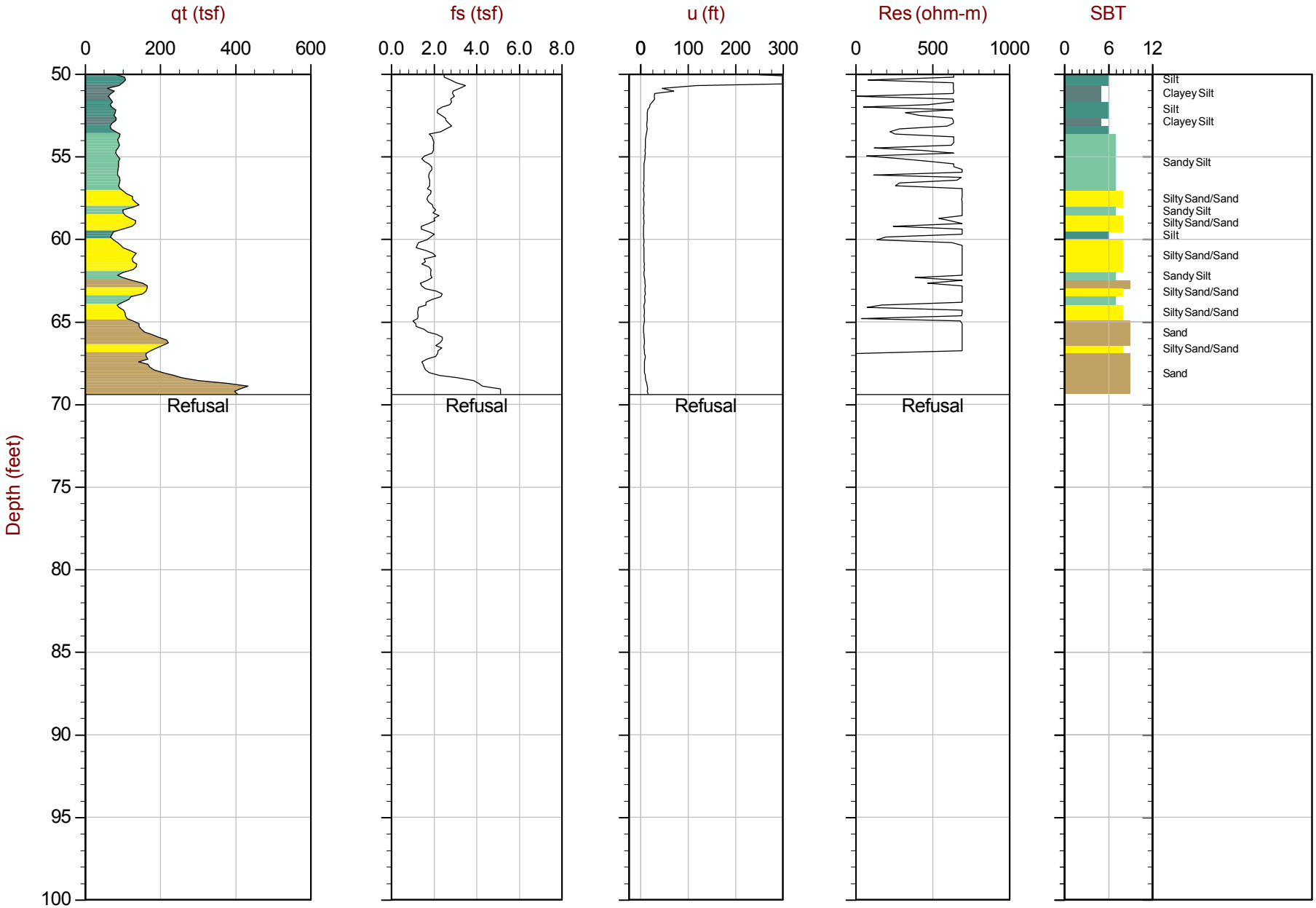
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647750 Long: -108.498150
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:06:13 14:52
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-09
Cone: 155:T1500F15U500



Max Depth: 21.150 m / 69.39 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP09.COR
Unit Wt: SBT Chart Soil Zones

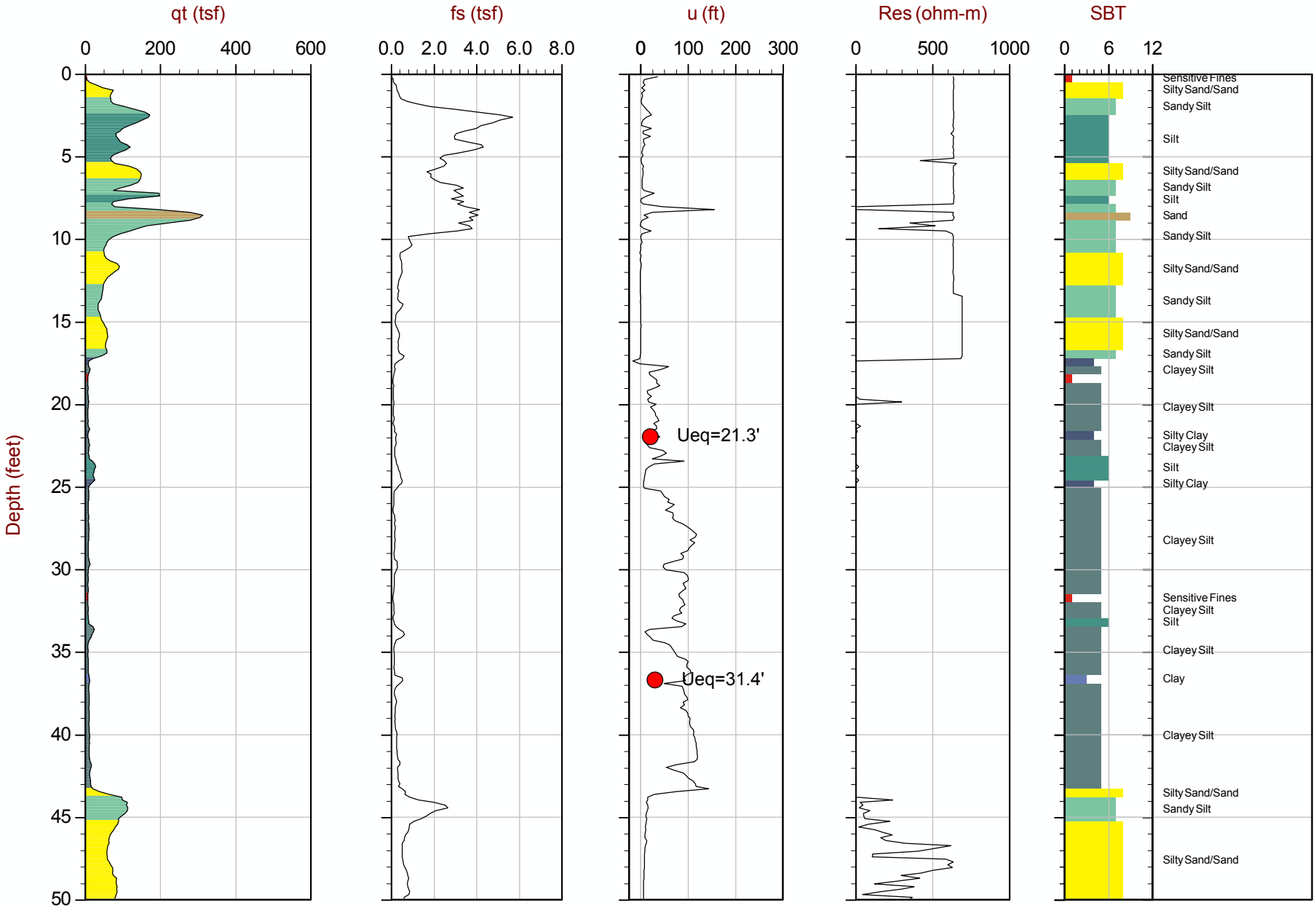
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647750 Long: -108.498150
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:06:13 10:23
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-10
Cone: 155:T1500F15U500



Max Depth: 19.250 m / 63.16 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP10.COR
Unit Wt: SBT Chart Soil Zones

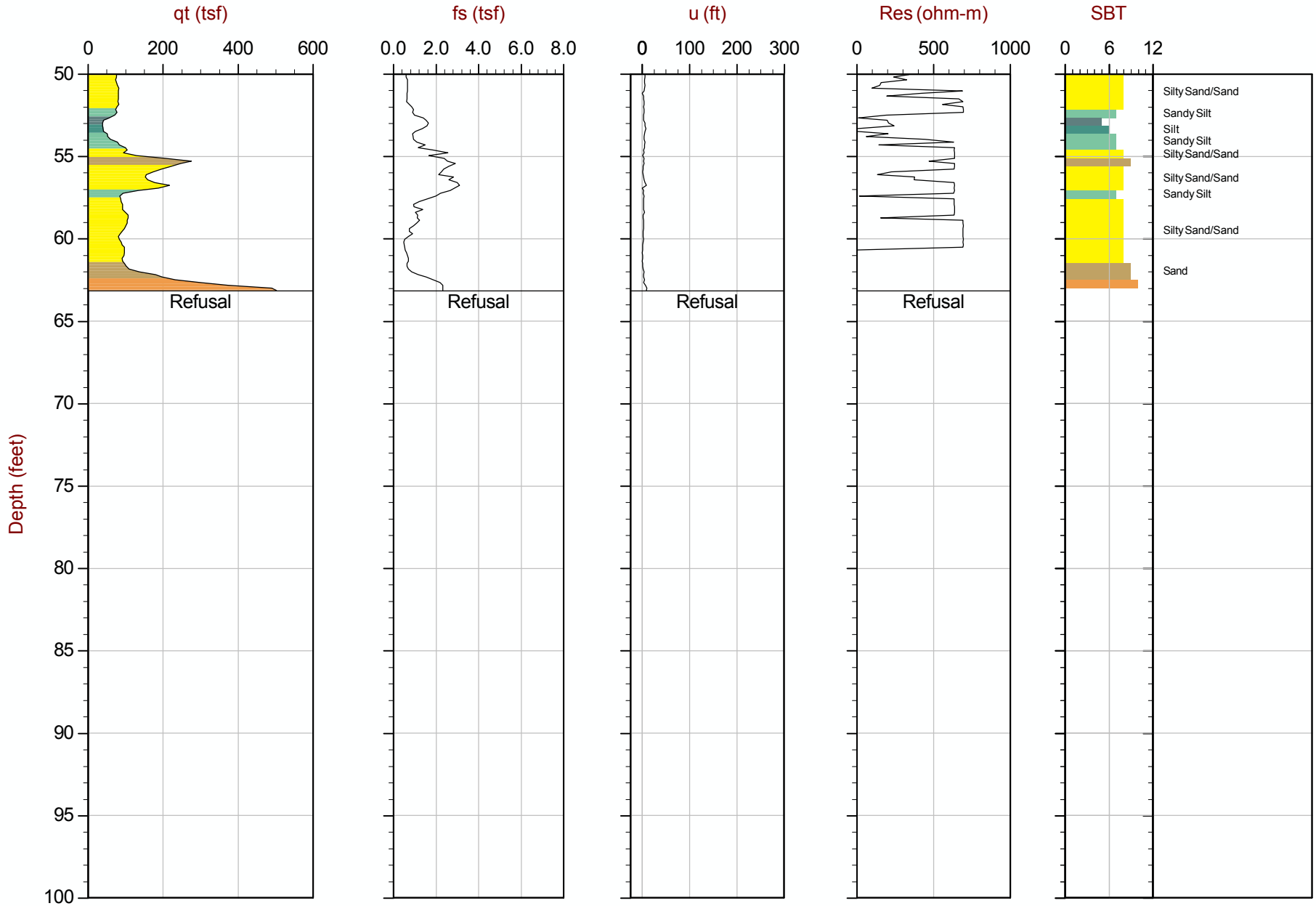
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647833 Long: -108.497217
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:06:13 10:23
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-10
Cone: 155:T1500F15U500



Max Depth: 19.250 m / 63.16 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP10.COR
Unit Wt: SBT Chart Soil Zones

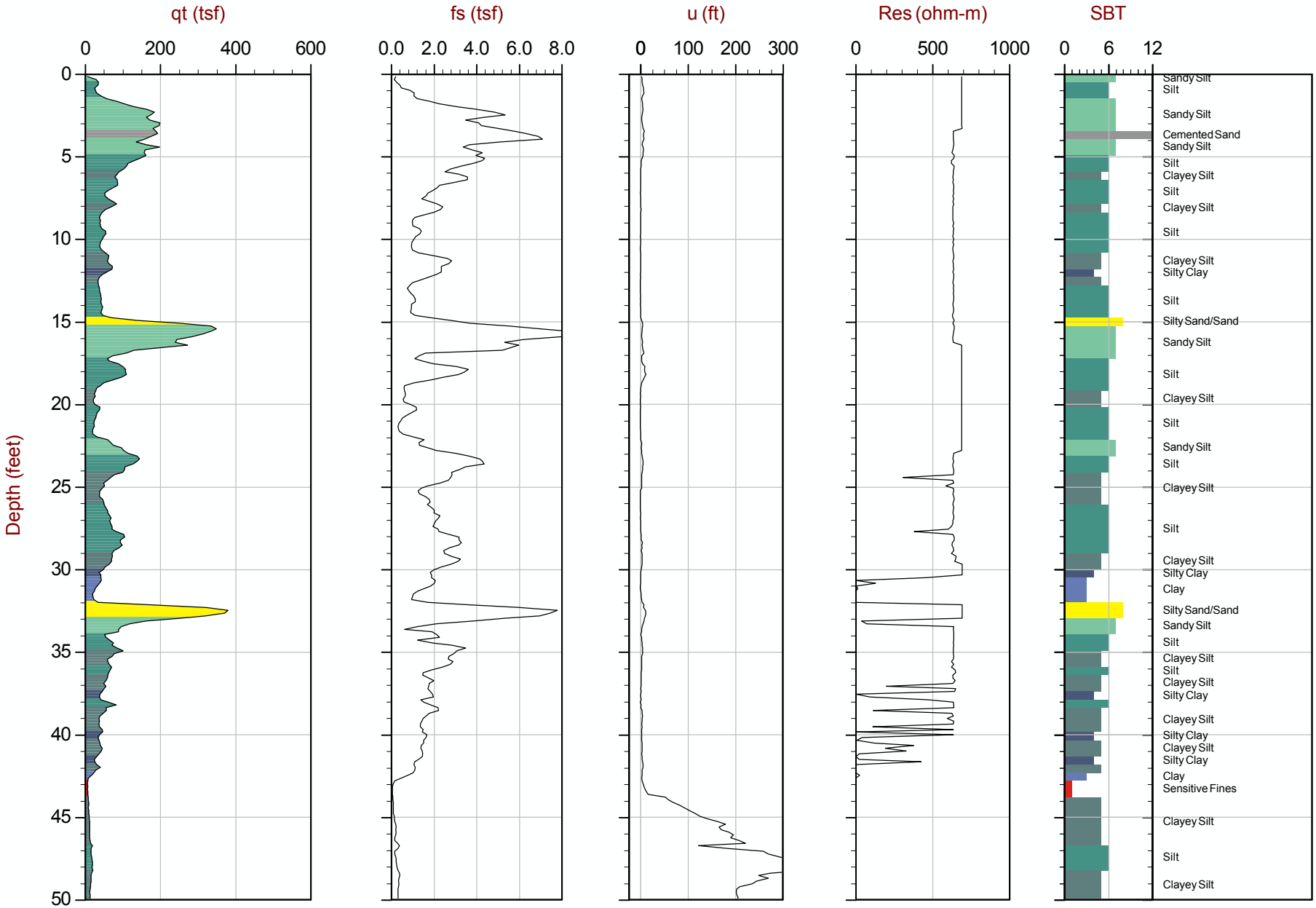
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647833 Long: -108.497217
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:07:13 12:13
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-11
Cone: 155:T1500F15U500



Max Depth: 29.500 m / 96.78 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP11.COR
Unit Wt: SBT Chart Soil Zones

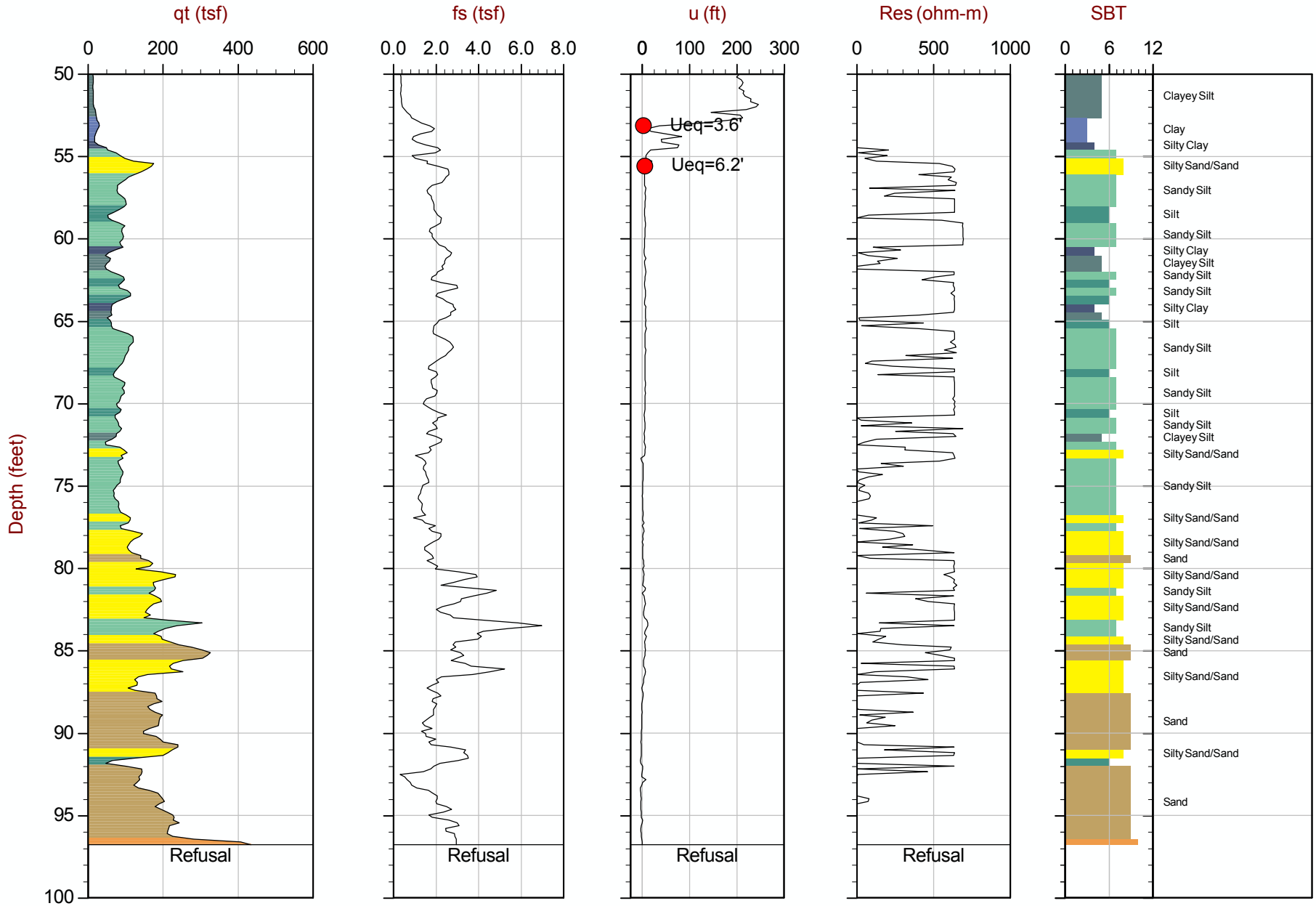
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647650 Long: -108.495850
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:07:13 12:13
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-11
Cone: 155:T1500F15U500



Max Depth: 29.500 m / 96.78 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP11.COR
Unit Wt: SBT Chart Soil Zones

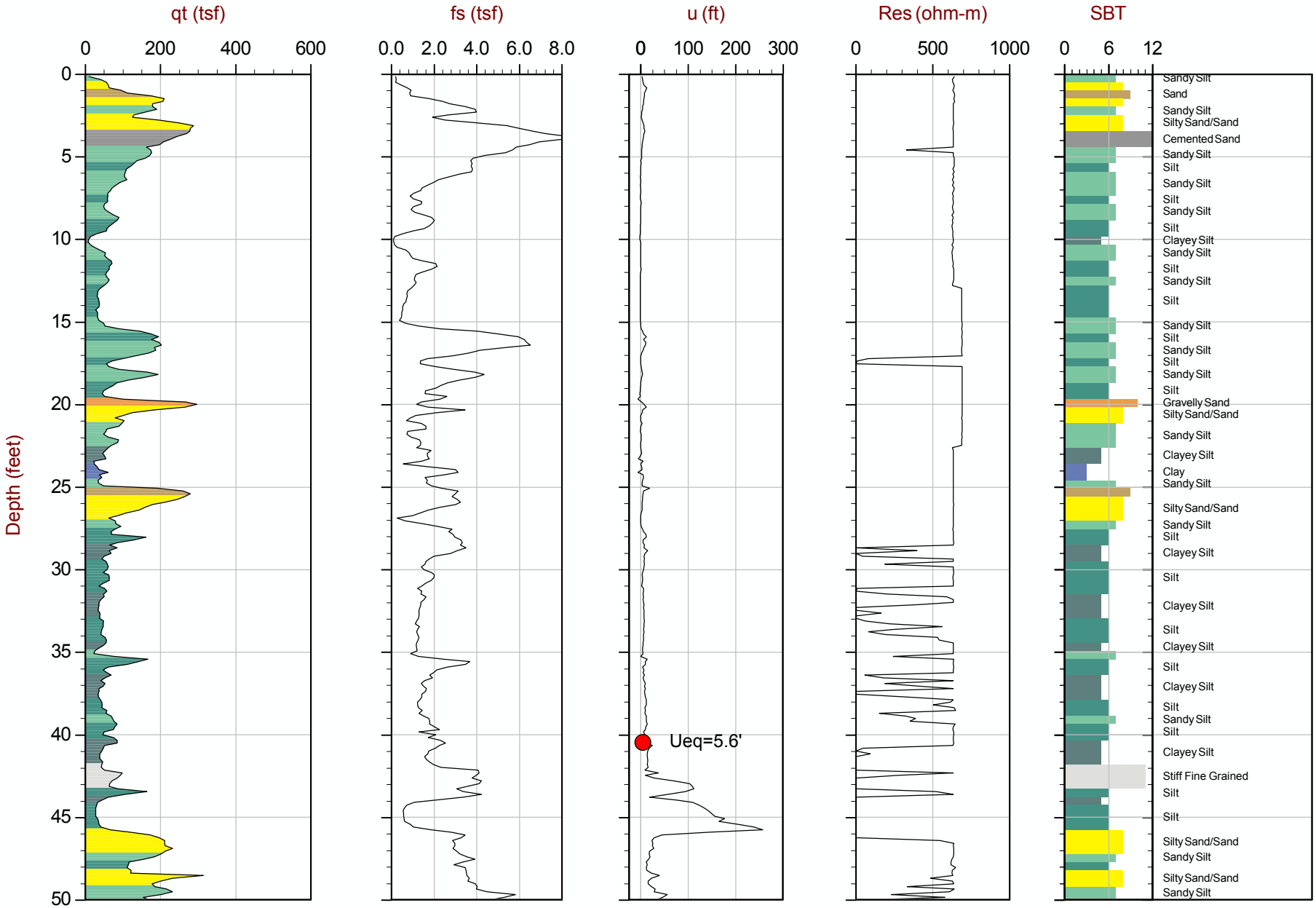
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647650 Long: -108.495850
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:07:13 10:22
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-12
Cone: 155:T1500F15U500



Max Depth: 16.000 m / 52.49 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP12.COR
Unit Wt: SBT Chart Soil Zones

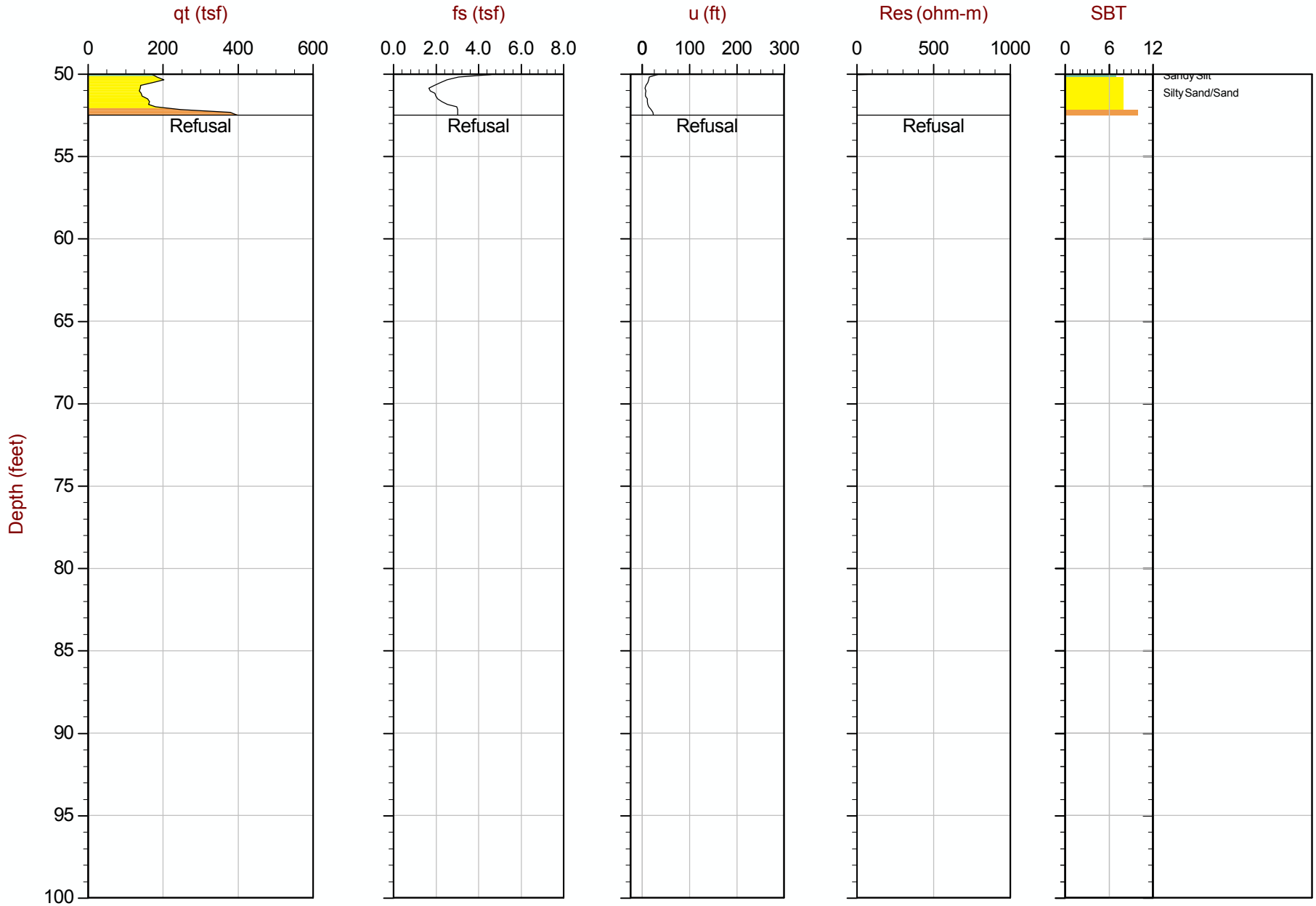
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647150 Long: -108.496000
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:07:13 10:22
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-12
Cone: 155:T1500F15U500



Max Depth: 16.000 m / 52.49 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP12.COR
Unit Wt: SBT Chart Soil Zones

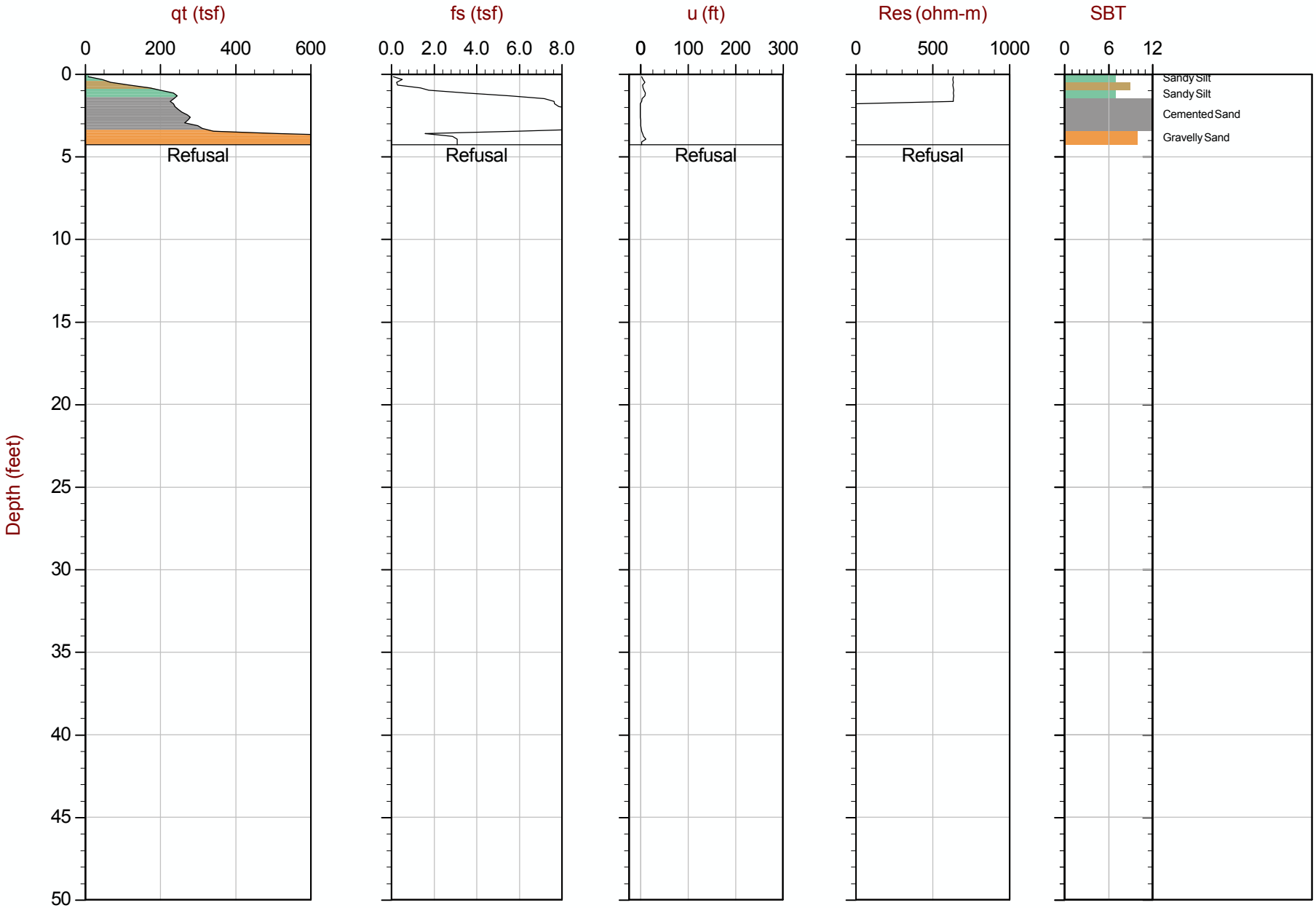
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647150 Long: -108.496000
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:08:13 09:36
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-13
Cone: 155:T1500F15U500



Max Depth: 1.300 m / 4.27 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP13.COR
Unit Wt: SBT Chart Soil Zones

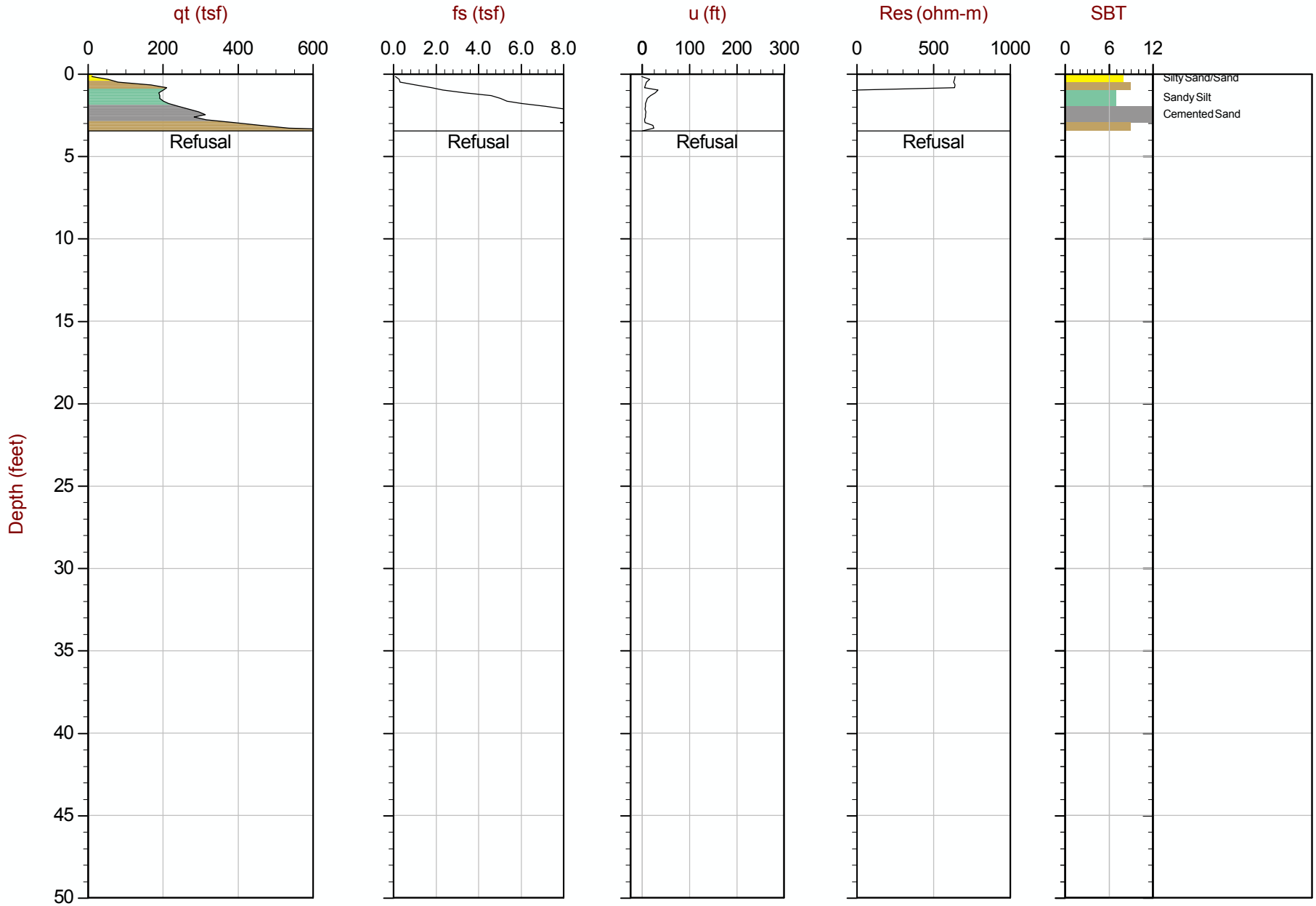
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.649067 Long: -108.499383
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:08:13 10:03
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-13B
Cone: 155:T1500F15U500



Max Depth: 1.050 m / 3.44 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP13B.COR
Unit Wt: SBT Chart Soil Zones

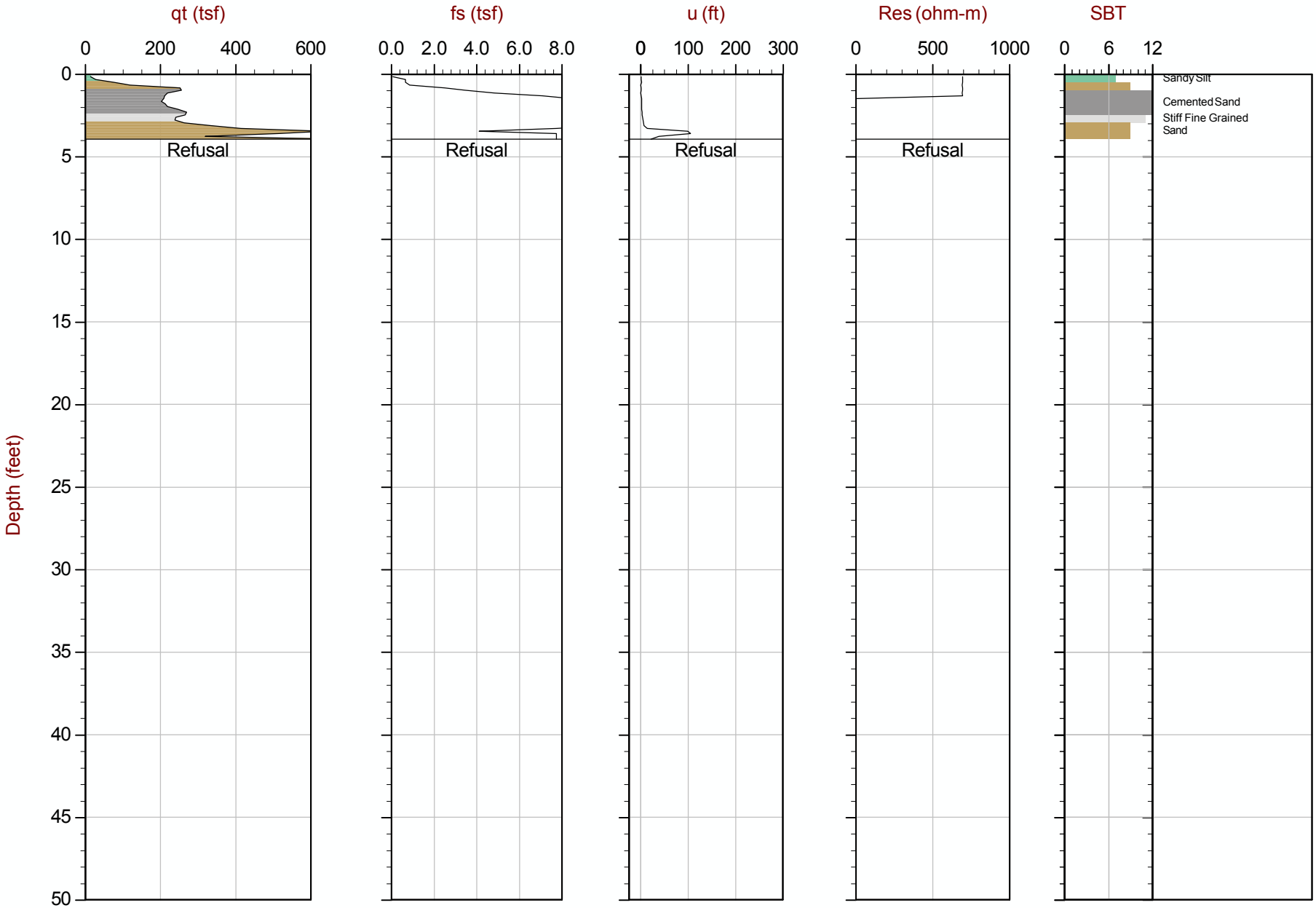
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.649067 Long: -108.499367
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:08:13 10:21
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-13BC
Cone: 155:T1500F15U500



Max Depth: 1.200 m / 3.94 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP13C.COR
Unit Wt: SBT Chart Soil Zones

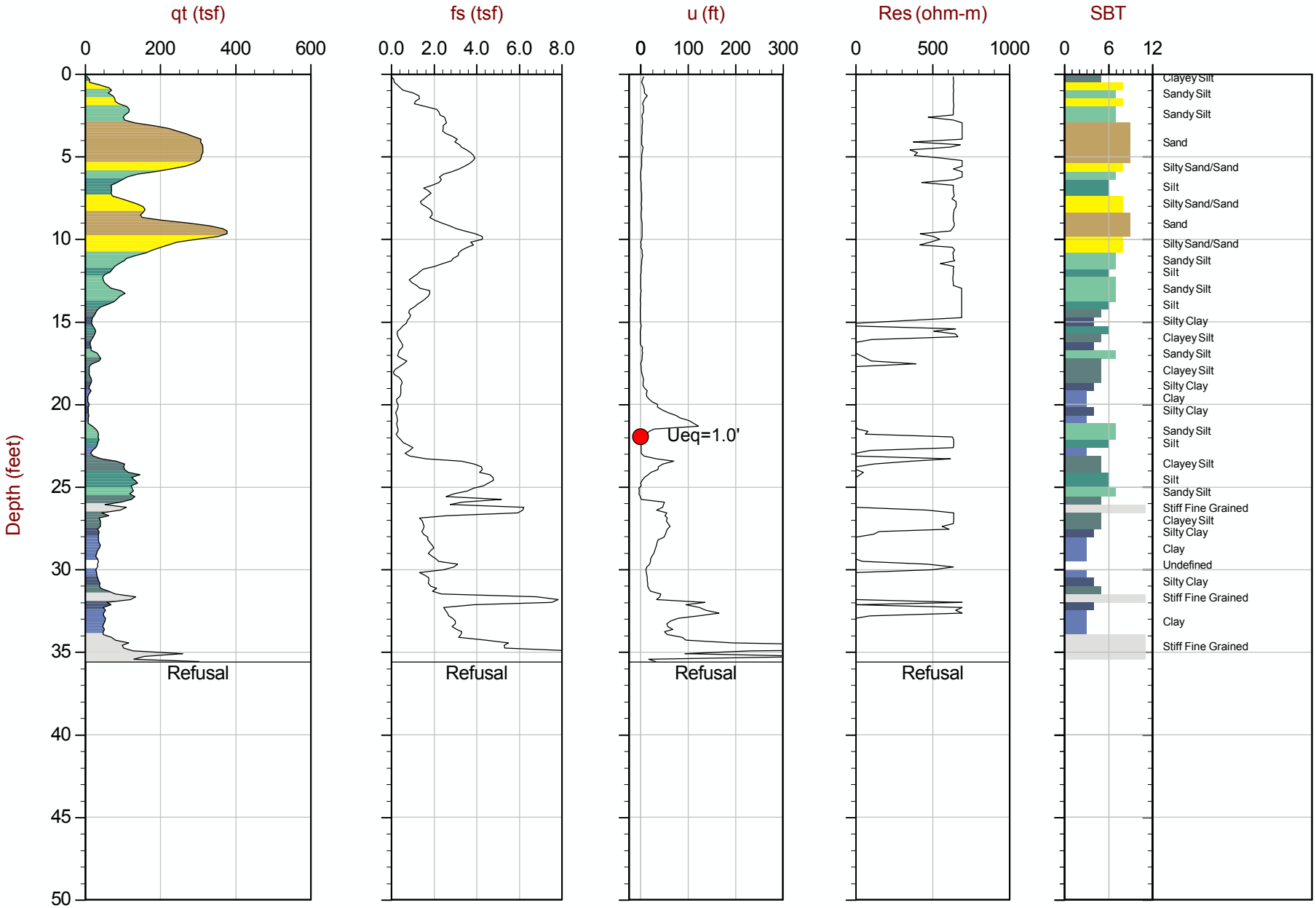
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.649083 Long: -108.499400
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:08:13 14:30
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-14
Cone: 155:T1500F15U500



Max Depth: 10.850 m / 35.60 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP14.COR
Unit Wt: SBT Chart Soil Zones

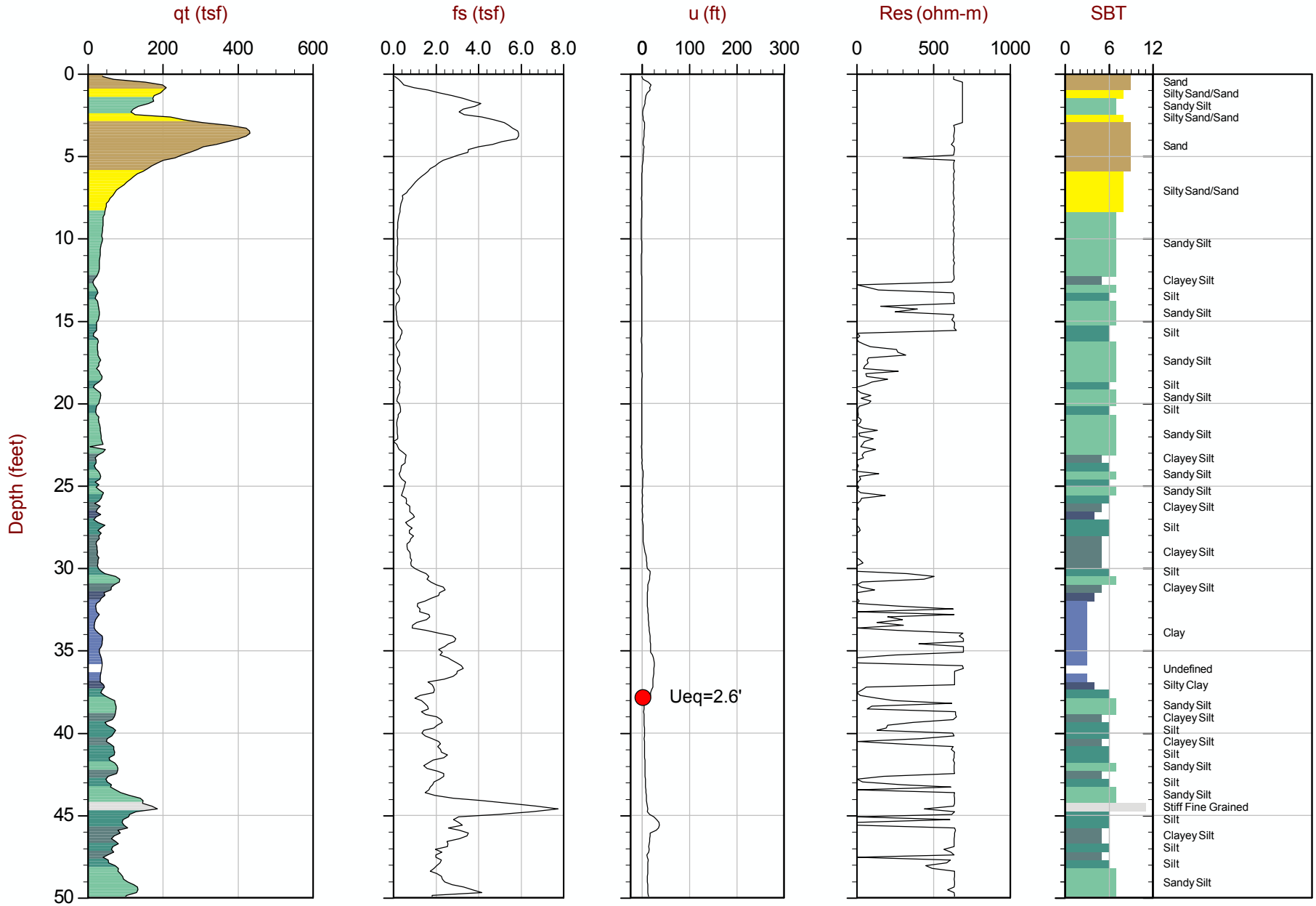
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647233 Long: -108.497867
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:06:13 16:32
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-15
Cone: 155:T1500F15U500



Max Depth: 16.800 m / 55.12 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP15.COR
Unit Wt: SBT Chart Soil Zones

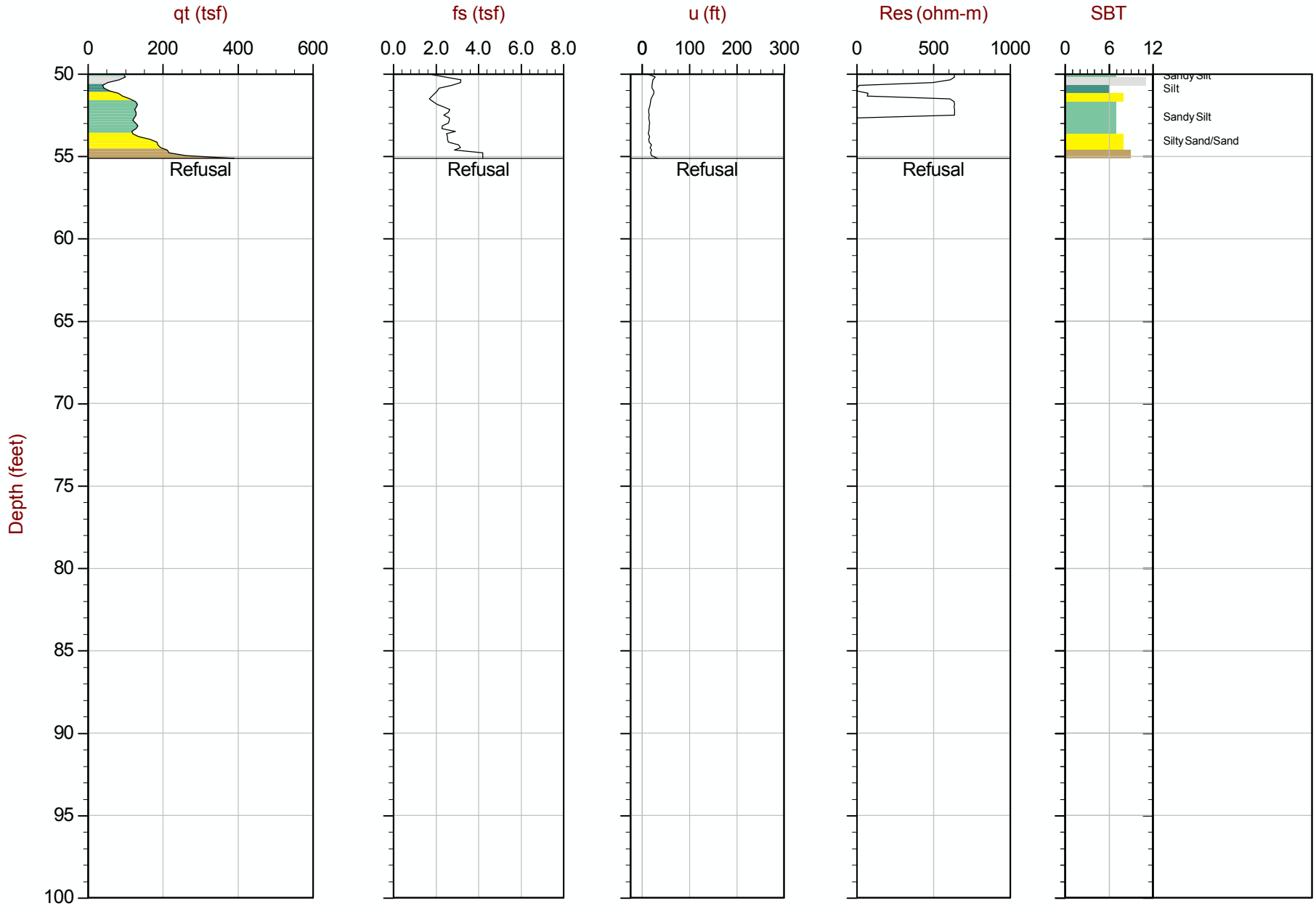
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647583 Long: -108.499800
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:06:13 16:32
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-15
Cone: 155:T1500F15U500



Max Depth: 16.800 m / 55.12 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP15.COR
Unit Wt: SBT Chart Soil Zones

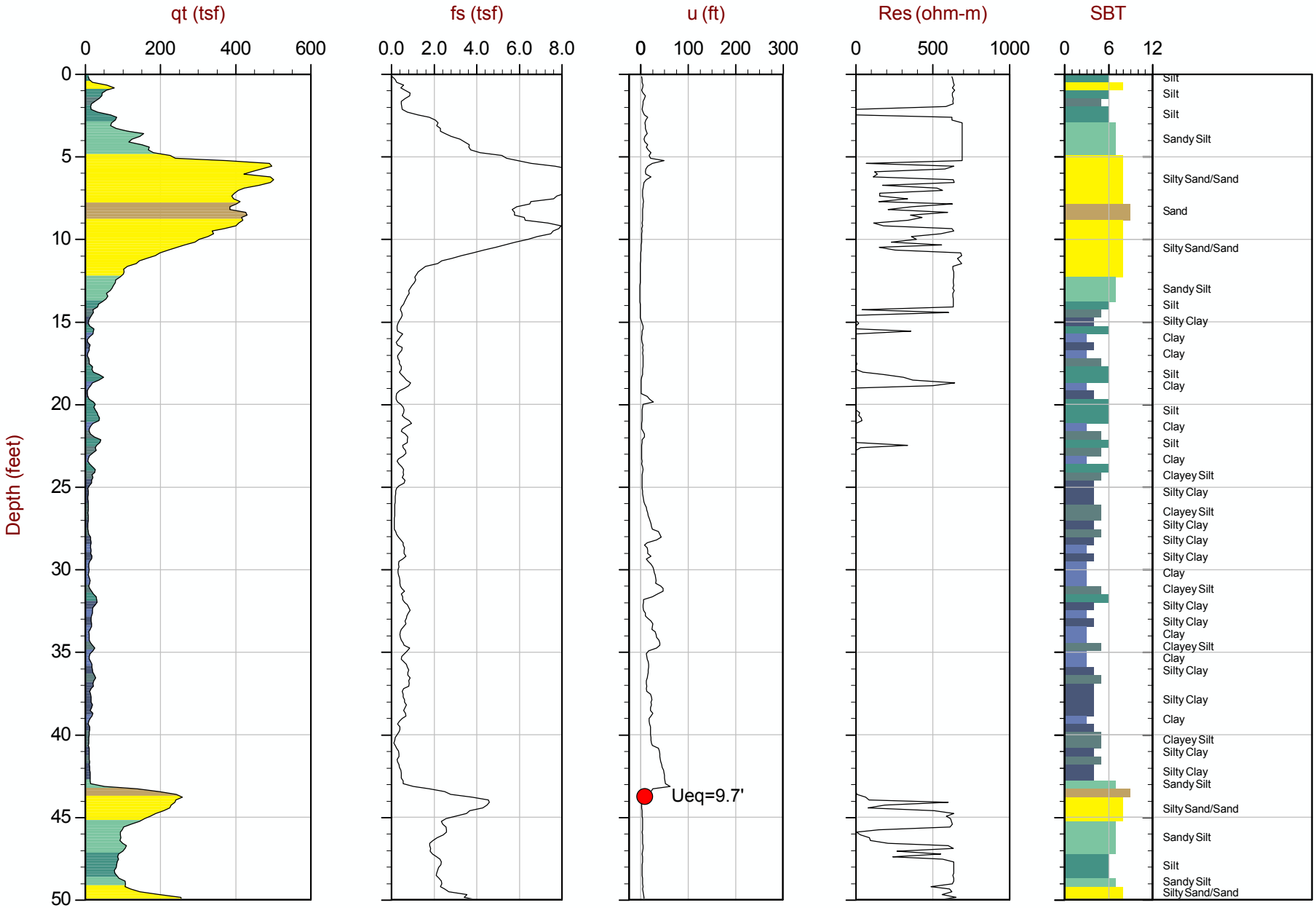
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647583 Long: -108.499800
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:08:13 12:56
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-16
Cone: 155:T1500F15U500



Max Depth: 16.800 m / 55.12 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP16.COR
Unit Wt: SBT Chart Soil Zones

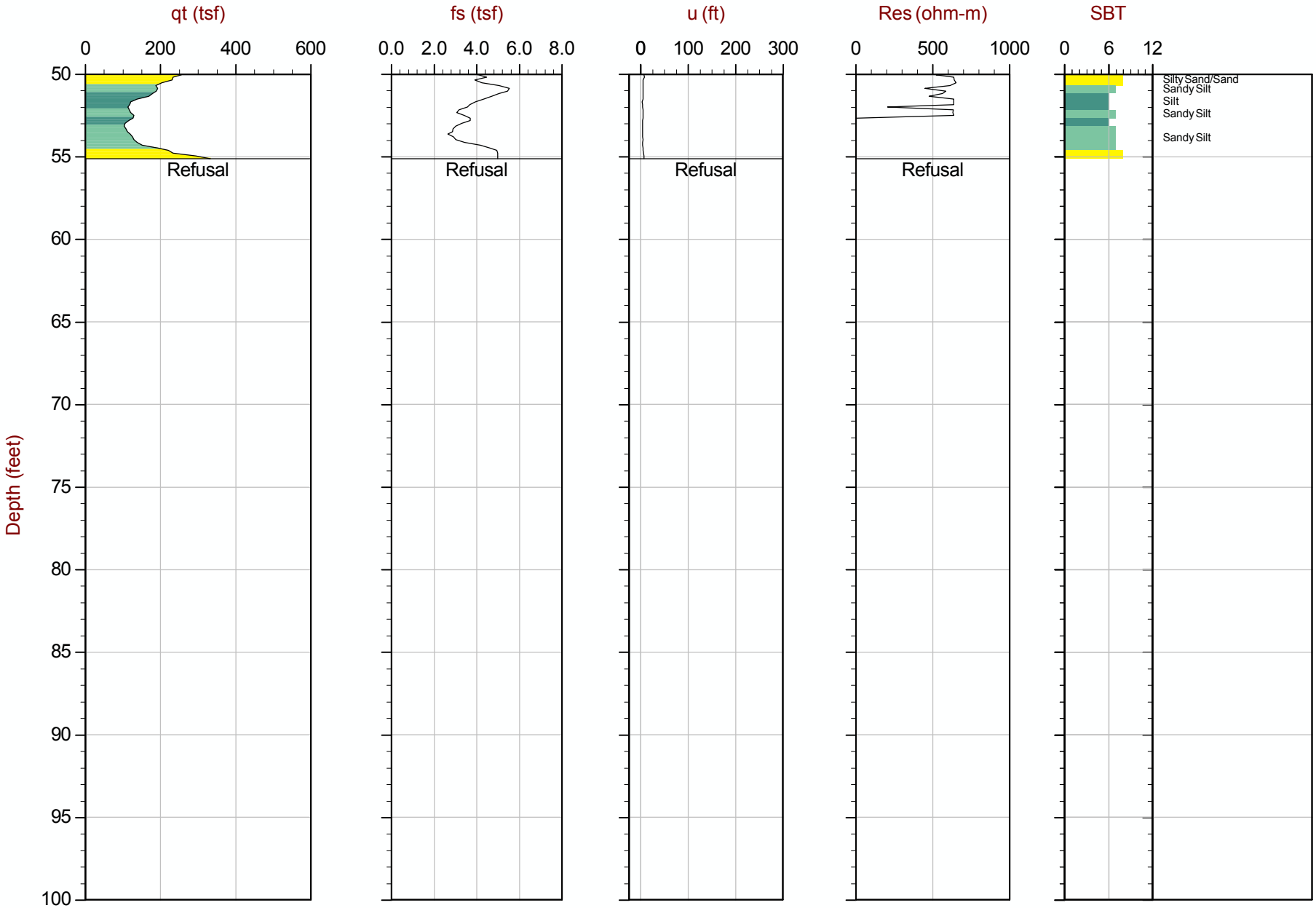
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.648200 Long: -108.497850
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:08:13 12:56
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-16
Cone: 155:T1500F15U500



Max Depth: 16.800 m / 55.12 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP16.COR
Unit Wt: SBT Chart Soil Zones

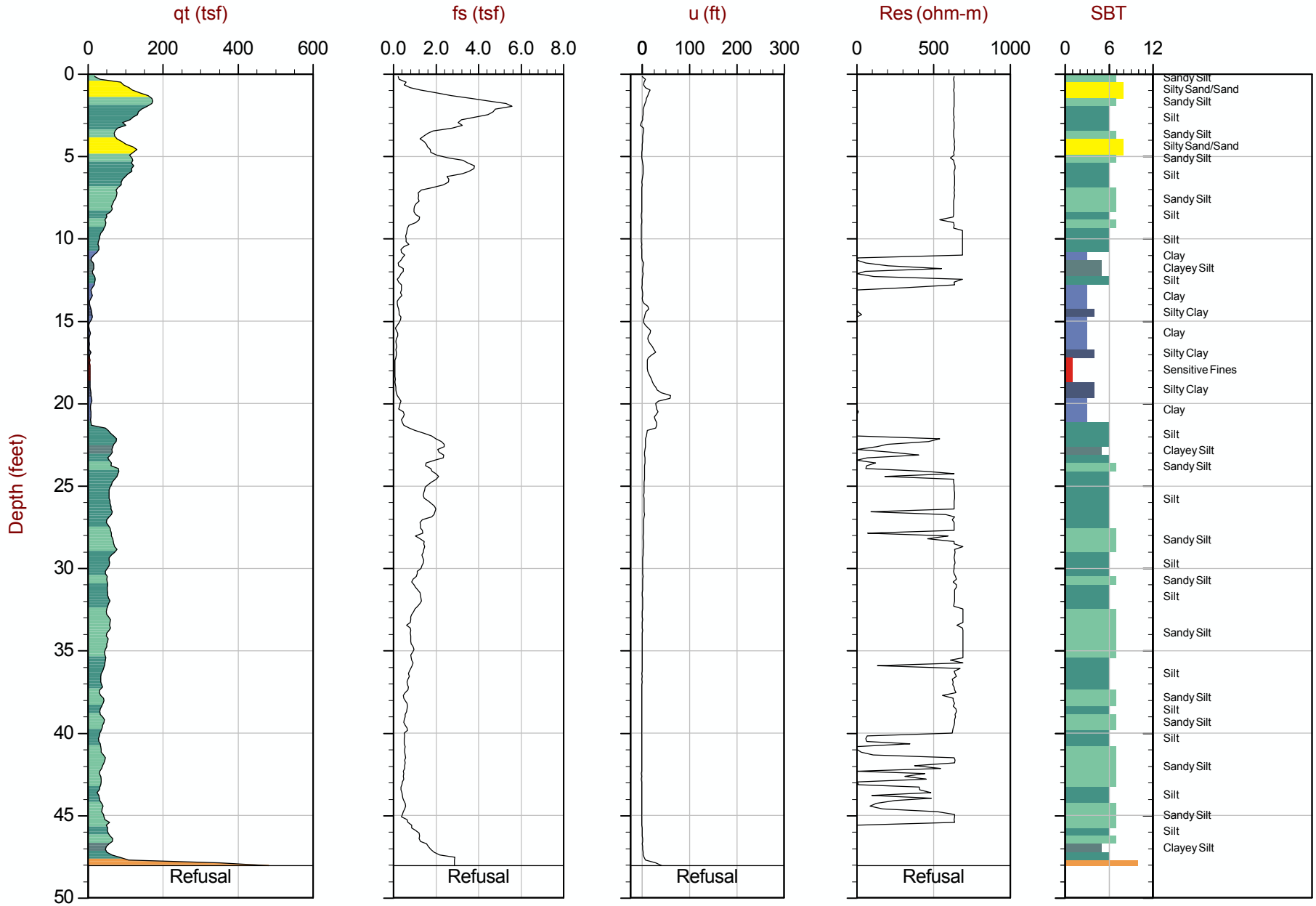
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.648200 Long: -108.497850
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:09:13 14:32
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-17
Cone: 155:T1500F15U500



Max Depth: 14.650 m / 48.06 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP17.COR
Unit Wt: SBT Chart Soil Zones

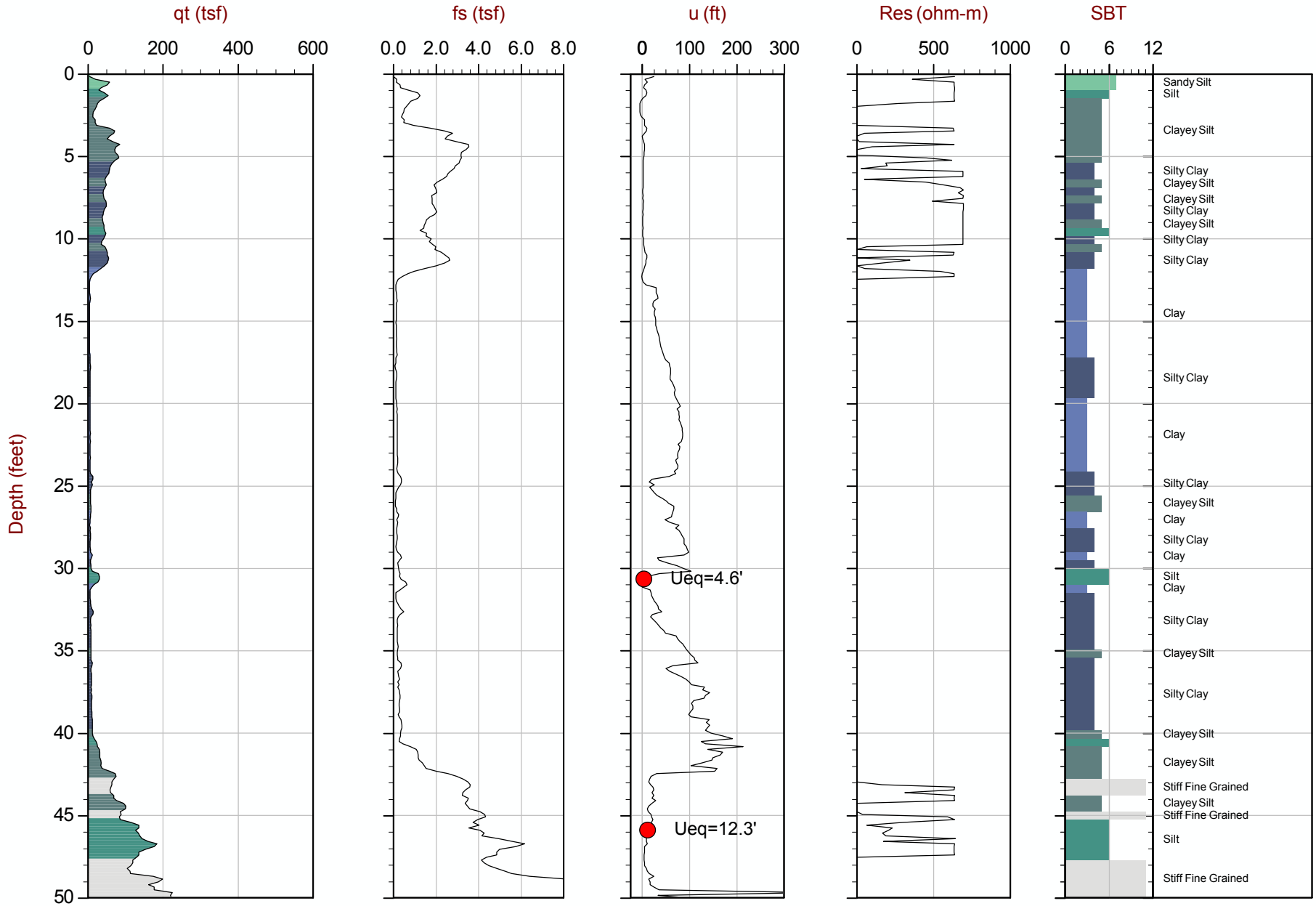
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.648617 Long: -108.496383
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:09:13 10:46
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-18
Cone: 155:T1500F15U500



Max Depth: 15.250 m / 50.03 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP18.COR
Unit Wt: SBT Chart Soil Zones

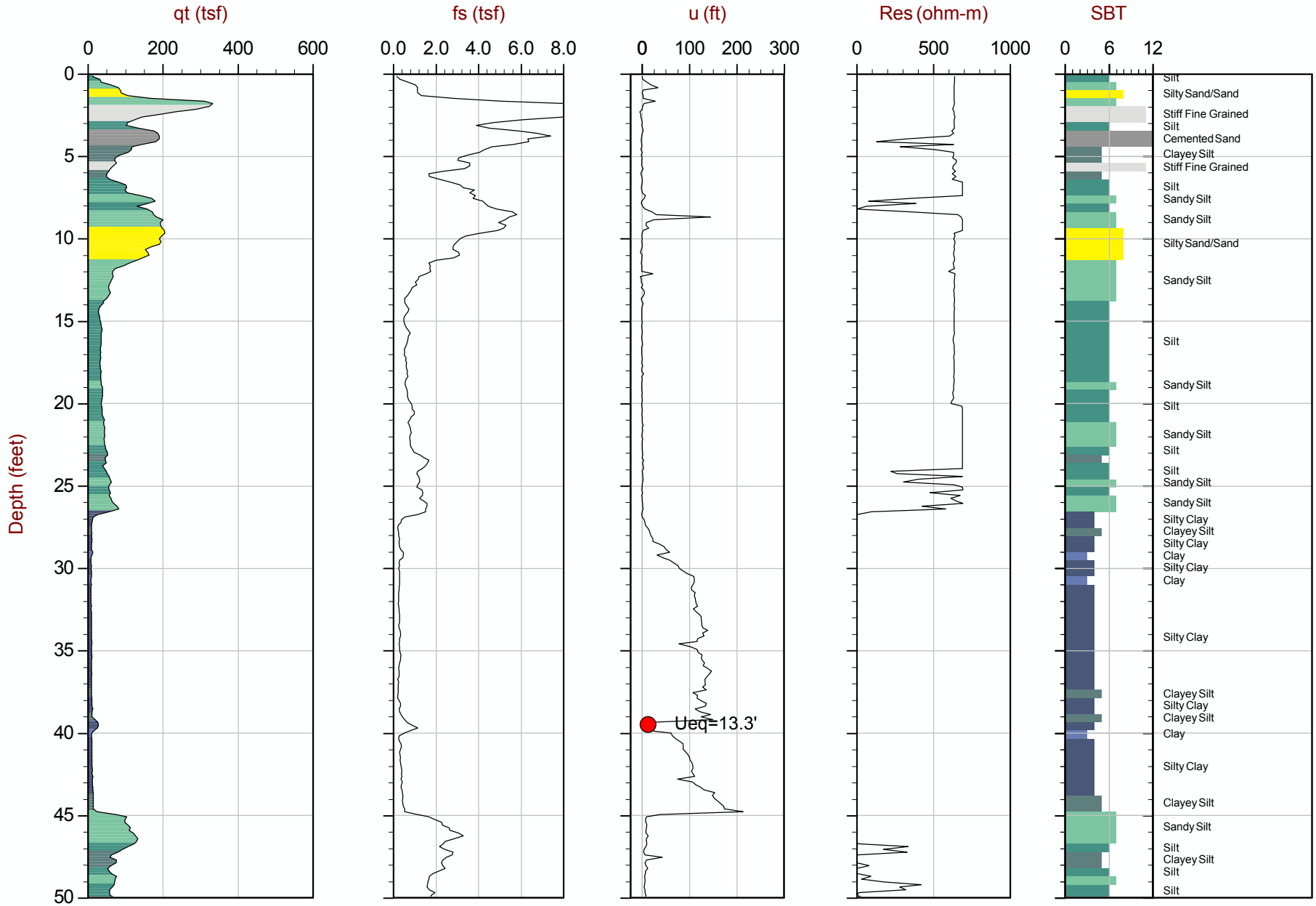
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.648000 Long: -108.496683
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:09:13 11:56
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-19
Cone: 155:T1500F15U500



Max Depth: 17.750 m / 58.23 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP19.COR
Unit Wt: SBT Chart Soil Zones

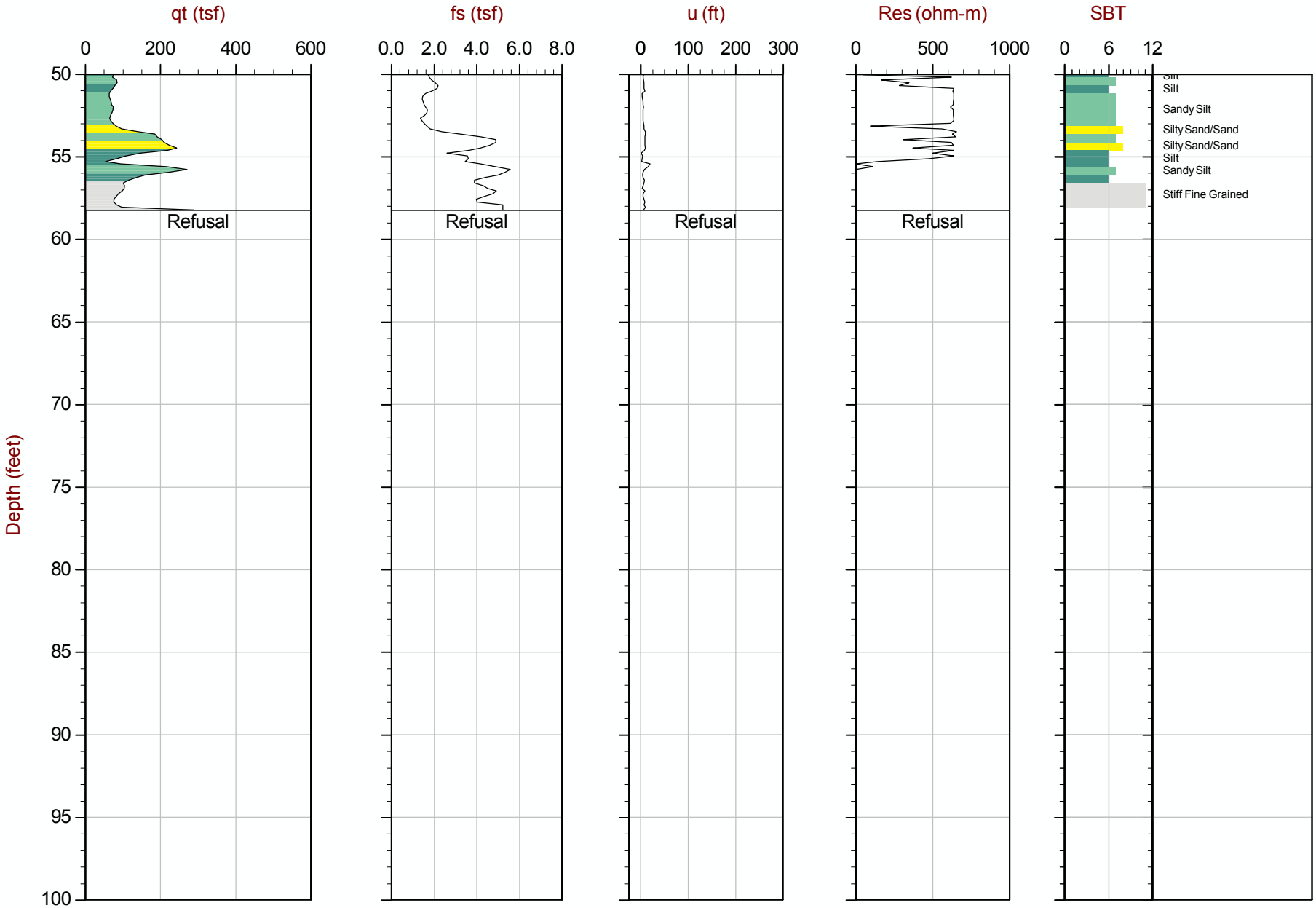
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647450 Long: -108.497000
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:09:13 11:56
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-19
Cone: 155:T1500F15U500



Max Depth: 17.750 m / 58.23 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP19.COR
Unit Wt: SBT Chart Soil Zones

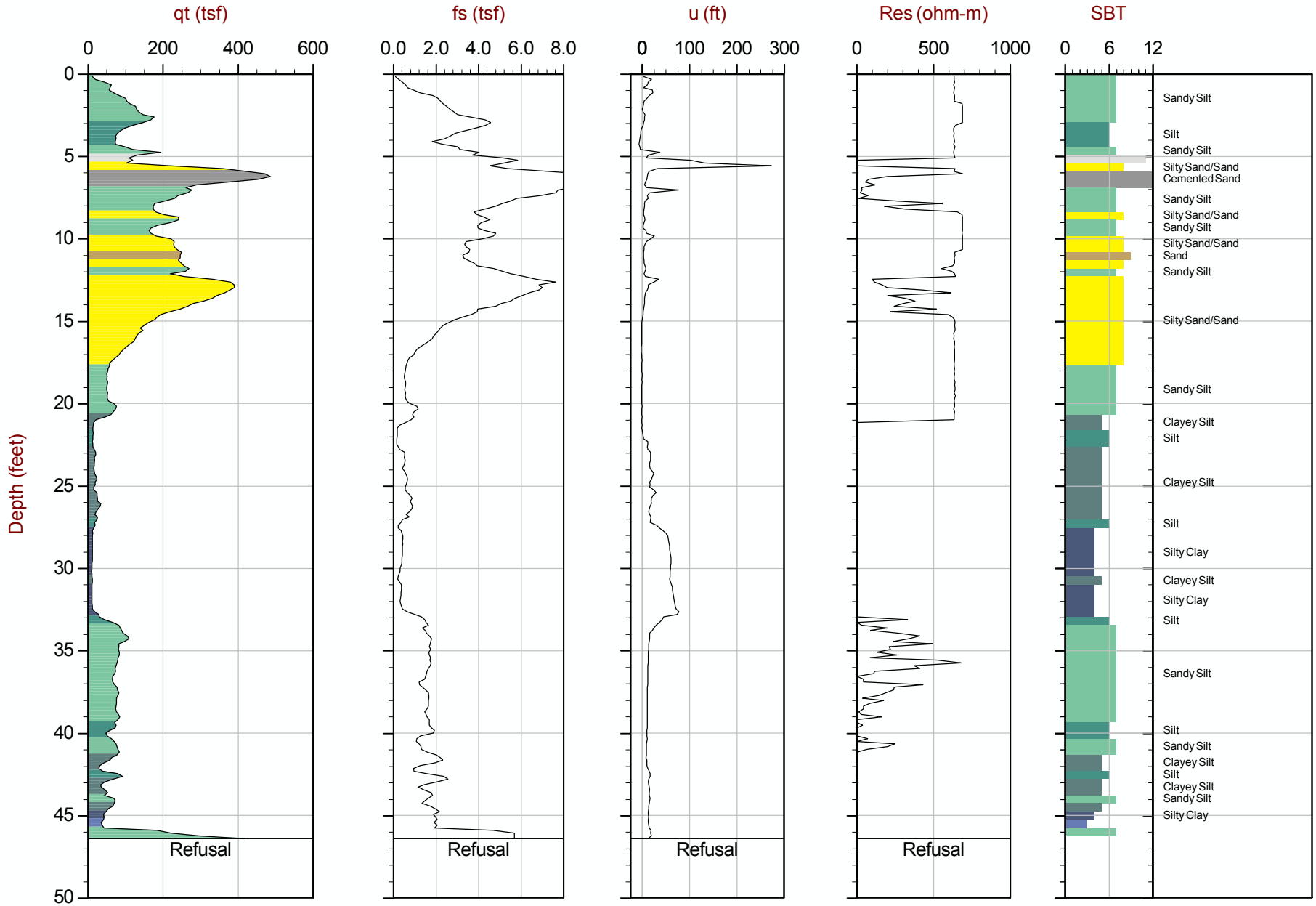
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647450 Long: -108.497000
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:09:13 13:36
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-20
Cone: 155:T1500F15U500



Max Depth: 14.150 m / 46.42 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP20.COR
Unit Wt: SBT Chart Soil Zones

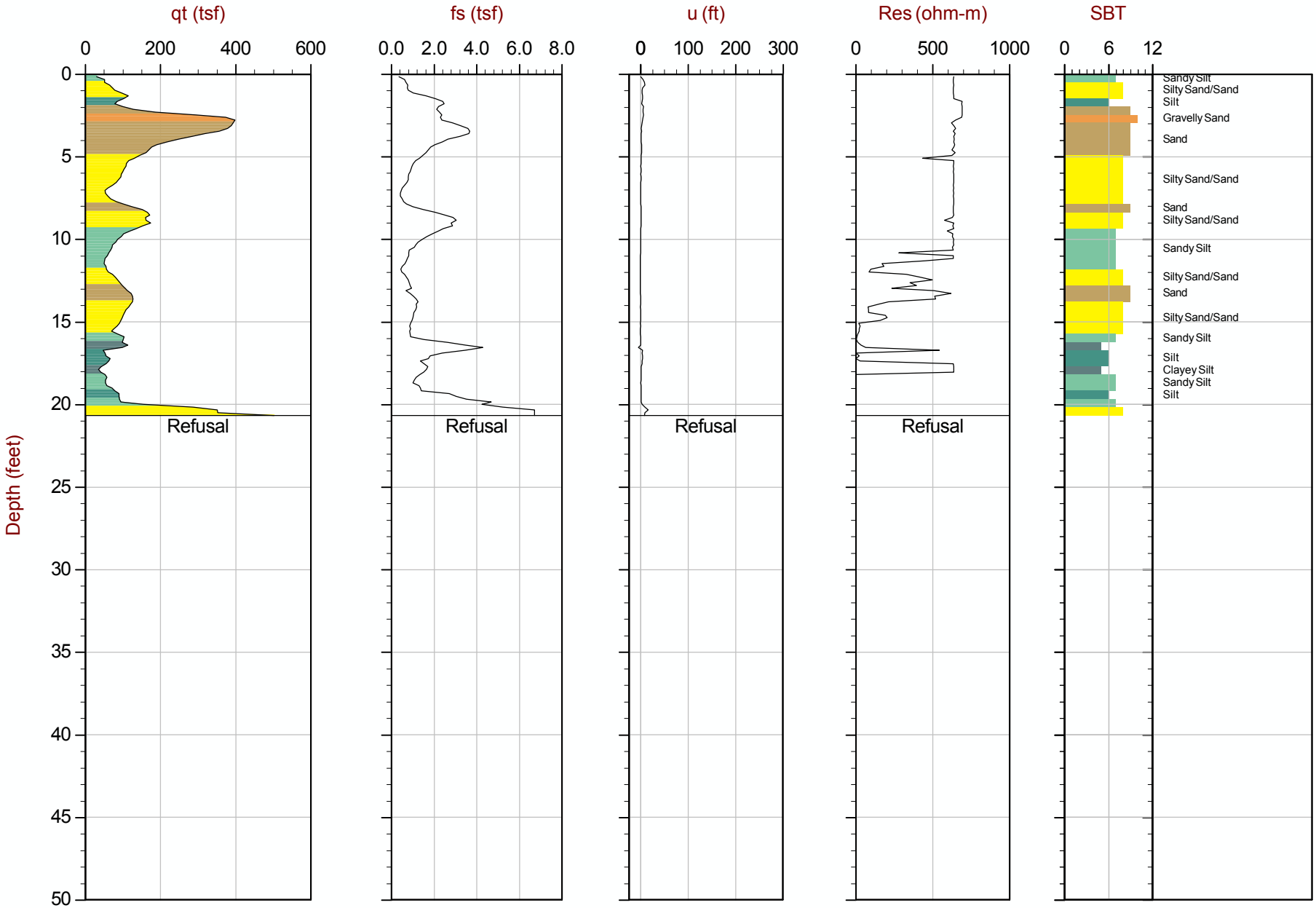
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.646883 Long: -108.497167
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:08:13 15:34
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-21
Cone: 155:T1500F15U500



Max Depth: 6.300 m / 20.67 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP21.COR
Unit Wt: SBT Chart Soil Zones

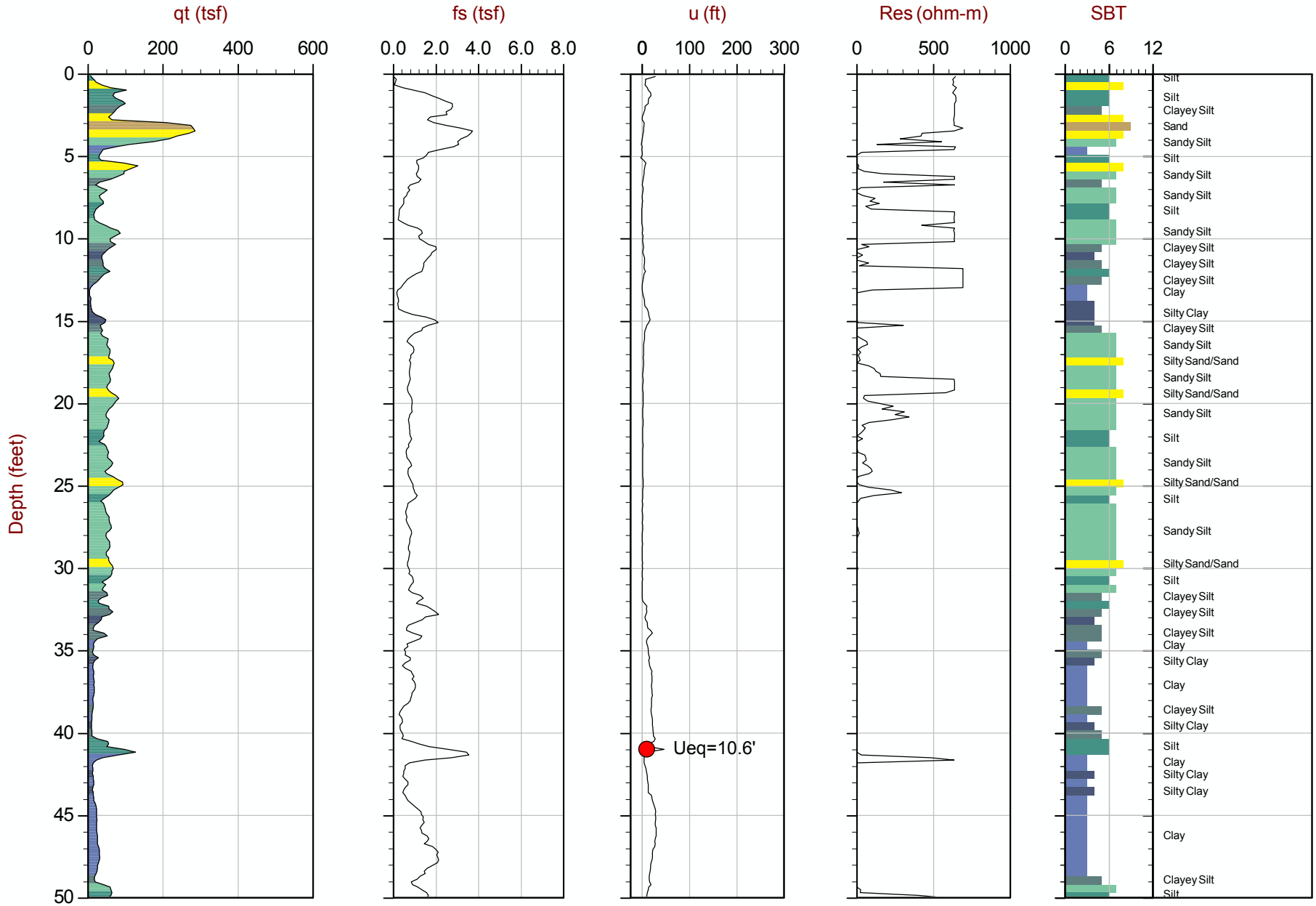
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.646283 Long: -108.501583
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:10:13 11:54
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-22
Cone: 155:T1500F15U500



Max Depth: 28.750 m / 94.32 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP22.COR
Unit Wt: SBT Chart Soil Zones

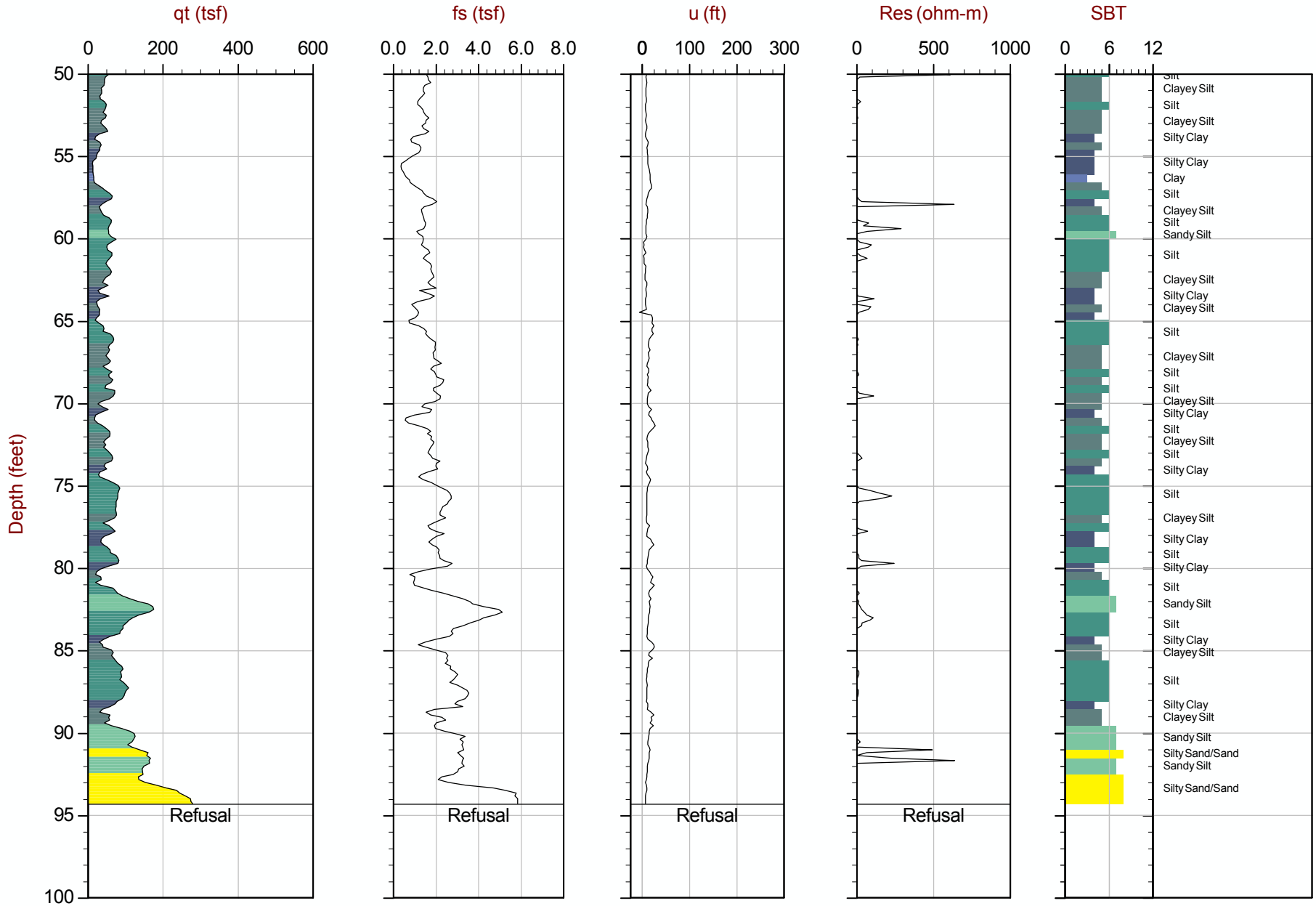
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647950 Long: -108.502917
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:10:13 11:54
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-22
Cone: 155:T1500F15U500



Max Depth: 28.750 m / 94.32 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP22.COR
Unit Wt: SBT Chart Soil Zones

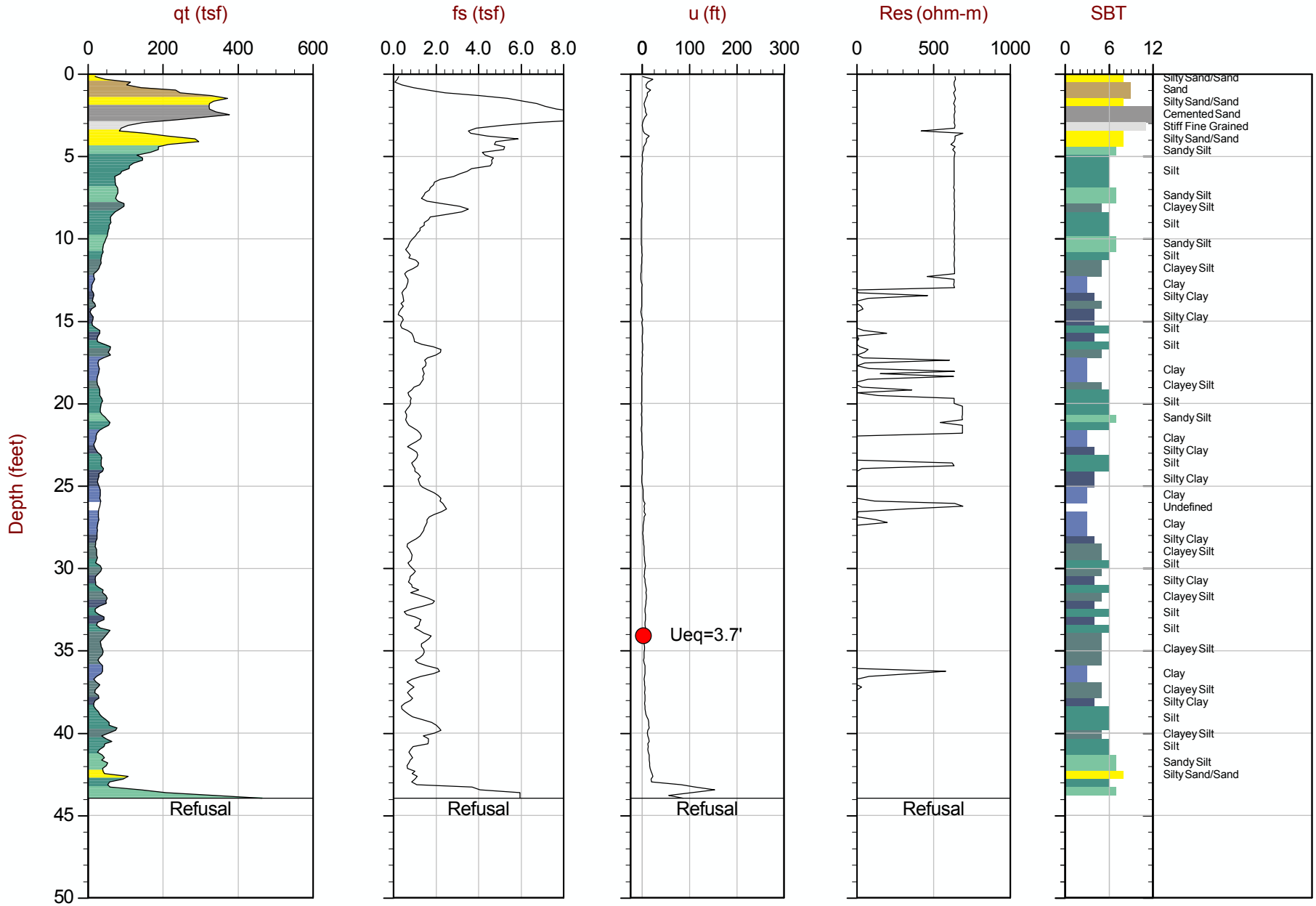
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647950 Long: -108.502917
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:08:13 16:21
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-23
Cone: 155:T1500F15U500



Max Depth: 13.400 m / 43.96 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP23.COR
Unit Wt: SBT Chart Soil Zones

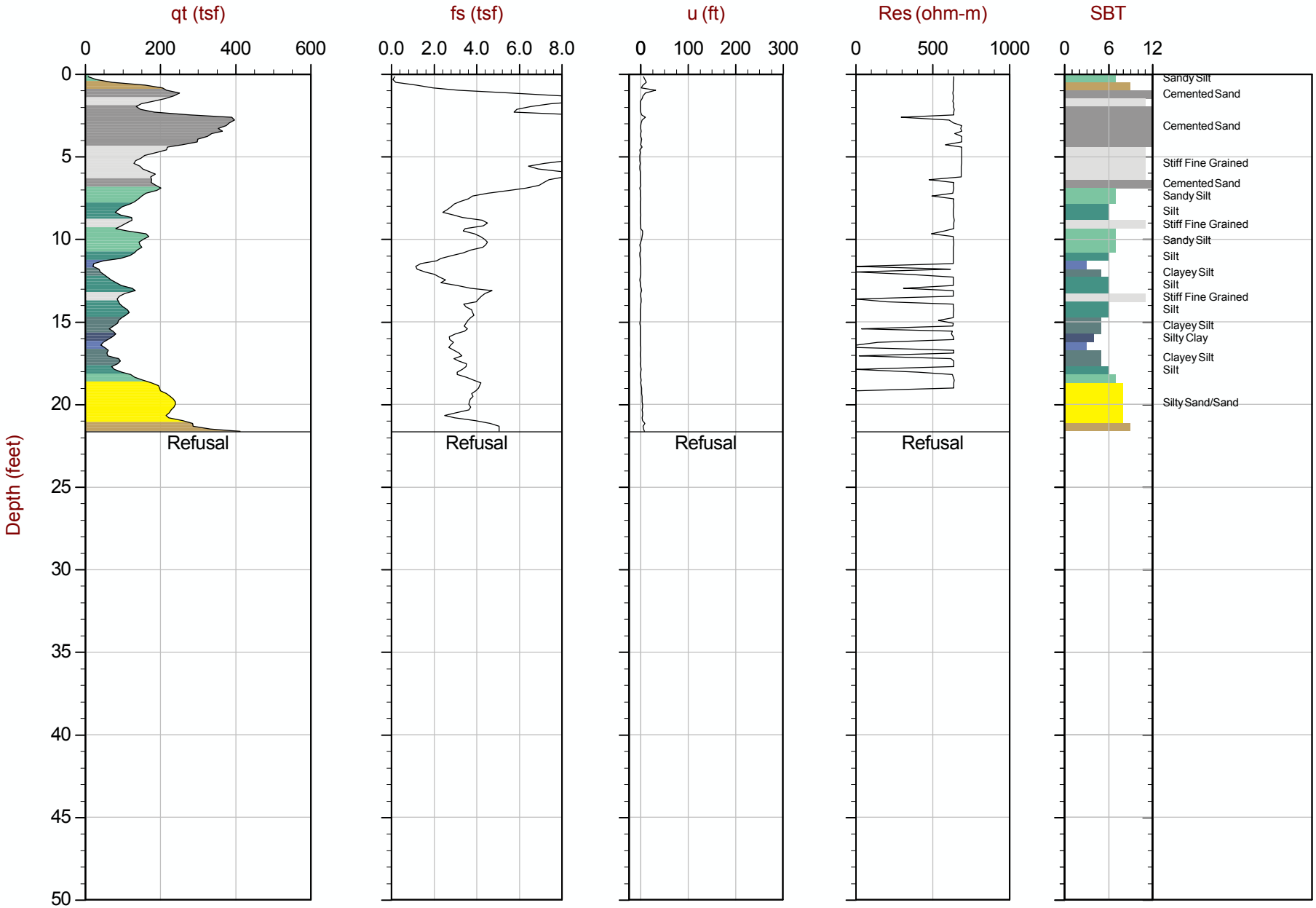
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.650833 Long: -108.497700
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:09:13 16:36
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-24
Cone: 155:T1500F15U500



Max Depth: 6.600 m / 21.65 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP24.COR
Unit Wt: SBT Chart Soil Zones

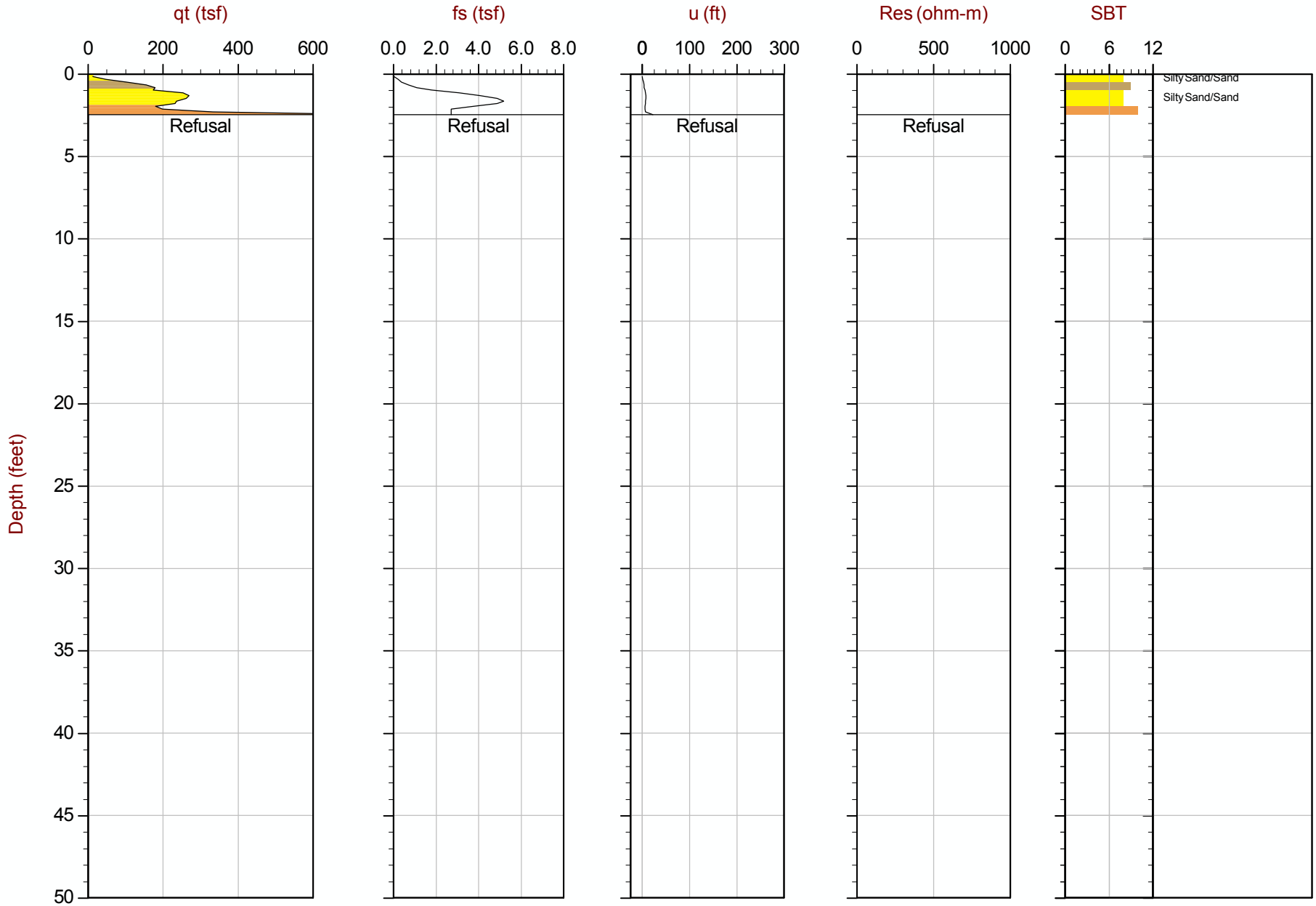
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.650000 Long: -108.498717
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:09:13 08:11
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-25
Cone: 155:T1500F15U500



Max Depth: 0.750 m / 2.46 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP25.COR
Unit Wt: SBT Chart Soil Zones

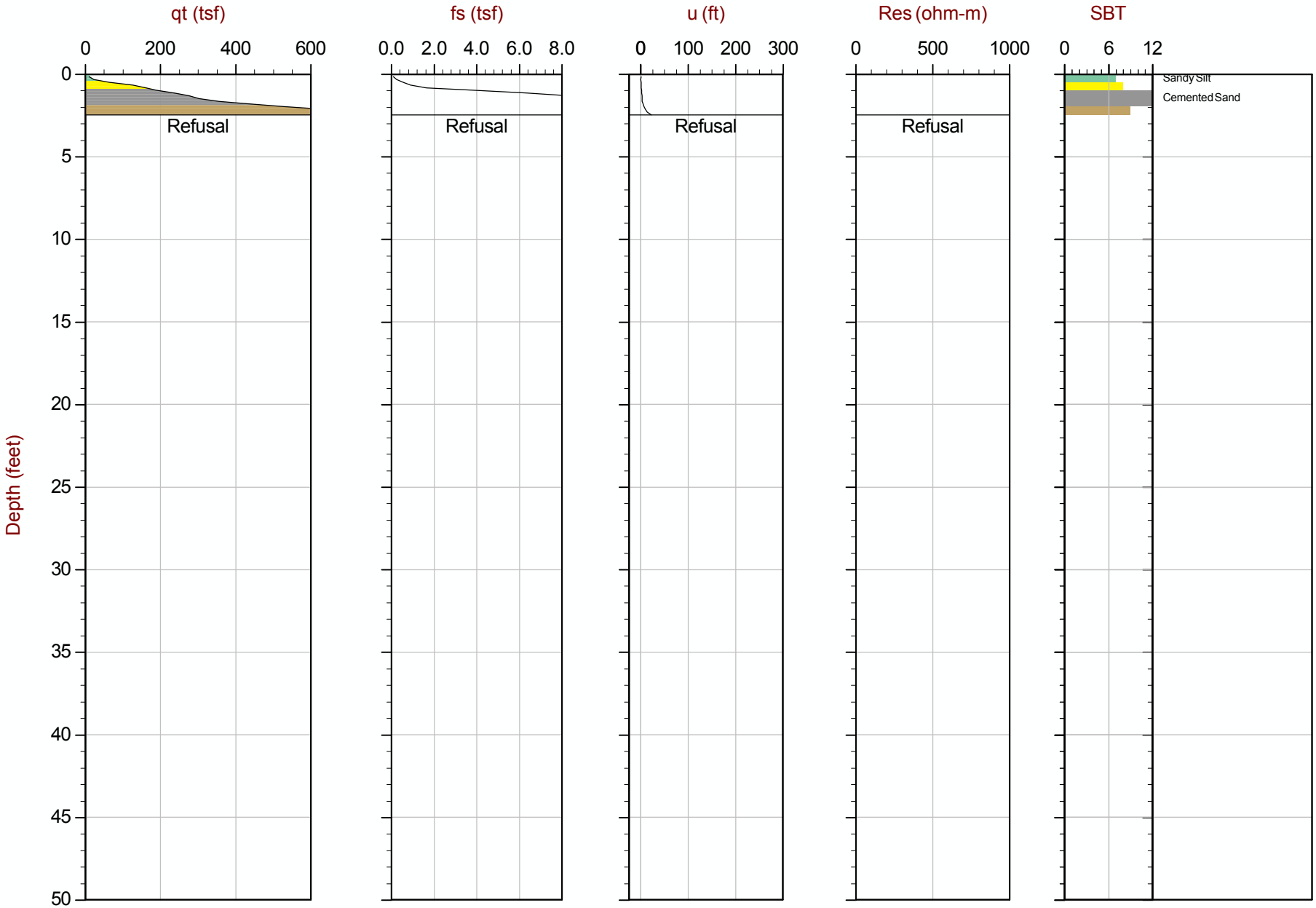
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.649650 Long: -108.497733
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:09:13 08:40
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-25B
Cone: 155:T1500F15U500



Max Depth: 0.750 m / 2.46 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP25B.COR
Unit Wt: SBT Chart Soil Zones

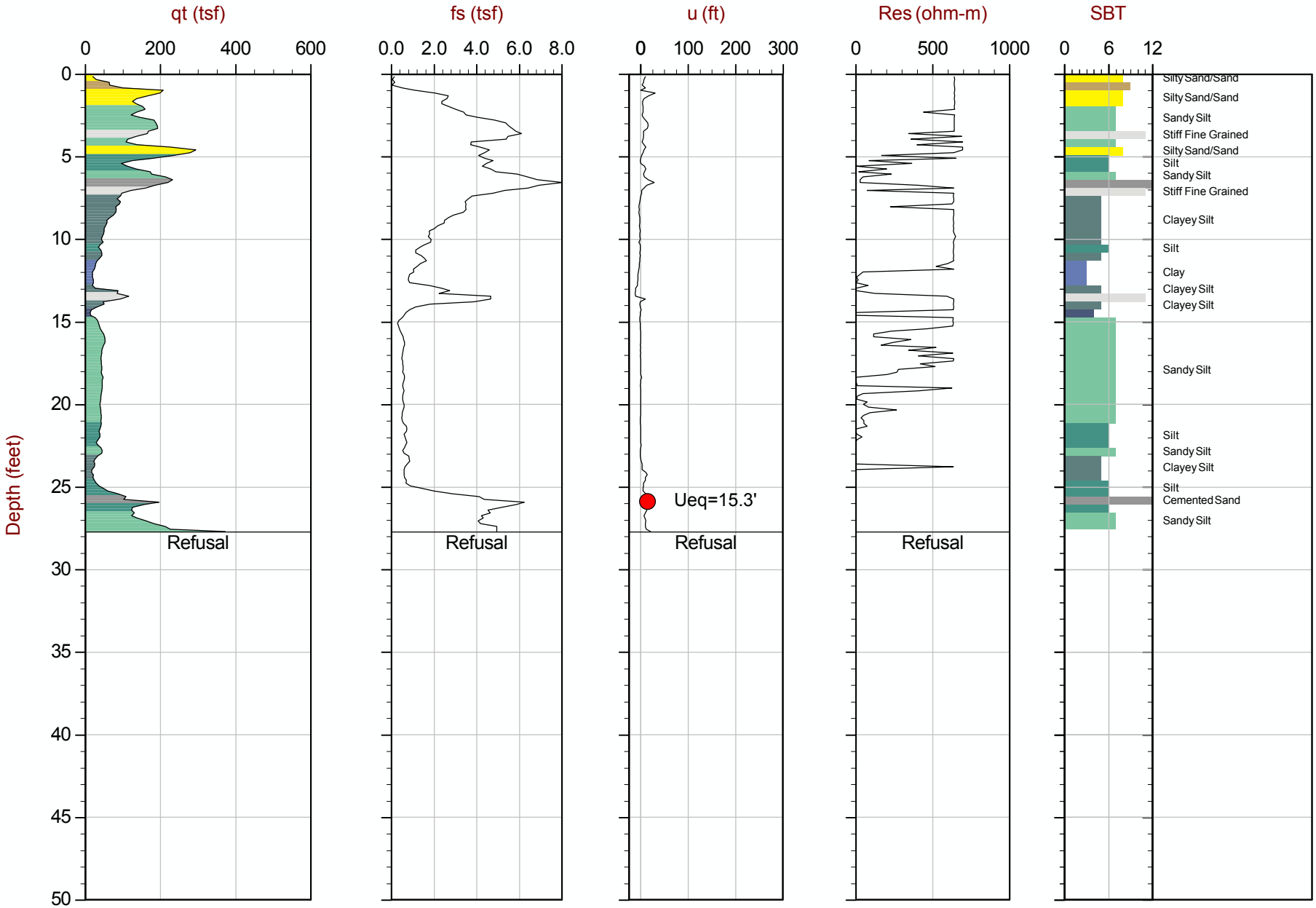
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.649650 Long: -108.497767
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:09:13 09:25
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-26
Cone: 155:T1500F15U500



Max Depth: 8.450 m / 27.72 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP26.COR
Unit Wt: SBT Chart Soil Zones

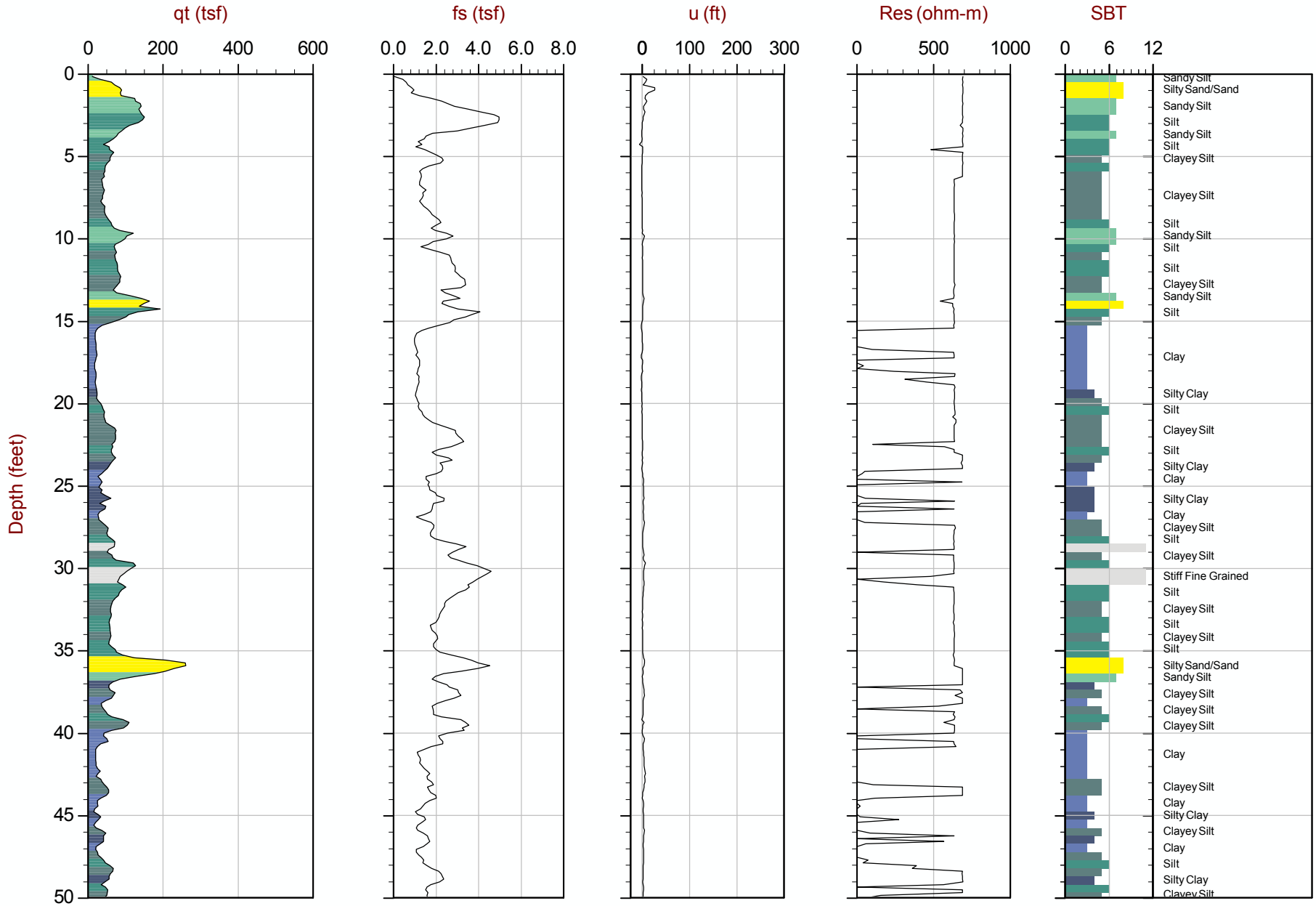
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.648417 Long: -108.500567
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:09:13 15:22
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-27
Cone: 155:T1500F15U500



Max Depth: 24.300 m / 79.72 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP27.COR
Unit Wt: SBT Chart Soil Zones

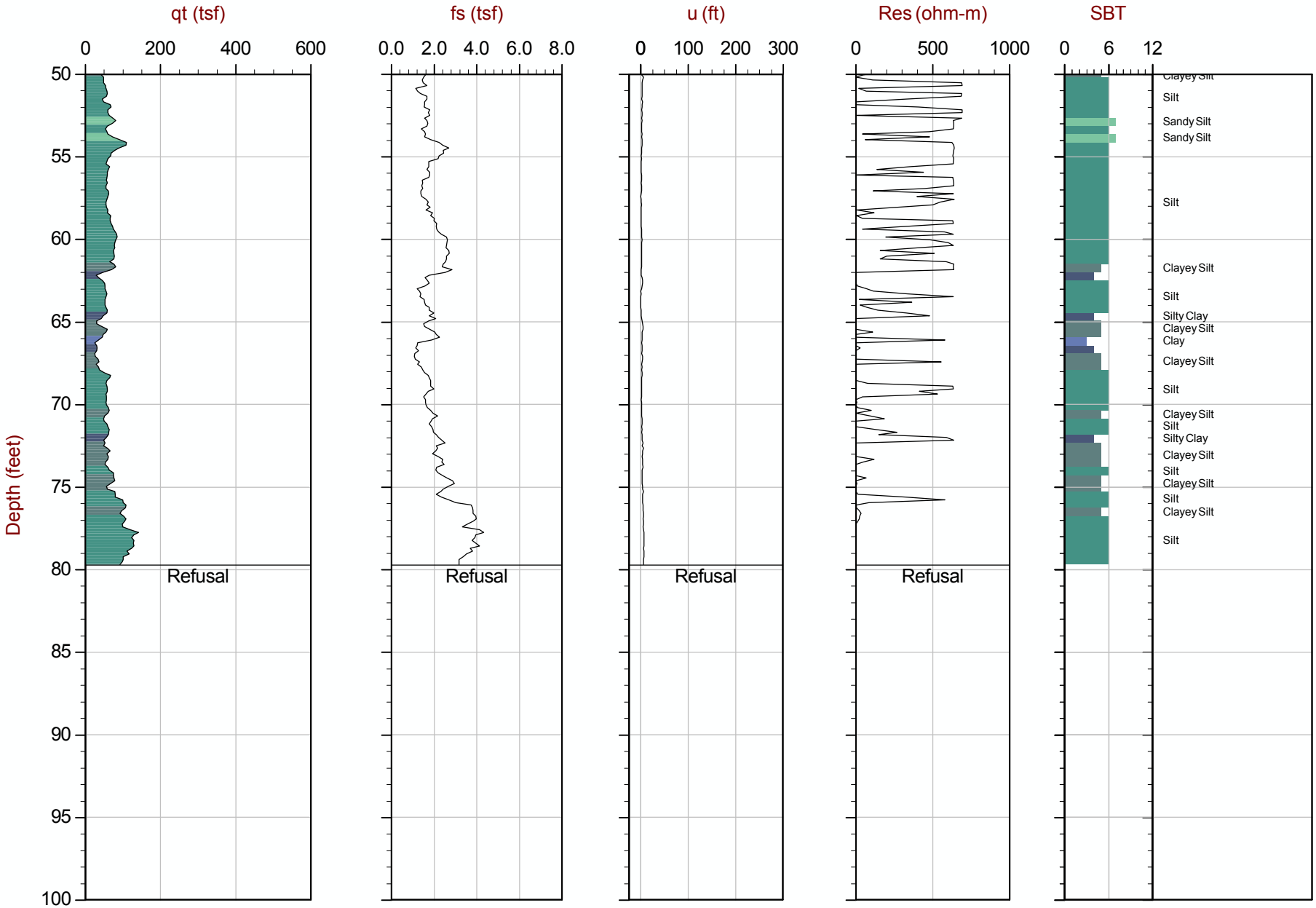
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647583 Long: -108.496367
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:09:13 15:22
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-27
Cone: 155:T1500F15U500



Max Depth: 24.300 m / 79.72 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP27.COR
Unit Wt: SBT Chart Soil Zones

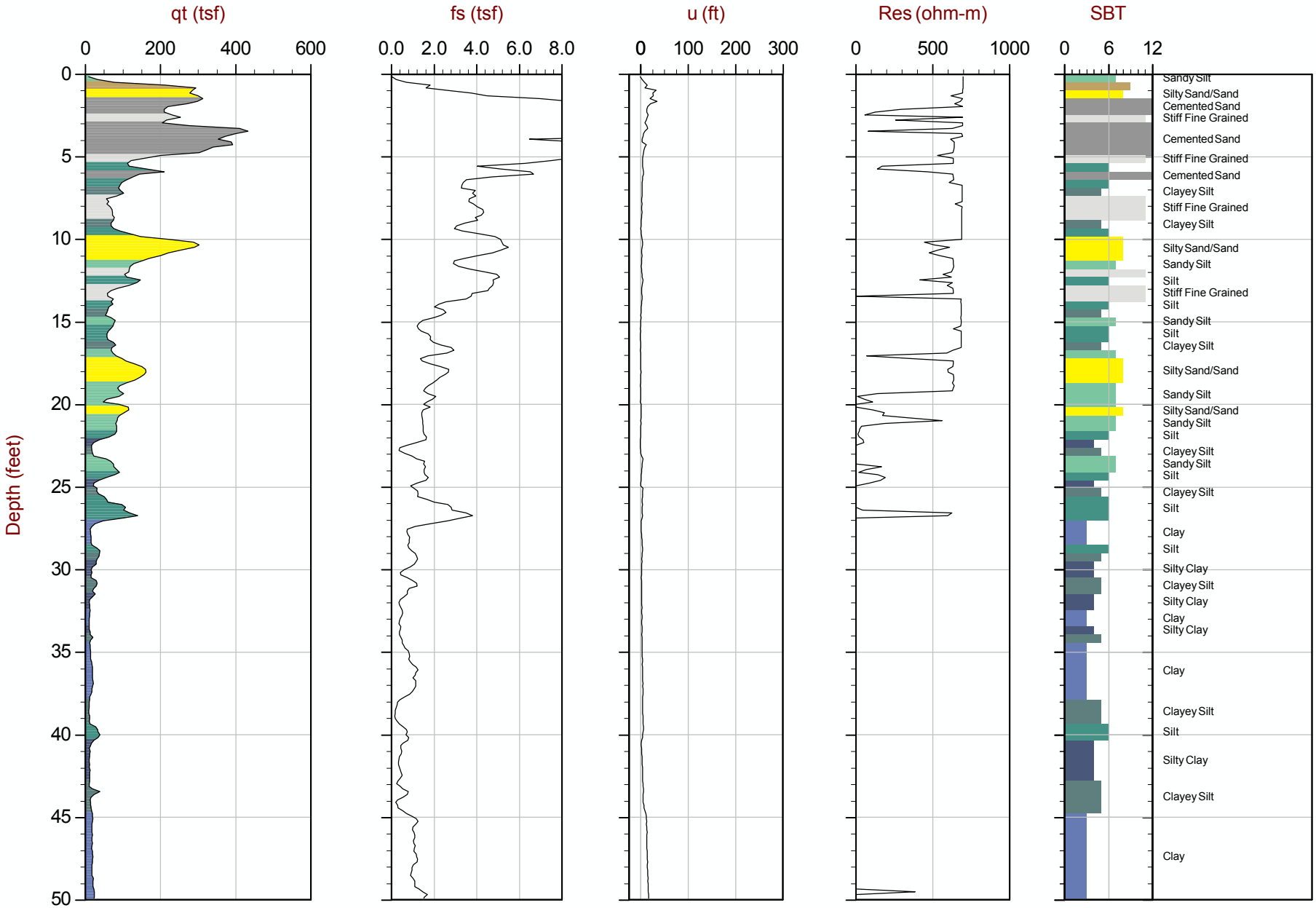
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647583 Long: -108.496367
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:10:13 08:17
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-28
Cone: 155:T1500F15U500



Max Depth: 25.600 m / 83.99 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP28.COR
Unit Wt: SBT Chart Soil Zones

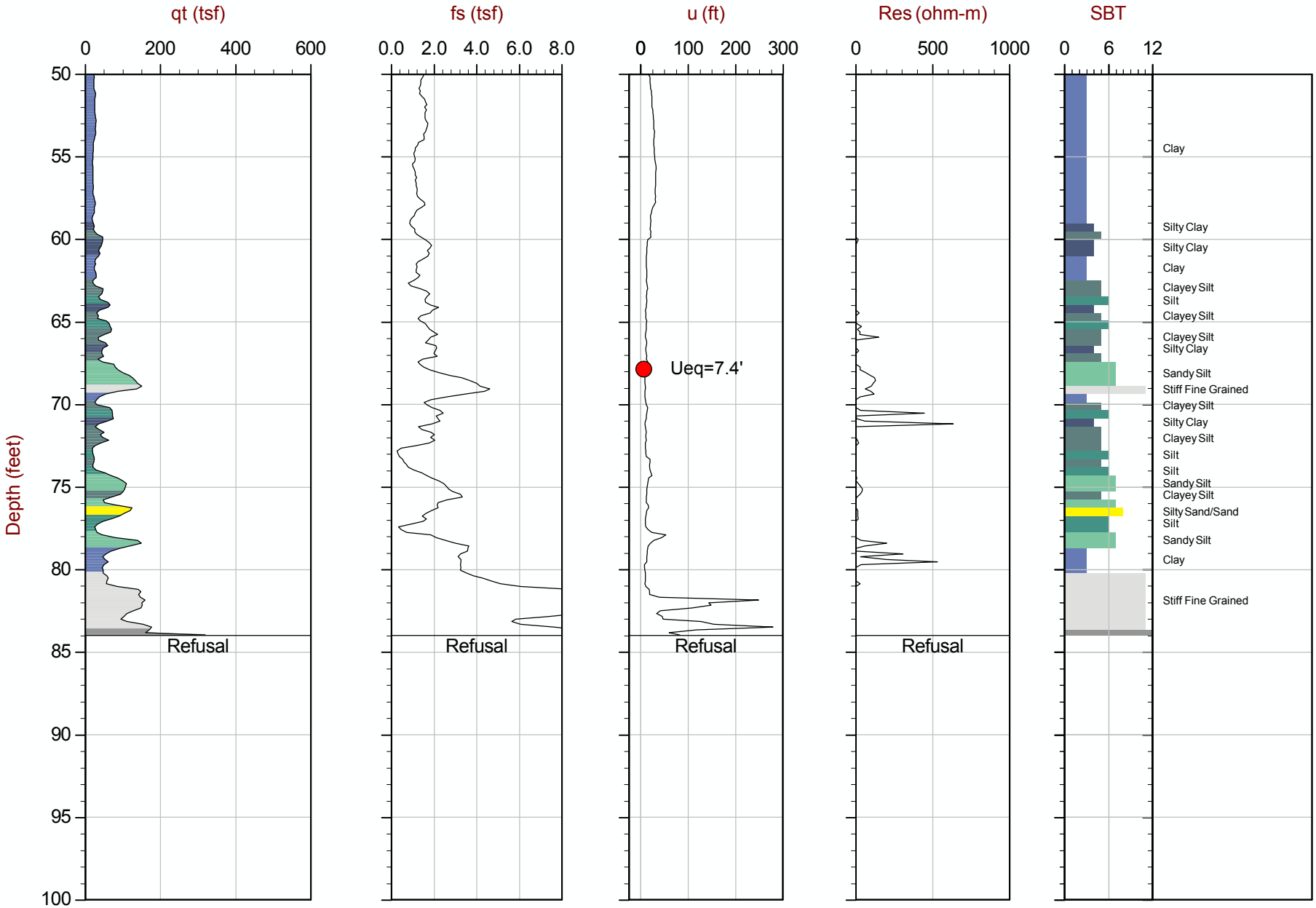
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.649767 Long: -108.501117
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:10:13 08:17
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-28
Cone: 155:T1500F15U500



Max Depth: 25.600 m / 83.99 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP28.COR
Unit Wt: SBT Chart Soil Zones

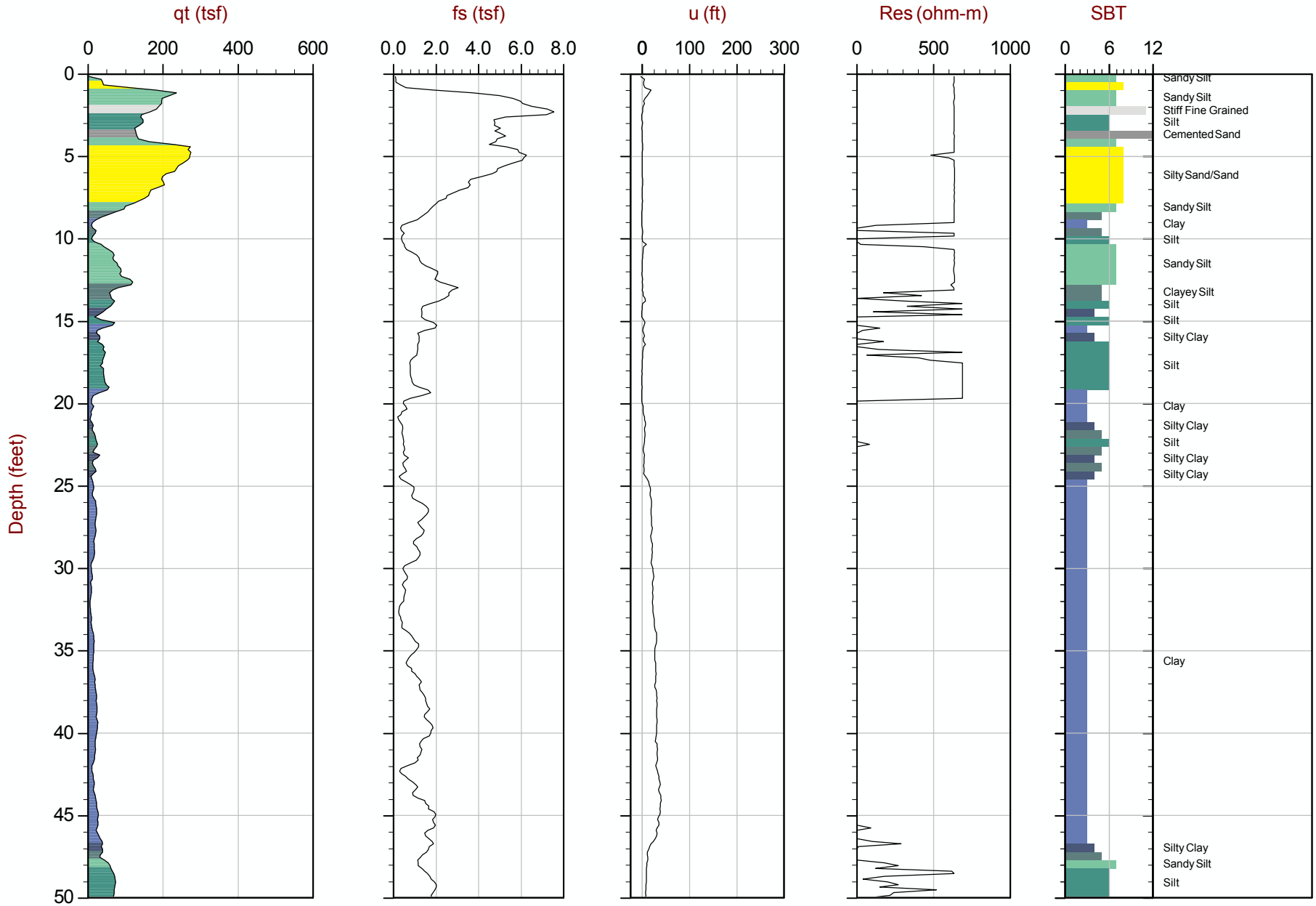
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.649767 Long: -108.501117
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:10:13 09:39
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-29
Cone: 155:T1500F15U500



Max Depth: 31.500 m / 103.35 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP29.COR
Unit Wt: SBT Chart Soil Zones

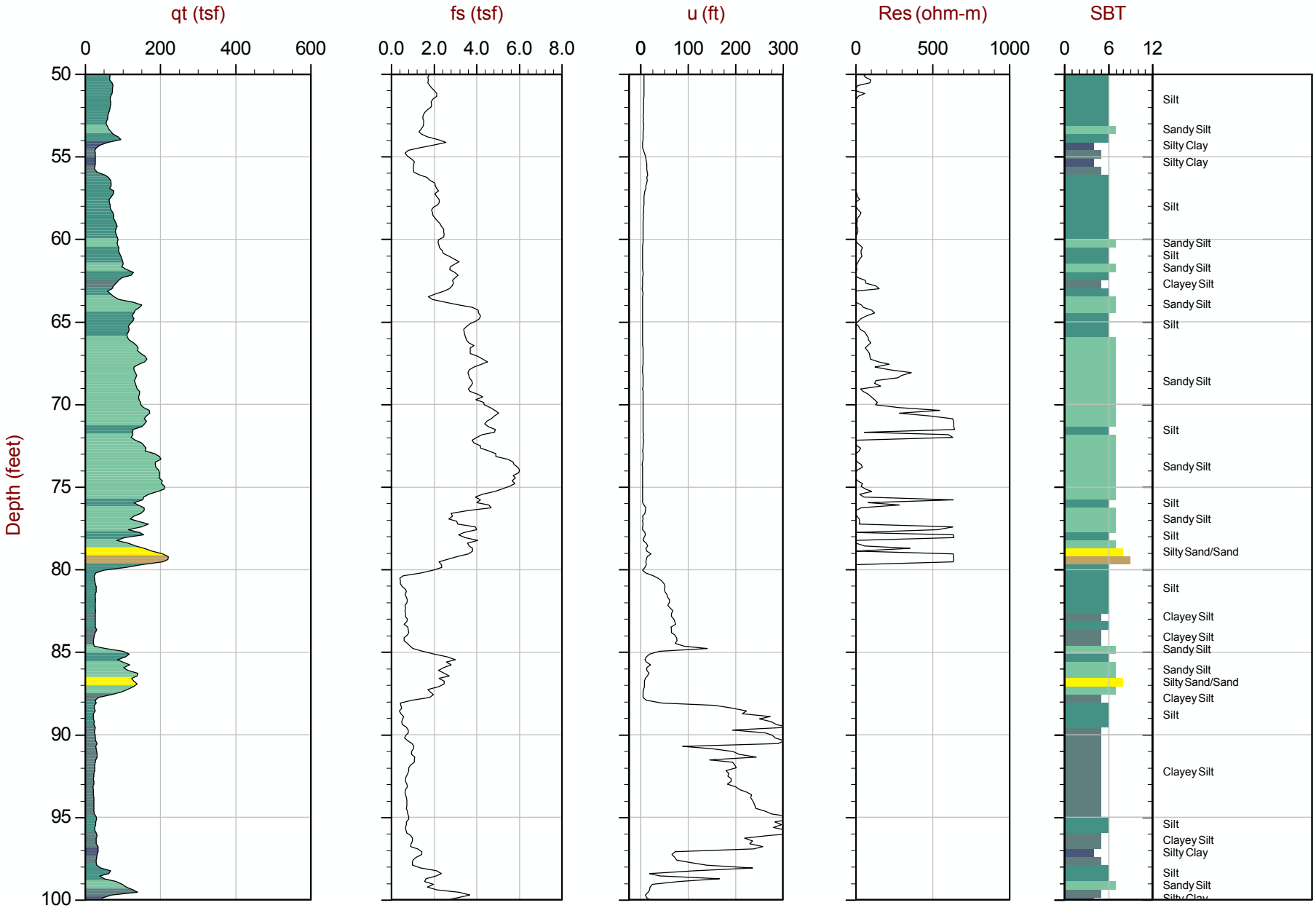
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.651200 Long: -108.499183
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:10:13 09:39
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-29
Cone: 155:T1500F15U500



Max Depth: 31.500 m / 103.35 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP29.COR
Unit Wt: SBT Chart Soil Zones

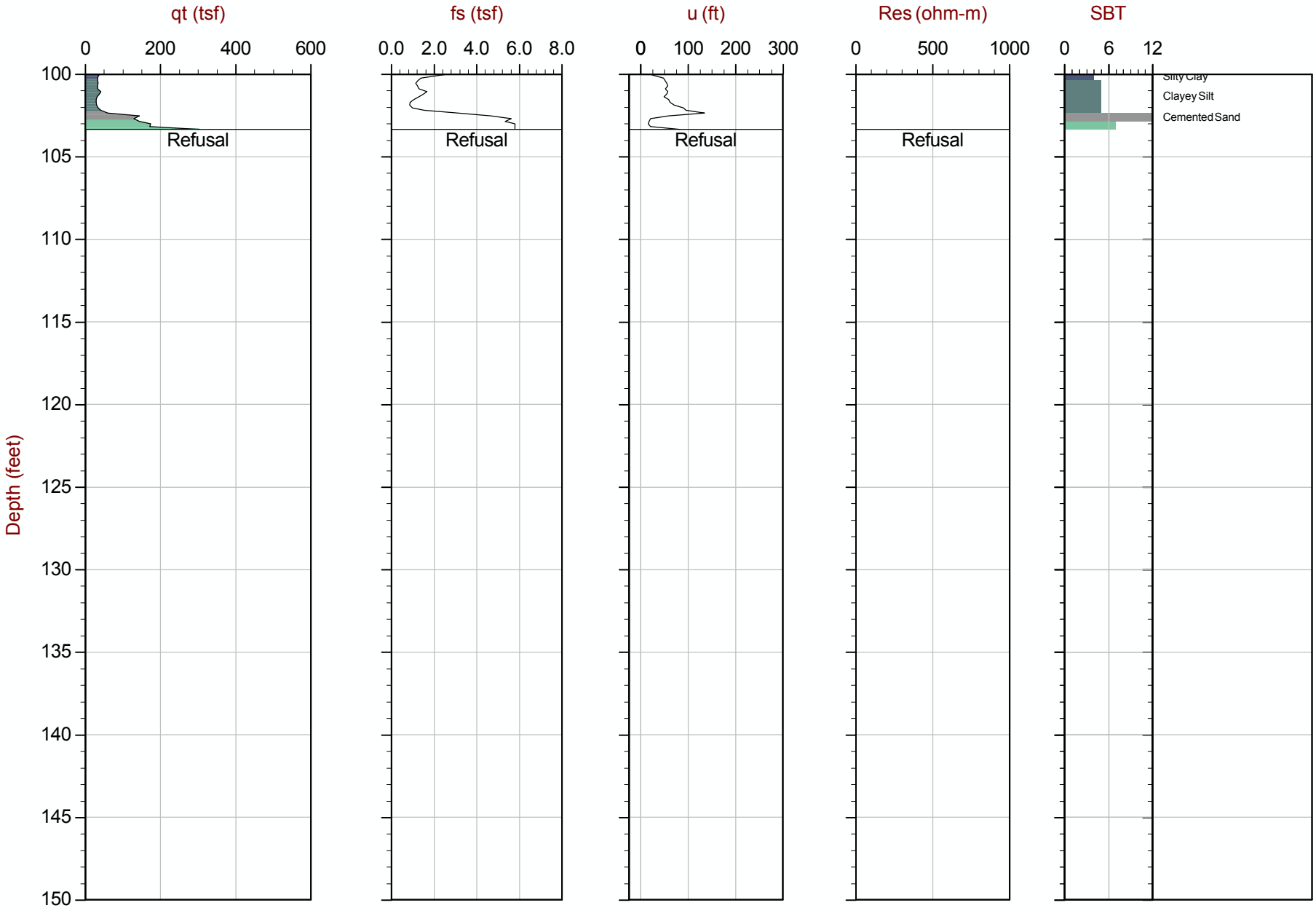
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.651200 Long: -108.499183
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:10:13 09:39
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-29
Cone: 155:T1500F15U500



Max Depth: 31.500 m / 103.35 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP29.COR
Unit Wt: SBT Chart Soil Zones

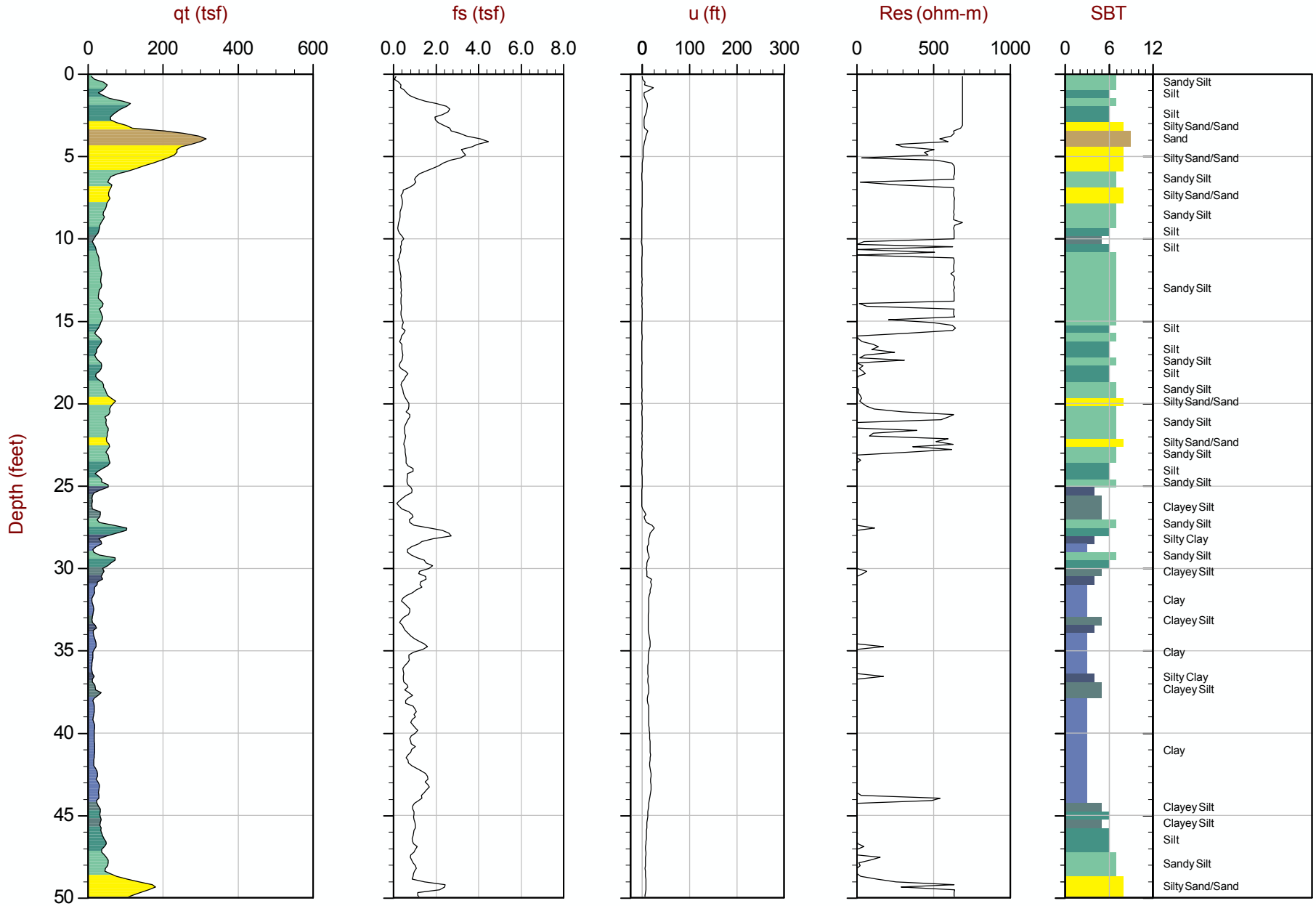
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.651200 Long: -108.499183
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:10:13 10:57
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-30
Cone: 155:T1500F15U500



Max Depth: 22.800 m / 74.80 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP30.COR
Unit Wt: SBT Chart Soil Zones

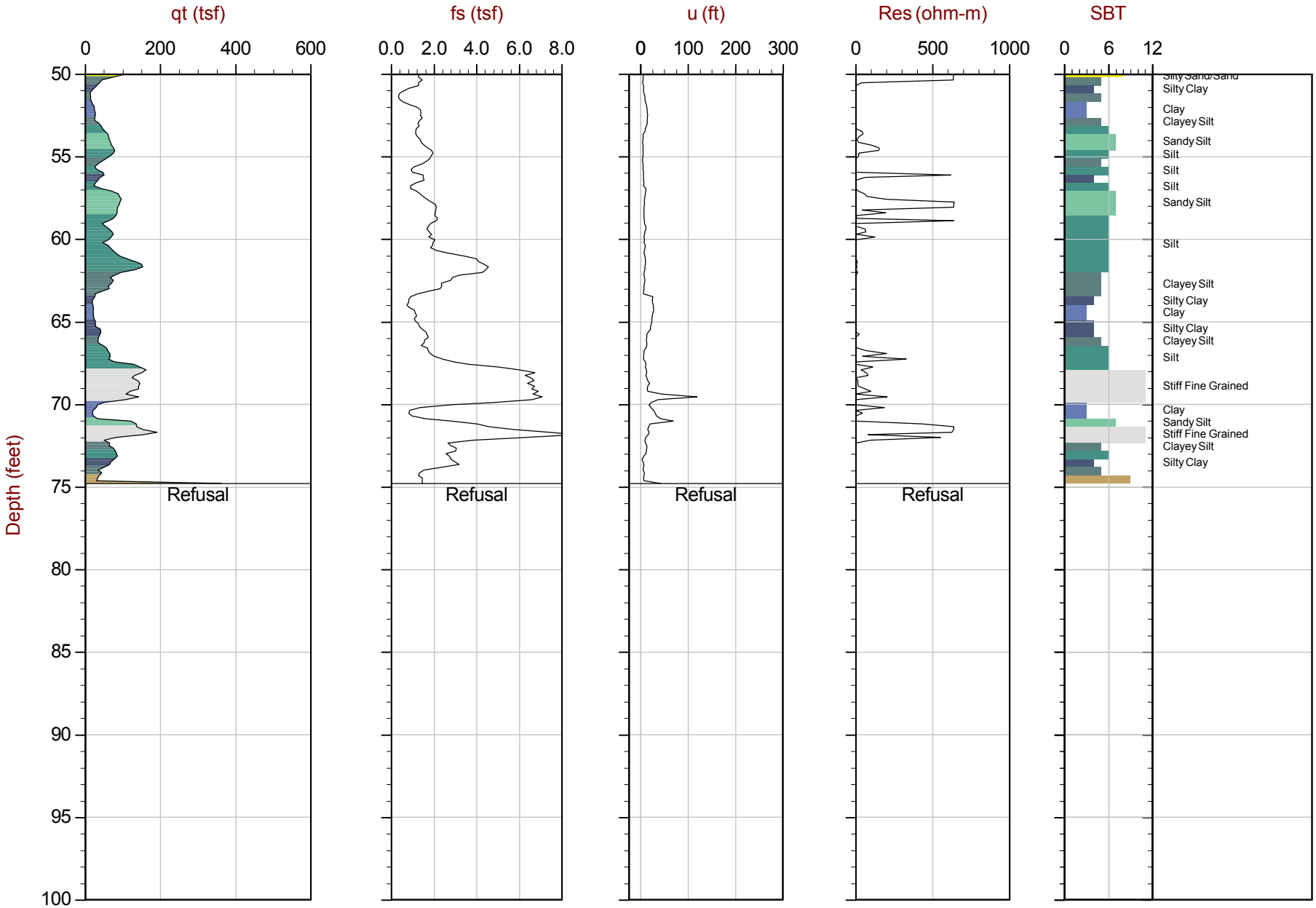
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647250 Long: -108.503350
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:10:13 10:57
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-30
Cone: 155:T1500F15U500



Max Depth: 22.800 m / 74.80 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP30.COR
Unit Wt: SBT Chart Soil Zones

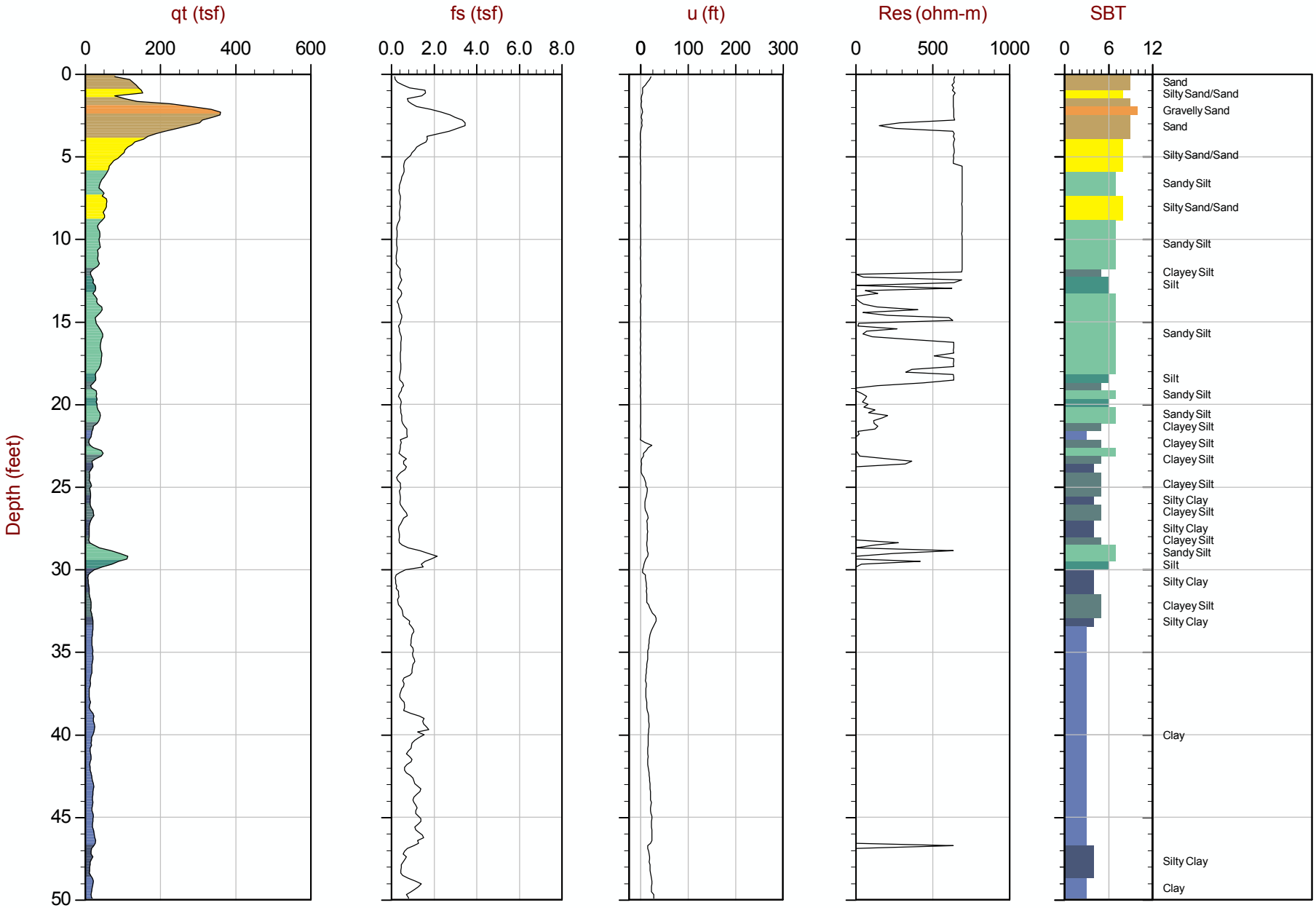
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647250 Long: -108.503350
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:10:13 13:10
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-31
Cone: 155:T1500F15U500



Max Depth: 24.400 m / 80.05 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP31.COR
Unit Wt: SBT Chart Soil Zones

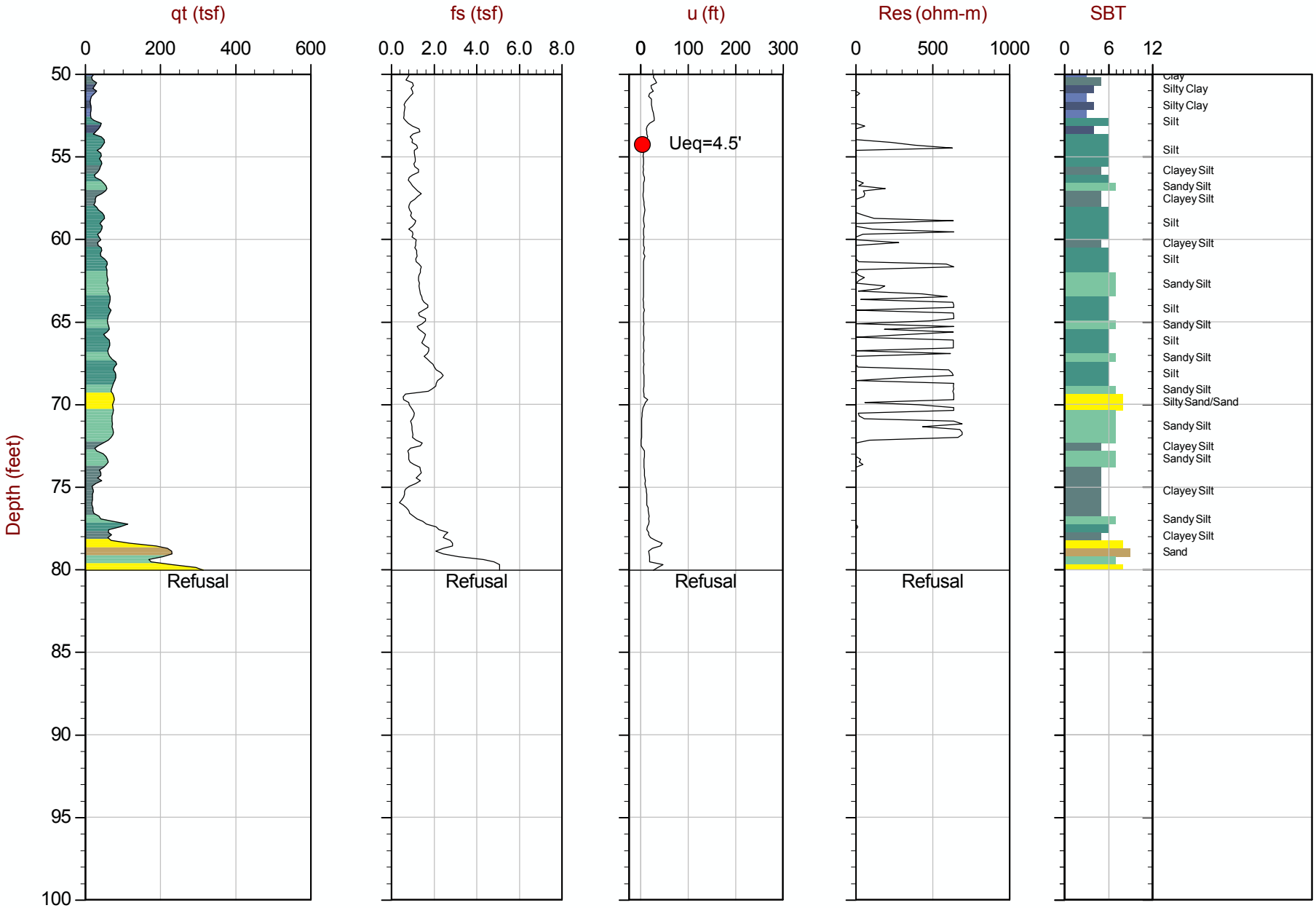
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.646450 Long: -108.504917
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:10:13 13:10
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-31
Cone: 155:T1500F15U500



Max Depth: 24.400 m / 80.05 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP31.COR
Unit Wt: SBT Chart Soil Zones

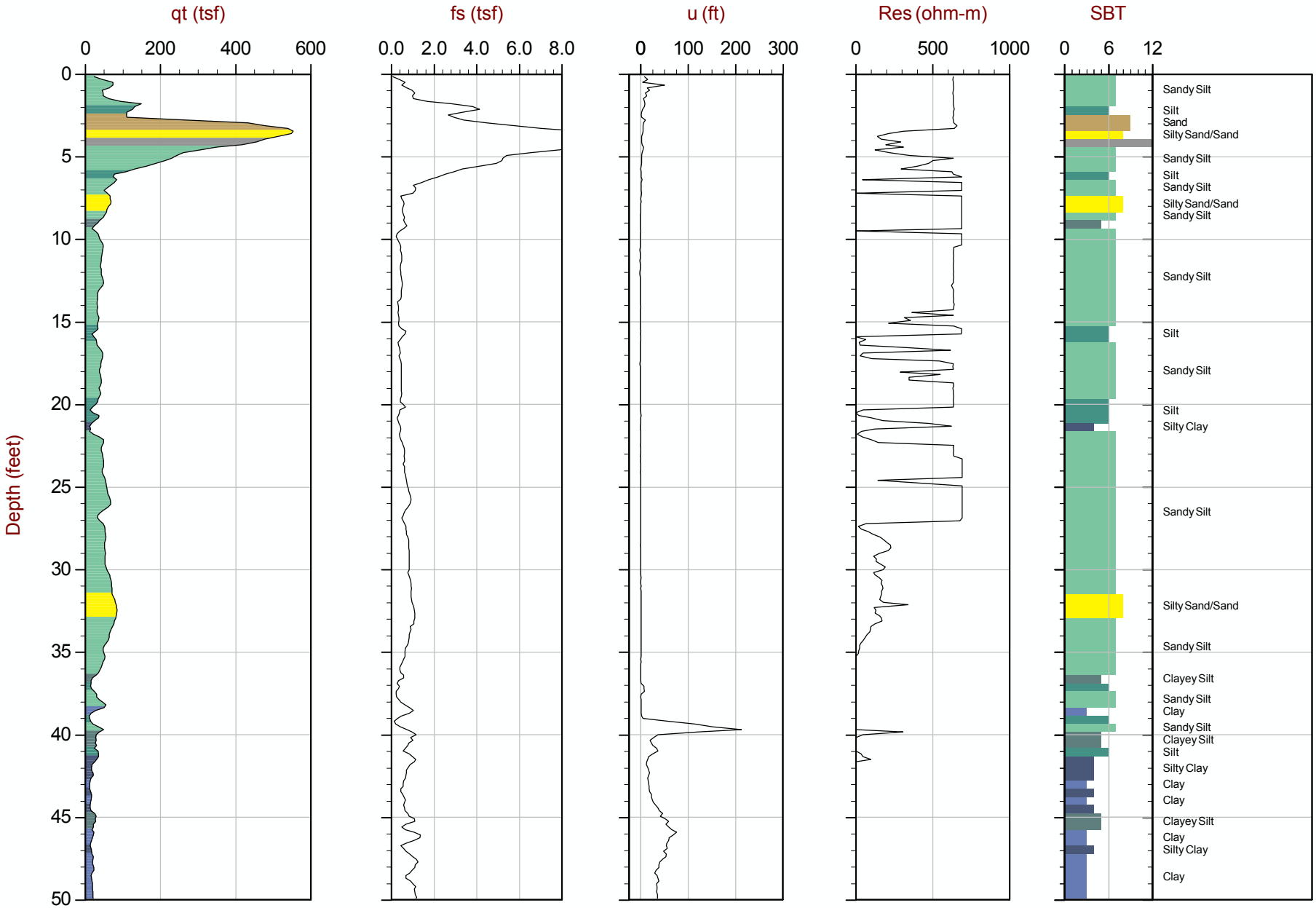
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.646450 Long: -108.504917
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:10:13 14:12
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-32
Cone: 155:T1500F15U500



Max Depth: 36.300 m / 119.09 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP32.COR
Unit Wt: SBT Chart Soil Zones

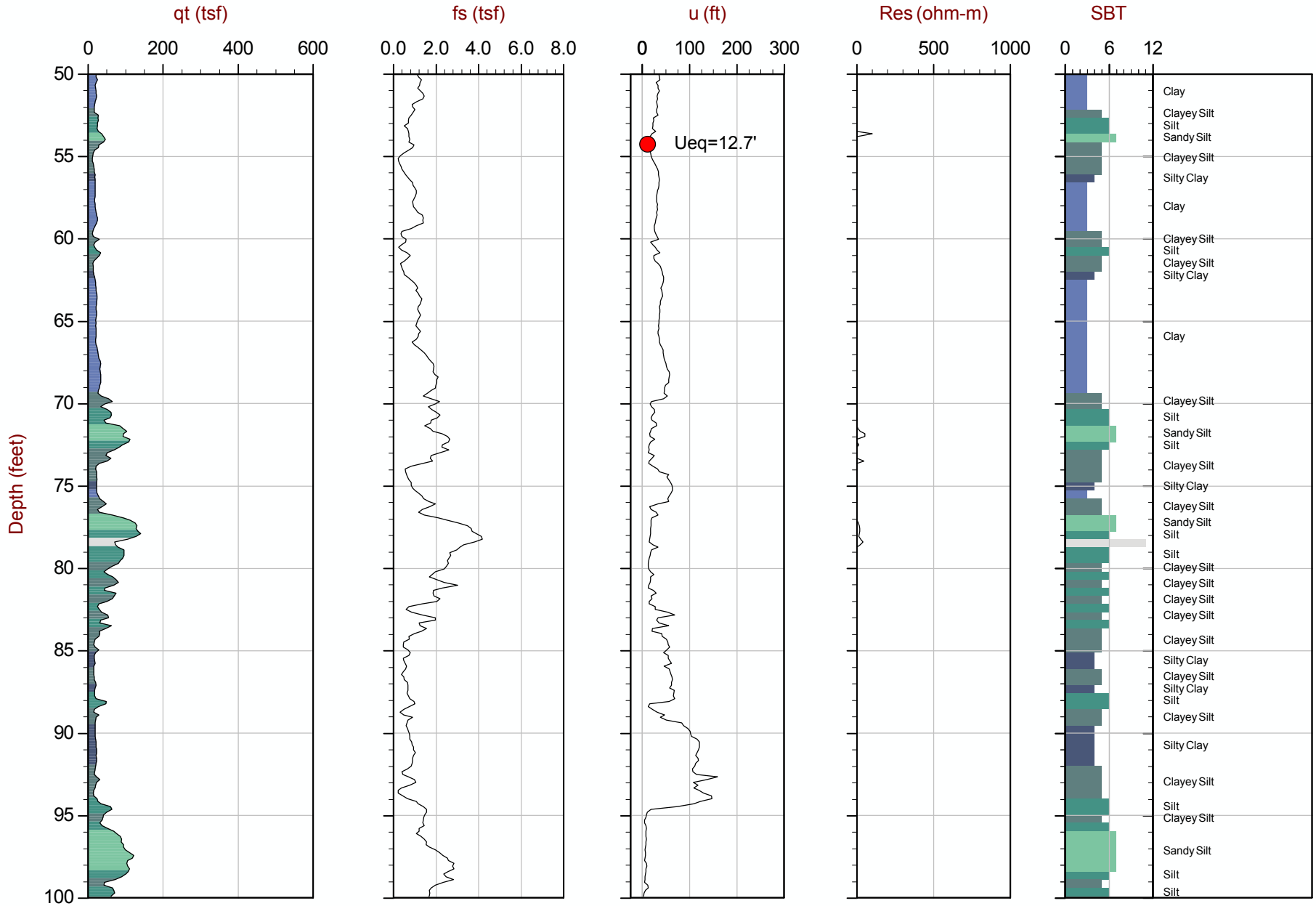
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.645383 Long: -108.505983
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:10:13 14:12
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-32
Cone: 155:T1500F15U500



Max Depth: 36.300 m / 119.09 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP32.COR
Unit Wt: SBT Chart Soil Zones

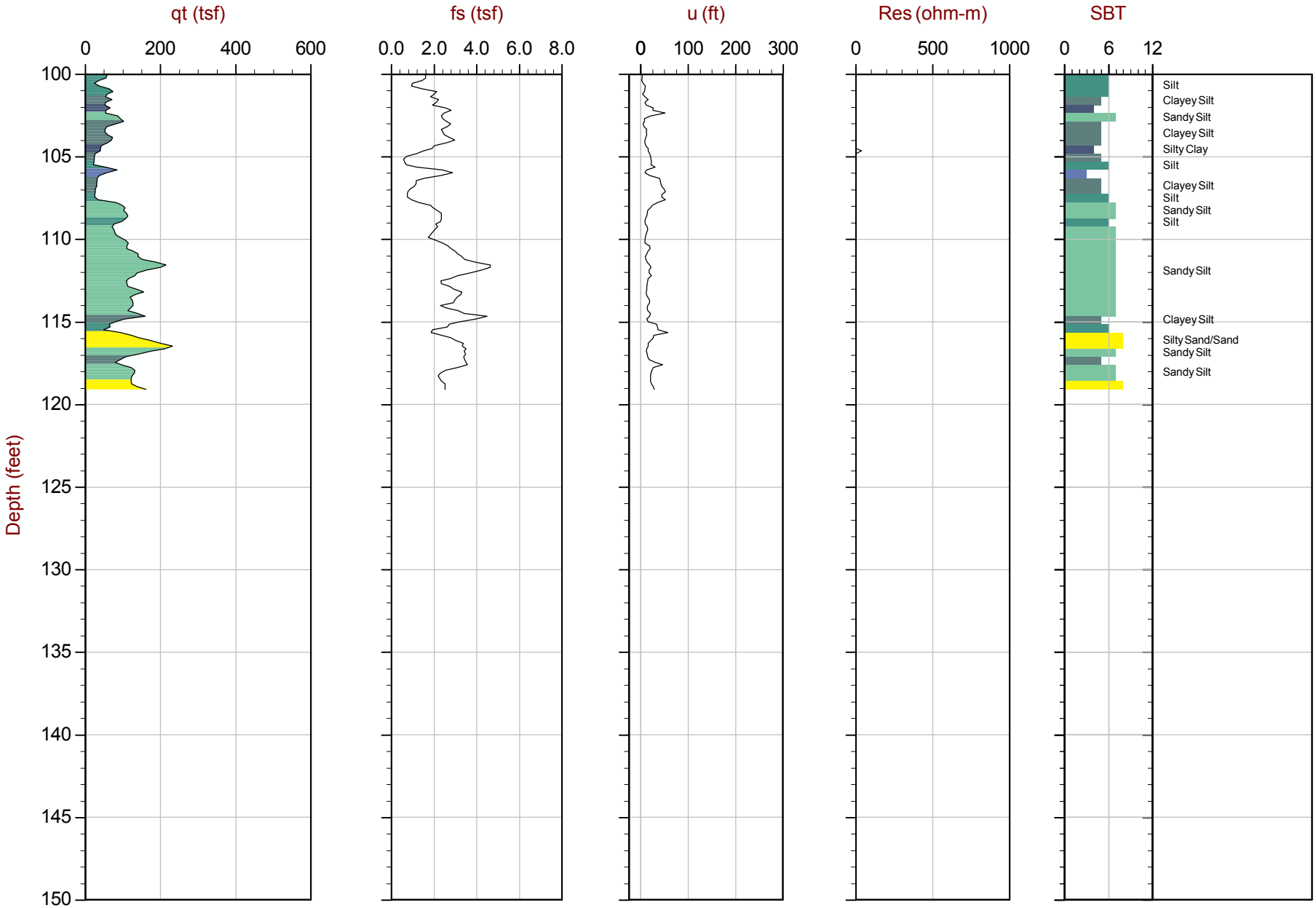
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.645383 Long: -108.505983
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:10:13 14:12
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-32
Cone: 155:T1500F15U500



Max Depth: 36.300 m / 119.09 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP32.COR
Unit Wt: SBT Chart Soil Zones

SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.645383 Long: -108.505983
● Equilibrium Pore Pressure from Dissipation

Shear Wave Velocity Calculations (V_s Calcs)

CONETEC

Shear Wave Velocity Calculations

Job No.: 13-52118
Client: MWH Americas, Inc.
CPT No.: RCPT-01
Location Church Rock Mill Site TSF
Date: November 7, 2013

Geophone Offset: 0.66 (ft)
Source Offset: 1.50 (ft)

Test Depth (ft)	Geophone Depth (ft)	Ray Path (ft)	Incremental Distance (ft)	Time Interval (ms)	Interval Velocity (m/s)	Interval Depth (m)	Interval Velocity (ft/s)	Interval Depth (ft)
5.08	4.43	4.68						
10.01	9.35	9.47	4.79	6.36	230	2.10	754	6.9
15.09	14.44	14.51	5.04	6.12	251	3.62	824	11.9
20.01	19.36	19.41	4.90	6.81	219	5.15	720	16.9
25.10	24.44	24.49	5.07	7.19	215	6.67	705	21.9
30.02	29.36	29.40	4.91	7.68	195	8.20	639	26.9
40.03	39.37	39.40	10.00	13.12	232	10.47	762	34.4
45.11	44.46	44.48	5.08	6.58	235	12.77	772	41.9
50.03	49.38	49.40	4.92	6.19	242	14.30	794	46.9
55.12	54.46	54.48	5.08	6.72	231	15.82	757	51.9
60.04	59.38	59.40	4.92	7.42	202	17.35	663	56.9
65.12	64.47	64.49	5.08	7.64	203	18.87	666	61.9
70.05	69.39	69.41	4.92	6.65	225	20.40	740	66.9
75.13	74.47	74.49	5.08	5.30	292	21.92	959	71.9
79.72	79.07	79.08	4.59	5.17	271	23.40	888	76.8
85.14	84.48	84.49	5.41	5.95	277	24.92	910	81.8

Shear Wave Velocity Calculations

Job No.: 13-52118
Client: MWH Americas, Inc.
CPT No.: RCPT-02
Location Church Rock Mill Site TSF
Date: November 5, 2013

Geophone Offset: 0.66 (ft)
Source Offset: 1.50 (ft)

Test Depth (ft)	Geophone Depth (ft)	Ray Path (ft)	Incremental Distance (ft)	Time Interval (ms)	Interval Velocity (m/s)	Interval Depth (m)	Interval Velocity (ft/s)	Interval Depth (ft)
4.43	3.77	4.06						
10.99	10.33	10.44	6.38	6.82	285	2.15	936	7.1
15.09	14.44	14.51	4.07	7.31	170	3.77	557	12.4
20.01	19.36	19.41	4.90	4.91	304	5.15	998	16.9
25.10	24.44	24.49	5.07	5.67	273	6.67	894	21.9
30.02	29.36	29.40	4.91	5.69	263	8.20	864	26.9
33.96	33.30	33.33	3.93	3.09	389	9.55	1275	31.3

Shear Wave Velocity Calculations

Job No.: 13-52118
Client: MWH Americas, Inc.
CPT No.: RCPT-04
Location Church Rock Mill Site TSF
Date: November 5, 2013

Geophone Offset: 0.66 (ft)
Source Offset: 1.50 (ft)

Test Depth (ft)	Geophone Depth (ft)	Ray Path (ft)	Incremental Distance (ft)	Time Interval (ms)	Interval Velocity (m/s)	Interval Depth (m)	Interval Velocity (ft/s)	Interval Depth (ft)
5.08	4.43	4.68						
10.01	9.35	9.47	4.79	5.18	282	2.10	925	6.9
15.09	14.44	14.51	5.04	6.78	227	3.62	743	11.9
20.51	19.85	19.91	5.39	11.70	141	5.22	461	17.1
25.10	24.44	24.49	4.58	4.50	310	6.75	1019	22.1
27.56	26.90	26.94	2.46	1.01	739	7.82	2423	25.7

Shear Wave Velocity Calculations

Job No.: 13-52118
Client: MWH Americas, Inc.
CPT No.: RCPT-05
Location Church Rock Mill Site TSF
Date: November 6, 2013

Geophone Offset: 0.66 (ft)
Source Offset: 1.50 (ft)

Test Depth (ft)	Geophone Depth (ft)	Ray Path (ft)	Incremental Distance (ft)	Time Interval (ms)	Interval Velocity (m/s)	Interval Depth (m)	Interval Velocity (ft/s)	Interval Depth (ft)
5.08	4.43	4.68						
10.01	9.35	9.47	4.79	8.76	167	2.10	547	6.9
15.09	14.44	14.51	5.04	9.00	171	3.62	560	11.9
20.01	19.36	19.41	4.90	6.12	244	5.15	801	16.9
25.10	24.44	24.49	5.07	6.41	241	6.67	791	21.9
30.68	30.02	30.06	5.57	6.76	251	8.30	823	27.2
35.10	34.45	34.48	4.42	6.65	203	9.82	666	32.2
37.89	37.24	37.27	2.79	2.76	307	10.92	1008	35.8

Shear Wave Velocity Calculations

Job No.: 13-52118
Client: MWH Americas, Inc.
CPT No.: RCPT-06
Location Church Rock Mill Site TSF
Date: November 6, 2013

Geophone Offset: 0.66 (ft)
Source Offset: 1.50 (ft)

Test Depth (ft)	Geophone Depth (ft)	Ray Path (ft)	Incremental Distance (ft)	Time Interval (ms)	Interval Velocity (m/s)	Interval Depth (m)	Interval Velocity (ft/s)	Interval Depth (ft)
5.08	4.43	4.68						
10.01	9.35	9.47	4.79	4.36	335	2.10	1100	6.9
15.09	14.44	14.51	5.04	6.47	238	3.62	779	11.9
20.01	19.36	19.41	4.90	7.74	193	5.15	633	16.9
25.10	24.44	24.49	5.07	9.47	163	6.67	535	21.9
30.02	29.36	29.40	4.91	10.78	139	8.20	456	26.9
35.10	34.45	34.48	5.08	9.30	167	9.72	546	31.9

Shear Wave Velocity Calculations

Job No.: 13-52118
Client: MWH Americas, Inc.
CPT No.: RCPT-07
Location Church Rock Mill Site TSF
Date: November 8, 2013

Geophone Offset: 0.66 (ft)
Source Offset: 1.50 (ft)

Test Depth (ft)	Geophone Depth (ft)	Ray Path (ft)	Incremental Distance (ft)	Time Interval (ms)	Interval Velocity (m/s)	Interval Depth (m)	Interval Velocity (ft/s)	Interval Depth (ft)
5.08	4.43	4.68						
10.01	9.35	9.47	4.79	6.43	227	2.10	746	6.9
15.09	14.44	14.51	5.04	8.92	172	3.62	565	11.9
20.34	19.68	19.74	5.23	9.52	167	5.20	549	17.1
25.26	24.61	24.65	4.91	9.80	153	6.75	501	22.1
30.02	29.36	29.40	4.75	10.46	138	8.22	454	27.0
35.27	34.61	34.65	5.24	10.92	146	9.75	480	32.0
40.03	39.37	39.40	4.75	7.79	186	11.27	610	37.0
45.28	44.62	44.64	5.25	5.56	288	12.80	944	42.0
50.03	49.38	49.40	4.75	5.70	254	14.32	834	47.0
55.12	54.46	54.48	5.08	5.99	259	15.82	849	51.9
60.04	59.38	59.40	4.92	6.56	229	17.35	750	56.9
65.12	64.47	64.49	5.08	6.19	250	18.87	821	61.9
70.05	69.39	69.41	4.92	6.24	240	20.40	789	66.9

Shear Wave Velocity Calculations

Job No.: 13-52118
Client: MWH Americas, Inc.
CPT No.: RCPT-08
Location Church Rock Mill Site TSF
Date: November 7, 2013

Geophone Offset: 0.66 (ft)
Source Offset: 1.50 (ft)

Test Depth (ft)	Geophone Depth (ft)	Ray Path (ft)	Incremental Distance (ft)	Time Interval (ms)	Interval Velocity (m/s)	Interval Depth (m)	Interval Velocity (ft/s)	Interval Depth (ft)
5.08	4.43	4.68						
10.01	9.35	9.47	4.79	4.07	359	2.10	1177	6.9
15.09	14.44	14.51	5.04	5.91	260	3.62	853	11.9
20.01	19.36	19.41	4.90	6.06	247	5.15	809	16.9
25.10	24.44	24.49	5.07	6.67	232	6.67	761	21.9
30.02	29.36	29.40	4.91	8.27	181	8.20	594	26.9
35.10	34.45	34.48	5.08	8.65	179	9.72	587	31.9
40.35	39.70	39.73	5.25	8.20	195	11.30	639	37.1
46.26	45.60	45.63	5.90	8.61	209	13.00	685	42.7
50.03	49.38	49.40	3.77	2.97	388	14.47	1272	47.5
55.12	54.46	54.48	5.08	4.17	372	15.82	1220	51.9
60.04	59.38	59.40	4.92	3.79	396	17.35	1298	56.9

Shear Wave Velocity Calculations

Job No.: 13-52118
Client: MWH Americas, Inc.
CPT No.: RCPT-09
Location Church Rock Mill Site TSF
Date: November 6, 2013

Geophone Offset: 0.66 (ft)
Source Offset: 1.50 (ft)

Test Depth (ft)	Geophone Depth (ft)	Ray Path (ft)	Incremental Distance (ft)	Time Interval (ms)	Interval Velocity (m/s)	Interval Depth (m)	Interval Velocity (ft/s)	Interval Depth (ft)
5.08	4.43	4.68						
10.01	9.35	9.47	4.79	4.77	306	2.10	1004	6.9
15.09	14.44	14.51	5.04	5.72	269	3.62	882	11.9
20.67	20.01	20.07	5.56	8.87	191	5.25	626	17.2
25.10	24.44	24.49	4.42	8.97	150	6.77	492	22.2
30.02	29.36	29.40	4.91	8.65	173	8.20	568	26.9
35.10	34.45	34.48	5.08	8.90	174	9.72	571	31.9
40.03	39.37	39.40	4.92	8.43	178	11.25	583	36.9
45.11	44.46	44.48	5.08	7.97	194	12.77	637	41.9
50.03	49.38	49.40	4.92	5.22	287	14.30	943	46.9
55.12	54.46	54.48	5.08	4.85	320	15.82	1048	51.9
60.04	59.38	59.40	4.92	5.29	283	17.35	929	56.9
65.12	64.47	64.49	5.08	5.20	298	18.87	978	61.9
69.39	68.73	68.75	4.26	3.73	349	20.30	1144	66.6

Shear Wave Velocity Calculations

Job No.: 13-52118
Client: MWH Americas, Inc.
CPT No.: RCPT-10
Location Church Rock Mill Site TSF
Date: November 6, 2013

Geophone Offset: 0.66 (ft)
Source Offset: 1.50 (ft)

Test Depth (ft)	Geophone Depth (ft)	Ray Path (ft)	Incremental Distance (ft)	Time Interval (ms)	Interval Velocity (m/s)	Interval Depth (m)	Interval Velocity (ft/s)	Interval Depth (ft)
5.08	4.43	4.68						
10.01	9.35	9.47	4.79	5.18	282	2.10	926	6.9
15.09	14.44	14.51	5.04	6.94	222	3.62	727	11.9
20.01	19.36	19.41	4.90	8.32	180	5.15	589	16.9
25.10	24.44	24.49	5.07	10.81	143	6.67	469	21.9
30.02	29.36	29.40	4.91	9.68	155	8.20	508	26.9
35.27	34.61	34.65	5.24	10.72	149	9.75	489	32.0
40.03	39.37	39.40	4.75	9.45	153	11.27	503	37.0
46.26	45.60	45.63	6.23	9.24	206	12.95	674	42.5
50.03	49.38	49.40	3.77	3.16	364	14.47	1194	47.5
55.12	54.46	54.48	5.08	3.37	459	15.82	1507	51.9
60.04	59.38	59.40	4.92	2.69	558	17.35	1829	56.9
63.16	62.50	62.52	3.12	2.06	461	18.57	1514	60.9

Shear Wave Velocity Calculations

Job No.: 13-52118
Client: MWH Americas, Inc.
CPT No.: RCPT-11
Location Church Rock Mill Site TSF
Date: November 7, 2013

Geophone Offset: 0.66 (ft)
Source Offset: 1.50 (ft)

Test Depth (ft)	Geophone Depth (ft)	Ray Path (ft)	Incremental Distance (ft)	Time Interval (ms)	Interval Velocity (m/s)	Interval Depth (m)	Interval Velocity (ft/s)	Interval Depth (ft)
5.08	4.43	4.68						
10.01	9.35	9.47	4.79	5.03	291	2.10	953	6.9
15.26	14.60	14.68	5.21	6.35	250	3.65	821	12.0
20.01	19.36	19.41	4.74	5.65	255	5.17	838	17.0
25.10	24.44	24.49	5.07	5.95	260	6.67	853	21.9
30.02	29.36	29.40	4.91	5.48	273	8.20	897	26.9
35.10	34.45	34.48	5.08	5.15	301	9.72	987	31.9
40.03	39.37	39.40	4.92	5.36	280	11.25	918	36.9
45.11	44.46	44.48	5.08	6.13	253	12.77	829	41.9
50.03	49.38	49.40	4.92	7.59	197	14.30	648	46.9
55.12	54.46	54.48	5.08	7.94	195	15.82	640	51.9
60.04	59.38	59.40	4.92	4.00	375	17.35	1229	56.9
65.29	64.63	64.65	5.25	4.81	332	18.90	1091	62.0
70.21	69.55	69.57	4.92	4.64	323	20.45	1060	67.1
75.13	74.47	74.49	4.92	4.90	306	21.95	1003	72.0
80.05	79.40	79.41	4.92	4.90	306	23.45	1005	76.9
85.14	84.48	84.49	5.08	4.12	376	24.97	1235	81.9
90.06	89.40	89.42	4.92	4.84	310	26.50	1016	86.9
95.14	94.49	94.50	5.08	3.11	499	28.02	1637	91.9

Shear Wave Velocity Calculations

Job No.: 13-52118
Client: MWH Americas, Inc.
CPT No.: RCPT-12
Location Church Rock Mill Site TSF
Date: November 7, 2013

Geophone Offset: 0.66 (ft)
Source Offset: 1.50 (ft)

Test Depth (ft)	Geophone Depth (ft)	Ray Path (ft)	Incremental Distance (ft)	Time Interval (ms)	Interval Velocity (m/s)	Interval Depth (m)	Interval Velocity (ft/s)	Interval Depth (ft)
5.08	4.43	4.68						
10.01	9.35	9.47	4.79	4.69	311	2.10	1021	6.9
15.09	14.44	14.51	5.04	5.05	305	3.62	999	11.9
20.01	19.36	19.41	4.90	5.17	289	5.15	948	16.9
25.10	24.44	24.49	5.07	5.42	285	6.67	936	21.9
30.02	29.36	29.40	4.91	5.58	268	8.20	881	26.9
35.10	34.45	34.48	5.08	5.56	278	9.72	913	31.9
40.03	39.37	39.40	4.92	5.55	270	11.25	886	36.9
45.11	44.46	44.48	5.08	4.67	332	12.77	1089	41.9
50.03	49.38	49.40	4.92	5.18	289	14.30	949	46.9

Shear Wave Velocity Calculations

Job No.: 13-52118
Client: MWH Americas, Inc.
CPT No.: RCPT-15
Location Church Rock Mill Site TSF
Date: November 6, 2013

Geophone Offset: 0.66 (ft)
Source Offset: 1.50 (ft)

Test Depth (ft)	Geophone Depth (ft)	Ray Path (ft)	Incremental Distance (ft)	Time Interval (ms)	Interval Velocity (m/s)	Interval Depth (m)	Interval Velocity (ft/s)	Interval Depth (ft)
5.08	4.43	4.68						
10.01	9.35	9.47	4.79	7.05	207	2.10	680	6.9
15.09	14.44	14.51	5.04	8.31	185	3.62	607	11.9
20.01	19.36	19.41	4.90	8.07	185	5.15	607	16.9
25.10	24.44	24.49	5.07	8.24	188	6.67	616	21.9
30.02	29.36	29.40	4.91	7.72	194	8.20	636	26.9
35.10	34.45	34.48	5.08	6.35	244	9.72	801	31.9
40.03	39.37	39.40	4.92	4.49	334	11.25	1095	36.9
45.93	45.28	45.30	5.90	5.41	333	12.90	1092	42.3
50.03	49.38	49.40	4.10	3.40	367	14.42	1206	47.3
55.12	54.46	54.48	5.08	4.45	348	15.82	1142	51.9

Seismic CPT Plots (SCPT Plots)

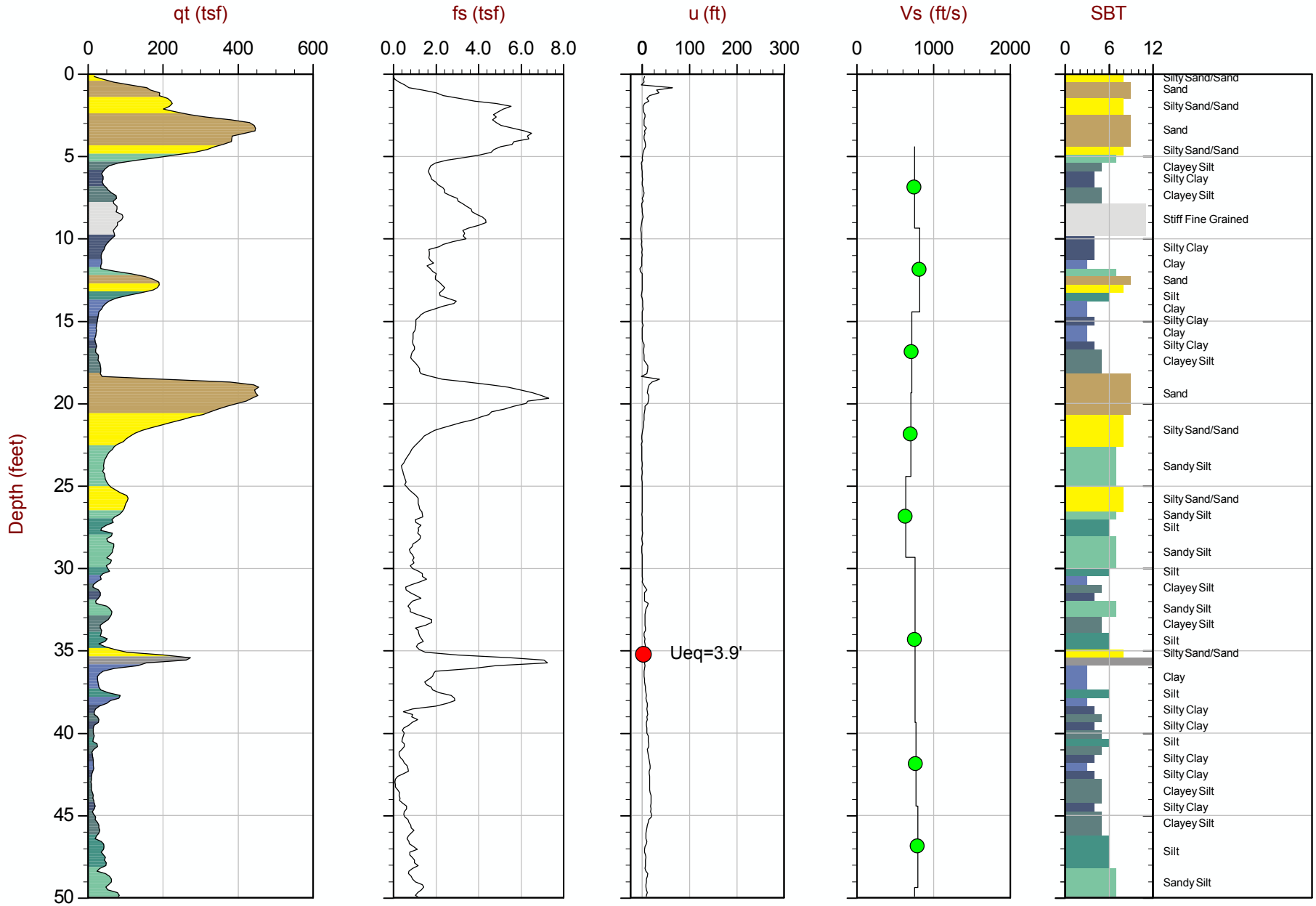
CONETEC

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:07:13 15:36
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-01
Cone: 155:T1500F15U500



Max Depth: 26.950 m / 88.42 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP01.COR
Unit Wt: SBT Chart Soil Zones

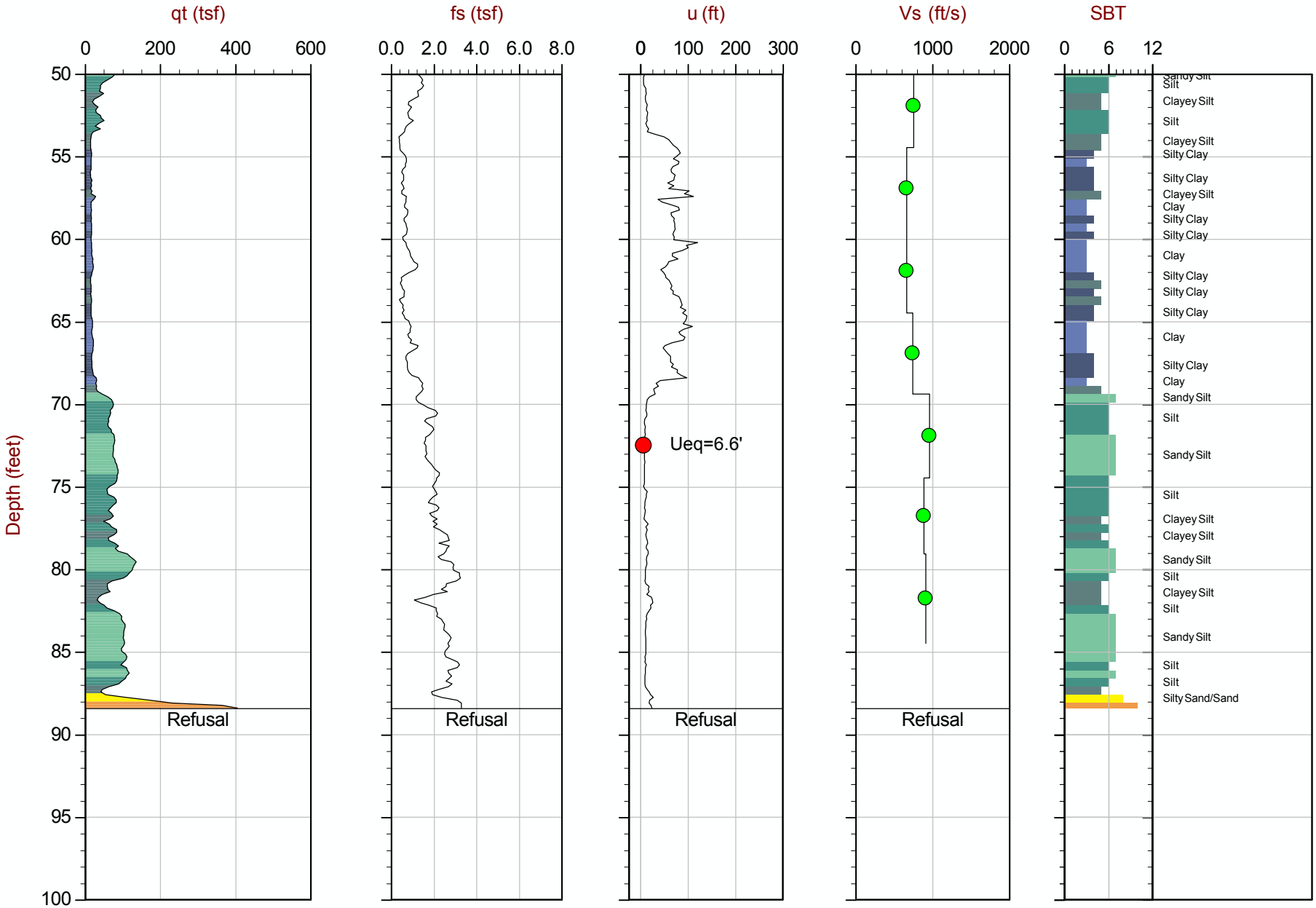
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.649117 Long: -108.501667
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:07:13 15:36
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-01
Cone: 155:T1500F15U500



Max Depth: 26.950 m / 88.42 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP01.COR
Unit Wt: SBT Chart Soil Zones

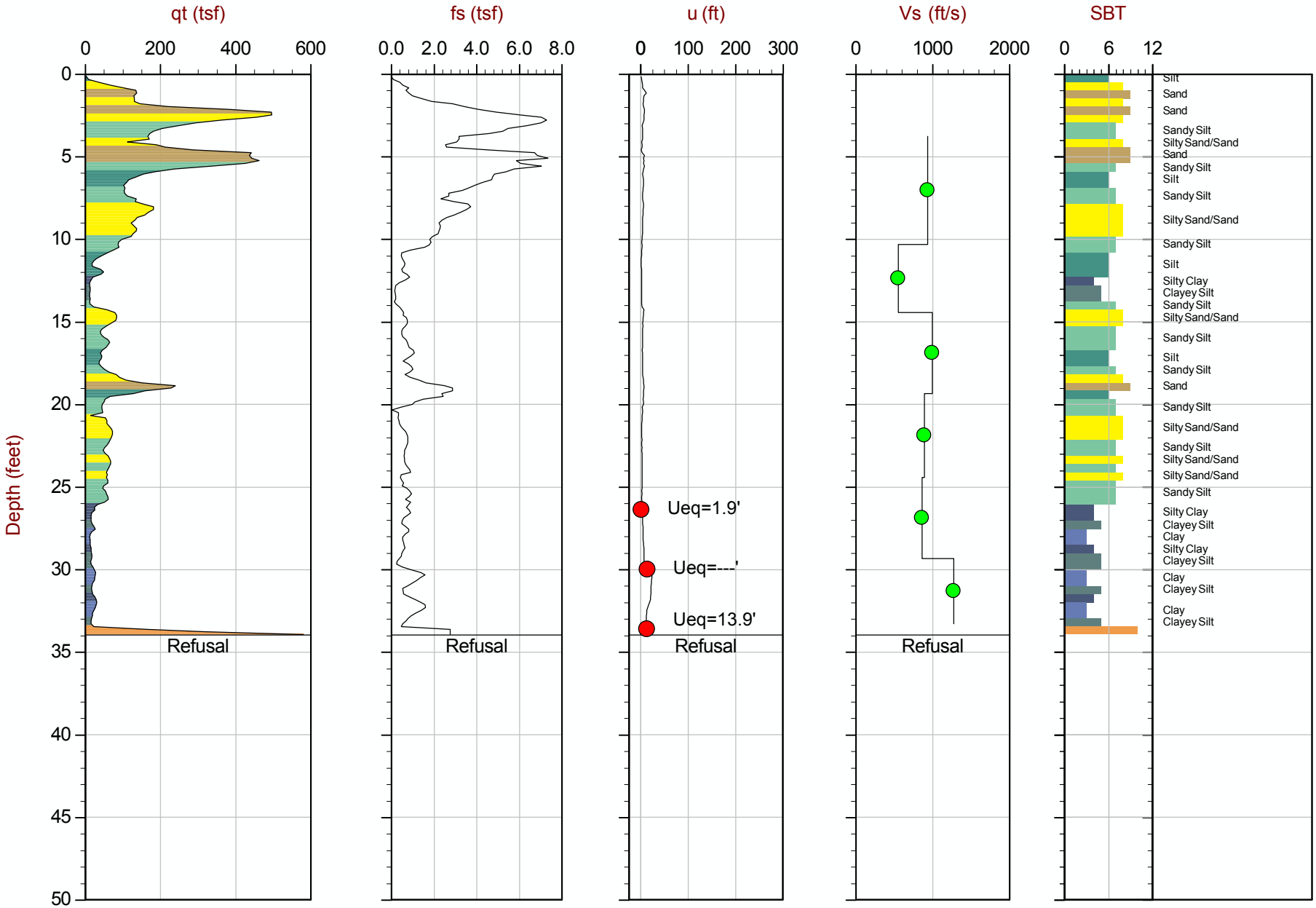
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.649117 Long: -108.501667
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:05:13 13:37
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-02
Cone: 155:T1500F15U500



Max Depth: 10.350 m / 33.96 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP02.COR
Unit Wt: SBT Chart Soil Zones

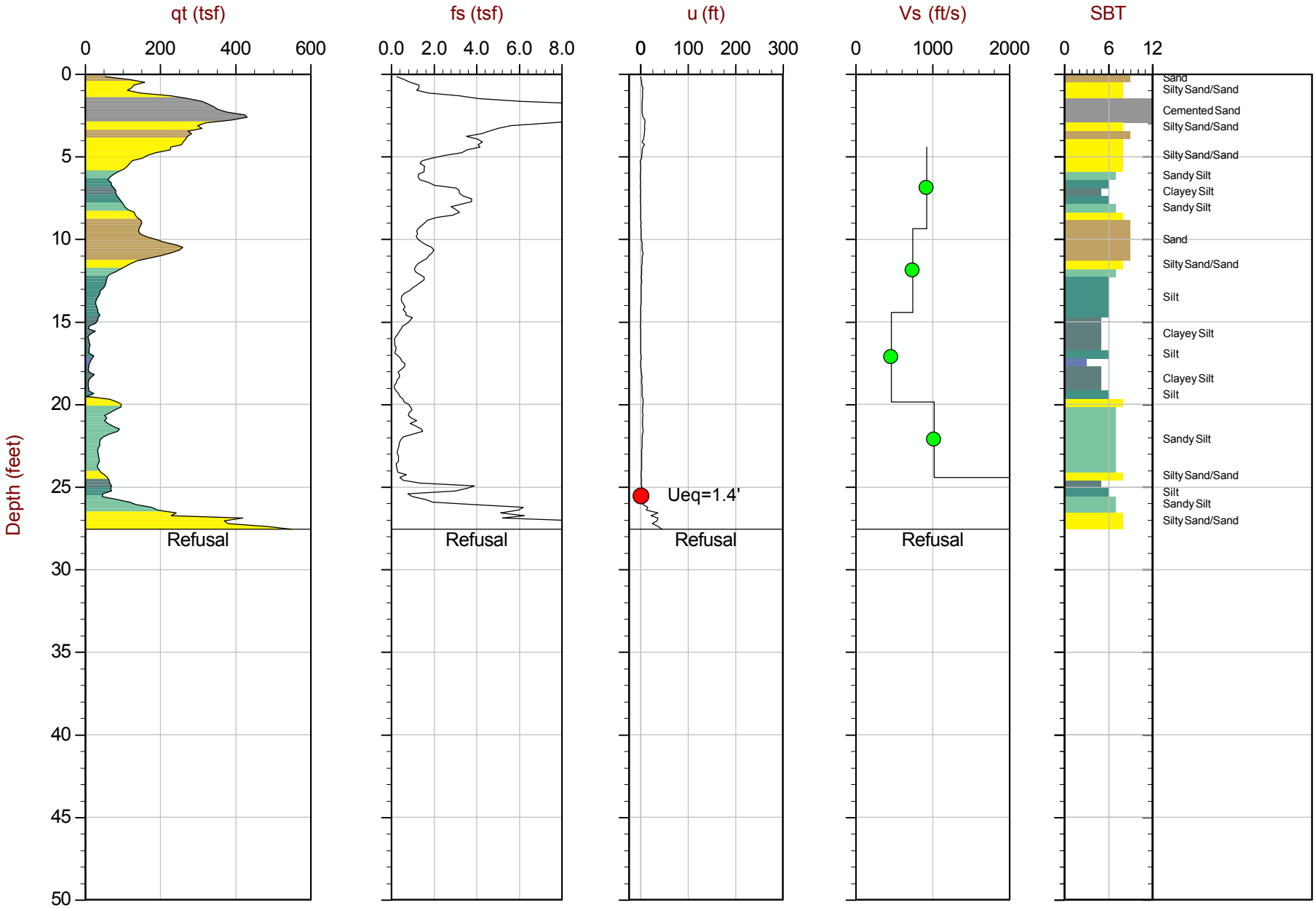
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.650200 Long: -108.499750
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:05:13 13:39
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-04
Cone: 155:T1500F15U500



Max Depth: 8.400 m / 27.56 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP04.COR
Unit Wt: SBT Chart Soil Zones

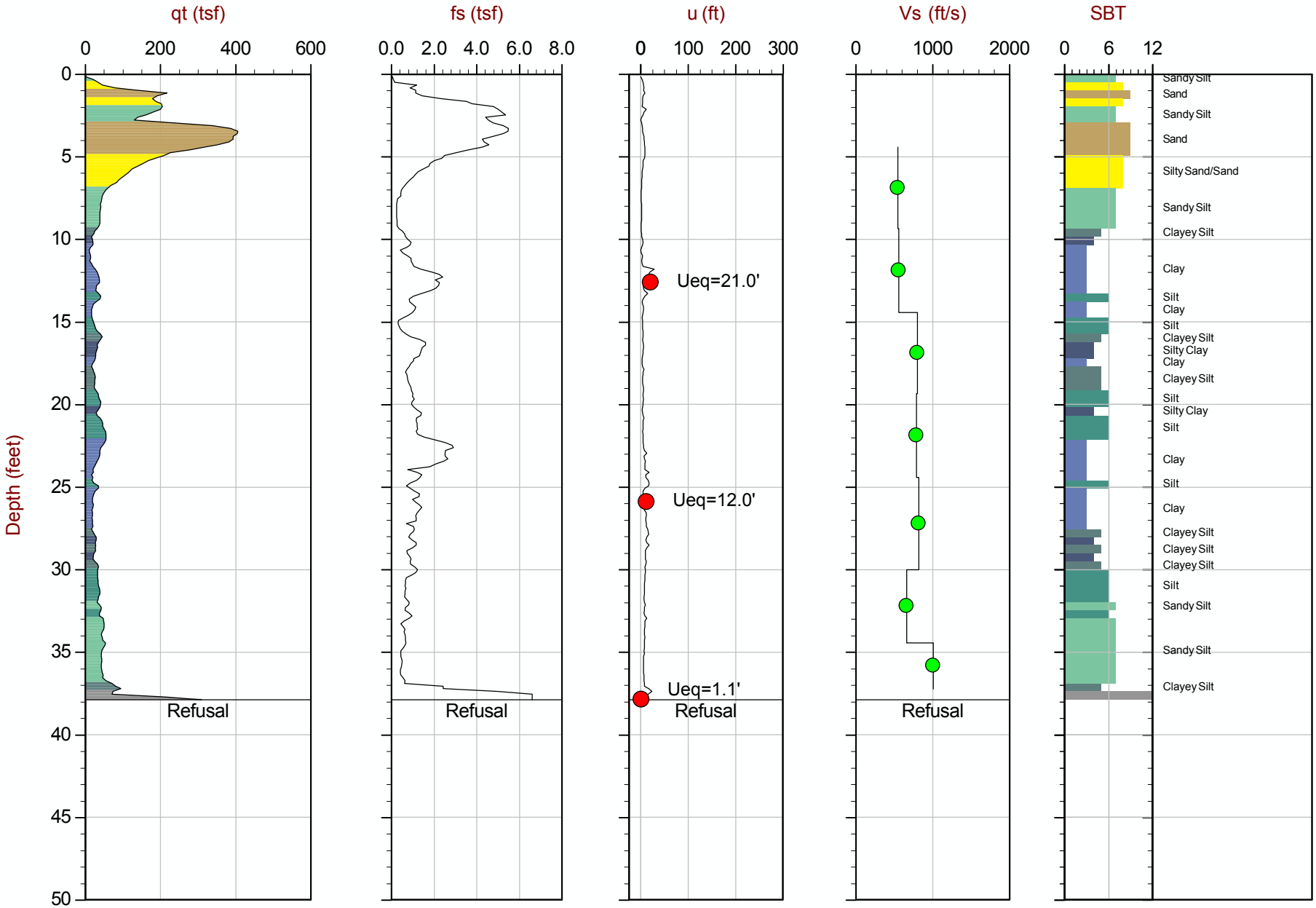
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.649533 Long: -108.500483
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:06:13 08:30
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-05
Cone: 155:T1500F15U500



Max Depth: 11.550 m / 37.89 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP05.COR
Unit Wt: SBT Chart Soil Zones

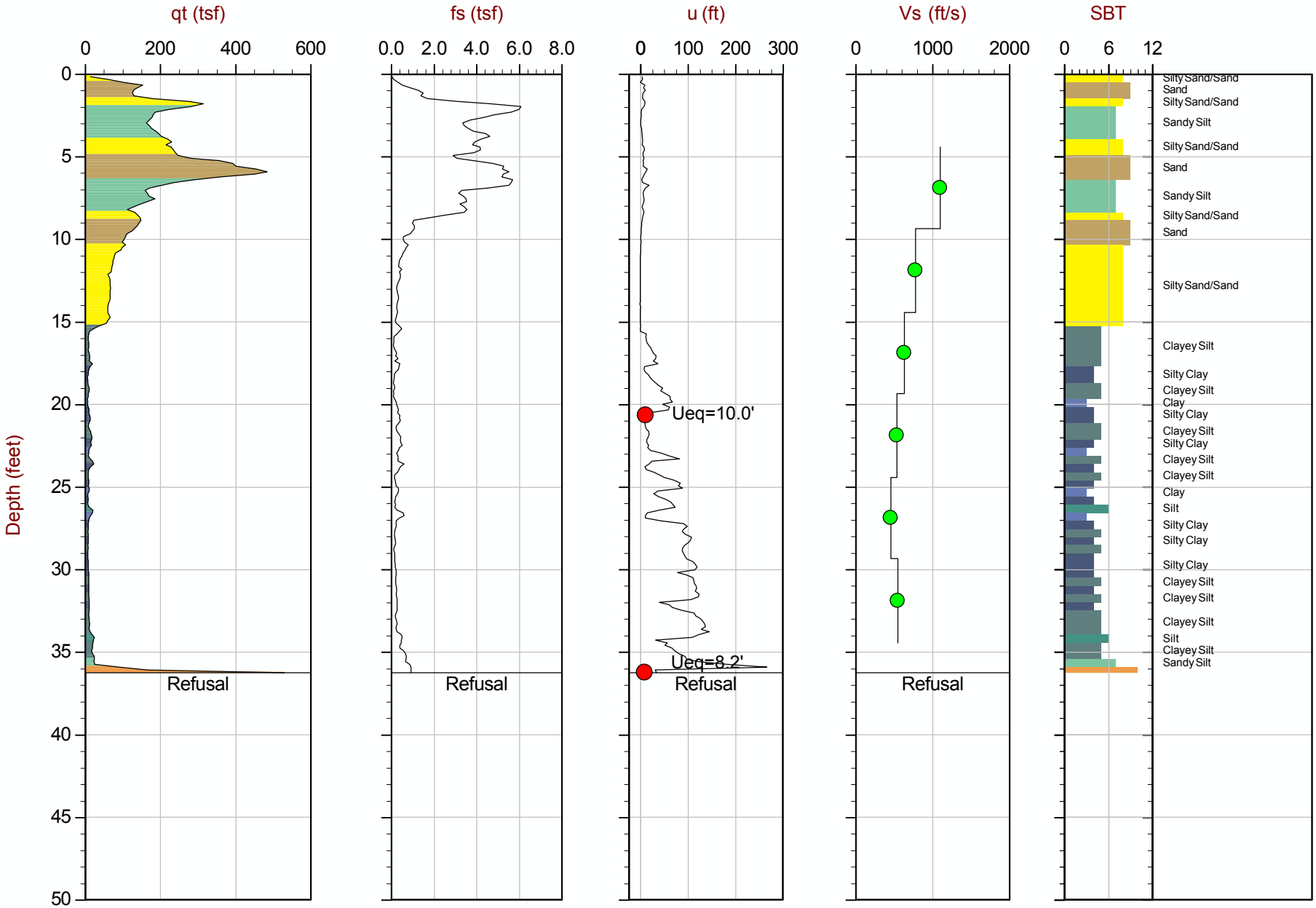
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.648633 Long: -108.498283
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:06:13 13:01
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-06
Cone: 155:T1500F15U500



Max Depth: 11.050 m / 36.25 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP06.COR
Unit Wt: SBT Chart Soil Zones

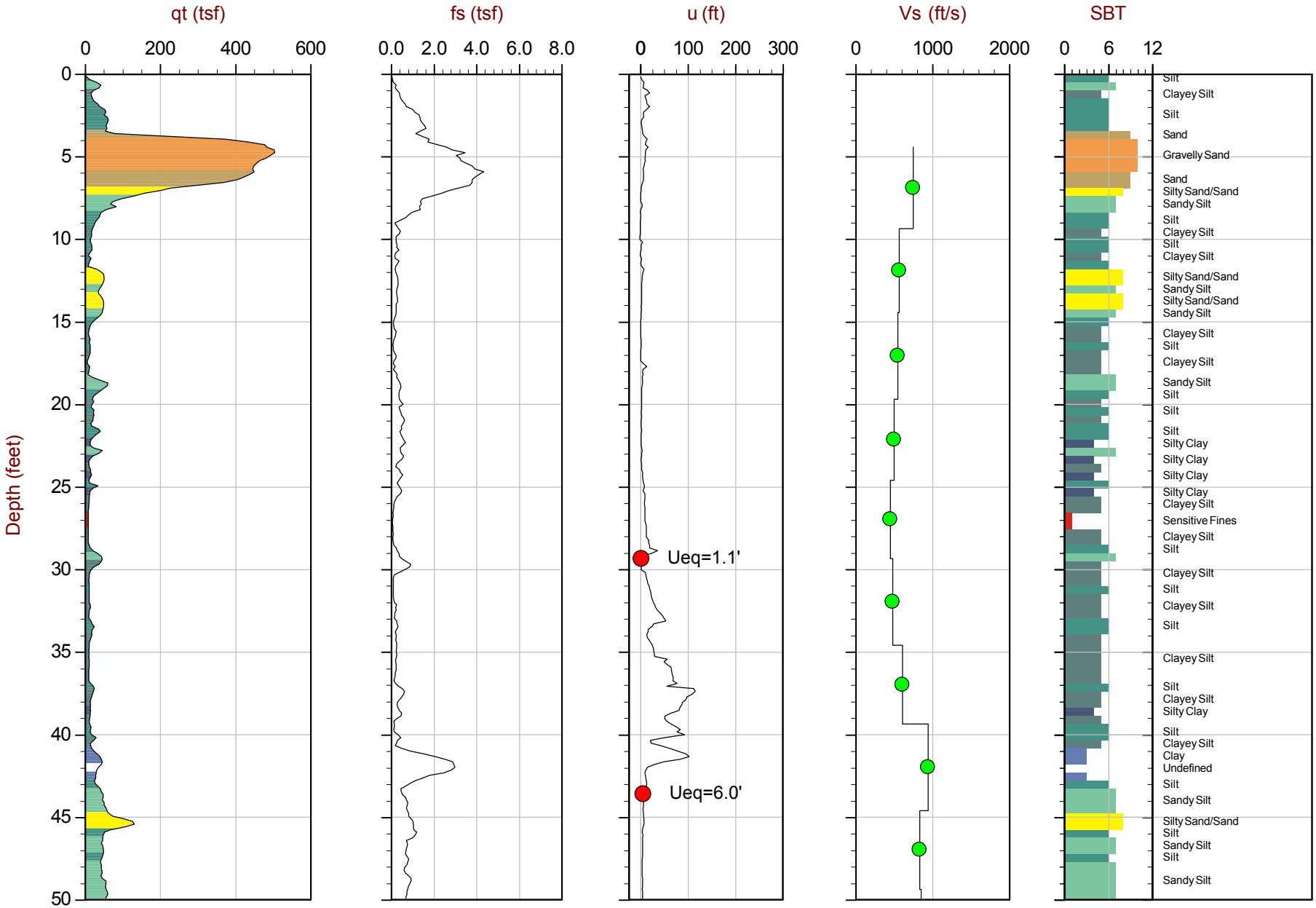
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.648250 Long: -108.497050
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:08:13 11:13
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-07
Cone: 155:T1500F15U500



Max Depth: 21.350 m / 70.05 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP07.COR
Unit Wt: SBT Chart Soil Zones

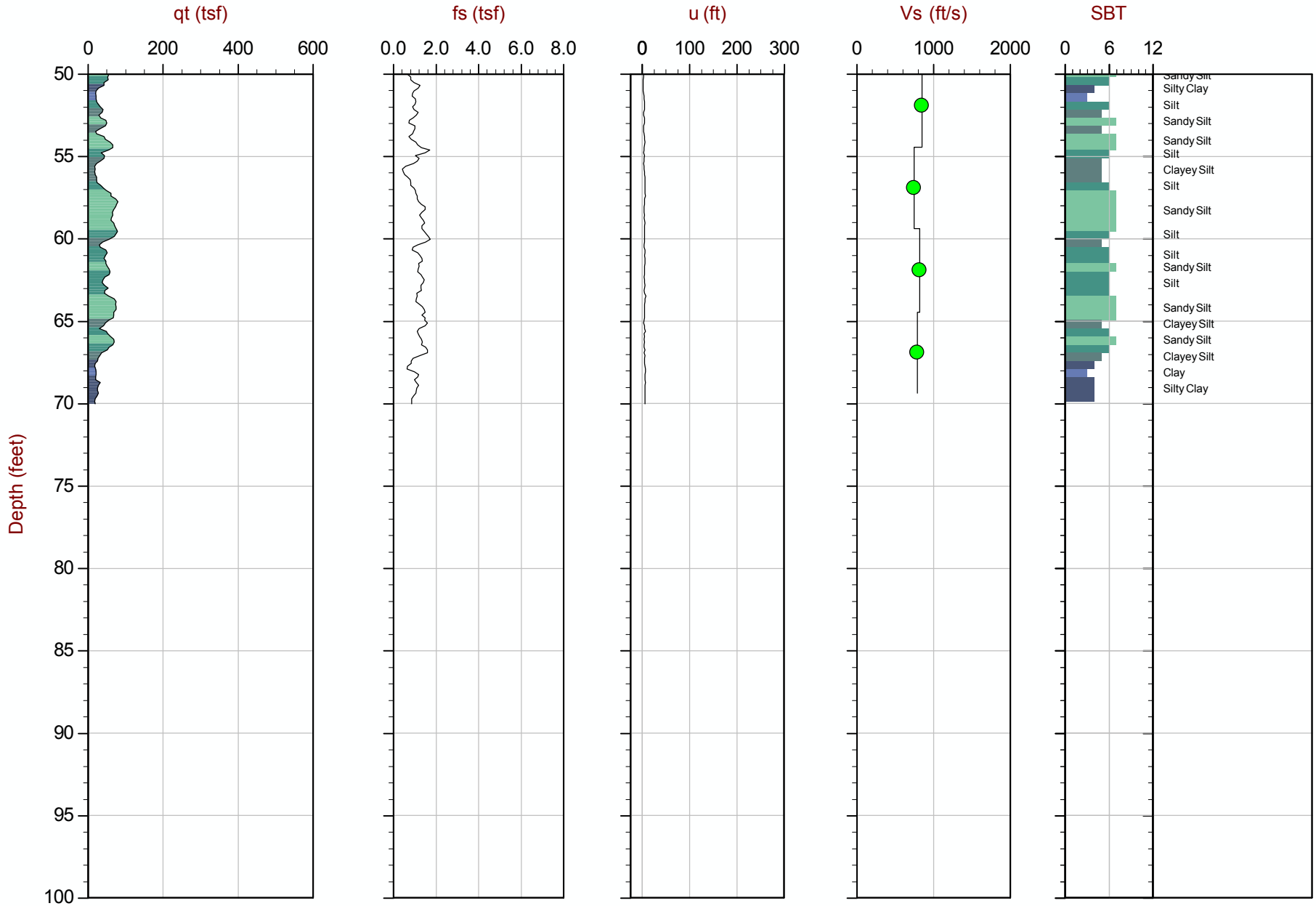
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647600 Long: -108.501200
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:08:13 11:13
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-07
Cone: 155:T1500F15U500



Max Depth: 21.350 m / 70.05 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP07.COR
Unit Wt: SBT Chart Soil Zones

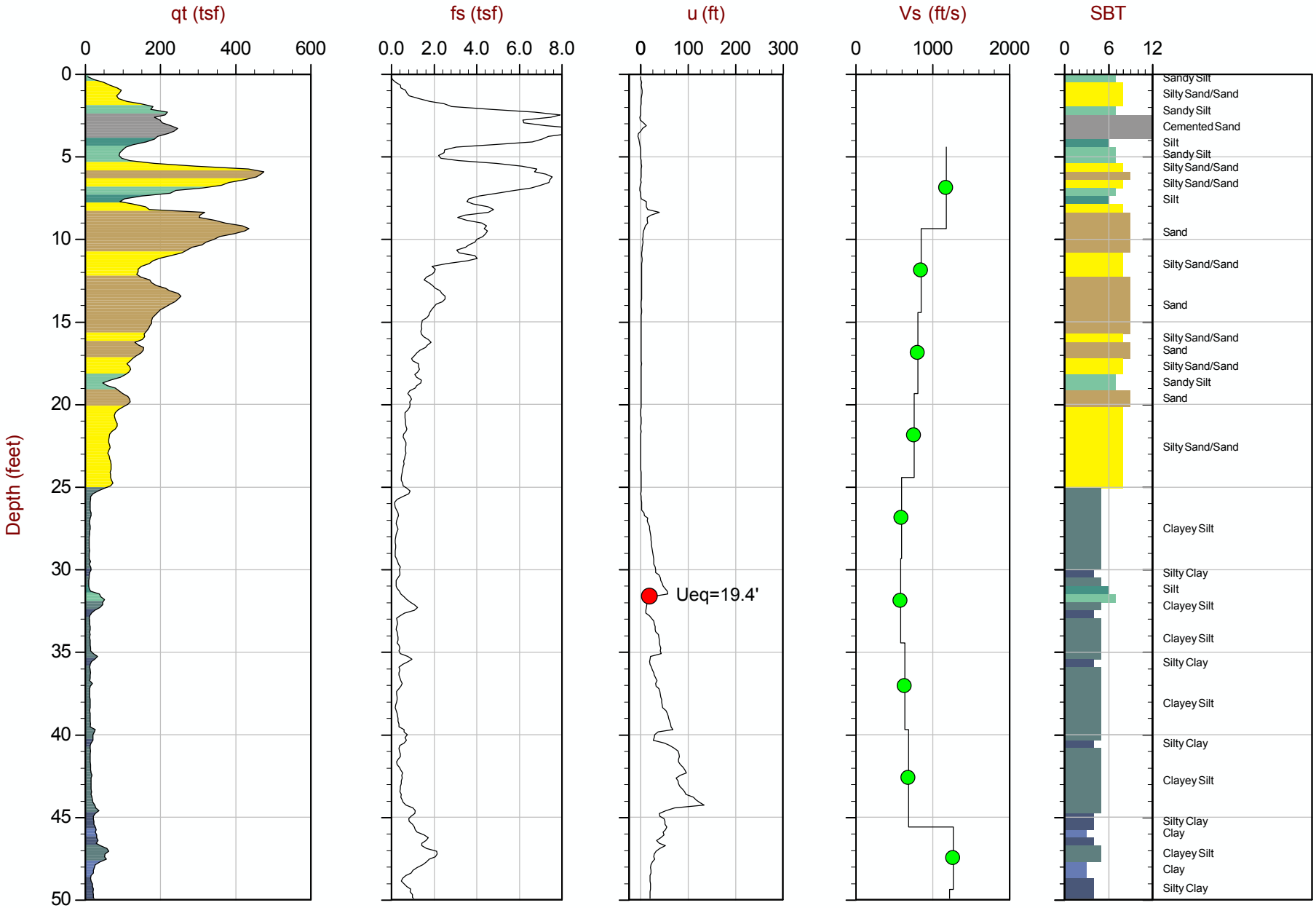
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647600 Long: -108.501200
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:07:13 08:21
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-08
Cone: 155:T1500F15U500



Max Depth: 18.550 m / 60.86 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP08.COR
Unit Wt: SBT Chart Soil Zones

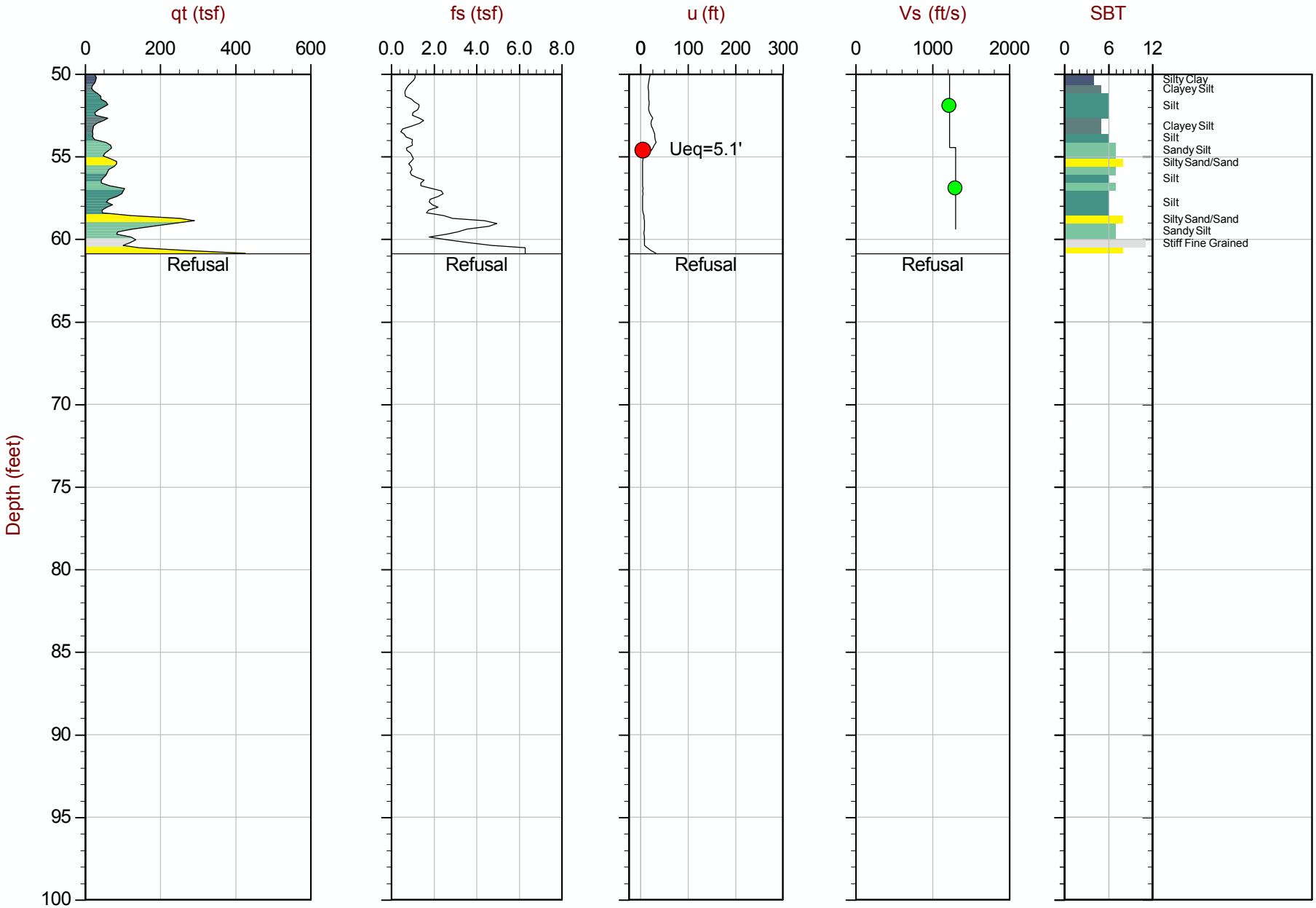
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647250 Long: -108.497250
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:07:13 08:21
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-08
Cone: 155:T1500F15U500



Max Depth: 18.550 m / 60.86 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP08.COR
Unit Wt: SBT Chart Soil Zones

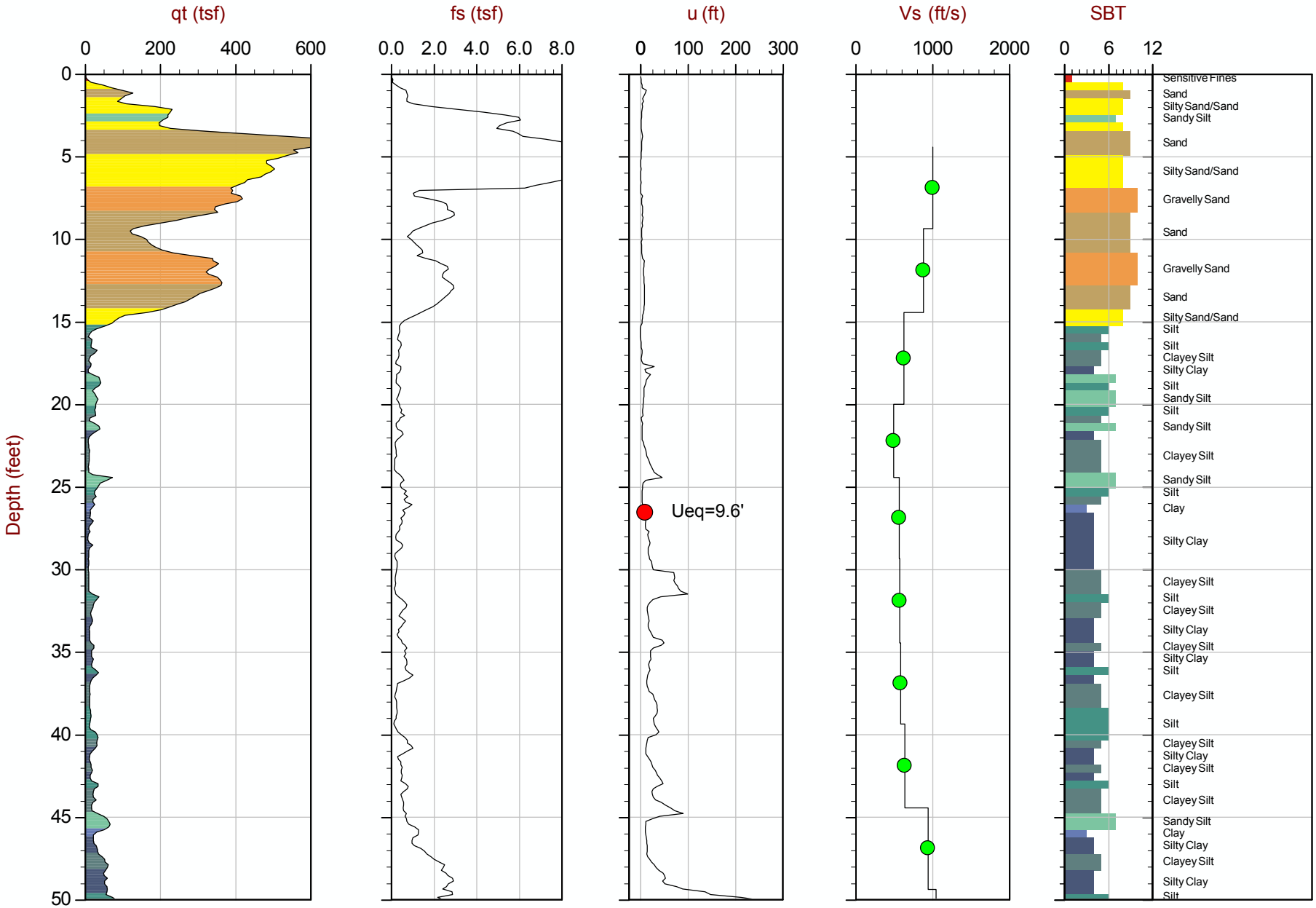
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647250 Long: -108.497250
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:06:13 14:52
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-09
Cone: 155:T1500F15U500



Max Depth: 21.150 m / 69.39 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP09.COR
Unit Wt: SBT Chart Soil Zones

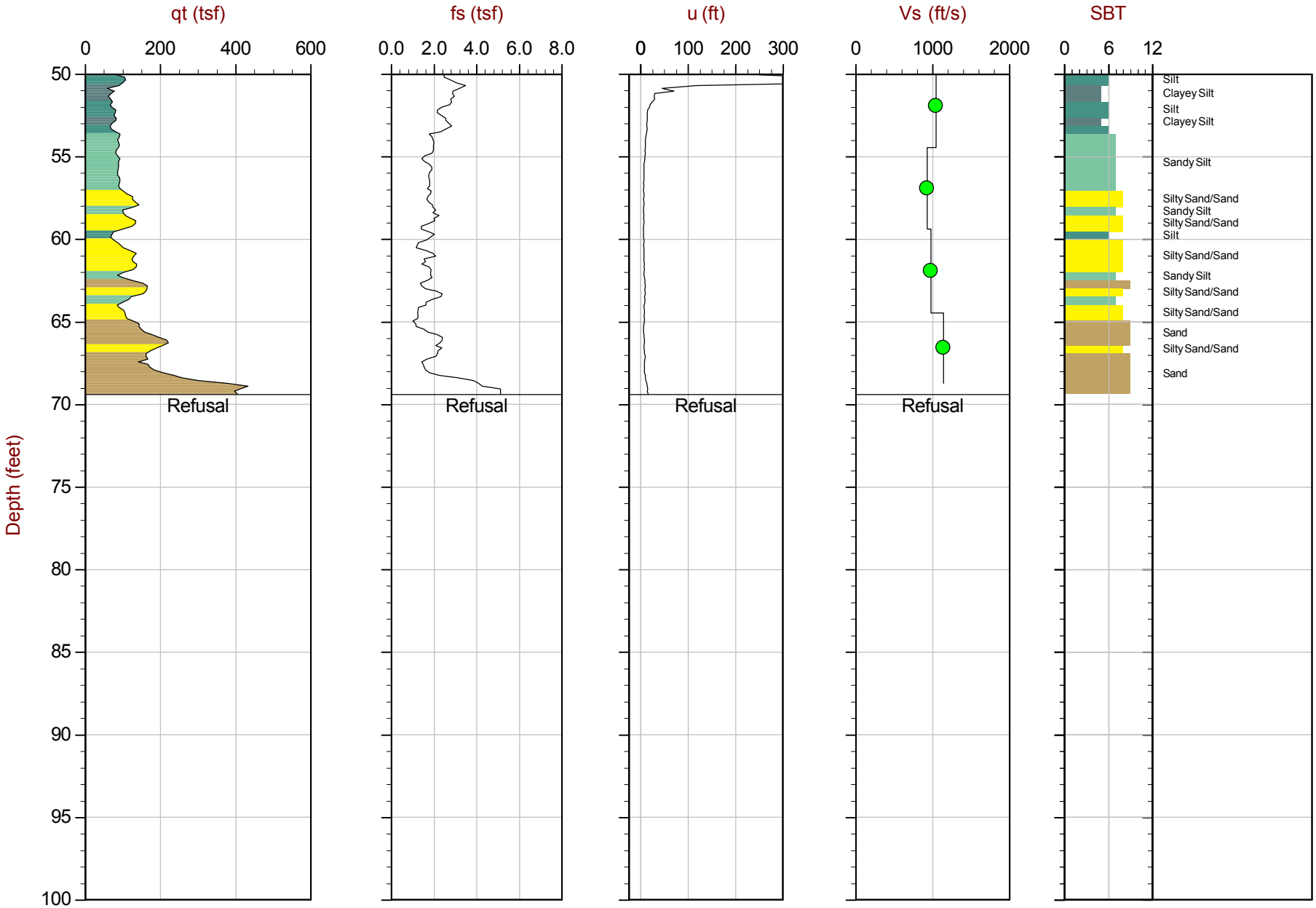
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647750 Long: -108.498150
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:06:13 14:52
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-09
Cone: 155:T1500F15U500



Max Depth: 21.150 m / 69.39 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP09.COR
Unit Wt: SBT Chart Soil Zones

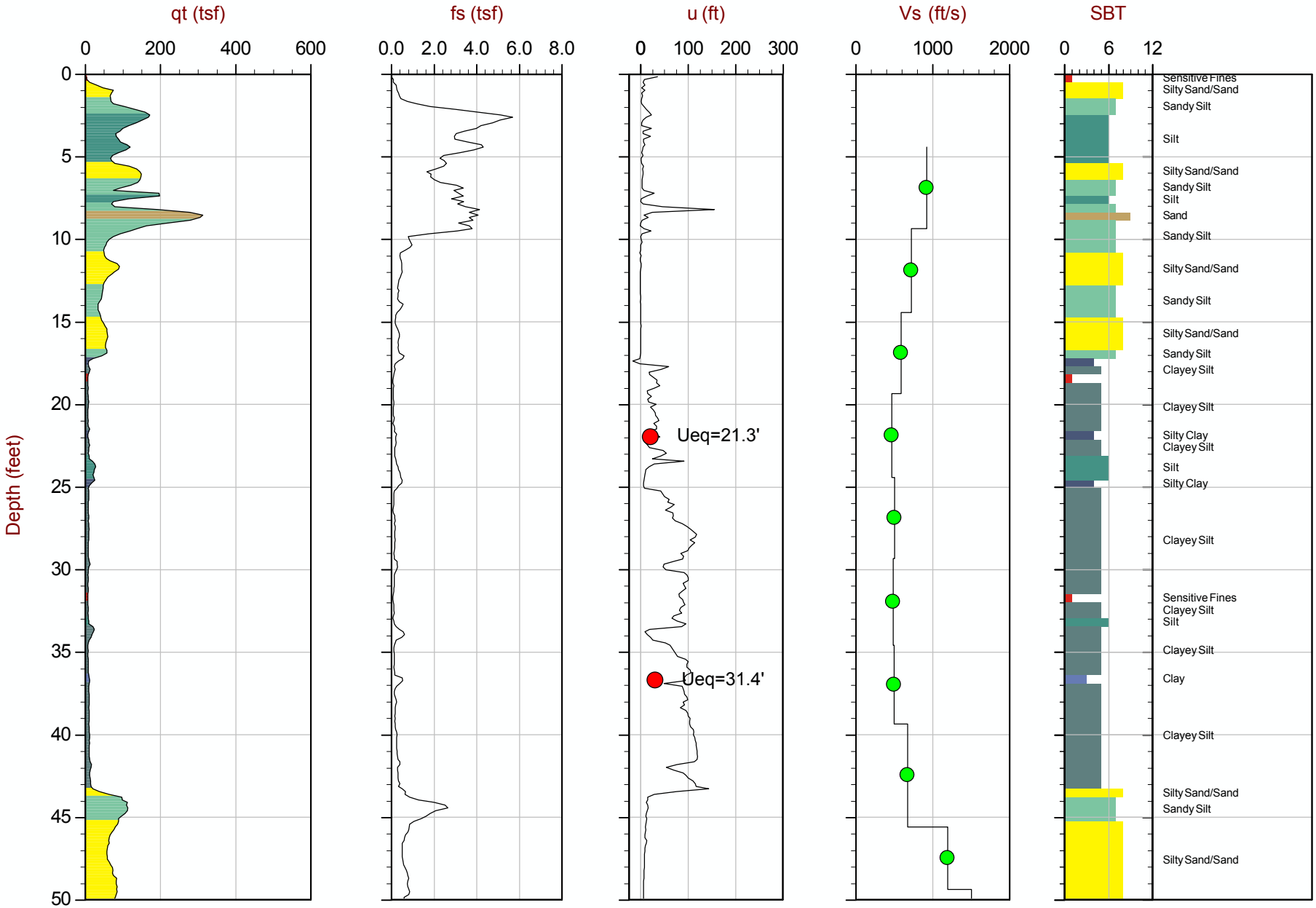
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647750 Long: -108.498150
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:06:13 10:23
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-10
Cone: 155:T1500F15U500



Max Depth: 19.250 m / 63.16 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP10.COR
Unit Wt: SBT Chart Soil Zones

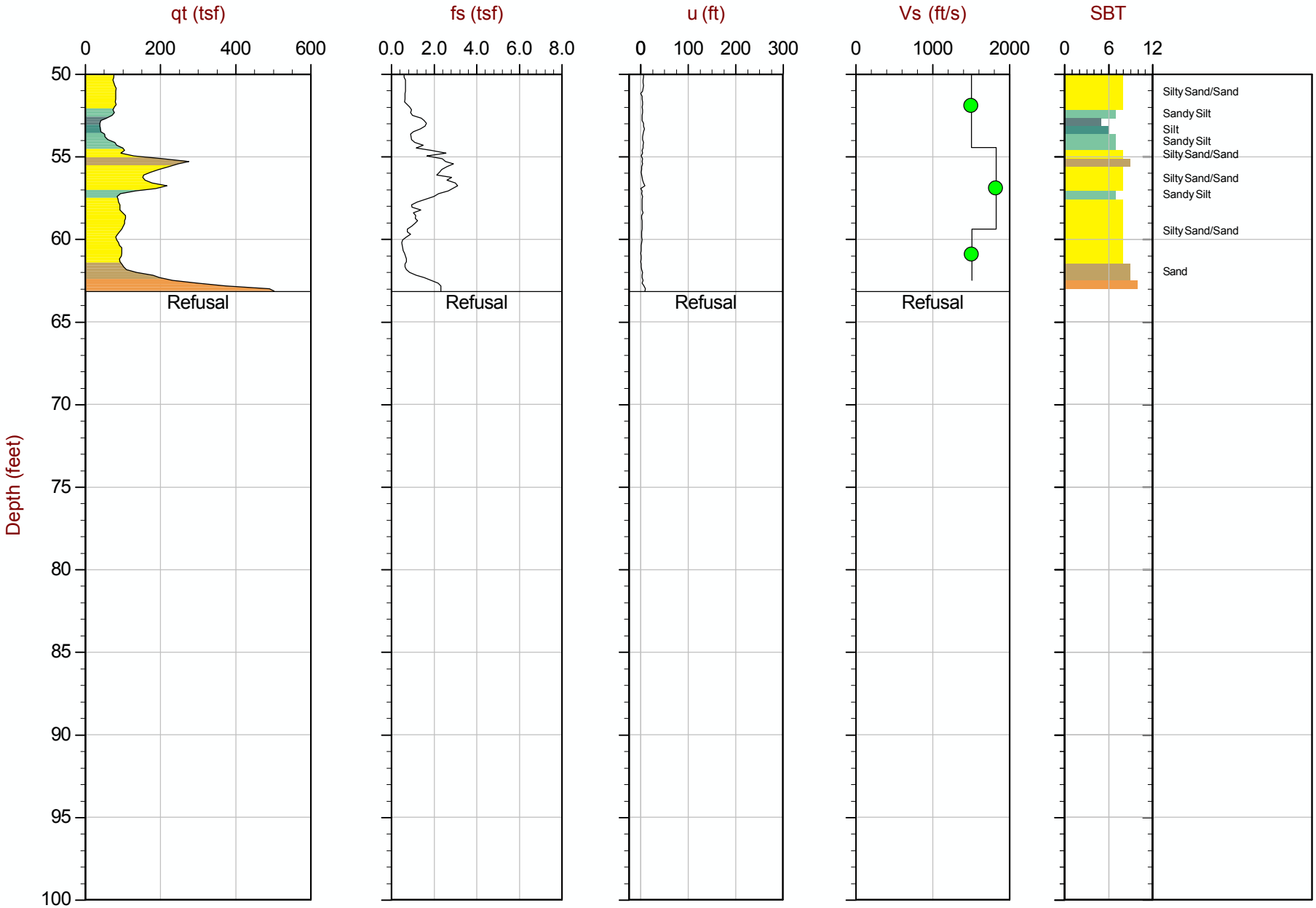
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647833 Long: -108.497217
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:06:13 10:23
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-10
Cone: 155:T1500F15U500



Max Depth: 19.250 m / 63.16 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP10.COR
Unit Wt: SBT Chart Soil Zones

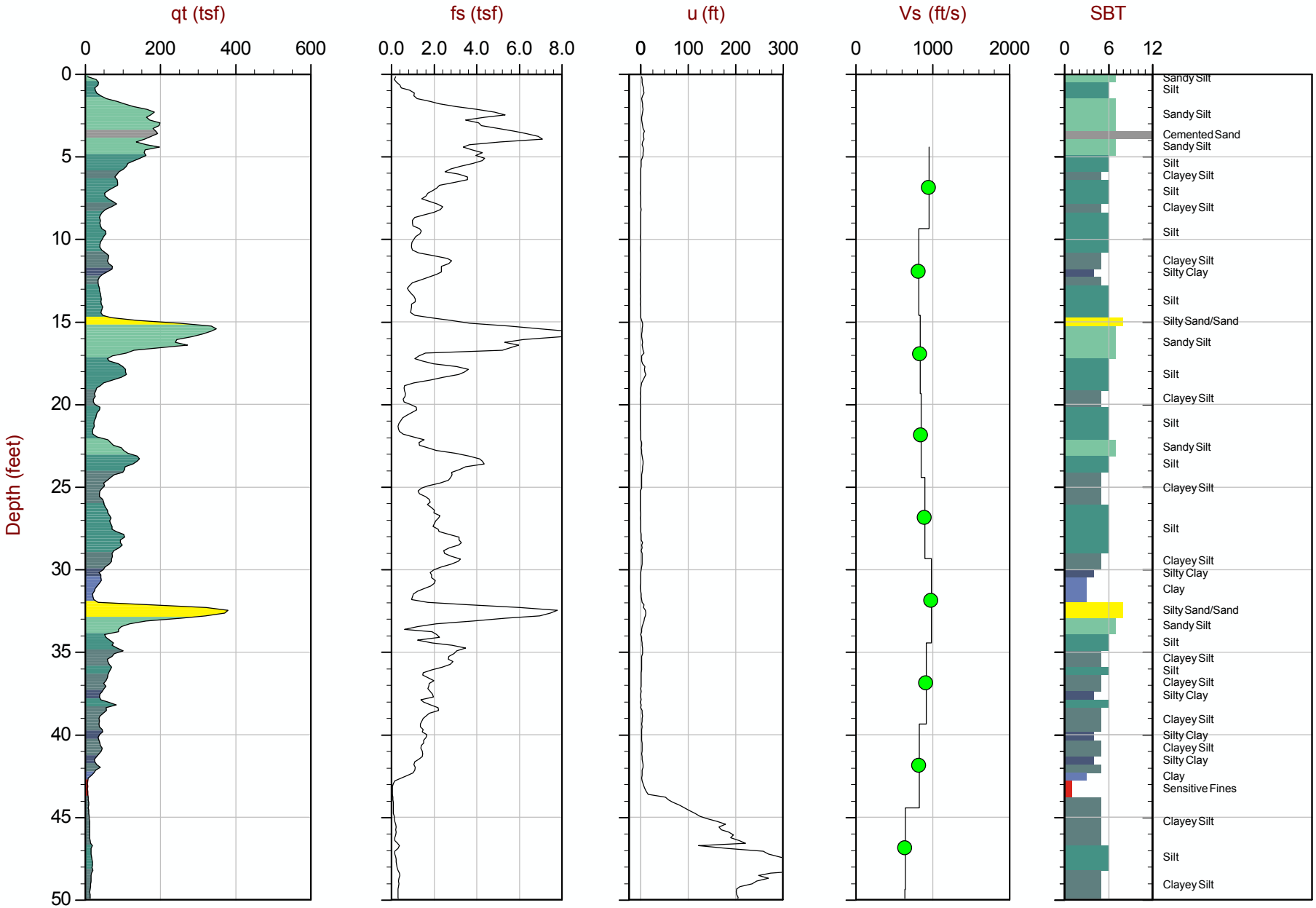
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647833 Long: -108.497217
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:07:13 12:13
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-11
Cone: 155:T1500F15U500



Max Depth: 29.500 m / 96.78 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP11.COR
Unit Wt: SBT Chart Soil Zones

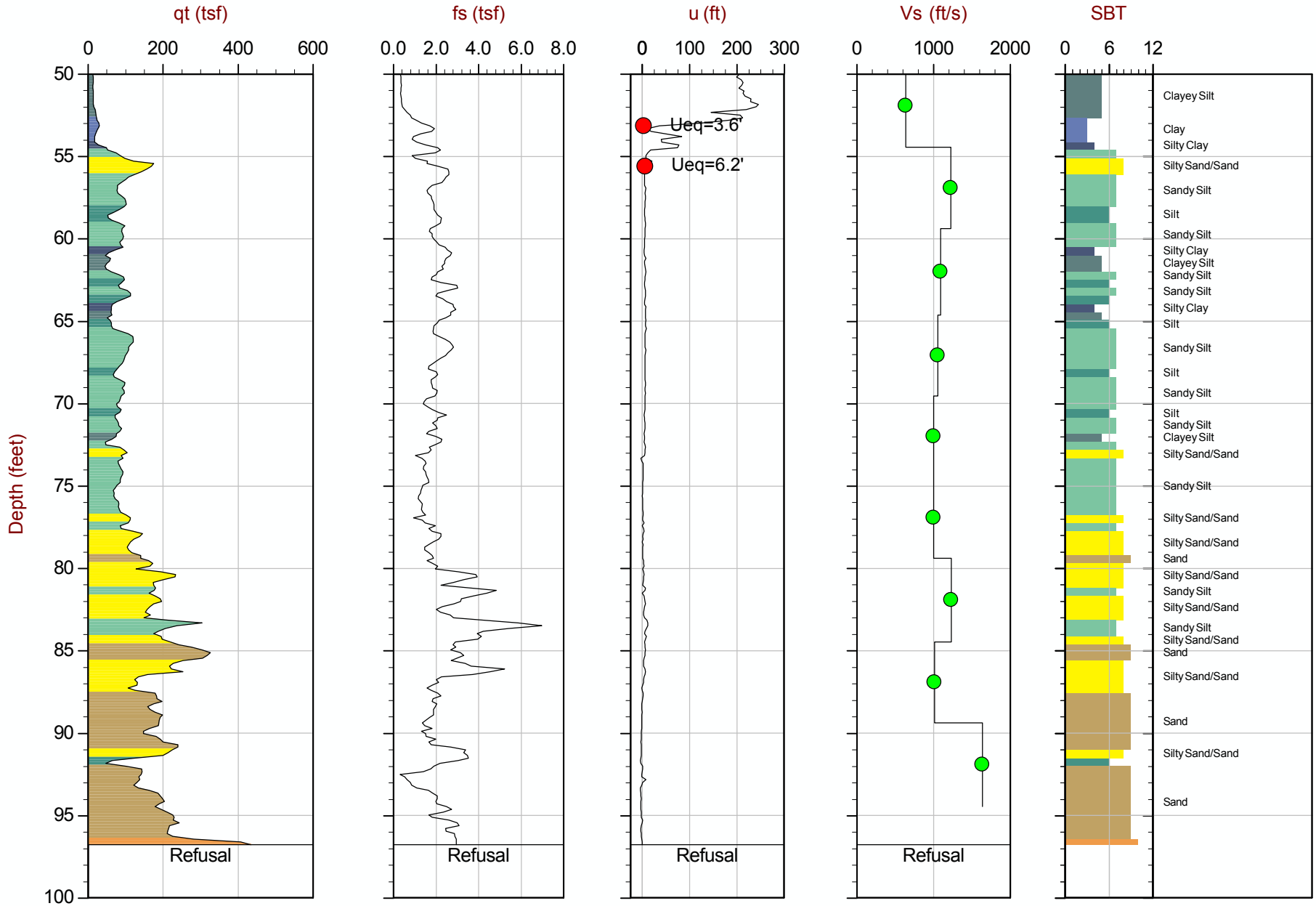
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647650 Long: -108.495850
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:07:13 12:13
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-11
Cone: 155:T1500F15U500



Max Depth: 29.500 m / 96.78 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP11.COR
Unit Wt: SBT Chart Soil Zones

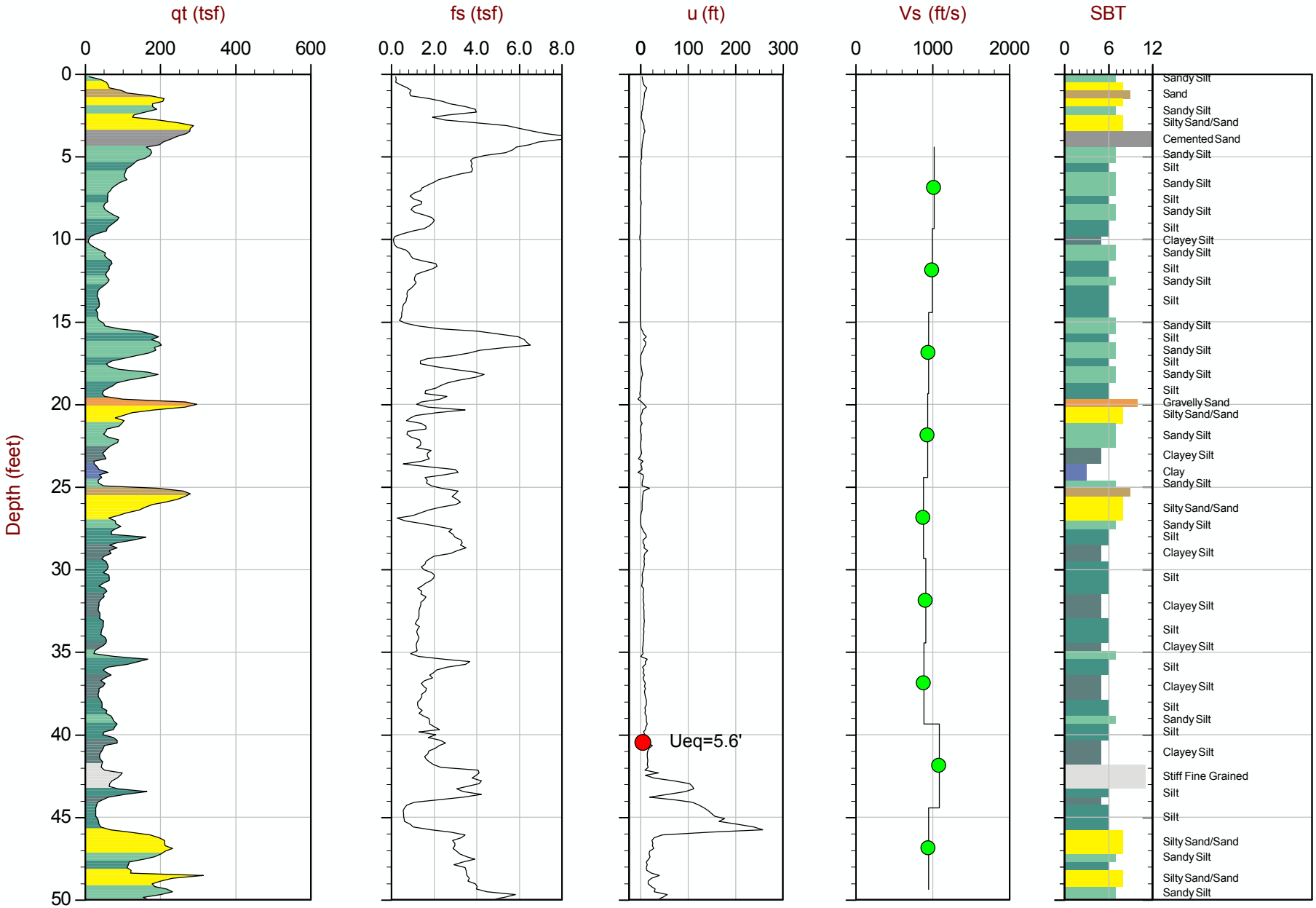
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647650 Long: -108.495850
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:07:13 10:22
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-12
Cone: 155:T1500F15U500



Max Depth: 16.000 m / 52.49 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP12.COR
Unit Wt: SBT Chart Soil Zones

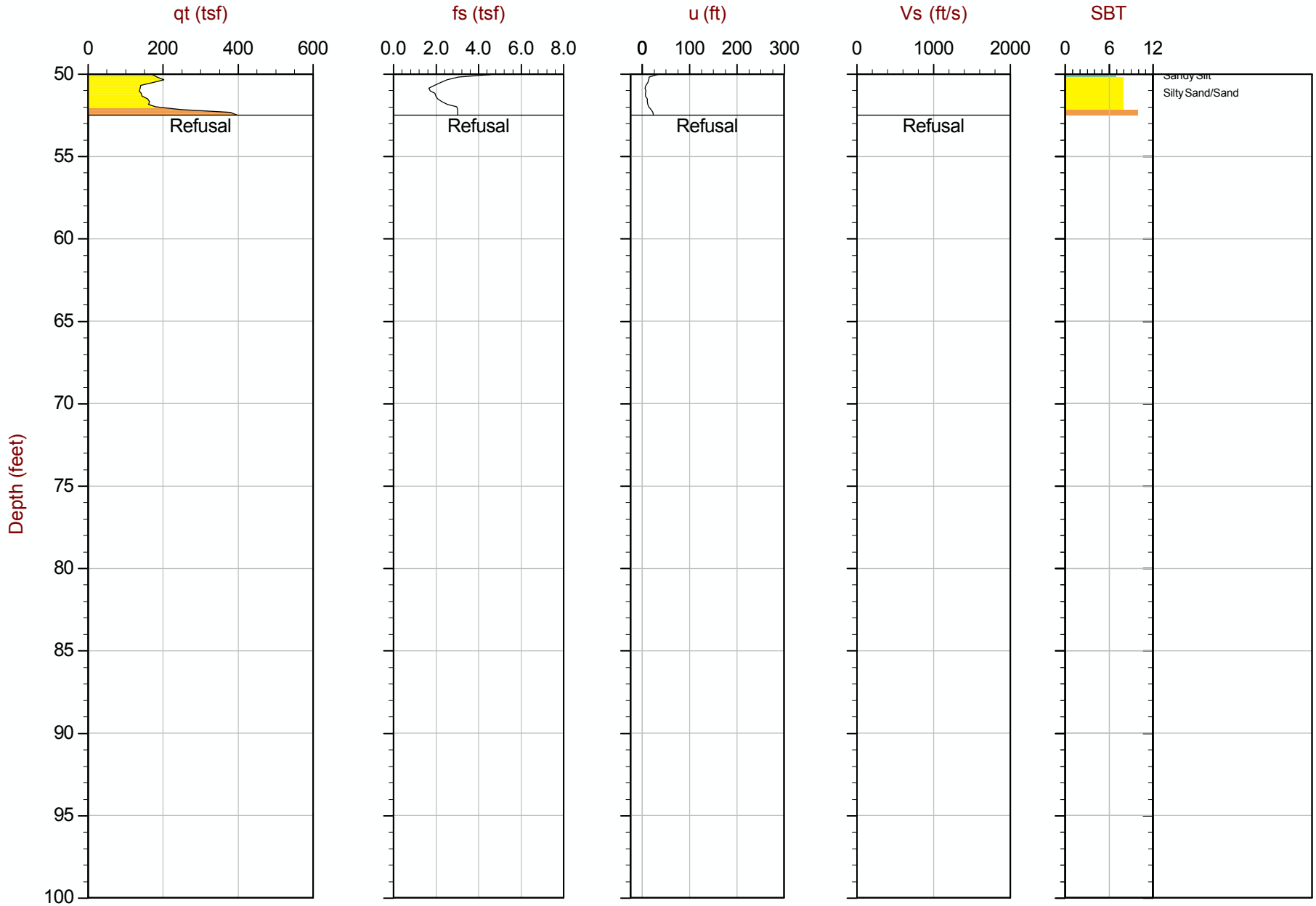
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647150 Long: -108.496000
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:07:13 10:22
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-12
Cone: 155:T1500F15U500



Max Depth: 16.000 m / 52.49 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP12.COR
Unit Wt: SBT Chart Soil Zones

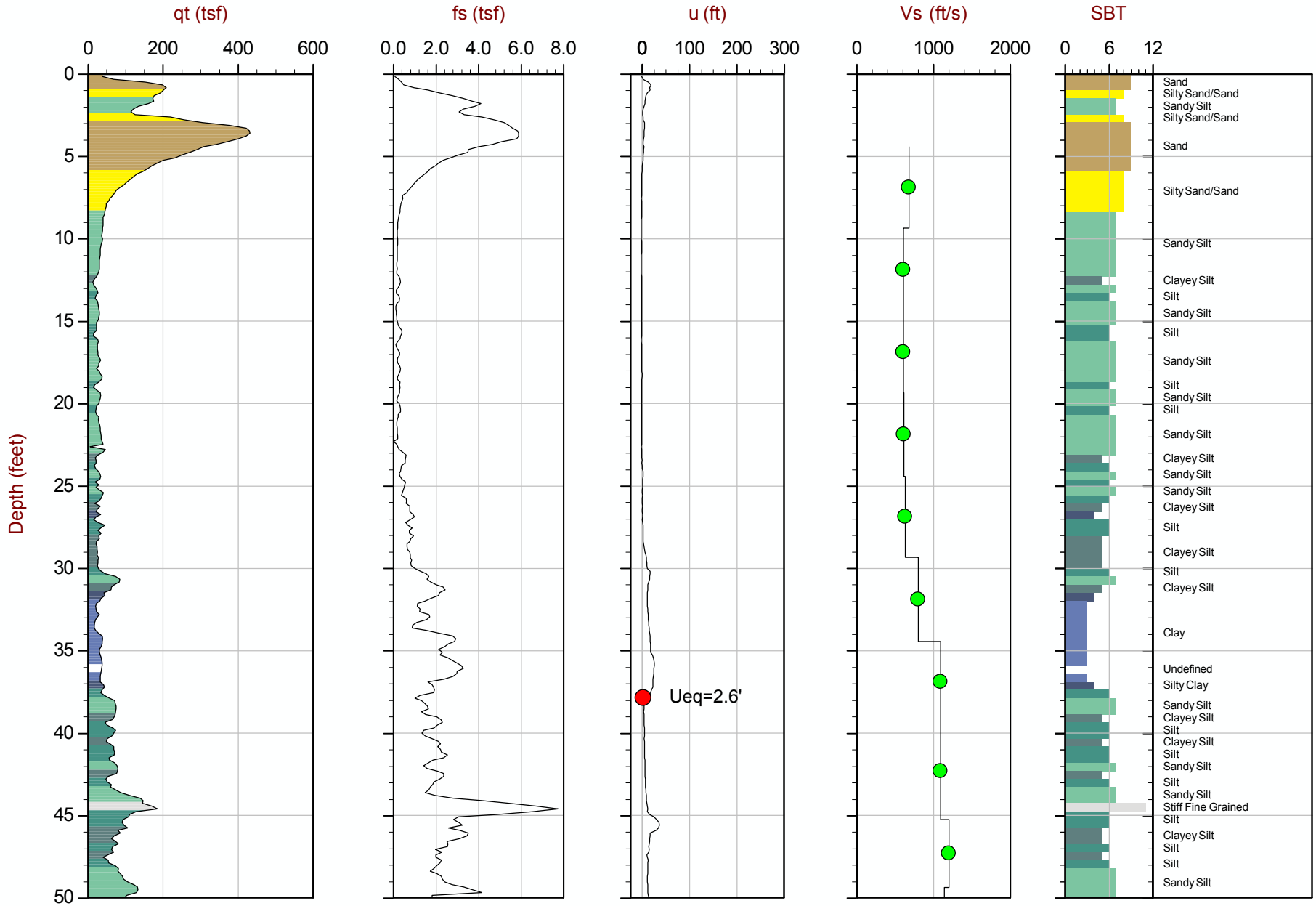
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647150 Long: -108.496000
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:06:13 16:32
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-15
Cone: 155:T1500F15U500



Max Depth: 16.800 m / 55.12 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP15.COR
Unit Wt: SBT Chart Soil Zones

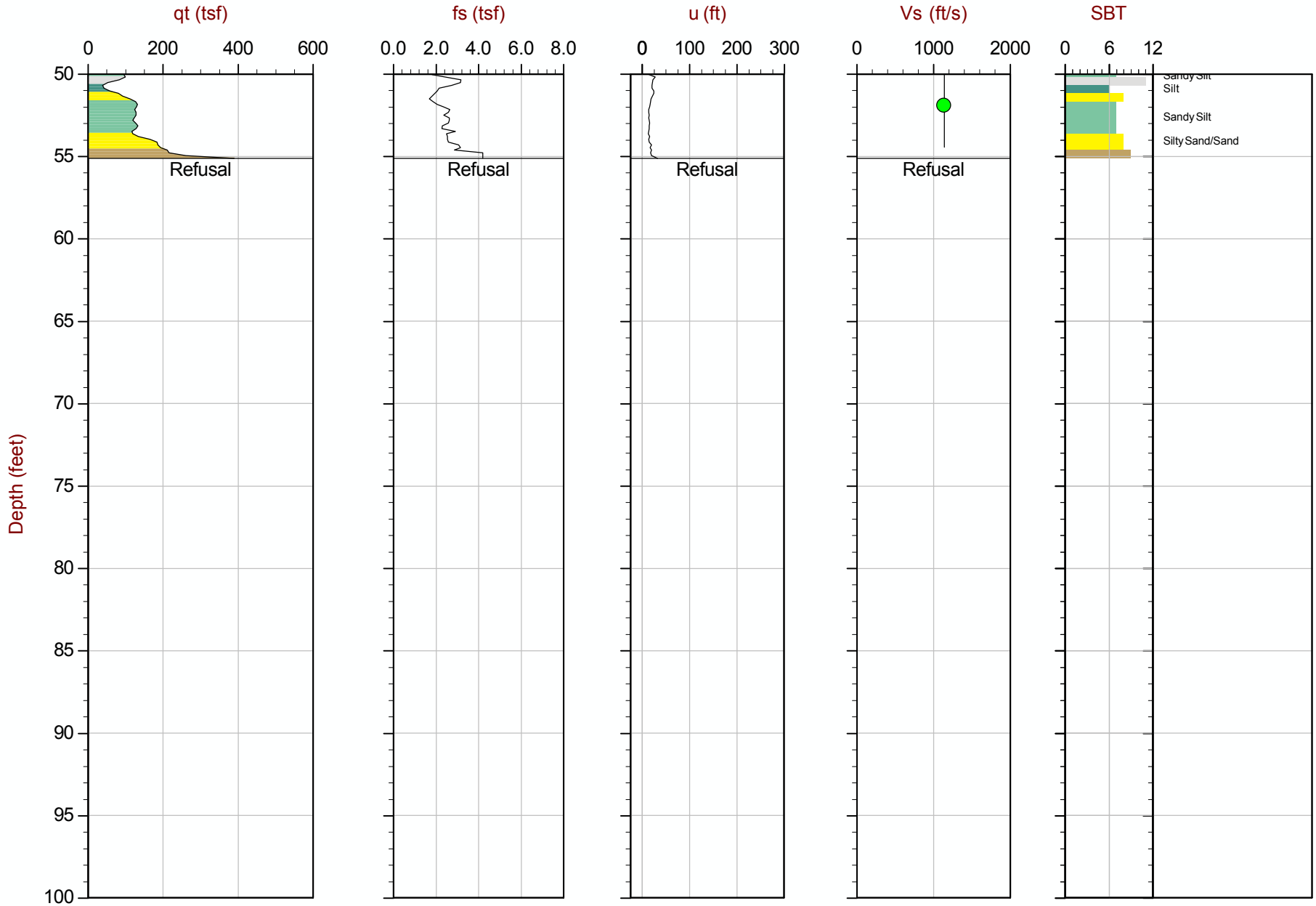
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647583 Long: -108.499800
● Equilibrium Pore Pressure from Dissipation

CONETEC

MWH Americas

Job No: 13-52118
Date: 11:06:13 16:32
Site: CHURCH ROCK MILL SITE TSF

Sounding: RCPT-15
Cone: 155:T1500F15U500



Max Depth: 16.800 m / 55.12 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.150 m

File: 13-52118_RP15.COR
Unit Wt: SBT Chart Soil Zones

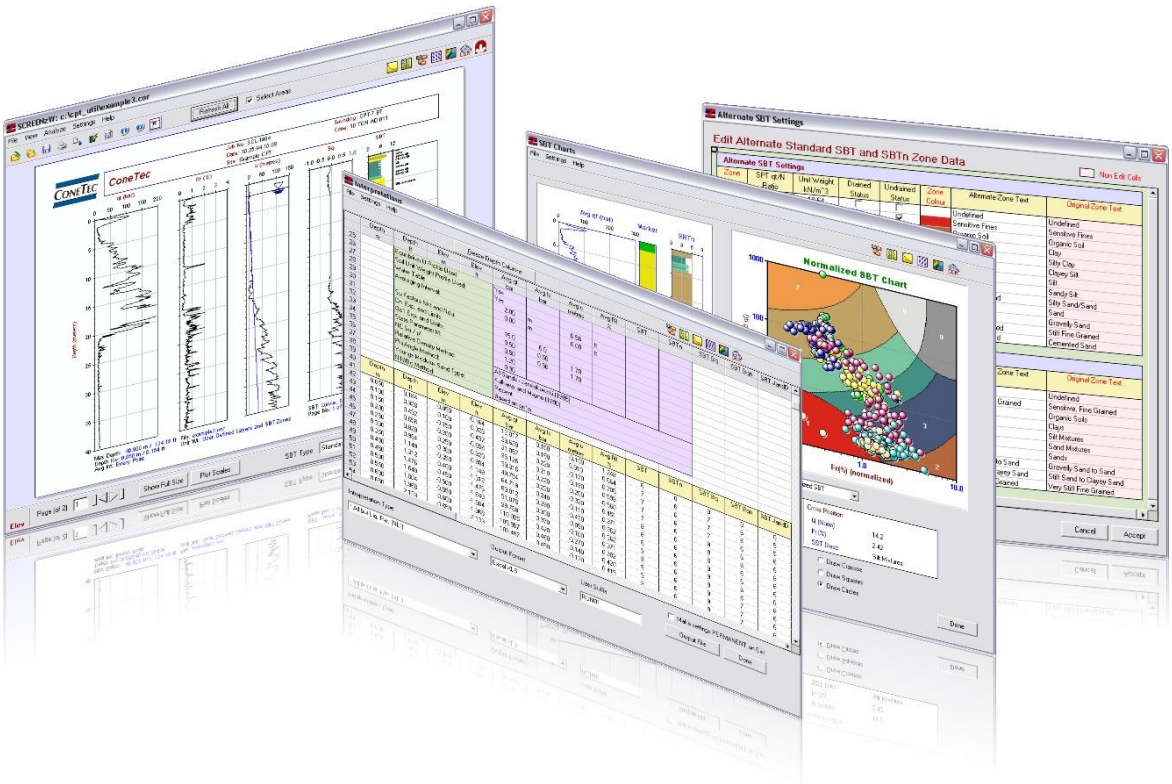
SBT: Lunne, Robertson and Powell, 1997
Coords: Lat: 35.647583 Long: -108.499800
● Equilibrium Pore Pressure from Dissipation

References

CONETEC

CONETEC INTERPRETATION METHODS

A Detailed Description of the Methods Used in ConeTec's CPT Interpretation and Plotting Software



Revision SZW-Rev 05A
April 8, 2011

Prepared by Jim Greig

ConeTec Interpretations as of April 8, 2011

ConeTec's interpretation routine provides a tabular output of geotechnical parameters based on current published CPT correlations and is subject to change to reflect the current state of practice. The interpreted values are not considered valid for all soil types. The interpretations are presented only as a guide for geotechnical use and should be carefully scrutinized for consideration in any geotechnical design. Reference to current literature is strongly recommended. ConeTec does not warranty the correctness or the applicability of any of the geotechnical parameters interpreted by the program and does not assume liability for any use of the results in any design or review. Representative hand calculations should be made for any parameter that is critical for design purposes. The end user of the interpreted output should also be fully aware of the techniques and the limitations of any method used in this program. The purpose of this document is to inform the user as to which methods were used and what the appropriate papers and/or publications are for further reference.

The CPT interpretations are based on values of tip, sleeve friction and pore pressure averaged over a user specified interval (e.g. 0.20m). Note that q_t is the tip resistance corrected for pore pressure effects and q_c is the recorded tip resistance. Since all ConeTec cones have equal end area friction sleeves, pore pressure corrections to sleeve friction, f_s, are not required.

The tip correction is: $q_t = q_c + (1-a) \cdot u_2$

where: q_t is the corrected tip resistance
q_c is the recorded tip resistance
u_2 is the recorded dynamic pore pressure behind the tip (u_2 position)
a is the Net Area Ratio for the cone (typically 0.80 for ConeTec cones)

The total stress calculations are based on soil unit weights that have been assigned to the Soil Behavior Type zones, from a user defined unit weight profile or by using a single value throughout the profile.

Effective vertical overburden stresses are calculated based on a hydrostatic distribution of equilibrium pore pressures below the water table or from a user defined equilibrium pore pressure profile (this can be obtained from CPT dissipation tests). For over water projects the effects of the column of water have been taken into account as has the appropriate unit weight of water. How this is done depends on where the instruments were zeroed (i.e. on deck or at mud line).

Details regarding the interpretation methods for all of the interpreted parameters are provided in Table 1. The appropriate references cited in Table 1 are listed in Table 2. Where methods are based on charts or techniques that are too complex to describe in this summary the user should refer to the cited material.

The Soil Behavior Type classification charts (normalized and non-normalized) shown in Figures 1 and 2 are based on the charts developed by Dr. Robertson and Dr. Campanella at the University of British Columbia. These charts appear in many publications, most notably: Robertson, Campanella, Gillespie and Greig (1986); Robertson (1990) and Lunne, Robertson and Powell (1997). The Bq classification charts shown in Figures 3a and 3b are based on those described in Robertson (1990) and Lunne, Robertson and Powell (1997). The Jefferies and Davies SBT chart shown in Figure 3c is based on that discussed in Jefferies and Davies, 1993.

Where the results of a calculation/interpretation are declared *'invalid'* the value will be represented by the text strings "-9999" or "-9999.0". In some cases the value 0 will be used. Invalid results will occur because of (and not limited to) one or a combination of:

1. Invalid or undefined CPT data (e.g. drilled out section or data gap).

2. Where the interpretation method is inappropriate, for example, drained parameters in an undrained material (and vice versa).

3. Where interpretation input values are beyond the range of the referenced charts or specified limitations of the interpretation method.

4. Where pre-requisite or intermediate interpretation calculations are invalid.

The parameters selected for output from the program are often specific to a particular project. As such, not all of the interpreted parameters listed in Table 1 may be included in the output files delivered with this report.

The output files are provided in Microsoft Excel XLS format. The ConeTec software has several options for output depending on the number or types of interpreted parameters desired. Each output file will be named using the original COR file basename followed by a three or four letter indicator of the interpretation set selected (e.g. BSC, TBL, NLI or IFI) and possibly followed by an operator selected suffix identifying the characteristics of the particular interpretation run.

Table 1
CPT Interpretation Methods

Interpreted Parameter	Description	Equation	Ref
Depth	Mid Layer Depth *(where interpretations are done at each point then Mid Layer Depth = Recorded Depth)*	*Depth (Layer Top) + Depth (Layer Bottom) / 2.0*	
Elevation	Elevation of Mid Layer based on sounding collar elevation supplied by client	Elevation = Collar Elevation - Depth	
Avgqc	Averaged recorded tip value (q_c)	$Avgqc = \frac{1}{n}\sum_{i=1}^{n} q_c$ *n=1 when interpretations are done at each point*	
Avgqt	Averaged corrected tip (q_t) where: $q_t = q_c + (1-a) \bullet u$	$Avgqt = \frac{1}{n}\sum_{i=1}^{n} q_t$ *n=1 when interpretations are done at each point*	
Avgfs	Averaged sleeve friction (f_s)	$Avgfs = \frac{1}{n}\sum_{i=1}^{n} fs$ *n=1 when interpretations are done at each point*	
AvgRf	Averaged friction ratio (Rf) where friction ratio is defined as: $Rf = 100\% \bullet \frac{fs}{qt}$	$AvgRf = 100\% \cdot \frac{Avgfs}{Avgqt}$ *n=1 when interpretations are done at each point*	
Avgu	Averaged dynamic pore pressure *(u)*	$Avgu = \frac{1}{n}\sum_{i=1}^{n} u_i$ *n=1 when interpretations are done at each point*	
AvgRes	Averaged Resistivity (this data is not always available since it is a specialized test requiring an additional module)	$Avgu = \frac{1}{n}\sum_{i=1}^{n} RESISTIVITY_i$ *n=1 when interpretations are done at each point*	
AvgUVIF	Averaged UVIF ultra-violet induced fluorescence (this data is not always available since it is a specialized test requiring an additional module)	$Avgu = \frac{1}{n}\sum_{i=1}^{n} UVIF_i$ *n=1 when interpretations are done at each point*	
AvgTemp	Averaged Temperature (this data is not always available since it is a specialized test)	$Avgu = \frac{1}{n}\sum_{i=1}^{n} TEMPERATURE_i$ *n=1 when interpretations are done at each point*	

Interpreted Parameter	Description	Equation	Ref
AvgGamma	Averaged Gamma Counts (this data is not always available since it is a specialized test requiring an additional module)	$Avgu = \frac{1}{n}\sum_{i=1}^{n} GAMMA_i$ *n=1 when interpretations are done at each point*	
SBT	Soil Behavior Type as defined by Robertson and Campanella	See Figure 1	2, 5
U.Wt.	Unit Weight of soil determined from one of the following user selectable options: 1) uniform value 2) value assigned to each SBT zone 3) user supplied unit weight profile	See references	5
T. Stress σ_v	Total vertical overburden stress at Mid Layer Depth. *A layer is defined as the averaging interval specified by the user. For data interpreted at each point the Mid Layer Depth is the same as the recorded depth.*	$TStress = \sum_{i=1}^{n} \gamma_i h_i$ *where* γ_i is layer unit weight h_i is layer thickness	
E. Stress σ_v'	Effective vertical overburden stress at Mid Layer Depth	$Estress = Tstress - u_{eq}$	
Ueq	Equilibrium pore pressure determined from one of the following user selectable options: 1) hydrostatic from water table depth 2) user supplied profile	For hydrostatic option: $u_{eq} = \gamma_w \cdot (D - D_{wt})$ where u_{eq} is equilibrium pore pressure γ_w is unit weight of water D is the current depth D_{wt} is the depth to the water table	
Cn	SPT N_{60} overburden correction factor	$Cn=(\sigma_v')^{-0.5}$ where σ_v' *is in tsf* $0.5 < C_n < 2.0$	
N_{60}	SPT N value at 60% energy calculated from qt/N ratios assigned to each SBT zone. This method has abrupt N value changes at zone boundaries.	*See Figure 1*	4, 5
$(N_1)_{60}$	SPT N_{60} value corrected for overburden pressure	$(N_1)_{60} = Cn \cdot N_{60}$	4
$N_{60}Ic$	SPT N_{60} values based on the Ic parameter	$(qt/pa)/ N_{60} = 8.5 (1 – Ic/4.6)$	5
$(N_1)_{60}Ic$	SPT N_{60} value corrected for overburden pressure (using N_{60} I_c). User has 2 options.	1) $(N_1)_{60}Ic= Cn \cdot (N_{60}\ Ic)$ 2) $q_{c1n}/ (N_1)_{60}Ic = 8.5 (1 – Ic/4.6)$	4 5
$(N_1)_{60cs}Ic$	Clean sand equivalent SPT $(N_1)_{60}Ic$. User has 3 options.	1) $(N_1)_{60cs}Ic = \alpha + \beta((N_1)_{60}Ic)$ 2) $(N_1)_{60cs}Ic = K_{SPT} * ((N_1)_{60}Ic)$ 3) $q_{c1ncs})/ (N_1)_{60cs}Ic = 8.5 (1 – Ic/4.6)$ FC ≤ 5%: α = 0, β=1.0 FC ≥ 35% α = 5.0, β=1.2 5% < FC < 35% $\alpha = \exp[1.76 – (190/FC^2)]$ $\beta = [0.99 + (FC^{1.5}/1000)]$	10 10 5
Su	Undrained shear strength based on q_t Su factor N_{kt} is user selectable	$Su = \frac{qt - \sigma_v}{N_{kt}}$	1, 5
Su	Undrained shear strength based on pore pressure Su factor $N_{\Delta u}$ is user selectable	$Su = \frac{u_2 - u_{eq}}{N_{\Delta u}}$	1, 5
k	Coefficient of permeability (assigned to each SBT zone)		5

Interpreted Parameter	Description	Equation	Ref
Bq	Pore pressure parameter	$Bq = \frac{\Delta u}{qt - \sigma_v}$ *where:* $\Delta u = u - u_{eq}$ *and u = dynamic pore pressure* *u_{eq} = equilibrium pore pressure*	1, 5
Q_t	Normalized q_t for Soil Behavior Type classification as defined by Robertson, 1990	$Qt = \frac{qt - \sigma_v}{\sigma'_v}$	2, 5
F_r	Normalized Friction Ratio for Soil Behavior Type classification as defined by Robertson, 1990	$Fr = 100\% \cdot \frac{fs}{qt - \sigma_v}$	2, 5
Net qt	Net tip resistance	$qt - \sigma_v$	
qe	Effective tip resistance	$qt - u_2$	
qeNorm	Normalized effective tip resistance	$\frac{qt - u_2}{\sigma'_v}$	
SBTn	Normalized Soil Behavior Type as defined by Robertson and Campanella	See Figure 2	2, 5
SBT-BQ	Non-normalized Soil Behavior type based on the Bq parameter	See Figure 3	2, 5
SBT-BQn	Normalized Soil Behavior based on the Bq parameter	See Figure 3	2, 5
SBT-JandD	Soil Behaviour Type as defined by Jeffries and Davies	See Figure 3	7
SBT-BQn	Normalized Soil Behavior base on the Bq parameter	See Figure 3	2, 5
I_c	Soil index for estimating grain characteristics	*$Ic = [(3.47 - \log_{10}Q)^2 + (\log_{10} Fr + 1.22)^2]^{0.5}$* *Where:* $Q = \left(\frac{qt - \sigma_v}{P_{a2}}\right)\left(\frac{P_a}{\sigma'_v}\right)^n$ *And Fr is in percent* *P_a = atmospheric pressure* *P_{a2} = atmospheric pressure* *n varies from 0.5 to 1.0 and is selected in an iterative manner based on the resulting I_c*	3, 8
FC	Apparent fines content (%)	*$FC=1.75(Ic^{3.25}) - 3.7$* *FC=100 for Ic > 3.5* *FC=0 for Ic < 1.26* *FC = 5% if 1.64 < Ic < 2.6 AND F_r<0.5*	3
Ic Zone	This parameter is the Soil Behavior Type zone based on the Ic parameter (valid for zones 2 through 7 on SBTn chart)	Ic < 1.31 Zone = 7 1.31 < Ic < 2.05 Zone = 6 2.05 < Ic < 2.60 Zone = 5 2.60 < Ic < 2.95 Zone = 4 2.95 < Ic < 3.60 Zone = 3 Ic > 3.60 Zone = 2	3
PHI ϕ	Friction Angle determined from one of the following user selectable options: a) Campanella and Robertson b) Durgunoglu and Mitchel c) Janbu d) Kulhawy and Mayne	See reference	5 5 5 11

Interpreted Parameter	Description	Equation	Ref
Dr	Relative Density determined from one of the following user selectable options: a) Ticino Sand b) Hokksund Sand c) Schmertmann 1976 d) Jamiolkowski - All Sands	See reference	5
OCR	Over Consolidation Ratio	a) Based on Schmertmann's method involving a plot of S_u/σ_v' /($S_u/\sigma_v')_{NC}$ and OCR where the Su/p' ratio for NC clay is user selectable	9
State Parameter	The state parameter is used to describe whether a soil is contractive (SP is positive) or dilative (SP is negative) at large strains based on the work by Been and Jefferies	See reference	8, 6, 5
Es/qt	Intermediate parameter for calculating Young's Modulus, E, in sands. It is the Y axis of the reference chart.	Based on Figure 5.59 in the reference	5
Young's Modulus E	Young's Modulus based on the work done in Italy. There are three types of sands considered in this technique. The user selects the appropriate type for the site from: a) OC Sands b) Aged NC Sands c) Recent NC Sands Each sand type has a family of curves that depend on mean normal stress. The program calculates mean normal stress and linearly interpolates between the two extremes provided in the Es/qt chart.	Mean normal stress is evaluated from: $\sigma'_m = \frac{1}{3}(\sigma'_v + \sigma'_h + \sigma'_h)$ where σ_v'= vertical effective stress σ_h'= horizontal effective stress and $\sigma_h = K_o \cdot \sigma_v'$ with Ko assumed to be 0.5	5
q_{c1}	q_t normalized for overburden stress used for seismic analysis	$q_{c1} = q_t \cdot (Pa/\sigma_v')^{0.5}$ where: Pa = atm. Pressure q_t is in MPa	3
q_{c1n}	q_{c1} in dimensionless form used for seismic analysis	$q_{c1n} = (q_{c1} / Pa)(Pa/\sigma_v')^n$ where: Pa = atm. Pressure and n ranges from 0.5 to 0.75 based on Ic.	3
K_{SPT}	Equivalent clean sand factor for $(N_1)60$	$K_{SPT} = 1 + ((0.75/30) \cdot (FC - 5))$	10
K_{CPT}	Equivalent clean sand correction for q_{c1N}	$K_{cpt} = 1.0$ for $I_c \leq 1.64$ $K_{cpt} = f(I_c)$ for $I_c > 1.64$ (see reference)	10
q_{c1ncs}	Clean sand equivalent q_{c1n}	$q_{c1ncs} = q_{c1n} \cdot K_{cpt}$	3
CRR	Cyclic Resistance Ratio (for Magnitude 7.5)	$q_{c1ncs} < 50$: $CRR_{7.5} = 0.833\ [(q_{c1ncs}/1000] + 0.05$ $50 \leq q_{c1ncs} < 160$: $CRR_{7.5} = 93\ [(q_{c1ncs}/1000]^3 + 0.08$	10

Interpreted Parameter	Description	Equation	Ref
CSR	Cyclic Stress Ratio	$CSR = (\tau_{av}/\sigma_v') = 0.65\ (a_{max} / g)\ (\sigma_v/ \sigma_v')\ r_d$ $r_d = 1.0 – 0.00765\ z$ $z \leq 9.15m$ $r_d = 1.174 – 0.0267\ z$ $9.15 < z \leq 23m$ $r_d = 0.744 – 0.008\ z$ $23 < z \leq 30m$ $r_d = 0.50$ $z > 30m$	10
MSF	Magnitude Scaling Factor	See Reference	10
FofS	Factor of Safety against Liquefaction	$FS = (CRR_{7.5} / CSR)\ MSF$	10
Liquefaction Status	Statement indicating possible liquefaction	Takes into account FofS and limitations based on I_c and q_{c1ncs}.	10
Cont/Dilat Tip	Contractive / Dilative qc1 Boundary based on $(N_1)_{60}$	$(\sigma_v')_{boundary} = 9.58 \times 10^{-4}\ [(N_1)_{60}]^{4.79}$ qc1 is calculated from specified qt(MPa)/N ratio	13
Cq	Normalizing Factor	$Cq = 1.8 / (0.8 + ((\sigma_v'/Pa))$	12
qc1 (Cq)	Normalized tip resistance based on Cq	$q_{c1} = C_q * q_t$ (some papers use q_c)	12
Su(Liq)/s'v	Liquefied Shear Strength Ratio	$\frac{Su(Liq)}{\sigma_v'} = 0.03 + 0.0143(q_{c1})$	13

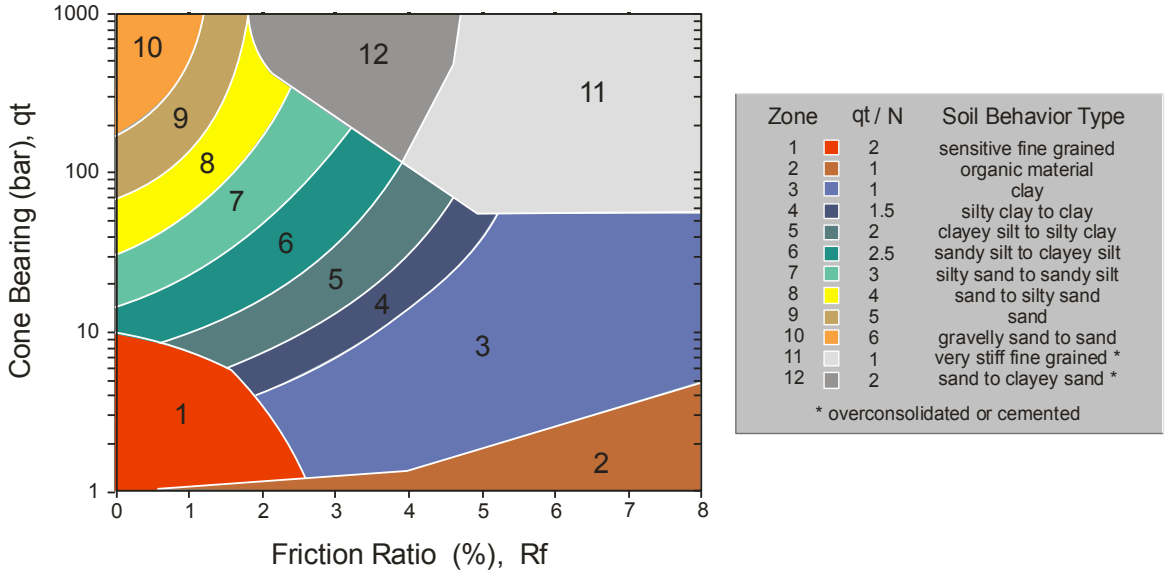


Figure 1 Non-Normalized Behavior Type Classification Chart

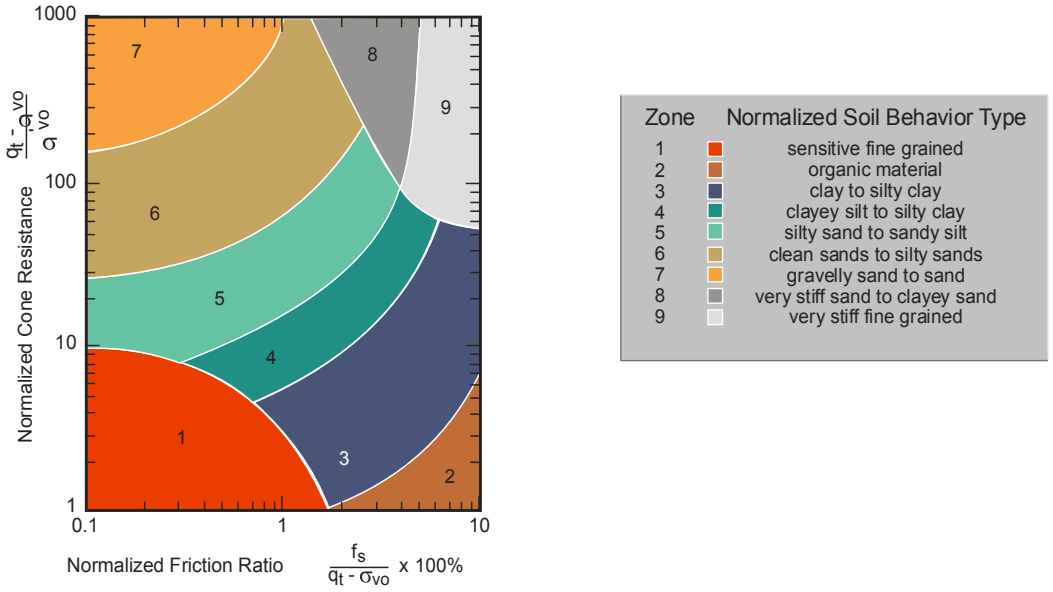


Figure 2 Normalized Behavior Type Classification Chart

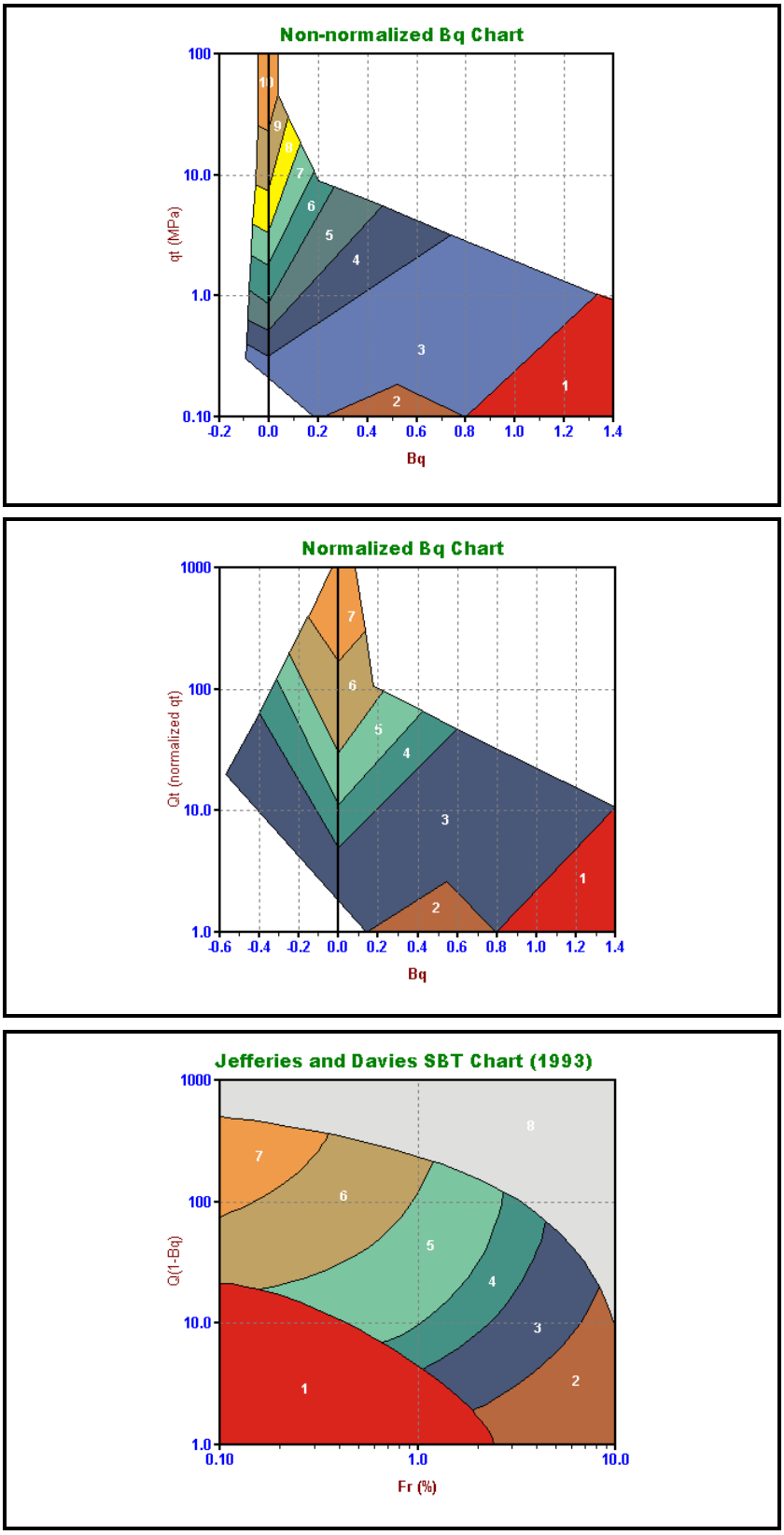


Figure 3 – Alternate Soil Behaviour Type Charts

Table 2 References

No.	References
1	Robertson, P.K., Campanella, R.G., Gillespie, D. and Greig, J., 1986, "Use of Piezometer Cone Data", Proceedings of InSitu 86, ASCE Specialty Conference, Blacksburg, Virginia.
2	Robertson, P.K., 1990, "Soil Classification Using the Cone Penetration Test", Canadian Geotechnical Journal, Volume 27.
3	Robertson, P.K. and Fear, C.E., 1998, "Evaluating cyclic liquefaction potential using the cone penetration test", Canadian Geotechnical Journal, 35: 442-459.
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5	Lunne, T., Robertson, P.K. and Powell, J. J. M., 1997, " Cone Penetration Testing in Geotechnical Practice," Blackie Academic and Professional.
6	Plewes, H.D., Davies, M.P. and Jefferies, M.G., 1992, "CPT Based Screening Procedure for Evaluating Liquefaction Susceptibility", 45th Canadian Geotechnical Conference, Toronto, Ontario, October 1992.
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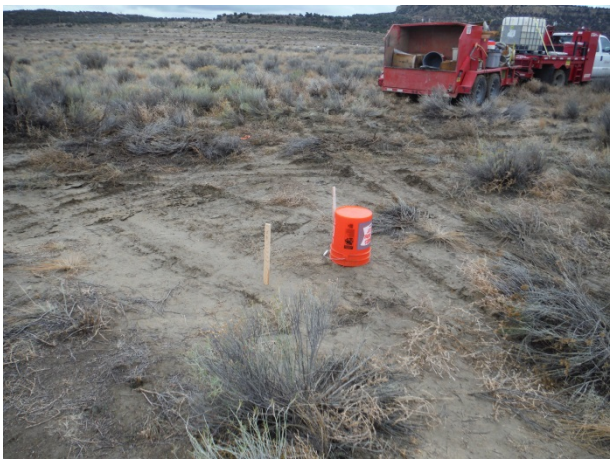
10	Proceedings of theNCEER Workshop on Evaluation of Liquefaction Resistance of Soils, Salt LakeCity, 1996. Chaired by Leslie Youd. 11
11	Kulhawy, F.H. and Mayne, P.W. ,1990, "Manual on Estimating Soil Properties for Foundation Design, *Report No. EL-6800"*, Electric Power Research Institute, Palo Alto, CA, August 1990, 306 p.
12	Olson, S.M. and Stark, T.D., 2002, "Liquefied strength ratio from liquefied flow filaure case histories", Canadian Geotechnical Journal, 39: 951-966.
13	Oslon, Scott M. and Stark, Timothy D., 2003, "Yield Strength Ratio and Liquefaction Analysis of Slopes and Embankments", Journal of Geotechnical and Geoenvironmental Engineering, ASCE, August 2003.

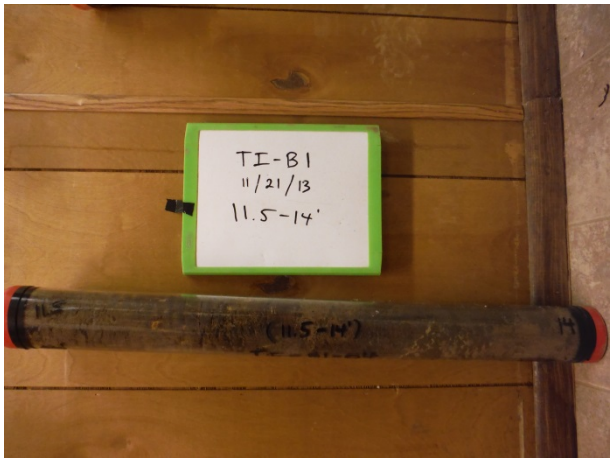
APPENDIX B2.5

TAILINGS IMPOUNDMENT DRILLLING PHOTOGRAPHS

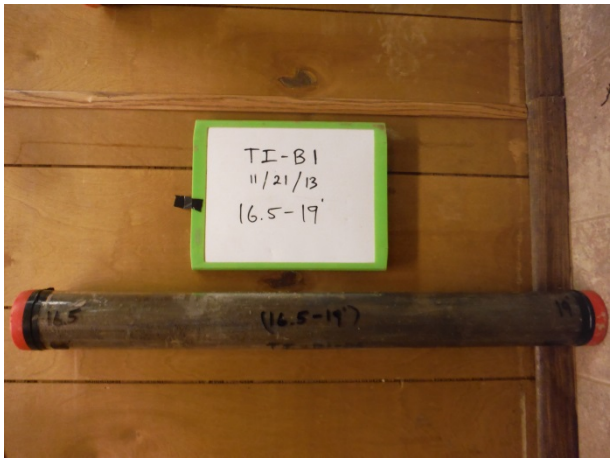


TI-B1 Before Drilling
11/21/13

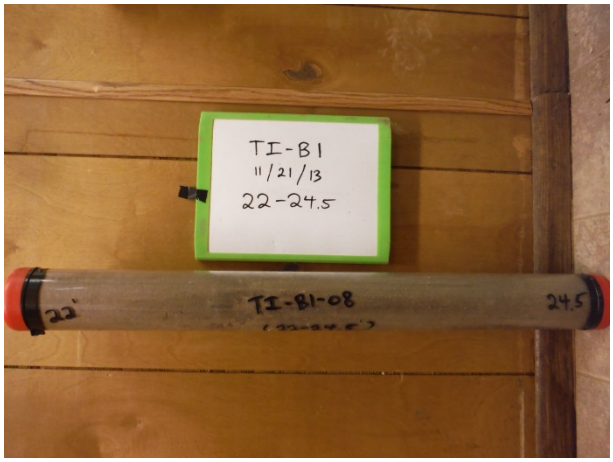
TI-B1 Acrylic Core Liner (6.5' – 8.5' interval)
11/21/13



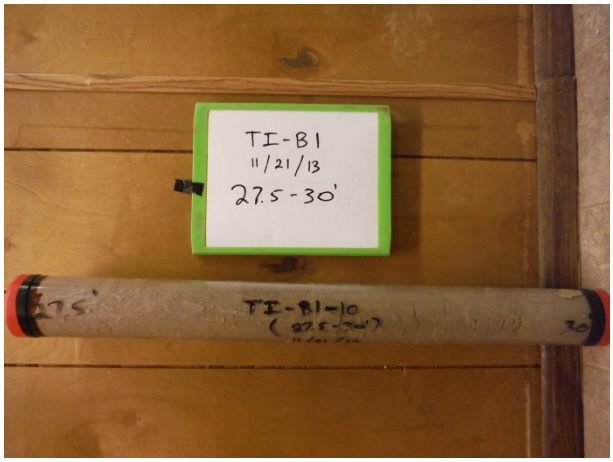
TI-B1 Acrylic Core Liner (11.5' – 14' interval)
11/21/13



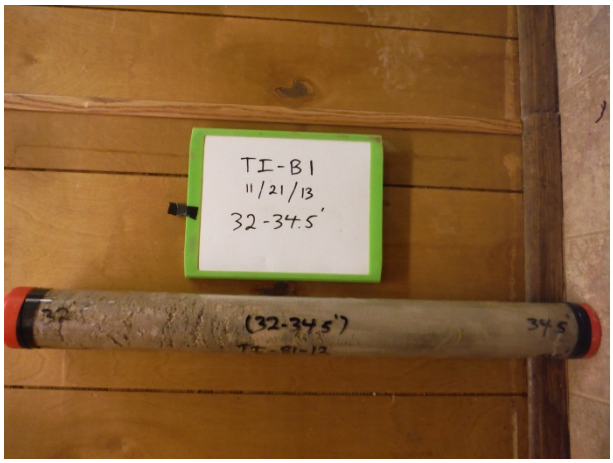
TI-B1 Acrylic Core Liner (16.5' – 19' interval)
11/21/13



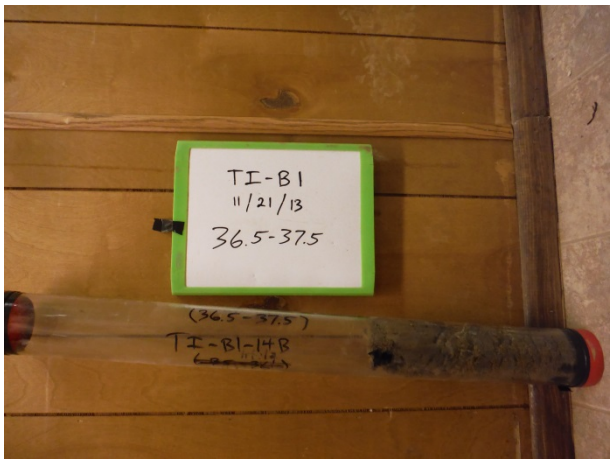
TI-B1 Acrylic Core Liner (22' – 24.5' interval)
11/21/13



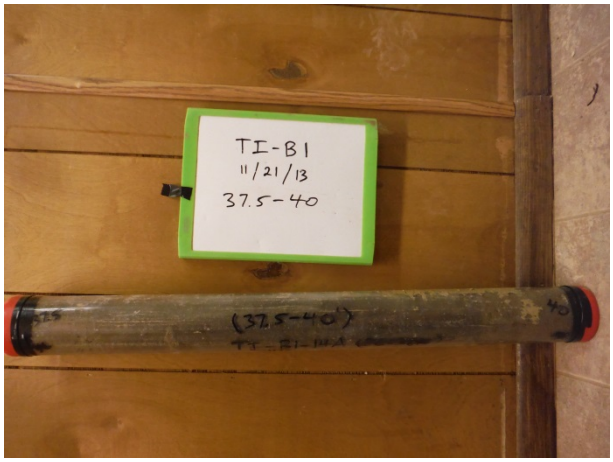
TI-B1 Acrylic Core Liner (27.5' – 30' interval)
11/21/13



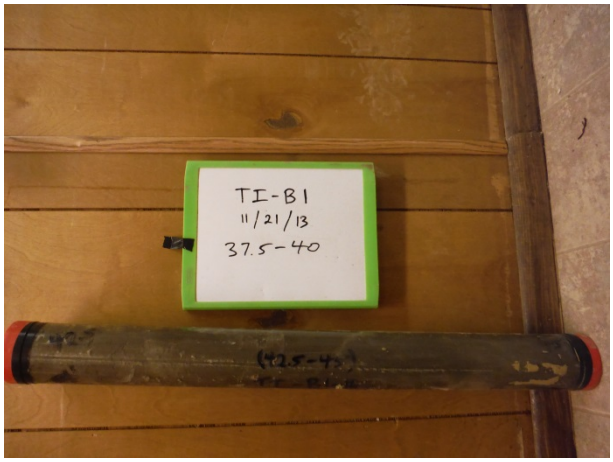
TI-B1 Acrylic Core Liner (32' – 34.5' interval)
11/21/13



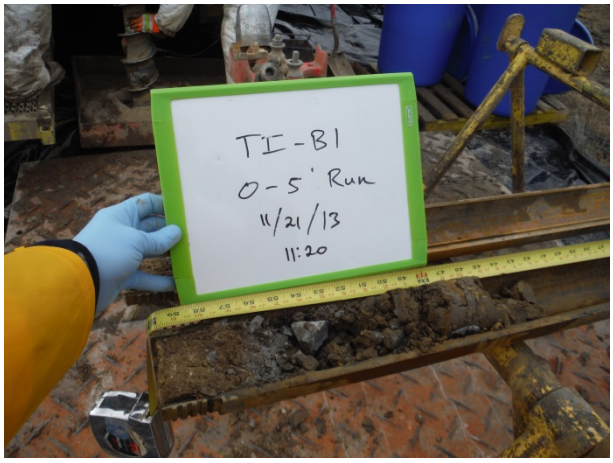
TI-B1 Acrylic Core Liner (36.5' – 37.5' interval)
11/21/13



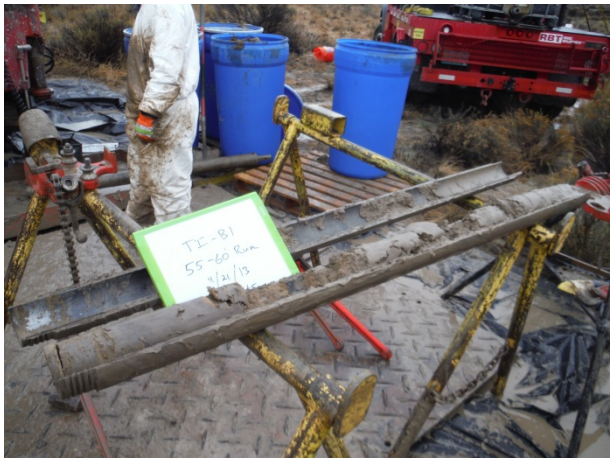
TI-B1 Acrylic Core Liner (37.5' – 40' interval)
11/21/13



TI-B1 Acrylic Core Liner (37.5' – 40' interval)
11/21/13

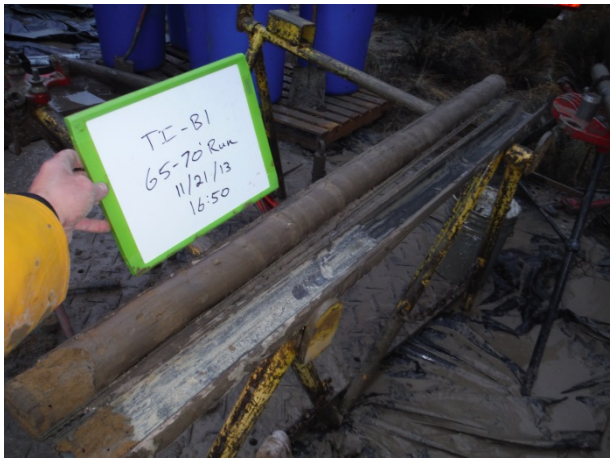


TI-B1 Core (0' – 5' interval)
11/21/13



TI-B1 Core (55' – 60' interval)
11/21/13

TI-B1 Core (60' – 65' interval)
11/21/13



TI-B1 Core (65' – 70' interval)
11/21/13

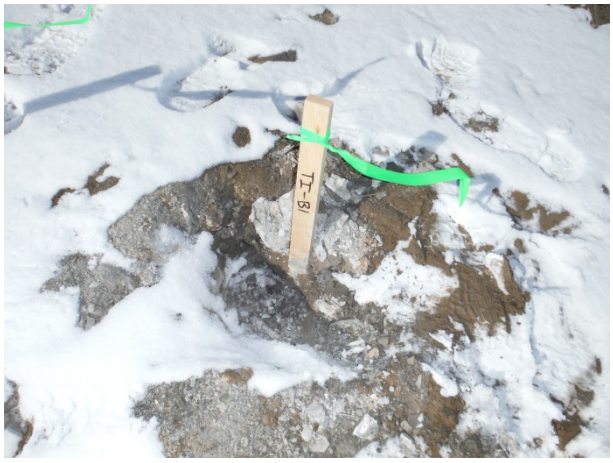
TI-B1 Core Box #1 (45' – 52' interval)
11/21/13

TI-B1 Core Box #2 (52' – 57.5' interval)
11/21/13

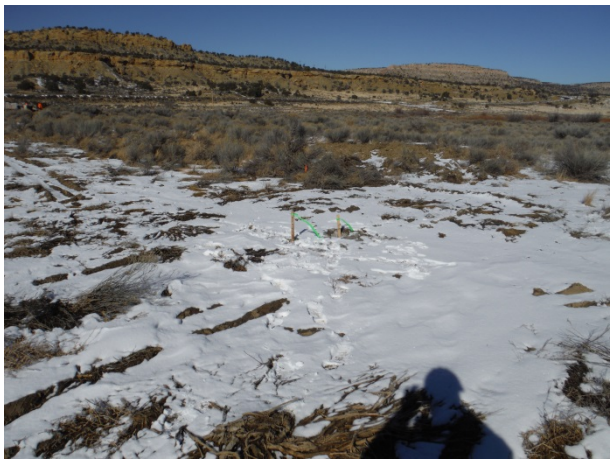
TI-B1 Core Box #3 (57.5' – 62.5' interval)
11/21/13

TI-B1 Core Box #4 (2.5' – 67.5' interval)
11/21/13

TI-B1 Core Box #5 (67.5' – 70' interval)
11/21/13

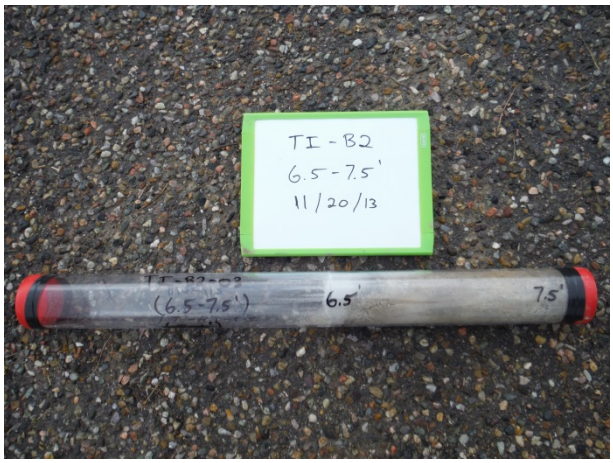


TI-B1 After Grouting
12/13/13

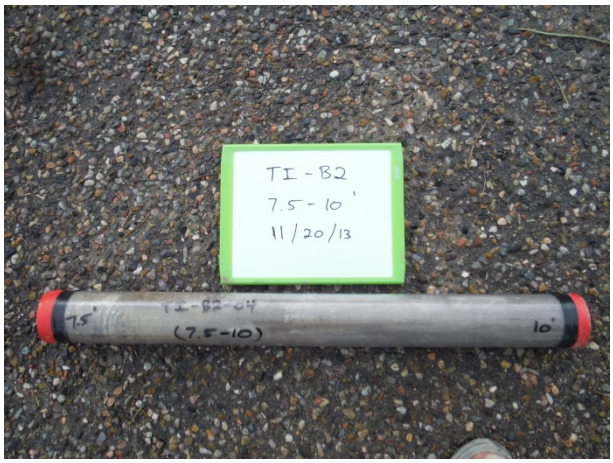


TI-B1 After Drilling and Grouting
12/31/13

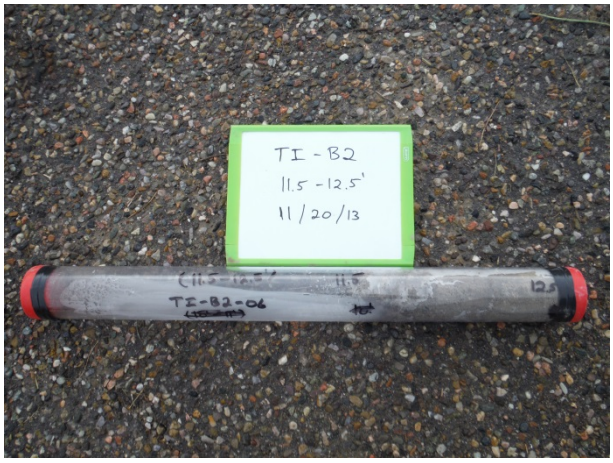
TI-B2 Before Drilling
11/20/13



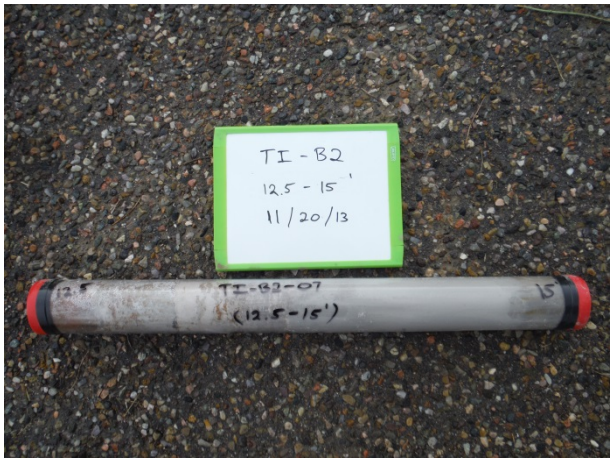
TI-B2 Acrylic Core Liner (6.5' – 7' interval)
11/20/13



TI-B2 Acrylic Core Liner (7.5' – 10' interval)
11/20/13

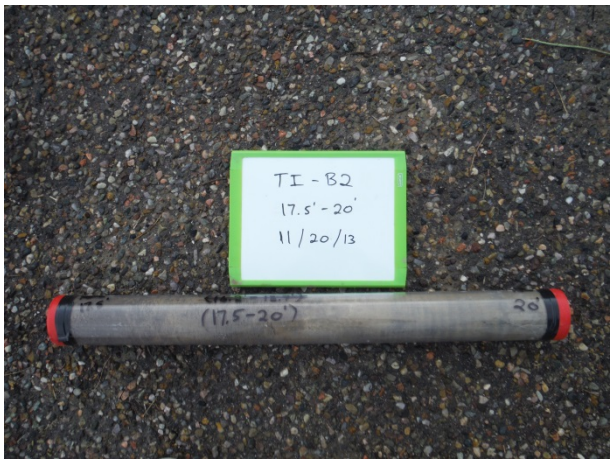


TI-B2 Acrylic Core Liner (11.5' – 12.5' interval)
11/20/13

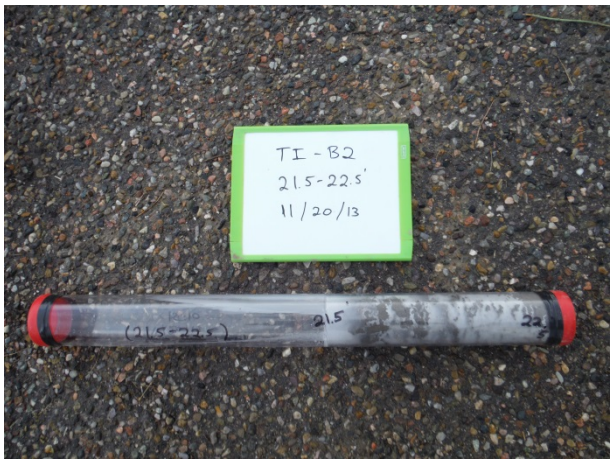


TI-B2 Acrylic Core Liner (12.5' – 15' interval)
11/20/13

TI-B2 Acrylic Core Liner (16.5' – 17.5' interval)
11/20/13



TI-B2 Acrylic Core Liner (17.5' – 20' interval)
11/20/13



TI-B2 Acrylic Core Liner (21.5' – 22.5' interval)
11/20/13

TI-B2 Acrylic Core Liner (22.5' – 25' interval)
11/20/13

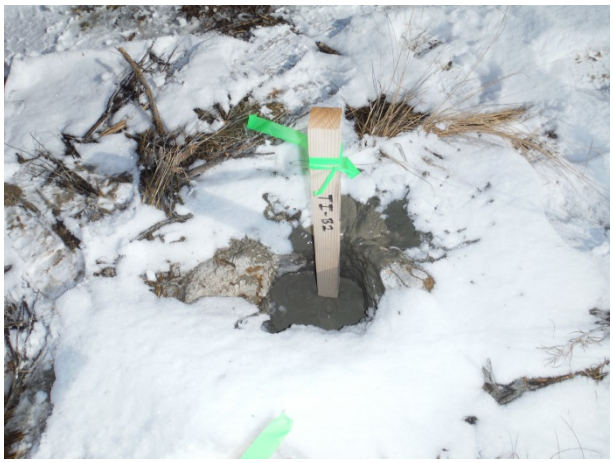
TI-B2 Core (25' – 30' interval)
11/20/13

TI-B2 Core Box #1 (25' – 30' interval)
11/20/13

TI-B2 Core Box #2 (30' – 35' interval)
11/20/13

TI-B2 Core Box #3 (35' – 38.7' interval)
11/20/13

TI-B2 Bagged Core Sample (38.4' – 38.7' interval)
11/20/13



TI-B2 After Grouting
12/13/13

TI-B2 After Drilling and Grouting
12/13/13

TI-B3 Before Drilling
11/19/13

TI-B3 Rig Setup
11/19/13

TI-B3 Core (0' – 5' interval)
11/19/13

TI-B3 Core (5' – 10' interval)
11/19/13

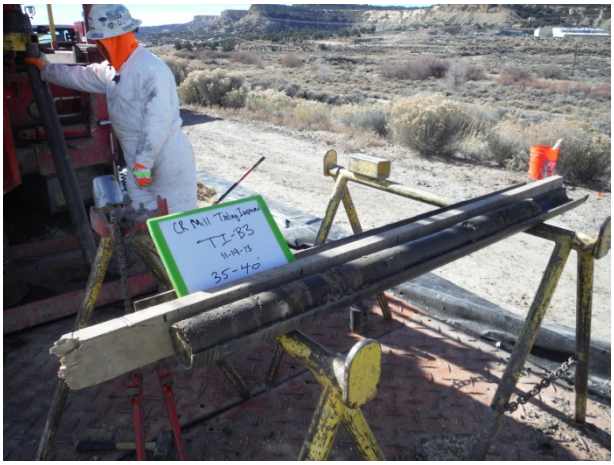
TI-B3 Core (10' – 15' interval)
11/19/13

TI-B3 Core (15’ – 20’ interval)
11/19/13

TI-B3 Core (20’ – 25’ interval)
11/19/13

TI-B3 Core (25’ – 30’ interval)
11/19/13

TI-B3 Core (30’ – 35’ interval)
11/19/13



TI-B3 Core (35’ – 40’ interval)
11/19/13

TI-B3 Core (40’ – 45’ interval)
11/19/13

TI-B3 Core (45' – 50' interval)
11/19/13

TI-B3 Core (50' – 55' interval)
11/19/13

TI-B3 Core (55' – 60' interval)
11/19/13

TI-B3 Core (60' – 65' interval)
11/19/13

TI-B3 Core (65' – 70' interval)
11/19/13

TI-B3 Core Box #1 (0' – 10' interval)
11/19/13

TI-B3 Core Box #2 (10’ – 15’ interval)
11/19/13

TI-B3 Core Box #3 (15’ – 21.5’ interval)
11/19/13

TI-B3 Core Box #4 (21.5’ – 27’ interval)
11/19/13

TI-B3 Core Box #5 (27’ – 32.5’ interval)
11/19/13

TI-B3 Core Box #6 (32.5’ – 37.5’ interval
11/19/13

TI-B3 Core Box #7 (37.5’ – 44’ interval)
11/19/13

TI-B3 Core Box #8 (44' – 50' interval)
11/19/13

TI-B3 Core Box #9 (50' – 60' interval)
11/19/13

TI-B3 Core Box #10 (60' – 70' interval)
11/19/13

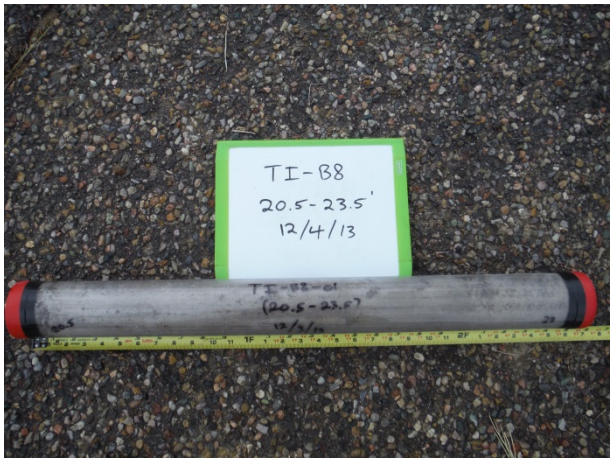
TI-B3 Waxing Shelby Tube Sample
11/19/13

TI-B3 Grouting the Hole
11/20/13

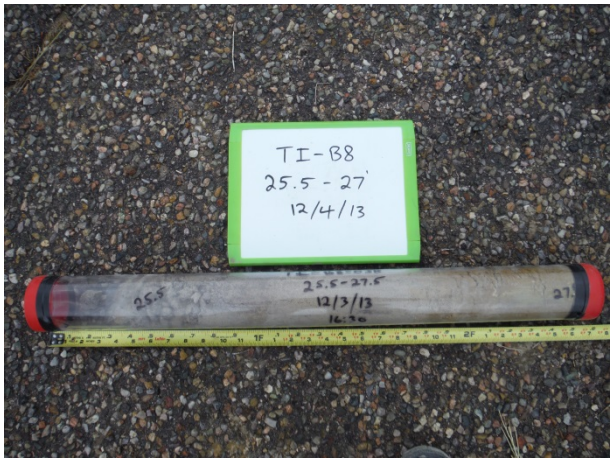
TI-B3 After Grouting
12/13/13

TI-B3 After Drilling and Grouting
12/13/13

TI-B8 Before Drilling
12/3/13

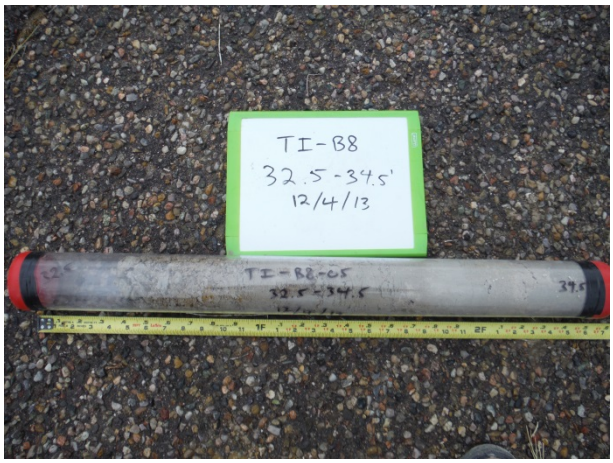


TI-B8 Acrylic Core Liner (20.5' – 23' interval)
12/4/13

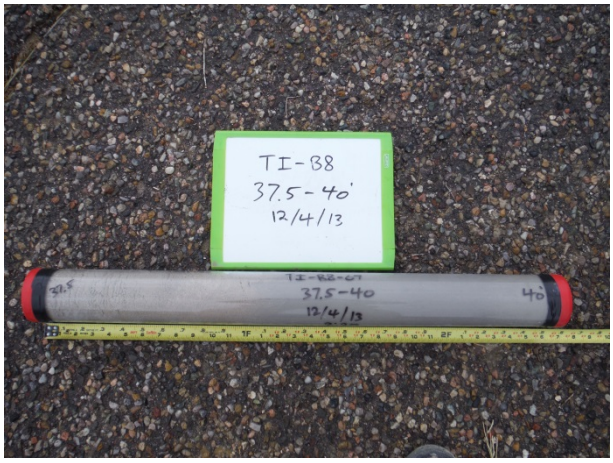


TI-B8 Acrylic Core Liner (25.5' – 27.5' interval)
12/4/13

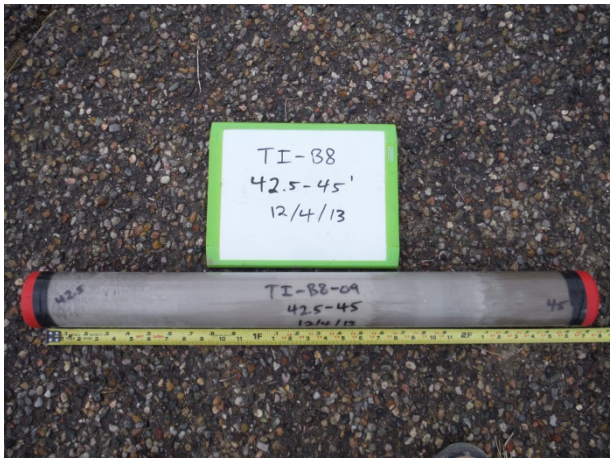
TI-B8 Acrylic Core Liner (27.5' – 30' interval)
12/4/13



TI-B8 Acrylic Core Liner (32.5' – 34.5' interval)
12/4/13



TI-B8 Acrylic Core Liner (37.5' – 40' interval)
12/4/13



TI-B8 Acrylic Core Liner (42.5' – 45' interval)
12/4/13

TI-B8 Core (45' – 50' interval)
12/4/13

TI-B8 Core (55' – 60' interval)
12/4/13

TI-B8 Core (60' – 64' interval)
12/4/13

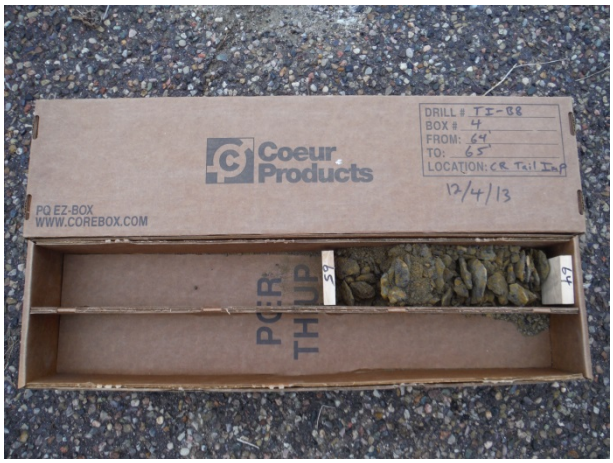
TI-B8 Core (64' – 65' interval)
12/4/13

TI-B8 Core Box #1 (45’ – 52.5’ interval)
12/4/13

TI-B8 Core Box #2 (52.5’ – 59’ interval)
12/4/13

TI-B8 Core Box #3 (59’ – 64’ interval)
12/4/13

TI-B8 Bagged Core Sample (63.5’ – 64’ interval)
12/4/13



TI-B8 Core Box #4 (64’ – 65’ interval)
12/4/13

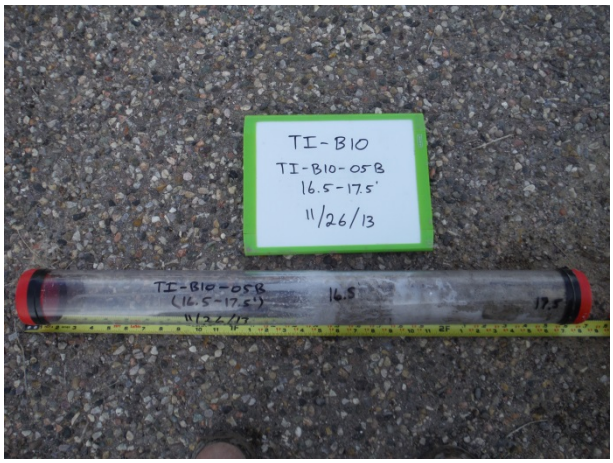
TI-B8 After Grouting
12/9/13

TI-B8 After Drilling and Grouting
12/13/13

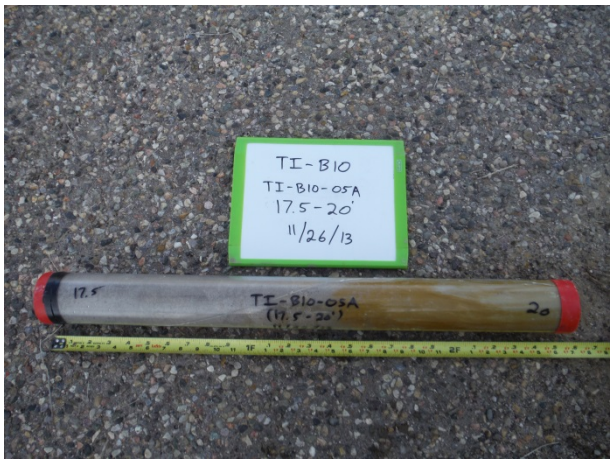
TI-B10 Before Drilling
11/26/13

TI-B10 Rig and Plastic
11/26/13

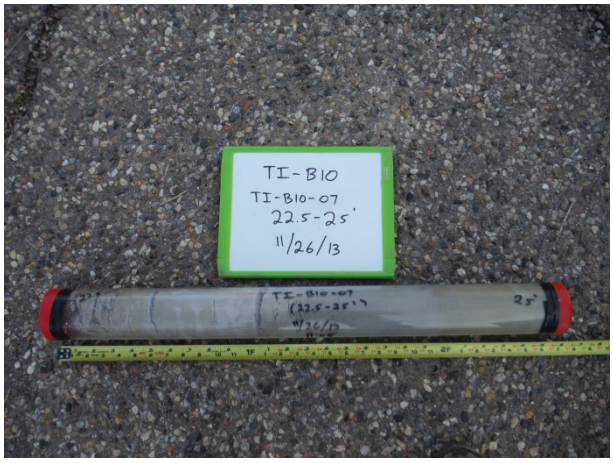
TI-B10 Acrylic Core Liner (12.5' – 15' interval)
11/26/13



TI-B10 Acrylic Core Liner (16.5' – 17.5' interval)
11/26/13



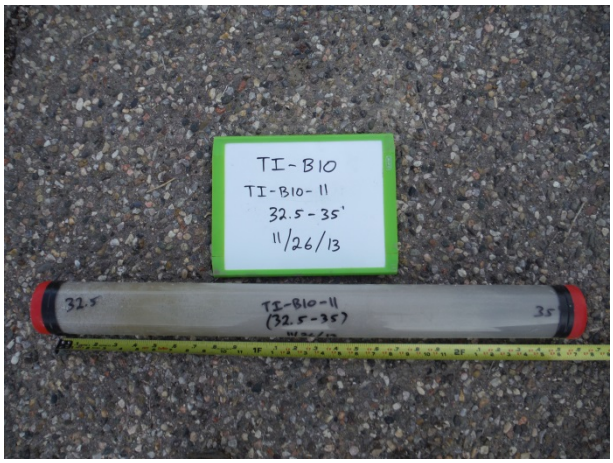
TI-B10 Acrylic Core Liner (17.5' – 20' interval)
11/26/13



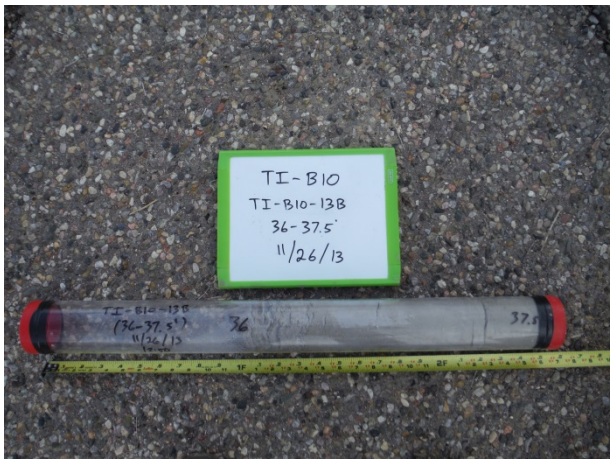
TI-B10 Acrylic Core Liner (22.5' – 25' interval)
11/26/13

TI-B10 Acrylic Core Liner (26.5' – 27.5' interval)
11/26/13

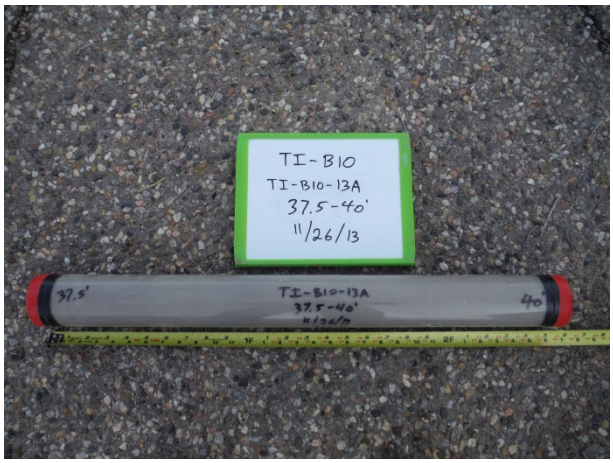
TI-B10 Acrylic Core Liner (27.5' – 30' interval)
11/26/13



TI-B10 Acrylic Core Liner (32.5' – 35' interval)
11/26/13



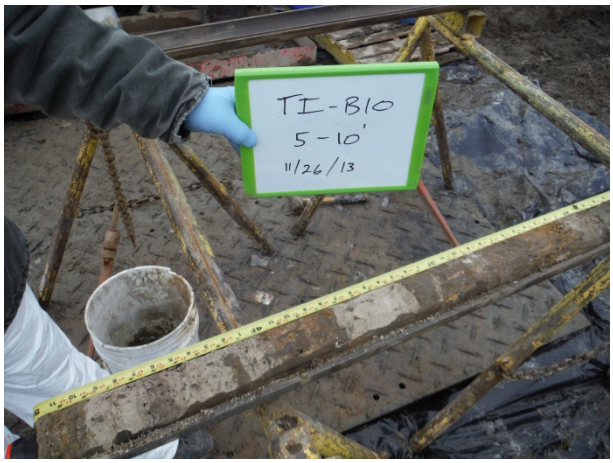
TI-B10 Acrylic Core Liner (36' – 37.5' interval)
11/26/13



TI-B10 Acrylic Core Liner (37.5' – 40' interval)
11/26/13

TI-B10 Acrylic Core Liner (42.5' – 45' interval)
11/26/13

TI-B10 Core (0' – 5' interval)
11/26/13



TI-B10 Core (5' – 10' interval)
11/26/13

TI-B10 Core (40' depth)
11/26/13

TI-B10 Core (50' – 55' depth)
11/26/13

TI-B10 Core (55' – 60' interval)
11/26/13

TI-B10 Core (60' – 65' interval)
11/26/13

TI-B10 Core (65' – 70' interval)
11/26/13

TI-B10 Core (75' – 80' interval)
11/26/13

TI-B10 Core (80' – 85' interval)
11/26/13

TI-B10 Core (85' – 90' interval)
11/26/13

TI-B10 Core (90' – 95' interval)
11/27/13

TI-B10 Core (95' – 100' interval)
11/27/13

TI-B10 Core (100' – 105' interval)
11/27/13

TI-B10 Core (105' – 108' interval)
11/27/13

TI-B10 Bagged Core (106.9' – 107.3' interval)
11/27/13

TI-B10 Bagged Core (107.9' – 108' interval)
11/27/13

TI-B10 Core Box #1 (0' – 8' interval)
11/26/13

TI-B10 Core Box #2 (8' – 8.8' interval)
11/26/13

TI-B10 Core Box #3 (45' – 51.5' interval)
11/26/13

TI-B10 Core Box #4 (51.5' – 57.5' interval)
11/26/13

TI-B10 Core Box #5 (57.5' – 65' interval)
11/26/13

TI-B10 Core Box #6 (65' – 71' interval)
11/26/13

TI-B10 Core Box #7 (71' – 78' interval)
11/26/2013

TI-B10 Core Box #8 (78' – 85' interval)
11/26/13

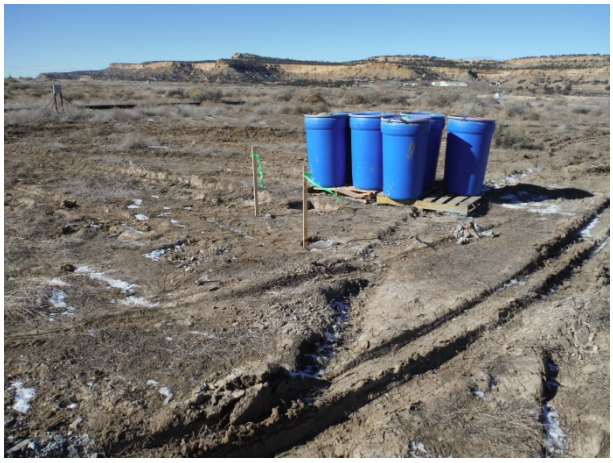
TI-B10 Core Box #9 (85' – 90' interval)
11/26/13

TI-B10 Core Box #10 (90' – 96.6' interval)
11/27/13

TI-B10 Core Box #11 (96.6' – 103' interval)
11/27/13

TI-B10 Core Box #12 (106' – 108' interval)
11/27/13

TI-B10 After Grouting
12/7/13



TI-B10 After Drilling and Grouting
12/7/13

TI-B11 Before Drilling
12/2/13

TI-B11 Acrylic Core Liner (52.5' – 55' interval)
12/2/13

TI-B11 Acrylic Core Liner (56' – 57.5' interval)
12/2/13

TI-B11 Acrylic Core Liner (57.5' – 60' interval)
12/2/13

TI-B11 Core (0' – 5' interval)
12/2/13

TI-B11 Core (5' – 10' interval)
12/2/13

TI-B11 Core (10' – 15' interval)
12/2/13

TI-B11 Core (15' – 20' interval)
12/2/13

TI-B11 Core (20' – 25' interval)
12/2/13

TI-B11 Core (30' – 34' interval)
12/2/13

TI-B11 Metallic Debric (from 34' – 38' Cuttings)
12/2/13

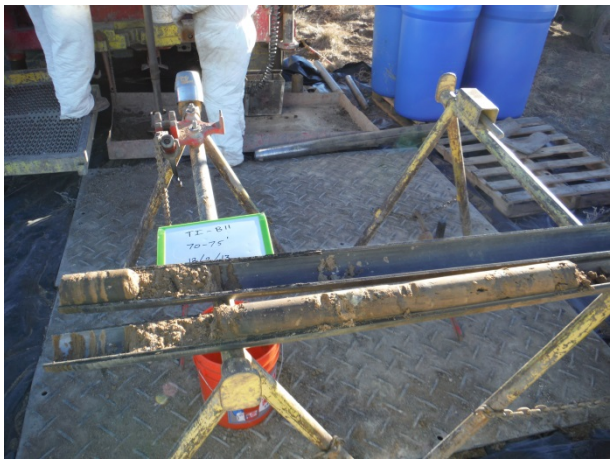
TI-B11 Core (40' – 45' interval)
12/2/13

TI-B11 at 45.5' (Bottom of CA sample)
12/2/13

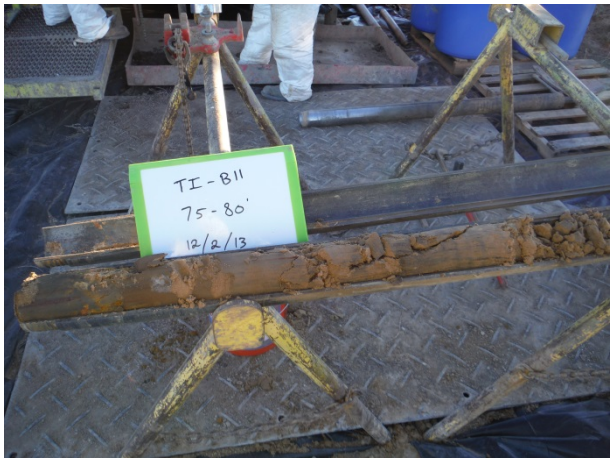
TI-B11 at 46.5' (Bottom of CA sample)
12/2/13

TI-B11 at 52.5' (Tip of Shelby tube)
12/2/13

TI-B11 Core (60' – 65' interval)
12/2/13

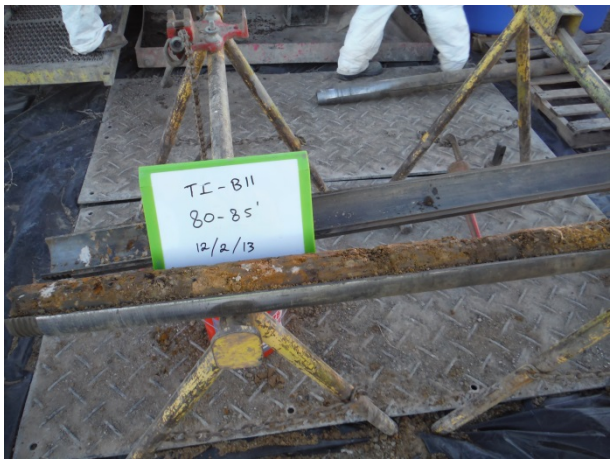


TI-B11 Core (70' – 75' interval)
12/2/13

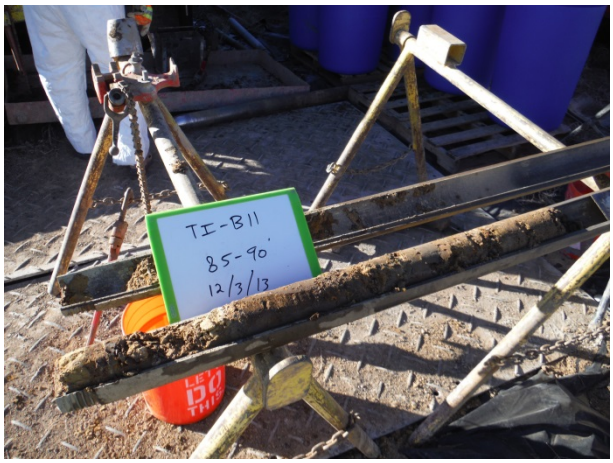


TI-B11 Core (75' – 80' interval)
12/2/13

TI-B11 Bagged Core Sample (77.5' – 78' interval)
12/2/13



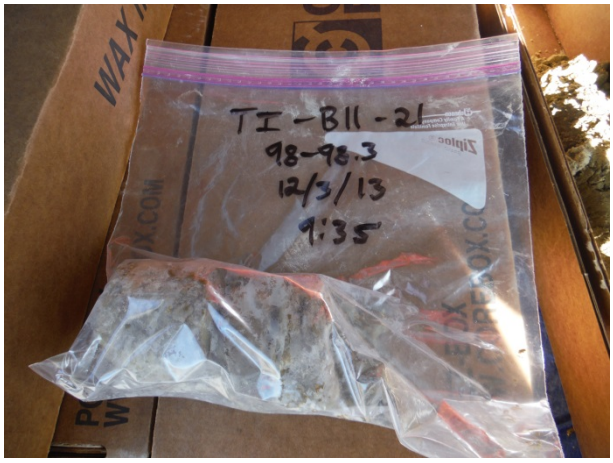
TI-B11 Core (80' – 85' interval)
12/2/13



TI-B11 Core (85' – 90' interval)
12/3/13

TI-B11 Core (90' – 95' interval)
12/3/13

TI-B11 Core (95' – 100' interval)
12/3/13



TI-B11 Bagged Core Sample (98' – 98.3' interval)
12/3/13

TI-B11 Core (100' – 103' interval)
12/3/13

TI-B11 Core Box #1 (0' – 10' interval)
12/2/13

TI-B11 Core Box #2 (10' – 18' interval)
12/2/13

TI-B11 Core Box #3 (18' – 23.5' interval)
11/4/13

TI-B11 Core Box #4 (23.5' – 28.5' interval)
12/2/13

TI-B11 Core Box #5 (28.5' – 34' interval)
12/2/13

TI-B100 Core Box #6 (40' – 45' interval)
12/2/13

TI-B11 Core Box #7 (45' – 50' interval)
12/2/13

TI-B11 Core Box #8 (60' – 66' interval)
12/2/13

TI-B11 Core Box #9 (66' – 71.5' interval)
12/2/13

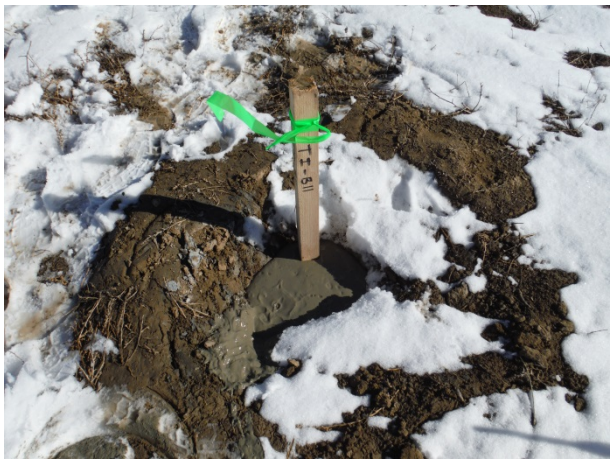
TI-B11 Core Box #10 (71.5' – 78' interval)
12/2/13

TI-B11 Core Box #11 (80' – 85' interval)
12/2/13

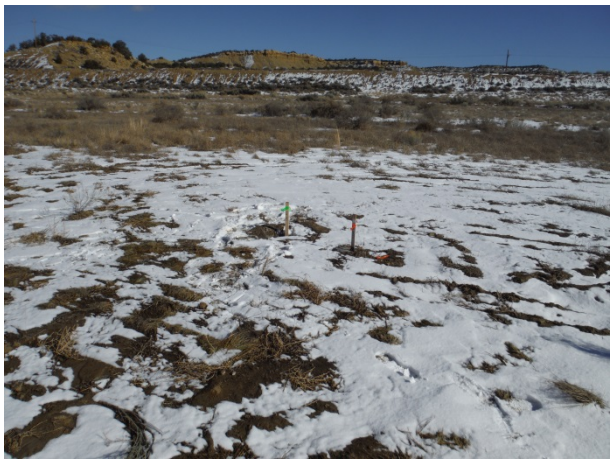
TI-B11 Core Box #12 (85' – 92' interval)
12/3/13

TI-B11 Core Box #13 (92' – 98' interval)
12/3/13

TI-B11 Core Box #14 (98' – 103' interval)
12/3/13

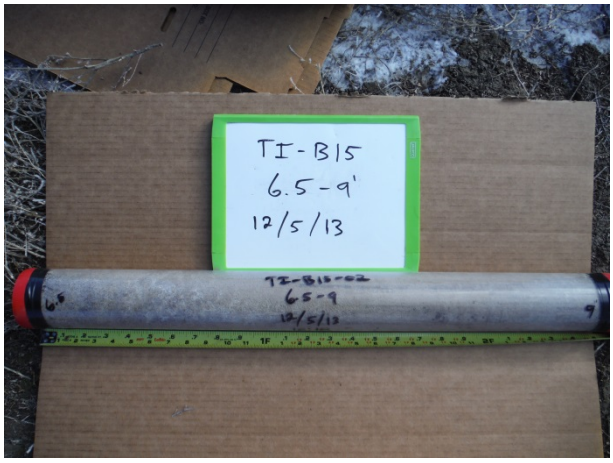


TI-B11 After Grouting
12/13/13

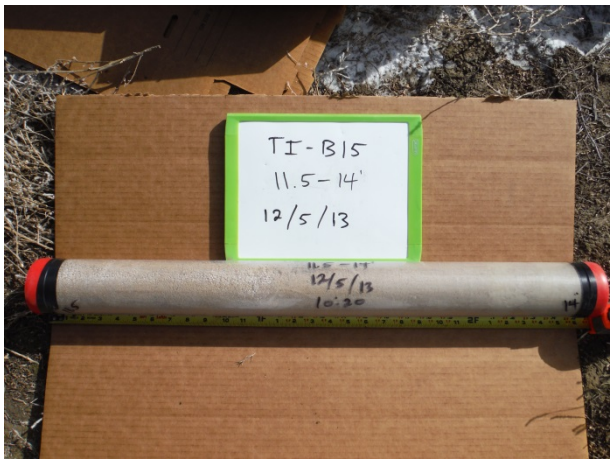


TI-B11 After Drilling and Grouting
12/13/13

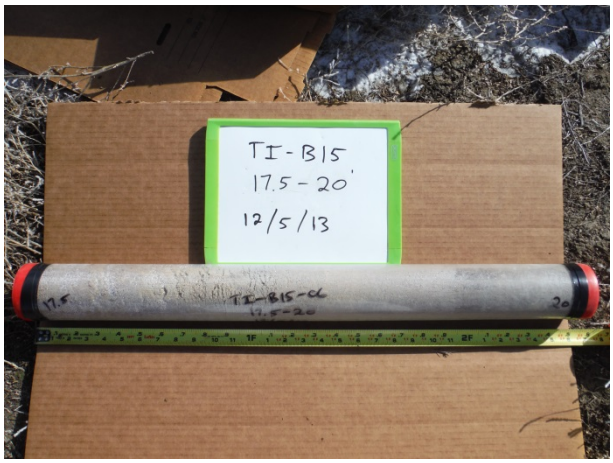
TI-B15 Before Drilling
12/3/13



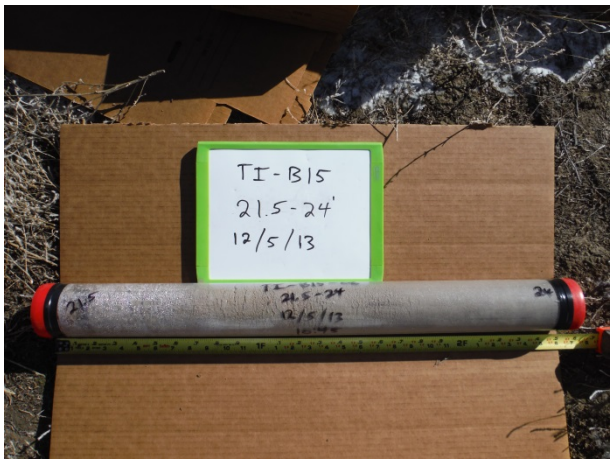
TI-B15 Acrylic Core Liner (6.5' – 9' interval)
12/5/13



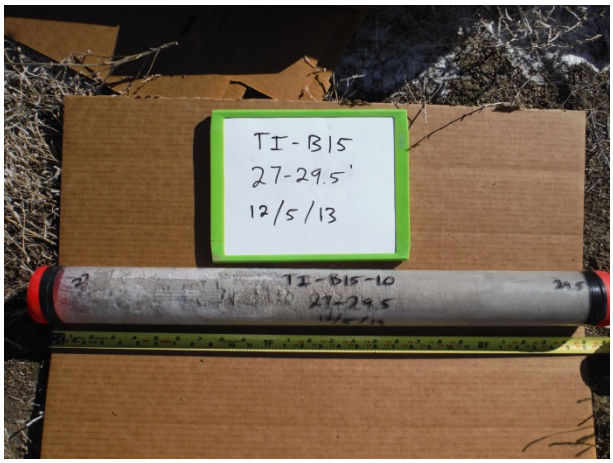
TI-B15 Acrylic Core Liner (11.5' – 14' interval)
12/5/13



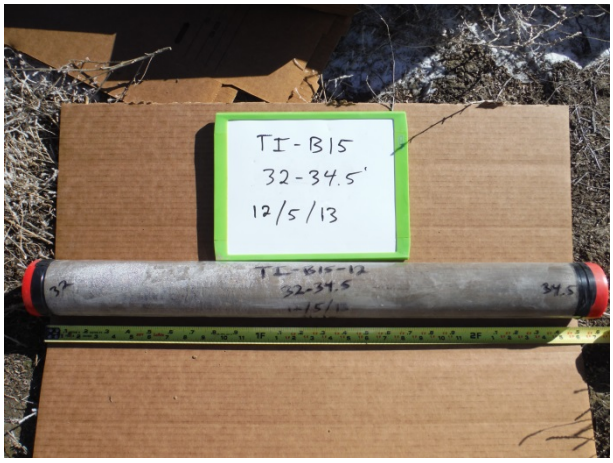
TI-B15 Acrylic Core Liner (17.5' – 20' interval)
12/5/13



TI-B15 Acrylic Core Liner (21.5' – 24' interval)
12/5/13



TI-B15 Acrylc Core Liner (27.5' – 29' interval)
12/5/13



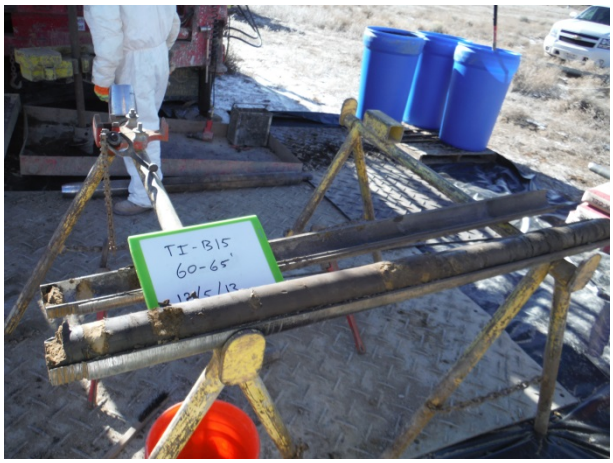
TI-B15 AcrylicCore Liner (32' – 34.5' interval)
12/5/13

TI-B15 Core (0' – 5' interval)
12/5/13

TI-B15 Core (40' – 45' interval)
12/5/13

TI-B15 Core (45' – 50' interval)
12/5/13

TI-B15 Core (50' – 55' interval)
12/5/13



TI-B15 Core (60' – 65' interval)
12/5/13

TI-B15 Core (65' – 70' interval)
12/5/13

TI-B15 Core Box #1 (0' - 15' and 35' – 38.5' intervals)
12/5/13

TI-B15 Core Box #2 (40' – 47' interval)
12/5/13

TI-B15 Core Box #3 (47' – 58' interval)
12/5/13

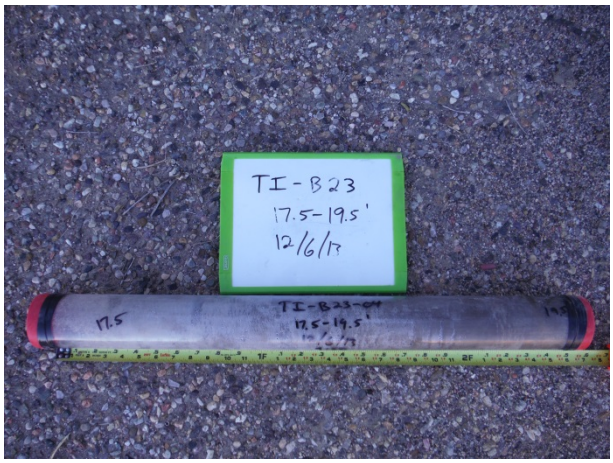
TI-B15 Core Box #4 (60' – 65' interval)
12/5/13

TI-B15 Core Box #5 (65' – 70' interval)
12/5/13

TI-B15 After Grouting
12/13/13

TI-B15 After Drilling and Grouting
12/13/13

TI-B23 Before Drilling
12/6/13



TI-B23 Acrylic Core Liner (17.5' – 19.5' interval)
12/6/13

TI-B23 Core (0' – 5' interval)
12/6/13

TI-B23 Core (5' – 10' interval)
12/6/13

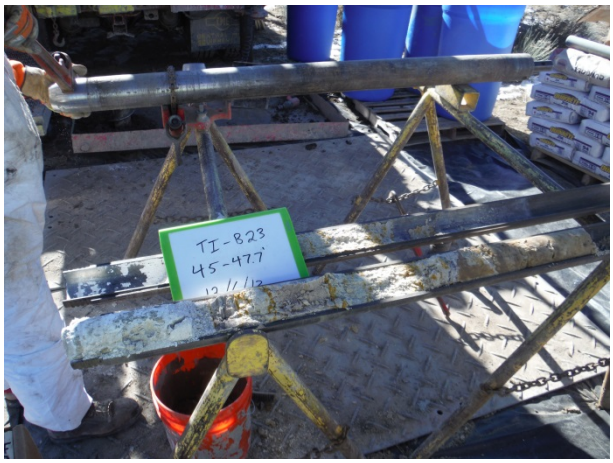
TI-B23 Core (10' – 15' interval)
12/6/13

TI-B23 Core (25' – 30' interval)
12/6/13

TI-B23 Core (30' – 35' interval)
12/6/13

TI-B23 Core (35' – 40' interval)
12/6/13

TI-B23 Core (43' – 45' interval)
12/6/13



TI-B23 Core (45' – 47.7' interval)
12/6/13

TI-B23 Core (47.7' – 49' interval)
12/6/13

TI-B23 Core (50' – 55' interval)
12/6/13

TI-B23 Core (55' – 60' interval)
(50' in photo is incorrect)
12/6/13

TI-B23 Core (60' – 65' interval)
12/6/13

TI-B23 Core (65' – 70' interval)
12/6/13

TI-B23 Core Box #1 (0' – 8' interval)
12/6/13

TI-B23 Core Box #2 (8’ – 14’ interval)
12/6/13

TI-B23 Core Box #3 (14’ – 24.5’ interval)
12/6/13

TI-B23 Core Box #4 (25’ – 30’ interval)
12/6/13

TI-B23 Core Box #5 (30’ – 35’ interval)
12/6/13

TI-B23 Core Box #6 (35’ – 40’ interval)
12/6/13

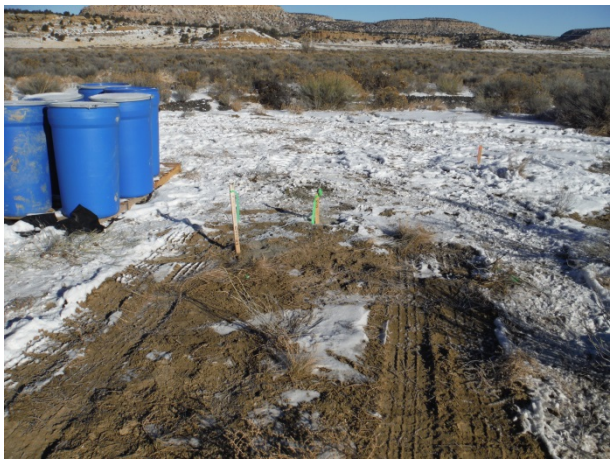
TI-B23 Core Box #7 (40’ – 44’ interval)
12/6/13

TI-B23 Core Box #8 (45’ – 49’ interval)
12/6/13

TI-B23 Core Box #9 (50’ – 60’ interval)
12/6/13

TI-B23 Core Box #10 (60’ – 70’ interval)
12/6/13

TI-B23 After Grouting
12/10/13



TI-B23 After Drilling and Grouting
12/10/13