

**REPORT OF GEOTECHNICAL EXPLORATION**

**EAST AND WEST ASH DISPOSAL AREAS  
ALLEN FOSSIL PLANT  
MEMPHIS, TENNESSEE**

**Prepared For:**

**TENNESSEE VALLEY AUTHORITY**

**Chattanooga, Tennessee**

**Prepared By:**

**MACTEC ENGINEERING AND CONSULTING, INC.**

**Knoxville, Tennessee**

**MACTEC Project 3043041037/01**

**August 18, 2004**





August 18, 2004

Mr. Ron Purkey  
Tennessee Valley Authority  
1101 Market Street, LP-2G  
Chattanooga, TN 37402

Subject: **Report of Geotechnical Exploration  
East and West Ash Disposal Areas  
TVA Allen Fossil Plant  
Memphis, Tennessee  
MACTEC Project 3043041037/01**

Dear Mr. Purkey:

We at MACTEC Engineering and Consulting, Inc., (MACTEC) are pleased to submit this Report of Geotechnical Exploration for your project. Our services, as authorized through TAO No. MAC-0701-00059 were provided in general accordance with our proposal number Prop04Knox/251, Revision 1, dated July 6, 2004.

This report reviews the information provided to us, discusses the site and subsurface conditions, and presents the results of our field and laboratory testing for the materials at the existing east and west disposal areas. The Appendices contain a brief description of the Field Exploratory Procedures, a Key Sheet and Test Boring Records, Cone Penetrometer Test Results, the Laboratory Test Procedures, and the Laboratory Test Results.

We anticipate further dialog and interaction with the designers as the design proceeds and will be happy to provide any additional information or interpretation of the data presented here in which may be necessary.

We will be pleased to discuss our data with you and would welcome the opportunity to provide the engineering and material testing services needed to successfully complete your project.

Sincerely,

MACTEC ENGINEERING AND CONSULTING, INC.

A handwritten signature in black ink, appearing to read "Hussein Benkhayal".

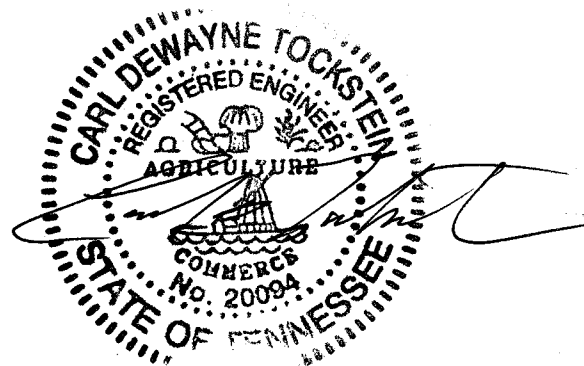
Hussein A. Benkhayal  
Senior Professional

HAB/CDT:sjm

A handwritten signature in black ink, appearing to read "Carl D. Tockstein".

Carl D. Tockstein, P.E.  
Chief Engineer - Tennessee Operations

MACTEC Engineering and Consulting  
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## EXECUTIVE SUMMARY

MACTEC was selected by the Tennessee Valley Authority (TVA) to perform a geotechnical exploration for the East and West Ash Disposal Areas at the Allen Fossil Plant in Memphis, Tennessee. The objectives of our exploration were to determine general subsurface conditions and to obtain data to evaluate the engineering characteristics of the fly ash and underlying soils.

The exploration consisted of drilling eight test borings and performing cone penetrometer testing (CPT) at five locations. Five test borings were drilled and cone penetrometer testing was performed at three locations in the East Ash Disposal Area. Three test borings were drilled and cone penetrometer testing was performed at two locations in the West Ash Disposal Area. All test borings were drilled to predetermined depths ranging from about 40 to 100 feet. The major findings of our geotechnical exploration are as follows:

- The test borings typically encountered an interval of ash underlain by alluvium. The ash interval extended from the existing ground surface to depths ranging from about 12 to 29 feet in the east disposal area and from about 15 to 23 feet in the west disposal area. The ash ranged in relative density from very loose to very dense. The alluvium, which extended below the ash to the termination depths, had consistencies ranging from soft to hard and relative densities ranging from firm to very dense.
- Ground water was encountered in several of the test borings at the time of drilling. Ground-water measurements were made at least 24 hours after completion of drilling. Long-term measurements for the presence or absence of ground water were not obtained during this exploration.
- Cone penetrometer test soundings were performed at five locations that correspond to test borings. The results of the cone penetrometer testing are presented in Appendix C.

This summary is only an overview and should not be used as a separate document or in place of reading the entire report, including the appendices.

## 1.0 INTRODUCTION

This report presents the findings of our subsurface exploration and laboratory testing recently performed for the East and West Ash Disposal Areas at TVA's Allen Fossil Plant. Our services were authorized by Mr. Ron Purkey of TVA.

## 2.0 OBJECTIVES OF EXPLORATION

The objectives of our exploration were to determine general subsurface conditions and to obtain data to evaluate the engineering characteristics of the fly ash and underlying soils. An assessment of site environmental conditions, or an assessment for the presence or absence of pollutants in the soil, bedrock, surface water, or ground water of the site was beyond the proposed objectives of our exploration.

## 3.0 SCOPE OF EXPLORATION

The scope of our exploration was based on our proposal number Prop04Knox/251, Revision 1, dated July 6, 2004, and the geotechnical scope of work outlined in the project's scope of work prepared by Parsons E&C. It includes the following:

- Reconnaissance of the immediate site
- Drilling eight test borings to depths ranging from about 40 to 100 feet
- Performing cone penetrometer testing (CPT) at five locations
- Laboratory testing
- Geotechnical report summarizing the field and laboratory test results

The drilling and sampling were performed in general accordance with ASTM procedures included in Appendix A. The drilling was performed during the period from July 13 to 22, 2004. The equipment used consisted of a CME Model 75 truck-mounted drill rig equipped with an automatic hammer. Standard penetration tests (SPTs) were performed at 3-foot vertical intervals in the upper 20 feet and at 5-foot intervals below a depth of 20 feet. In addition to the SPT samples, ten relatively undisturbed samples were obtained from three test borings for laboratory testing.

Ground-water levels were observed during drilling in each boring by observing the wetness of samples. Ground water measurements were made in the borings at approximately 24 hours or later after the completion of the borings.



Upon completion of drilling, the borings were plugged and abandoned by backfilling the full depth with cement grout.

The CPT soundings were performed on July 20, 2004. The CPT testing procedures are presented in Appendix C. A truck-mounted CPT rig with a 20-ton capacity electronic cone was utilized to perform the testing. During the CPT testing, the cone is continuously pushed into the ground and measurements are taken of the cone tip resistance, sleeve friction, and dynamic pore pressure. Pore pressure dissipation testing was performed only once at each CPT location to estimate the depth to ground-water level. Upon completion of the CPT testing, each hole was plugged and abandoned by backfilling the full depth with hole plug.

All samples were transported to our laboratories in Knoxville, Tennessee, where ash and soil samples were selected for laboratory testing. The testing program for this project consisted of the following:

- 6 Plasticity Index (Atterberg Limits) Tests
- 19 Grain Size Distribution Tests
- 36 Natural Moisture Content Tests
- 7 Specific Gravity Tests
- 4 Consolidated Undrained Triaxial Compression (CU) Test

Subsurface conditions encountered in the test borings are presented on the Test Boring Records in Appendix B. The results of the CPT testing are presented in Appendix C. The laboratory testing results are presented in Appendix D.

#### **4.0 PROJECT INFORMATION AND SITE CONDITIONS**

Project information was provided to us by Mr. Daniel Smith with Parsons E&C in the form of a Geotechnical Investigation Scope of Work and a boring/CPT location plan. The exploration included both the East and the West Ash Disposal Areas. The two sites are located on the respective sides (east and west) of the Allen Fossil Plant site. The ground surface elevations varied by as much as 1 foot and 8 feet in the areas explored at the East and West Ash Disposal Areas, respectively.

## 5.0 AREA AND SITE GEOLOGY

The published geologic map of this area shows that this site is underlain by fill material, which in turn is underlain by Quaternary-aged alluvium deposits. The fill material is comprised of brown to gray, fine to coarse sands with some brown and gray silts. This fill material was obtained from dredgings in the harbor development work of the site. The thickness of this fill material varies from a minimum of 20 feet to a maximum of 40 feet in the plant area. The alluvium is a water-transported deposit, consisting generally of irregular lenses of fine sand, silt and clay in the upper part, and of coarse sand, graveliferous sand, and sandy gravel in the lower part. The maximum thickness of this deposit is 175 feet in areas of the Mississippi flood plain but is believed to be about 120 feet thick in the plant area. The alluvium is shown to be underlain by a series of dense clays and sands known as the Claiborne Group. The clays and sands in this formation are highly consolidated and are of considerable thickness (up to 800 feet).

## 6.0 SUBSURFACE CONDITIONS

Subsurface conditions for the project were explored with eight test borings (EAD-1 through EAD-5 and WAD-1 through WAD-3) and five CPT soundings (CPT-1 through CPT-5). The locations for all the borings and CPT soundings were proposed by Parsons E&C. The boring locations were established in the field by MACTEC personnel. After drilling was completed, the boring locations were surveyed by others and we were provided with the surveyed locations and elevations of all borings. Because of access restrictions, some of the borings were offset from the originally proposed location.

Subsurface conditions encountered at each boring location are shown on the Test Boring Records in Appendix B. The Test Boring Records represent our interpretation of the subsurface conditions, based on the field logs and visual examination of the samples by one of our geotechnical engineers. The lines designating the interfaces between various strata on the Test Boring Records represent the approximate interface locations.

The test borings performed at this site typically encountered ash and alluvial materials. Alluvial soils are soils that have been transported to their present location by running water. None of the borings encountered refusal; therefore, all borings were drilled to the predetermined depths. A summary of the test boring depths is presented in Table 1.

<b>Boring Number</b>	<b>Ground Surface Elevation (Feet msl)</b>	<b>Boring Termination Depth (Feet)</b>	<b>Boring Termination Elevation (Feet msl)</b>
WAD-1	227.9	41.5	186.4
WAD-2	228.1	51.5	176.6
WAD-3	228.2	41.5	186.6
EAD-1	238.6	71.5	167.1
EAD-1B	238.6	100.5	138.1
EAD-2	236.6	51.5	185.1
EAD-3	236.4	51.5	184.9
EAD-4	236.6	51.5	185.1
EAD-5	230.5	51.5	179.0

Prepared/Date: HAB 8/18/04  
Checked/Date: CDT 8/18/04

## 6.1 ASH

Ash material was encountered in all test borings. The ash interval extended from the existing ground surface to depths ranging from about 12 to 29 feet in the east disposal area and from about 15 to 23 feet in the west disposal area. The standard penetration test (SPT) resistance values in the ash ranged from 0 (weight of hammer) to over 50 blows per foot (bpf); indicating very loose to very dense relative densities.

## 6.2 ALLUVIUM

Alluvial soils were encountered in all test borings. The alluvial soils were encountered below the ash and extended to the termination depths in all borings. The alluvial soils consisted primarily of brown, gray, dark gray, and olive-brown silty clay, sandy silt, and silty sand. The SPT resistance values in the alluvium ranged from 3 to over 50 blows per foot (bpf), indicating soft to very hard consistencies and firm to very dense relative densities. However, the majority of the alluvium had a stiff to very stiff consistency or firm to dense relative densities.

## 7.0 CONE PENETROMETER TESTING

Five CPT soundings (CPT-1 through CPT-5) were performed in general accordance with ASTM Standard D5778-95 and the procedures in Appendix C. The CPT sounding locations were proposed by Parsons E&C and corresponded to five boring locations. The results are presented in Appendix C.

During the CPT testing, the cone is pushed into the ground at a constant rate. Measurement of tip resistance ( $q_c$ ), sleeve friction ( $f_s$ ), and dynamic pore pressure ( $U$ ) are obtained at small intervals (approximately 2-inch intervals). Using published correlations, the collected data is used to estimate several soil parameters such as unit weight, strength parameters, standard penetration test (SPT) value, relative density, and others. Graphs in Appendix C show plots of recorded field data versus depth. The estimated SPT values are also plotted versus depth. The recorded field data and estimated parameters are presented in table format in Appendix C, in addition to the correlations used to develop them.

In addition to the above, pore pressure dissipation tests were performed at all CPT locations to estimate the depth to ground water. Also, seismic cone penetrometer tests were performed at the location of CPT-5 at the 5-foot depth interval. The results of the pore pressure and seismic tests are also presented in Appendix C.

The results of the CPT soundings and the estimated SPT values are in good agreement with the SPT values obtained during drilling for the corresponding locations. The results of the seismic cone penetrometer testing indicate that the estimated shear wave velocity of the ash was 571 feet per second (fps); and the shear wave velocity of the alluvium ranged from 507 to 1,032 fps.

## 8.0 LABORATORY TESTING AND DISCUSSION OF TEST RESULTS

This section describes the geotechnical laboratory testing program. The laboratory testing procedures and laboratory test results are included in Appendix D. The following paragraphs provide a short discussion of the general types of testing conducted and the test results.

## 8.1 INDEX PROPERTIES, SPECIFIC GRAVITY AND UNIT WEIGHTS

Natural moisture content tests were performed on many of the split-spoon and undisturbed soil samples. Liquid limit, plastic limit, and plasticity index tests (collectively referred to herein as Atterberg limits); specific gravity tests; and grain size distributions with hydrometer analyses were performed on selected samples and a split-spoon sample. These tests were used to confirm our visual-manual classifications.

The ash samples tested were all non-plastic. The plasticity tests were performed only on the clayey alluvial soils. Liquid limits for the clayey alluvium tested varied from 56 to 76; plastic limits varied from 24 to 34; and plasticity indices varied from 32 to 42. The tested alluvial soils classified as CH in accordance with the Unified Soil Classification System (USCS).

Natural moisture contents for the ash ranged from 2.9 percent (boring EAD-3) to 139.3 percent (boring EAD-1). However, the majority of the moisture contents in the ash varied from about 12.8 to 33.4 percent. The natural moisture content of the alluvium ranged from 13.9 percent (boring WAD-3) to 42.7 percent (boring WAD-3). The majority of the alluvium samples tested had a natural moisture content ranging from about 20 to 37 percent.

Specific gravities of the ash ranged from 2.53 to 2.83 and averaged about 2.72. Specific gravities of the alluvium was 2.69.

## 8.2 STRENGTH

Four consolidated undrained (CU) triaxial compression test were performed on undisturbed ash and soil samples. Three CU tests were performed on ash samples obtained from borings EAD-1, EAD-3, and WAD-2. The fourth CU test was performed on an alluvium sample obtained from boring WAD-2.

The results of the CU tests performed on the ash indicated that the tested samples had a total friction angle ranging from 26.5 to 31.9 degrees and a total cohesion intercept from 1,950 to 3,700 pounds per square foot (psf). The tests also indicated that the effective friction angle ranged from 35.5 to 39.8 degrees and the effective cohesion intercept ranged from 0.0 to 1,010 psf for the ash samples tested.

The CU test performed on the alluvium yielded a total friction angle of 19.7 degrees and a total cohesion intercept of 1,050 psf. The effective friction angle was 35.8 degrees and the effective cohesion intercept was 0.0 psf.

### 9.0 GROUND-WATER CONDITIONS

Ground-water levels were observed in the test borings at the time of drilling. Further, ground-water measurements were obtained approximately 24 hours or later after the completion of drilling. The recorded ground-water levels are presented in Table 2. For safety reasons, the borings were backfilled promptly; consequently, long-term measurements for the presence or absence of ground water were not obtained.

Fluctuations in the ground-water level occur because of variation in rainfall, evaporation, construction activity, surface run-off, and other site-specific factors such as fluctuation of water levels in the adjacent Lake McKellar.

**Table 2**  
**Ground-Water Data**

Boring Number	Ground Elevation (msl) (Feet)	Depth to Ground Water at Time of Drilling (Feet)	Ground-Water Elevation (msl) at Time of Drilling (Feet)	Depth to Ground Water 24 Hours After Drilling (Feet)	Ground-Water Elevation 24 Hours After Drilling (msl) (Feet)
WAD-1	227.9	Not Recorded	Not Recorded	31.6*	196.3
WAD-2	228.1	Not Recorded	Not Recorded	30.5*	197.6
WAD-3	228.2	Not Recorded	Not Recorded	32.6	195.6
EAD-1	238.6	7.8	230.8	Not Measured	Not Measured
EAD-1B	238.6	Not Recorded	Not Recorded	Not Measured	Not Measured
EAD-2	236.6	Not Recorded	Not Recorded	3.0*	233.6
EAD-3	236.4	Not Recorded	Not Recorded	6.8	229.6
EAD-4	236.6	Not Recorded	Not Recorded	14.8	221.8
EAD-5	230.5	Not Recorded	Not Recorded	3.0*	227.5

\*This is the depth of the hole cave-in.

Prepared/Date: HAB 8/18/04  
 Checked/Date: CDT 8/18/04

## **10.0 BASIS OF RESULTS**

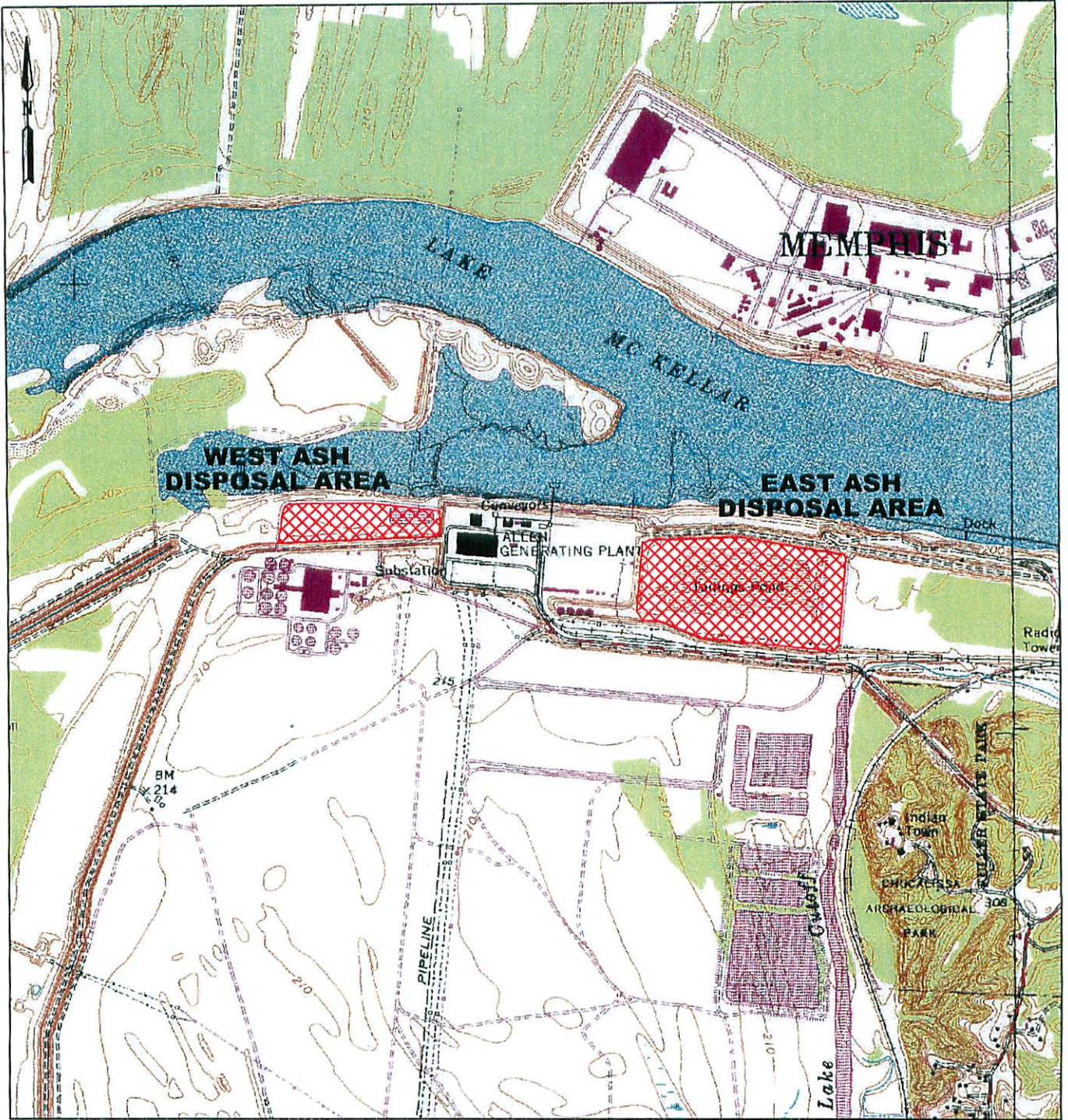
The results provided herein are based on the encountered subsurface conditions related to the specific project and site discussed in this report.

Regardless of the thoroughness of a field exploration, there is always a possibility that conditions between test locations will differ from those at specific test locations, and that conditions may not be anticipated. In addition, interpretation of the data is critical to the intended design and/or analysis. Therefore, experienced geotechnical engineer should interpret the field data and review any site-specific analysis or design that incorporates the field data. We recommend that TVA retain MACTEC to provide this service, based upon our familiarity with the subsurface conditions, the field and laboratory data, and our geotechnical experience.

Our exploration services include storing the collected samples and making them available for inspection for a period of 30 days. The samples are then discarded unless you request otherwise.

**FIGURES**





SOURCE: USGS TOPOGRAPHIC MAP OF THE FLETCHER LAKE, TN QUADRANGLE

**FIGURE 1: SITE LOCATION MAP  
ASH DISPOSAL AREAS  
TVA ALLEN FOSSIL PLANT  
MEMPHIS, TENNESSEE**



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Knoxville, Tennessee 37921-5904  
865-588-8544 • Fax: 865-588-8026

DRAFTING BY: *[Signature]*

PREPARED BY: HAB

CHECKED BY: *[Signature]*

JOB NUMBER:  
3043041037/0001

DATE:  
AUGUST 2, 2004

SCALE:  
0 2000'

COORDINATES: N 35°04'27" W 90°08'57"

3043041037\_01\_FIG1.dwg Mon, 02 Aug 2004 - 1:24pm reverentc



ASH DISPOSAL EASEMENT AREA No.6  
 U.S. CORPS OF ENGINEERS

NOTE: THIS DRAWING WAS ADAPTED FROM A BORING LOCATION PLAN PROVIDED BY PARSONS E&C.

LEGEND	
<span style="color: orange;">●</span> EAD-1	BORING LOCATION AND IDENTIFICATION
<span style="color: orange;">●</span> CPT-1	CONE PENETROMETER SOUNDING LOCATION AND IDENTIFICATION



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**FIGURE 2: BORING LOCATION PLAN  
 ASH DISPOSAL AREAS  
 TVA ALLEN FOSSIL PLANT  
 MEMPHIS, TENNESSEE**

DRAWN BY: <i>[Signature]</i>	PREPARED BY: H.A.B.	CHECKED BY: <i>[Signature]</i>
JOB NUMBER: 3043041037/0001	DATE: AUGUST 18, 2004	SCALE: 0 300'

**APPENDIX A**

**FIELD EXPLORATORY PROCEDURES**

## FIELD EXPLORATORY PROCEDURES

### Soil Test Boring (Hollow Stem)

All boring and sampling operations were conducted in general accordance with ASTM D 1586. The borings were advanced by mechanically twisting continuous steel hollow-stem auger flights into the ground. At regular intervals, soil samples were obtained with a standard 1.4-inch I.D., 2-inch O.D., split-tube sampler. The sampler was first seated six inches to penetrate any loose cuttings and then driven an additional foot with blows of a 140-pound hammer falling 30 inches. The number of hammer blows required to drive the sampler the final foot of penetration was recorded and is designated the "standard penetration resistance (SPT)". Proper evaluation of the penetration resistance provides an index to the soil's strength, density, and ability to support foundations.

Representative portions of the soil samples obtained from the split-tube sampler were sealed in glass jars and transported to our laboratory, where they were examined by our engineer to verify the driller's field classifications. Test Boring Records are attached, graphically showing the soil descriptions and penetration resistances.

### Undisturbed Sampling

The relatively undisturbed samples were obtained by pushing a section of 3-inch O.D., 16-gauge steel tubing into the soil at the desired sampling level. The sampling was performed in general accordance with ASTM D-1587. The tube, together with the encased soils, was carefully removed from the ground, made airtight, and transported to our laboratory.

### Boring Backfill

The borings were backfilled to the ground surface with auger cuttings. The owner is advised that, even with this backfill technique, there is the possibility of future borehole subsidence depending on actual subsurface conditions, surface drainage, etc. The property owner should monitor the boring locations over time to discover subsidence and make the necessary repairs.

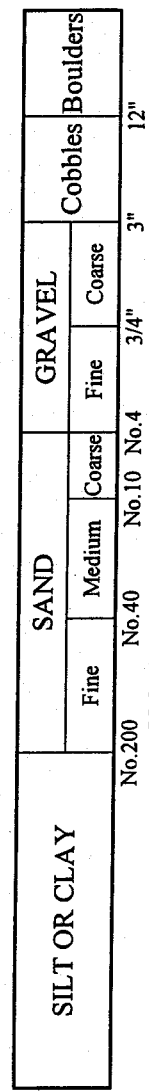
**APPENDIX B**

**KEY TO SYMBOLS AND DESCRIPTIONS**

**TEST BORING RECORDS**

GROUP SYMBOLS	TYPICAL NAMES	GROUP SYMBOLS	TYPICAL NAMES	Undisturbed Sample 1.5-2.0 = Recovered (ft) / Pushed (ft)
	TOPSOIL		CONCRETE	Split Spoon Sample Auger Cuttings
	ASPHALT		DOLOMITE	Rock Core 60-100 = RQD / Recovery Dilatometer
	GRAVEL		LIMESTONE	No Sample Crandall Sampler
	FILL		SHALE	Rotary Drill Pressure Meter
	SUBSOIL		LIMESTONE/SHALE - Limestone with shale interbeds	Water Table at time of drilling No Recovery
	ALLUVIUM		SANDSTONE	Water Table after 24 hours
	COLLUVIUM		SILTSTONE	
	RESIDUUM - Soft to firm		AUGER BORING	
	RESIDUUM - Stiff to very hard		UNDISTURBED SAMPLE ATTEMPT	

**BOUNDARY CLASSIFICATIONS:** Soils possessing characteristics of two groups are designated by combinations of group symbols.



Reference: The Unified Soil Classification System, Corps of Engineers, U.S. Army Technical Memorandum No. 3-357, Vol. 1, March, 1953 (Revised April, 1960)

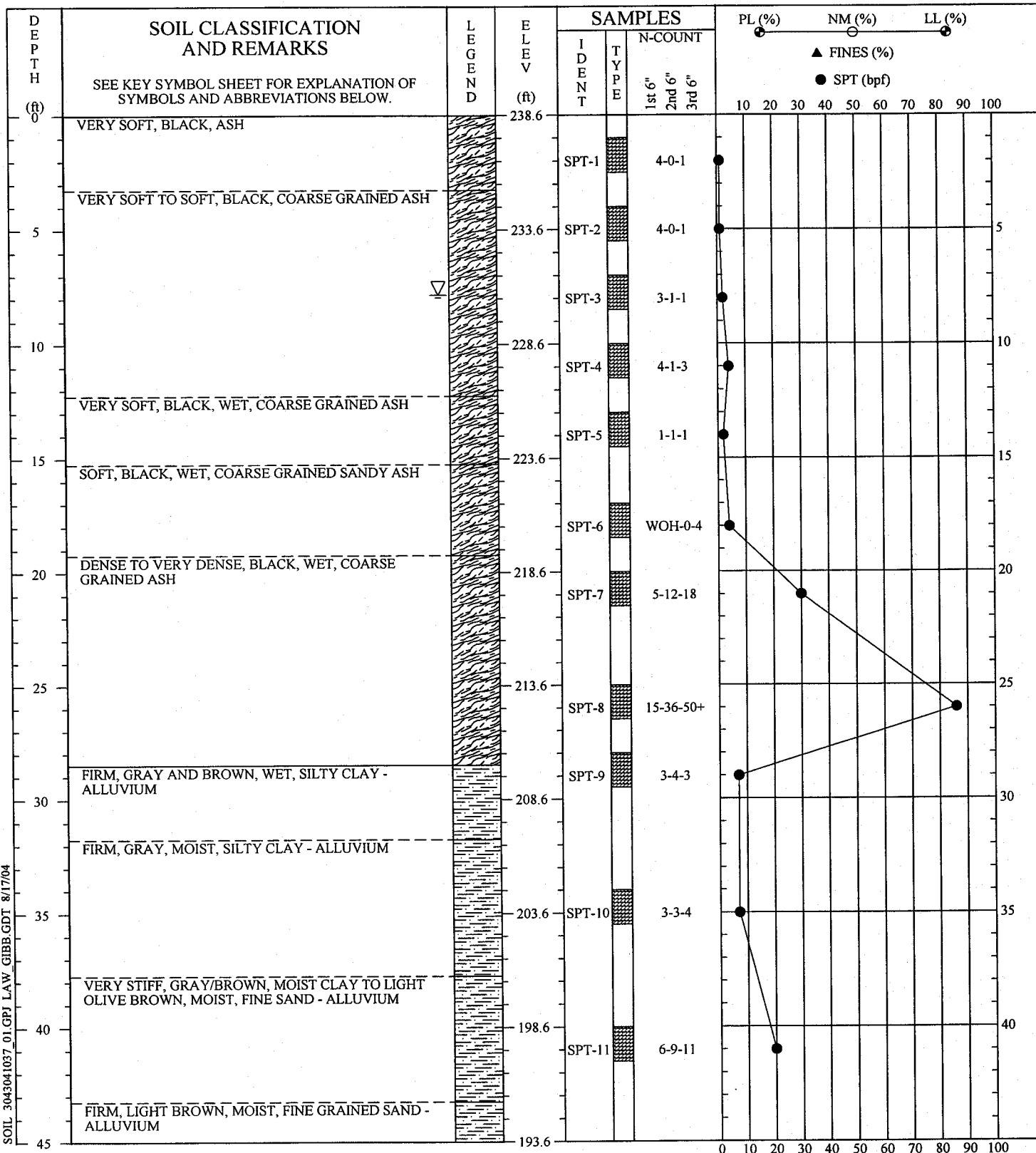
**Correlation of Penetration Resistance  
with Relative Density and Consistency**

SAND & GRAVEL		SILT & CLAY	
No. of Blows	Relative Density	No. of Blows	Consistency
0 - 4	Very Loose	0 - 2	Very Soft
5 - 10	Loose	3 - 4	Soft
11 - 20	Firm	5 - 8	Firm
21 - 30	Very Firm	9 - 15	Stiff
31 - 50	Dense	16 - 30	Very Stiff
Over 50	Very Dense	31 - 50	Hard
		Over 50	Very Hard

**KEY TO SYMBOLS AND  
DESCRIPTIONS**



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SOIL 3043041037 01.GPJ LAW\_GIBB.GDT 8/17/04

REMARKS: STANDARD PENETRATION RESISTANCE TESTING PERFORMED USING AN AUTOMATIC HAMMER.

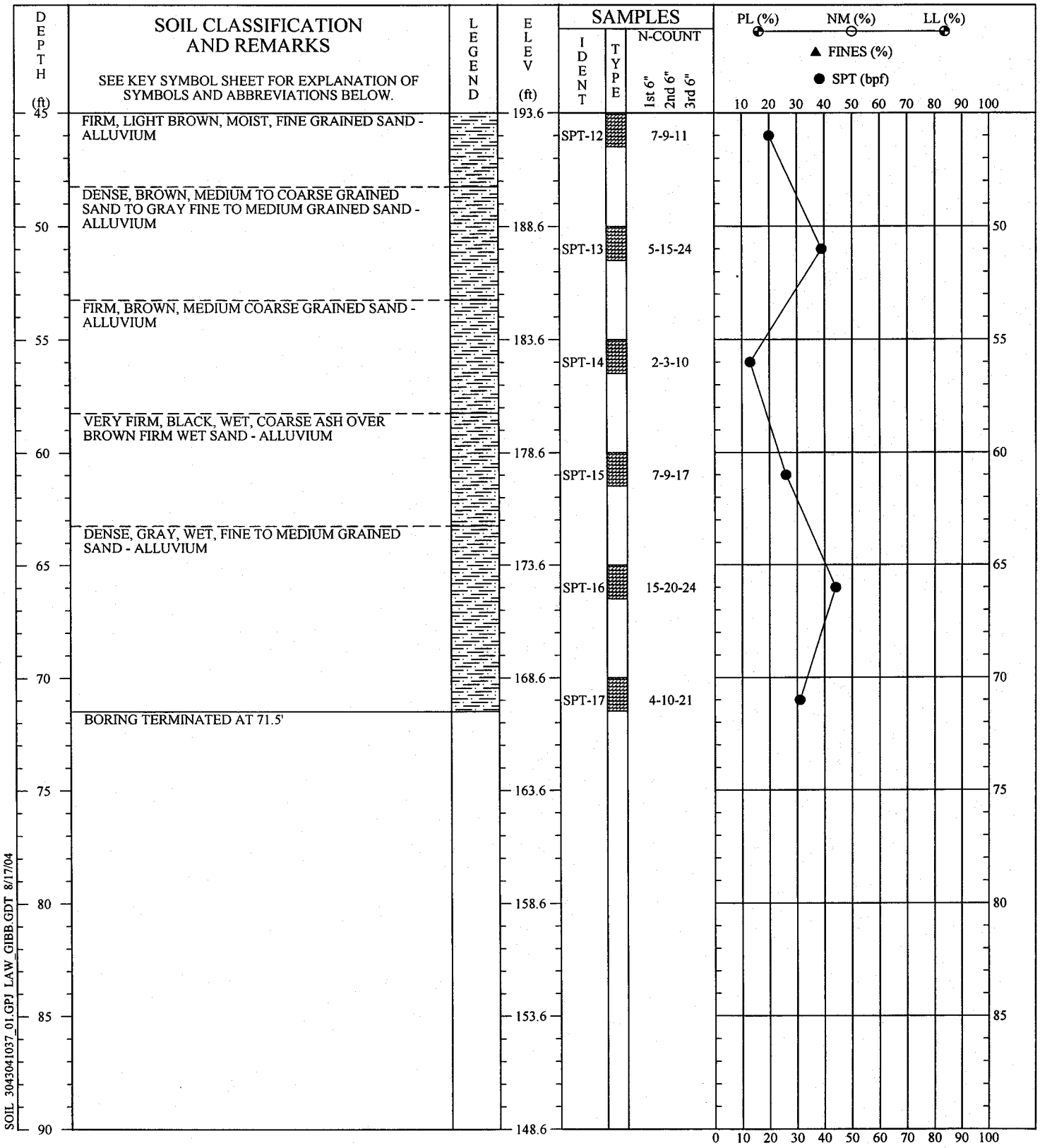
THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

Driller : Warren  
Prepared By: Smith  
Checked By: H.A.B.

**SOIL TEST BORING RECORD**

**PROJECT:** Allen Fossil Plant - East and West Ash Ponds  
**DRILLED:** July 17, 2004 **BORING NO.:** EAD-1  
**PROJ. NO.:** 3043041037/0001 **PAGE 1 OF 2**





SOIL 3043041037\_01.GPJ LAW\_GIBB.GDT 8/17/04

REMARKS: STANDARD PENETRATION RESISTANCE TESTING PERFORMED USING AN AUTOMATIC HAMMER.

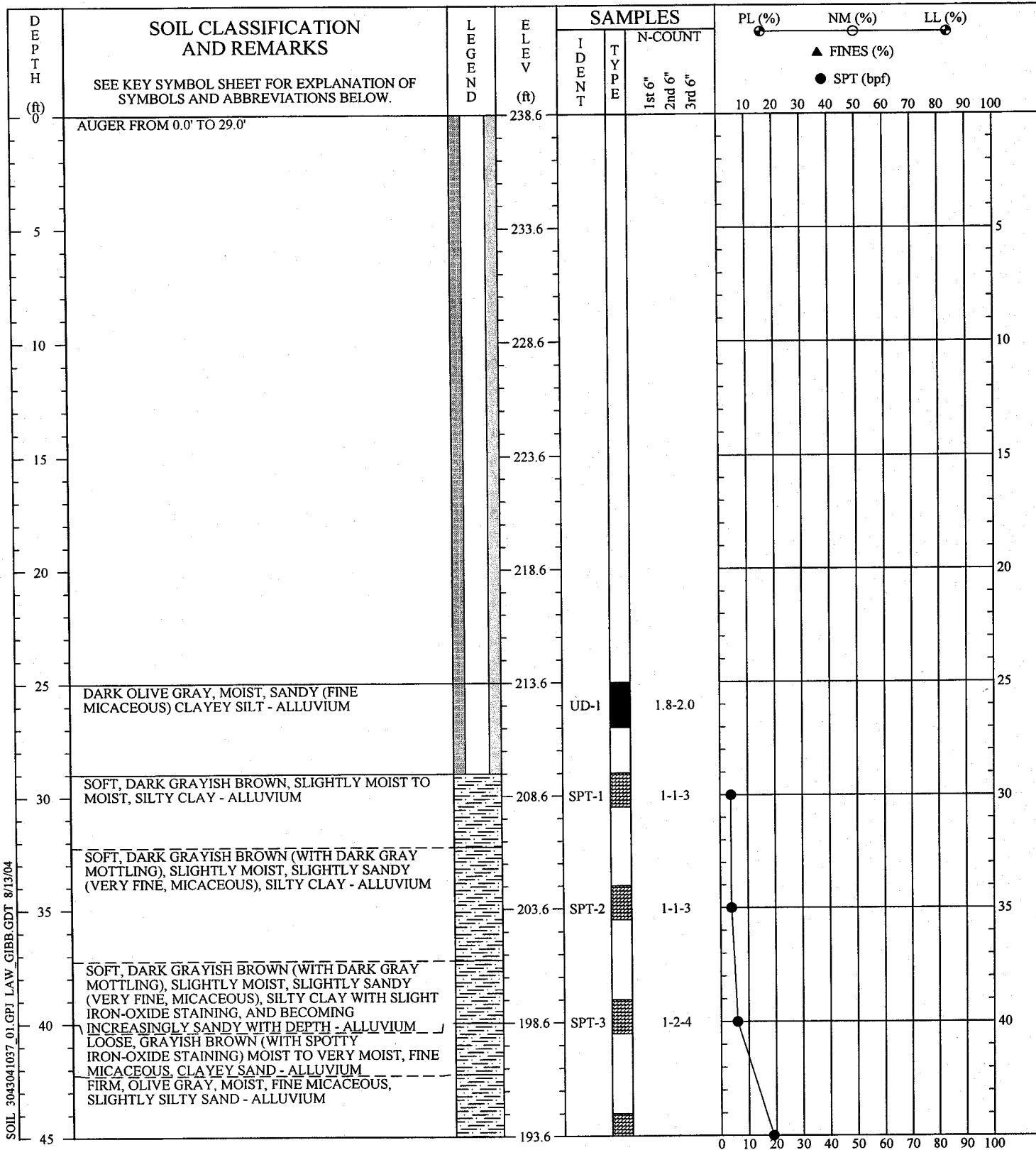
SOIL TEST BORING RECORD	
<b>PROJECT:</b> Allen Fossil Plant - East and West Ash Ponds	<b>BORING NO.:</b> EAD-1
<b>DRILLED:</b> July 17, 2004	
<b>PROJ. NO.:</b> 3043041037/0001	<b>PAGE 2 OF 2</b>

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

Driller : Warren  
Prepared By: Smith  
Checked By: H.A.B.








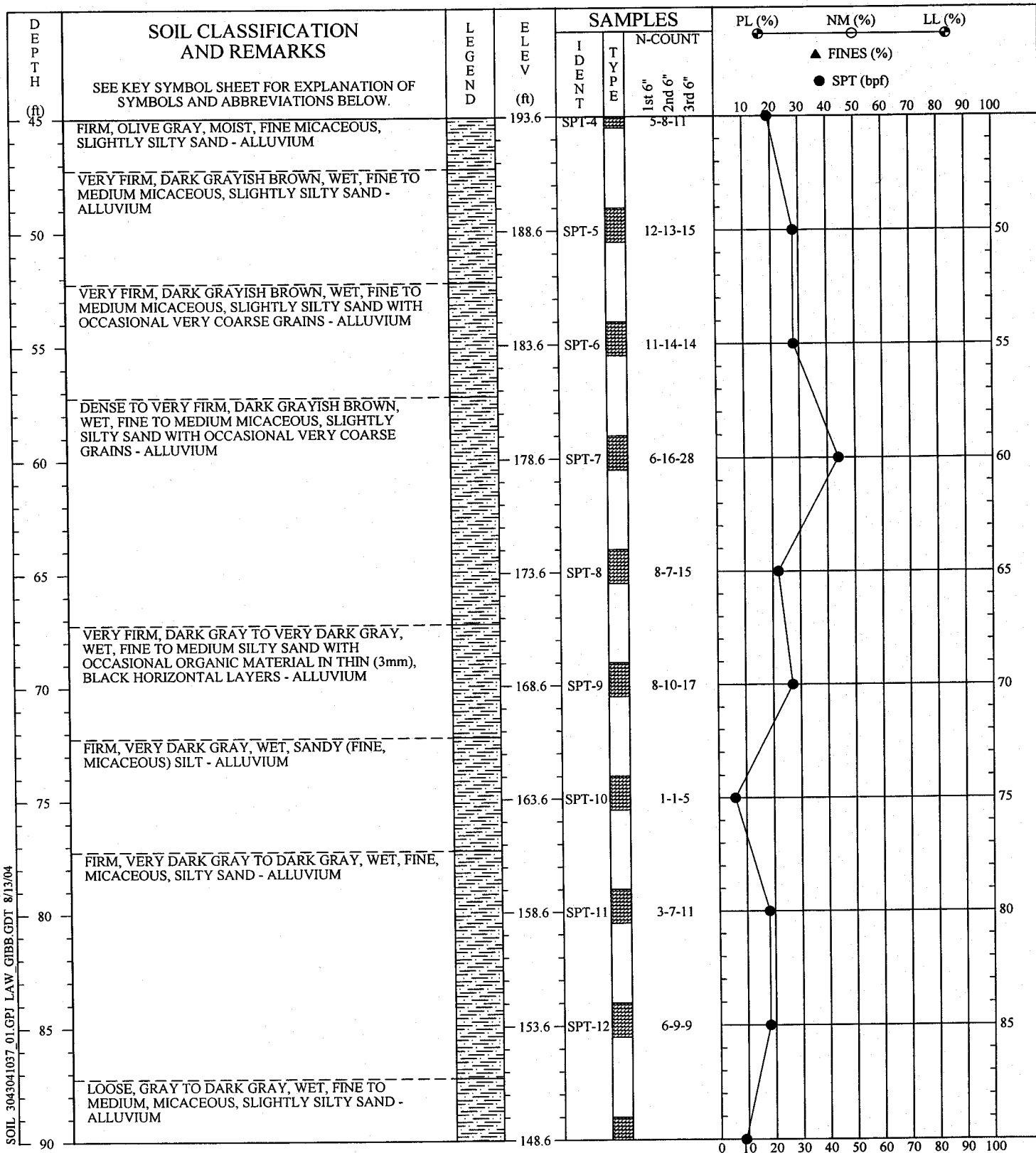
SOIL 3043041037 01.GPJ LAW GIBB GDT 8/13/04

REMARKS: STANDARD PENETRATION RESISTANCE TESTING PERFORMED USING AN AUTOMATIC HAMMER. NO GROUND WATER ENCOUNTERED AT TIME OF EXPLORATION. BORING IS LOCATED APPROXIMATELY 10.0' NORTH OF EAD-1, AND IS THE THIRD ATTEMPT TO SAMPLE TO A DEPTH OF 100.0'.

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

Driller : Akins  
Prepared By: Mason  
Checked By: H.A.B.

SOIL TEST BORING RECORD	
<b>PROJECT:</b> Allen Fossil Plant - East and West Ash Ponds	<b>BORING NO.:</b> EAD-1B
<b>DRILLED:</b> July 21, 2004	
<b>PROJ. NO.:</b> 3043041037/0001	<b>PAGE 1 OF 3</b>
	



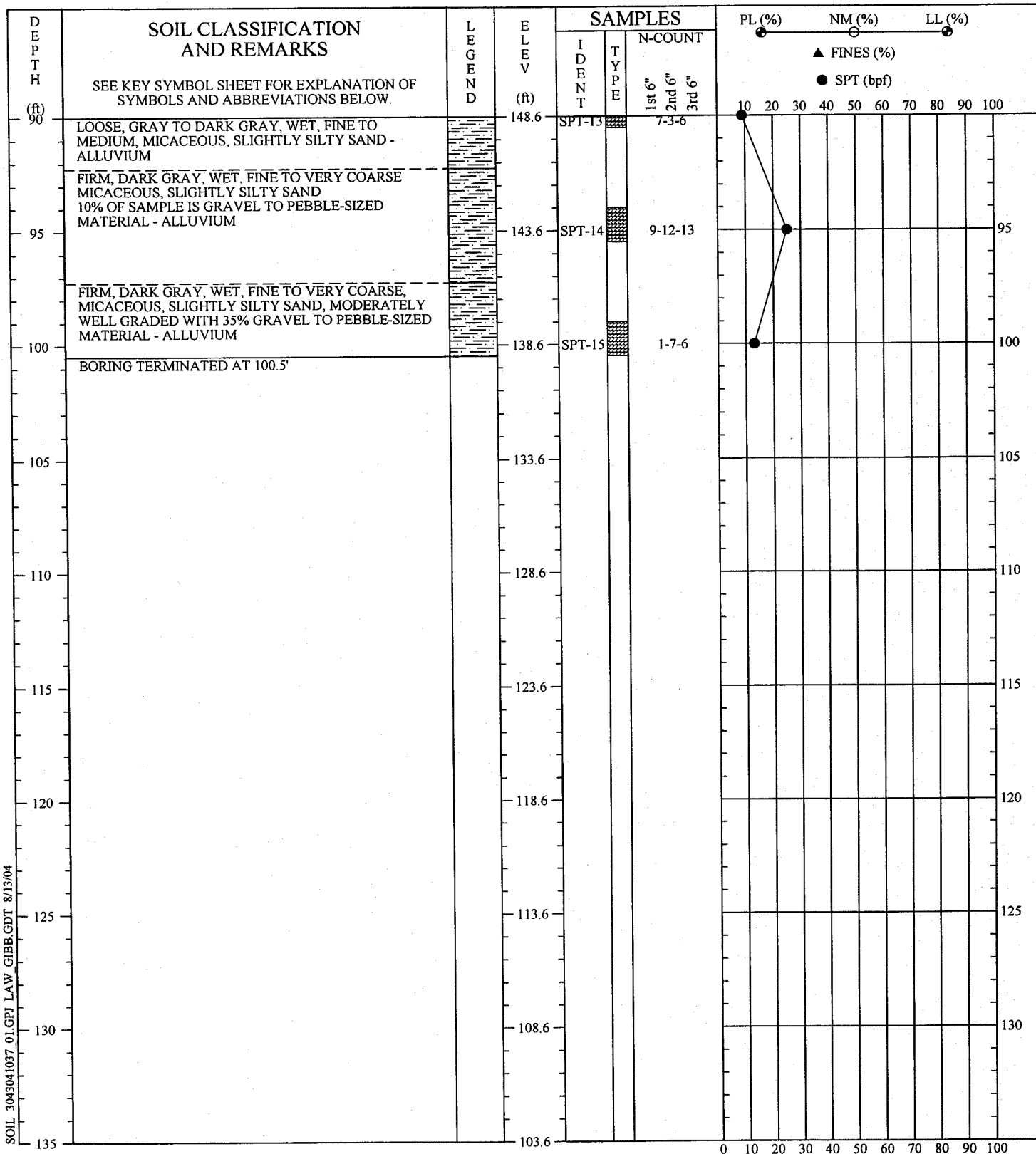
SOIL 3043041037 01.GPI LAW\_GIBB.GDT 8/13/04

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Driller : Akins  
 Prepared By: Mason  
 Checked By: H.A.B.

SOIL TEST BORING RECORD	
<b>PROJECT:</b> Allen Fossil Plant - East and West Ash Ponds	
<b>DRILLED:</b> July 21, 2004	<b>BORING NO.:</b> EAD-1B
<b>PROJ. NO.:</b> 3043041037/0001	<b>PAGE 2 OF 3</b>
<span style="font-size: 2em; font-weight: bold; vertical-align: middle;">MACTEC</span>	




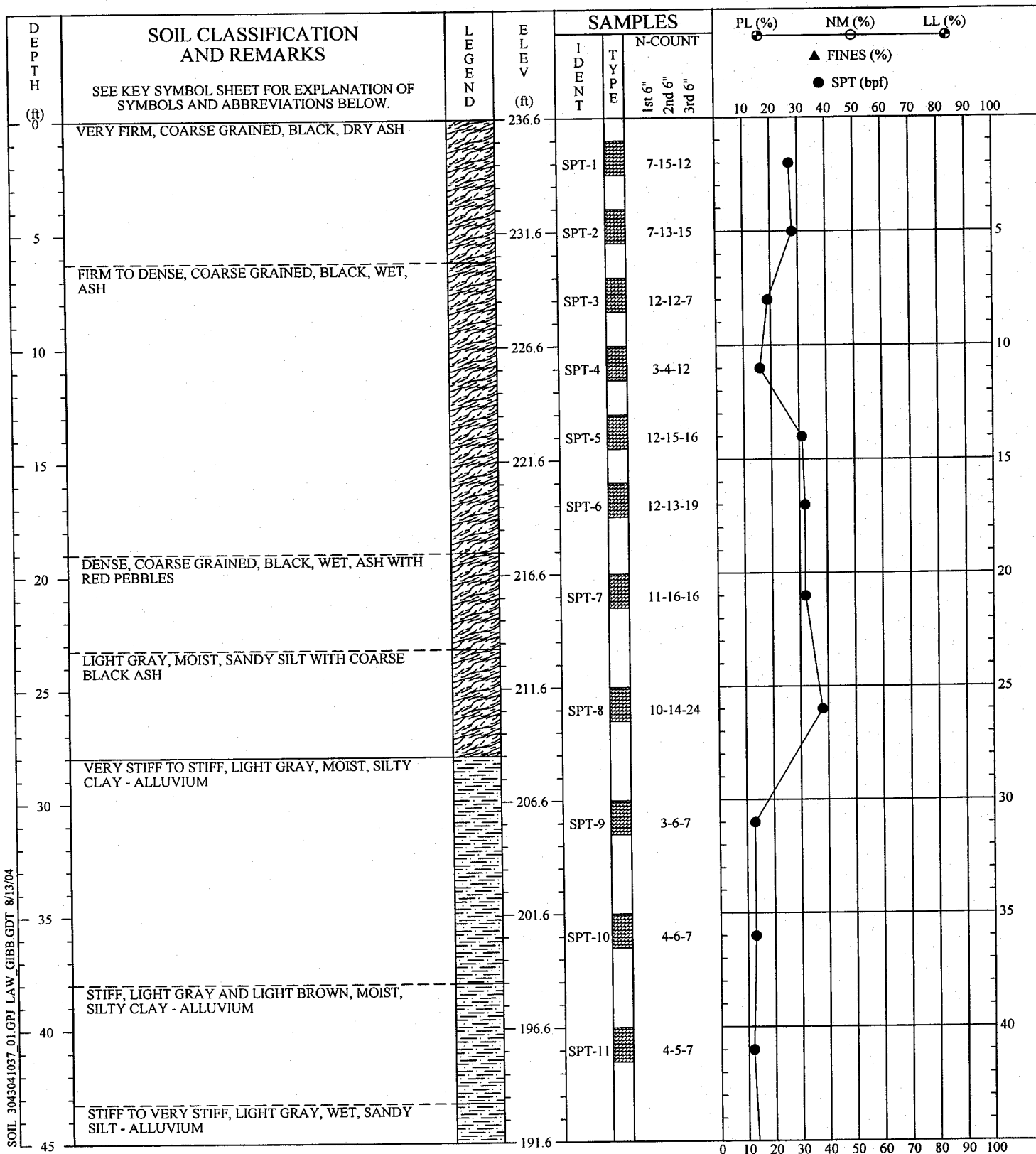
SOIL 3043041037\_01.GPJ LAW GIBB.GDT 8/13/04

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Driller : Akins  
Prepared By: Mason  
Checked By: H. A. B.

SOIL TEST BORING RECORD	
<b>PROJECT:</b> Allen Fossil Plant - East and West Ash Ponds	<b>BORING NO.:</b> EAD-1B
<b>DRILLED:</b> July 21, 2004	
<b>PROJ. NO.:</b> 3043041037/0001	<b>PAGE 3 OF 3</b>
	



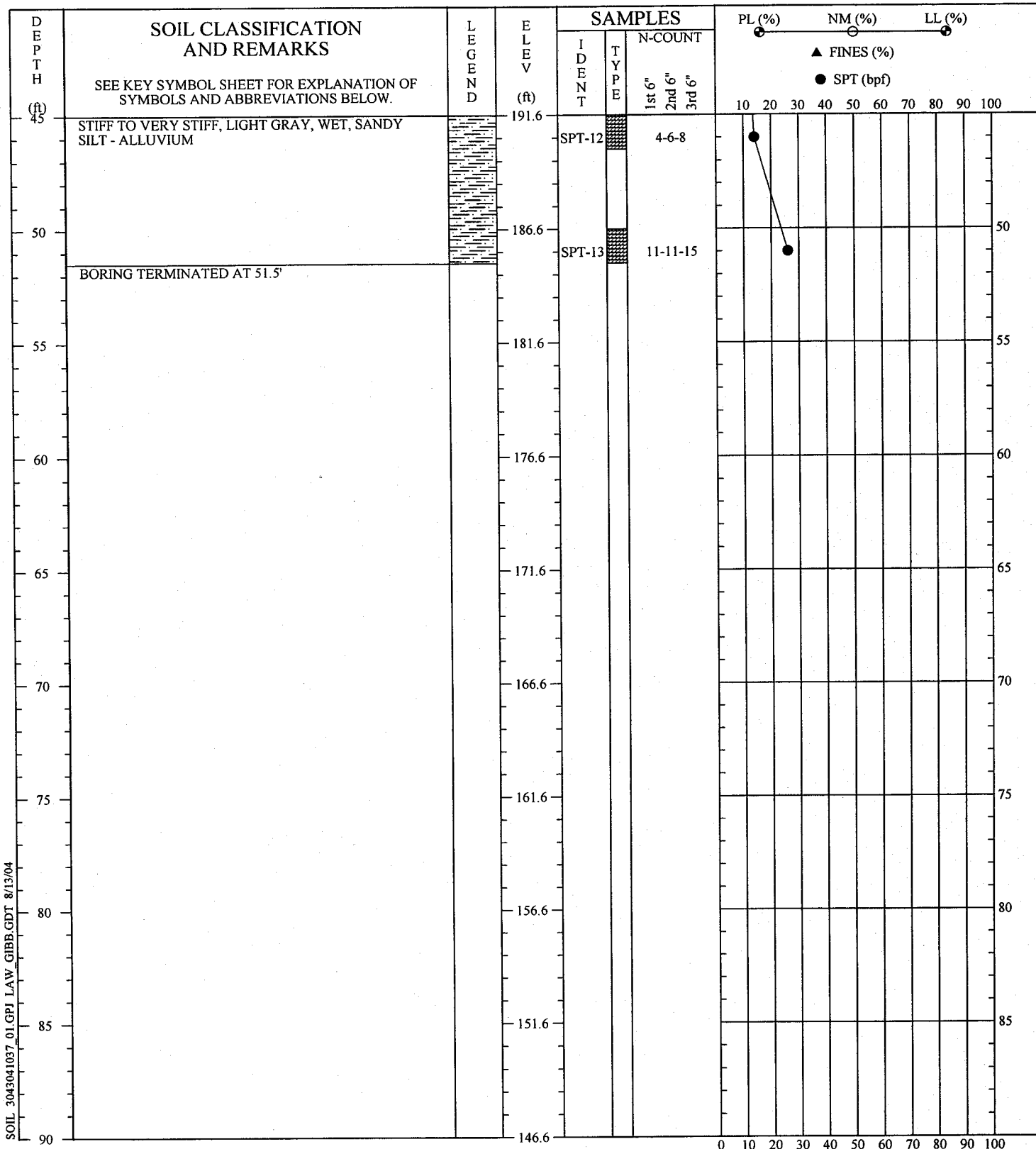
SOIL 3043041037\_01.GPJ LAW GIBB.GDT 8/13/04

REMARKS: STANDARD PENETRATION RESISTANCE TESTING PERFORMED USING AN AUTOMATIC HAMMER. HOLE CAVED IN TO A DEPTH OF ABOUT 3.0' ON 7/17/04.

SOIL TEST BORING RECORD	
<b>PROJECT:</b> Allen Fossil Plant - East and West Ash Ponds	<b>BORING NO.:</b> EAD-2
<b>DRILLED:</b> July 15, 2004	
<b>PROJ. NO.:</b> 3043041037/0001	<b>PAGE 1 OF 2</b>

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

Driller : Warren  
Prepared By: Smith  
Checked By: H.A.B.



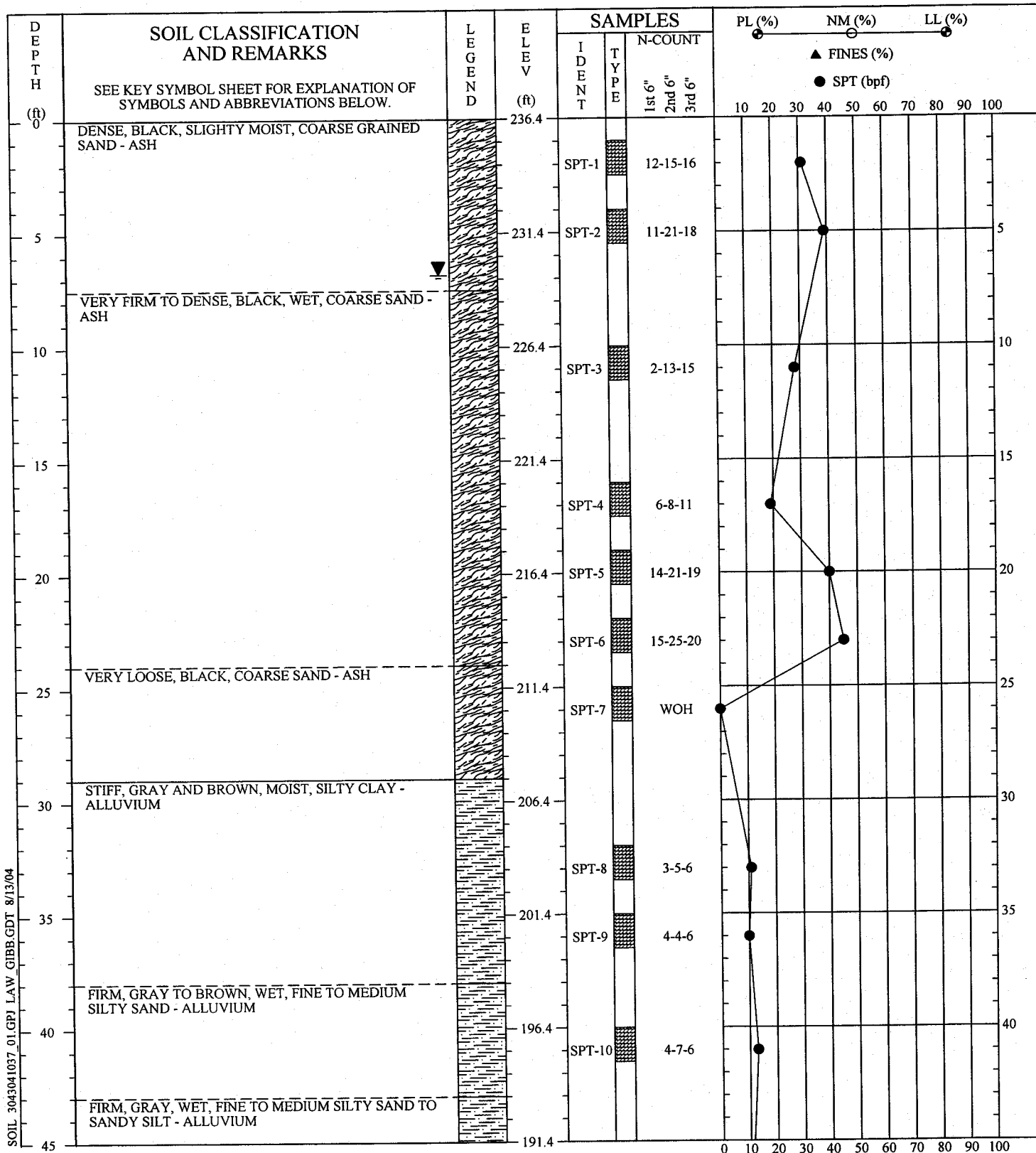
SOIL\_3043041037\_01.GPJ LAW\_GIBB\_GDT\_8/13/04

REMARKS: STANDARD PENETRATION RESISTANCE TESTING PERFORMED USING AN AUTOMATIC HAMMER. HOLE CAVED IN TO A DEPTH OF ABOUT 3.0' ON 7/17/04.

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Driller : Warren  
Prepared By: Smith  
Checked By: H.A.B.

SOIL TEST BORING RECORD	
<b>PROJECT:</b> Allen Fossil Plant - East and West Ash Ponds	
<b>DRILLED:</b> July 15, 2004	<b>BORING NO.:</b> EAD-2
<b>PROJ. NO.:</b> 3043041037/0001	<b>PAGE 2 OF 2</b>



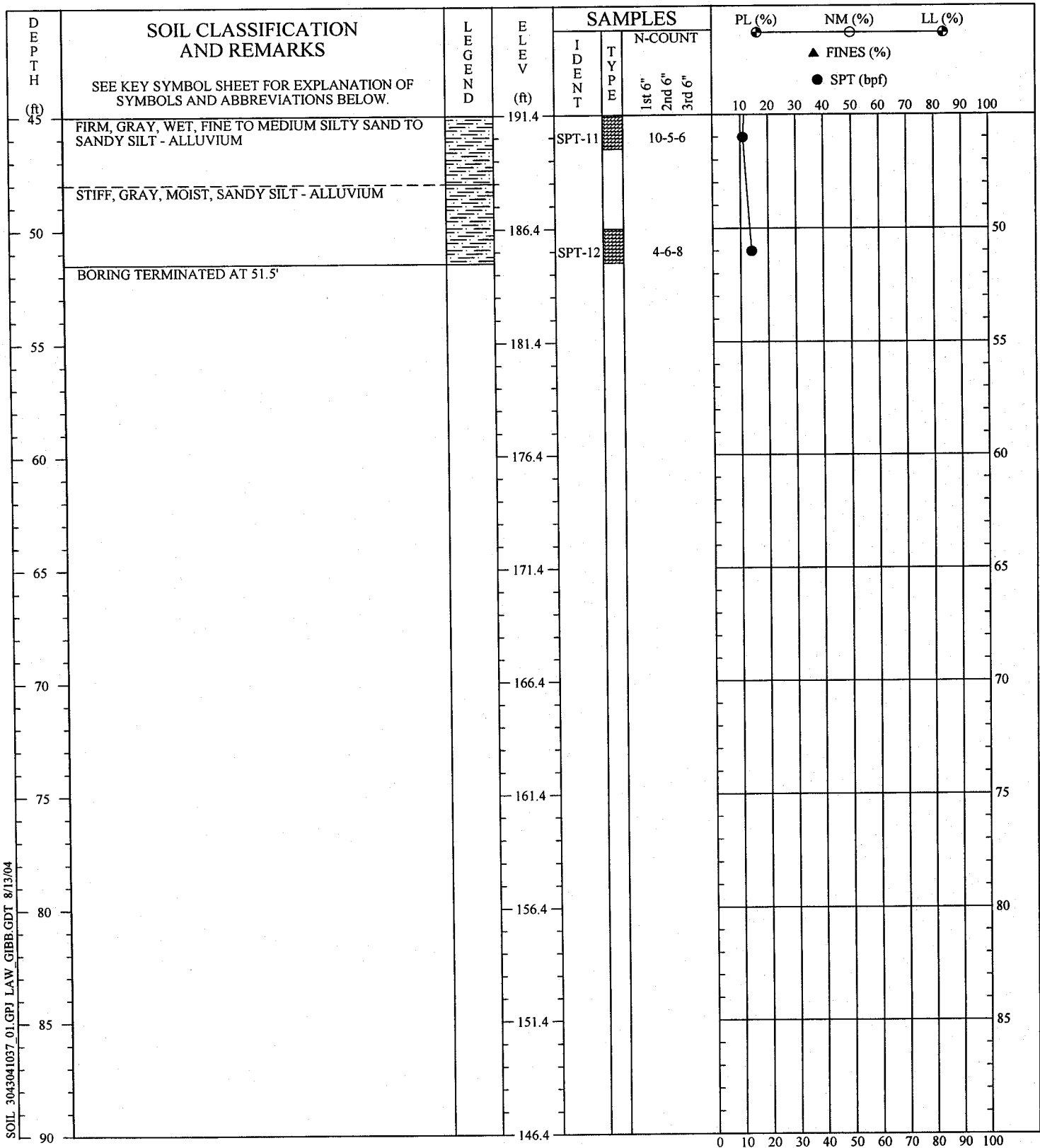
SOIL 3043041037 01.GPI LAW\_GIBB.GDT 8/13/04

REMARKS: STANDARD PENETRATION RESISTANCE TESTING PERFORMED USING AN AUTOMATIC HAMMER.

SOIL TEST BORING RECORD	
<b>PROJECT:</b> Allen Fossil Plant - East and West Ash Ponds	
<b>DRILLED:</b> July 18, 2004	<b>BORING NO.:</b> EAD-3
<b>PROJ. NO.:</b> 3043041037/0001	<b>PAGE 1 OF 2</b>
<span style="font-size: 2em; font-weight: bold; vertical-align: middle;">MACTEC</span>	

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Driller : Warren  
 Prepared By: Smith  
 Checked By: H.A.B.




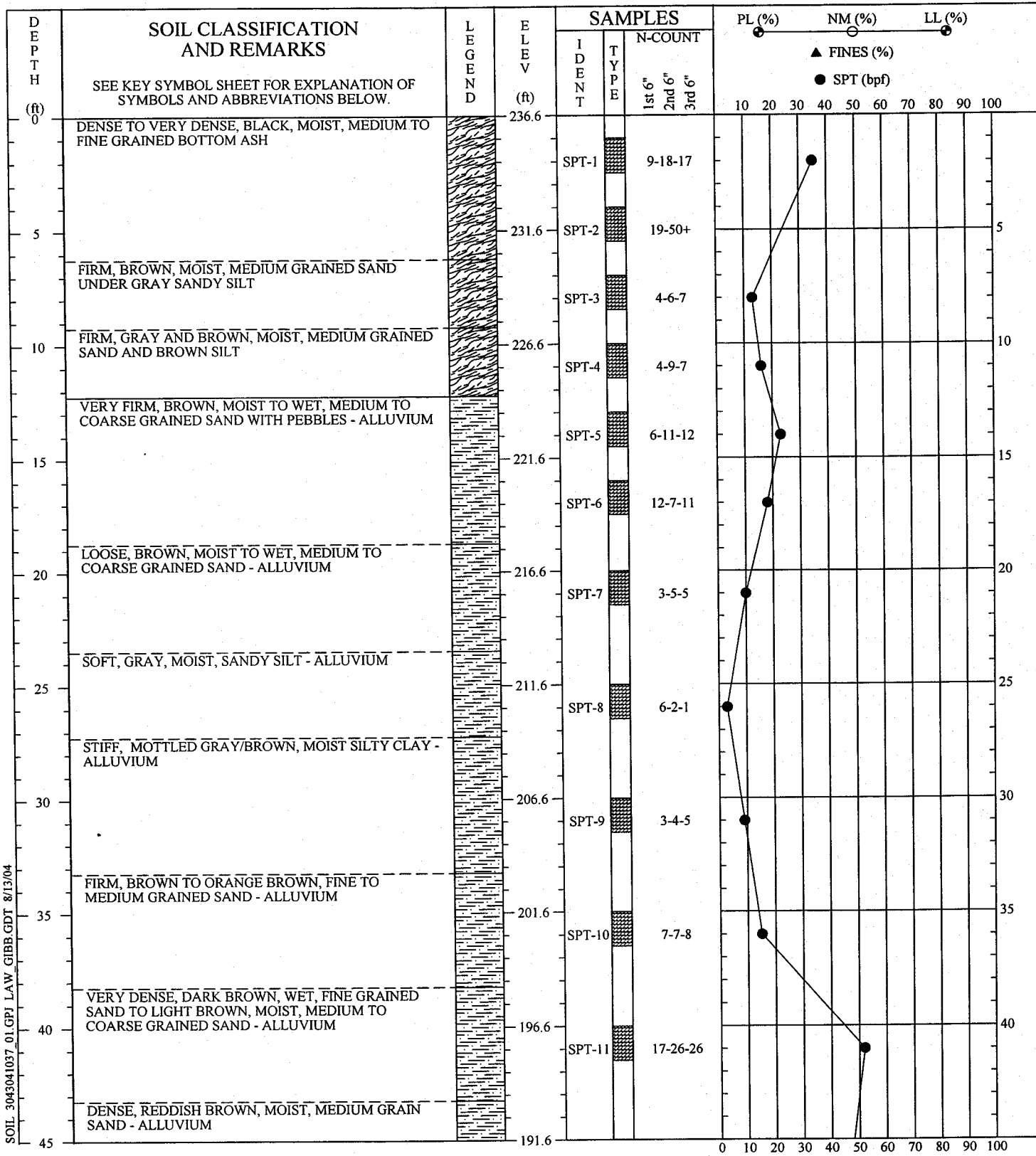
SOIL 3043041037 01.GPJ LAW\_GIBB.GDT 8/13/04

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Driller : Warren  
Prepared By: Smith  
Checked By: H.A.B.

SOIL TEST BORING RECORD	
PROJECT: Allen Fossil Plant - East and West Ash Ponds	
DRILLED: July 18, 2004	BORING NO.: EAD-3
PROJ. NO.: 3043041037/0001	PAGE 2 OF 2
 <b>MACTEC</b>	



SOIL 3043041037\_01.GPJ LAW GIBB.GDT 8/13/04

REMARKS: STANDARD PENETRATION RESISTANCE TESTING PERFORMED USING AN AUTOMATIC HAMMER. HOLE CAVED IN TO A DEPTH OF ABOUT 14.8' ON 7/17/04.

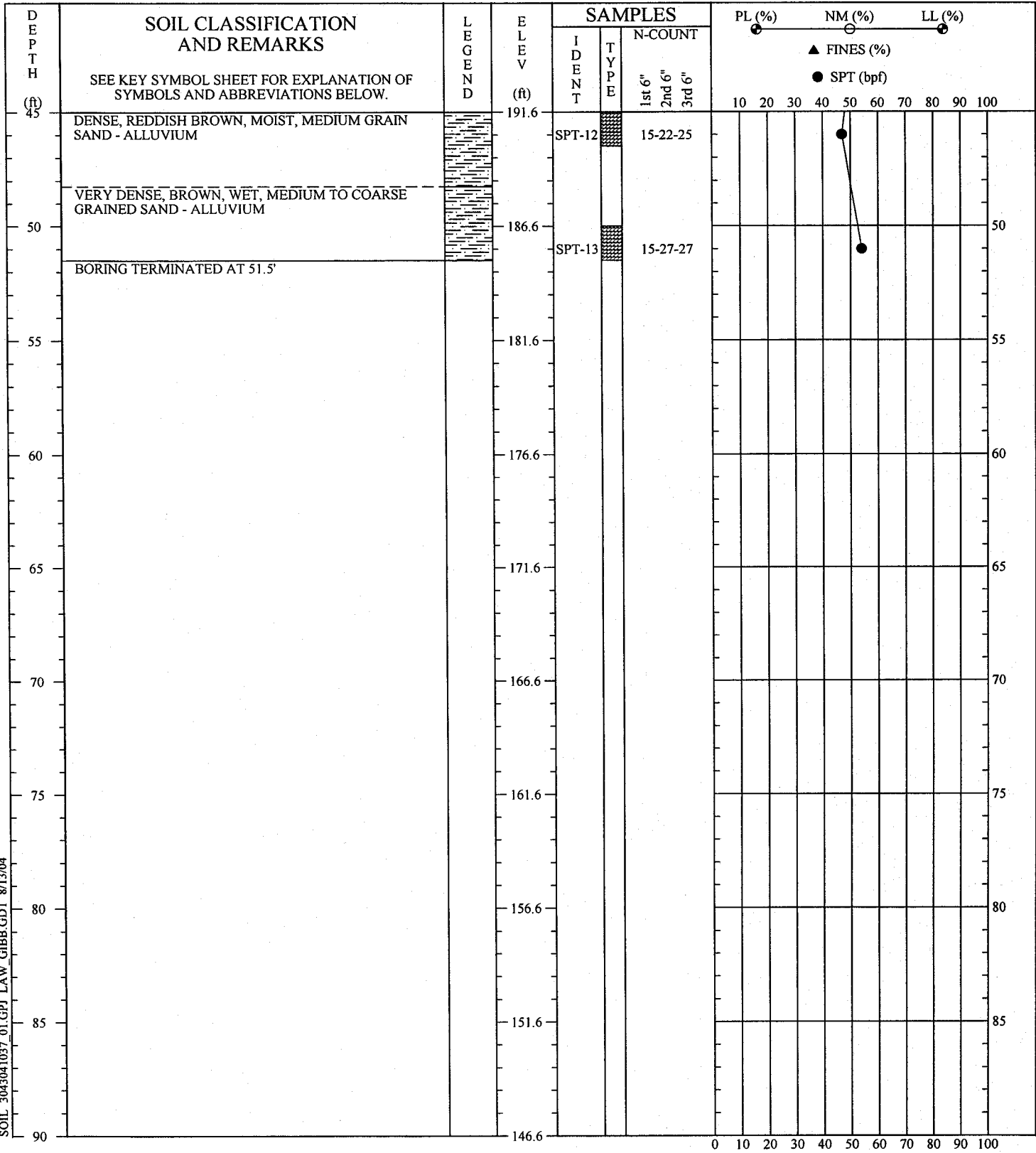
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Driller : Warren  
Prepared By: Smith  
Checked By: H.A.B.

SOIL TEST BORING RECORD	
<b>PROJECT:</b> Allen Fossil Plant - East and West Ash Ponds	<b>BORING NO.:</b> EAD-4
<b>DRILLED:</b> July 16, 2004	<b>PAGE 1 OF 2</b>
<b>PROJ. NO.:</b> 3043041037/0001	

**MACTEC**





SOIL 3043041037\_01.GPJ LAW\_GIBB.GDT 8/13/04

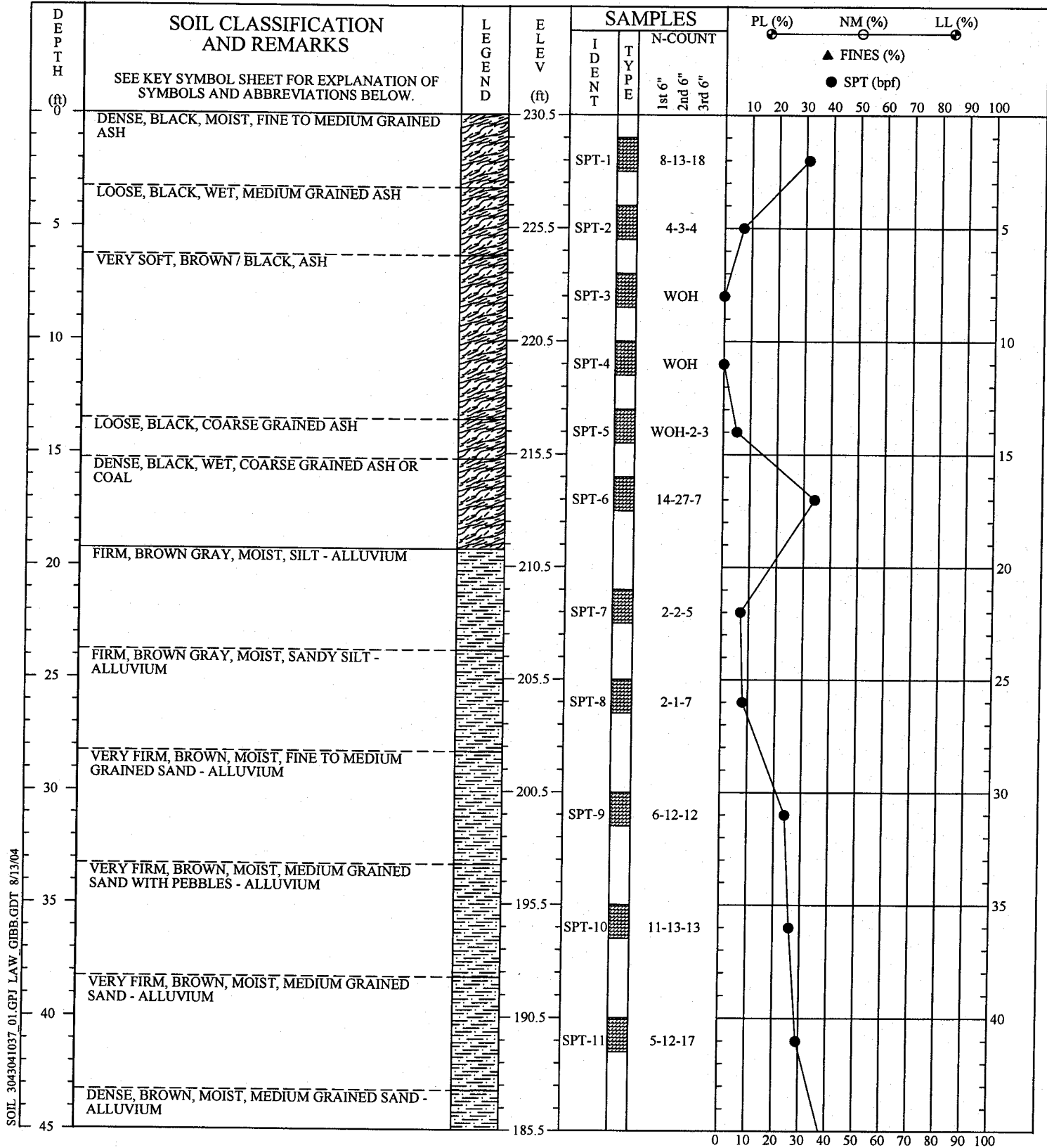
REMARKS: STANDARD PENETRATION RESISTANCE TESTING PERFORMED USING AN AUTOMATIC HAMMER. HOLE CAVED IN TO A DEPTH OF ABOUT 14.8' ON 7/17/04.

SOIL TEST BORING RECORD	
<b>PROJECT:</b> Allen Fossil Plant - East and West Ash Ponds	<b>BORING NO.:</b> EAD-4
<b>DRILLED:</b> July 16, 2004	
<b>PROJ. NO.:</b> 3043041037/0001	<b>PAGE 2 OF 2</b>

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Driller : Warren  
Prepared By: Smith  
Checked By: H.A.B.





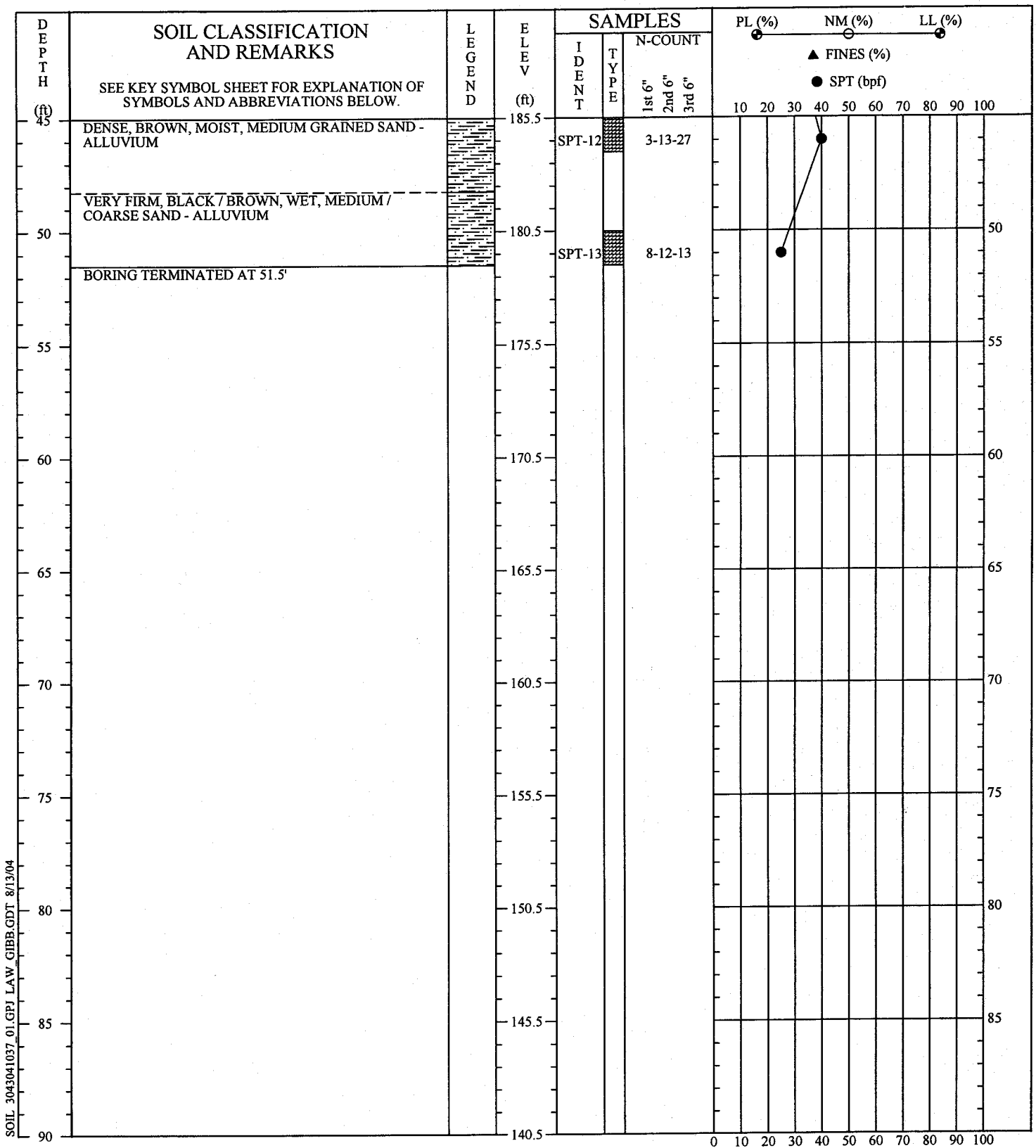
SOIL 3043041037\_01.GPJ LAW. GIBB.GDT 8/13/04

**REMARKS:** STANDARD PENETRATION RESISTANCE TESTING PERFORMED USING AN AUTOMATIC HAMMER. HOLE CAVED IN TO A DEPTH OF ABOUT 3.0' ON 7/17/04.

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Driller : Warren  
 Prepared By: Smith  
 Checked By: H.A.B.

SOIL TEST BORING RECORD	
<b>PROJECT:</b> Allen Fossil Plant - East and West Ash Ponds	
<b>DRILLED:</b> July 15, 2004	<b>BORING NO.:</b> EAD-5
<b>PROJ. NO.:</b> 3043041037/0001	<b>PAGE 1 OF 2</b>
<span style="font-size: 2em; font-weight: bold; vertical-align: middle;">MACTEC</span>	



SOIL 3043041037\_01.GPJ LAW\_GIBB.GDT 8/13/04

REMARKS: STANDARD PENETRATION RESISTANCE TESTING PERFORMED USING AN AUTOMATIC HAMMER. HOLE CAVED IN TO A DEPTH OF ABOUT 3.0' ON 7/17/04.

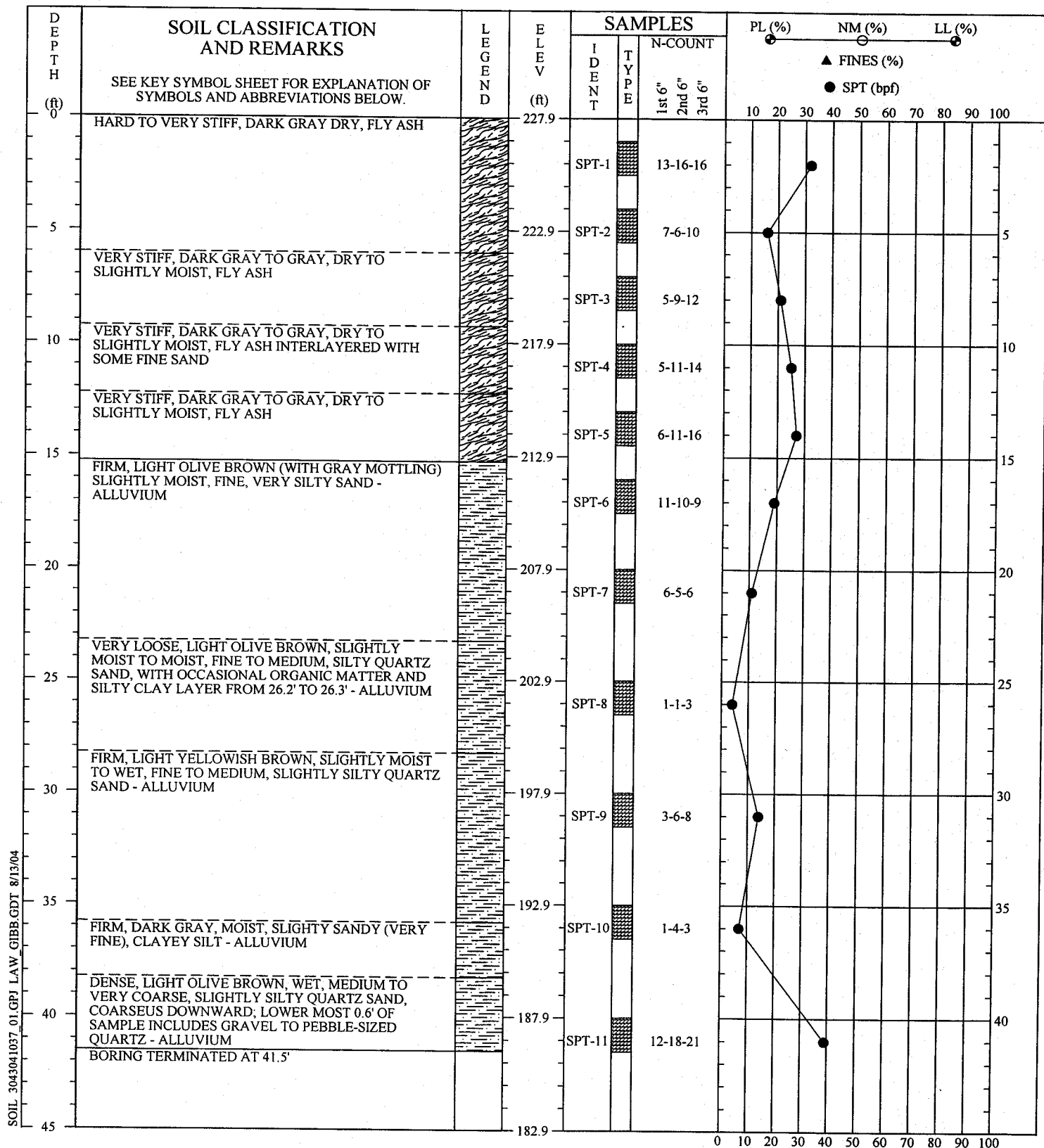
**SOIL TEST BORING RECORD**

**PROJECT:** Allen Fossil Plant - East and West Ash Ponds  
**DRILLED:** July 15, 2004 **BORING NO.:** EAD-5  
**PROJ. NO.:** 3043041037/0001 **PAGE 2 OF 2**

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

Driller : Warren  
 Prepared By: Smith  
 Checked By: H.A.B.





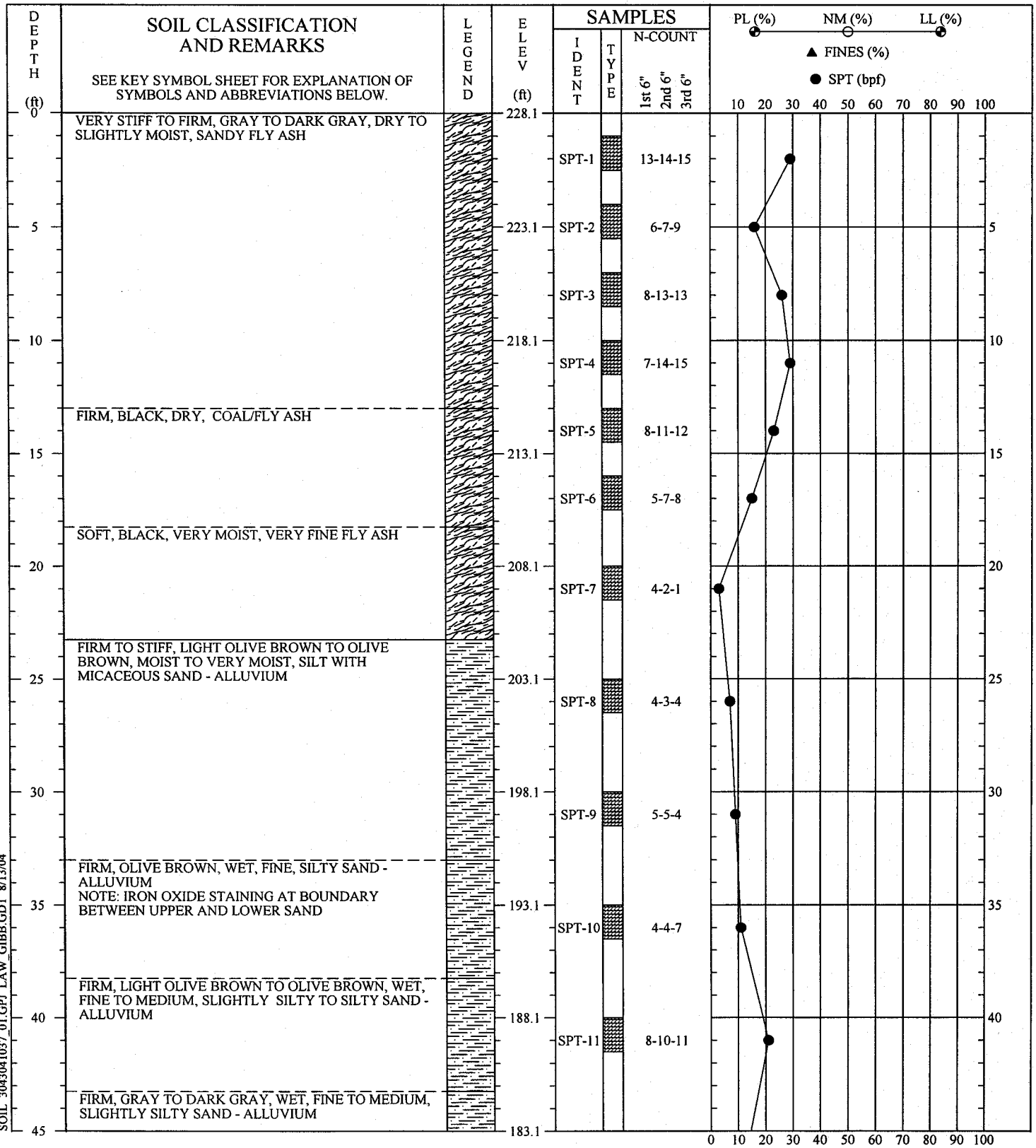
SOIL 3043041037\_01.GPJ LAW GIBB.GDT 8/13/04

REMARKS: STANDARD PENETRATION RESISTANCE TESTING PERFORMED USING AN AUTOMATIC HAMMER. HOLE CAVED IN TO A DEPTH OF ABOUT 31.5' ON 7/17/04.

SOIL TEST BORING RECORD	
<b>PROJECT:</b> Allen Fossil Plant - East and West Ash Ponds	
<b>DRILLED:</b> July 14, 2004	<b>BORING NO.:</b> WAD-1
<b>PROJ. NO.:</b> 3043041037/0001	<b>PAGE 1 OF 1</b>
<span style="font-size: 2em; font-weight: bold; vertical-align: middle;">MACTEC</span>	

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Driller : Warren  
 Prepared By: Mason  
 Checked By: H.A.B.



SOIL 3043041037\_01.GPJ LAW\_GIBB.GDT 8/13/04

REMARKS: STANDARD PENETRATION RESISTANCE TESTING PERFORMED USING AN AUTOMATIC HAMMER. HOLE CAVED IN TO A DEPTH OF ABOUT 30.5' ON 7/17/04.

**SOIL TEST BORING RECORD**

**PROJECT:** Allen Fossil Plant - East and West Ash Ponds

**DRILLED:** July 14, 2004

**BORING NO.:** WAD-2

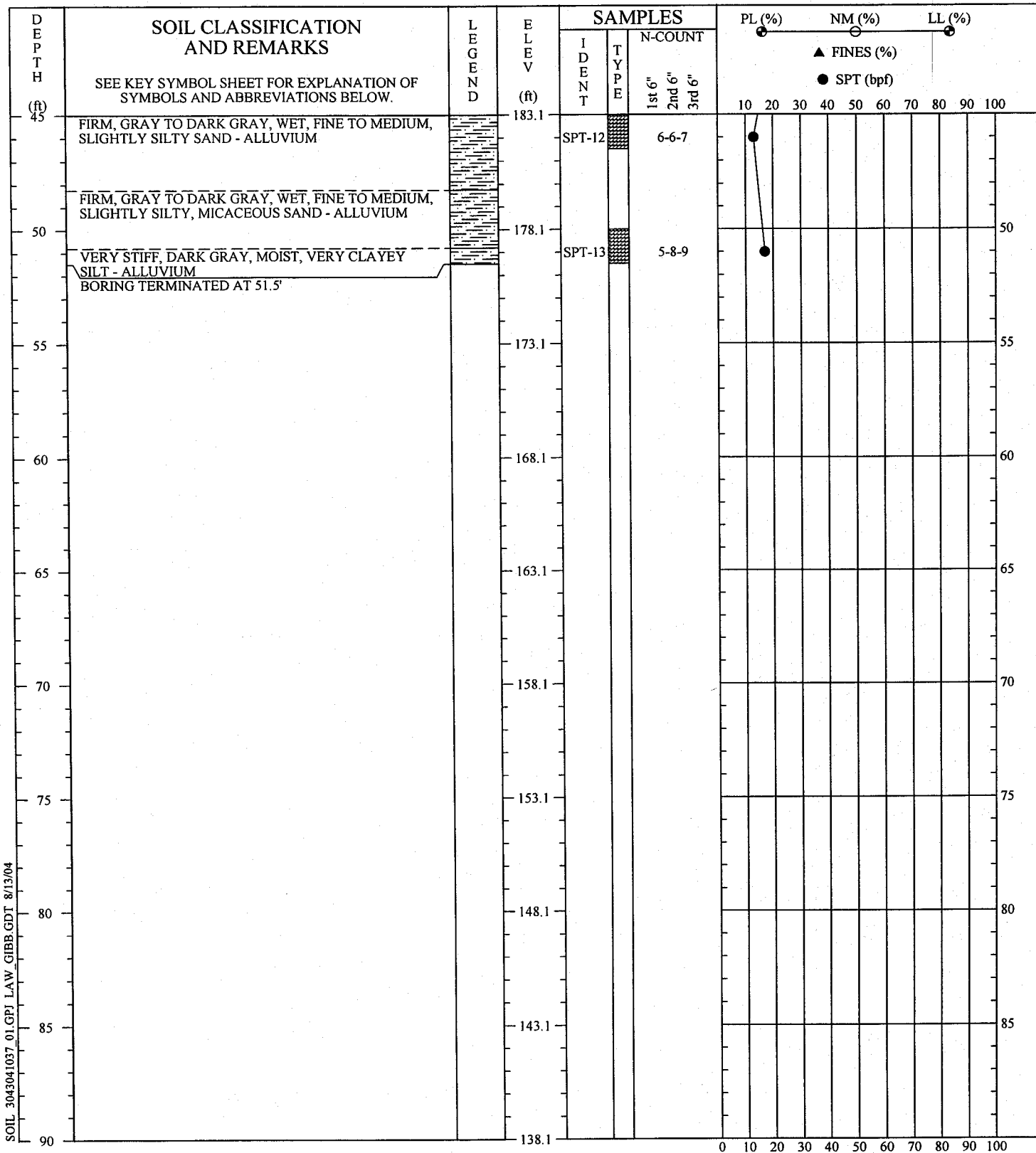
**PROJ. NO.:** 3043041037/0001

**PAGE 1 OF 2**

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

Driller : Warren  
Prepared By: Mason  
Checked By: H.A.B.





SOIL 3043041037 01.GPJ LAW\_GIBB.GDT 8/13/04

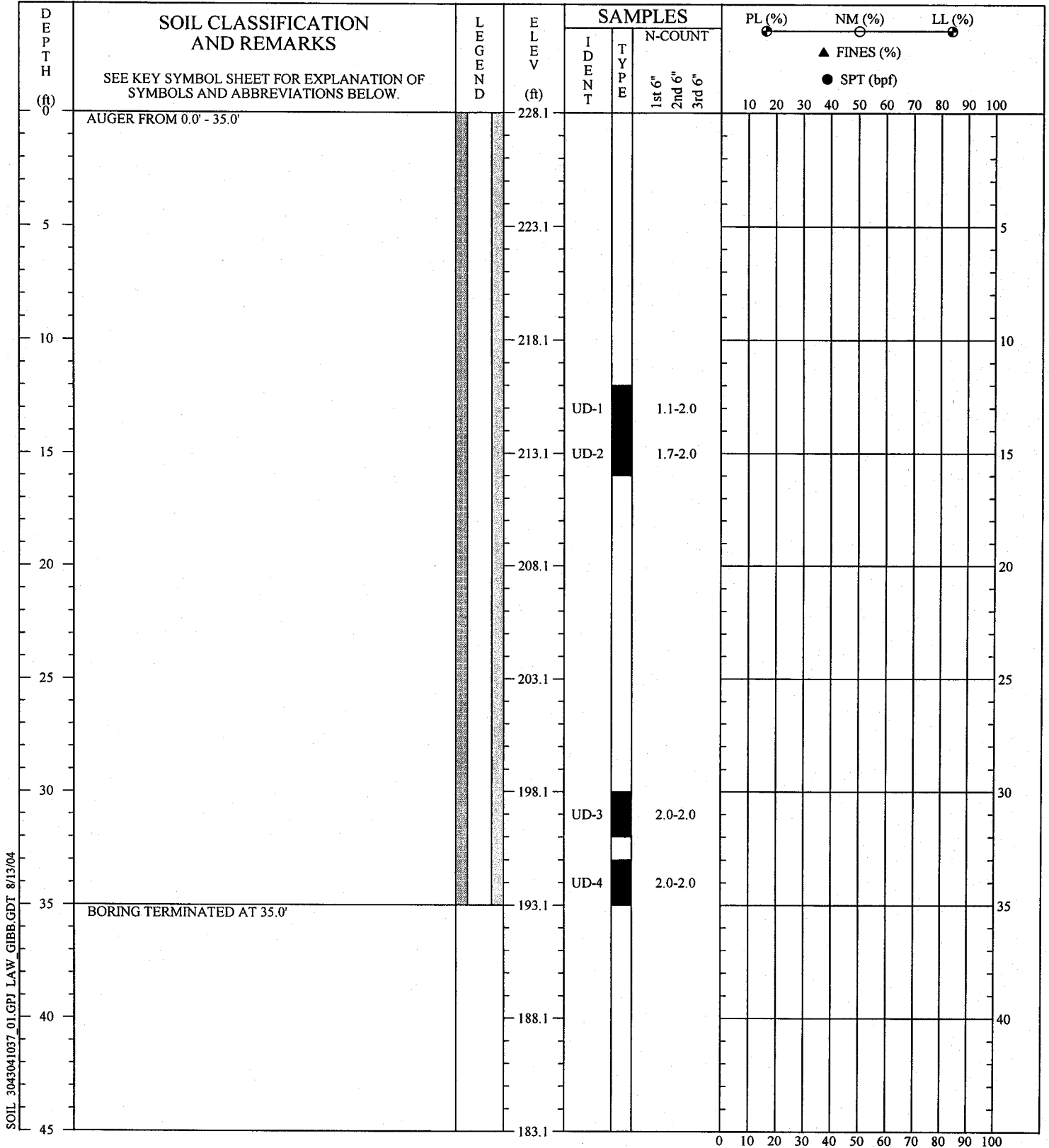
REMARKS: STANDARD PENETRATION RESISTANCE TESTING PERFORMED USING AN AUTOMATIC HAMMER. HOLE CAVED IN TO A DEPTH OF ABOUT 30.5' ON 7/17/04.

SOIL TEST BORING RECORD	
<b>PROJECT:</b> Allen Fossil Plant - East and West Ash Ponds	<b>BORING NO.:</b> WAD-2
<b>DRILLED:</b> July 14, 2004	
<b>PROJ. NO.:</b> 3043041037/0001	<b>PAGE 2 OF 2</b>

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Driller : Warren  
Prepared By: Mason  
Checked By: H.A.B.





SOIL 3043041037 01.GPI LAW\_GIBB.GDT 8/13/04

REMARKS: TEST BORING WAD-2 WAS OFFSET APPROXIMATELY 10.0' TO THE WEST TO OBTAIN UNDISTURBED SAMPLES.

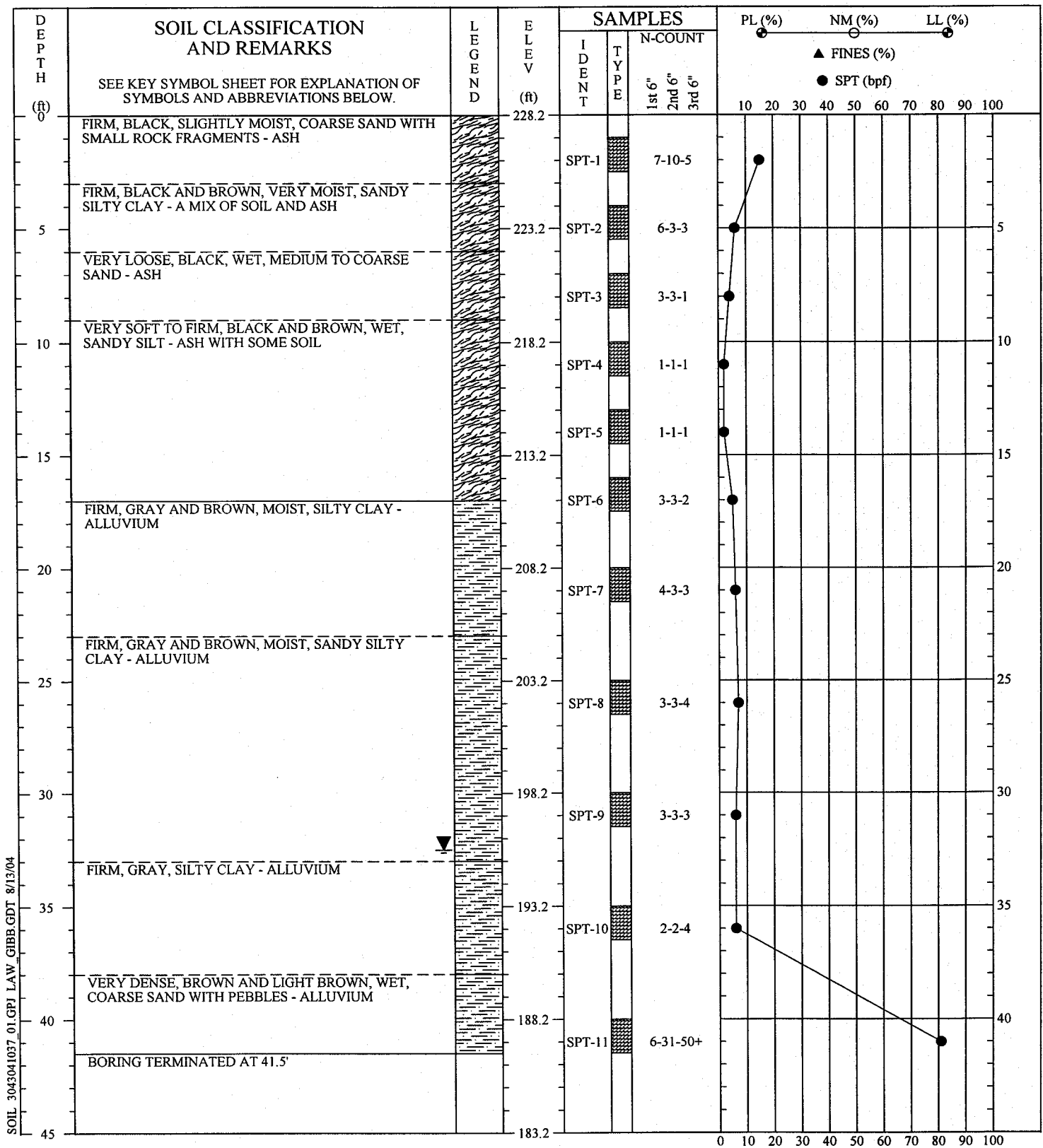
**SOIL TEST BORING RECORD**

**PROJECT:** Allen Fossil Plant - East and West Ash Ponds  
**DRILLED:** July 14, 2004      **BORING NO.:** WAD-2ud  
**PROJ. NO.:** 3043041037/0001      **PAGE 1 OF 1**

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Driller : Warren  
 Prepared By: Smith  
 Checked By: H.A.B.

SOIL TEST BORING RECORD	
<b>PROJECT:</b> Allen Fossil Plant - East and West Ash Ponds	<b>BORING NO.:</b> WAD-3
<b>DRILLED:</b> July 15, 2004	<b>PROJ. NO.:</b> 3043041037/0001
<b>PAGE 1 OF 1</b>	



**APPENDIX C**

**CONE PENETROMETER TEST PROCEDURES**

**CONE PENETROMETER TEST RESULTS**

**CONE PENETROMETER TEST PROCEDURES**

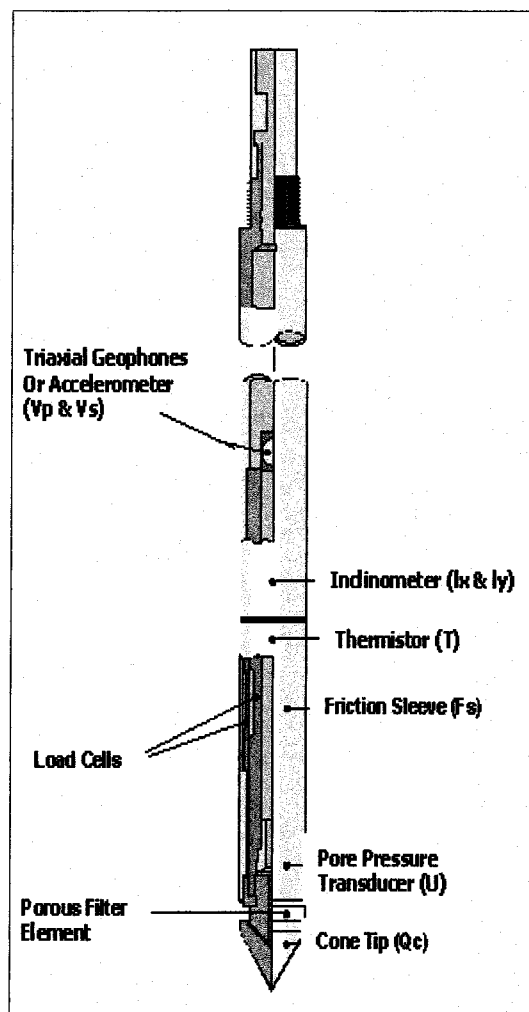


## Cone Penetration Testing Procedure (CPT)

Gregg In Situ, Inc. carries out all Cone Penetration Tests (CPT) using an integrated electronic cone system, *Figure CPT*. The soundings were conducted using a 20 ton capacity cone with a tip area of 15 cm<sup>2</sup> and a friction sleeve area of 225 cm<sup>2</sup>. The cone is designed with an equal end area friction sleeve and a tip end area ratio of 0.85.

The cone takes measurements of cone bearing ( $q_c$ ), sleeve friction ( $f_s$ ) and dynamic pore water pressure ( $u_2$ ) at 5-cm intervals during penetration to provide a nearly continuous hydrogeologic log. CPT data reduction and interpretation is performed in real time facilitating on-site decision making. The above mentioned parameters are simultaneously printed and stored on disk for further analysis and reference. All CPT soundings are performed in accordance with ASTM standards (D 5778-95).

The cone also contains a porous filter element located directly behind the cone tip, *Figure CPT*. It consists of porous plastic and is 5.0mm thick. The filter element is used to obtain Pore Pressure Dissipation Tests (PPDT's) at 5 second intervals during appropriate pauses in penetration. It should be noted that prior to penetration, the element is fully saturated with silicon oil under vacuum pressure to ensure accurate and fast dissipation.



*Figure CPT*

When the soundings are complete, the test holes are grouted using a Gregg In Situ support rig. The grouting procedure consists of pushing a hollow CPT rod with a "knock out" plug to the termination depth of the test hole. Grout is then pumped under pressure as the tremie pipe is pulled from the hole. Disruption or further contamination to the site is therefore minimized.



# GREGG IN SITU

Environmental and Geotechnical Site Investigation Contractors

## GREGG IN SITU CPT Interpretations as of July 31, 2002 (Release 1.20c)

GREGG IN SITU'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. GREGG IN SITU, Inc. and GREGG DRILLING & TESTING Inc. do not warranty the correctness or the applicability of any of the geotechnical parameters interpreted by the program and can 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 recorded tip value,  $q_c$ , corrected for pore pressure effects. Since all GREGG IN SITU 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 0.85 for GREGG IN SITU 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 in to 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 reference to the cited references.

The estimated Soil Behavior Types (normalized and non-normalized) are based on the charts developed by Robertson and Campanella shown in Figures 1 and 2.

Where the results of a calculation/interpretation are declared 'invalid' the value will be represented by the text strings "-9999" or "-9999.0". 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.

## CPT Interpretations

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.

**Table 1**  
**CPT Interpretation Methods**

Interpreted Parameter	Description	Equation	Ref
Depth	Mid Layer Depth <i>(where interpretations are done at each point then Mid Layer Depth = Recorded Depth)</i>	$Depth (Layer Top) + Depth (Layer Bottom) / 2.0$	
Elevation	Elevation of Mid Layer based on sounding collar elevation supplied by client	$Elevation = Collar Elevation - Depth$	
Avgqc	Averaged recorded tip value ( $q_c$ )	$Avgqc = \frac{1}{n} \sum_{i=1}^n q_c$ <i>n=1 when interpretations are done at each point</i>	
Avgqt	Averaged corrected tip ( $q_t$ ) where: $q_t = q_c + (1 - a) \cdot u$	$Avgqt = \frac{1}{n} \sum_{i=1}^n q_t$ <i>n=1 when interpretations are done at each point</i>	
Avgfs	Averaged sleeve friction ( $f_s$ )	$Avgfs = \frac{1}{n} \sum_{i=1}^n f_s$ <i>n=1 when interpretations are done at each point</i>	
AvgRf	Averaged friction ratio (Rf) where friction ratio is defined as: $Rf = 100\% \cdot \frac{f_s}{q_t}$	$AvgRf = 100\% \cdot \frac{Avgfs}{Avgqt}$ <i>n=1 when interpretations are done at each point</i>	
Avgu	Averaged dynamic pore pressure ( $u$ )	$Avgu = \frac{1}{n} \sum_{i=1}^n u_i$ <i>n=1 when interpretations are done at each point</i>	
AvgRes	Averaged Resistivity (this data is not always available since it is a specialized test requiring an additional module)	$Avgu = \frac{1}{n} \sum_{i=1}^n RESISTIVITY_i$ <i>n=1 when interpretations are done at each point</i>	
AvgUVIF	Averaged UVIF ultra-violet induced fluorescence (this data is not always available since it is a specialized test requiring an additional module)	$Avgu = \frac{1}{n} \sum_{i=1}^n UVIF_i$ <i>n=1 when interpretations are done at each point</i>	
AvgTemp	Averaged Temperature (this data is not always available since it is a specialized test)	$Avgu = \frac{1}{n} \sum_{i=1}^n TEMPERATURE_i$ <i>n=1 when interpretations are done at each point</i>	
AvgGamma	Averaged Gamma Counts (this data is not always available since it is a specialized test requiring an additional module)	$Avgu = \frac{1}{n} \sum_{i=1}^n GAMMA_i$ <i>n=1 when interpretations are done at each point</i>	
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 $\sigma_v$	Total vertical overburden stress at Mid Layer Depth.  <i>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.</i>	$TStress = \sum_{i=1}^n \gamma_i \cdot h_i$  <i>where <math>\gamma_i</math> is layer unit weight <math>h_i</math> is layer thickness</i>	

## CPT Interpretations

Interpreted Parameter	Description	Equation	Ref
E. Stress			
$\sigma_v$	Effective vertical overburden stress at Mid Layer Depth	$E_{stress} = T_{stress} - u_{eq}$	
$u_{eq}$	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 $\gamma_w$ is unit weight of water $D$ is the current depth $D_{wt}$ is the depth to the water table	
$C_n$	SPT $N_{60}$ overburden correction factor	$C_n = (\sigma_v')^{-0.5}$ where $\sigma_v'$ 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
$N_{60}(Ic)$	SPTN Value at 60% energy. This method is a slight modification of the Jefferies and Davies technique whereby the qt/N ratio varies across soil classification zones based on the Ic parameter. This techniques is limited to zones 2 through 7 on the normalized Soil Behavior Type Chart	See Figure 1	5, 8
$(N_1)_{60}$	SPT $N_{60}$ value corrected for overburden pressure	$(N_1)_{60} = C_n \cdot N_{60}$	4
$\Delta(N_1)_{60}$	Equivalent Clean Sand Correction to $(N_1)_{60}$	$\Delta(N_1)_{60} = \frac{K_{SPT}}{1 - K_{SPT}} \cdot (N_1)_{60}$ Where: $K_{SPT}$ is defined as: 0.0 for FC < 5% 0.0167 • (FC - 5) for 5% < FC < 35% 0.5 for FC > 35% FC - Fines Content in %	4
$(N_1)_{60cs}$	Equivalent Clean Sand $(N_1)_{60}$	$(N_1)_{60cs} = (N_1)_{60} + \Delta(N_1)_{60}$	4
$S_u$	Undrained shear strength - $N_k$ is user selectable	$S_u = \frac{qt - \sigma_v}{N_k}$	1, 5
$k$	Coefficient of permeability (assigned to each SBT zone)		5
$B_q$	Pore pressure parameter	$B_q = \frac{\Delta u}{qt - \sigma_v}$ 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	$Q_t = \frac{qt - \sigma_v}{\sigma_v}$	2, 5
$F_r$	Normalized Friction Ratio for Soil Behavior Type classification as defined by Robertson, 1990	$F_r = 100\% \cdot \frac{f_s}{qt - \sigma_v}$	2, 5
SBTn	Normalized Soil Behavior Type as defined by Robertson and Campanella	See Figure 2	2, 5

### CPT Interpretations

Interpreted Parameter	Description	Equation	Ref
$q_{c1}$	$q_t$ 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	$q_{c1N} = q_{c1} / Pa$ where: $Pa$ = atm. pressure	3
$K_c$	Equivalent clean sand correction for $q_{c1N}$	$K_c = 1.0$ for $I_c \leq 1.64$ $K_c = f(I_c)$ for $I_c > 1.64$ (see reference) $K_c = 1.0$ for $1.64 < I_c < 2.36$ and $F_c < 0.5\%$	3
$q_{c1Ncs}$	Clean Sand equivalent $q_{c1N}$	$q_{c1Ncs} = q_{c1N} \cdot K_c$	3
$I_c$	Soil index for estimating grain characteristics	$I_c = [(3.47 - \log_{10} Q)^2 + (\log_{10} Fr + 1.22)^2]^{0.5}$  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 (%)	$FC = 1.75(I_c^{3.25}) - 3.7$ $FC = 100$ for $I_c > 3.5$ $FC = 0$ for $I_c < 1.26$ $FC = 5\%$ if $1.64 < I_c < 2.6$ AND $F_r < 0.5$	3
$I_c$ Zone	This parameter is the Soil Behavior Type zone based on the $I_c$ parameter (valid for zones 2 through 7 on SBTn chart)	$I_c < 1.31$ Zone = 7 $1.31 < I_c < 2.05$ Zone = 6 $2.05 < I_c < 2.60$ Zone = 5 $2.60 < I_c < 2.95$ Zone = 4 $2.95 < I_c < 3.60$ Zone = 3 $I_c > 3.60$ Zone = 2	3
PHI $\phi$	Friction Angle determined from one of the following user selectable options:  a) Campanella and Robertson b) Durgunoglu and Mitchel c) Janbu	See reference	5
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 – 2 methods available	a) Based on Schmertmann's method involving a plot of $S_u/\sigma_v'$ / $(S_u/\sigma_v')_{NC}$ and OCR  b) Based on $OCR = k \cdot \left( \frac{qt - \sigma_v}{\sigma_v} \right)$ where an average value of $k=0.3$ is used	5
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	9, 7, 5

## CPT Interpretations

Interpreted Parameter	Description	Equation	Ref
CRR	Cyclic Resistance Ratio (for M=7.5)	<p>For <math>(q_{c1N})_{cs} &lt; 160</math>:</p> $CRR = 93 \cdot \left( \frac{(q_{c1N})_{cs}}{1000} \right)^3 + 0.08$ <p>For <math>(q_{c1N})_{cs} &lt; 50</math>:</p> $CRR = 0.833 \cdot \left( \frac{(q_{c1N})_{cs}}{1000} \right)^3 + 0.05$	5
Youngs Modulus E	<p>Youngs Modulus based on the work by Baldi. There are three types of sands considered in this technique. The user selects the appropriate type for the site from:</p> <p>a) OC Sands b) Aged NC Sands c) Recent NC Sands</p> <p>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 Baldi's chart.</p>	<p>Mean normal stress is evaluated from:</p> $\sigma'_n = \frac{1}{3} \cdot (\sigma'_v + \sigma'_h + \sigma'_h)$ <p>where <math>\sigma'_v</math> = vertical effective stress <math>\sigma'_h</math> = horizontal effective stress and <math>\sigma'_h = K_o \cdot \sigma'_v</math> with <math>K_o</math> assumed to be 0.5</p>	5
$K_o$	Coefficient of lateral earth pressure at rest.	$K_o = 0.1 \cdot \left( \frac{q_t - \sigma_{v0}}{\sigma'_v} \right)$	5

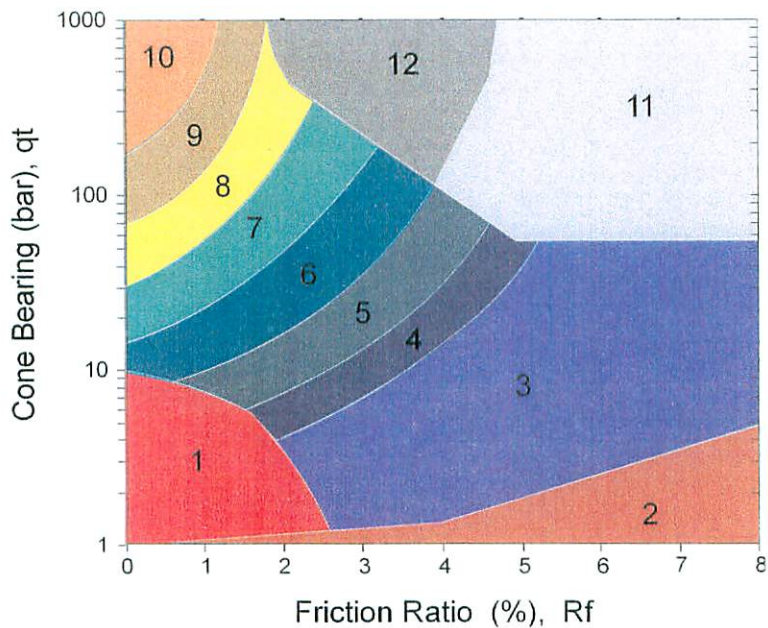
### Savannah River Site Specific Parameters

Interpreted Parameter	Description	Equation	Ref
lc	lc based on normalized data at the Savannah River Site; developed by Frank Syms and SGS	$lc = [(1.95 - \log_{10} Q)^2 + (\log_{10} Fr + 1.78)^2]^{0.5}$ <p>Where: <math>Q</math> is the normalized tip resistance And <math>Fr</math> is the normalized friction ratio</p>	10
FC	Fines content based on the normalized Savannah River Site lc parameter; developed by Frank Syms and SGS	$FC = (5.31 \cdot (lc)^{2.31}) + 9.61$ <p>For FC &gt; 100 and <math>q_t &lt; 15</math> tsf the material is flagged as a soft zone</p>	10
FC	Fines Content directly from non-normalized data at the Savannah River Site; developed by Frank Syms and SGS	$FC = [(3.58 - \log_{10}(qtsf))^2 + (1.43 + \log_{10}(Rf))^2]^{1.8}$ <p>For FC &gt; 100 and <math>q_t &lt; 15</math> tsf the material is flagged as a soft zone</p> <p>Where: <math>qtsf</math> is the non-normalized tip resistance in tsf <math>Rf</math> is the non-normalized friction ratio</p>	11



CPT Interpretations

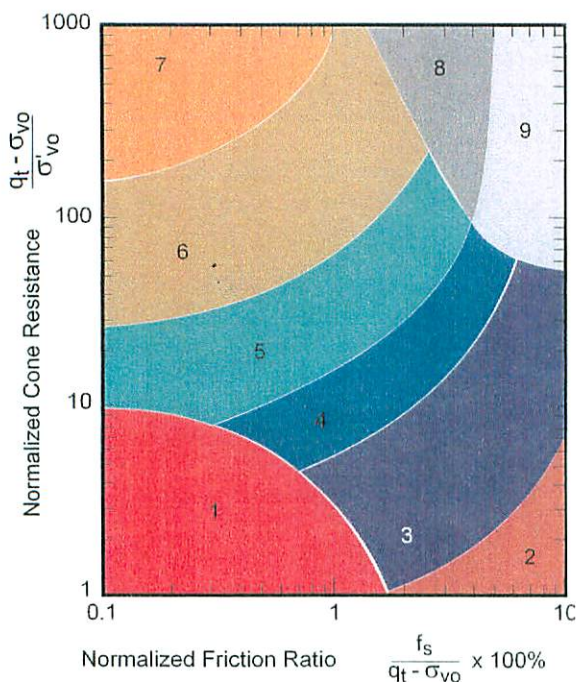
**Figure 1**  
Non-Normalized Behavior Type Classification Chart



Zone	qt / N	Soil Behavior Type
1	2	sensitive fine grained
2	1	organic material
3	1	clay
4	1.5	silty clay to clay
5	2	clayey silt to silty clay
6	2.5	sandy silt to clayey silt
7	3	silty sand to sandy silt
8	4	sand to silty sand
9	5	sand
10	6	gravelly sand to sand
11	1	very stiff fine grained *
12	2	sand to clayey sand *

\* overconsolidated or cemented

**Figure 2**  
Normalized Behavior Type Classification Chart



Zone	Normalized Soil Behavior Type
1	sensitive fine grained
2	organic material
3	clay to silty clay
4	clayey silt to silty clay
5	silty sand to sandy silt
6	clean sands to silty sands
7	gravelly sand to sand
8	very stiff sand to clayey sand
9	very stiff fine grained

## CPT Interpretations

**Table 2  
References**

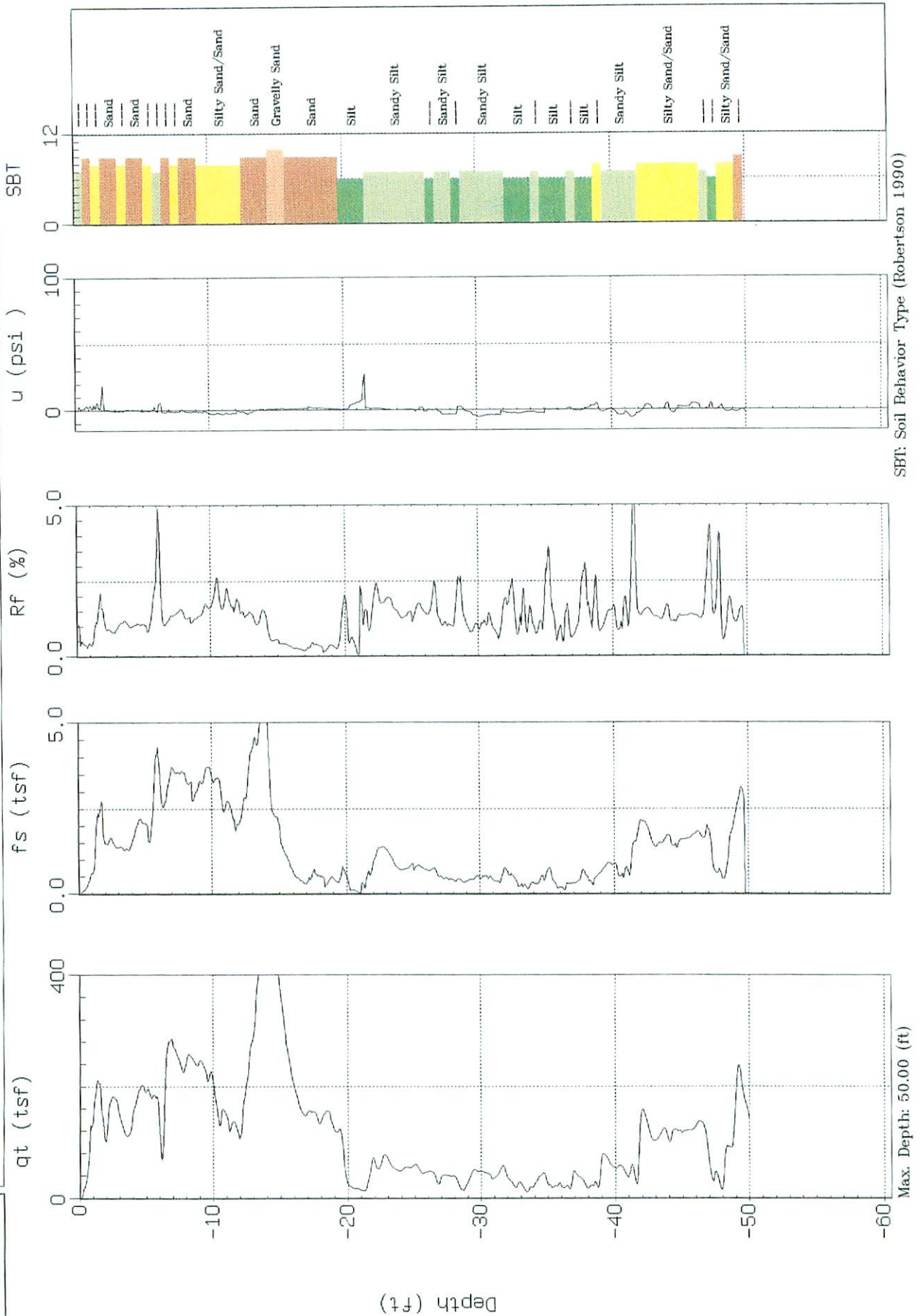
No.	References
1	Robertson, P.K., Campanella, R.G., Gillespie, D. and Greig, J., 1986, "Use of Piezometer Cone Data", Proceedings of InSitu 86, ASCE Specialty Conference, Blacksburg, Virginia.
2	Robertson, P.K., 1990, "Soil Classification Using the Cone Penetration Test", Canadian Geotechnical Journal, 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.
4	Robertson, P.K. and Wride, C.E., 1998, "Cyclic Liquefaction and its Evaluation Based on SPT and CPT", NCEER Workshop Paper, January 22, 1997
5	Lunne, T., Robertson, P.K. and Powell, J. J. M., 1997, "Cone Penetration Testing in Geotechnical Practice," Blackie Academic and Professional.
6	GREGG IN SITU Internal Report
7	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.
8	Jefferies, M.G. and Davies, M.P., 1993. "Use of CPTu to Estimate equivalent $N_{60}$ ", Geotechnical Testing Journal, 16(4): 458-467.
9	Been, K. and Jefferies, M.P., 1985, "A state parameter for sands", Geotechnique, 35(2), 99-112.
10	Frank Syms, Bechtel Corp (Savannah River Site), 2001, "CPTU Fines Content Determination", Calculation No. K-CIC-G-00065 Revision 0.
11	Frank Syms, Bechtel Corp (Savannah River Site) – personal communication



MACTEC

Sounding: CPT-01  
Location: Allen Plant

Over site: H. Benkhayal  
Date: 07:20:04 10:19



Legend for SBT:

- Sand
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Sand
- Silt
- Sandy Silt
- Sandy Silt
- Sandy Silt
- Silt
- Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Silty Sand/Sand

SBT: Soil Behavior Type (Robertson 1990)

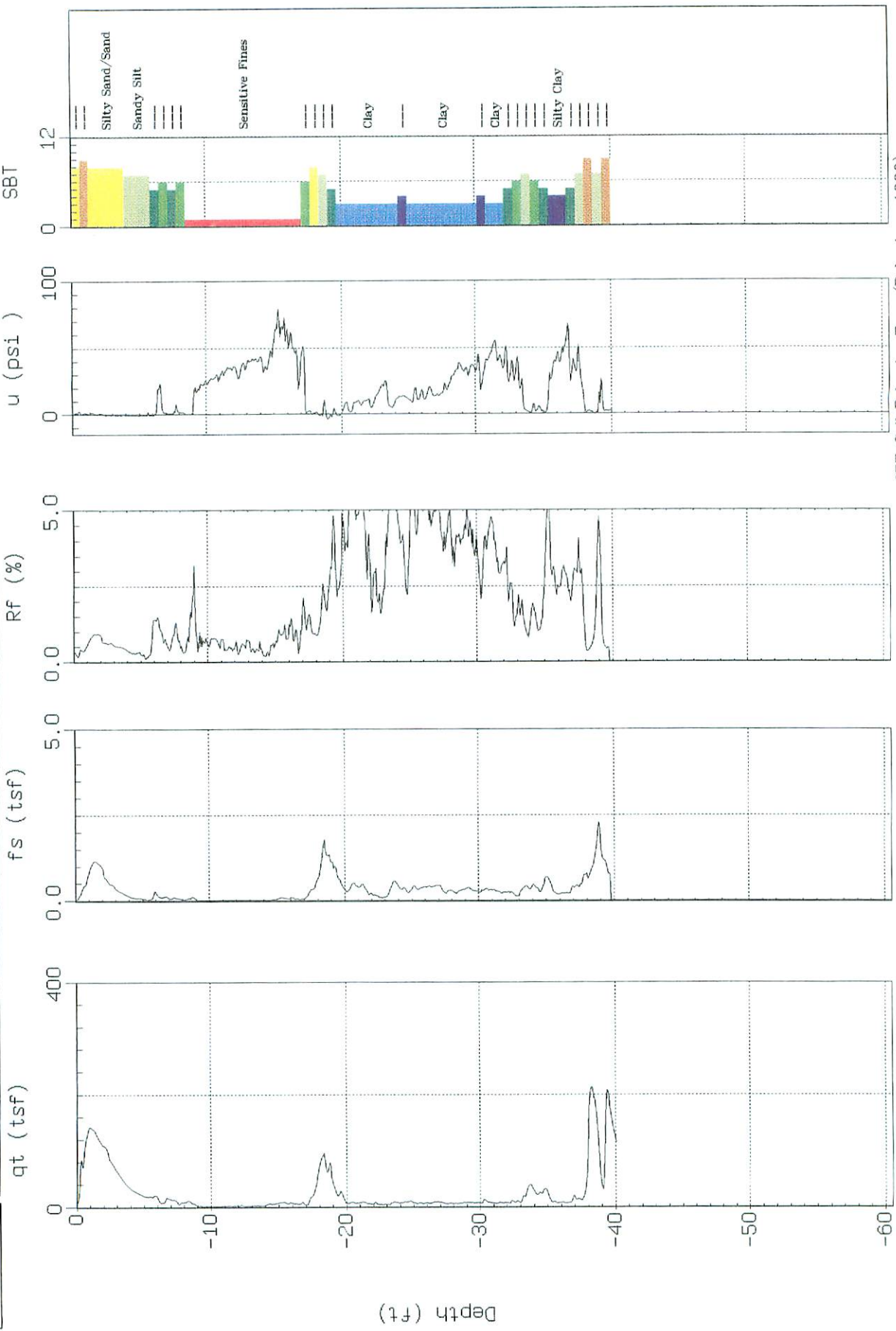
Max. Depth: 50.00 (ft)  
Depth Inc.: 0.066 (ft)



MACTEC

Sounding: CPT-02  
Location: Allen Plant

Oversite: H. Benkhalal  
Date: 07:20:04 11:13



SBT: Soil Behavior Type (Robertson 1990)

Max. Depth: 40.03 (ft)

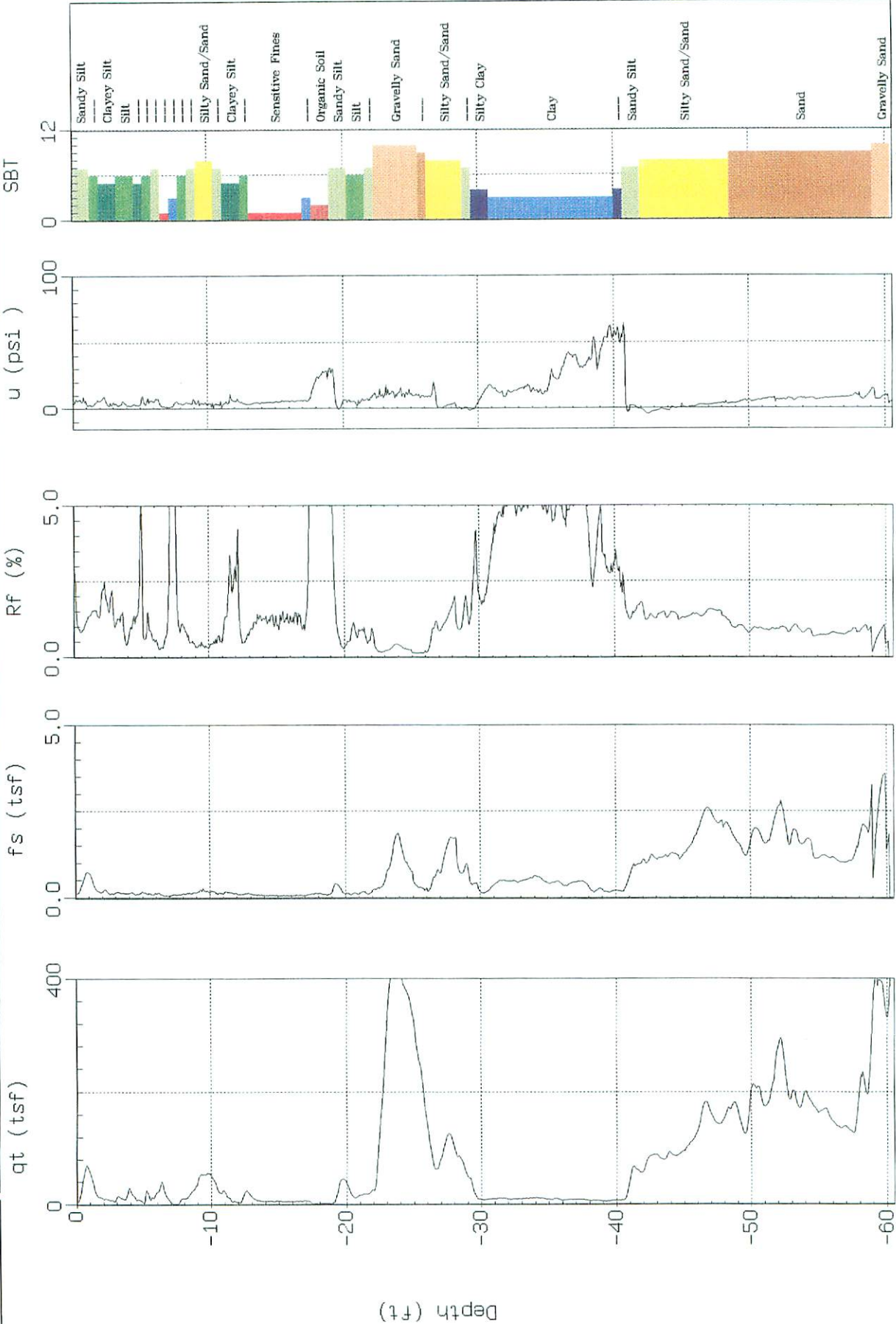
Depth Inc.: 0.066 (ft)



MACTEC

Sounding: CPT-03  
Location: Allen Plant

Over site: H. Benkhalal  
Date: 07:20:04 12:06



Sandy Silt  
Clayey Silt  
Silt  
Silty Sand/Sand  
Clayey Silt  
Sensitive Fines  
Organic Soil  
Sandy Silt  
Silt  
Gravelly Sand  
Silty Sand/Sand  
Silty Clay  
Clay  
Sandy Silt  
Silty Sand/Sand  
Sand  
Gravelly Sand

SBT: Soil Behavior Type (Robertson 1990)

Max. Depth: 60.50 (ft)  
Depth Inc.: 0.066 (ft)

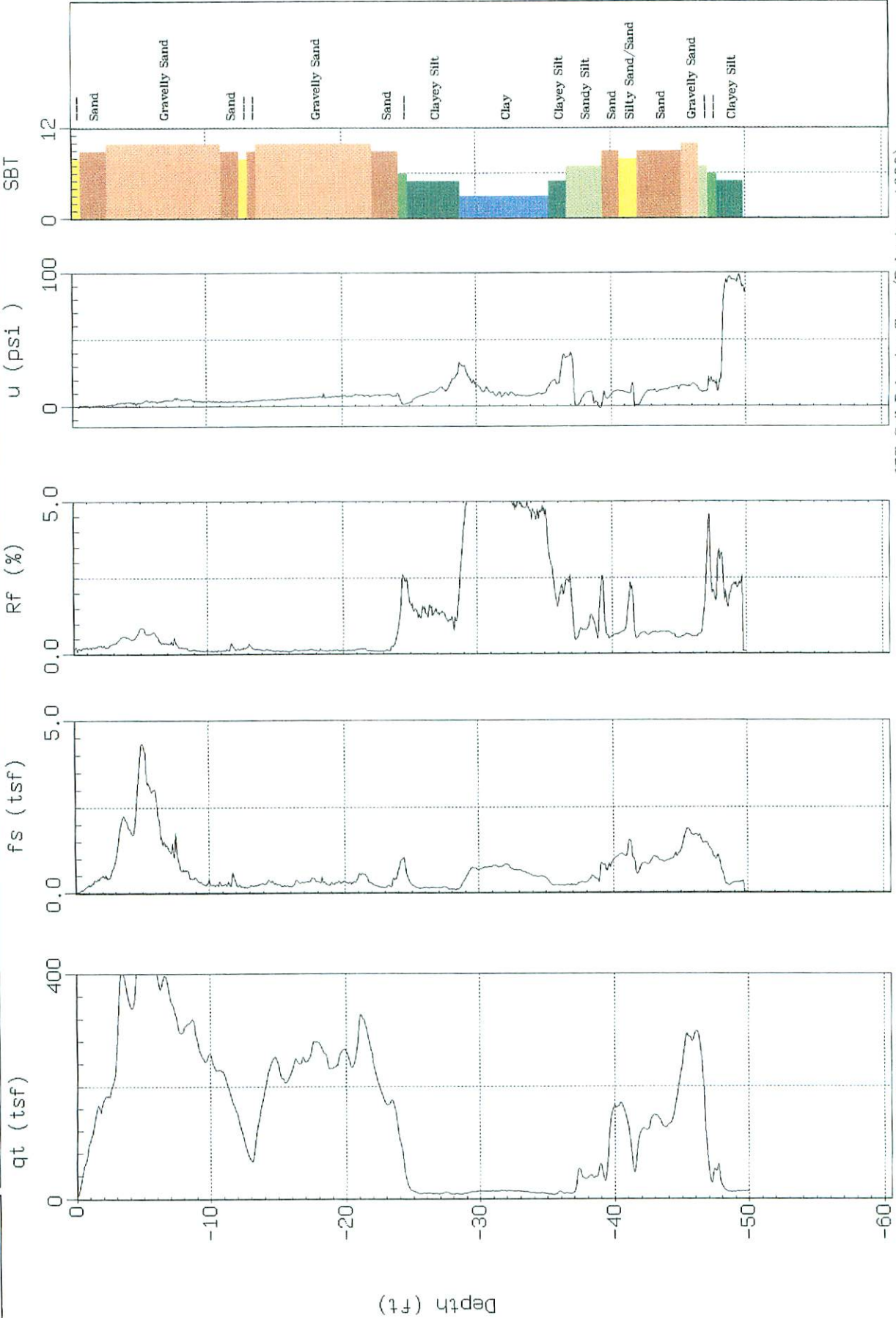
Depth (ft)



MACTEC

Sounding: CPT-04  
Location: Allen Plant

Over site: H. Benkhayal  
Date: 07:20:04 13:08



SBT: Soil Behavior Type (Robertson 1990)

Max. Depth: 50.00 (ft)

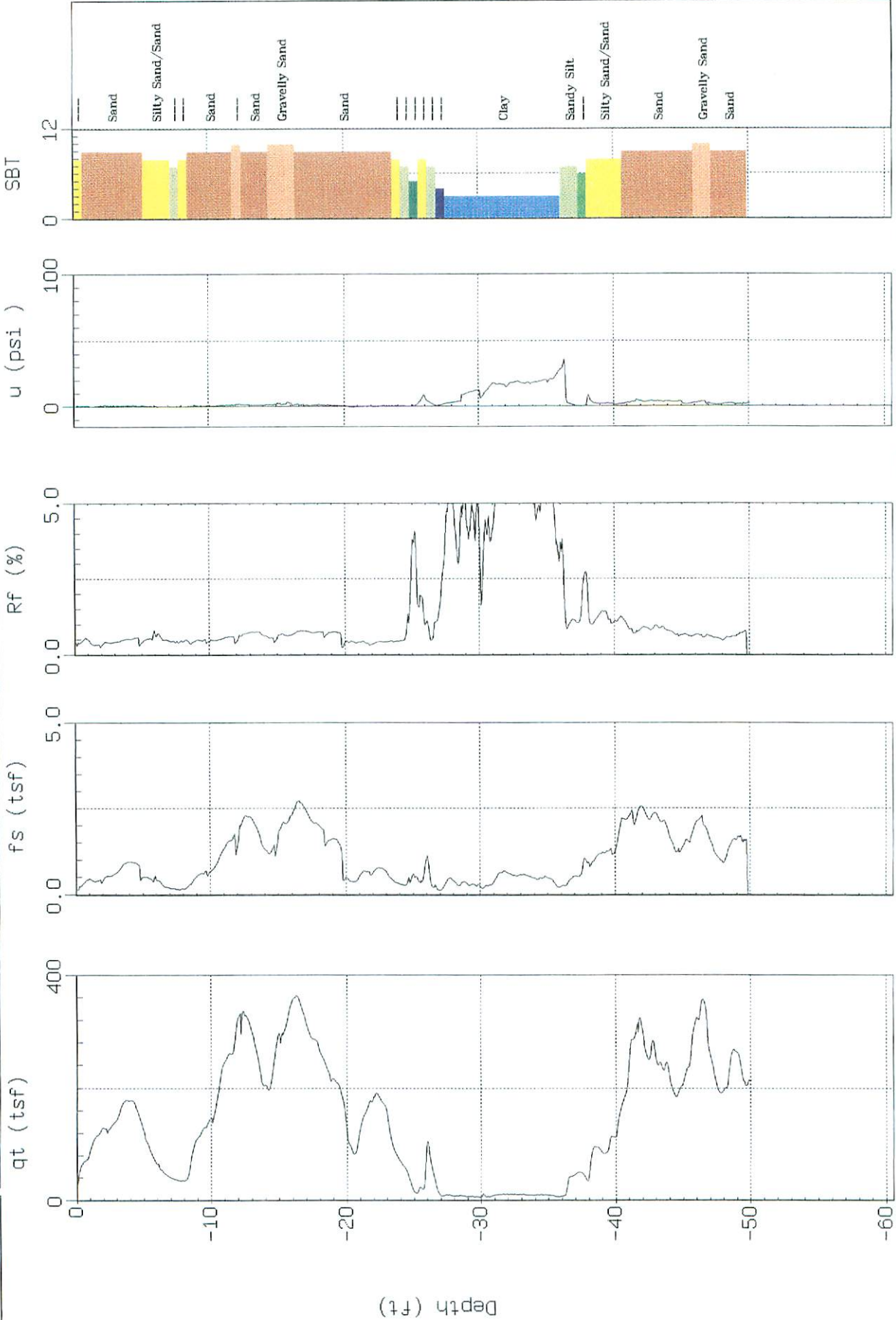
Depth Inc.: 0.066 (ft)



MACTEC

Sounding: CPT-05  
Location: Allen Plant

Over site: H. Benkhayal  
Date: 07:20:04 14:24



SBT: Soil Behavior Type (Robertson 1990)

Max. Depth: 50.07 (ft)

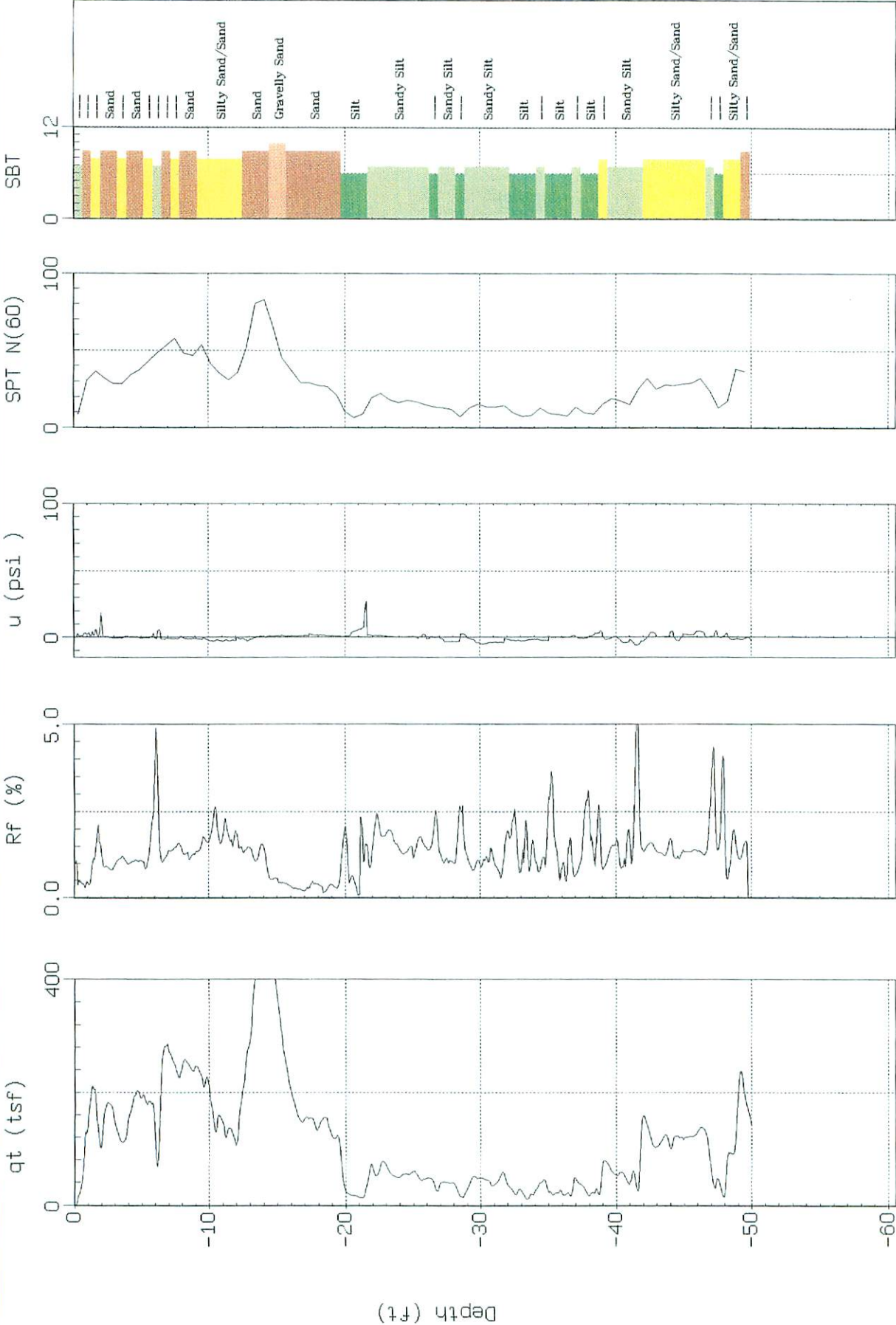
Depth Inc.: 0.066 (ft)



MACTEC

Sounding: CPT-01  
Location: Allen Plant

Over site: H. Benkhayal  
Date: 07:20:04 10:19



SBT: Soil Behavior Type (Robertson 1990)

Max. Depth: 50.00 (ft)  
Depth Inc.: 0.066 (ft)

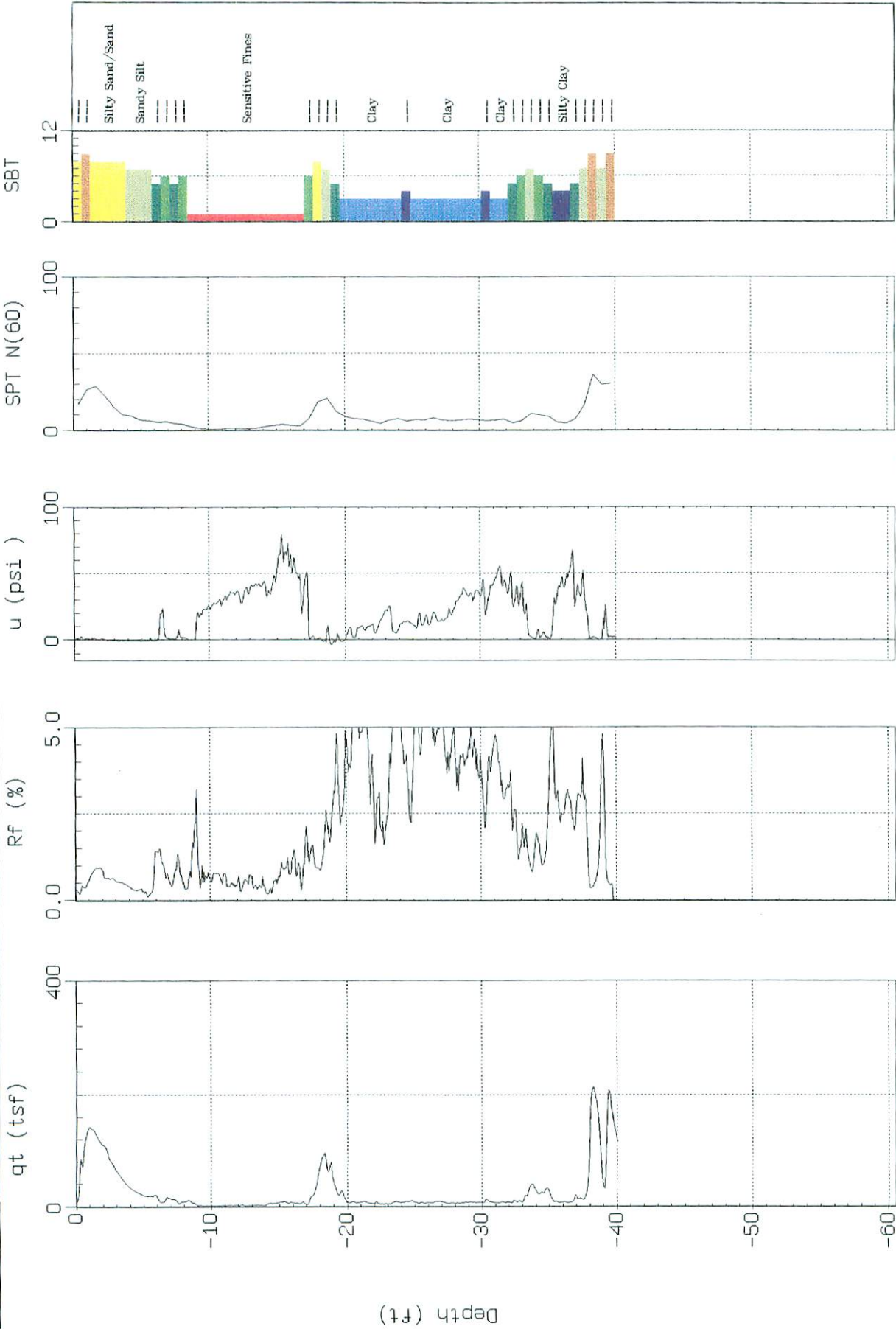




MACTEC

Sounding: CPT-02  
Location: Allen Plant

Oversite: H. Benkhalal  
Date: 07:20:04 11:13



SBT: Soil Behavior Type (Robertson 1990)

Max. Depth: 40.03 (ft)

Depth Inc.: 0.066 (ft)

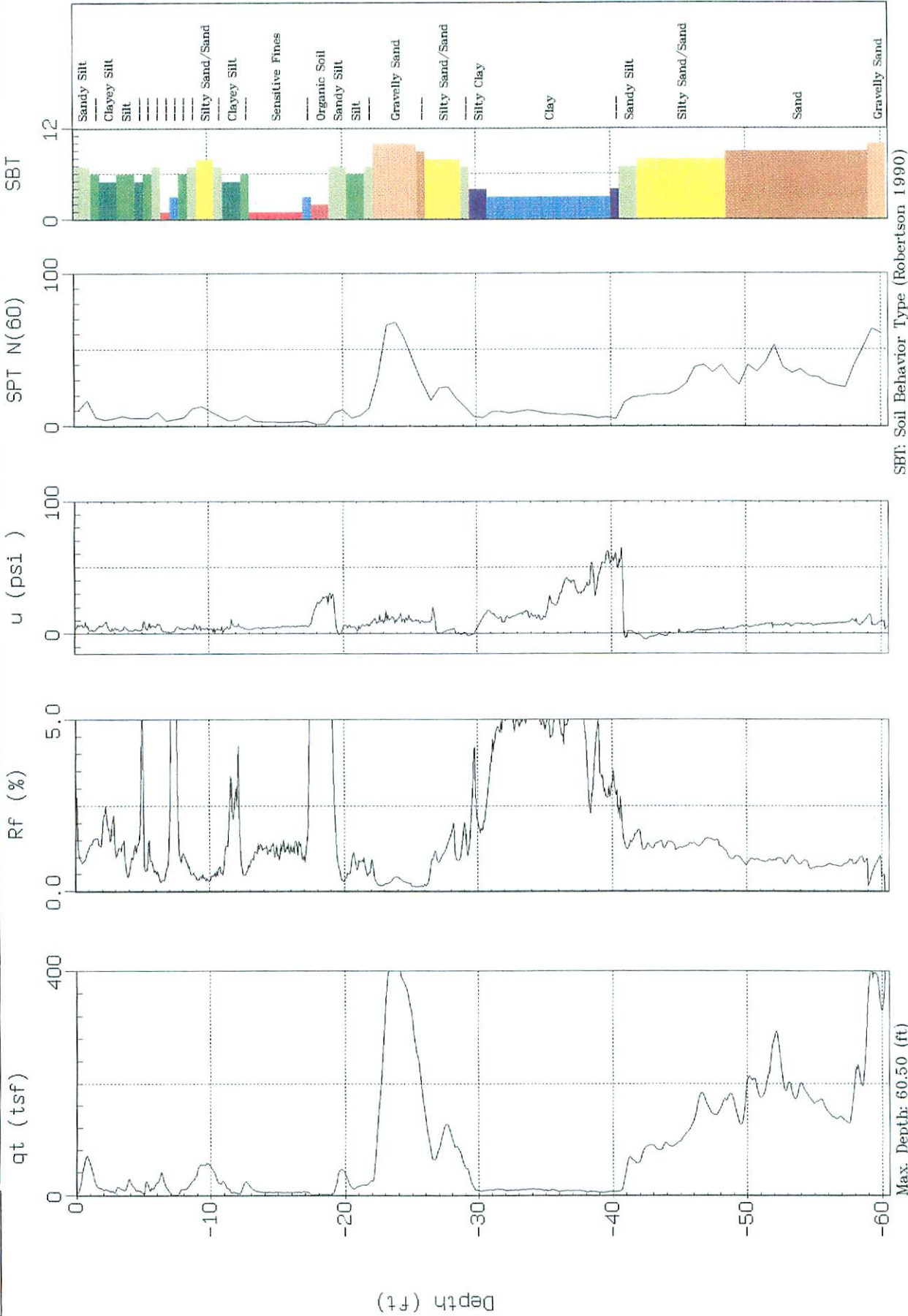
Depth (ft)



MACTEC

Sounding: CPT-03  
Location: Allen Plant

Over site: H. Benkhayal  
Date: 07:20:04 12:06



SBT: Soil Behavior Type (Robertson 1990)

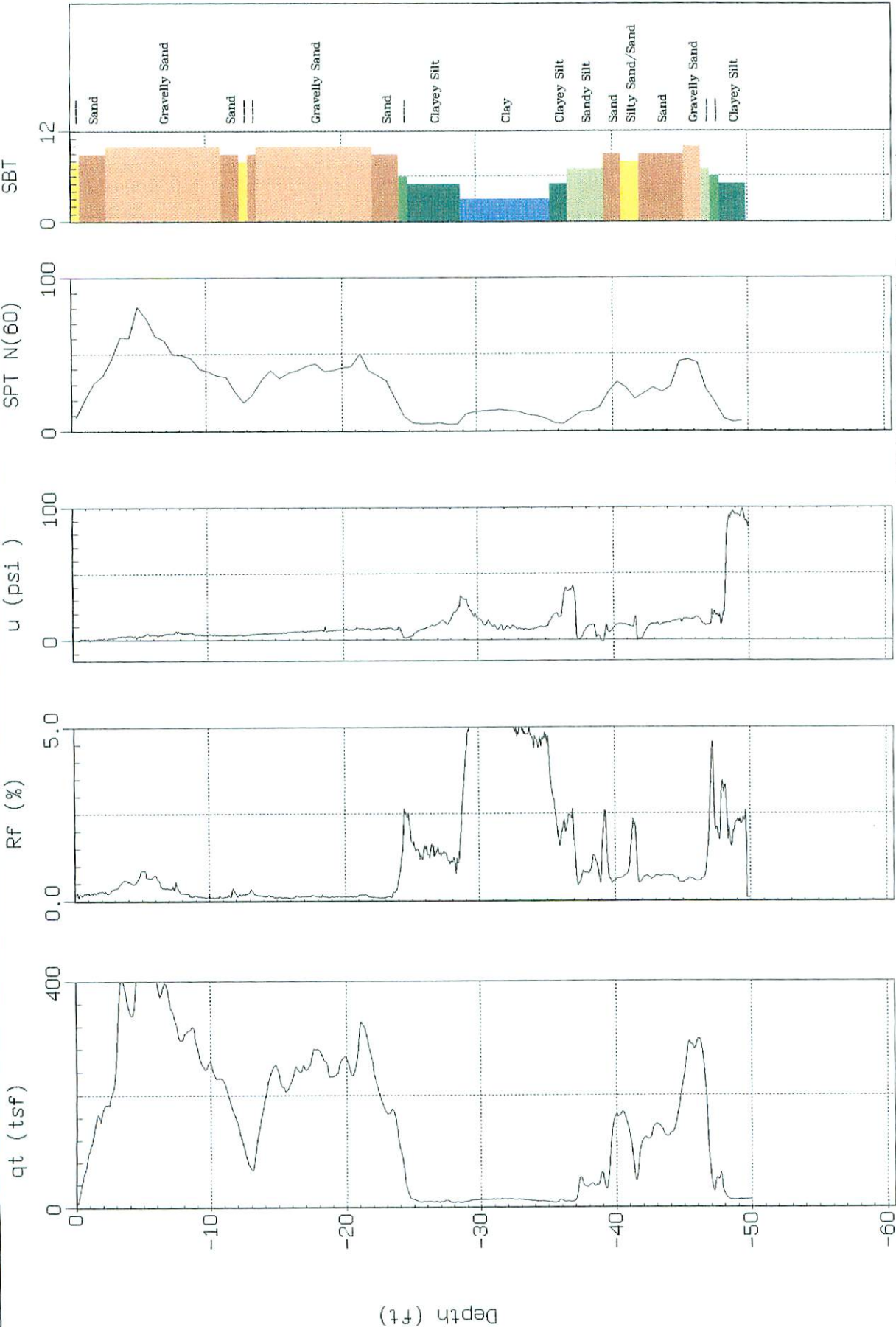
Max. Depth: 60.50 (ft)  
Depth Inc.: 0.066 (ft)



MACTEC

Sounding: CPT-04  
Location: Allen Plant

Over site: H. Benkhalal  
Date: 07:20:04 13:08



SBT: Soil Behavior Type (Robertson 1990)

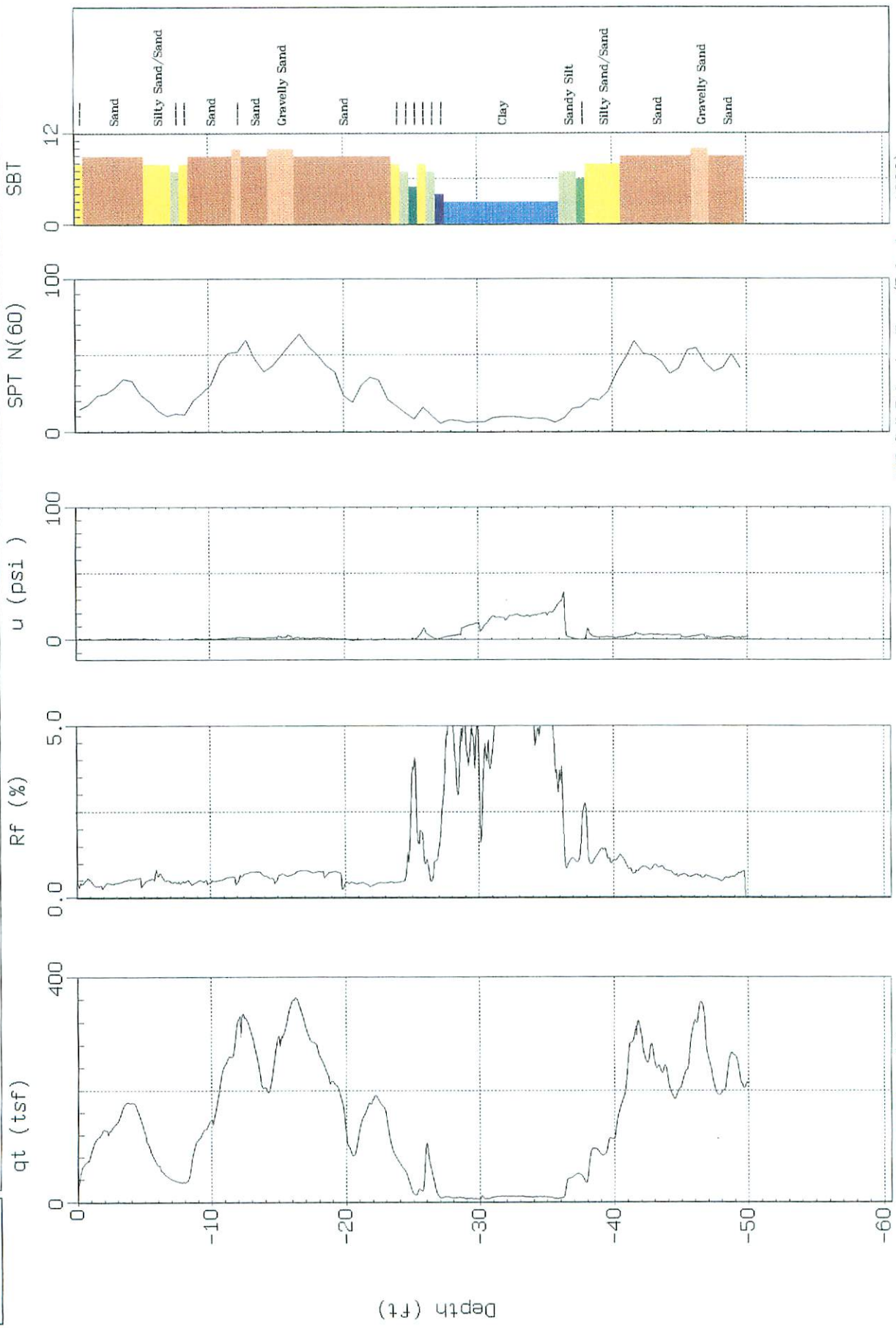
Max. Depth: 50.00 (ft)  
Depth Inc.: 0.066 (ft)



MACTEC

Sounding: CPT-05  
Location: Allen Plant

Over site: H. Benkhaya  
Date: 07:20:04 14:24



SBT: Soil Behavior Type (Robertson 1990)

Max Depth: 50.07 (ft)

Depth Inc.: 0.066 (ft)

**CONE PENETROMETER TEST RESULTS - GRAPHS**

**CONE PENETROMETER TEST RESULTS - TABLES**

Gregg In Situ, Inc. - CPT Interpretation  
Imperial  
Interpretation Output - Release 1.22A Format: NLI  
Run No: 04-0816-0955-2271  
Job No: 04-127SC  
Client: MACTEC  
Project: Allen Fossil Plant  
Site: CPT-01  
Location: Allen Plant  
Oversite: H. Benkhayal  
CPT Date: 04/20/07  
CPT Time: 10:19  
CPT File: 130CP01.COR  
Northing (m): 0.000000  
Easting (m): 0.000000  
Elevation (m): 0.000000  
Water Table (m): 5.18 (ft): 17.0  
Unit Weight of Water (default): 62.40 pcf  
Averaging Increment (m): 0.0 (Every Data Point)  
Phi Method: Robertson and Campanella, 1983  
Su Nkt used: 15.00 Su/P' (nc): 0.30  
Dr Method: Jamiolkowski - All Sands  
State Parameter M: 1.20  
Constant Unit Weight Used Throughout (pcf): 119.97  
N160lc Calculated using qc1n  
N160cs Calculated using qc1ncs















Table with 36 columns: Col-02 Depth, Col-05 qc, Col-06 qt, Col-07 fs, Col-08 Rf, Col-09 u, Col-14 Permk, Col-15 Unit Wt, Col-16 T Stress, Col-17 U Stress, Col-18 E Stress, Col-22 N1(60)/c, Col-23 N1(60)/c, Col-24 Qt, Col-25 Fr, Col-26 Bq, Col-28 FC, Col-30 Dr, Col-31 Phi, Col-33 Es/qc, Col-34 YoungE, Col-35 Su, Col-36 OCR. The table contains numerical data for each parameter across 36 rows.







Table with columns: Col-02 (Depth ft), Col-05 (qc lbf/ft), Col-06 (qt lbf/ft), Col-07 (is lbf/ft), Col-08 (Rf %), Col-09 (u ft), Col-14 (Perm-k cm/s), Col-15 (Unit Wt pcf), Col-16 (T Stress kPa), Col-17 (U Stress lbf), Col-18 (E Stress lbf), Col-22 (N(60)lc (bfr)), Col-23 (N(60)hc (bfr)), Col-24 (Cl), Col-25 (Fr %), Col-26 (Bq), Col-28 (FC %), Col-30 (Dr %), Col-31 (Phi (deg)), Col-33 (Esq), Col-34 (YoungE (tsf)), Col-35 (Su (tsf)), Col-36 (OCR)



Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 RF (%)	Col-09 u (ft)	Col-14 Perm-k (cm/s)	Col-15 Unit Wt (pcf)	Col-16 T Stress (kPa)	Col-17 U Stress (tsf)	Col-18 E Stress (tsf)	Col-22 N(60)lc (b/ft)	Col-23 N(60)lc (b/ft)	Col-24 Ql (b/ft)	Col-25 Fr (%)	Col-26 Bq (%)	Col-28 FC (%)	Col-30 Dr (%)	Col-31 Phi (deg)	Col-33 Estqt (tsf)	Col-34 YoungE (tsf)	Col-35 Su (tsf)	Col-36 OCR
48.146	237.83	237.81	2.66	1.12	-1.17	5.0E-02	120.0	2.949	1.004	1.945	43.7	32.1	120.74	1.13	0.00	7.8	82.0	42.0	2.003	476.3	-9999.0	-9999.0
49.212	239.62	239.61	2.74	1.14	-1.50	5.0E-02	120.0	2.953	1.006	1.947	44.2	32.3	121.55	1.16	0.00	7.9	82.2	42.0	2.001	479.3	-9999.0	-9999.0
49.278	233.68	233.66	2.87	1.23	-1.45	5.0E-02	120.0	2.957	1.008	1.949	43.5	31.9	118.38	1.24	0.00	8.5	81.4	42.0	2.011	469.8	-9999.0	-9999.0
49.343	223.58	223.57	3.00	1.34	-1.58	5.0E-02	120.0	2.961	1.010	1.951	42.3	30.9	113.08	1.36	-0.01	9.4	80.1	42.0	2.036	455.1	-9999.0	-9999.0
49.409	212.92	212.90	3.12	1.46	-1.52	5.0E-03	120.0	2.965	1.012	1.953	40.9	29.9	107.51	1.49	-0.01	10.4	78.7	42.0	2.069	440.5	-9999.0	-9999.0
49.474	200.91	200.90	3.14	1.56	-1.12	5.0E-03	120.0	2.969	1.014	1.955	39.1	28.6	101.26	1.59	-0.01	11.4	77.0	42.0	2.112	424.4	-9999.0	-9999.0
49.540	189.98	189.97	3.07	1.61	-0.79	5.0E-03	120.0	2.972	1.016	1.956	37.4	27.3	95.58	1.64	-0.01	12.1	75.4	42.0	2.155	409.4	-9999.0	-9999.0
49.606	180.02	180.01	2.98	1.65	-0.71	5.0E-03	120.0	2.976	1.018	1.958	35.8	26.1	90.40	1.68	-0.01	12.7	73.9	42.0	2.196	395.3	-9999.0	-9999.0
49.671	173.76	173.76	2.71	1.56	-0.28	5.0E-03	120.0	2.980	1.020	1.960	34.4	25.1	87.12	1.58	-0.01	12.5	72.8	42.0	2.223	386.3	-9999.0	-9999.0
49.737	166.39	166.39	0.01	0.01	0.12	5.0E-02	120.0	2.984	1.022	1.962	33.0	24.0	84.30	0.01	-0.01	12.5	71.9	42.0	2.247	378.4	-9999.0	-9999.0
49.803	162.19	162.19	0.01	0.01	-0.10	5.0E-02	120.0	2.988	1.024	1.964	31.5	23.0	81.06	0.01	-0.01	12.5	70.8	42.0	2.276	369.1	-9999.0	-9999.0
49.868	154.73	154.72	0.01	0.01	-0.63	5.0E-02	120.0	2.992	1.026	1.966	30.0	22.0	77.18	0.01	-0.01	12.5	69.5	42.0	2.312	357.7	-9999.0	-9999.0
49.934	146.65	146.63	0.01	0.01	-1.60	5.0E-02	120.0	2.996	1.028	1.968	28.5	21.0	74.01	0.01	-0.01	12.5	68.3	40.0	2.343	348.3	-9999.0	-9999.0
49.999	141.69	141.67	0.01	0.01	-1.98	5.0E-02	120.0	3.000	1.030	1.970	27.0	20.0	70.40	0.01	-0.01	12.5	66.9	40.0	2.382	337.5	-9999.0	-9999.0

Gregg In Situ, Inc. - CPT Interpretation  
Imperial  
NLI  
Format: 1.22A  
04-0816-0955-2326  
Run No:  
04-127SC  
Job No:  
MACTEC  
Client:  
Allen Fossil Plant  
Project:  
CPT-02  
Site:  
Allen Plant  
Location:  
H. Benkhayal  
Oversite:  
04/20/07  
CPT Date:  
11:13  
CPT Time:  
130CP02.COR  
CPT File:  
Northing (m): 0.000000  
Easting (m): 0.000000  
Elevation (m): 0.000000

Water Table (m): 9.75 (ft): 32.0  
Unit Weight of Water (default): 62.40 pcf  
Averaging Increment (m): 0.0 (Every Data Point)  
Phi Method : Robertson and Campanella, 1983  
Su Nkt used: 15.00 Su/P' (nc): 0.30  
Dr Method : Jamilolkowski - All Sands  
State Parameter M: 1.20  
Constant Unit Weight Used Throughout (pcf): 119.97  
N1601c Calculated using qc1n  
N160cs Calculated using qc1ncs





















Gregg In Situ, Inc. - CPT Interpretation  
 Interpretation Output - Release 1.22A Format: NLI Imperial  
 Run No: 04-0816-0955-2469  
 Job No: 04-127SC  
 Client: MACTEC  
 Project: Allen Fossil Plant  
 Site: CPT-03  
 Location: Allen Plant  
 Oversite: H. Benkhayal  
 CPT Date: 04/20/07  
 CPT Time: 12:06  
 CPT File: 130CP03.COR  
 Northing (m): 0.000000  
 Easting (m): 0.000000  
 Elevation (m): 0.000000

Water Table (m): 11.28 (ft): 37.0  
 Unit Weight of Water (default): 62.40 pcf  
 Averaging Increment (m): 0.0 (Every Data Point)  
 Phi Method: Robertson and Campanella, 1983  
 Su Nkt used: 15.00 Su/P' (nc): 0.30  
 Dr. Method: Jamilolkowski - All Sands  
 State Parameter M: 1.20  
 Constant Unit Weight Used Throughout (pcf): 119.97  
 N1601c Calculated using qc1n  
 N160cs Calculated using qc1ncs













Table with 35 columns: Col-02 (Depth (ft)), Col-05 (oc (lbf)), Col-06 (qt (lbf)), Col-07 (fs (lbf)), Col-08 (Rf (%)), Col-09 (u (ft)), Col-14 (Parr-k (cm/s)), Col-15 (Unit Wt (pcf)), Col-16 (T Stress (MPa)), Col-17 (U Stress (lbf)), Col-18 (E Stress (lbf)), Col-22 (N(60)lc (lbf)), Col-23 (N(60)lc (lbf)), Col-24 (Qi), Col-25 (Fr (%)), Col-26 (Bq), Col-28 (FC (%)), Col-30 (Dr (%)), Col-31 (Phi (deg)), Col-33 (Estqt), Col-34 (YoungE (lbf)), Col-35 (Su (lbf)), Col-36 (OCR). The table contains multiple rows of data points for various measurements and calculations.

















Col-02	Col-03	Col-04	Col-05	Col-06	Col-07	Col-08	Col-09	Col-14	Col-15	Col-16	Col-17	Col-18	Col-22	Col-23	Col-24	Col-25	Col-26	Col-28	Col-30	Col-31	Col-33	Col-34	Col-35	Col-36
Depth	qc	qs	Unit Wt	Penn-k	T Stress	U Stress	E Stress	N(60)lc	N(60)lc	Qc	Fr	Bq	FC	Dr	Phi	Est/qt	YoungE	Su	OCR					
(ft)	(tsf)	(tsf)	(pcf)	(cmis)	(kPa)	(tsf)	(tsf)	(tsf)	(tsf)	(tsf)	(%)	(%)	(%)	(%)	(deg)	(tsf)	(tsf)	(tsf)	(%)					
58.070	231.82	231.82	120.0	5.0E-02	3.484	0.658	2.826	42.2	25.7	80.82	0.82	0.00	7.2	75.9	42.0	2.275	527.6	-9999.0	-9999.0					
58.136	226.14	226.26	120.0	5.0E-02	3.488	0.660	2.828	41.7	25.3	78.77	0.89	0.00	7.8	75.2	42.0	2.298	519.9	-9999.0	-9999.0					
58.201	236.23	236.33	120.0	5.0E-02	3.492	0.662	2.830	43.3	26.3	82.27	0.86	0.00	7.5	76.4	42.0	2.269	533.9	-9999.0	-9999.0					
58.267	230.36	230.44	120.0	5.0E-02	3.496	0.664	2.832	42.5	25.8	80.13	0.93	0.00	8.0	75.7	42.0	2.283	526.0	-9999.0	-9999.0					
58.333	219.88	219.96	120.0	5.0E-02	3.500	0.666	2.834	41.0	24.9	76.38	0.87	0.00	8.6	74.3	40.0	2.325	511.3	-9999.0	-9999.0					
58.398	208.15	208.22	120.0	5.0E-02	3.504	0.668	2.836	39.4	23.9	72.54	1.00	0.00	9.2	72.9	40.0	2.369	495.6	-9999.0	-9999.0					
58.464	200.72	200.79	120.0	5.0E-02	3.508	0.670	2.838	38.1	23.1	69.52	1.03	0.00	9.6	71.7	40.0	2.404	482.7	-9999.0	-9999.0					
58.529	196.63	196.70	120.0	5.0E-02	3.512	0.672	2.840	37.5	22.7	68.03	1.04	0.00	9.9	71.1	40.0	2.422	476.4	-9999.0	-9999.0					
58.595	199.50	199.60	120.0	5.0E-02	3.516	0.674	2.842	37.7	22.8	69.01	0.98	0.00	9.3	71.5	40.0	2.410	481.1	-9999.0	-9999.0					
58.661	211.00	211.09	120.0	5.0E-02	3.520	0.676	2.844	39.2	23.8	73.00	0.89	0.00	8.4	73.1	40.0	2.363	498.9	-9999.0	-9999.0					
58.727	257.57	257.68	120.0	5.0E-02	3.524	0.678	2.846	42.3	25.6	80.00	0.86	0.00	7.5	75.7	42.0	2.284	527.9	-9999.0	-9999.0					
58.793	237.11	237.16	120.0	5.0E-02	3.528	0.680	2.848	46.8	28.3	89.26	0.89	0.00	7.0	78.8	42.0	2.185	563.0	-9999.0	-9999.0					
58.858	269.70	269.82	120.0	5.0E-02	3.532	0.682	2.849	52.3	31.6	100.48	0.95	0.00	6.6	82.2	42.0	2.095	607.3	-9999.0	-9999.0					
58.923	337.11	337.24	120.0	5.0E-02	3.535	0.685	2.851	60.0	36.3	117.05	0.98	0.00	5.9	86.5	42.0	2.150	725.0	-9999.0	-9999.0					
58.989	369.94	370.08	120.0	5.0E+00	3.539	0.687	2.853	56.6	34.2	128.48	0.15	0.00	0.0	90.5	44.0	-9999.0	-9999.0	-9999.0	-9999.0					
59.054	388.14	388.30	120.0	5.0E+00	3.543	0.689	2.855	60.2	36.4	134.78	0.22	0.00	0.0	91.4	44.0	-9999.0	-9999.0	-9999.0	-9999.0					
59.120	401.24	401.40	120.0	5.0E+00	3.547	0.691	2.857	63.3	38.2	139.27	0.31	0.00	0.5	92.1	44.0	-9999.0	-9999.0	-9999.0	-9999.0					
59.186	410.89	411.04	120.0	5.0E+00	3.551	0.693	2.859	65.8	39.7	142.55	0.39	0.00	1.1	92.5	44.0	-9999.0	-9999.0	-9999.0	-9999.0					
59.251	416.00	416.15	120.0	5.0E+00	3.555	0.695	2.860	67.5	40.8	144.24	0.46	0.00	1.6	90.4	44.0	-9999.0	-9999.0	-9999.0	-9999.0					
59.317	397.85	398.02	120.0	5.0E+00	3.559	0.697	2.862	64.7	39.1	134.32	0.58	0.00	2.7	90.4	44.0	-9999.0	-9999.0	-9999.0	-9999.0					
59.382	398.31	398.38	120.0	5.0E+00	3.563	0.699	2.864	66.8	40.3	137.85	0.64	0.00	3.0	91.2	44.0	-9999.0	-9999.0	-9999.0	-9999.0					
59.448	397.66	397.74	120.0	5.0E+00	3.567	0.701	2.866	67.4	40.7	137.53	0.71	0.00	3.4	91.1	44.0	-9999.0	-9999.0	-9999.0	-9999.0					
59.514	397.59	397.67	120.0	5.0E+00	3.571	0.703	2.868	68.0	41.0	137.41	0.77	0.00	3.8	91.1	44.0	-9999.0	-9999.0	-9999.0	-9999.0					
59.579	395.30	395.37	120.0	5.0E+00	3.575	0.705	2.870	68.0	41.1	136.52	0.83	0.00	4.2	90.9	44.0	-9999.0	-9999.0	-9999.0	-9999.0					
59.645	392.68	392.76	120.0	5.0E+00	3.579	0.707	2.872	68.0	41.0	135.52	0.87	0.00	4.5	90.7	44.0	-9999.0	-9999.0	-9999.0	-9999.0					
59.711	396.04	396.11	120.0	5.0E-02	3.583	0.709	2.874	67.4	40.6	133.12	0.92	0.00	4.9	90.3	44.0	-9999.0	-9999.0	-9999.0	-9999.0					
59.776	371.92	372.01	120.0	5.0E-02	3.587	0.711	2.876	65.5	39.5	128.12	0.96	0.00	5.3	89.2	44.0	-9999.0	-9999.0	-9999.0	-9999.0					
59.842	354.29	354.38	120.0	5.0E-02	3.591	0.713	2.877	63.1	38.0	121.91	1.02	0.00	5.9	87.8	42.0	-9999.0	-9999.0	-9999.0	-9999.0					
59.907	341.38	341.47	120.0	5.0E-02	3.595	0.715	2.879	61.3	36.9	117.35	1.06	0.00	6.3	86.7	42.0	2.166	739.7	-9999.0	-9999.0					
59.973	331.09	331.19	120.0	5.0E+00	3.598	0.717	2.881	54.6	32.9	113.70	0.42	0.00	2.3	85.8	42.0	2.118	701.5	-9999.0	-9999.0					
60.039	332.00	332.11	120.0	5.0E+00	3.602	0.719	2.883	55.0	33.1	113.94	0.44	0.00	2.4	85.9	42.0	2.121	704.4	-9999.0	-9999.0					
60.104	345.73	345.83	120.0	5.0E+00	3.606	0.721	2.885	57.4	34.5	118.62	0.48	0.00	2.5	87.0	42.0	2.192	758.1	-9999.0	-9999.0					
60.170	370.39	370.49	120.0	5.0E+00	3.610	0.723	2.887	61.2	36.8	127.09	0.49	0.00	2.3	89.0	44.0	-9999.0	-9999.0	-9999.0	-9999.0					
60.235	409.60	409.71	120.0	5.0E+00	3.614	0.725	2.889	-9999.0	-9999.0	140.58	0.00	0.00	-9999.0	91.9	44.0	-9999.0	-9999.0	-9999.0	-9999.0					
60.301	457.33	457.36	120.0	5.0E+00	3.618	0.728	2.891	-9999.0	-9999.0	156.97	0.00	0.00	0.0	95.0	44.0	-9999.0	-9999.0	-9999.0	-9999.0					
60.367	479.17	479.22	120.0	5.0E+00	3.622	0.730	2.893	-9999.0	-9999.0	164.42	0.00	0.00	0.0	95.0	44.0	-9999.0	-9999.0	-9999.0	-9999.0					
60.432	492.91	492.96	120.0	5.0E+00	3.626	0.732	2.894	-9999.0	-9999.0	169.06	0.00	0.00	0.0	95.0	44.0	-9999.0	-9999.0	-9999.0	-9999.0					
60.498	503.13	503.19	120.0	5.0E+00	3.630	0.734	2.896	-9999.0	-9999.0	172.48	0.00	0.00	0.0	95.0	44.0	-9999.0	-9999.0	-9999.0	-9999.0					

Gregg In Situ, Inc. - CPT Interpretation  
 Interpretation Output - Release 1.22A Format: NLI Imperial  
 Run No: 04-0816-0955-2535  
 Job No: 04-127SC  
 Client: MAGTEC  
 Project: Allen Fossil Plant  
 Site: CPT-04  
 Location: Allen Plant  
 Oversite: H. Benkhayal  
 CPT Date: 04/20/07  
 CPT Time: 13:08  
 CPT File: 130CP04.COR  
 Northing (m): 0.000000  
 Easting (m): 0.000000  
 Elevation (m): 0.000000

Water Table (m): 4.57 (ft): 15.0  
 Unit Weight of Water (default): 62.40 pcf  
 Averaging Increment (m): 0.0 (Every Data Point)  
 Phi Method : Robertson and Campanella, 1983  
 Su Nkt used: 15.00 Su/P' (nc): 0.30  
 Dr Method : Jamiolkowski - All Sands  
 State Parameter M: 1.20  
 Constant Unit Weight Used Throughout (pcf): 119.97  
 N160lc Calculated using qc1n  
 N160cs Calculated using qc1ncs









Col-02	Col-03	Col-04	Col-05	Col-06	Col-07	Col-08	Col-09	Col-14	Col-15	Col-16	Col-17	Col-18	Col-22	Col-23	Col-24	Col-25	Col-26	Col-28	Col-30	Col-31	Col-33	Col-34	Col-35	Col-36
Depth	qc	Is	Permi-k	Unit Wt	T Stress	U Stress	E Stress	N(60)lc	N(60)li	N(60)le	U Stress	E Stress	N(60)li	N(60)le	Ql	Fr	Bq	FC	Dr	Phi	Esq	YoungE	Su	OCR
(ft)	(tsf)	(tsf)	(cm/s)	(pcf)	(MPa)	(tsf)	(tsf)	(tsf)	(tsf)	(tsf)	(tsf)	(tsf)	(tsf)	(tsf)	(%)	(%)	(%)	(%)	(%)	(deg)	(tsf)	(tsf)	(tsf)	(tsf)
13.451	125.01	0.22	5.0E-02	120.0	0.807	0.000	0.807	20.4	23.2	153.95	0.18	0.18	20.4	23.2	153.95	0.18	0.00	1.7	76.1	44.0	1.965	245.7	-9999.0	-9999.0
13.517	133.64	0.21	5.0E-02	120.0	0.811	0.000	0.811	21.5	24.4	163.84	0.16	0.16	21.5	24.4	163.84	0.16	0.00	1.2	78.0	44.0	1.931	265.1	-9999.0	-9999.0
13.583	141.29	0.23	5.0E-02	120.0	0.815	0.000	0.815	22.6	25.6	172.37	0.16	0.16	22.6	25.6	172.37	0.16	0.00	1.0	79.5	44.0	1.907	288.1	-9999.0	-9999.0
13.648	149.48	0.22	5.0E-02	120.0	0.819	0.000	0.819	23.6	26.7	181.60	0.15	0.15	23.6	26.7	181.60	0.15	0.00	0.6	81.1	44.0	1.888	282.4	-9999.0	-9999.0
13.714	157.40	0.26	5.0E-02	120.0	0.823	0.000	0.823	24.8	28.0	190.35	0.17	0.17	24.8	28.0	190.35	0.17	0.00	0.6	82.5	44.0	1.863	296.3	-9999.0	-9999.0
13.779	166.52	0.25	5.0E-02	120.0	0.827	0.000	0.827	26.0	29.2	200.41	0.15	0.15	26.0	29.2	200.41	0.15	0.00	0.2	84.0	46.0	1.895	315.5	-9999.0	-9999.0
13.845	173.25	0.26	5.0E-02	120.0	0.831	0.000	0.831	26.9	30.2	207.62	0.15	0.15	26.9	30.2	207.62	0.15	0.00	0.1	85.1	46.0	1.922	333.1	-9999.0	-9999.0
13.911	181.49	0.27	5.0E-02	120.0	0.835	0.000	0.835	28.0	31.4	216.51	0.15	0.15	28.0	31.4	216.51	0.15	0.00	0.0	86.3	46.0	1.963	360.0	-9999.0	-9999.0
13.976	192.99	0.26	5.0E-02	120.0	0.839	0.000	0.839	29.5	33.0	229.20	0.14	0.14	29.5	33.0	229.20	0.14	0.00	0.0	88.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0
14.042	198.16	0.26	5.0E+00	120.0	0.843	0.000	0.843	30.2	33.6	234.26	0.13	0.13	30.2	33.6	234.26	0.13	0.00	0.0	88.7	46.0	-9999.0	-9999.0	-9999.0	-9999.0
14.107	207.87	0.25	5.0E+00	120.0	0.846	0.000	0.846	31.4	34.8	244.64	0.12	0.12	31.4	34.8	244.64	0.12	0.00	0.0	90.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0
14.173	215.72	0.26	5.0E+00	120.0	0.850	0.000	0.850	32.4	35.9	252.74	0.12	0.12	32.4	35.9	252.74	0.12	0.00	0.0	91.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0
14.239	223.20	0.29	5.0E+00	120.0	0.854	0.000	0.854	33.5	37.0	260.25	0.13	0.13	33.5	37.0	260.25	0.13	0.00	0.0	92.5	46.0	-9999.0	-9999.0	-9999.0	-9999.0
14.304	227.99	0.30	5.0E+00	120.0	0.858	0.000	0.858	34.2	37.7	264.71	0.13	0.13	34.2	37.7	264.71	0.13	0.00	0.0	93.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0
14.370	233.16	0.38	5.0E+00	120.0	0.862	0.000	0.862	35.2	38.7	269.42	0.16	0.16	35.2	38.7	269.42	0.16	0.00	0.0	93.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0
14.436	238.85	0.35	5.0E+00	120.0	0.866	0.000	0.866	35.8	39.3	274.82	0.15	0.15	35.8	39.3	274.82	0.15	0.00	0.0	93.7	46.0	-9999.0	-9999.0	-9999.0	-9999.0
14.501	243.83	0.32	5.0E+00	120.0	0.870	0.000	0.870	36.3	39.7	279.30	0.13	0.13	36.3	39.7	279.30	0.13	0.00	0.0	94.2	46.0	-9999.0	-9999.0	-9999.0	-9999.0
14.567	247.80	0.30	5.0E+00	120.0	0.874	0.000	0.874	36.7	40.1	282.58	0.12	0.12	36.7	40.1	282.58	0.12	0.00	0.0	94.9	46.0	-9999.0	-9999.0	-9999.0	-9999.0
14.632	250.99	0.35	5.0E+00	120.0	0.878	0.000	0.878	37.3	40.7	284.94	0.14	0.14	37.3	40.7	284.94	0.14	0.00	0.0	94.9	46.0	-9999.0	-9999.0	-9999.0	-9999.0
14.698	251.12	0.31	5.0E+00	120.0	0.882	0.000	0.882	37.2	40.4	283.81	0.12	0.12	37.2	40.4	283.81	0.12	0.00	0.0	95.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0
14.764	253.93	0.29	5.0E+00	120.0	0.886	0.000	0.886	37.4	40.7	285.71	0.11	0.11	37.4	40.7	285.71	0.11	0.00	0.0	95.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0
14.829	252.84	0.25	5.0E+00	120.0	0.890	0.000	0.890	37.4	40.7	285.71	0.11	0.11	37.4	40.7	285.71	0.11	0.00	0.0	94.9	46.0	-9999.0	-9999.0	-9999.0	-9999.0
14.895	247.48	0.24	5.0E+00	120.0	0.894	0.000	0.894	36.6	39.6	275.96	0.11	0.11	36.6	39.6	275.96	0.11	0.00	0.0	94.2	46.0	-9999.0	-9999.0	-9999.0	-9999.0
14.960	243.38	0.28	5.0E+00	120.0	0.898	0.000	0.898	36.6	39.6	275.96	0.11	0.11	36.6	39.6	275.96	0.11	0.00	0.0	93.7	46.0	-9999.0	-9999.0	-9999.0	-9999.0
15.026	237.57	0.23	5.0E+00	120.0	0.902	0.001	0.902	36.6	39.6	275.96	0.11	0.11	36.6	39.6	275.96	0.11	0.00	0.0	93.7	46.0	-9999.0	-9999.0	-9999.0	-9999.0
15.092	229.27	0.29	5.0E+00	120.0	0.906	0.003	0.903	34.2	36.8	263.05	0.10	0.10	34.2	36.8	263.05	0.10	0.00	0.0	91.9	46.0	-9999.0	-9999.0	-9999.0	-9999.0
15.157	221.15	0.25	5.0E+00	120.0	0.909	0.005	0.905	33.2	35.7	243.48	0.11	0.11	33.2	35.7	243.48	0.11	0.00	0.0	90.8	46.0	-9999.0	-9999.0	-9999.0	-9999.0
15.223	216.44	0.23	5.0E+00	120.0	0.913	0.007	0.908	32.5	34.9	237.83	0.11	0.11	32.5	34.9	237.83	0.11	0.00	0.0	90.2	46.0	-9999.0	-9999.0	-9999.0	-9999.0
15.289	214.51	0.22	5.0E+00	120.0	0.917	0.009	0.906	32.2	34.6	235.21	0.10	0.10	32.2	34.6	235.21	0.10	0.00	0.0	89.9	46.0	-9999.0	-9999.0	-9999.0	-9999.0
15.354	215.72	0.18	5.0E+00	120.0	0.921	0.011	0.910	30.9	32.2	226.73	0.10	0.10	30.9	32.2	226.73	0.10	0.00	0.0	89.9	46.0	-9999.0	-9999.0	-9999.0	-9999.0
15.420	213.62	0.21	5.0E+00	120.0	0.925	0.013	0.912	29.6	30.9	219.03	0.09	0.09	29.6	30.9	219.03	0.09	0.00	0.0	89.3	46.0	-9999.0	-9999.0	-9999.0	-9999.0
15.485	207.99	0.18	5.0E+00	120.0	0.929	0.015	0.914	28.5	29.1	213.95	0.08	0.08	28.5	29.1	213.95	0.08	0.00	0.0	88.8	46.0	-9999.0	-9999.0	-9999.0	-9999.0
15.551	207.16	0.20	5.0E+00	120.0	0.933	0.017	0.916	27.5	27.5	209.03	0.08	0.08	27.5	27.5	209.03	0.08	0.00	0.0	88.8	46.0	-9999.0	-9999.0	-9999.0	-9999.0
15.617	208.96	0.22	5.0E+00	120.0	0.937	0.019	0.918	26.8	26.8	203.66	0.08	0.08	26.8	26.8	203.66	0.08	0.00	0.0	88.8	46.0	-9999.0	-9999.0	-9999.0	-9999.0
15.682	211.51	0.19	5.0E+00	120.0	0.941	0.021	0.920	25.6	25.6	195.03	0.08	0.08	25.6	25.6	195.03	0.08	0.00	0.0	89.3	46.0	-9999.0	-9999.0	-9999.0	-9999.0
15.748	217.07	0.20	5.0E+00	120.0	0.945	0.023	0.922	24.6	24.6	187.96	0.09	0.09	24.6	24.6	187.96	0.09	0.00	0.0	89.3	46.0	-9999.0	-9999.0	-9999.0	-9999.0
15.813	217.13	0.20	5.0E+00	120.0	0.949	0.025	0.922	23.6	23.6	181.60	0.09	0.09	23.6	23.6	181.60	0.09	0.00	0.0	88.7	46.0	-9999.0	-9999.0	-9999.0	-9999.0
15.879	219.81	0.19	5.0E+00	120.0	0.953	0.027	0.925	22.6	22.6	175.96	0.09	0.09	22.6	22.6	175.96	0.09	0.00	0.0	90.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0
15.945	223.84	0.17	5.0E+00	120.0	0.957	0.029	0.927	21.6	21.6	170.46	0.08	0.08	21.6	21.6	170.46	0.08	0.00	0.0	90.8	46.0	-9999.0	-9999.0	-9999.0	-9999.0
16.010	228.44	0.17	5.0E+00	120.0	0.961	0.032	0.929	20.6	20.6	165.03	0.08	0.08	20.6	20.6	165.03	0.08	0.00	0.0	91.4	46.0	-9999.0	-9999.0	-9999.0	-9999.0
16.076	233.74	0.17	5.0E+00	120.0	0.965	0.034	0.931	19.6	19.6	160.39	0.07	0.07	19.6	19.6	160.39	0.07	0.00	0.0	92.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0
16.142	239.49	0.19	5.0E+00	120.0	0.969	0.036	0.933	18.6	18.6	156.46	0.08	0.08	18.6	18.6	156.46	0.08	0.00	0.0	92.7	46.0	-9999.0	-9999.0	-9999.0	-9999.0
16.207	246.84	0.22	5.0E+00	120.0	0.972	0.038	0.935	17.6	17.6	153.10	0.09	0.09	17.6	17.6	153.10	0.09	0.00	0.0	93.5	46.0	-9999.0	-9999.0	-9999.0	-9999.0
16.273	250.98	0.25	5.0E+00	120.0	0.976	0.040	0.937	16.6	16.6	150.35	0.10	0.10	16.6	16.6	150.35	0.10	0.00	0.0	94.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0
16.338	248.11	0.27	5.0E+00	120.0	0.980	0.042	0.939	15.6	15.6	148.16	0.11	0.11	15.6	15.6	148.16	0.11	0.00	0.0	94.6	46.0	-9999.0	-9999.0	-9999.0	-9999.0
16.404	246.07	0.36	5.0E+00	120.0	0.984	0.044	0.940	14.6	14.6	146.68	0.15	0.15	14.6	14.6	146.68	0.15	0.00	0.0	93.4	46.0	-9999.0	-9999.0	-9999.0	-9999.0
16.470	243.45	0.35	5.0E+00	120.0	0.988	0.046	0.942	13.6																

Col-02	Col-03	Col-04	Col-05	Col-06	Col-07	Col-08	Col-09	Col-10	Col-11	Col-12	Col-13	Col-14	Col-15	Col-16	Col-17	Col-18	Col-19	Col-20	Col-21	Col-22	Col-23	Col-24	Col-25	Col-26	Col-27	Col-28	Col-29	Col-30	Col-31	Col-32	Col-33	Col-34	Col-35	Col-36
Depth (ft)	qc (tsf)	qc (tsf)	qc (tsf)	qc (tsf)	qc (tsf)	qc (tsf)	u (ft)	u (ft)	Perms-k (cm/s)	Unit wt (pcf)	T Stress (kPa)	E Stress (tsf)	N(60)lc (b/hr)	N(60)lc (b/hr)	Cl.	Fr (%)	Bq	FC (%)	Dr (%)	Phi (deg)	Esqft	YoungE (tsf)	Su (tsf)	OCR										
17.913	280.18	280.26	0.33	0.12	7.15	7.15	5.0E+00	120.0	1.075	0.091	0.884	41.1	42.4	283.76	0.12	0.00	0.0	95.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0											
17.979	279.17	279.24	0.33	0.12	6.97	6.97	5.0E+00	120.0	1.079	0.093	0.886	41.0	42.2	282.19	0.12	0.00	0.0	95.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0											
18.044	276.61	276.69	0.33	0.11	6.93	6.93	5.0E+00	120.0	1.083	0.095	0.888	40.7	41.9	279.05	0.12	0.00	0.0	95.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0											
18.110	273.54	273.62	0.31	0.11	7.31	7.31	5.0E+00	120.0	1.087	0.097	0.890	40.2	41.3	275.42	0.11	0.00	0.0	95.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0											
18.176	270.41	270.48	0.28	0.10	7.09	7.09	5.0E+00	120.0	1.091	0.099	0.891	38.7	40.8	271.73	0.10	0.00	0.0	95.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0											
18.241	265.94	266.01	0.30	0.11	7.23	7.23	5.0E+00	120.0	1.095	0.101	0.893	38.3	40.3	266.71	0.11	0.00	0.0	94.8	46.0	-9999.0	-9999.0	-9999.0	-9999.0											
18.307	268.91	269.02	0.34	0.13	7.80	7.80	5.0E+00	120.0	1.102	0.105	0.897	38.6	39.5	258.65	0.13	0.00	0.0	94.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0											
18.372	258.97	259.08	0.28	0.11	7.05	7.05	5.0E+00	120.0	1.106	0.107	0.899	38.4	39.3	258.11	0.11	0.00	0.0	94.1	46.0	-9999.0	-9999.0	-9999.0	-9999.0											
18.438	258.78	258.85	0.28	0.12	7.25	7.25	5.0E+00	120.0	1.110	0.109	0.901	38.4	39.2	256.89	0.12	0.00	0.0	93.8	46.0	-9999.0	-9999.0	-9999.0	-9999.0											
18.504	255.34	255.42	0.29	0.11	7.01	7.01	5.0E+00	120.0	1.114	0.111	0.903	37.9	38.7	253.61	0.11	0.00	0.0	93.5	46.0	-9999.0	-9999.0	-9999.0	-9999.0											
18.569	243.64	243.75	0.25	0.10	10.41	10.41	5.0E+00	120.0	1.118	0.113	0.905	36.3	37.0	241.52	0.10	0.00	0.0	93.2	46.0	-9999.0	-9999.0	-9999.0	-9999.0											
18.635	234.00	234.07	0.24	0.10	6.68	6.68	5.0E+00	120.0	1.122	0.116	0.907	35.0	35.7	231.44	0.10	0.00	0.0	90.9	46.0	-9999.0	-9999.0	-9999.0	-9999.0											
18.701	232.06	232.16	0.21	0.09	6.68	6.68	5.0E+00	120.0	1.126	0.118	0.908	-9999.0	-9999.0	229.10	0.09	0.00	-9999.0	90.7	46.0	-9999.0	-9999.0	-9999.0	-9999.0											
18.766	232.05	232.15	0.22	0.09	6.68	6.68	5.0E+00	120.0	1.130	0.120	0.910	-9999.0	-9999.0	229.24	0.10	0.00	-9999.0	90.7	46.0	-9999.0	-9999.0	-9999.0	-9999.0											
18.832	233.65	233.73	0.22	0.09	6.99	6.99	5.0E+00	120.0	1.134	0.122	0.912	-9999.0	-9999.0	229.50	0.09	0.00	-9999.0	90.8	46.0	-9999.0	-9999.0	-9999.0	-9999.0											
18.897	233.36	233.43	0.22	0.09	6.99	6.99	5.0E+00	120.0	1.138	0.124	0.914	-9999.0	-9999.0	228.57	0.11	0.00	0.0	90.7	46.0	-9999.0	-9999.0	-9999.0	-9999.0											
18.963	232.84	232.92	0.26	0.11	7.01	7.01	5.0E+00	120.0	1.142	0.126	0.916	35.5	35.6	228.57	0.11	0.00	0.0	90.7	46.0	-9999.0	-9999.0	-9999.0	-9999.0											
19.029	232.84	232.92	0.30	0.13	7.11	7.11	5.0E+00	120.0	1.146	0.128	0.918	35.5	35.6	228.57	0.11	0.00	0.0	90.7	46.0	-9999.0	-9999.0	-9999.0	-9999.0											
19.094	234.89	234.97	0.25	0.11	7.09	7.09	5.0E+00	120.0	1.149	0.130	0.920	35.2	35.7	229.92	0.11	0.00	0.0	90.9	46.0	-9999.0	-9999.0	-9999.0	-9999.0											
19.160	235.53	235.61	0.25	0.11	6.97	6.97	5.0E+00	120.0	1.153	0.132	0.922	35.2	35.6	228.93	0.10	0.00	0.0	90.8	46.0	-9999.0	-9999.0	-9999.0	-9999.0											
19.225	234.96	235.04	0.24	0.10	7.19	7.19	5.0E+00	120.0	1.154	0.132	0.922	35.2	35.6	228.93	0.10	0.00	0.0	90.8	46.0	-9999.0	-9999.0	-9999.0	-9999.0											
19.291	239.30	239.38	0.20	0.13	7.44	7.44	5.0E+00	120.0	1.157	0.134	0.924	36.3	36.3	232.75	0.13	0.00	0.0	91.3	46.0	-9999.0	-9999.0	-9999.0	-9999.0											
19.357	238.60	238.68	0.28	0.12	7.31	7.31	5.0E+00	120.0	1.161	0.136	0.926	35.8	36.1	231.63	0.12	0.00	0.0	91.2	46.0	-9999.0	-9999.0	-9999.0	-9999.0											
19.422	243.53	243.61	0.27	0.11	7.27	7.27	5.0E+00	120.0	1.165	0.138	0.928	36.4	36.7	235.03	0.11	0.00	0.0	91.8	46.0	-9999.0	-9999.0	-9999.0	-9999.0											
19.488	262.33	262.41	0.30	0.12	7.44	7.44	5.0E+00	120.0	1.169	0.140	0.929	37.6	37.9	244.12	0.12	0.00	0.0	92.8	46.0	-9999.0	-9999.0	-9999.0	-9999.0											
19.554	258.79	258.87	0.34	0.13	7.96	7.96	5.0E+00	120.0	1.173	0.142	0.931	38.6	38.9	249.94	0.13	0.00	0.0	93.5	46.0	-9999.0	-9999.0	-9999.0	-9999.0											
19.620	261.02	261.10	0.31	0.12	7.56	7.56	5.0E+00	120.0	1.177	0.144	0.933	38.8	39.0	251.63	0.12	0.00	0.0	93.7	46.0	-9999.0	-9999.0	-9999.0	-9999.0											
19.685	264.40	264.48	0.26	0.10	7.50	7.50	5.0E+00	120.0	1.181	0.146	0.935	-9999.0	-9999.0	254.44	0.10	0.00	-9999.0	94.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0											
19.750	265.42	265.51	0.29	0.11	7.54	7.54	5.0E+00	120.0	1.185	0.148	0.937	39.3	39.4	254.96	0.11	0.00	0.0	94.1	46.0	-9999.0	-9999.0	-9999.0	-9999.0											
19.816	266.90	266.98	0.30	0.11	7.42	7.42	5.0E+00	120.0	1.189	0.150	0.939	39.5	39.8	255.91	0.11	0.00	0.0	94.3	46.0	-9999.0	-9999.0	-9999.0	-9999.0											
19.882	267.86	267.94	0.34	0.13	7.83	7.83	5.0E+00	120.0	1.193	0.152	0.941	39.8	39.9	256.37	0.13	0.00	0.0	94.3	46.0	-9999.0	-9999.0	-9999.0	-9999.0											
19.947	265.55	265.64	0.33	0.12	7.76	7.76	5.0E+00	120.0	1.197	0.154	0.942	39.5	39.5	253.69	0.13	0.00	0.0	94.1	46.0	-9999.0	-9999.0	-9999.0	-9999.0											
20.013	264.60	264.68	0.34	0.13	7.66	7.66	5.0E+00	120.0	1.201	0.157	0.944	39.4	39.4	252.31	0.13	0.00	0.0	93.9	46.0	-9999.0	-9999.0	-9999.0	-9999.0											
20.078	259.55	259.63	0.30	0.12	7.81	7.81	5.0E+00	120.0	1.205	0.159	0.946	38.4	38.5	247.02	0.12	0.00	0.0	93.4	46.0	-9999.0	-9999.0	-9999.0	-9999.0											
20.144	255.21	255.30	0.28	0.11	8.18	8.18	5.0E+00	120.0	1.209	0.161	0.948	38.0	37.9	242.44	0.11	0.00	0.0	92.8	46.0	-9999.0	-9999.0	-9999.0	-9999.0											
20.210	248.88	248.96	0.28	0.11	8.53	8.53	5.0E+00	120.0	1.213	0.163	0.950	37.2	37.1	235.98	0.11	0.00	0.0	92.1	46.0	-9999.0	-9999.0	-9999.0	-9999.0											
20.275	242.62	242.70	0.27	0.11	7.68	7.68	5.0E+00	120.0	1.217	0.165	0.952	36.3	36.2	228.58	0.11	0.00	0.0	91.3	46.0	-9999.0	-9999.0	-9999.0	-9999.0											
20.341	235.91	236.00	0.31	0.13	7.66	7.66	5.0E+00	120.0	1.220	0.167	0.954	35.6	35.5	222.80	0.13	0.00	0.0	90.5	46.0	-9999.0	-9999.0	-9999.0	-9999.0											
20.407	235.27	235.35	0.29	0.12	7.44	7.44	5.0E+00	120.0	1.224	0.169	0.956	35.5	35.3	221.79	0.12	0.00	0.0	90.4	46.0	-9999.0	-9999.0	-9999.0	-9999.0											
20.472	234.57	234.65	0.25	0.11	7.66	7.66	5.0E+00	120.0	1.228	0.171	0.958	35.2	35.0	220.73	0.11	0.00	0.0	90.3	46.0	-9999.0	-9999.0	-9999.0	-9999.0											
20.538	238.03	238.11	0.30	0.13	7.85	7.85	5.0E+00	120.0	1.232	0.173	0.960	35.9	35.6	223.60	0.13	0.00	0.0	90.7	46.0	-9999.0	-9999.0	-9999.0	-9999.0											
20.603	242.11	242.19	0.27	0.12	7.74	7.74	5.0E+00	120.0	1.236	0.175	0.961	36.3	36.0	227.04	0.11	0.00	0.0	91.2	46.0	-9999.0	-9999.0	-9999.0	-9999.0											
20.669	247.80	247.88	0.33	0.13	7.52	7.52	5.0E+00	120.0	1.240	0.177	0.963	37.3	36.9	231.99	0.12	0.00	0.0	91.8	46.0	-9999.0	-9999.0	-9999.0	-9999.0											
20.735	256.35	256.43	0.31	0.12	7.64	7.64	5.0E+00	120.0	1.244	0.179	0.965	36.3	37.9	239.60	0.12	0.00	0.0	92.7	46.0	-9999.0	-9999.0	-9999.0	-9999.0											
20.800	268.68	268.77	0.30	0.11	8.20	8.20	5.0E+00	120.0	1.248	0.181	0.967	36.8	36.3	250.74	0.11	0.00	0.0	94.1	46.0	-9999.0	-9999.0	-9999.0	-9999.0											
20.866	280.89	280.98	0.36	0.13	8.28	8.28	5.0E+00	120.0	1.252	0.183	0.969	41.6	41.1	261.71	0.13	0.00	0.0	95.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0											
20.932	315.83	315.93	0.44	0.14	9.36	9.36	5.0E+00	120.0	1.256	0.185	0.971	43.6	43.0	293.37	0.14	0.00	0.0	95.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0											
21.063	328.42	328.51	0.57	0.17	8.93	8.93	5.0E+00	120.0	1.264	0.189	0.974	48.4	47.7	304.56	0.17	0.00	0.0	95.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0											
21.129	328.67	328.76																																

Col-02	Col-03	Col-04	Col-05	Col-06	Col-07	Col-08	Col-09	Col-10	Col-11	Col-12	Col-13	Col-14	Col-15	Col-16	Col-17	Col-18	Col-22	Col-23	Col-24	Col-25	Col-26	Col-28	Col-30	Col-31	Col-33	Col-34	Col-35	Col-36
Depth (ft)	qc (ksf)	qt (ksf)	ts (ksf)	Rf (%)	u (ft)	Perm-k (cm/s)	Unit Wt (pcf)	T Stress (KPa)	U Stress (ksf)	E Stress (ksf)	N(60)lc (b/ft)	N(100)lc (b/ft)	Cl	Fr (%)	Bq	FC (%)	Dr (%)	Phi (deg)	Esqt	YoungE (ksf)	Su (ksf)	OCR						
22,375	206.95	206.04	0.19	0.09	8.22	5.0E-06	120.0	1.343	0.230	1.112	-9999.0	-9999.0	184.04	0.09	0.00	-9999.0	85.9	44.0	1.978	407.5	-9999.0	-9999.0	44.0	1.878	407.5	-9999.0	-9999.0	
22,441	203.59	203.69	0.19	0.09	8.57	5.0E-06	120.0	1.346	0.232	1.114	-9999.0	-9999.0	181.61	0.09	0.00	-9999.0	85.5	44.0	1.962	399.6	-9999.0	-9999.0	44.0	1.962	399.6	-9999.0	-9999.0	
22,506	198.86	198.95	0.18	0.09	8.32	5.0E-06	120.0	1.350	0.234	1.116	-9999.0	-9999.0	177.06	0.09	0.00	-9999.0	84.8	44.0	1.938	365.5	-9999.0	-9999.0	44.0	1.938	365.5	-9999.0	-9999.0	
22,572	194.07	194.16	0.16	0.08	8.44	5.0E-06	120.0	1.354	0.236	1.118	-9999.0	-9999.0	172.47	0.08	0.00	-9999.0	84.3	44.0	1.922	373.3	-9999.0	-9999.0	44.0	1.922	373.3	-9999.0	-9999.0	
22,638	189.15	189.24	0.16	0.08	8.57	5.0E-06	120.0	1.358	0.238	1.120	-9999.0	-9999.0	167.78	0.08	0.00	-9999.0	83.3	44.0	1.914	362.3	-9999.0	-9999.0	44.0	1.914	362.3	-9999.0	-9999.0	
22,703	184.56	184.65	0.15	0.08	8.89	5.0E-06	120.0	1.362	0.241	1.122	-9999.0	-9999.0	163.40	0.08	0.00	-9999.0	82.6	44.0	1.913	353.2	-9999.0	-9999.0	44.0	1.913	353.2	-9999.0	-9999.0	
22,834	175.42	175.51	0.13	0.07	8.34	5.0E-06	120.0	1.370	0.245	1.125	-9999.0	-9999.0	154.72	0.07	0.00	-9999.0	81.1	44.0	1.923	337.5	-9999.0	-9999.0	44.0	1.923	337.5	-9999.0	-9999.0	
22,890	170.43	170.53	0.15	0.09	8.71	5.0E-06	120.0	1.374	0.247	1.127	-9999.0	-9999.0	150.04	0.09	0.00	-9999.0	80.2	44.0	1.934	328.8	-9999.0	-9999.0	44.0	1.934	328.8	-9999.0	-9999.0	
22,966	169.51	169.51	0.14	0.09	8.71	5.0E-06	120.0	1.378	0.249	1.129	-9999.0	-9999.0	148.88	0.08	0.00	-9999.0	80.0	44.0	1.937	328.4	-9999.0	-9999.0	44.0	1.937	328.4	-9999.0	-9999.0	
23,031	167.44	167.53	0.15	0.09	8.50	5.0E-06	120.0	1.382	0.251	1.131	-9999.0	-9999.0	146.88	0.09	0.00	-9999.0	79.7	44.0	1.943	325.6	-9999.0	-9999.0	44.0	1.943	325.6	-9999.0	-9999.0	
23,097	167.12	167.21	0.15	0.09	8.61	5.0E-06	120.0	1.386	0.253	1.133	-9999.0	-9999.0	146.35	0.09	0.00	-9999.0	79.5	44.0	1.945	325.2	-9999.0	-9999.0	44.0	1.945	325.2	-9999.0	-9999.0	
23,162	168.14	168.23	0.19	0.11	8.50	5.0E-06	120.0	1.390	0.255	1.135	-9999.0	-9999.0	147.01	0.11	0.00	-9999.0	79.5	44.0	1.943	326.8	-9999.0	-9999.0	44.0	1.943	326.8	-9999.0	-9999.0	
23,228	168.36	168.45	0.21	0.12	8.73	5.0E-06	120.0	1.394	0.257	1.137	-9999.0	-9999.0	146.86	0.13	0.00	-9999.0	80.4	44.0	1.943	327.3	-9999.0	-9999.0	44.0	1.943	327.3	-9999.0	-9999.0	
23,294	172.29	172.38	0.20	0.12	8.83	5.0E-06	120.0	1.398	0.259	1.139	-9999.0	-9999.0	150.16	0.12	0.00	-9999.0	80.4	44.0	1.933	333.2	-9999.0	-9999.0	44.0	1.933	333.2	-9999.0	-9999.0	
23,359	176.00	176.09	0.18	0.10	8.81	5.0E-06	120.0	1.402	0.261	1.141	-9999.0	-9999.0	153.16	0.10	0.00	-9999.0	81.0	44.0	1.926	339.1	-9999.0	-9999.0	44.0	1.926	339.1	-9999.0	-9999.0	
23,425	175.36	175.45	0.16	0.09	9.05	5.0E-06	120.0	1.406	0.263	1.142	-9999.0	-9999.0	152.34	0.09	0.00	-9999.0	80.9	44.0	1.927	338.2	-9999.0	-9999.0	44.0	1.927	338.2	-9999.0	-9999.0	
23,491	172.80	172.89	0.19	0.11	8.81	5.0E-06	120.0	1.409	0.265	1.144	-9999.0	-9999.0	149.85	0.11	0.00	-9999.0	80.4	44.0	1.934	334.3	-9999.0	-9999.0	44.0	1.934	334.3	-9999.0	-9999.0	
23,556	169.03	169.13	0.36	0.21	9.24	5.0E-06	120.0	1.413	0.267	1.146	-9999.0	-9999.0	146.32	0.22	0.00	-9999.0	79.8	44.0	1.944	328.8	-9999.0	-9999.0	44.0	1.944	328.8	-9999.0	-9999.0	
23,622	162.64	162.74	0.42	0.26	8.63	5.0E-06	120.0	1.417	0.269	1.148	-9999.0	-9999.0	140.51	0.26	0.00	-9999.0	78.6	44.0	1.964	319.7	-9999.0	-9999.0	44.0	1.964	319.7	-9999.0	-9999.0	
23,687	156.00	156.09	0.35	0.22	8.30	5.0E-06	120.0	1.421	0.271	1.150	-9999.0	-9999.0	134.49	0.23	0.00	-9999.0	77.4	44.0	1.989	310.5	-9999.0	-9999.0	44.0	1.989	310.5	-9999.0	-9999.0	
23,753	142.33	142.41	0.40	0.28	7.68	5.0E-06	120.0	1.425	0.273	1.152	-9999.0	-9999.0	122.39	0.28	0.00	-9999.0	74.8	42.0	2.046	291.4	-9999.0	-9999.0	42.0	2.046	291.4	-9999.0	-9999.0	
23,819	128.72	128.80	0.39	0.30	7.58	5.0E-06	120.0	1.429	0.275	1.154	-9999.0	-9999.0	110.40	0.31	0.00	-9999.0	71.9	42.0	2.110	271.8	-9999.0	-9999.0	42.0	2.110	271.8	-9999.0	-9999.0	
23,884	116.52	116.61	0.48	0.41	7.89	5.0E-06	120.0	1.433	0.277	1.156	-9999.0	-9999.0	98.66	0.42	0.00	-9999.0	69.0	42.0	2.177	253.9	-9999.0	-9999.0	42.0	2.177	253.9	-9999.0	-9999.0	
23,950	105.35	105.43	0.62	0.59	7.74	5.0E-06	120.0	1.437	0.279	1.158	-9999.0	-9999.0	88.84	0.60	0.00	-9999.0	66.1	42.0	2.253	237.5	-9999.0	-9999.0	42.0	2.253	237.5	-9999.0	-9999.0	
24,015	100.29	100.38	0.70	0.70	8.06	5.0E-06	120.0	1.441	0.281	1.159	-9999.0	-9999.0	85.33	0.71	0.00	-9999.0	64.6	42.0	2.293	230.2	-9999.0	-9999.0	42.0	2.293	230.2	-9999.0	-9999.0	
24,081	95.44	95.54	0.75	0.79	9.52	5.0E-06	120.0	1.445	0.284	1.161	-9999.0	-9999.0	81.03	0.80	0.00	-9999.0	63.2	42.0	2.338	223.3	-9999.0	-9999.0	42.0	2.338	223.3	-9999.0	-9999.0	
24,147	90.14	90.25	0.90	0.90	9.95	5.0E-06	120.0	1.449	0.286	1.163	-9999.0	-9999.0	76.34	1.02	0.00	-9999.0	61.5	40.0	2.392	215.9	-9999.0	-9999.0	40.0	2.392	215.9	-9999.0	-9999.0	
24,212	79.34	79.44	0.96	1.21	9.12	5.0E-06	120.0	1.453	0.288	1.165	-9999.0	-9999.0	66.93	1.23	0.00	-9999.0	57.9	40.0	2.530	201.0	-9999.0	-9999.0	40.0	2.530	201.0	-9999.0	-9999.0	
24,278	65.86	65.93	0.96	1.46	6.13	5.0E-06	120.0	1.457	0.290	1.167	-9999.0	-9999.0	55.24	1.49	0.00	-9999.0	52.5	40.0	2.769	182.6	-9999.0	-9999.0	40.0	2.769	182.6	-9999.0	-9999.0	
24,344	49.62	49.62	1.00	2.02	4.94	5.0E-06	120.0	1.461	0.292	1.169	-9999.0	-9999.0	41.20	2.08	0.00	-9999.0	44.3	38.0	3.189	158.7	-9999.0	-9999.0	38.0	3.189	158.7	-9999.0	-9999.0	
24,409	39.09	39.13	1.03	2.64	2.82	5.0E-06	120.0	1.465	0.294	1.171	-9999.0	-9999.0	32.17	2.74	0.00	-9999.0	37.5	36.0	3.585	140.3	-9999.0	-9999.0	36.0	3.585	140.3	-9999.0	-9999.0	
24,475	32.20	32.22	0.82	2.55	1.68	5.0E-06	120.0	1.469	0.296	1.173	-9999.0	-9999.0	25.22	2.67	-0.01	-9999.0	36.9	31.9	3.699	129.0	-9999.0	-9999.0	31.9	3.699	129.0	-9999.0	-9999.0	
24,540	25.93	25.95	0.65	2.51	1.70	5.0E-06	120.0	1.472	0.298	1.175	-9999.0	-9999.0	20.84	2.66	-0.01	-9999.0	40.9	30.0	3.400	109.9	-9999.0	-9999.0	30.0	3.400	109.9	-9999.0	-9999.0	
24,606	22.87	22.88	0.55	2.41	1.66	5.0E-06	120.0	1.476	0.300	1.176	-9999.0	-9999.0	18.20	2.58	-0.01	-9999.0	43.2	30.0	3.200	99.9	-9999.0	-9999.0	30.0	3.200	99.9	-9999.0	-9999.0	
24,672	19.74	19.75	0.47	2.38	1.58	5.0E-06	120.0	1.480	0.302	1.178	-9999.0	-9999.0	15.51	2.58	-0.01	-9999.0	46.0	30.0	2.900	89.9	-9999.0	-9999.0	30.0	2.900	89.9	-9999.0	-9999.0	
24,737	16.42	16.44	0.41	2.50	1.82	5.0E-06	120.0	1.484	0.304	1.180	-9999.0	-9999.0	12.67	2.75	-0.01	-9999.0	51.4	29.0	2.600	79.9	-9999.0	-9999.0	29.0	2.600	79.9	-9999.0	-9999.0	
24,803	14.82	14.84	0.33	2.23	2.07	5.0E-06	120.0	1.488	0.306	1.182	-9999.0	-9999.0	11.29	2.48	-0.01	-9999.0	52.4	28.0	2.400	69.9	-9999.0	-9999.0	28.0	2.400	69.9	-9999.0	-9999.0	
24,868	14.51	14.53	0.28	2.93	2.35	5.0E-06	120.0	1.492	0.308	1.184	-9999.0	-9999.0	11.01	2.15	-0.01	-9999.0	50.9	27.0	2.200	59.9	-9999.0	-9999.0	27.0	2.200	59.9	-9999.0	-9999.0	
24,934	14.18	14.21	0.24	1.69	2.55	5.0E-06	120.0	1.496	0.310	1.186	-9999.0	-9999.0	10.72	1.89	-0.01	-9999.0	49.7	26.0	2.000	49.7	-9999.0	-9999.0	26.0	2.000	49.7	-9999.0	-9999.0	
25,000	13.29	13.32	0.22	1.66	2.74	5.0E-06	120.0	1.500	0.312	1.188	-9999.0	-9999.0	9.95	1.87	-0.01	-9999.0	51.2	25.0	1.800	39.7	-9999.0	-9999.0	25.0	1.800	39.7	-9999.0	-9999.0	
25,065	13.16	13.20	0.21	1.60	3.12	5.0E-06	120.0	1.504	0.314	1.190	-9999.0	-9999.0	9.83	1.80	-0.01	-9999.0	60.8	24.0	1.600	29.7	-9999.0	-9999.0	24.0	1.600	29.7	-9999.0	-9999.0	
25,131	11.80	11.85	0.20	1.89	3.22	5.0E-06	120.0	1.508	0.																			

Col-02	Col-03	Col-04	Col-05	Col-06	Col-07	Col-08	Col-09	Col-10	Col-11	Col-12	Col-13	Col-14	Col-15	Col-16	Col-17	Col-18	Col-19	Col-20	Col-21	Col-22	Col-23	Col-24	Col-25	Col-26	Col-27	Col-28	Col-29	Col-30	Col-31	Col-32	Col-33	Col-34	Col-35	Col-36						
Depth	qc	qc	qs	q <sub>t</sub>	f <sub>ie</sub>	R <sub>f</sub>	u	Permi-k	Unit Wt	T Stress	U Stress	E Stress	N(δ) <sub>ijc</sub>	N(δ) <sub>ijc</sub>	Cl	Fr	Bq	FC	Dr	Phi	Es/qr	YoungE	Su	Su	OCR															
(ft)	(tsf)	(tsf)	(tsf)	(tsf)	(tsf)	(%)	(ft)	(cm/s)	(pcf)	(kPa)	(tsf)	(tsf)	(tsf)	(bft)	(bft)		(%)	(%)	(%)	(deg)	(tsf)	(tsf)	(tsf)	(tsf)	(tsf)	(tsf)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)		
26.837	9.13	9.25	0.13	10.67	1.41	1.41	10.67	5.0E-06	120.0	1.610	0.370	1.241	3.1	3.1	2.1	6.16	0.05	61.8	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	61.8	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.509	1.4	
26.903	8.43	8.55	0.13	10.92	1.52	1.52	10.92	5.0E-06	120.0	1.614	0.372	1.243	3.0	3.0	2.0	5.58	0.06	65.9	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	65.9	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.462	1.2
26.968	9.32	9.45	0.13	11.57	1.38	1.38	11.57	5.0E-06	120.0	1.618	0.374	1.244	3.1	3.1	2.2	6.29	0.06	60.6	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	60.6	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.522	1.4
27.034	9.64	9.77	0.13	12.08	1.33	1.33	12.08	5.0E-06	120.0	1.622	0.376	1.246	3.2	3.2	2.2	6.54	0.06	59.3	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	59.3	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.543	1.5
27.099	9.32	9.46	0.13	12.33	1.36	1.36	12.33	5.0E-06	120.0	1.626	0.378	1.248	3.1	3.1	2.2	6.27	0.07	61.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	61.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.522	1.4
27.165	9.96	10.10	0.13	12.84	1.29	1.29	12.84	5.0E-06	120.0	1.630	0.380	1.250	3.3	3.3	2.3	6.78	0.06	57.9	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	57.9	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.565	1.5
27.231	10.15	10.30	0.14	13.37	1.36	1.36	13.37	5.0E-06	120.0	1.634	0.382	1.252	3.3	3.3	2.3	6.92	0.07	58.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	58.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.578	1.6
27.296	10.93	11.08	0.15	14.26	1.36	1.36	14.26	5.0E-06	120.0	1.638	0.384	1.254	3.5	3.5	2.5	7.53	0.07	55.7	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	55.7	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.630	1.7
27.362	11.18	11.33	0.16	14.49	1.42	1.42	14.49	5.0E-06	120.0	1.642	0.386	1.256	3.6	3.6	2.5	7.72	0.07	55.6	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	55.6	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.646	1.8
27.427	11.56	11.71	0.16	14.52	1.37	1.37	14.52	5.0E-06	120.0	1.646	0.388	1.258	3.6	3.6	2.6	8.01	0.07	54.2	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	54.2	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.671	1.9
27.493	11.63	11.77	0.16	14.70	1.36	1.36	14.70	5.0E-06	120.0	1.650	0.390	1.260	3.7	3.7	2.6	8.04	0.06	54.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	54.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.675	1.9
27.559	11.25	11.39	0.15	13.14	1.32	1.32	13.14	5.0E-06	120.0	1.654	0.392	1.261	3.6	3.6	2.5	7.72	0.06	54.6	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	54.6	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.649	1.8
27.624	10.86	10.99	0.13	12.76	1.19	1.19	12.76	5.0E-06	120.0	1.657	0.394	1.263	3.4	3.4	2.4	7.39	0.06	54.4	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	54.4	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.622	1.7
27.690	9.39	9.52	0.11	11.69	1.16	1.16	11.69	5.0E-06	120.0	1.661	0.396	1.265	3.1	3.1	2.1	6.21	0.06	58.9	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	58.9	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.524	1.4
27.756	8.62	8.75	0.10	11.53	1.15	1.15	11.53	5.0E-06	120.0	1.665	0.398	1.267	2.9	2.9	1.9	5.59	0.06	61.8	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	61.8	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.472	1.2
27.821	8.43	8.57	0.09	10.95	1.05	1.05	10.95	5.0E-06	120.0	1.669	0.400	1.269	2.9	2.9	1.9	5.43	0.07	61.5	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	61.5	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.460	1.2
27.887	7.92	8.07	0.09	11.2	1.09	1.09	11.2	5.0E-06	120.0	1.673	0.402	1.271	2.8	2.8	1.8	5.03	0.09	64.7	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	64.7	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.426	1.1
27.952	7.73	7.89	0.09	11.4	1.12	1.12	11.4	5.0E-06	120.0	1.677	0.404	1.273	2.7	2.7	1.8	4.88	0.11	65.9	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	65.9	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.414	1.1
28.018	7.86	8.05	0.10	12.4	1.11	1.11	12.4	5.0E-06	120.0	1.681	0.406	1.275	2.8	2.8	1.8	5.03	0.12	64.6	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	64.6	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.428	1.1
28.084	7.92	8.10	0.10	12.76	1.13	1.13	12.76	5.0E-06	120.0	1.685	0.409	1.277	2.8	2.8	1.8	4.99	0.14	66.4	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	66.4	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.424	1.1
28.149	8.69	8.90	0.10	13.14	1.13	1.13	13.14	5.0E-06	120.0	1.689	0.411	1.278	3.0	3.0	2.0	5.64	0.14	61.3	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	61.3	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.481	1.3
28.215	8.86	9.10	0.10	13.37	1.03	1.03	13.37	5.0E-06	120.0	1.693	0.413	1.280	2.9	2.9	1.9	5.54	0.15	60.6	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	60.6	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.473	1.2
28.280	8.58	8.79	0.10	12.84	1.03	1.03	12.84	5.0E-06	120.0	1.697	0.415	1.282	2.9	2.9	1.9	5.54	0.15	60.6	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	60.6	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.494	1.3
28.346	8.81	9.04	0.11	12.22	1.07	1.07	12.22	5.0E-06	120.0	1.701	0.417	1.284	3.0	3.0	2.0	5.71	0.15	62.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	62.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.489	1.3
28.412	8.05	8.28	0.09	11.75	1.08	1.08	11.75	5.0E-06	120.0	1.705	0.419	1.286	2.8	2.8	1.8	5.12	0.17	63.8	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	63.8	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.439	1.1
28.477	7.82	8.17	0.09	11.09	1.10	1.10	11.09	5.0E-06	120.0	1.709	0.421	1.288	2.8	2.8	1.8	5.02	0.19	64.6	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	64.6	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.431	1.1
28.543	7.87	7.93	0.12	12.46	1.52	1.52	12.46	5.0E-06	120.0	1.713	0.423	1.290	2.9	2.9	1.8	4.82	0.22	70.5	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	70.5	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.415	1.1
28.609	7.86	8.12	0.15	13.57	1.85	1.85	13.57	5.0E-06	120.0	1.717	0.425																													

Col-02	Col-04	Col-05	Col-06	Col-07	Col-08	Col-09	Col-14	Col-15	Col-16	Col-17	Col-18	Col-22	Col-23	Col-24	Col-25	Col-26	Col-28	Col-30	Col-31	Col-33	Col-34	Col-35	Col-36
Depth (ft)	qc (tsf)	qt (tsf)	fs (tsf)	Rf (%)	u (ft)	Permi-k (cm/s)	Unit Wt (pcf)	T Stress (kPa)	U Stress (tsf)	E Stress (tsf)	N(60)ic (tsf)	N(60)ic (tsf)	Qt	Fr (%)	Bq	FC (%)	Dr (%)	Phi (deg)	Es/qt	YoungE (tsf)	Su (tsf)	OCR	
31.299	13.89	14.10	0.78	5.54	10.26	5.0E-08	120.0	1.878	0.509	1.369	5.3	3.5	8.93	6.39	0.02	75.6	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.815	2.2
31.364	13.54	13.64	0.77	5.66	9.14	5.0E-08	120.0	1.882	0.511	1.371	5.3	3.4	8.58	6.56	0.01	77.2	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.784	2.1
31.430	13.48	13.57	0.75	5.44	8.26	5.0E-08	120.0	1.886	0.513	1.373	5.3	3.4	8.51	6.43	0.01	77.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.779	2.0
31.496	13.92	14.01	0.73	5.22	8.04	5.0E-08	120.0	1.890	0.515	1.375	5.3	3.5	8.82	6.04	0.01	74.7	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.808	2.1
31.561	14.44	14.53	0.75	5.18	8.53	5.0E-08	120.0	1.894	0.517	1.377	5.4	3.6	9.18	5.85	0.01	73.3	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.842	2.3
31.627	14.11	14.22	0.75	5.29	9.71	5.0E-08	120.0	1.988	0.519	1.379	5.3	3.5	8.94	6.10	0.01	74.5	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.821	2.2
31.693	13.86	13.96	0.75	5.38	11.06	5.0E-08	120.0	1.902	0.521	1.380	5.3	3.5	8.75	6.22	0.02	75.5	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.805	2.1
31.758	14.18	14.30	0.76	5.33	10.81	5.0E-08	120.0	1.906	0.523	1.382	5.4	3.5	8.97	6.15	0.02	74.6	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.826	2.2
31.824	14.18	14.29	0.77	5.40	10.04	5.0E-08	120.0	1.909	0.525	1.384	5.4	3.5	8.95	6.23	0.02	75.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.826	2.2
31.889	14.11	14.19	0.79	5.58	8.72	5.0E-08	120.0	1.913	0.527	1.386	5.4	3.5	8.85	6.45	0.00	76.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.818	2.2
31.955	13.48	13.57	0.81	5.98	7.89	5.0E-08	120.0	1.917	0.529	1.388	5.3	3.4	8.39	6.97	0.00	79.2	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.777	2.0
32.021	13.99	14.08	0.82	5.64	8.40	5.0E-08	120.0	1.921	0.531	1.390	5.4	3.5	8.75	6.76	0.01	77.3	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.811	2.1
32.086	13.99	14.09	0.81	5.76	9.22	5.0E-08	120.0	1.925	0.533	1.392	5.4	3.5	8.74	6.67	0.01	77.1	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.811	2.1
32.152	13.92	14.03	0.81	5.79	10.29	5.0E-08	120.0	1.929	0.536	1.394	5.4	3.5	8.69	6.71	0.02	77.4	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.807	2.1
32.217	14.11	14.23	0.80	5.64	10.31	5.0E-08	120.0	1.933	0.538	1.396	5.4	3.5	8.81	6.52	0.01	76.4	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.820	2.1
32.283	13.67	13.78	0.76	5.53	9.60	5.0E-08	120.0	1.937	0.540	1.397	5.3	3.4	8.47	6.01	0.01	77.1	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.789	2.0
32.349	13.86	13.96	0.72	5.17	8.85	5.0E-08	120.0	1.941	0.542	1.399	5.3	3.4	8.59	6.01	0.01	75.3	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.801	2.1
32.414	13.16	13.25	0.70	5.30	8.26	5.0E-08	120.0	1.945	0.544	1.401	5.1	3.3	8.07	6.21	0.00	77.7	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.754	1.9
32.480	13.09	13.19	0.69	5.24	9.14	5.0E-08	120.0	1.949	0.546	1.403	5.1	3.2	8.01	6.15	0.01	77.7	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.749	1.9
32.546	13.41	13.53	0.68	5.04	10.69	5.0E-08	120.0	1.957	0.550	1.407	5.1	3.2	8.09	5.81	0.02	76.2	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.759	1.9
32.611	13.22	13.34	0.66	4.96	10.79	5.0E-08	120.0	1.961	0.552	1.409	5.1	3.2	8.12	5.69	0.02	75.7	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.763	1.9
32.677	13.29	13.41	0.65	4.86	10.51	5.0E-08	120.0	1.961	0.552	1.409	5.1	3.2	8.13	5.69	0.02	75.7	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.763	1.9
32.742	12.90	13.00	0.66	4.96	9.56	5.0E-08	120.0	1.965	0.554	1.411	5.0	3.2	7.83	5.89	0.01	74.2	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.787	2.0
32.808	13.67	13.77	0.65	4.73	9.40	5.0E-08	120.0	1.969	0.556	1.413	5.2	3.3	8.36	5.52	0.01	74.2	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.787	2.0
32.874	13.22	13.32	0.65	4.89	8.65	5.0E-08	120.0	1.972	0.558	1.414	5.1	3.2	8.02	5.74	0.01	76.2	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.756	1.9
32.939	13.54	13.63	0.65	4.78	8.00	5.0E-08	120.0	1.976	0.560	1.416	5.1	3.2	8.23	5.59	0.00	74.9	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.777	2.0
33.005	12.97	13.07	0.65	4.99	8.32	5.0E-08	120.0	1.980	0.562	1.418	5.0	3.1	7.81	5.88	0.00	77.3	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.716	1.7
33.070	12.97	13.07	0.65	4.99	9.09	5.0E-08	120.0	1.984	0.564	1.420	5.0	3.1	7.81	5.88	0.01	77.4	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.739	1.8
33.136	12.90	12.99	0.65	5.01	8.48	5.0E-08	120.0	1.988	0.566	1.422	5.0	3.1	7.74	5.92	0.00	77.8	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.734	1.8
33.202	12.98	12.99	0.62	4.91	8.08	5.0E-08	120.0	1.992	0.568	1.424	4.9	3.0	7.50	5.82	0.00	78.4	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.712	1.7
33.267	12.07	12.16	0.60	4.95	8.32	5.0E-08	120.0	1.996	0.570	1.426	4.8	2.9	7.13	5.92	0.00	80.1	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.678	1.6
33.333	12.67	12.75	0.61	4.80	8.70	5.0E-08	120.0	2.000	0.572	1.428	4.9	3.0	7.52	5.69	0.00	79.3	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.716	1.7
33.399	12.27	12.35	0.60	4.87	8.16	5.0E-08	120.0	2.004	0.574	1.430	4.8	3.0	7.24	5.81	0.00	79.3	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.716	1.7
33.464	12.27	12.36	0.59	4.79	8.28	5.0E-08	120.0	2.008	0.577	1.431	4.8	3.0	7.23	5.71	0.00	79.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.690	1.7
33.530	12.01	12.10	0.58	4.81	8.32	5.0E-08	120.0	2.012	0.579	1.433	4.8	2.9	7.04	5.76	0.00	79.9	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.672	1.6
33.596	11.63	11.72	0.56	4.79	8.22	5.0E-08	120.0	2.016	0.581	1.435	4.7	2.8	6.76	5.78	0.00	81.2	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.647	1.5
33.661	11.37	11.45	0.55	4.81	7.85	5.0E-08	120.0	2.020	0.583	1.437	4.6	2.8	6.56	5.84	0.00	82.3	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.629	1.5
33.727	10.80	10.86	0.55	5.07	7.50	5.0E-08	120.0	2.024	0.585	1.439	4.5	2.7	6.15	6.23	-0.01	85.6	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.580	1.4
33.792	11.05	11.13	0.53	4.77	7.54	5.0E-08	120.0	2.028	0.587	1.441	4.5	2.7	6.32	5.84	0.00	83.4	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.607	1.4
33.858	10.80	10.82	0.52	4.82	7.84	5.0E-08	120.0	2.032	0.589	1.443	4.5	2.6	6.02	5.93	0.00	84.8	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.586	1.4
33.923	10.35	10.43	0.49	4.71	8.04	5.0E-08	120.0	2.035	0.591	1.445	4.5	2.6	6.12	5.78	0.00	84.1	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.590	1.4
33.989	10.35	10.43	0.49	4.71	8.04	5.0E-08	120.0	2.039	0.593	1.446	4.4	2.5	5.80	5.85	0.00	86.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.560	1.3
34.055	10.86	10.95	0.48	4.40	8.26	5.0E-08	120.0	2.043	0.595	1.448	4.4	2.6	6.15	5.40	0.00	82.5	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.593	1.4
34.120	10.32	10.12	0.48	4.75	8.04	5.0E-08	120.0	2.047	0.597	1.450	4.3	2.5	5.67	5.96	0.00	87.6	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.538	1.2
34.186	10.22	10.32	0.48	4.66	8.46	5.0E-08	120.0	2.051	0.599	1.452	4.3	2.5	5.69	5.82	0.00	86.4	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.551	1.3
34.252	10.03	10.13	0.47	4.85	8.57	5.0E-08	120.0	2.055	0.601	1.454	4.3	2.4	5.55	5.84	0.00	87.3	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.538	1.2
34.317	10.03	10.13	0.46	4.65	8.57	5.0E-08	120.0	2.059	0.603	1.456	4.3	2.4	5.54	5.72	0.00	86.9	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.538	1.2
34.383	10.15	10.25	0.45	4.40	9.09	5.0E-08	120.0	2.063	0.605	1.458	4.3	2.4	5.62	5.51	0.01	85.6	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.546	1.2
34.448	9.90	10.00	0.45	4.51	9.20	5.0E-08	120.0	2.067	0.607	1.460	4.2	2.4	5.44	5.68	0.01	87.3	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.528	1.2
34.514	9.64	9.75	0.46	4.73	9.44	5.0E-08	120.0	2.071	0.60														

Col-02	Col-05	Col-06	Col-07	Col-08	Col-09	Col-14	Col-15	Col-16	Col-17	Col-18	Col-22	Col-23	Col-24	Col-25	Col-26	Col-28	Col-30	Col-31	Col-33	Col-34	Col-35	Col-36
Depth (ft)	dc (ksf)	qt (ksf)	qs (ksf)	Rf (%)	u (ft)	Perm-k (cm/s)	Unit Wt (pcf)	T Stress (ksi)	U Stress (ksf)	E Stress (ksf)	N(50)lc (ksf)	N(50)lc (ksf)	Ql	Fr (%)	Bq	FC (%)	Dr (%)	Phi (deg)	Esqt	YoungE (ksf)	Su (ksf)	OCR
35.761	10.54	10.75	0.22	2.05	19.64	5.0E-06	120.0	2.146	0.648	1.487	3.9	2.2	5.74	2.56	0.09	70.1	-9999.0	-9999.0	-9999.0	-9999.0	0.573	1.3
35.826	11.88	12.09	0.22	1.62	19.93	5.0E-06	120.0	2.150	0.650	1.499	4.1	2.4	6.63	2.22	0.06	63.8	-9999.0	-9999.0	-9999.0	-9999.0	0.663	1.5
35.892	12.78	12.98	0.22	1.57	18.27	5.0E-06	120.0	2.154	0.652	1.501	4.3	2.5	7.21	2.04	0.06	60.3	-9999.0	-9999.0	-9999.0	-9999.0	0.722	1.7
35.958	12.58	12.76	0.20	1.70	16.79	5.0E-06	120.0	2.158	0.654	1.503	4.2	2.4	7.05	1.89	0.05	59.7	-9999.0	-9999.0	-9999.0	-9999.0	0.707	1.6
36.023	12.46	12.64	0.21	1.67	16.77	5.0E-06	120.0	2.161	0.656	1.505	4.2	2.4	6.96	2.01	0.05	61.0	-9999.0	-9999.0	-9999.0	-9999.0	0.699	1.6
36.089	10.61	10.79	0.21	1.95	17.27	5.0E-06	120.0	2.165	0.658	1.507	3.9	2.1	5.72	2.44	0.07	69.4	-9999.0	-9999.0	-9999.0	-9999.0	0.575	1.3
36.220	8.69	8.95	0.20	2.24	17.34	5.0E-06	120.0	2.169	0.661	1.509	3.7	2.0	5.20	2.55	0.07	72.9	-9999.0	-9999.0	-9999.0	-9999.0	0.523	1.2
36.286	8.81	9.13	0.21	2.31	29.11	5.0E-06	120.0	2.177	0.663	1.511	3.5	1.8	4.58	2.96	0.16	80.0	-9999.0	-9999.0	-9999.0	-9999.0	0.452	1.0
36.351	9.32	9.70	0.19	1.96	34.50	5.0E-06	120.0	2.181	0.667	1.514	3.6	1.9	4.96	2.53	0.24	74.1	-9999.0	-9999.0	-9999.0	-9999.0	0.501	1.1
36.417	9.99	9.99	0.20	2.41	37.53	5.0E-06	120.0	2.185	0.669	1.516	3.7	2.0	5.15	2.57	0.28	73.3	-9999.0	-9999.0	-9999.0	-9999.0	0.508	1.1
36.482	9.58	9.92	0.21	2.14	39.21	5.0E-06	120.0	2.189	0.671	1.518	3.7	2.0	5.02	2.76	0.28	75.3	-9999.0	-9999.0	-9999.0	-9999.0	0.520	1.1
36.548	9.13	9.55	0.22	2.31	36.59	5.0E-06	120.0	2.193	0.673	1.520	3.7	2.0	4.84	3.00	0.28	77.9	-9999.0	-9999.0	-9999.0	-9999.0	0.490	1.1
36.614	8.94	9.33	0.23	2.47	36.26	5.0E-06	120.0	2.197	0.675	1.522	3.7	1.9	4.69	3.23	0.27	80.2	-9999.0	-9999.0	-9999.0	-9999.0	0.476	1.0
36.679	8.69	9.08	0.22	2.43	36.40	5.0E-06	120.0	2.201	0.677	1.524	3.6	1.9	4.52	3.20	0.28	81.2	-9999.0	-9999.0	-9999.0	-9999.0	0.459	1.0
36.745	8.62	9.02	0.22	2.44	36.98	5.0E-06	120.0	2.205	0.679	1.526	3.6	1.9	4.47	3.24	0.29	81.8	-9999.0	-9999.0	-9999.0	-9999.0	0.454	1.0
36.811	8.56	8.97	0.21	2.35	37.51	5.0E-06	120.0	2.209	0.681	1.528	3.6	1.8	4.42	3.12	0.30	81.3	-9999.0	-9999.0	-9999.0	-9999.0	0.450	1.0
36.876	9.13	9.54	0.25	2.63	37.49	5.0E-07	120.0	2.213	0.683	1.530	3.8	2.0	4.79	3.42	0.28	80.7	-9999.0	-9999.0	-9999.0	-9999.0	0.488	1.1
36.942	10.03	10.46	0.21	2.01	39.17	5.0E-06	120.0	2.217	0.685	1.533	3.8	2.1	5.38	2.55	0.26	71.9	-9999.0	-9999.0	-9999.0	-9999.0	0.549	1.2
37.007	11.37	11.81	0.21	1.78	40.61	5.0E-06	120.0	2.220	0.687	1.533	4.1	2.3	6.25	2.20	0.23	65.2	-9999.0	-9999.0	-9999.0	-9999.0	0.539	1.4
37.073	15.27	15.68	0.23	1.47	38.59	5.0E-05	120.0	2.224	0.689	1.535	4.8	2.6	8.77	1.71	0.16	53.0	-9999.0	-9999.0	-9999.0	-9999.0	0.877	2.1
37.139	21.08	21.46	0.22	1.03	34.89	5.0E-05	120.0	2.228	0.691	1.537	5.8	3.6	12.51	1.15	0.09	40.2	-9999.0	-9999.0	-9999.0	-9999.0	1.282	3.5
37.204	35.84	36.12	0.21	0.58	26.43	5.0E-04	120.0	2.232	0.693	1.539	8.0	6.6	22.02	0.62	0.04	20.9	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
37.270	50.40	50.45	0.22	0.44	4.35	5.0E-03	120.0	2.236	0.695	1.541	10.3	8.5	31.29	0.48	-0.01	5.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
37.336	53.15	53.16	0.25	0.47	0.69	5.0E-03	120.0	2.240	0.697	1.543	10.8	8.9	33.00	0.49	-0.01	5.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
37.401	52.32	52.32	0.26	0.54	0.61	5.0E-03	120.0	2.244	0.699	1.545	10.8	8.9	32.42	0.56	-0.01	15.6	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
37.467	47.53	47.53	0.27	0.57	0.39	5.0E-03	120.0	2.248	0.701	1.547	10.0	8.2	29.28	0.60	-0.01	17.1	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
37.532	42.35	42.36	0.29	0.69	0.73	5.0E-04	120.0	2.252	0.704	1.548	9.3	7.6	25.90	0.72	-0.02	19.9	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
37.598	37.94	37.96	0.29	0.77	1.27	5.0E-04	120.0	2.256	0.706	1.550	8.5	7.0	23.03	0.81	-0.02	22.3	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
37.664	36.35	36.37	0.31	0.85	2.27	5.0E-04	120.0	2.260	0.708	1.552	8.3	6.8	21.87	0.88	-0.01	23.6	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
37.729	36.22	36.26	0.30	0.83	3.80	5.0E-04	120.0	2.264	0.710	1.554	8.3	6.8	21.87	0.88	-0.01	23.6	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
37.795	35.84	35.90	0.28	0.78	5.61	5.0E-04	120.0	2.268	0.712	1.556	8.2	6.7	21.61	0.83	-0.01	23.3	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
37.860	35.00	35.08	0.28	0.80	6.56	5.0E-04	120.0	2.272	0.714	1.558	8.0	6.6	21.06	0.86	-0.01	23.8	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
37.926	35.20	35.28	0.28	0.80	7.89	5.0E-04	120.0	2.276	0.716	1.560	8.1	6.6	21.16	0.85	0.00	23.7	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
37.992	36.48	36.57	0.29	0.79	8.81	5.0E-04	120.0	2.280	0.718	1.562	8.3	6.8	21.96	0.85	0.00	23.2	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
38.057	38.58	38.68	0.30	0.78	9.05	5.0E-04	120.0	2.283	0.720	1.564	8.7	7.1	23.26	0.83	0.00	22.2	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
38.123	40.06	40.16	0.32	0.80	9.97	5.0E-04	120.0	2.287	0.722	1.565	9.0	7.3	24.20	0.82	0.00	21.1	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
38.189	41.46	41.57	0.36	0.87	10.45	5.0E-04	120.0	2.291	0.724	1.567	9.3	7.6	25.06	0.82	0.00	22.1	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
38.254	41.27	41.39	0.38	0.92	10.67	5.0E-04	120.0	2.295	0.726	1.569	9.3	7.6	24.91	0.97	0.00	22.6	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
38.320	39.80	39.92	0.44	1.11	11.00	5.0E-04	120.0	2.299	0.728	1.571	9.2	7.5	23.94	1.17	0.00	24.8	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
38.385	37.43	37.55	0.49	1.31	10.73	5.0E-04	120.0	2.303	0.730	1.573	8.9	7.3	22.43	1.39	0.00	27.4	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
38.451	36.54	36.66	0.47	1.29	11.22	5.0E-04	120.0	2.307	0.732	1.575	8.7	7.1	21.81	1.37	0.00	27.6	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
38.517	37.82	37.95	0.48	1.27	11.57	5.0E-04	120.0	2.311	0.734	1.577	9.0	7.3	22.60	1.35	0.00	26.9	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
38.582	39.29	39.40	0.45	1.14	11.04	5.0E-04	120.0	2.315	0.736	1.579	9.2	7.5	23.49	1.22	0.00	25.4	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
38.648	37.69	37.77	0.41	1.09	7.56	5.0E-04	120.0	2.319	0.738	1.581	8.8	7.2	22.43	1.16	-0.01	25.5	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
38.713	39.61	39.63	0.39	0.99	1.82	5.0E-04	120.0	2.323	0.740	1.582	9.1	7.4	23.57	1.05	-0.02	23.9	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
38.779	47.08	47.11	0.39	0.83	2.78	5.0E-04	120.0	2.327	0.742	1.584	10.3	8.4	28.27	0.87	-0.01	20.1	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
38.845	56.67	56.71	0.36	0.64	3.50	5.0E-03	120.0	2.331	0.744	1.586	11.8	9.5	34.28	0.66	-0.01	15.9	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
38.910	61.20	61.23	0.30	0.49	2.86	5.0E-03	120.0	2.335	0.747	1.588	12.3	10.0	37.08	0.51	-0.01	13.5	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
38.976	60.82	60.85	0.49	0.81	2.55	5.0E-03	120.0	2.339	0.749	1.590	12.8	10.3	36.80	0.84	-0.01	16.7	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
39.042	55.45	55.45	0.77	1.39	0.63	5.0E-04	120.0	2.343	0.751	1.592	12.5	10.1	33.36	1.45	-0.01	22.5	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
39.107	47.41	47.40	0.87	1.84	-0.87	5.0E-04	120.0	2.346	0.753	1.594	11.3	9.2	28.27	1.94	-0.02	27.6	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
39.173	39.03	39.02	0.83	2.13	-1.25	5.0E-05	120.0	2.350	0.755	1.596	10.3	6.3	22.96									

Col-02	Col-03	Col-04	Col-05	Col-06	Col-07	Col-08	Col-09	Col-14	Col-15	Col-16	Col-17	Col-18	Col-22	Col-23	Col-24	Col-25	Col-26	Col-28	Col-30	Col-31	Col-33	Col-34	Col-35	Col-36
Depth	qc	Is	Rf	u	Permk	Unit Wt	T Stress	E Stress	U Stress	E Stress	N(60)c	N(60)lc	Ql	Fr	Bq	FC	Dr	Phi	Es/qt	YoungE	Su	OCR		
(ft)	(tsf)	(tsf)	(%)	(ft)	(cm/s)	(pcf)	(kPa)	(tsf)	(tsf)	(tsf)	(tsf)	(tsf)	(tsf)	(tsf)	(%)	(%)	(deg)	(%)	(deg)	(tsf)	(tsf)	(tsf)	(tsf)	
40.223	162.90	1.03	0.63	10.90	5.0E-02	120.0	2.413	0.788	1.628	1.628	29.3	23.5	98.78	0.64	0.00	6.4	73.7	42.0	2.147	349.9	-9999.0	-9999.0		
40.288	164.24	1.05	0.64	11.04	5.0E-02	120.0	2.417	0.790	1.628	1.628	29.5	23.7	99.49	0.65	0.00	6.4	73.9	42.0	2.142	352.0	-9999.0	-9999.0		
40.354	167.37	1.07	0.64	11.57	5.0E-02	120.0	2.421	0.792	1.630	1.630	30.0	24.0	101.29	0.65	0.00	6.3	74.4	42.0	2.129	356.2	-9999.0	-9999.0		
40.419	170.50	1.10	0.65	11.89	5.0E-02	120.0	2.425	0.794	1.632	1.632	30.5	24.4	103.10	0.66	0.00	6.2	75.0	42.0	2.117	361.6	-9999.0	-9999.0		
40.485	169.80	1.11	0.65	11.83	5.0E-02	120.0	2.429	0.796	1.633	1.633	30.5	24.4	102.54	0.66	0.00	6.3	74.8	42.0	2.120	360.3	-9999.0	-9999.0		
40.551	167.56	1.12	0.67	11.69	5.0E-02	120.0	2.433	0.798	1.635	1.635	30.2	24.1	101.05	0.66	0.00	6.5	74.4	42.0	2.130	357.2	-9999.0	-9999.0		
40.616	164.24	1.12	0.68	11.61	5.0E-02	120.0	2.437	0.800	1.637	1.637	29.7	23.7	98.90	0.69	0.00	6.8	73.8	42.0	2.167	345.6	-9999.0	-9999.0		
40.682	159.39	1.12	0.70	11.20	5.0E-02	120.0	2.441	0.802	1.639	1.639	29.0	23.2	95.32	0.73	0.00	7.1	73.0	42.0	2.192	337.5	-9999.0	-9999.0		
40.748	153.82	1.10	0.72	11.42	5.0E-02	120.0	2.445	0.804	1.641	1.641	28.2	22.5	92.32	0.75	0.00	7.9	70.7	42.0	2.222	328.3	-9999.0	-9999.0		
40.813	147.75	1.08	0.76	11.34	5.0E-02	120.0	2.449	0.806	1.643	1.643	27.2	21.7	88.44	0.77	0.00	8.4	69.3	42.0	2.258	317.7	-9999.0	-9999.0		
40.879	140.60	1.06	0.76	11.28	5.0E-02	120.0	2.453	0.810	1.645	1.645	26.2	20.9	84.07	0.77	0.00	9.1	67.8	42.0	2.286	307.2	-9999.0	-9999.0		
40.944	133.64	1.06	0.79	10.96	5.0E-02	120.0	2.457	0.810	1.647	1.647	25.2	20.0	79.74	0.81	0.00	10.5	66.0	40.0	2.348	294.7	-9999.0	-9999.0		
41.010	125.40	1.14	0.91	10.73	5.0E-02	120.0	2.461	0.812	1.649	1.649	24.1	19.2	74.65	0.83	0.00	12.6	63.9	40.0	2.411	281.5	-9999.0	-9999.0		
41.076	116.64	1.31	1.12	10.69	5.0E-03	120.0	2.465	0.814	1.650	1.650	23.2	18.4	69.25	1.15	0.00	15.2	61.3	40.0	2.489	266.4	-9999.0	-9999.0		
41.141	106.49	1.49	1.10	10.39	5.0E-03	120.0	2.469	0.816	1.652	1.652	21.9	17.4	63.02	1.43	0.00	18.1	57.5	40.0	2.646	224.4	-9999.0	-9999.0		
41.207	93.33	1.54	1.65	10.43	5.0E-04	120.0	2.472	0.818	1.654	1.654	19.9	15.9	55.32	2.02	0.00	21.9	52.1	38.0	2.894	224.4	-9999.0	-9999.0		
41.272	77.43	1.51	1.95	10.01	5.0E-04	120.0	2.476	0.820	1.656	1.656	17.3	13.8	45.32	2.44	0.00	28.8	45.7	38.0	3.236	200.9	-9999.0	-9999.0		
41.338	61.96	1.45	2.34	9.58	5.0E-05	120.0	2.480	0.822	1.658	1.658	14.7	11.7	35.94	2.21	0.00	28.9	39.1	36.0	3.620	178.2	-9999.0	-9999.0		
41.404	49.13	1.03	2.10	9.58	5.0E-05	120.0	2.484	0.824	1.660	1.660	11.9	9.5	28.16	2.21	0.00	28.9	36.6	34.0	4.000	149.4	-9999.0	-9999.0		
41.469	45.10	1.01	2.24	10.57	5.0E-05	120.0	2.488	0.826	1.662	1.662	11.7	9.0	25.71	1.90	0.01	25.8	36.6	34.0	4.360	127.9	-9999.0	-9999.0		
41.535	54.11	0.98	1.81	17.17	5.0E-04	120.0	2.492	0.828	1.664	1.664	12.7	10.1	31.14	1.90	0.01	25.8	36.6	34.0	4.360	127.9	-9999.0	-9999.0		
41.601	68.17	0.85	1.25	17.34	5.0E-04	120.0	2.496	0.831	1.666	1.666	14.8	11.7	39.54	1.29	0.01	19.1	48.4	38.0	3.089	211.1	-9999.0	-9999.0		
41.666	83.87	0.66	0.79	13.43	5.0E-03	120.0	2.500	0.833	1.667	1.667	16.8	13.3	48.89	0.57	0.00	13.3	54.3	38.0	2.780	234.4	-9999.0	-9999.0		
41.732	99.40	0.55	0.55	-0.61	5.0E-02	120.0	2.504	0.835	1.669	1.669	18.0	14.9	58.04	0.57	0.00	9.6	59.1	40.0	2.583	256.7	-9999.0	-9999.0		
41.797	107.64	0.53	0.49	0.88	5.0E-02	120.0	2.508	0.837	1.671	1.671	20.0	15.8	62.91	0.51	-0.01	8.4	61.4	40.0	2.499	269.0	-9999.0	-9999.0		
41.863	114.73	0.59	0.52	0.88	5.0E-02	120.0	2.512	0.839	1.673	1.673	21.2	16.8	67.08	0.53	-0.01	8.1	63.2	40.0	2.437	279.7	-9999.0	-9999.0		
41.929	118.63	0.65	0.61	0.96	5.0E-02	120.0	2.516	0.841	1.675	1.675	22.0	17.3	69.33	0.56	-0.01	8.1	64.2	40.0	2.408	285.7	-9999.0	-9999.0		
42.000	123.10	0.79	0.64	0.73	5.0E-02	120.0	2.520	0.843	1.677	1.677	23.0	18.1	71.83	0.66	-0.01	8.5	64.7	40.0	2.377	292.7	-9999.0	-9999.0		
42.066	123.74	0.82	0.66	1.62	5.0E-02	120.0	2.524	0.845	1.679	1.679	23.0	18.1	71.83	0.66	-0.01	8.8	65.3	40.0	2.374	293.8	-9999.0	-9999.0		
42.132	123.74	0.84	0.68	2.88	5.0E-02	120.0	2.528	0.847	1.681	1.681	23.2	18.3	72.13	0.68	-0.01	8.8	65.3	40.0	2.374	293.8	-9999.0	-9999.0		
42.197	122.58	0.84	0.69	4.82	5.0E-02	120.0	2.532	0.849	1.683	1.683	23.2	18.3	72.13	0.69	-0.01	8.9	65.3	40.0	2.383	293.8	-9999.0	-9999.0		
42.263	122.08	0.86	0.71	6.11	5.0E-02	120.0	2.536	0.851	1.685	1.685	23.0	18.2	71.30	0.70	0.00	9.1	65.0	40.0	2.383	293.8	-9999.0	-9999.0		
42.329	122.08	0.85	0.70	7.29	5.0E-02	120.0	2.540	0.853	1.687	1.687	22.9	18.0	70.21	0.72	0.00	9.3	64.9	40.0	2.387	291.6	-9999.0	-9999.0		
42.395	121.47	0.83	0.68	8.67	5.0E-02	120.0	2.544	0.855	1.689	1.689	22.9	18.0	70.21	0.72	0.00	9.3	64.6	40.0	2.396	290.1	-9999.0	-9999.0		
42.461	121.47	0.83	0.66	9.75	5.0E-02	120.0	2.548	0.857	1.691	1.691	22.9	18.0	70.21	0.72	0.00	9.2	64.7	40.0	2.384	290.8	-9999.0	-9999.0		
42.527	120.99	0.82	0.66	10.37	5.0E-02	120.0	2.552	0.859	1.693	1.693	23.0	18.1	71.23	0.67	0.00	8.8	65.1	40.0	2.383	293.3	-9999.0	-9999.0		
42.593	120.46	0.81	0.63	10.37	5.0E-02	120.0	2.556	0.861	1.694	1.694	23.9	18.7	74.40	0.64	0.00	7.6	67.8	42.0	2.306	313.0	-9999.0	-9999.0		
42.659	119.73	0.82	0.61	10.37	5.0E-02	120.0	2.559	0.863	1.696	1.696	24.9	19.6	76.53	0.62	0.00	7.4	69.0	42.0	2.275	321.9	-9999.0	-9999.0		
42.725	118.31	0.82	0.61	11.81	5.0E-02	120.0	2.563	0.865	1.698	1.698	25.9	20.3	81.84	0.62	0.00	7.5	69.6	42.0	2.261	328.5	-9999.0	-9999.0		
42.791	116.83	0.86	0.64	11.79	5.0E-02	120.0	2.567	0.867	1.700	1.700	26.4	20.7	83.48	0.65	0.00	7.5	70.3	42.0	2.242	332.9	-9999.0	-9999.0		
42.857	115.50	0.86	0.64	11.55	5.0E-02	120.0	2.571	0.869	1.701	1.701	26.9	21.1	84.77	0.67	0.00	7.6	70.3	42.0	2.242	332.9	-9999.0	-9999.0		
42.923	114.33	0.86	0.66	12.03	5.0E-02	120.0	2.575	0.872	1.703	1.703	27.2	21.3	85.65	0.69	0.00	7.6	69.6	42.0	2.251	332.9	-9999.0	-9999.0		
42.989	113.04	0.85	0.61	12.66	5.0E-02	120.0	2.579	0.874	1.705	1.705	27.3	21.4	85.33	0.72	0.00	7.9	70.3	42.0	2.245	332.4	-9999.0	-9999.0		
43.055	111.73	1.05	0.71	11.63	5.0E-02	120.0	2.583	0.876	1.707	1.707	27.2	21.2	84.59	0.74	0.00	8.0	70.0	42.0	2.249	331.9	-9999.0	-9999.0		
43.121	110.44	1.06	0.72	11.63	5.0E-02	120.0	2.587	0.878	1.709	1.709	27.2	21.2	84.87	0.71	0.00	7.8	70.1	42.0	2.249	331.9	-9999.0	-9999.0		
43.187	109.15	1.03	0.70	11.83	5.0E-02	120.0	2.591	0.880	1.711	1.711	27.0	21.1	83.99	0.71	0.00	7.9	69.9							

Col-2	Col-3	Col-4	Col-5	Col-6	Col-7	Col-8	Col-9	Col-10	Col-11	Col-12	Col-13	Col-14	Col-15	Col-16	Col-17	Col-18	Col-19	Col-20	Col-21	Col-22	Col-23	Col-24	Col-25	Col-26	Col-27	Col-28	Col-29	Col-30	Col-31	Col-32	Col-33	Col-34	Col-35	Col-36
Depth (ft)	qc (tsf)	qc (tsf)	u (ft)	Rf (%)	is (tsf)	is (tsf)	Rf (%)	u (ft)	Permk (cm/s)	Unit Wt (pcf)	K Stps (kPa)	U Stress (tsf)	E Stress (tsf)	N(60)/c (bft)	N(160)/c (bft)	Ol	Fr (%)	Bq	FC (%)	Dr (%)	Phi (deg)	Es/qt	YoungE (tsf)	Su (tsf)	OCR									
44.684	190.62	190.78	1.04	0.55	1.04	1.04	0.55	14.38	5.0E-02	120.0	2.681	0.927	1.754	33.3	25.7	107.22	0.55	0.00	5.0	77.1	42.0	2.082	397.2	-9999.0	-9999.0	5.0	77.1	42.0	2.082	397.2	-9999.0	-9999.0	3.840	10.0
44.784	199.63	199.79	1.06	0.53	1.06	1.06	0.53	14.56	5.0E-02	120.0	2.685	0.929	1.756	34.7	27.7	112.24	0.54	0.00	4.6	78.4	42.0	2.050	409.6	-9999.0	-9999.0	4.6	78.4	42.0	2.050	409.6	-9999.0	-9999.0	3.840	10.0
44.816	207.99	208.15	1.11	0.53	1.11	1.11	0.53	14.74	5.0E-02	120.0	2.689	0.931	1.758	35.9	27.7	116.87	0.54	0.00	4.3	79.6	42.0	2.024	421.3	-9999.0	-9999.0	4.3	79.6	42.0	2.024	421.3	-9999.0	-9999.0	3.840	10.0
44.881	218.22	218.38	1.15	0.53	1.15	1.15	0.53	14.84	5.0E-02	120.0	2.693	0.933	1.760	37.5	28.9	122.55	0.53	0.00	4.0	80.9	42.0	1.997	436.2	-9999.0	-9999.0	4.0	80.9	42.0	1.997	436.2	-9999.0	-9999.0	3.840	10.0
44.947	228.83	228.99	1.17	0.51	1.17	1.17	0.51	15.07	5.0E-02	120.0	2.697	0.935	1.762	39.0	30.0	128.44	0.52	0.00	3.6	82.3	44.0	1.980	453.4	-9999.0	-9999.0	3.6	82.3	44.0	1.980	453.4	-9999.0	-9999.0	3.840	10.0
45.013	235.02	235.15	1.24	0.53	1.24	1.24	0.53	15.21	5.0E-02	120.0	2.701	0.937	1.764	40.0	30.6	131.80	0.53	0.00	3.6	83.0	44.0	1.976	464.7	-9999.0	-9999.0	3.6	83.0	44.0	1.976	464.7	-9999.0	-9999.0	3.840	10.0
45.078	241.56	241.69	1.30	0.52	1.30	1.30	0.52	15.47	5.0E-02	120.0	2.705	0.939	1.766	42.5	32.8	141.15	0.52	0.00	3.2	86.2	44.0	1.968	480.6	-9999.0	-9999.0	3.2	86.2	44.0	1.968	480.6	-9999.0	-9999.0	3.840	10.0
45.144	248.23	248.36	1.44	0.55	1.44	1.44	0.55	15.79	5.0E-02	120.0	2.709	0.941	1.768	44.3	34.0	147.03	0.56	0.00	3.1	87.4	44.0	1.969	498.0	-9999.0	-9999.0	3.1	87.4	44.0	1.969	498.0	-9999.0	-9999.0	3.840	10.0
45.209	254.74	254.87	1.54	0.56	1.54	1.54	0.56	16.15	5.0E-02	120.0	2.713	0.943	1.771	47.8	36.7	158.30	0.57	0.00	3.0	88.5	44.0	1.969	517.0	-9999.0	-9999.0	3.0	88.5	44.0	1.969	517.0	-9999.0	-9999.0	3.840	10.0
45.275	261.27	261.40	1.61	0.57	1.61	1.61	0.57	16.54	5.0E-02	120.0	2.717	0.945	1.773	49.0	37.8	163.28	0.59	0.00	3.0	89.2	44.0	1.969	537.3	-9999.0	-9999.0	3.0	89.2	44.0	1.969	537.3	-9999.0	-9999.0	3.840	10.0
45.341	267.82	267.95	1.71	0.59	1.71	1.71	0.59	16.94	5.0E-02	120.0	2.721	0.947	1.775	49.5	38.0	163.28	0.61	0.00	3.1	88.4	44.0	1.969	557.3	-9999.0	-9999.0	3.1	88.4	44.0	1.969	557.3	-9999.0	-9999.0	3.840	10.0
45.406	274.36	274.49	1.78	0.61	1.78	1.78	0.61	17.35	5.0E-02	120.0	2.725	0.951	1.777	48.0	37.6	161.20	0.65	0.00	3.4	88.9	44.0	1.969	577.3	-9999.0	-9999.0	3.4	88.9	44.0	1.969	577.3	-9999.0	-9999.0	3.840	10.0
45.472	280.90	281.03	1.86	0.64	1.86	1.86	0.64	17.76	5.0E-02	120.0	2.729	0.955	1.779	48.0	37.8	161.20	0.65	0.00	3.4	88.9	44.0	1.969	597.3	-9999.0	-9999.0	3.4	88.9	44.0	1.969	597.3	-9999.0	-9999.0	3.840	10.0
45.538	287.44	287.57	1.85	0.64	1.85	1.85	0.64	18.17	5.0E-02	120.0	2.733	0.959	1.781	48.8	37.5	160.28	0.65	0.00	3.5	88.7	44.0	1.969	617.3	-9999.0	-9999.0	3.5	88.7	44.0	1.969	617.3	-9999.0	-9999.0	3.840	10.0
45.603	293.98	294.11	1.85	0.64	1.85	1.85	0.64	18.58	5.0E-02	120.0	2.737	0.963	1.783	48.3	36.9	158.31	0.64	0.00	3.4	88.4	44.0	1.969	637.3	-9999.0	-9999.0	3.4	88.4	44.0	1.969	637.3	-9999.0	-9999.0	3.840	10.0
45.669	300.52	300.65	1.74	0.62	1.74	1.74	0.62	19.00	5.0E-02	120.0	2.741	0.967	1.785	47.5	36.4	155.71	0.63	0.00	3.4	87.9	44.0	1.969	657.3	-9999.0	-9999.0	3.4	87.9	44.0	1.969	657.3	-9999.0	-9999.0	3.840	10.0
45.734	307.06	307.19	1.70	0.61	1.70	1.70	0.61	19.43	5.0E-02	120.0	2.745	0.971	1.788	48.1	36.7	158.02	0.60	0.00	3.3	88.0	44.0	1.969	677.3	-9999.0	-9999.0	3.3	88.0	44.0	1.969	677.3	-9999.0	-9999.0	3.840	10.0
45.800	313.60	313.73	1.69	0.59	1.69	1.69	0.59	19.86	5.0E-02	120.0	2.749	0.975	1.790	48.8	37.3	161.10	0.58	0.00	3.2	88.4	44.0	1.969	697.3	-9999.0	-9999.0	3.2	88.4	44.0	1.969	697.3	-9999.0	-9999.0	3.840	10.0
45.865	320.14	320.27	1.68	0.57	1.68	1.68	0.57	20.29	5.0E-02	120.0	2.753	0.979	1.792	48.6	37.8	164.17	0.57	0.00	2.8	89.5	44.0	1.969	717.3	-9999.0	-9999.0	2.8	89.5	44.0	1.969	717.3	-9999.0	-9999.0	3.840	10.0
45.931	326.68	326.81	1.67	0.56	1.67	1.67	0.56	20.72	5.0E-02	120.0	2.757	0.983	1.794	48.0	38.1	165.57	0.57	0.00	2.7	89.7	44.0	1.969	737.3	-9999.0	-9999.0	2.7	89.7	44.0	1.969	737.3	-9999.0	-9999.0	3.840	10.0
45.996	333.22	333.35	1.66	0.56	1.66	1.66	0.56	21.15	5.0E-02	120.0	2.761	0.987	1.796	48.9	38.1	164.90	0.58	0.00	2.8	89.6	44.0	1.969	757.3	-9999.0	-9999.0	2.8	89.6	44.0	1.969	757.3	-9999.0	-9999.0	3.840	10.0
46.062	339.76	339.89	1.68	0.57	1.68	1.68	0.57	21.58	5.0E-02	120.0	2.765	0.991	1.798	49.5	37.8	163.30	0.58	0.00	2.9	89.4	44.0	1.969	777.3	-9999.0	-9999.0	2.9	89.4	44.0	1.969	777.3	-9999.0	-9999.0	3.840	10.0
46.127	346.30	346.43	1.70	0.57	1.70	1.70	0.57	22.01	5.0E-02	120.0	2.769	0.995	1.800	49.0	37.5	161.10	0.58	0.00	2.8	89.4	44.0	1.969	797.3	-9999.0	-9999.0	2.8	89.4	44.0	1.969	797.3	-9999.0	-9999.0	3.840	10.0
46.193	352.84	352.97	1.67	0.57	1.67	1.67	0.57	22.44	5.0E-02	120.0	2.773	0.999	1.802	48.0	36.3	156.00	0.58	0.00	3.1	88.1	44.0	1.969	817.3	-9999.0	-9999.0	3.1	88.1	44.0	1.969	817.3	-9999.0	-9999.0	3.840	10.0
46.258	359.38	359.51	1.62	0.57	1.62	1.62	0.57	22.87	5.0E-02	120.0	2.777	0.999	1.803	48.5	35.3	149.91	0.63	0.00	3.0	87.0	44.0	2.106	837.3	-9999.0	-9999.0	3.0	87.0	44.0	2.106	837.3	-9999.0	-9999.0	3.840	10.0
46.324	365.92	366.05	1.62	0.57	1.62	1.62	0.57	23.30	5.0E-02	120.0	2.781	0.999	1.805	44.5	33.8	142.18	0.65	0.00	4.0	85.5	44.0	2.019	857.3	-9999.0	-9999.0	4.0	85.5	44.0	2.019	857.3	-9999.0	-9999.0	3.840	10.0
46.389	372.46	372.59	1.66	0.64	1.66	1.66	0.64	23.73	5.0E-02	120.0	2.785	0.992	1.807	41.7	31.7	131.90	0.65	0.00	4.4	83.4	44.0	2.006	877.3	-9999.0	-9999.0	4.4	83.4	44.0	2.006	877.3	-9999.0	-9999.0	3.840	10.0
46.455	379.00	379.13	1.54	0.64	1.54	1.54	0.64	24.16	5.0E-02	120.0	2.789	0.988	1.811	38.6	29.4	120.03	0.69	0.00	5.2	80.8	42.0	2.069	897.3	-9999.0	-9999.0	5.2	80.8	42.0	2.069	897.3	-9999.0	-9999.0	3.840	10.0
46.520	385.54	385.67	1.49	0.68	1.49	1.49	0.68	24.59	5.0E-02	120.0	2.793	0.988	1.813	36.5	26.5	105.09	0.75	0.00	6.4	77.2	42.0	2.294	917.3	-9999.0	-9999.0	6.4	77.2	42.0	2.294	917.3	-9999.0	-9999.0	3.840	10.0
46.586	392.08	392.21	1.44	0.74	1.44	1.44	0.74	25.02	5.0E-02	120.0	2.797	0.988	1.815	28.0	21.3	78.36	1.00	0.00	10.1	69.1	40.0	2.433	937.3	-9999.0	-9999.0	10.1	69.1	40.0	2.433	937.3	-9999.0	-9999.0	3.840	10.0
46.651	398.62	398.75	1.43	0.98	1.43	1.43	0.98	25.45	5.0E-02	120.0	2.801	0.982	1.817	24.6	18.7	66.66	1.20	0.00	12.9	64.2	40.0	2.639	957.3	-9999.0	-9999.0	12.9	64.2	40.0	2.639	957.3	-9999.0	-9999.0	3.840	10.0
46.717	405.16	405.29	1.45	1.17	1.45	1.45	1.17	25.88	5.0E-02	120.0	2.805	0.984	1.817	21.2	16.1	54.25	1.48	0.00	16.5	56.5	40.0	2.855	977.3	-9999.0	-9999.0	16.5	56.5	40.0	2.855	977.3	-9999.0	-9999.0	3.840	10.0
46.782	411.70	411.83	1.46	1.44	1.46	1.46	1.44	26.31	5.0E-02	120.0	2.809	0.984	1.818	17.7	13.4	42.36	1.86	0.00	21.3	51.6	38.0	3.395	997.3	-9999.0	-9999.0	21.3	51.6	38.0	3.395	997.3	-9999.0	-9999.0	3.840	10.0
46.848	418.24	418.37	1.43	1.80	1.43	1.43	1.80	26.74	5.0E-02	120.0	2.813	0.985	1.818	14.6	11.0	31.64	2.56	0.00	28.4	43.6	36.0	3.995	1017.3	-9999.0	-9999.0	28.4	43.6	36.0	3.995	1017.3	-9999.0	-9999.0	3.840</	



Col-02	Col-05	Col-06	Col-07	Col-08	Col-09	Col-14	Col-15	Col-16	Col-17	Col-18	Col-22	Col-23	Col-24	Col-25	Col-26	Col-28	Col-30	Col-31	Col-33	Col-34	Col-35	Col-36
Depth (ft)	qc (tsf)	qt (tsf)	fs (tsf)	Rf (%)	u (ft)	Penn-k (cm/s)	Unit Wt (pcf)	T Stress (kPa)	U Stress (tsf)	E Stress (tsf)	N(60)lc (blft)	N1(60)lc (blft)	Ql	Fr (%)	Bq	FC (%)	Dr (%)	Phi (deg)	Es/qt (tsf)	YoungE (tsf)	Su (tsf)	OCR
49.146	11.88	12.90	0.29	2.25	94.22	5.0E-06	120.0	2.949	1.066	1.863	4.9	2.1	5.28	2.92	0.57	74.8	-9999.0	-9999.0	-9999.0	-9999.0	0.663	1.2
49.212	11.31	12.32	0.29	2.36	94.06	5.0E-06	120.0	2.953	1.068	1.885	4.8	2.0	4.97	3.10	0.61	77.7	-9999.0	-9999.0	-9999.0	-9999.0	0.625	1.1
49.278	11.88	12.89	0.28	2.18	93.33	5.0E-06	120.0	2.957	1.070	1.866	4.8	2.1	5.26	2.83	0.57	74.3	-9999.0	-9999.0	-9999.0	-9999.0	0.682	1.2
49.343	11.69	12.69	0.28	2.21	92.26	5.0E-06	120.0	2.961	1.072	1.868	4.8	2.0	5.15	2.89	0.57	75.3	-9999.0	-9999.0	-9999.0	-9999.0	0.648	1.1
49.409	11.82	12.84	0.29	2.26	94.77	5.0E-06	120.0	2.965	1.074	1.890	4.9	2.1	5.23	2.84	0.58	75.3	-9999.0	-9999.0	-9999.0	-9999.0	0.659	1.2
49.474	11.56	12.60	0.30	2.39	96.78	5.0E-06	120.0	2.969	1.076	1.892	4.8	2.0	5.09	3.12	0.61	77.1	-9999.0	-9999.0	-9999.0	-9999.0	0.642	1.1
49.540	12.14	13.20	0.30	2.28	98.48	5.0E-06	120.0	2.972	1.078	1.894	4.9	2.1	5.40	2.94	0.59	74.3	-9999.0	-9999.0	-9999.0	-9999.0	0.682	1.2
49.606	12.07	13.10	0.31	2.37	95.21	5.0E-06	120.0	2.976	1.080	1.896	5.0	2.1	5.34	3.07	0.57	75.4	-9999.0	-9999.0	-9999.0	-9999.0	0.675	1.2
49.671	11.76	12.75	0.33	2.59	91.73	5.0E-06	120.0	2.980	1.083	1.898	5.0	2.1	5.15	3.39	0.57	78.3	-9999.0	-9999.0	-9999.0	-9999.0	0.651	1.1
49.737	12.07	13.03	0.01	0.08	88.67	5.0E-05	120.0	2.984	1.085	1.900	-9999.0	-9999.0	5.29	0.10	0.53	-9999.0	30.0	30.0	-9999.0	-9999.0	0.670	1.2
49.803	12.39	13.04	0.01	0.08	89.97	5.0E-05	120.0	2.988	1.087	1.902	-9999.0	-9999.0	5.29	0.10	0.54	-9999.0	30.0	30.0	-9999.0	-9999.0	0.670	1.2
49.868	12.39	13.34	0.01	0.08	87.60	5.0E-05	120.0	2.992	1.089	1.903	-9999.0	-9999.0	5.43	0.10	0.50	-9999.0	30.0	30.0	-9999.0	-9999.0	0.690	1.2
49.934	12.14	13.05	0.01	0.08	84.70	5.0E-05	120.0	2.996	1.091	1.905	-9999.0	-9999.0	5.28	0.10	0.50	-9999.0	30.0	30.0	-9999.0	-9999.0	0.671	1.2
49.999	12.14	13.09	0.01	0.08	88.22	5.0E-05	120.0	3.000	1.093	1.907	-9999.0	-9999.0	5.29	0.10	0.52	-9999.0	30.0	30.0	-9999.0	-9999.0	0.673	1.2

Gregg In Situ, Inc. - CPT Interpretation  
 Interpretation Output - Release 1.22A Format: NLI Imperial  
 Run No: 04-0816-0955-2700  
 Job No: 04-127SC  
 Client: MAGTEC  
 Project: Allen Fossil Plant  
 Site: CPT-05  
 Location: Allen Plant  
 Oversight: H. Benkhayal  
 CPT Date: 04/20/07  
 CPT Time: 14:24  
 CPT File: 130CPO5.COR  
 Northing (m): 0.000000  
 Easting (m): 0.000000  
 Elevation (m): 0.000000

Water Table (m): 13.72 (ft): 45.0  
 Unit Weight of Water (default): 62.40 pcf  
 Averaging Increment (m): 0.0 (Every Data Point)  
 Phi Method : Robertson and Campanella, 1983  
 Su Nkt used: 15.00 Su/P' (nc): 0.30  
 Dr Method : Jamiolkowski - All Sands  
 State Parameter M: 1.20  
 Constant Unit Weight Used Throughout (pcf): 119.97  
 N160lc Calculated using qc1n  
 N160cs Calculated using qc1ncs

Col-02	Col-05	Col-06	Col-07	Col-08	Col-09	Col-14	Col-15	Col-16	Col-17	Col-18	Col-22	Col-23	Col-24	Col-25	Col-26	Col-28	Col-30	Col-31	Col-33	Col-34	Col-35	Col-36
Depth (ft)	oc (ft)	di (ft)	ts (ft)	Rf (%)	u (ft)	Perm-k (cm/s)	Unit Wt (pcf)	T Stress (kPa)	U Stress (tsf)	E Stress (tsf)	N(60)lc (bkt)	N(160)lc (bkt)	CI	Fr (%)	Bq	FC (%)	Dr (%)	Phi (deg)	Es(q)	YoungE (tsf)	Su (tsf)	OCR
0.065	31.05	31.05	0.13	0.42	0.24	5.0E-04	120.0	0.004	0.000	0.004	-9999.0	-9999.0	3000.00	0.42	0.00	-9999.0	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
0.131	49.13	49.13	0.14	0.29	0.31	5.0E-03	120.0	0.008	0.000	0.008	-9999.0	-9999.0	3000.00	0.29	0.00	-9999.0	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
0.197	52.96	52.96	0.19	0.36	0.53	5.0E-03	120.0	0.012	0.000	0.012	-9999.0	-9999.0	3000.00	0.36	0.00	-9999.0	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
0.262	57.69	57.70	0.24	0.42	1.06	5.0E-03	120.0	0.016	0.000	0.016	-9999.0	-9999.0	3000.00	0.42	0.00	-9999.0	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
0.328	62.98	62.99	0.24	0.38	0.37	5.0E-03	120.0	0.020	0.000	0.020	-9999.0	-9999.0	3000.00	0.38	0.00	-9999.0	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
0.394	64.40	64.40	0.25	0.39	0.43	5.0E-03	120.0	0.024	0.000	0.024	-9999.0	-9999.0	2725.27	0.39	0.00	-9999.0	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
0.459	68.17	68.17	0.28	0.41	0.26	5.0E-03	120.0	0.028	0.000	0.028	-9999.0	-9999.0	2472.50	0.41	0.00	-9999.0	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
0.525	69.25	69.25	0.31	0.45	0.37	5.0E-03	120.0	0.031	0.000	0.031	-9999.0	-9999.0	1937.73	0.45	0.00	-9999.0	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
0.591	70.65	70.66	0.34	0.48	0.59	5.0E-03	120.0	0.035	0.000	0.035	-9999.0	-9999.0	1937.10	0.48	0.00	-9999.0	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
0.656	72.38	72.38	0.36	0.50	0.49	5.0E-03	120.0	0.039	0.000	0.039	-9999.0	-9999.0	1837.45	0.50	0.00	-9999.0	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
0.722	74.66	74.69	0.39	0.52	0.69	5.0E-03	120.0	0.043	0.000	0.043	-9999.0	-9999.0	1723.61	0.52	0.00	-9999.0	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
0.787	72.96	72.96	0.41	0.56	0.59	5.0E-03	120.0	0.047	0.000	0.047	-9999.0	-9999.0	1543.37	0.56	0.00	-9999.0	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
0.853	77.43	77.43	0.43	0.56	0.57	5.0E-03	120.0	0.051	0.000	0.051	-9999.0	-9999.0	1511.92	0.56	0.00	-9999.0	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
0.919	83.75	83.76	0.42	0.50	0.37	5.0E-03	120.0	0.055	0.000	0.055	-9999.0	-9999.0	1516.58	0.50	0.00	-9999.0	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.050	95.44	95.44	0.45	0.51	0.47	5.0E-02	120.0	0.063	0.000	0.063	-9999.0	-9999.0	1514.20	0.47	0.00	-9999.0	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.115	100.48	100.49	0.43	0.43	0.35	5.0E-02	120.0	0.067	0.000	0.067	-9999.0	-9999.0	1500.39	0.43	0.00	-9999.0	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.181	106.24	106.24	0.41	0.39	0.33	5.0E-02	120.0	0.071	0.000	0.071	-9999.0	-9999.0	1498.17	0.39	0.00	-9999.0	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.247	108.53	108.53	0.39	0.36	0.08	5.0E-02	120.0	0.075	0.000	0.075	-9999.0	-9999.0	1449.91	0.36	0.00	-9999.0	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.312	111.09	111.09	0.39	0.35	0.10	5.0E-02	120.0	0.079	0.000	0.079	-9999.0	-9999.0	1409.83	0.35	0.00	-9999.0	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.378	112.94	112.94	0.38	0.34	0.10	5.0E-02	120.0	0.083	0.000	0.083	-9999.0	-9999.0	1365.08	0.34	0.00	-9999.0	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.444	115.18	115.18	0.37	0.32	0.22	5.0E-02	120.0	0.087	0.000	0.087	-9999.0	-9999.0	1328.81	0.32	0.00	-9999.0	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.509	116.26	116.26	0.38	0.33	0.20	5.0E-02	120.0	0.091	0.000	0.091	-9999.0	-9999.0	1282.95	0.33	0.00	-9999.0	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.575	116.90	116.91	0.40	0.34	0.18	5.0E-02	120.0	0.094	0.000	0.094	-9999.0	-9999.0	1236.24	0.34	0.00	-9999.0	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.640	119.20	119.20	0.39	0.33	0.33	5.0E-02	120.0	0.098	0.000	0.098	-9999.0	-9999.0	1210.10	0.33	0.00	-9999.0	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.706	121.64	121.64	0.41	0.34	0.28	5.0E-02	120.0	0.102	0.000	0.102	-9999.0	-9999.0	1187.30	0.34	0.00	-9999.0	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.772	125.33	125.34	0.42	0.34	0.49	5.0E-02	120.0	0.106	0.000	0.106	-9999.0	-9999.0	1178.11	0.34	0.00	-9999.0	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.837	127.95	127.96	0.44	0.34	0.43	5.0E-02	120.0	0.110	0.000	0.110	-9999.0	-9999.0	1159.73	0.35	0.00	-9999.0	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.903	129.23	129.24	0.31	0.24	0.39	5.0E-02	120.0	0.114	0.000	0.114	-9999.0	-9999.0	1130.93	0.24	0.00	-9999.0	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.968	129.67	129.68	0.38	0.29	0.41	5.0E-02	120.0	0.118	0.000	0.118	-9999.0	-9999.0	1096.94	0.29	0.00	-9999.0	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.034	128.53	128.54	0.42	0.33	0.31	5.0E-02	120.0	0.122	0.000	0.122	-9999.0	-9999.0	1052.15	0.33	0.00	-9999.0	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.100	128.59	128.60	0.47	0.37	0.43	5.0E-02	120.0	0.126	0.000	0.126	-9999.0	-9999.0	1019.72	0.37	0.00	-9999.0	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.165	134.34	134.35	0.50	0.39	0.43	5.0E-02	120.0	0.130	0.000	0.130	-9999.0	-9999.0	986.86	0.39	0.00	-9999.0	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.231	119.84	119.86	0.52	0.43	1.39	5.0E-02	120.0	0.134	0.000	0.134	-9999.0	-9999.0	894.38	0.44	0.00	-9999.0	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.297	126.11	126.12	0.52	0.41	1.23	5.0E-02	120.0	0.138	0.000	0.138	-9999.0	-9999.0	914.26	0.41	0.00	-9999.0	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.362	127.38	127.39	0.54	0.42	1.08	5.0E-02	120.0	0.142	0.000	0.142	-9999.0	-9999.0	887.80	0.43	0.00	-9999.0	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.428	127.57	127.58	0.53	0.42	0.81	5.0E-02	120.0	0.146	0.000	0.146	-9999.0	-9999.0	874.80	0.42	0.00	-9999.0	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.493	130.32	130.33	0.53	0.40	0.85	5.0E-02	120.0	0.150	0.000	0.150	-9999.0	-9999.0	870.11	0.41	0.00	-9999.0	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.559	133.00	133.01	0.53	0.40	0.85	5.0E-02	120.0	0.154	0.000	0.154	-9999.0	-9999.0	865.27	0.40	0.00	-9999.0	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.625	134.67	134.67	0.53	0.39	0.63	5.0E-02	120.0	0.157	0.000	0.157	-9999.0	-9999.0	854.17	0.39	0.00	-9999.0	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.690	137.02	137.03	0.54	0.40	0.69	5.0E-02	120.0	0.161	0.000	0.161	-9999.0	-9999.0	847.91	0.40	0.00	-9999.0	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.756	139.14	139.15	0.55	0.40	0.71	5.0E-02	120.0	0.165	0.000	0.165	-9999.0	-9999.0	840.49	0.40	0.00	-9999.0	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.821	140.22	140.23	0.55	0.41	0.67	5.0E-02	120.0	0.169	0.000	0.169	-9999.0	-9999.0	827.31	0.42	0.00	-9999.0	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.887	141.49	141.50	0.59	0.42	0.65	5.0E-02	120.0	0.173	0.000	0.173	-9999.0	-9999.0	815.83	0.42	0.00	-9999.0	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.953	143.03	143.04	0.59	0.41	0.75	5.0E-02	120.0	0.177	0.000	0.177	-9999.0	-9999.0	806.34	0.41	0.00	-9999.0	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.018	145.90	145.91	0.62	0.43	0.67	5.0E-02	120.0	0.181	0.000	0.181	-9999.0	-9999.0	804.67	0.43	0.00	-9999.0	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.084	150.57	150.57	0.64	0.43	0.69	5.0E-02	120.0	0.185	0.000	0.185	-9999.0	-9999.0	812.72	0.43	0.00	-9999.0	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.150	154.98	154.98	0.67	0.43	0.63	5.0E-02	120.0	0.189	0.000	0.189	-9999.0	-9999.0	819.11	0.43	0.00	-9999.0	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.215	160.41	160.42	0.70	0.44	0.71	5.0E-02	120.0	0.193	0.000	0.193	-9999.0	-9999.0	830.54	0.44	0.00	-9999.0	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.281	166.15	166.16	0.73	0.44	0.73	5.0E-02	120.0	0.197	0.000	0.197	-9999.0	-9999.0	843.09	0.44	0.00	-9999.0	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.346	170.75	170.76	0.77	0.45	0.77	5.0E-02																

Col-02	Col-05	Col-06	Col-07	Col-08	Col-09	Col-14	Col-15	Col-16	Col-17	Col-18	Col-22	Col-23	Col-24	Col-25	Col-26	Col-28	Col-30	Col-31	Col-33	Col-34	Col-35	Col-36
Depth (ft)	qc (tsf)	qt (tsf)	fs (tsf)	Rf (%)	u (ft)	Perm-k (cm/s)	Unit Wt (pcf)	T-Stress (kPa)	U-Stress (tsf)	E-Stress (tsf)	N(60)ic (tsf)	N(60)lc (tsf)	Ql	Ft (%)	Bq	FC (%)	Dr (%)	Phi (deg)	Es/rt	YoungE (tsf)	Su (tsf)	OCR
4.528	159.83	159.84	0.89	0.56	0.86	5.0E-02	120.0	0.272	0.000	0.272	25.8	50.5	587.38	0.56	0.00	1.4	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
4.593	155.12	155.13	0.87	0.56	0.81	5.0E-02	120.0	0.276	0.000	0.276	25.1	48.9	561.84	0.57	0.00	1.5	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
4.659	150.11	150.13	0.85	0.57	0.98	5.0E-02	120.0	0.280	0.000	0.280	24.4	47.2	536.10	0.57	0.00	1.7	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
4.724	143.61	143.61	0.84	0.59	1.43	5.0E-02	120.0	0.283	0.000	0.283	23.6	45.2	505.64	0.59	0.00	2.0	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
4.790	138.82	138.82	0.81	0.30	0.67	5.0E-02	120.0	0.287	0.000	0.287	21.6	41.2	482.03	0.30	0.00	0.1	93.9	48.0	-9999.0	-9999.0	-9999.0	-9999.0
4.856	133.57	133.58	0.44	0.33	0.65	5.0E-02	120.0	0.291	0.000	0.291	21.1	39.9	457.50	0.33	0.00	0.5	92.6	48.0	-9999.0	-9999.0	-9999.0	-9999.0
4.921	129.29	129.30	0.47	0.38	0.67	5.0E-02	120.0	0.295	0.000	0.295	20.6	38.8	436.89	0.37	0.00	1.0	91.5	48.0	-9999.0	-9999.0	-9999.0	-9999.0
5.052	120.35	120.36	0.50	0.42	0.55	5.0E-02	120.0	0.303	0.000	0.303	19.6	36.4	416.90	0.42	0.00	1.3	90.4	48.0	-9999.0	-9999.0	-9999.0	-9999.0
5.118	107.45	107.46	0.50	0.47	1.15	5.0E-02	120.0	0.307	0.000	0.307	17.9	33.0	348.94	0.47	0.00	2.7	89.1	48.0	-9999.0	-9999.0	-9999.0	-9999.0
5.184	105.85	105.86	0.50	0.47	0.83	5.0E-02	120.0	0.311	0.000	0.311	17.7	32.4	339.34	0.47	0.00	2.8	85.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
5.249	102.72	102.73	0.50	0.49	0.77	5.0E-02	120.0	0.315	0.000	0.315	17.3	31.5	325.16	0.49	0.00	3.1	84.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
5.315	99.27	99.28	0.50	0.49	0.69	5.0E-02	120.0	0.319	0.000	0.319	16.8	30.4	310.31	0.51	0.00	3.5	82.8	46.0	-9999.0	-9999.0	-9999.0	-9999.0
5.381	95.31	95.32	0.49	0.52	0.61	5.0E-02	120.0	0.323	0.000	0.323	16.3	29.3	294.25	0.52	0.00	3.8	81.5	46.0	-9999.0	-9999.0	-9999.0	-9999.0
5.446	90.90	90.91	0.48	0.53	0.47	5.0E-03	120.0	0.327	0.000	0.327	15.6	28.0	277.19	0.53	0.00	4.2	80.6	46.0	-9999.0	-9999.0	-9999.0	-9999.0
5.512	87.20	87.21	0.45	0.52	0.47	5.0E-03	120.0	0.331	0.000	0.331	15.1	26.8	262.69	0.52	0.00	4.4	78.6	46.0	-9999.0	-9999.0	-9999.0	-9999.0
5.577	83.36	83.37	0.46	0.55	0.26	5.0E-03	120.0	0.335	0.000	0.335	14.6	25.7	248.11	0.55	0.00	5.0	77.1	46.0	-9999.0	-9999.0	-9999.0	-9999.0
5.643	79.59	79.60	0.43	0.54	0.37	5.0E-03	120.0	0.339	0.000	0.339	14.0	24.5	234.09	0.54	0.00	5.2	75.6	46.0	-9999.0	-9999.0	-9999.0	-9999.0
5.709	76.28	76.28	0.41	0.54	0.41	5.0E-03	120.0	0.343	0.000	0.343	13.5	23.5	221.70	0.54	0.00	5.5	74.2	46.0	-9999.0	-9999.0	-9999.0	-9999.0
5.774	73.53	73.53	0.36	0.49	0.43	5.0E-03	120.0	0.346	0.000	0.346	12.9	22.5	211.24	0.49	0.00	7.4	71.2	46.0	-9999.0	-9999.0	-9999.0	-9999.0
5.840	69.44	69.44	0.48	0.69	0.22	5.0E-03	120.0	0.350	0.000	0.350	12.7	21.9	197.16	0.70	0.00	8.8	68.6	44.0	-9999.0	-9999.0	-9999.0	-9999.0
5.905	65.99	65.99	0.54	0.82	0.31	5.0E-03	120.0	0.354	0.000	0.354	12.3	21.2	185.25	0.82	0.00	8.3	69.1	44.0	-9999.0	-9999.0	-9999.0	-9999.0
5.971	65.29	65.29	0.48	0.71	0.51	5.0E-03	120.0	0.358	0.000	0.358	12.1	20.7	171.25	0.74	0.00	6.8	68.7	44.0	-9999.0	-9999.0	-9999.0	-9999.0
6.037	64.72	64.72	0.41	0.64	0.31	5.0E-03	120.0	0.362	0.000	0.362	11.9	20.2	177.68	0.64	0.00	7.6	67.1	44.0	-9999.0	-9999.0	-9999.0	-9999.0
6.102	65.67	65.67	0.40	0.61	0.35	5.0E-03	120.0	0.366	0.000	0.366	12.0	20.2	178.36	0.61	0.00	7.3	69.0	44.0	-9999.0	-9999.0	-9999.0	-9999.0
6.168	58.00	58.01	0.41	0.71	0.67	5.0E-03	120.0	0.370	0.000	0.370	10.9	18.3	155.74	0.71	0.00	9.1	65.3	44.0	-9999.0	-9999.0	-9999.0	-9999.0
6.234	55.38	55.38	0.39	0.71	-0.08	5.0E-03	120.0	0.374	0.000	0.374	10.5	17.5	147.08	0.71	0.00	9.5	63.8	44.0	-9999.0	-9999.0	-9999.0	-9999.0
6.300	50.78	50.79	0.29	0.57	0.20	5.0E-03	120.0	0.386	0.000	0.386	9.6	15.7	130.63	0.58	0.00	9.2	60.9	44.0	-9999.0	-9999.0	-9999.0	-9999.0
6.366	49.95	49.95	0.27	0.54	0.20	5.0E-03	120.0	0.390	0.000	0.390	9.4	15.4	127.16	0.55	0.00	9.1	60.3	44.0	-9999.0	-9999.0	-9999.0	-9999.0
6.430	48.30	48.30	0.24	0.56	0.20	5.0E-03	120.0	0.394	0.000	0.394	9.1	14.8	121.66	0.50	0.00	9.0	59.2	42.0	-9999.0	-9999.0	-9999.0	-9999.0
6.496	47.14	47.15	0.23	0.49	0.24	5.0E-03	120.0	0.398	0.000	0.398	8.9	14.4	117.57	0.49	0.00	5.0	58.3	42.0	-9999.0	-9999.0	-9999.0	-9999.0
6.562	45.48	45.48	0.22	0.46	0.24	5.0E-03	120.0	0.402	0.000	0.402	8.6	13.9	112.26	0.49	0.00	5.0	57.1	42.0	-9999.0	-9999.0	-9999.0	-9999.0
6.627	44.46	44.46	0.22	0.50	0.14	5.0E-03	120.0	0.406	0.000	0.406	8.5	13.6	108.64	0.50	0.00	9.8	56.4	42.0	-9999.0	-9999.0	-9999.0	-9999.0
6.693	43.44	43.44	0.22	0.47	0.26	5.0E-03	120.0	0.409	0.000	0.409	8.3	13.3	105.09	0.51	0.00	10.2	55.6	42.0	-9999.0	-9999.0	-9999.0	-9999.0
6.758	42.29	42.29	0.20	0.45	0.28	5.0E-04	120.0	0.413	0.000	0.413	8.1	12.9	101.31	0.48	0.00	5.0	54.7	42.0	-9999.0	-9999.0	-9999.0	-9999.0
6.824	41.46	41.46	0.20	0.48	0.16	5.0E-03	120.0	0.417	0.000	0.417	8.0	12.6	98.35	0.49	0.00	5.0	53.9	42.0	-9999.0	-9999.0	-9999.0	-9999.0
6.890	40.31	40.31	0.18	0.45	0.20	5.0E-04	120.0	0.421	0.000	0.421	7.7	12.2	94.69	0.45	0.00	5.0	53.0	42.0	-9999.0	-9999.0	-9999.0	-9999.0
6.955	39.87	39.87	0.18	0.45	0.10	5.0E-04	120.0	0.425	0.000	0.425	7.7	12.0	92.76	0.46	0.00	5.0	52.6	42.0	-9999.0	-9999.0	-9999.0	-9999.0
7.021	40.06	40.06	0.17	0.44	0.37	5.0E-04	120.0	0.429	0.000	0.429	7.7	12.0	92.35	0.43	0.00	5.0	52.6	42.0	-9999.0	-9999.0	-9999.0	-9999.0
7.087	38.45	38.45	0.17	0.44	0.31	5.0E-04	120.0	0.433	0.000	0.433	7.4	11.6	87.80	0.45	0.00	5.0	51.3	42.0	-9999.0	-9999.0	-9999.0	-9999.0
7.152	37.94	37.94	0.17	0.45	0.26	5.0E-04	120.0	0.437	0.000	0.437	7.4	11.4	85.83	0.45	0.00	5.0	50.7	42.0	-9999.0	-9999.0	-9999.0	-9999.0
7.218	37.05	37.05	0.17	0.46	0.24	5.0E-04	120.0	0.441	0.000	0.441	7.2	11.1	83.03	0.44	0.00	5.0	49.9	42.0	-9999.0	-9999.0	-9999.0	-9999.0
7.283	36.92	36.92	0.16	0.43	0.31	5.0E-04	120.0	0.445	0.000	0.445	7.2	11.0	81.99	0.44	0.00	5.0	49.7	42.0	-9999.0	-9999.0	-9999.0	-9999.0
7.349	36.10	36.10	0.15	0.42	0.31	5.0E-04	120.0	0.449	0.000	0.449	7.0	10.7	79.43	0.42	0.00	5.0	48.9	42.0	-9999.0	-9999.0	-9999.0	-9999.0
7.415	35.85	35.85	0.15	0.42	0.39	5.0E-04	120.0	0.453	0.000	0.453	7.0	10.6	77.74	0.43	0.00	5.0	48.4	40.0	-9999.0	-9999.0	-9999.0	-9999.0
7.480	35.33	35.33	0.16	0.45	0.28	5.0E-04	120.0	0.457	0.000	0.457	7.0	10.5	76.36	0.46	0.00	5.0	48.1	40.0	-9999.0	-9999.0	-9999.0	-9999.0
7.546	35.90	35.90	0.15	0.42	0.41	5.0E-04	120.0	0.461	0.000	0.461	7.0	10.6	76.94	0.42	0.00	5.0	48.4	40.0	-9999.0	-9999.0	-9999.0	-9999.0
7.611	35.14	35.14	0.14	0.43	0.22	5.0E-04	120.0	0.465	0.000	0.465	6.9	10.3	74.63	0.40	0.00	5.0	47.7	40.0	-9999.0	-9999.0	-9999.0	-9999.0
7.677	35.14	35.14	0.15	0.43	0.26	5.0E-04	120.0	0.469	0.000	0.469	6.9	10.3	74.00	0.43	0.00	5.0	47.5	40.0	-9999.0	-9999.0	-9999.0	-9999.0
7.743	35.59	35.59	0.16	0.48	0.38	5.0E-04	120.0	0.472	0.000	0.472	7.0	10.4	74.71	0.49	0.00	5.0	47.8	40.0	-9999.0	-9999.0	-9999.0	-9999.0
7.808	35.20	35.20	0.15	0.43	0.31	5.0E-04	120.0	0.480	0.000	0.480	6.9	10.2	72.28	0.43	0.00	5.0	47.2	40.0	-9999.0	-9999.0	-9999.0	-9999.0
7.874	35.46	35.46	0.16	0.44	0.18	5.0E-04	120.0	0.484	0.000	0.484	7.0	10.3	72.22	0.46	0.00	5.0	47.3	40.0	-9999.0	-9999.0	-9999.0	-9999.0
7.940	35.35	35.35	0.16	0.44	0.24	5.0E-																

Col-02	Col-03	Col-04	Col-05	Col-06	Col-07	Col-08	Col-09	Col-10	Col-11	Col-12	Col-13	Col-14	Col-15	Col-16	Col-17	Col-18	Col-22	Col-23	Col-24	Col-25	Col-26	Col-28	Col-30	Col-31	Col-33	Col-34	Col-35	Col-36
Depth (ft)	oc (hr)	at (hr)	is (hr)	Rf (%)	u (ft)	Perm-k (cm/s)	Unit Wt (pcf)	T Stress (kPa)	U Stress (hr)	E Stress (hr)	N(60)lc (hr)	N(60)li (hr)	Ol	Fr (%)	Bq	FC (%)	Dr (%)	Phi (deg)	Es/qc	YoungE (hr)	Su (hr)	OCR	Col-33 Es/qc	Col-34 YoungE (hr)	Col-35 Su (hr)	Col-36 OCR		
8.989	112.49	112.51	0.52	0.46	1.15	5.0E-02	120.0	0.539	0.000	0.539	19.2	26.8	207.58	0.47	0.00	3.9	78.9	46.0	1.912	215.1	-9999.0	-9999.0	-9999.0	-9999.0	215.1	-9999.0	-9999.0	-9999.0
9.055	113.59	113.60	0.54	0.48	1.02	5.0E-02	120.0	0.543	0.000	0.543	19.5	27.0	208.08	0.48	0.00	3.9	79.1	46.0	1.909	216.9	-9999.0	-9999.0	-9999.0	-9999.0	216.9	-9999.0	-9999.0	-9999.0
9.121	114.41	114.42	0.56	0.49	0.92	5.0E-02	120.0	0.547	0.000	0.547	19.6	27.1	208.08	0.49	0.00	4.0	79.2	46.0	1.908	216.3	-9999.0	-9999.0	-9999.0	-9999.0	216.3	-9999.0	-9999.0	-9999.0
9.186	116.77	116.78	0.57	0.49	0.75	5.0E-02	120.0	0.551	0.000	0.551	20.0	27.5	210.87	0.50	0.00	3.9	79.6	46.0	1.901	222.0	-9999.0	-9999.0	-9999.0	-9999.0	222.0	-9999.0	-9999.0	-9999.0
9.252	120.67	120.68	0.60	0.50	0.69	5.0E-02	120.0	0.555	0.000	0.555	20.6	28.3	216.39	0.50	0.00	3.8	80.5	46.0	1.890	228.1	-9999.0	-9999.0	-9999.0	-9999.0	228.1	-9999.0	-9999.0	-9999.0
9.317	124.76	124.77	0.60	0.48	0.67	5.0E-02	120.0	0.559	0.000	0.559	21.2	29.0	222.18	0.48	0.00	3.6	81.3	46.0	1.882	234.8	-9999.0	-9999.0	-9999.0	-9999.0	234.8	-9999.0	-9999.0	-9999.0
9.383	127.38	127.38	0.61	0.48	0.53	5.0E-02	120.0	0.563	0.000	0.563	21.6	29.4	225.28	0.48	0.00	3.4	81.8	46.0	1.879	238.4	-9999.0	-9999.0	-9999.0	-9999.0	238.4	-9999.0	-9999.0	-9999.0
9.449	130.38	130.39	0.60	0.46	0.75	5.0E-02	120.0	0.567	0.000	0.567	22.0	29.8	228.00	0.46	0.00	3.2	82.4	46.0	1.878	244.9	-9999.0	-9999.0	-9999.0	-9999.0	244.9	-9999.0	-9999.0	-9999.0
9.514	130.64	130.64	0.60	0.46	0.63	5.0E-02	120.0	0.571	0.000	0.571	22.0	29.8	227.85	0.46	0.00	3.2	82.4	46.0	1.878	245.4	-9999.0	-9999.0	-9999.0	-9999.0	245.4	-9999.0	-9999.0	-9999.0
9.580	130.13	130.13	0.62	0.48	0.63	5.0E-02	120.0	0.575	0.000	0.575	22.0	29.7	228.39	0.48	0.00	3.4	82.1	46.0	1.878	244.4	-9999.0	-9999.0	-9999.0	-9999.0	244.4	-9999.0	-9999.0	-9999.0
9.646	130.90	130.90	0.66	0.51	0.63	5.0E-02	120.0	0.579	0.000	0.579	22.2	29.9	228.19	0.51	0.00	3.6	82.2	46.0	1.878	245.9	-9999.0	-9999.0	-9999.0	-9999.0	245.9	-9999.0	-9999.0	-9999.0
9.711	135.56	135.57	0.68	0.50	0.59	5.0E-02	120.0	0.583	0.000	0.583	22.9	30.7	231.66	0.50	0.00	3.4	83.1	46.0	1.880	254.9	-9999.0	-9999.0	-9999.0	-9999.0	254.9	-9999.0	-9999.0	-9999.0
9.777	139.77	139.78	0.53	0.38	0.61	5.0E-02	120.0	0.587	0.000	0.587	23.1	30.8	237.27	0.38	0.00	2.3	83.9	46.0	1.899	264.0	-9999.0	-9999.0	-9999.0	-9999.0	264.0	-9999.0	-9999.0	-9999.0
9.842	143.03	143.03	0.58	0.41	0.37	5.0E-02	120.0	0.591	0.000	0.591	23.7	31.5	241.20	0.41	0.00	2.4	84.5	46.0	1.900	271.8	-9999.0	-9999.0	-9999.0	-9999.0	271.8	-9999.0	-9999.0	-9999.0
9.908	146.09	146.10	0.82	0.43	0.71	5.0E-02	120.0	0.594	0.000	0.594	24.2	32.1	244.76	0.43	0.00	2.5	85.0	46.0	1.915	279.8	-9999.0	-9999.0	-9999.0	-9999.0	279.8	-9999.0	-9999.0	-9999.0
9.974	146.42	146.42	0.86	0.45	0.57	5.0E-02	120.0	0.598	0.000	0.598	24.4	32.2	243.76	0.45	0.00	2.7	84.9	46.0	1.914	280.2	-9999.0	-9999.0	-9999.0	-9999.0	280.2	-9999.0	-9999.0	-9999.0
10.039	147.12	147.12	0.86	0.45	0.61	5.0E-02	120.0	0.602	0.000	0.602	24.5	32.2	243.24	0.45	0.00	2.6	85.0	46.0	1.915	281.8	-9999.0	-9999.0	-9999.0	-9999.0	281.8	-9999.0	-9999.0	-9999.0
10.105	138.50	138.51	0.69	0.50	1.25	5.0E-02	120.0	0.606	0.000	0.606	23.4	30.7	227.45	0.50	0.00	3.4	83.2	46.0	1.881	260.5	-9999.0	-9999.0	-9999.0	-9999.0	260.5	-9999.0	-9999.0	-9999.0
10.170	146.89	146.89	0.71	0.46	0.31	5.0E-02	120.0	0.610	0.000	0.610	24.6	32.2	238.87	0.49	0.00	3.0	84.8	46.0	1.909	280.5	-9999.0	-9999.0	-9999.0	-9999.0	280.5	-9999.0	-9999.0	-9999.0
10.236	154.79	154.79	0.73	0.47	0.37	5.0E-02	120.0	0.614	0.000	0.614	25.8	33.6	251.03	0.47	0.00	2.6	86.2	46.0	1.969	304.7	-9999.0	-9999.0	-9999.0	-9999.0	304.7	-9999.0	-9999.0	-9999.0
10.302	162.19	162.20	0.77	0.48	0.43	5.0E-02	120.0	0.618	0.000	0.618	26.9	34.9	261.41	0.48	0.00	2.4	87.4	46.0	1.999	329.0	-9999.0	-9999.0	-9999.0	-9999.0	329.0	-9999.0	-9999.0	-9999.0
10.367	171.97	171.97	0.82	0.48	0.55	5.0E-02	120.0	0.622	0.000	0.622	28.3	36.7	275.46	0.48	0.00	2.2	89.0	46.0	1.999	359.0	-9999.0	-9999.0	-9999.0	-9999.0	359.0	-9999.0	-9999.0	-9999.0
10.433	182.12	182.13	0.87	0.48	0.53	5.0E-02	120.0	0.626	0.000	0.626	29.8	38.5	289.94	0.48	0.00	2.0	90.6	46.0	1.999	389.0	-9999.0	-9999.0	-9999.0	-9999.0	389.0	-9999.0	-9999.0	-9999.0
10.499	191.38	191.39	0.92	0.48	0.65	5.0E-02	120.0	0.630	0.000	0.630	31.2	40.2	302.83	0.48	0.00	1.8	91.9	46.0	1.999	419.0	-9999.0	-9999.0	-9999.0	-9999.0	419.0	-9999.0	-9999.0	-9999.0
10.564	199.24	199.25	0.96	0.49	0.63	5.0E-02	120.0	0.634	0.000	0.634	32.4	41.5	313.34	0.48	0.00	1.6	92.9	46.0	1.999	449.0	-9999.0	-9999.0	-9999.0	-9999.0	449.0	-9999.0	-9999.0	-9999.0
10.630	208.45	208.45	1.01	0.49	0.75	5.0E-02	120.0	0.638	0.000	0.638	33.7	43.2	325.83	0.49	0.00	1.5	94.2	48.0	1.999	479.0	-9999.0	-9999.0	-9999.0	-9999.0	479.0	-9999.0	-9999.0	-9999.0
10.695	218.03	218.04	1.09	0.50	1.00	5.0E-02	120.0	0.642	0.000	0.642	35.2	44.9	338.76	0.50	0.00	1.4	95.0	48.0	1.999	509.0	-9999.0	-9999.0	-9999.0	-9999.0	509.0	-9999.0	-9999.0	-9999.0
10.761	228.96	228.97	1.15	0.50	1.00	5.0E-02	120.0	0.646	0.000	0.646	36.8	46.9	353.61	0.50	0.00	1.3	95.0	48.0	1.999	539.0	-9999.0	-9999.0	-9999.0	-9999.0	539.0	-9999.0	-9999.0	-9999.0
10.827	236.87	236.88	1.20	0.51	0.86	5.0E-02	120.0	0.650	0.000	0.650	38.0	48.2	365.66	0.51	0.00	1.2	95.0	48.0	1.999	569.0	-9999.0	-9999.0	-9999.0	-9999.0	569.0	-9999.0	-9999.0	-9999.0
10.892	241.49	241.49	1.25	0.52	1.19	5.0E-02	120.0	0.654	0.000	0.654	39.8	49.0	366.50	0.52	0.00	1.2	95.0	48.0	1.999	599.0	-9999.0	-9999.0	-9999.0	-9999.0	599.0	-9999.0	-9999.0	-9999.0
10.958	245.11	245.12	1.30	0.53	0.90	5.0E-02	120.0	0.657	0.000	0.657	39.4	49.7	371.82	0.53	0.00	1.2	95.0	48.0	1.999	629.0	-9999.0	-9999.0	-9999.0	-9999.0	629.0	-9999.0	-9999.0	-9999.0
11.023	247.48	247.49	1.33	0.54	0.98	5.0E-02	120.0	0.661	0.000	0.661	39.8	50.0	373.18	0.54	0.00	1.3	95.0	48.0	1.999	659.0	-9999.0	-9999.0	-9999.0	-9999.0	659.0	-9999.0	-9999.0	-9999.0
11.089	249.32	249.34	1.37	0.55	1.06	5.0E-02	120.0	0.665	0.000	0.665	40.6	50.3	373.74	0.55	0.00	1.3	95.0	48.0	1.999	689.0	-9999.0	-9999.0	-9999.0	-9999.0	689.0	-9999.0	-9999.0	-9999.0
11.155	251.82	251.83	1.42	0.57	0.90	5.0E-02	120.0	0.669	0.000	0.669	40.6	50.3	375.26	0.57	0.00	1.4	95.0	48.0	1.999	719.0	-9999.0	-9999.0	-9999.0	-9999.0	719.0	-9999.0	-9999.0	-9999.0
11.220	256.99	257.00	1.48	0.58	1.02	5.0E-02	120.0	0.673	0.000	0.673	41.5	51.7	380.74	0.58	0.00	1.4	95.0	48.0	1.999	749.0	-9999.0	-9999.0	-9999.0	-9999.0	749.0	-9999.0	-9999.0	-9999.0
11.286	259.04	259.05	1.51	0.58	1.08	5.0E-02	120.0	0.677	0.000	0.677	41.9	52.0	381.55	0.59	0.00	1.4	95.0	48.0	1.999	779.0	-9999.0	-9999.0	-9999.0	-9999.0	779.0	-9999.0	-9999.0	-9999.0
11.352	261.98	261.99	1.53	0.59	1.29	5.0E-02	120.0	0.681	0.000	0.681	42.3	52.4	383.65	0.59	0.00	1.4	95.0	48.0	1.999	809.0	-9999.0	-9999.0	-9999.0	-9999.0	809.0	-9999.0	-9999.0	-9999.0
11.417	260.95	260.97	1.55	0.60	1.21	5.0E-02	120.0	0.685	0.000	0.685	42.2	52.1	379.95	0.60	0.00	1.5	95.0	48.0	1.999	839.0	-9999.0	-9999.0	-9999.0	-9999.0	839.0	-9999.0	-9999.0	-9999.0
11.483	260.12	260.13	1.54	0.59	1.12	5.0E-02	120.0	0.689	0.000	0.689	42.1	51.8	375.56	0.60	0.00	1.5	95.0	48.0	1.999	869.0	-9999.0	-9999.0	-9999.0	-9999.0	869.0	-9999.0	-9999.0	-9999.0
11.548	260.63	260.64	1.56	0.60	1.10	5.0E-02	120.0	0.693	0.000	0.693	42.1	51.9	375.15	0.60														

Col-02	Col-03	Col-04	Col-05	Col-06	Col-07	Col-08	Col-09	Col-10	Col-11	Col-12	Col-13	Col-14	Col-15	Col-16	Col-17	Col-18	Col-19	Col-20	Col-21	Col-22	Col-23	Col-24	Col-25	Col-26	Col-27	Col-28	Col-29	Col-30	Col-31	Col-32	Col-33	Col-34	Col-35	Col-36
Depth (ft)	qc (tsf)	qc (tsf)	qc (tsf)	qc (tsf)	qc (tsf)	Rf (%)	u (ft)	Perm-k (cm/s)	Unit Wt (pcf)	T Stress (kPa)	U Stress (tsf)	E Stress (tsf)	N(60)ic (b/ft)	N(60)lc (b/ft)	Qr (tsf)	Fr (%)	Bq	FC (%)	Dr (%)	Phi (deg)	Es/qt (tsf)	YoungE (tsf)	Su (tsf)	OCR										
13.451	252.65	252.67	1.23	5.0E-02	120.0	0.807	0.000	0.807	0.807	0.807	0.000	42.3	48.1	312.06	0.76	0.00			95.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0										
13.517	243.28	243.28	1.37	5.0E-02	120.0	0.811	0.000	0.811	0.811	0.811	0.000	40.9	46.4	298.96	0.75	0.00			95.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0										
13.583	232.14	232.16	1.37	5.0E-02	120.0	0.815	0.000	0.815	0.815	0.815	0.000	39.2	44.4	293.87	0.76	0.00			93.7	46.0	-9999.0	-9999.0	-9999.0	-9999.0										
13.648	221.67	221.68	1.19	5.0E-02	120.0	0.819	0.000	0.819	0.819	0.819	0.000	37.6	42.5	289.70	0.75	0.00			92.3	46.0	-9999.0	-9999.0	-9999.0	-9999.0										
13.714	212.35	212.36	1.13	5.0E-02	120.0	0.823	0.000	0.823	0.823	0.823	0.000	36.2	40.8	287.08	0.75	0.00			91.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0										
13.779	207.87	207.89	1.17	5.0E-02	120.0	0.827	0.000	0.827	0.827	0.827	0.000	35.3	39.7	250.44	0.71	0.00			90.4	46.0	-9999.0	-9999.0	-9999.0	-9999.0										
13.845	204.62	204.63	1.09	5.0E-02	120.0	0.831	0.000	0.831	0.831	0.831	0.000	34.7	38.9	245.33	0.68	0.00			89.8	46.0	-9999.0	-9999.0	-9999.0	-9999.0										
13.911	205.19	205.20	1.19	5.0E-02	120.0	0.835	0.000	0.835	0.835	0.835	0.000	34.7	38.8	244.85	0.66	0.00			89.8	46.0	-9999.0	-9999.0	-9999.0	-9999.0										
13.976	205.95	205.96	1.31	5.0E-02	120.0	0.839	0.000	0.839	0.839	0.839	0.000	34.7	38.7	244.60	0.64	0.00			89.9	46.0	-9999.0	-9999.0	-9999.0	-9999.0										
14.042	205.06	205.07	1.17	5.0E-02	120.0	0.843	0.000	0.843	0.843	0.843	0.000	34.5	38.4	242.40	0.63	0.00			89.7	46.0	-9999.0	-9999.0	-9999.0	-9999.0										
14.107	201.93	201.94	1.27	5.0E-02	120.0	0.846	0.000	0.846	0.846	0.846	0.000	34.1	37.9	237.57	0.63	0.00			89.2	46.0	-9999.0	-9999.0	-9999.0	-9999.0										
14.173	198.35	198.37	1.23	5.0E-02	120.0	0.850	0.000	0.850	0.850	0.850	0.000	33.5	37.1	232.26	0.62	0.00			88.6	46.0	-9999.0	-9999.0	-9999.0	-9999.0										
14.239	196.76	196.77	1.20	5.0E-02	120.0	0.854	0.000	0.854	0.854	0.854	0.000	33.2	36.7	229.32	0.61	0.00			88.3	46.0	-9999.0	-9999.0	-9999.0	-9999.0										
14.304	199.75	199.77	1.18	5.0E-02	120.0	0.858	0.000	0.858	0.858	0.858	0.000	33.6	37.0	231.76	0.59	0.00			88.7	46.0	-9999.0	-9999.0	-9999.0	-9999.0										
14.370	206.53	206.55	1.17	5.0E-02	120.0	0.862	0.000	0.862	0.862	0.862	0.000	34.5	37.9	238.56	0.57	0.00			88.6	46.0	-9999.0	-9999.0	-9999.0	-9999.0										
14.436	214.96	214.98	1.20	5.0E-02	120.0	0.866	0.000	0.866	0.866	0.866	0.000	35.7	39.2	247.20	0.56	0.00			90.7	46.0	-9999.0	-9999.0	-9999.0	-9999.0										
14.501	223.65	223.67	1.24	5.0E-02	120.0	0.870	0.000	0.870	0.870	0.870	0.000	37.0	40.5	256.07	0.56	0.00			91.7	46.0	-9999.0	-9999.0	-9999.0	-9999.0										
14.567	236.55	236.57	1.33	5.0E-02	120.0	0.874	0.000	0.874	0.874	0.874	0.000	38.9	42.6	269.67	0.57	0.00			93.3	46.0	-9999.0	-9999.0	-9999.0	-9999.0										
14.632	248.43	248.45	1.36	5.0E-02	120.0	0.878	0.000	0.878	0.878	0.878	0.000	40.6	44.3	281.98	0.55	0.00			94.6	46.0	-9999.0	-9999.0	-9999.0	-9999.0										
14.698	259.68	259.70	1.42	5.0E-02	120.0	0.882	0.000	0.882	0.882	0.882	0.000	42.2	46.0	293.47	0.55	0.00			95.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0										
14.764	269.00	269.02	1.08	5.0E-02	120.0	0.886	0.000	0.886	0.886	0.886	0.000	42.4	46.1	302.68	0.40	0.00			95.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0										
14.829	278.40	278.41	1.20	5.0E+00	120.0	0.890	0.000	0.890	0.890	0.890	0.000	44.0	47.7	311.90	0.43	0.00			95.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0										
14.895	289.19	289.21	1.35	5.0E+00	120.0	0.894	0.000	0.894	0.894	0.894	0.000	45.9	49.6	322.61	0.47	0.00			95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0										
14.960	296.41	296.43	1.50	5.0E+00	120.0	0.898	0.000	0.898	0.898	0.898	0.000	47.3	51.0	329.23	0.51	0.00			95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0										
15.026	297.16	297.20	1.63	5.0E+00	120.0	0.902	0.000	0.902	0.902	0.902	0.000	48.3	52.0	328.64	0.62	0.00			95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0										
15.092	279.61	279.64	1.86	5.0E-02	120.0	0.906	0.000	0.906	0.906	0.906	0.000	46.3	49.5	307.82	0.67	0.00			95.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0										
15.157	291.56	291.58	1.91	5.0E-02	120.0	0.909	0.000	0.909	0.909	0.909	0.000	47.8	51.2	319.61	0.66	0.00			95.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0										
15.223	298.32	298.35	1.96	5.0E+00	120.0	0.913	0.000	0.913	0.913	0.913	0.000	48.8	52.2	325.64	0.66	0.00			95.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0										
15.289	294.36	294.39	2.00	5.0E-02	120.0	0.917	0.000	0.917	0.917	0.917	0.000	48.4	51.6	319.92	0.68	0.00			95.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0										
15.354	298.71	298.73	2.08	5.0E-02	120.0	0.921	0.000	0.921	0.921	0.921	0.000	49.2	52.3	323.26	0.70	0.00			95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0										
15.420	303.31	303.32	2.09	5.0E-02	120.0	0.925	0.000	0.925	0.925	0.925	0.000	49.8	52.9	326.84	0.69	0.00			95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0										
15.485	308.04	308.05	2.05	5.0E+00	120.0	0.929	0.000	0.929	0.929	0.929	0.000	50.4	53.4	330.55	0.67	0.00			95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0										
15.551	315.56	315.60	2.04	5.0E+00	120.0	0.933	0.000	0.933	0.933	0.933	0.000	51.3	54.3	337.23	0.65	0.00			95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0										
15.617	322.62	322.62	2.05	5.0E+00	120.0	0.937	0.000	0.937	0.937	0.937	0.000	52.3	55.2	343.31	0.64	0.00			95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0										
15.682	331.80	331.82	2.09	5.0E+00	120.0	0.941	0.000	0.941	0.941	0.941	0.000	53.6	56.4	351.65	0.63	0.00			95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0										
15.748	339.40	339.44	2.13	5.0E+00	120.0	0.945	0.000	0.945	0.945	0.945	0.000	54.7	57.5	358.24	0.63	0.00			95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0										
15.813	343.87	343.91	2.17	5.0E+00	120.0	0.949	0.000	0.949	0.949	0.949	0.000	55.4	58.1	361.46	0.63	0.00			95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0										
15.879	348.32	348.32	2.27	5.0E+00	120.0	0.953	0.000	0.953	0.953	0.953	0.000	56.2	58.9	364.59	0.65	0.00			95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0										
15.945	353.59	353.62	2.28	5.0E+00	120.0	0.957	0.000	0.957	0.957	0.957	0.000	56.9	59.5	368.62	0.65	0.00			95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0										
16.010	358.38	358.41	2.32	5.0E+00	120.0	0.961	0.000	0.961	0.961	0.961	0.000	57.7	60.1	372.09	0.65	0.00			95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0										
16.076	359.97	360.00	2.40	5.0E+00	120.0	0.965	0.000	0.965	0.965	0.965	0.000	58.1	60.4	372.22	0.67	0.00			95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0										
16.142	360.68	360.69	2.46	5.0E+00	120.0	0.969	0.000	0.969	0.969	0.969	0.000	58.3	60.6	371.41	0.68	0.00			95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0										
16.207	363.29	363.30	2.52	5.0E+00	120.0	0.972	0.000	0.972	0.972	0.972	0.000	58.8	61.0	372.59	0.69	0.00			95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0										
16.273	364.25	364.27	2.59	5.0E+00	120.0	0.976	0.000	0.976	0.976	0.976	0.000	59.1	61.2	372.08	0.71	0.00			95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0										
16.338	362.91	362.93	2.67	5.0E+00	120.0	0.980	0.000	0.980	0.980	0.980	0.000	61.0	66.9	373.78	0.73	0.00			95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0										
16.404	355.82	355.84	2.71	5.0E+00	120.0	0.984	0.000	0.984	0.984	0.984	0.000	60.8	66.8	366.56	0.74	0.00			95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0										
16.470	351.35	351.37	2.73	5.0E+00	120.0	0.988	0.000	0.988	0.988	0.988	0.000	58.4	60.0	359.09	0.76	0.00			95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0										
16.535	346.11	346.13	2.73	5.0E+00	120.0	0.992	0.000	0.992	0.992	0.992																								

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 q <sub>t</sub> (tsf)	Col-07 f <sub>s</sub> (tsf)	Col-08 R <sub>f</sub> (%)	Col-09 u (ft)	Col-14 Perm-k (cm/s)	Col-15 Unit Wt (pcf)	Col-16 T Stress (kPa)	Col-17 U Stress (tsf)	Col-18 E Stress (tsf)	Col-22 N <sub>1(60)</sub> (blf)	Col-23 N <sub>1(60)</sub> (blf)	Col-24 Q <sub>t</sub>	Col-25 Fr (%)	Col-26 B <sub>q</sub>	Col-28 FC (%)	Col-30 Dr (%)	Col-31 Phi (deg)	Col-33 Esq <sub>t</sub>	Col-34 YoungE (tsf)	Col-35 Su (tsf)	Col-36 OCR
17.913	272.39	272.41	2.02	0.74	1.37	5.0E-02	120.0	1.075	0.000	1.075	45.2	45.2	252.44	0.75	0.00	3.2	94.3	46.0	-9999.0	-9999.0	-9999.0	-9999.0
17.979	266.07	266.08	2.00	0.75	1.25	5.0E-02	120.0	1.079	0.000	1.079	45.0	44.3	245.65	0.76	0.00	3.3	93.6	46.0	-9999.0	-9999.0	-9999.0	-9999.0
18.044	261.74	261.74	1.97	0.75	1.35	5.0E-02	120.0	1.083	0.000	1.083	44.3	43.5	240.75	0.76	0.00	3.4	93.1	46.0	-9999.0	-9999.0	-9999.0	-9999.0
18.110	258.34	258.35	1.94	0.75	1.50	5.0E-02	120.0	1.087	0.000	1.087	43.8	43.0	236.76	0.76	0.00	3.5	92.7	46.0	-9999.0	-9999.0	-9999.0	-9999.0
18.176	255.65	255.67	1.91	0.75	1.41	5.0E-02	120.0	1.091	0.000	1.091	43.4	42.5	233.76	0.76	0.00	3.5	92.3	46.0	-9999.0	-9999.0	-9999.0	-9999.0
18.241	252.16	252.16	1.87	0.74	1.33	5.0E-02	120.0	1.095	0.000	1.095	42.8	41.8	229.38	0.75	0.00	3.6	91.9	46.0	-9999.0	-9999.0	-9999.0	-9999.0
18.307	248.81	248.83	1.87	0.75	1.27	5.0E-02	120.0	1.098	0.000	1.098	42.4	41.3	225.53	0.76	0.00	3.7	91.4	46.0	-9999.0	-9999.0	-9999.0	-9999.0
18.372	245.17	245.19	1.84	0.75	1.29	5.0E-02	120.0	1.102	0.000	1.102	41.8	40.7	221.42	0.76	0.00	3.7	91.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0
18.438	241.54	241.55	1.38	0.57	1.39	5.0E-02	120.0	1.106	0.000	1.106	40.2	39.1	217.34	0.58	0.00	2.9	90.5	46.0	-9999.0	-9999.0	-9999.0	-9999.0
18.504	237.00	237.02	1.42	0.60	1.31	5.0E-02	120.0	1.110	0.000	1.110	39.7	38.5	212.48	0.60	0.00	2.9	90.5	46.0	-9999.0	-9999.0	-9999.0	-9999.0
18.569	232.46	232.48	1.49	0.64	1.25	5.0E-02	120.0	1.114	0.000	1.114	38.3	37.6	207.65	0.65	0.00	3.3	89.3	46.0	-9999.0	-9999.0	-9999.0	-9999.0
18.635	228.63	228.64	1.52	0.67	0.57	5.0E-02	120.0	1.118	0.000	1.118	38.9	37.6	203.49	0.67	0.00	3.6	88.8	46.0	-9999.0	-9999.0	-9999.0	-9999.0
18.701	225.12	225.12	1.56	0.69	0.73	5.0E-02	120.0	1.122	0.000	1.122	38.5	37.1	199.63	0.70	0.00	3.9	88.6	46.0	-9999.0	-9999.0	-9999.0	-9999.0
18.766	212.02	212.04	1.56	0.74	1.64	5.0E-02	120.0	1.126	0.000	1.126	37.1	35.3	187.31	0.74	0.00	4.5	86.5	44.0	2.016	427.6	-9999.0	-9999.0
18.832	214.58	214.60	1.56	0.73	1.33	5.0E-02	120.0	1.130	0.000	1.130	36.7	35.8	188.92	0.73	0.00	4.3	86.8	44.0	2.038	437.3	-9999.0	-9999.0
18.897	216.69	216.70	1.57	0.73	1.17	5.0E-02	120.0	1.134	0.000	1.134	37.4	35.9	190.11	0.73	0.00	4.3	87.0	44.0	2.056	445.6	-9999.0	-9999.0
18.963	212.26	212.27	1.60	0.74	0.87	5.0E-02	120.0	1.138	0.000	1.138	37.5	36.0	189.95	0.74	0.00	4.4	87.0	44.0	2.059	447.3	-9999.0	-9999.0
19.029	216.82	216.83	1.60	0.74	0.85	5.0E-02	120.0	1.142	0.000	1.142	37.5	35.8	189.91	0.74	0.00	4.4	86.9	44.0	2.050	444.5	-9999.0	-9999.0
19.094	214.77	214.78	1.60	0.75	0.92	5.0E-02	120.0	1.146	0.000	1.146	37.2	35.5	186.47	0.75	0.00	4.5	86.6	44.0	2.026	435.2	-9999.0	-9999.0
19.160	212.47	212.47	1.60	0.75	0.75	5.0E-02	120.0	1.150	0.000	1.150	36.2	35.2	183.92	0.76	0.00	4.6	86.3	44.0	2.003	425.6	-9999.0	-9999.0
19.225	210.17	210.18	1.58	0.75	0.81	5.0E-02	120.0	1.154	0.000	1.154	36.5	34.8	181.20	0.76	0.00	4.7	85.9	44.0	1.983	416.9	-9999.0	-9999.0
19.291	209.21	209.22	1.58	0.76	0.83	5.0E-02	120.0	1.157	0.000	1.157	36.4	34.6	177.75	0.76	0.00	4.7	85.7	44.0	1.975	413.2	-9999.0	-9999.0
19.357	207.10	207.11	1.55	0.75	0.65	5.0E-02	120.0	1.161	0.000	1.161	36.1	34.2	179.32	0.75	0.00	4.7	85.4	44.0	1.961	406.1	-9999.0	-9999.0
19.422	205.76	205.77	1.49	0.73	0.90	5.0E-02	120.0	1.165	0.000	1.165	35.7	33.8	175.57	0.73	0.00	4.6	85.1	44.0	1.953	401.8	-9999.0	-9999.0
19.488	201.67	201.68	1.46	0.73	0.98	5.0E-02	120.0	1.169	0.000	1.169	35.1	33.2	171.48	0.73	0.00	4.7	84.5	44.0	1.936	390.4	-9999.0	-9999.0
19.554	193.31	193.32	1.42	0.64	0.74	5.0E-02	120.0	1.173	0.000	1.173	33.9	32.0	163.77	0.70	0.00	5.1	82.2	44.0	1.919	358.6	-9999.0	-9999.0
19.619	186.85	186.86	1.33	0.71	0.57	5.0E-02	120.0	1.177	0.000	1.177	32.8	30.9	157.73	0.72	0.00	5.0	81.3	44.0	1.919	358.6	-9999.0	-9999.0
19.685	181.30	181.31	1.17	0.65	0.24	5.0E-02	120.0	1.181	0.000	1.181	31.6	29.7	152.60	0.65	0.00	4.8	81.0	44.0	1.927	348.3	-9999.0	-9999.0
19.750	173.57	173.58	0.41	0.24	0.69	5.0E-02	120.0	1.185	0.000	1.185	28.2	28.5	145.47	0.24	0.00	1.6	80.0	44.0	1.944	337.5	-9999.0	-9999.0
19.816	162.84	162.84	0.40	0.25	0.61	5.0E-02	120.0	1.189	0.000	1.189	26.7	25.0	135.96	0.25	0.00	2.1	78.2	44.0	1.979	322.3	-9999.0	-9999.0
19.882	147.95	147.95	0.44	0.30	0.43	5.0E-02	120.0	1.193	0.000	1.193	24.9	23.3	123.03	0.30	0.00	3.1	75.4	42.0	2.039	301.7	-9999.0	-9999.0
19.947	133.38	133.39	0.48	0.36	0.37	5.0E-02	120.0	1.197	0.000	1.197	23.0	21.5	110.45	0.36	0.00	4.3	72.3	42.0	2.107	281.0	-9999.0	-9999.0
20.013	121.89	121.89	0.49	0.40	0.35	5.0E-02	120.0	1.201	0.000	1.201	21.5	20.0	100.51	0.41	0.00	5.0	69.7	42.0	2.168	264.3	-9999.0	-9999.0
20.078	104.12	104.13	0.48	0.46	0.96	5.0E-02	120.0	1.205	0.000	1.205	18.9	17.6	85.44	0.47	0.00	5.0	68.2	42.0	2.288	238.2	-9999.0	-9999.0
20.144	101.07	101.07	0.45	0.45	0.59	5.0E-02	120.0	1.209	0.000	1.209	18.4	17.1	82.62	0.45	0.00	5.0	64.2	42.0	2.315	234.0	-9999.0	-9999.0
20.210	98.95	98.95	0.41	0.42	0.31	5.0E-02	120.0	1.213	0.000	1.213	16.0	16.7	80.60	0.42	0.00	5.0	63.6	42.0	2.336	231.1	-9999.0	-9999.0
20.275	95.31	95.31	0.38	0.40	0.08	5.0E-02	120.0	1.217	0.000	1.217	17.3	16.1	77.35	0.40	0.00	5.0	62.5	40.0	2.372	226.1	-9999.0	-9999.0
20.341	90.33	90.33	0.38	0.42	0.26	5.0E-02	120.0	1.224	0.000	1.224	16.6	15.4	73.01	0.43	0.00	5.0	60.9	40.0	2.427	219.2	-9999.0	-9999.0
20.407	86.43	86.43	0.38	0.44	-0.26	5.0E-02	120.0	1.224	0.000	1.224	16.1	14.8	69.59	0.45	0.00	5.0	59.6	40.0	2.476	214.0	-9999.0	-9999.0
20.472	84.06	84.06	0.37	0.44	-0.45	5.0E-02	120.0	1.228	0.000	1.228	15.7	14.5	67.43	0.45	0.00	5.0	58.7	40.0	2.509	210.9	-9999.0	-9999.0
20.538	82.92	82.92	0.36	0.44	-0.26	5.0E-02	120.0	1.232	0.000	1.232	15.5	14.3	66.29	0.44	0.00	5.0	58.3	40.0	2.527	209.5	-9999.0	-9999.0
20.603	84.00	84.00	0.36	0.43	-0.33	5.0E-02	120.0	1.236	0.000	1.236	15.6	14.4	66.95	0.44	0.00	5.0	58.6	40.0	2.515	211.2	-9999.0	-9999.0
20.669	86.43	86.42	0.36	0.42	-0.57	5.0E-02	120.0	1.240	0.000	1.240	16.0	14.7	68.69	0.42	0.00	5.0	59.4	40.0	2.486	214.8	-9999.0	-9999.0
20.735	94.10	94.09	0.38	0.40	-0.37	5.0E-02	120.0	1.244	0.000	1.244	17.2	15.7	74.63	0.41	0.00	5.0	61.8	40.0	2.401	225.9	-9999.0	-9999.0
20.800	105.08	105.08	0.40	0.38	-0.26	5.0E-02	120.0	1.248	0.000	1.248	16.8	17.2	83.20	0.39	0.00	5.0	64.9	42.0	2.303	242.0	-9999.0	-9999.0
20.866	113.32	113.32	0.44	0.39	-0.33	5.0E-02	120.0	1.252	0.000	1.252	20.1	18.5	89.51	0.39	0.00	5.0	67.0	42.0	2.245	254.4	-9999.0	-9999.0
20.932	121.43	121.43	0.48	0.40	-0.22	5.0E-02	120.0	1.256	0.000	1.256	21.4	19.5	95.69	0.40	0.00	5.0	70.6	42.0	2.196	266.7	-9999.0	-9999.0
20.997	128.59	128.59	0.53	0.41	-0.22	5.0E-02	120.0	1.260	0.000	1.260	22.6	20.6	101.07	0.42	0.00	5.0	70.6	42.0	2.159	277.6	-9999.0	-9999.0
21.063	137.02	137.02	0.57	0.42	-0.12	5.0E-02	120.0	1.264	0.000	1.264	23.9	21.7	107.42	0.42	0.00	4.8	72.3	42.0	2.118	290.3	-9999.0	-9999.0
21.128	143.61	143.61	0.60	0.42	-0.22	5.0E-02	120.0	1.268	0.000	1.268	24.9	22.6	112.28	0.42	0.00	4.6	73.6	42.0	2.090	300.1	-9999.0	-9999.0
21.194	148.59	148.59	0.62	0.43	-0.16	5.0E-02	120.0	1.272	0.000	1.272	25.7	23.3	115.85	0.42	0.00	4.4	74.6	42.0	2.069	307.5	-9999.0	-9999.0
21.260	152.29	152.29	0.66	0.43	-0.0																	







Col-02	Col-05	Col-06	Col-07	Col-08	Col-09	Col-14	Col-15	Col-16	Col-17	Col-18	Col-22	Col-23	Col-24	Col-25	Col-26	Col-28	Col-30	Col-31	Col-33	Col-34	Col-35	Col-36
Depth (ft)	qc (tsf)	qt (tsf)	fs (tsf)	Rf (%)	u (ft)	Penn-k (cm/s)	Unit Wt (pcf)	T Stress (RPa)	U Stress (tsf)	E Stress (tsf)	N(60)/ic (tsf)	N1(60)/ic (tsf)	Qt (tsf)	Fr (%)	Bq	FC (%)	Dr (%)	Phi (deg)	Es/rt	YoungE (tsf)	Su (tsf)	OCR
31.299	9.64	9.83	0.57	5.81	17.05	5.0E-08	120.0	1.878	0.000	1.878	4.7	2.1	4.23	7.19	0.15	100.0	-9999.0	-9999.0	-9999.0	-9999.0	0.530	0.9
31.364	9.77	9.95	0.60	6.04	16.69	5.0E-08	120.0	1.882	0.000	1.882	4.8	2.2	4.29	7.45	0.15	100.0	-9999.0	-9999.0	-9999.0	-9999.0	0.538	1.0
31.430	9.90	10.08	0.61	6.06	16.69	5.0E-08	120.0	1.886	0.000	1.886	4.8	2.2	4.35	7.46	0.15	100.0	-9999.0	-9999.0	-9999.0	-9999.0	0.547	1.0
31.496	10.15	10.34	0.62	6.01	16.83	5.0E-08	120.0	1.890	0.000	1.890	4.9	2.2	4.47	7.36	0.14	100.0	-9999.0	-9999.0	-9999.0	-9999.0	0.563	1.0
31.561	9.96	10.15	0.62	6.13	16.85	5.0E-08	120.0	1.894	0.000	1.894	4.9	2.2	4.36	7.53	0.15	100.0	-9999.0	-9999.0	-9999.0	-9999.0	0.550	1.0
31.627	10.22	10.41	0.62	5.97	17.03	5.0E-08	120.0	1.898	0.000	1.898	4.9	2.2	4.49	7.30	0.14	100.0	-9999.0	-9999.0	-9999.0	-9999.0	0.567	1.0
31.693	10.35	10.53	0.66	6.28	16.83	5.0E-08	120.0	1.902	0.000	1.902	5.0	2.3	4.54	7.87	0.14	100.0	-9999.0	-9999.0	-9999.0	-9999.0	0.575	1.0
31.759	9.71	9.90	0.67	6.79	16.83	5.0E-08	120.0	1.906	0.000	1.906	5.0	2.2	4.19	8.41	0.15	100.0	-9999.0	-9999.0	-9999.0	-9999.0	0.533	0.9
31.824	9.83	10.01	0.68	6.81	16.75	5.0E-08	120.0	1.909	0.000	1.909	5.0	2.2	4.24	8.41	0.15	100.0	-9999.0	-9999.0	-9999.0	-9999.0	0.540	0.9
31.889	10.54	10.71	0.67	6.27	16.57	5.0E-08	120.0	1.913	0.000	1.913	5.1	2.3	4.60	7.63	0.14	100.0	-9999.0	-9999.0	-9999.0	-9999.0	0.587	1.0
31.955	10.22	10.40	0.64	6.17	16.21	5.0E-08	120.0	1.917	0.000	1.917	5.0	2.2	4.42	7.56	0.14	100.0	-9999.0	-9999.0	-9999.0	-9999.0	0.566	1.0
32.021	9.90	10.06	0.63	6.28	14.45	5.0E-08	120.0	1.921	0.000	1.921	4.9	2.2	4.30	7.76	0.13	100.0	-9999.0	-9999.0	-9999.0	-9999.0	0.543	0.9
32.086	10.03	10.20	0.61	6.00	15.09	5.0E-08	120.0	1.925	0.000	1.925	4.9	2.2	4.30	7.39	0.13	100.0	-9999.0	-9999.0	-9999.0	-9999.0	0.551	1.0
32.152	10.42	10.59	0.60	5.68	16.08	5.0E-08	120.0	1.929	0.000	1.929	5.0	2.2	4.49	6.95	0.13	98.1	-9999.0	-9999.0	-9999.0	-9999.0	0.577	1.0
32.217	10.03	10.22	0.59	5.79	16.83	5.0E-08	120.0	1.933	0.000	1.933	4.9	2.1	4.28	7.14	0.15	100.0	-9999.0	-9999.0	-9999.0	-9999.0	0.552	1.0
32.283	10.54	10.73	0.57	5.33	17.70	5.0E-08	120.0	1.937	0.000	1.937	4.9	2.2	4.54	6.50	0.15	96.2	-9999.0	-9999.0	-9999.0	-9999.0	0.586	1.0
32.349	10.15	10.35	0.57	5.52	17.95	5.0E-08	120.0	1.941	0.000	1.941	4.9	2.1	4.33	6.80	0.15	98.8	-9999.0	-9999.0	-9999.0	-9999.0	0.561	1.0
32.414	10.09	10.29	0.55	5.36	18.09	5.0E-08	120.0	1.945	0.000	1.945	4.8	2.1	4.29	6.61	0.16	98.4	-9999.0	-9999.0	-9999.0	-9999.0	0.556	1.0
32.480	10.28	10.48	0.54	5.16	18.19	5.0E-08	120.0	1.949	0.000	1.949	4.8	2.1	4.38	6.34	0.15	98.8	-9999.0	-9999.0	-9999.0	-9999.0	0.569	1.0
32.546	9.45	9.65	0.55	5.71	18.05	5.0E-08	120.0	1.953	0.000	1.953	4.7	2.0	3.94	7.16	0.17	100.0	-9999.0	-9999.0	-9999.0	-9999.0	0.513	0.9
32.611	10.03	10.23	0.54	5.29	18.21	5.0E-08	120.0	1.957	0.000	1.957	4.8	2.1	4.23	6.54	0.16	98.7	-9999.0	-9999.0	-9999.0	-9999.0	0.552	0.9
32.677	9.39	9.59	0.53	5.54	18.27	5.0E-08	120.0	1.961	0.000	1.961	4.7	2.0	3.69	6.96	0.17	100.0	-9999.0	-9999.0	-9999.0	-9999.0	0.509	0.9
32.742	9.64	9.85	0.53	5.40	18.80	5.0E-08	120.0	1.965	0.000	1.965	4.7	2.0	4.01	6.74	0.17	100.0	-9999.0	-9999.0	-9999.0	-9999.0	0.525	0.9
32.808	10.03	10.24	0.54	5.29	18.96	5.0E-08	120.0	1.969	0.000	1.969	4.8	2.1	4.20	6.55	0.17	98.9	-9999.0	-9999.0	-9999.0	-9999.0	0.551	0.9
32.874	10.48	10.68	0.55	5.16	19.24	5.0E-08	120.0	1.972	0.000	1.972	4.8	2.1	4.42	6.33	0.17	96.4	-9999.0	-9999.0	-9999.0	-9999.0	0.581	1.0
32.939	9.83	10.04	0.56	5.59	19.18	5.0E-08	120.0	1.976	0.000	1.976	4.8	2.1	4.08	6.96	0.16	100.0	-9999.0	-9999.0	-9999.0	-9999.0	0.538	0.9
33.005	10.03	10.24	0.57	5.58	18.74	5.0E-08	120.0	1.980	0.000	1.980	4.9	2.1	4.17	6.82	0.16	100.0	-9999.0	-9999.0	-9999.0	-9999.0	0.550	0.9
33.070	10.15	10.35	0.56	5.42	18.19	5.0E-08	120.0	1.984	0.000	1.984	4.9	2.1	4.22	6.41	0.16	100.0	-9999.0	-9999.0	-9999.0	-9999.0	0.568	0.9
33.136	10.67	10.86	0.57	5.26	18.01	5.0E-08	120.0	1.988	0.000	1.988	5.0	2.1	4.46	6.44	0.15	96.5	-9999.0	-9999.0	-9999.0	-9999.0	0.591	1.0
33.202	10.09	10.29	0.57	5.55	17.76	5.0E-08	120.0	1.992	0.000	1.992	4.9	2.1	4.16	6.69	0.15	100.0	-9999.0	-9999.0	-9999.0	-9999.0	0.553	0.9
33.267	10.09	10.29	0.58	5.65	17.78	5.0E-08	120.0	1.996	0.000	1.996	4.9	2.1	4.15	7.01	0.15	100.0	-9999.0	-9999.0	-9999.0	-9999.0	0.563	0.9
33.333	9.13	9.32	0.56	6.02	17.56	5.0E-08	120.0	2.000	0.000	2.000	4.8	2.0	3.86	7.67	0.17	100.0	-9999.0	-9999.0	-9999.0	-9999.0	0.488	0.8
33.399	9.20	9.39	0.55	5.87	17.42	5.0E-08	120.0	2.004	0.000	2.004	4.8	2.0	3.69	7.46	0.17	100.0	-9999.0	-9999.0	-9999.0	-9999.0	0.484	0.8
33.464	9.07	9.26	0.54	5.85	17.50	5.0E-08	120.0	2.008	0.000	2.008	4.7	1.9	3.61	7.08	0.17	100.0	-9999.0	-9999.0	-9999.0	-9999.0	0.482	0.8
33.530	9.26	9.45	0.54	5.73	17.82	5.0E-08	120.0	2.012	0.000	2.012	4.8	1.9	3.70	7.27	0.17	100.0	-9999.0	-9999.0	-9999.0	-9999.0	0.496	0.8
33.595	9.32	9.52	0.53	5.58	18.19	5.0E-08	120.0	2.016	0.000	2.016	4.8	1.9	3.72	7.19	0.17	100.0	-9999.0	-9999.0	-9999.0	-9999.0	0.500	0.9
33.661	9.07	9.27	0.52	5.62	18.35	5.0E-08	120.0	2.020	0.000	2.020	4.7	1.9	3.59	7.19	0.18	100.0	-9999.0	-9999.0	-9999.0	-9999.0	0.483	0.8
33.727	8.81	9.01	0.51	5.68	18.03	5.0E-08	120.0	2.024	0.000	2.024	4.7	1.9	3.45	7.32	0.19	100.0	-9999.0	-9999.0	-9999.0	-9999.0	0.466	0.8
33.792	8.86	9.07	0.49	5.42	17.50	5.0E-08	120.0	2.028	0.000	2.028	4.6	1.8	3.47	6.97	0.18	100.0	-9999.0	-9999.0	-9999.0	-9999.0	0.470	0.8
33.858	8.30	8.49	0.49	5.79	17.19	5.0E-08	120.0	2.032	0.000	2.032	4.6	1.8	3.18	7.61	0.19	100.0	-9999.0	-9999.0	-9999.0	-9999.0	0.430	0.8
33.923	8.30	8.49	0.48	5.67	17.62	5.0E-08	120.0	2.035	0.000	2.035	4.5	1.8	3.17	7.45	0.20	100.0	-9999.0	-9999.0	-9999.0	-9999.0	0.430	0.8
33.989	8.81	9.01	0.48	5.34	18.05	5.0E-08	120.0	2.039	0.000	2.039	4.6	1.8	3.42	6.91	0.19	100.0	-9999.0	-9999.0	-9999.0	-9999.0	0.464	0.8
34.055	8.75	8.95	0.47	5.27	18.23	5.0E-08	120.0	2.043	0.000	2.043	4.6	1.8	3.38	6.82	0.19	100.0	-9999.0	-9999.0	-9999.0	-9999.0	0.460	0.8
34.120	8.81	9.01	0.45	5.01	18.47	5.0E-08	120.0	2.047	0.000	2.047	4.5	1.8	3.40	6.48	0.19	100.0	-9999.0	-9999.0	-9999.0	-9999.0	0.464	0.8
34.186	9.77	9.97	0.44	4.42	18.96	5.0E-08	120.0	2.051	0.000	2.051	4.7	1.9	3.66	5.57	0.17	97.9	-9999.0	-9999.0	-9999.0	-9999.0	0.528	0.9
34.252	9.13	9.33	0.43	4.62	18.64	5.0E-08	120.0	2.055	0.000	2.055	4.5	1.8	3.54	5.92	0.18	100.0	-9999.0	-9999.0	-9999.0	-9999.0	0.485	0.8
34.317	9.01	9.21	0.44	4.79	18.17	5.0E-08	120.0	2.059	0.000	2.059	4.6	1.8	3.47	6.17	0.18	100.0	-9999.0	-9999.0	-9999.0	-9999.0	0.477	0.8
34.383	9.26	9.46	0.46	4.87	18.56	5.0E-08	120.0	2.063	0.000	2.063	4.6	1.8	3.59	6.23	0.18	100.0	-9999.0	-9999.0	-9999.0	-9999.0	0.493	0.8
34.448	9.32	9.53	0.47	4.95	18.97	5.0E-08	120.0	2.067	0.000	2.067	4.7	1.9	3.61	6.32	0.18	100.0	-9999.0	-9999.0	-9999.0	-9999.0	0.497	0.8
34.514	9.83	10.04	0.47	4.69	19.05	5.0E-08	120.0	2.071	0.000	2.071	4.8	1.9	3.65	5.81	0.17	100.0	-9999.0	-9999.0	-9999.0	-9999.0	0.531	0.9
34.580	8.94	9.15	0.46	5.04	19.03	5.0E-08	120.0	2.075	0.000	2.075	4.6	1.8	3.41	6.52	0.19	100.0	-9999.0	-9999.0	-9999.0	-9999.0	0.472	0.8
34.645	8.69	8.90	0.47	5.29	19.18	5.0E-08	120.0	2.079	0.000	2.079												

Col-02	Col-05	Col-06	Col-07	Col-08	Col-09	Col-14	Col-15	Col-16	Col-17	Col-18	Col-22	Col-23	Col-24	Col-25	Col-26	Col-28	Col-30	Col-31	Col-33	Col-34	Col-35	Col-36	
Depth	qc	qt	fs	Rf	u	Perm-k	Unit Wt	T Stress	U Stress	E Stress	N(60)lc	N(100)lc	QI	Fr	Bq	FC	Dr	Phi	Es/qt	YoungE	Su	OCR	
(ft)	(tsf)	(tsf)	(tsf)	(%)	(ft)	(cm/s)	(pcf)	(KPa)	(tsf)	(tsf)	(bft)	(bft)		(%)		(%)	(%)	(deg)		(tsf)			
35.761	5.68	5.84	0.22	3.71	24.00	5.0E-08	120.0	2.146	0.000	2.146	3.8	1.2	1.77	5.81	0.46	100.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.253	0.6
35.826	5.68	5.96	0.20	3.36	25.57	5.0E-08	120.0	2.150	0.000	2.150	3.7	1.1	1.77	5.26	0.48	100.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.254	0.6
35.892	6.27	6.55	0.20	3.06	26.51	5.0E-08	120.0	2.154	0.000	2.154	3.7	1.2	2.04	4.56	0.43	100.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.293	0.6
35.958	6.46	6.75	0.22	3.27	27.02	5.0E-08	120.0	2.158	0.000	2.158	3.8	1.2	2.13	4.80	0.42	100.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.306	0.6
36.023	6.20	6.49	0.24	3.71	27.59	5.0E-08	120.0	2.161	0.000	2.161	3.9	1.2	2.00	5.55	0.46	100.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.289	0.6
36.089	6.78	7.08	0.24	3.40	28.45	5.0E-08	120.0	2.165	0.000	2.165	3.9	1.3	2.27	4.89	0.42	100.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.328	0.6
36.154	6.78	7.09	0.27	3.82	28.56	5.0E-08	120.0	2.169	0.000	2.169	4.0	1.3	2.27	5.51	0.42	100.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.328	0.6
36.220	8.05	8.38	0.26	3.11	30.52	5.0E-07	120.0	2.173	0.000	2.173	4.1	1.4	2.86	4.20	0.35	100.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.414	0.7
36.286	11.50	11.86	0.24	2.03	33.87	5.0E-06	120.0	2.177	0.000	2.177	4.6	1.8	4.45	2.48	0.25	77.1	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	0.646	1.0
36.351	20.12	20.50	0.26	1.27	35.73	5.0E-05	120.0	2.181	0.000	2.181	6.2	2.7	8.40	1.42	0.14	51.5	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	1.222	2.0
36.417	29.89	30.11	0.28	0.93	19.91	5.0E-04	120.0	2.185	0.000	2.185	8.0	3.6	12.78	1.01	0.05	38.4	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
36.482	38.01	38.09	0.32	0.84	7.54	5.0E-04	120.0	2.189	0.000	2.189	8.9	6.1	16.40	0.89	0.02	25.5	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
36.548	48.14	41.17	0.36	0.68	3.04	5.0E-04	120.0	2.193	0.000	2.193	9.5	6.6	17.78	0.93	0.01	24.6	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
36.614	41.58	41.62	0.41	0.96	2.53	5.0E-04	120.0	2.197	0.000	2.197	9.7	6.7	17.94	1.04	0.00	25.5	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
36.679	42.48	42.51	0.43	1.01	2.23	5.0E-04	120.0	2.201	0.000	2.201	9.9	6.8	18.31	1.07	0.00	25.5	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
36.745	42.10	42.12	0.45	1.07	2.02	5.0E-04	120.0	2.205	0.000	2.205	9.9	6.8	18.11	1.13	0.00	26.1	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
36.811	43.05	43.07	0.48	1.12	1.86	5.0E-04	120.0	2.209	0.000	2.209	10.1	7.0	18.50	1.18	0.00	26.2	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
36.876	43.95	43.96	0.51	1.16	1.45	5.0E-04	120.0	2.213	0.000	2.213	10.3	7.1	18.87	1.22	0.00	26.3	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
36.942	45.16	45.17	0.52	1.15	1.23	5.0E-04	120.0	2.217	0.000	2.217	10.6	7.3	19.38	1.21	0.00	25.8	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
37.007	45.99	46.00	0.53	1.15	1.08	5.0E-04	120.0	2.220	0.000	2.220	10.7	7.4	19.72	1.21	0.00	25.6	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
37.073	47.01	47.03	0.53	1.13	1.06	5.0E-04	120.0	2.224	0.000	2.224	10.9	7.5	20.14	1.19	0.00	25.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
37.139	48.55	48.56	0.53	1.09	0.90	5.0E-04	120.0	2.228	0.000	2.228	11.2	7.6	20.79	1.15	0.00	24.3	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
37.204	49.57	49.57	0.52	1.05	0.43	5.0E-04	120.0	2.232	0.000	2.232	11.3	7.7	21.21	1.10	0.00	23.6	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
37.270	49.95	49.96	0.52	1.04	0.49	5.0E-04	120.0	2.236	0.000	2.236	11.4	7.8	21.34	1.09	0.00	23.5	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
37.336	50.15	50.16	0.52	1.04	0.49	5.0E-04	120.0	2.240	0.000	2.240	11.4	7.8	21.36	1.09	0.00	23.4	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
37.401	49.95	49.95	0.55	1.10	0.31	5.0E-04	120.0	2.244	0.000	2.244	11.3	7.7	20.74	1.23	0.00	24.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
37.467	48.87	48.87	0.57	1.17	0.28	5.0E-04	120.0	2.248	0.000	2.248	11.3	7.7	20.74	1.23	0.00	24.9	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
37.532	48.04	48.04	0.63	1.31	0.28	5.0E-04	120.0	2.252	0.000	2.252	11.3	7.7	20.33	1.38	0.00	26.3	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
37.598	45.99	45.99	0.76	1.66	0.18	5.0E-04	120.0	2.256	0.000	2.256	12.1	5.3	19.39	1.74	0.00	36.7	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
37.664	43.76	43.76	0.99	2.27	0.02	5.0E-05	120.0	2.260	0.000	2.260	12.1	5.3	18.36	2.39	0.00	41.8	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
37.729	41.59	41.59	1.04	2.51	0.20	5.0E-05	120.0	2.264	0.000	2.264	11.8	5.1	17.37	2.65	0.00	44.3	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
37.795	37.56	37.56	1.00	2.67	0.22	5.0E-05	120.0	2.268	0.000	2.268	11.0	4.7	15.56	2.84	0.00	47.5	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
37.860	34.66	34.66	0.95	2.75	0.35	5.0E-05	120.0	2.272	0.000	2.272	10.4	4.5	14.27	2.94	0.00	49.9	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
37.926	33.96	33.96	0.90	2.65	0.73	5.0E-05	120.0	2.276	0.000	2.276	10.2	4.3	13.94	2.84	0.00	48.9	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
37.992	36.11	36.63	0.92	2.52	1.64	5.0E-05	120.0	2.280	0.000	2.280	10.7	4.6	15.07	2.69	0.00	47.4	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
38.057	48.17	48.17	0.92	1.91	5.61	5.0E-04	120.0	2.283	0.000	2.283	12.8	5.6	20.09	2.01	0.01	37.8	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
38.123	65.80	65.90	0.79	1.20	8.89	5.0E-04	120.0	2.287	0.000	2.287	14.6	9.9	27.81	1.24	0.01	21.1	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
38.189	79.78	79.86	0.83	1.04	7.21	5.0E-03	120.0	2.291	0.000	2.291	16.9	11.4	33.85	1.07	0.01	17.6	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
38.254	89.44	89.49	0.89	1.00	4.76	5.0E-03	120.0	2.295	0.000	2.295	16.6	12.5	37.99	1.02	0.00	16.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
38.320	93.59	93.63	0.93	1.00	3.97	5.0E-03	120.0	2.299	0.000	2.299	19.3	13.0	39.72	1.02	0.00	15.5	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
38.385	95.82	95.86	0.95	0.99	3.64	5.0E-03	120.0	2.303	0.000	2.303	19.7	13.3	40.62	1.02	0.00	15.2	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
38.451	95.18	95.21	0.98	1.03	2.80	5.0E-03	120.0	2.307	0.000	2.307	19.7	13.2	40.27	1.06	0.00	15.6	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
38.517	95.88	95.91	1.02	1.07	2.57	5.0E-03	120.0	2.311	0.000	2.311	19.9	13.4	40.50	1.09	0.00	15.8	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
38.582	94.99	95.02	1.06	1.12	2.41	5.0E-03	120.0	2.315	0.000	2.315	19.8	13.3	40.04	1.15	0.00	16.3	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
38.648	95.06	95.09	1.10	1.16	2.27	5.0E-03	120.0	2.319	0.000	2.319	19.9	13.4	40.00	1.19	0.00	16.6	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
38.713	94.35	94.37	1.13	1.20	2.25	5.0E-03	120.0	2.323	0.000	2.323	19.9	13.3	39.63	1.23	0.00	16.9	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
38.779	91.99	92.02	1.15	1.25	2.07	5.0E-03	120.0	2.327	0.000	2.327	19.5	13.1	36.55	1.29	0.00	17.6	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
38.845	89.88	89.90	1.16	1.29	1.90	5.0E-03	120.0	2.331	0.000	2.331	19.2	12.9	37.57	1.33	0.00	18.1	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
38.910	87.01	87.03	1.16	1.34	1.84	5.0E-03	120.0	2.335	0.000	2.335	18.7	12											

Col-02	Col-05	Col-06	Col-07	Col-08	Col-09	Col-14	Col-15	Col-16	Col-17	Col-18	Col-22	Col-23	Col-24	Col-25	Col-26	Col-28	Col-30	Col-31	Col-33	Col-34	Col-35	Col-36
Depth	qc	qt	fs	Rf	u	Prem-k	Unit Wt	T Stress	U Stress	E Stress	N(60)lc	NT(60)lc	Ql	Fr	Bq	FC	Dr	Phi	Es/qt	YoungE	Su	OCR
(ft)	(tsf)	(tsf)	(tsf)	(%)	(ft)	(c/s)	(pcf)	(KPa)	(tsf)	(tsf)	(b/ft)	(b/ft)	(in)	(%)	(%)	(%)	(%)	(deg)	(tsf)	(tsf)	(tsf)	(%)
40.223	147.25	147.26	1.61	1.10	1.27	5.0E-03	120.0	2.413	0.000	2.413	29.0	19.1	60.02	1.11	0.00	12.0	65.1	40.0	2.520	371.2	-9999.0	-9999.0
40.288	154.92	154.93	1.77	1.15	1.29	5.0E-03	120.0	2.417	0.000	2.417	30.4	20.0	63.09	1.16	0.00	11.9	66.6	40.0	2.477	383.8	-9999.0	-9999.0
40.354	162.13	162.13	1.91	1.18	1.45	5.0E-03	120.0	2.421	0.000	2.421	31.8	20.9	65.97	1.20	0.00	11.8	67.8	40.0	2.440	395.7	-9999.0	-9999.0
40.419	169.09	169.11	2.05	1.22	1.58	5.0E-03	120.0	2.425	0.000	2.425	33.1	21.7	68.73	1.23	0.00	11.6	69.0	40.0	2.407	407.1	-9999.0	-9999.0
40.485	174.52	174.54	2.20	1.26	1.82	5.0E-03	120.0	2.429	0.000	2.429	34.1	22.4	70.85	1.28	0.00	11.6	69.9	40.0	2.383	416.0	-9999.0	-9999.0
40.551	179.06	179.08	2.20	1.23	1.74	5.0E-02	120.0	2.433	0.000	2.433	34.8	22.8	72.60	1.24	0.00	11.2	70.6	40.0	2.364	423.4	-9999.0	-9999.0
40.616	182.89	182.91	2.19	1.19	1.92	5.0E-02	120.0	2.437	0.000	2.437	35.4	23.2	74.06	1.21	0.00	10.9	71.2	40.0	2.349	429.6	-9999.0	-9999.0
40.682	186.85	186.87	2.19	1.17	1.92	5.0E-02	120.0	2.441	0.000	2.441	36.0	23.5	75.56	1.18	0.00	10.6	71.8	40.0	2.333	436.0	-9999.0	-9999.0
40.748	192.22	192.24	2.16	1.13	1.80	5.0E-02	120.0	2.445	0.000	2.445	36.7	24.0	77.63	1.14	0.00	10.1	72.6	40.0	2.312	444.4	-9999.0	-9999.0
40.813	198.48	198.50	2.17	1.09	1.96	5.0E-02	120.0	2.449	0.000	2.449	37.6	24.6	80.06	1.10	0.00	9.6	73.5	40.0	2.287	454.0	-9999.0	-9999.0
40.879	203.92	203.94	2.22	0.95	2.37	5.0E-02	120.0	2.453	0.000	2.453	39.9	26.0	86.00	1.03	0.00	8.7	75.5	40.0	2.229	475.6	-9999.0	-9999.0
40.944	213.37	213.39	2.22	0.85	2.61	5.0E-02	120.0	2.457	0.000	2.457	42.8	27.9	93.62	0.96	0.00	7.8	78.0	40.0	2.186	502.3	-9999.0	-9999.0
41.010	255.06	255.11	2.27	0.89	2.63	5.0E-02	120.0	2.461	0.000	2.461	46.0	30.0	102.67	0.90	0.00	6.6	80.6	40.0	2.086	532.1	-9999.0	-9999.0
41.076	274.38	274.41	2.29	0.82	2.80	5.0E-02	120.0	2.465	0.000	2.465	48.8	31.8	110.34	0.84	0.00	5.8	82.7	40.0	2.048	562.1	-9999.0	-9999.0
41.141	283.89	283.92	2.34	0.82	2.78	5.0E-02	120.0	2.469	0.000	2.469	50.2	32.7	114.02	0.83	0.00	5.6	83.6	40.0	2.043	580.1	-9999.0	-9999.0
41.207	286.06	286.09	2.37	0.83	2.72	5.0E-02	120.0	2.472	0.000	2.472	50.6	32.9	114.71	0.83	0.00	5.6	83.8	40.0	2.044	584.7	-9999.0	-9999.0
41.272	285.61	285.64	2.45	0.86	2.92	5.0E-02	120.0	2.476	0.000	2.476	50.7	32.9	114.35	0.86	0.00	5.8	83.9	40.0	2.045	583.9	-9999.0	-9999.0
41.338	287.24	287.24	2.24	0.78	3.18	5.0E-02	120.0	2.480	0.000	2.480	50.5	32.8	114.81	0.79	0.00	5.2	83.7	40.0	2.045	587.3	-9999.0	-9999.0
41.404	290.46	290.50	1.99	0.69	3.56	5.0E-02	120.0	2.484	0.000	2.484	50.4	32.7	115.94	0.69	0.00	4.6	84.2	40.0	2.047	594.6	-9999.0	-9999.0
41.469	296.41	296.45	2.05	0.69	3.46	5.0E-02	120.0	2.488	0.000	2.488	51.4	32.3	118.14	0.70	0.00	4.5	84.7	40.0	2.054	609.0	-9999.0	-9999.0
41.535	306.18	306.22	2.16	0.70	3.56	5.0E-02	120.0	2.492	0.000	2.492	52.9	34.3	121.87	0.71	0.00	4.4	85.6	40.0	2.080	636.9	-9999.0	-9999.0
41.601	314.42	314.46	2.34	0.71	3.85	5.0E-02	120.0	2.496	0.000	2.496	54.3	35.1	124.96	0.72	0.00	4.3	86.4	40.0	2.116	665.4	-9999.0	-9999.0
41.666	299.23	299.28	2.24	0.78	3.09	5.0E-02	120.0	2.500	0.000	2.500	52.4	33.9	116.71	0.79	0.00	5.0	84.9	40.0	2.060	616.5	-9999.0	-9999.0
41.732	322.28	322.34	2.43	0.75	4.96	5.0E-02	120.0	2.504	0.000	2.504	55.8	36.0	127.73	0.76	0.00	4.5	87.0	40.0	2.164	687.5	-9999.0	-9999.0
41.797	324.78	324.83	2.49	0.77	4.66	5.0E-02	120.0	2.508	0.000	2.508	56.3	36.3	128.52	0.77	0.00	4.5	87.2	40.0	-9999.0	-9999.0	-9999.0	-9999.0
41.863	319.02	319.07	2.54	0.79	4.42	5.0E-02	120.0	2.512	0.000	2.512	55.6	35.9	126.03	0.80	0.00	4.8	86.0	40.0	2.139	682.4	-9999.0	-9999.0
41.929	308.29	308.33	2.56	0.83	3.97	5.0E-02	120.0	2.516	0.000	2.516	54.2	34.9	121.56	0.84	0.00	5.2	85.7	40.0	2.084	642.6	-9999.0	-9999.0
41.994	300.18	300.22	2.56	0.85	3.99	5.0E-02	120.0	2.520	0.000	2.520	53.0	34.1	118.15	0.86	0.00	5.5	84.9	40.0	2.061	618.7	-9999.0	-9999.0
42.060	289.38	289.42	2.53	0.87	3.87	5.0E-02	120.0	2.524	0.000	2.524	51.5	33.1	113.66	0.88	0.00	5.9	83.8	40.0	2.049	592.9	-9999.0	-9999.0
42.125	277.31	277.35	2.49	0.90	3.66	5.0E-02	120.0	2.528	0.000	2.528	49.7	31.9	108.73	0.90	0.00	6.9	79.7	40.0	2.118	533.3	-9999.0	-9999.0
42.191	268.34	268.34	2.43	0.92	3.29	5.0E-02	120.0	2.532	0.000	2.532	48.3	31.0	105.00	0.91	0.00	6.3	82.6	40.0	2.055	570.0	-9999.0	-9999.0
42.257	262.56	262.59	2.37	0.90	3.33	5.0E-02	120.0	2.535	0.000	2.535	47.4	30.4	102.57	0.91	0.00	6.6	81.0	40.0	2.085	547.6	-9999.0	-9999.0
42.322	256.86	256.90	2.30	0.89	3.29	5.0E-02	120.0	2.539	0.000	2.539	46.4	29.8	100.17	0.90	0.00	6.7	80.3	40.0	2.102	539.9	-9999.0	-9999.0
42.388	251.76	251.80	2.25	0.89	3.31	5.0E-02	120.0	2.543	0.000	2.543	45.6	29.2	98.00	0.90	0.00	6.8	79.6	40.0	2.123	531.7	-9999.0	-9999.0
42.454	250.35	250.38	2.19	0.85	3.50	5.0E-02	120.0	2.547	0.000	2.547	45.3	29.0	97.30	0.86	0.00	6.6	79.9	40.0	2.116	535.7	-9999.0	-9999.0
42.519	253.09	253.13	2.16	0.87	3.42	5.0E-02	120.0	2.551	0.000	2.551	45.6	29.2	98.22	0.86	0.00	6.6	79.9	40.0	2.106	535.6	-9999.0	-9999.0
42.585	260.19	260.23	2.17	0.83	3.68	5.0E-02	120.0	2.555	0.000	2.555	46.6	29.8	100.85	0.84	0.00	6.3	80.6	40.0	2.086	545.5	-9999.0	-9999.0
42.650	271.88	271.92	2.20	0.81	3.70	5.0E-02	120.0	2.559	0.000	2.559	48.3	30.9	105.26	0.82	0.00	5.8	81.9	40.0	2.070	562.8	-9999.0	-9999.0
42.716	282.81	282.91	2.26	0.80	4.03	5.0E-02	120.0	2.563	0.000	2.563	50.0	31.9	109.38	0.80	0.00	5.5	83.0	40.0	2.055	581.4	-9999.0	-9999.0
42.782	284.57	284.57	2.31	0.81	4.03	5.0E-02	120.0	2.567	0.000	2.567	50.4	32.1	109.66	0.82	0.00	5.6	83.1	40.0	2.054	584.6	-9999.0	-9999.0
42.847	277.69	277.74	2.34	0.84	4.07	5.0E-02	120.0	2.571	0.000	2.571	49.5	31.5	107.03	0.85	0.00	5.9	82.4	40.0	2.062	578.8	-9999.0	-9999.0
42.913	284.66	284.71	2.36	0.88	4.05	5.0E-02	120.0	2.575	0.000	2.575	47.7	30.4	101.81	0.80	0.00	6.6	81.0	40.0	2.090	573.1	-9999.0	-9999.0
42.978	252.65	252.68	2.37	0.94	3.63	5.0E-02	120.0	2.579	0.000	2.579	46.0	29.3	96.98	0.95	0.00	7.2	78.7	40.0	2.125	537.0	-9999.0	-9999.0
43.044	244.85	244.89	2.36	0.96	3.78	5.0E-02	120.0	2.583	0.000	2.583	44.9	28.5	93.82	0.97	0.00	7.5	78.7	40.0	2.152	527.0	-9999.0	-9999.0
43.110	240.19	240.23	2.31	0.96	3.66	5.0E-02	120.0	2.587	0.000	2.587	44.1	28.0	91.87	0.97	0.00	7.7	78.2	40.0	2.170	521.2	-9999.0	-9999.0
43.175	240.45	240.49	2.26	0.94	3.76	5.0E-02	120.0	2.591	0.000	2.591	44.1	28.0	91.83	0.95	0.00	7.5	78.2	40.0	2.170	521.9	-9999.0	-9999.0
43.241	244.22	244.26	2.21	0.90	3.85	5.0E-02	120.0	2.595	0.000	2.595	44.5	28.2	93.15	0.91	0.00	7.2	78.6	40.0	2.158	527.1	-9999.0	-9999.0
43.307	245.76	245.80	2.16	0.88	3.91	5.0E-02	120.0	2.598	0.000	2.598	44.6	28.3	93.59	0.89	0.00	7.0	78.7	40.0	2.154	529.3	-9999.0	-9999.0
43.372	242.50	242.54	2.10	0.86	3.63	5.0E-02	120.0	2.602	0.000	2.602	44.0	27.9	92.20	0.87	0.00	7.0	78.3	40.0	2.166	525.4	-9999.0	-9999.0
43.438	238.03	238.07	2.09	0.88	3.72	5.0E-02	120.0	2.606	0.000	2.606	43.4	27.5	90.34	0.89	0.00	7.2	77.8	40.0	2.184	519.8	-9999.0	-9999.0
43.503	233.04	233.08	2.10	0.90	3.68	5.0E-02	120.0	2.610	0.000	2.610	42.7	27.0	88.29	0.9								

Col-02	Col-03	Col-04	Col-05	Col-06	Col-07	Col-08	Col-09	Col-10	Col-11	Col-12	Col-13	Col-14	Col-15	Col-16	Col-17	Col-18	Col-19	Col-20	Col-21	Col-22	Col-23	Col-24	Col-25	Col-26	Col-27	Col-28	Col-29	Col-30	Col-31	Col-32	Col-33	Col-34	Col-35	Col-36
Depth	qc	qt	fs	Rf	u	Perme-k	Unit Wt	T Stress	U Stress	E Stress	N(60)ic	N(60)ic	Qt	Fr	Bq	FC	Dr	Phi	Es/qt	YoungE	Su	OCR												
(ft)	(tsf)	(tsf)	(tsf)	(%)	(ft)	(cm/s)	(pcf)	(MPa)	(tsf)	(tsf)	(tsf)	(b/fi)	(b/fi)	(b/fi)	(%)	(%)	(%)	(deg)	(ksi)	(ksi)	(tsf)	(tsf)	(%)	(%)	(%)	(%)	(%)	(%)	(deg)	(tsf)	(tsf)	(tsf)	(tsf)	
44.684	195.99	196.02	1.32	0.68	3.40	5.0E-02	120.0	2.681	0.000	2.681	35.7	22.3	72.11	0.68	0.00	7.2	71.8	40.0	2.374	465.3	-9999.0	-9999.0												
44.750	199.75	199.79	1.20	0.60	3.40	5.0E-02	120.0	2.685	0.000	2.685	35.9	22.4	73.41	0.61	0.00	6.5	72.3	40.0	2.359	471.3	-9999.0	-9999.0												
44.816	203.33	203.37	1.21	0.60	3.44	5.0E-02	120.0	2.689	0.000	2.689	36.5	22.7	74.63	0.60	0.00	6.3	72.8	40.0	2.346	477.0	-9999.0	-9999.0												
44.881	204.30	204.33	1.23	0.63	3.56	5.0E-02	120.0	2.693	0.000	2.693	36.8	22.9	74.88	0.64	0.00	6.5	72.9	40.0	2.343	477.0	-9999.0	-9999.0												
44.947	205.32	205.36	1.33	0.64	3.56	5.0E-02	120.0	2.697	0.000	2.697	37.1	23.1	75.15	0.66	0.00	6.7	73.1	40.0	2.340	480.5	-9999.0	-9999.0												
45.013	212.27	212.32	1.37	0.65	3.78	5.0E-02	120.0	2.701	0.000	2.701	38.2	23.7	77.62	0.66	0.00	6.4	74.0	40.0	2.313	491.1	-9999.0	-9999.0												
45.078	216.09	216.11	1.41	0.65	2.25	5.0E-02	120.0	2.705	0.002	2.702	39.1	24.3	79.71	0.66	0.00	6.3	74.8	42.0	2.290	499.6	-9999.0	-9999.0												
45.144	224.09	224.11	1.48	0.66	1.84	5.0E-02	120.0	2.709	0.004	2.704	40.1	24.9	81.87	0.67	0.00	6.2	75.5	42.0	2.267	508.1	-9999.0	-9999.0												
45.209	228.63	228.65	1.55	0.68	1.78	5.0E-02	120.0	2.713	0.009	2.708	40.9	25.4	83.49	0.69	0.00	6.2	76.1	42.0	2.250	514.5	-9999.0	-9999.0												
45.275	233.68	233.69	1.58	0.68	1.64	5.0E-02	120.0	2.717	0.009	2.708	41.7	25.9	85.30	0.69	0.00	6.0	76.7	42.0	2.231	521.4	-9999.0	-9999.0												
45.341	238.93	238.95	1.57	0.68	1.72	5.0E-02	120.0	2.720	0.011	2.710	42.1	26.2	86.44	0.67	0.00	5.9	77.1	42.0	2.220	525.9	-9999.0	-9999.0												
45.406	236.74	236.76	1.53	0.65	1.72	5.0E-02	120.0	2.724	0.013	2.712	42.0	26.1	86.31	0.68	0.00	5.7	77.1	42.0	2.221	525.8	-9999.0	-9999.0												
45.472	240.13	240.15	1.51	0.63	1.70	5.0E-02	120.0	2.728	0.015	2.714	42.4	26.3	87.49	0.64	0.00	5.5	77.5	42.0	2.209	530.4	-9999.0	-9999.0												
45.538	251.33	251.33	1.49	0.59	1.68	5.0E-02	120.0	2.732	0.017	2.716	43.9	27.3	91.55	0.60	0.00	5.0	78.8	42.0	2.169	545.1	-9999.0	-9999.0												
45.603	271.50	271.52	1.65	0.61	1.98	5.0E-02	120.0	2.736	0.019	2.717	47.2	29.2	98.91	0.62	0.00	4.6	81.0	42.0	2.107	572.1	-9999.0	-9999.0												
45.669	291.88	291.90	1.71	0.59	1.86	5.0E+00	120.0	2.740	0.021	2.719	50.1	31.1	106.34	0.59	0.00	4.1	83.0	42.0	2.070	604.2	-9999.0	-9999.0												
45.734	302.41	302.44	1.82	0.60	1.98	5.0E+00	120.0	2.744	0.023	2.721	51.9	32.1	110.28	0.61	0.00	4.0	84.0	42.0	2.067	625.2	-9999.0	-9999.0												
45.800	305.74	305.77	1.83	0.60	2.31	5.0E+00	120.0	2.748	0.025	2.723	52.3	32.4	111.26	0.61	0.00	3.9	84.3	42.0	2.069	632.8	-9999.0	-9999.0												
45.866	314.10	314.13	1.94	0.62	2.31	5.0E+00	120.0	2.752	0.027	2.725	53.8	33.3	114.27	0.62	0.00	3.9	85.1	42.0	2.062	654.0	-9999.0	-9999.0												
45.931	320.39	320.39	2.00	0.63	2.57	5.0E+00	120.0	2.756	0.029	2.727	54.8	33.9	116.49	0.63	0.00	3.9	85.7	42.0	2.059	672.6	-9999.0	-9999.0												
45.997	325.67	325.70	2.08	0.64	2.61	5.0E+00	120.0	2.760	0.031	2.729	55.7	34.4	118.35	0.64	0.00	3.9	86.1	42.0	2.120	690.3	-9999.0	-9999.0												
46.062	322.03	322.06	2.12	0.66	2.72	5.0E+00	120.0	2.764	0.033	2.731	55.3	34.2	116.93	0.66	0.00	4.1	85.8	42.0	2.105	677.8	-9999.0	-9999.0												
46.128	320.69	320.72	2.14	0.67	2.80	5.0E+00	120.0	2.768	0.035	2.733	55.2	34.1	116.36	0.67	0.00	4.1	85.7	42.0	2.100	673.4	-9999.0	-9999.0												
46.194	324.27	324.30	2.16	0.66	2.88	5.0E+00	120.0	2.772	0.037	2.734	55.7	34.4	117.58	0.67	0.00	4.1	86.0	42.0	2.113	685.1	-9999.0	-9999.0												
46.259	333.27	333.30	2.18	0.65	2.98	5.0E+00	120.0	2.776	0.039	2.736	57.0	35.2	120.79	0.66	0.00	3.9	86.7	42.0	2.158	719.2	-9999.0	-9999.0												
46.325	346.88	346.92	2.21	0.64	3.18	5.0E+00	120.0	2.780	0.041	2.738	58.9	36.4	125.68	0.64	0.00	3.5	87.9	44.0	-9999.0	-9999.0	-9999.0	-9999.0												
46.391	356.01	356.05	2.24	0.63	3.14	5.0E+00	120.0	2.783	0.043	2.740	60.2	37.2	128.93	0.63	0.00	3.4	88.8	44.0	-9999.0	-9999.0	-9999.0	-9999.0												
46.456	357.93	357.96	2.29	0.64	3.38	5.0E+00	120.0	2.787	0.045	2.742	60.6	37.4	128.93	0.64	0.00	3.4	88.8	44.0	-9999.0	-9999.0	-9999.0	-9999.0												
46.522	353.30	353.34	1.96	0.57	3.66	5.0E+00	120.0	2.791	0.048	2.744	59.5	36.7	128.46	0.57	0.00	2.9	88.5	44.0	-9999.0	-9999.0	-9999.0	-9999.0												
46.587	343.30	343.34	1.96	0.57	3.52	5.0E+00	120.0	2.795	0.052	2.746	59.0	36.4	127.03	0.57	0.00	3.0	88.2	44.0	-9999.0	-9999.0	-9999.0	-9999.0												
46.652	353.54	353.58	1.98	0.56	3.54	5.0E+00	120.0	2.799	0.052	2.748	57.8	35.6	123.94	0.58	0.00	3.1	87.5	42.0	-9999.0	-9999.0	-9999.0	-9999.0												
46.717	328.10	328.14	1.91	0.58	3.86	5.0E+00	120.0	2.803	0.054	2.750	55.6	34.3	118.32	0.58	0.00	3.5	86.2	42.0	2.127	687.8	-9999.0	-9999.0												
46.782	270.29	270.30	1.73	0.64	1.39	5.0E-02	120.0	2.815	0.060	2.755	47.2	28.1	97.08	0.65	0.00	3.8	84.9	42.0	2.080	652.3	-9999.0	-9999.0												
46.847	262.43	262.46	1.54	0.63	1.26	5.0E-02	120.0	2.819	0.062	2.757	45.9	28.3	94.17	0.63	0.00	5.0	79.0	42.0	2.167	553.7	-9999.0	-9999.0												
46.912	249.26	249.29	1.50	0.60	2.13	5.0E-02	120.0	2.823	0.064	2.759	44.7	27.5	91.98	0.61	0.00	5.0	79.0	42.0	2.144	562.6	-9999.0	-9999.0												
46.977	255.46	255.48	1.64	0.61	2.23	5.0E-02	120.0	2.827	0.066	2.761	43.7	26.9	89.27	0.61	0.00	5.1	78.3	42.0	2.189	545.8	-9999.0	-9999.0												
47.042	242.13	242.13	1.43	0.59	1.82	5.0E-02	120.0	2.831	0.068	2.763	42.6	26.2	86.82	0.60	0.00	5.2	77.4	42.0	2.216	536.6	-9999.0	-9999.0												
47.107	242.11	242.11	1.43	0.59	1.82	5.0E-02	120.0	2.835	0.070	2.765	41.4	25.4	83.94	0.59	0.00	5.3	76.6	42.0	2.244	527.2	-9999.0	-9999.0												
47.172	234.89	234.91	1.36	0.58	1.41	5.0E-02	120.0	2.839	0.072	2.767	40.0	24.9	80.97	0.57	0.00	5.4	75.6	42.0	2.278	516.4	-9999.0	-9999.0												
47.237	226.84	226.86	1.28	0.57	1.41	5.0E-02	120.0	2.843	0.074	2.768	38.8	23.9	78.34	0.56	0.00	5.5	74.6	42.0	2.305	506.4	-9999.0	-9999.0												
47.302	219.69	219.71	1.21	0.55	1.43	5.0E-02	120.0	2.846	0.076	2.770	37.6	23.1	75.40	0.56	0.00	5.8	73.6	40.0	2.338	494.9	-9999.0	-9999.0												
47.367	211.70	211.72	1.17	0.55	1.39	5.0E-02	120.0	2.850	0.078	2.772	36.6	22.4	73.02	0.55	0.00	5.9	72.7	40.0	2.365	485.4	-9999.0	-9999.0												
47.432	205.25	205.28	1.12	0.55	1.41	5.0E-02	120.0	2.854	0.080	2.774	35.6	21.9	70.78	0.56	0.00	6.2	71.8	40.0	2.390	476.2	-9999.0	-9999.0												
47.497	199.18	199.19	1.09	0.55	1.04	5.0E-02	120.0	2.858	0.082	2.776	35.0	21.5	69.32	0.55	0.00	6.3	71.2	40.0	2.408	470.2	-9999.0	-9999.0												
47.562	195.28	195.30	1.06	0.54	1.08	5.0E-02	120.0	2.862	0.084	2.778	34.7	21.3	68.68	0.54	0.00	6.2	71.0	40.0	2.415	467.7	-9999.0	-9999.0												
47.627	193.63	193.64	1.03	0.53	1.27	5.0E-02	120.0	2.866	0.086	2.780	34.3	21.0	68.03	0.52	0.00	6.1	70.7	40.0	2.423	465.2	-9999.0	-9999.0												
47.692	191.97	191.98	0.99	0.52	1.19	5.0E-02	120.0	2.866	0.086	2.780	34.3	21.0	68.03	0.52	0.00	6.0	70.7	40.0	2.422	465.8	-9999.0	-9999.0												
47.757	192.29	192.30	0.96	0.50	1.29	5.0E-02	120.0	2.870	0.088	2.782	34.3	21.0	68.03	0.51	0.00	6.0	70.9	40.0	2.419	467.4	-9999.0	-9999.0												
47.822	193.24	193.25	0.97	0.50	1.37	5.0E-02	120.0	2.874	0.091	2.784	34.5	21.1	68.40	0.51	0.00	6.0	71.1	40.0	2.411	470.6	-9999.0	-9999.0												
47.887	195.15	195.17	0.92	0.47	1.35	5.0E-02	120.0	2.878	0.093	2.785	34.6	21.2	69.04	0.48	0.00	5.0	71.6	40.0																

Col-02	Col-05	Col-06	Col-07	Col-08	Col-09	Col-14	Col-15	Col-16	Col-17	Col-18	Col-22	Col-23	Col-24	Col-25	Col-26	Col-28	Col-30	Col-31	Col-33	Col-34	Col-35	Col-36
Depth (ft)	qc (tsf)	qt (tsf)	fs (tsf)	Rf (%)	u (ft)	Perm-k (cm/s)	Unit Wt (pcf)	T Stress (kPa)	U Stress (tsf)	E Stress (tsf)	N(60)lc (b/ft)	N(60)lc (b/ft)	Qt	Fr (%)	Bq	FC (%)	Dr (%)	Phi (deg)	Es/rt	YoungE (tsf)	Su (tsf)	OCR
49.146	256.10	256.12	1.66	0.65	1.62	5.0E-02	120.0	2.949	0.129	2.819	45.2	27.5	89.80	0.66	0.00	5.4	78.8	42.0	2.182	559.0	-9999.0	-9999.0
49.212	246.07	246.08	1.62	0.66	1.50	5.0E-02	120.0	2.953	0.132	2.821	43.7	26.6	86.18	0.67	0.00	5.7	77.6	42.0	2.219	546.1	-9999.0	-9999.0
49.278	235.91	235.93	1.70	0.72	1.54	5.0E-02	120.0	2.957	0.134	2.823	42.4	25.8	82.52	0.73	0.00	6.4	76.4	42.0	2.258	532.8	-9999.0	-9999.0
49.343	227.03	227.05	1.81	0.71	1.45	5.0E-02	120.0	2.961	0.136	2.825	40.9	24.9	79.32	0.72	0.00	6.6	75.3	42.0	2.294	520.8	-9999.0	-9999.0
49.409	219.43	219.45	1.53	0.70	2.04	5.0E-02	120.0	2.965	0.138	2.827	39.7	24.1	76.58	0.71	0.00	6.8	74.3	40.0	2.325	510.1	-9999.0	-9999.0
49.474	213.37	213.38	1.49	0.70	1.50	5.0E-02	120.0	2.969	0.140	2.829	38.7	23.5	74.38	0.71	0.00	7.0	73.5	40.0	2.350	501.4	-9999.0	-9999.0
49.540	212.67	212.68	1.59	0.75	1.37	5.0E-02	120.0	2.972	0.142	2.831	38.9	23.6	74.06	0.76	0.00	7.4	73.4	40.0	2.353	500.4	-9999.0	-9999.0
49.606	206.27	206.29	1.53	0.74	2.11	5.0E-02	120.0	2.976	0.144	2.833	37.8	23.0	71.76	0.75	0.00	7.5	72.5	40.0	2.380	490.9	-9999.0	-9999.0
49.671	205.32	205.34	1.59	0.78	1.78	5.0E-02	120.0	2.980	0.146	2.834	37.8	22.9	71.39	0.79	0.00	7.8	72.3	40.0	2.384	489.6	-9999.0	-9999.0
49.737	206.34	206.36	1.55	0.75	1.66	5.0E-02	120.0	2.984	0.148	2.836	37.9	23.0	71.70	0.76	0.00	7.6	72.5	40.0	2.381	491.3	-9999.0	-9999.0
49.803	211.70	211.72	0.01	0.00	1.78	5.0E+00	120.0	2.988	0.150	2.838	-9999.0	-9999.0	73.54	0.00	0.00	-9999.0	73.2	40.0	2.359	495.5	-9999.0	-9999.0
49.868	215.02	215.04	0.01	0.00	2.04	5.0E+00	120.0	2.992	0.152	2.840	-9999.0	-9999.0	74.66	0.00	0.00	-9999.0	73.6	40.0	2.346	504.6	-9999.0	-9999.0
49.934	214.32	214.34	0.01	0.00	2.11	5.0E+00	120.0	2.996	0.154	2.842	-9999.0	-9999.0	74.36	0.00	0.00	-9999.0	73.5	40.0	2.350	503.7	-9999.0	-9999.0
49.999	213.56	213.58	0.01	0.00	2.25	5.0E+00	120.0	3.000	0.156	2.844	-9999.0	-9999.0	74.05	0.00	0.00	-9999.0	73.4	40.0	2.354	502.7	-9999.0	-9999.0
50.065	215.28	215.31	0.01	0.00	2.11	5.0E+00	120.0	3.004	0.158	2.846	-9999.0	-9999.0	74.60	0.00	0.00	-9999.0	73.6	40.0	2.347	505.4	-9999.0	-9999.0

**PORE PRESSURE DISSIPATION TEST PROCEDURES AND RESULTS**



## Pore Pressure Dissipation Tests (PPDT)

Pore Pressure Dissipation Tests (PPDT's) conducted at various intervals measured hydrostatic water pressures and determined the approximate depth of the ground water table. A PPDT is conducted when the cone is halted at specific intervals determined by the field representative. The variation of the penetration pore pressure ( $u$ ) with time is measured behind the tip of the cone and recorded by a computer system.

Pore pressure dissipation data can be interpreted to provide estimates of:

- Equilibrium piezometric pressure
- Phreatic Surface
- In situ horizontal coefficient of consolidation ( $c_h$ )
- In situ horizontal coefficient of permability ( $k_h$ )

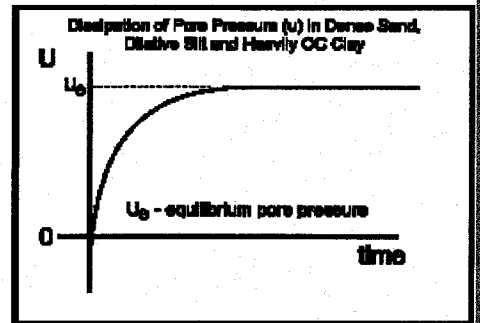
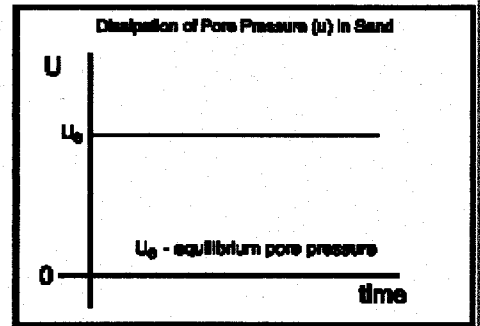
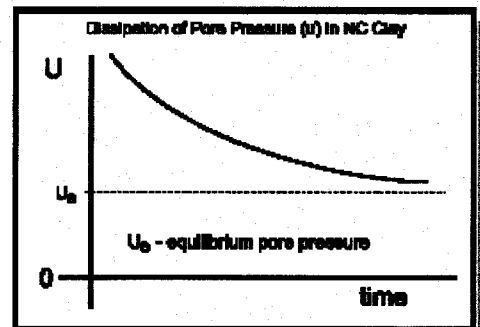
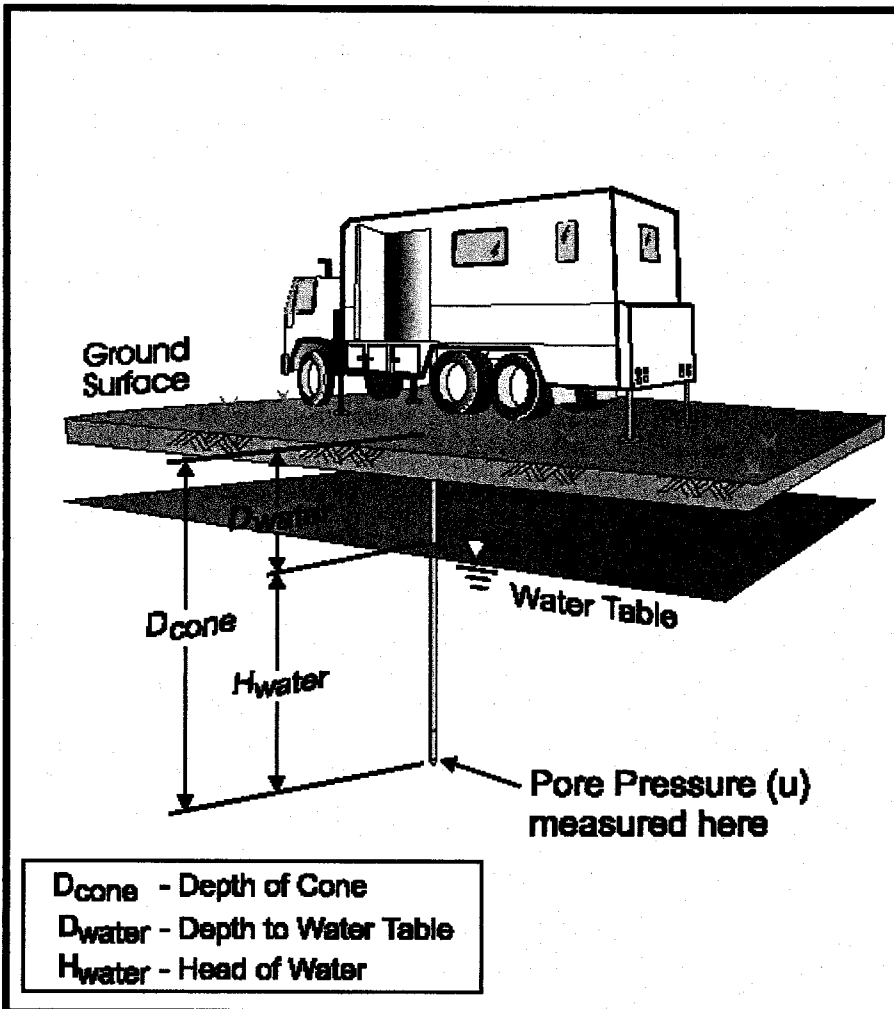
In order to correctly interpret the equilibrium piezometric pressure and/or the phreatic surface, the pore pressure must be monitored until such time as there is no variation in pore pressure with time (refer to Figure PPD). This time is commonly referred to as  $t_{100}$ , the point at which 100% of the excess pore pressure has dissipated.

Interpretation of either  $c_h$  and  $k_h$  from dissipation results can be most easily achieved using either of two analytical approaches: cavity-expansion theory or the strain-path approach. Comparisons of the available solutions and results from field studies suggest that the cavity-expansion method of Torstensson (1977) and the strain-path approaches of Levadous (1980) and Teh (1987) all provide similar predications of consolidation parameters from CPTU dissipation data (Gillespie 1981; Kabir and Lutenegger 1990; Robertson et al. (1991). Robertson et al. (1991) have shown that these methods, although developed for normally consolidated soils, can be equally applied to overconsolidated soils. Furthermore, comparisons of field and laboratory data indicate that the trends in the measured (laboratory) and predicated (CPTU) data are consistent provided the micro fabric and nature of the soils being tested are taken into consideration. (Danziger 1990; Robertson et al. 1991).

A complete reference on pore pressure dissipation tests is presented by Robertson et al. 1991.

A summary of the pore pressure dissipation tests is summarized in Table PPD (Appendix PPD). Pore pressure dissipation data is presented in Appendix PPD.





### Water Table Calculation

$$D_{\text{water}} = D_{\text{cone}} - H_{\text{water}}$$

where  $H_{\text{water}} = U_e$  (depth units)

Useful Conversion Factors: 1psi = 0.704m = 2.31 feet (water)  
 1tsf = 0.958 bar = 13.9 psi  
 1m = 3.28 feet

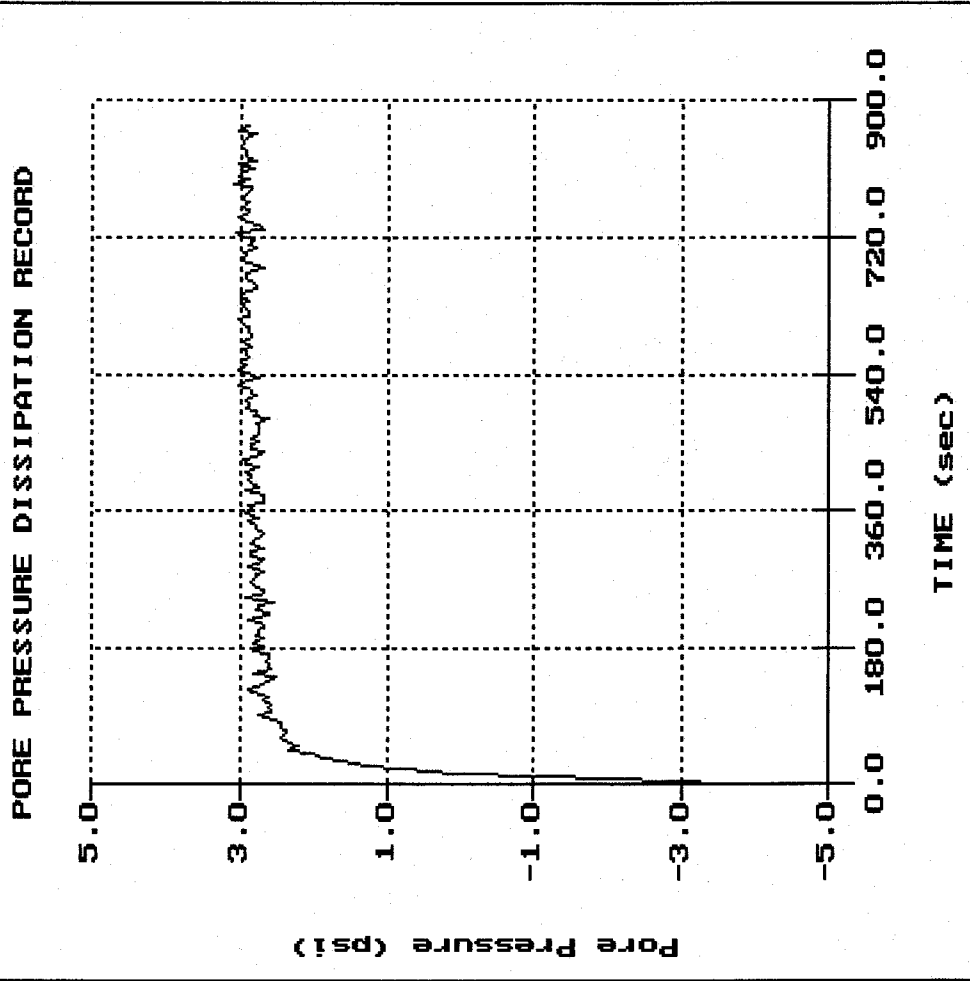
Figure PPD

MACTEC

Sounding: CPT-01  
Location: Allen Plant

Oversight: H. Benkhay  
Date: 07:20:04 10:19

File: 130CP01.PPD  
Depth (m): 12.48  
Depth (ft): 40.94  
Duration: 865.0s  
U-min: -3.64 0.0s  
U-max: 3.09 790.0s

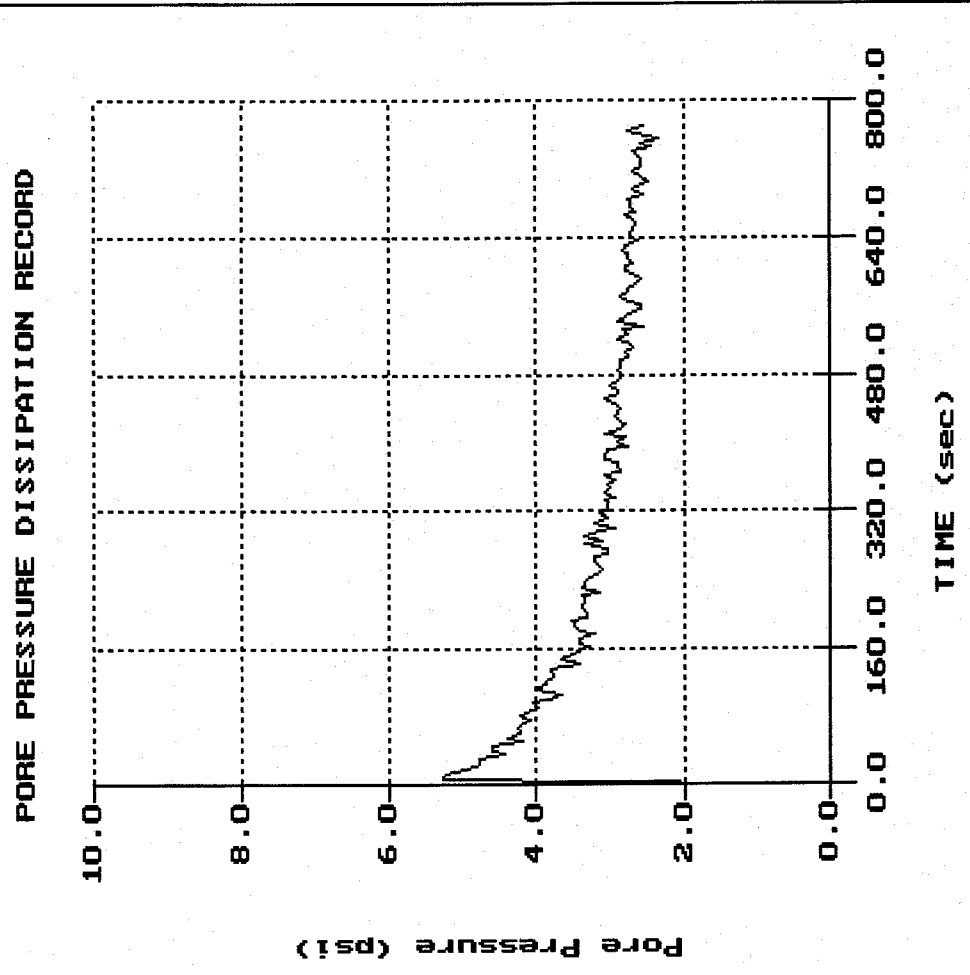


**MACTEC**

Sounding: CPT-02  
Location: Allen Plant

Oversight: H. Benkay  
Date: 07:20:04 11:13

File: 130CP02.PPD  
Depth (m): 11.68  
Duration (ft): 38.32  
U-min: 0.94 0.0s  
U-max: 5.23 10.0s

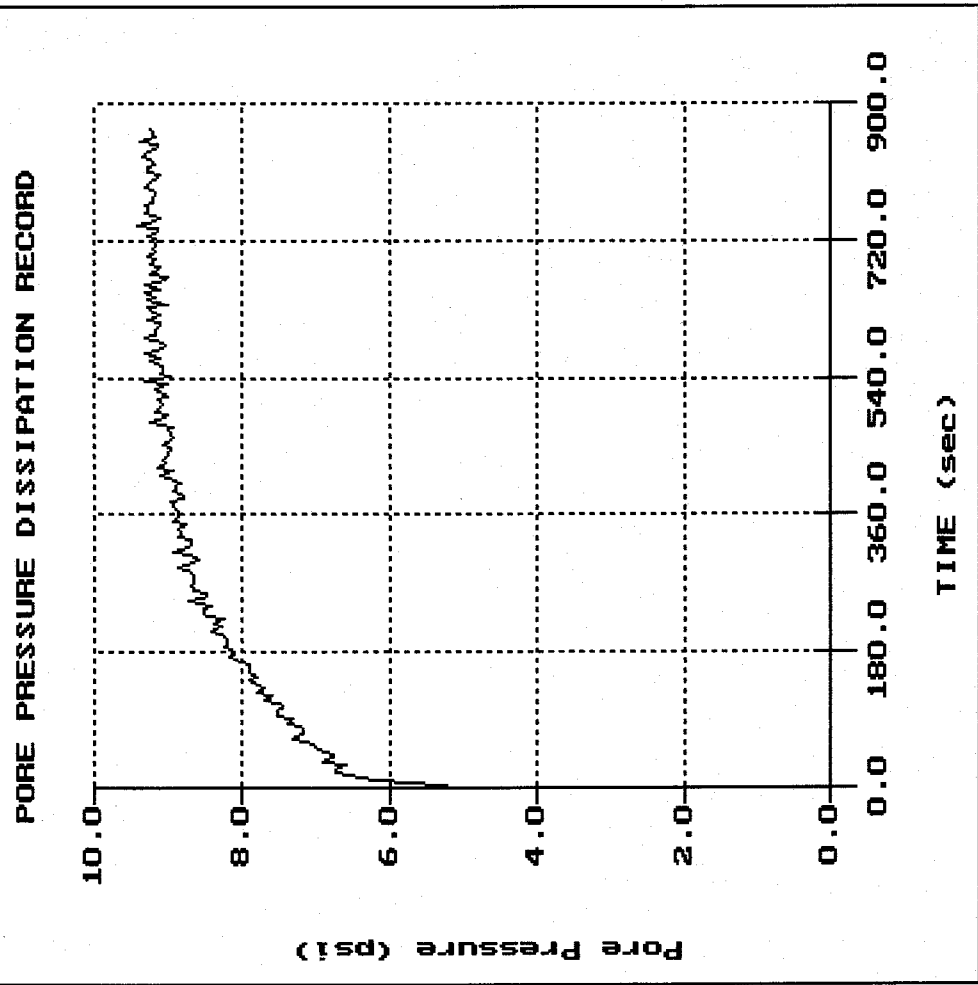


**MACTEC**

Sounding: CPT-03  
Location: Allen Plant

Oversight: H. Benkay  
Date: 07:20:04 12:06

File: 130CP03.PPD  
Depth (m): 18.44  
Duration (ft): 60.50  
U-min: 5.07 0.0s  
U-max: 9.40 740.0s

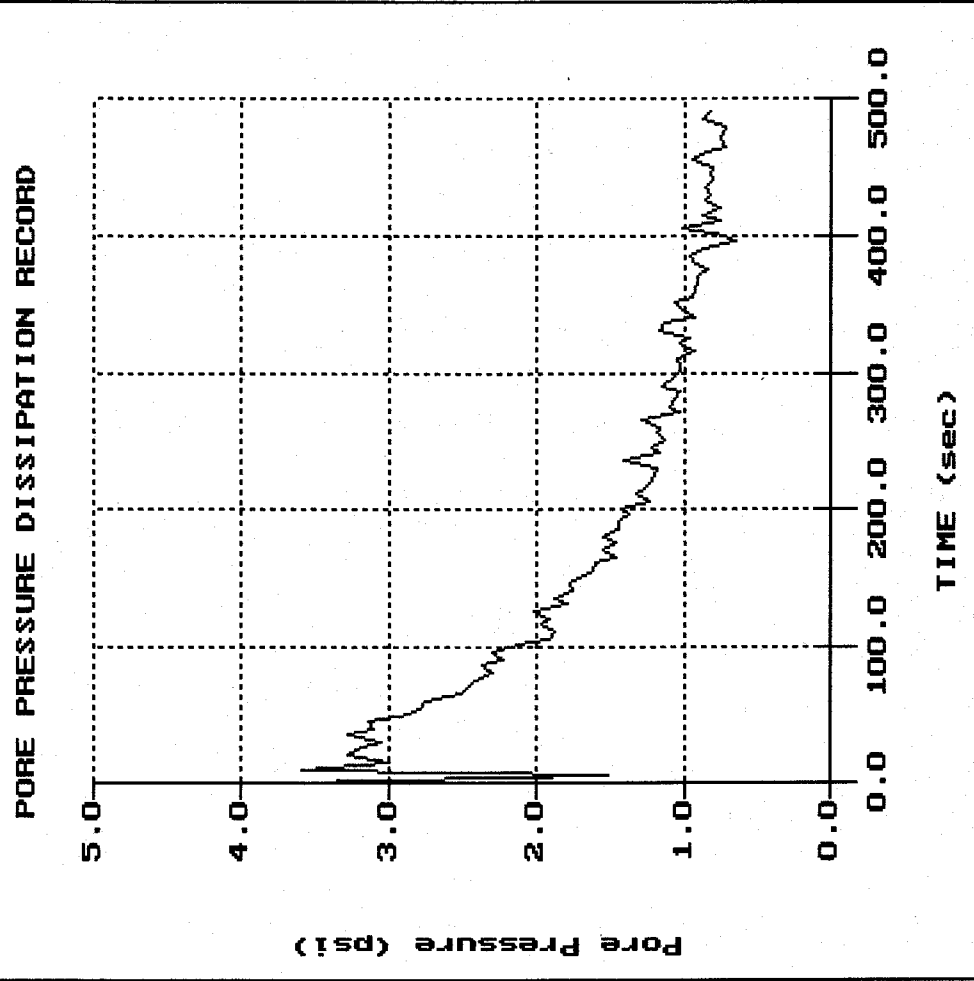


**MACTEC**

Sounding: CPT-05  
Location: Allen Plant

Oversight: H. Benkhay  
Date: 07:20:04 14:24

File: 130CP05.PPD  
Depth (m): 14.26  
Depth (ft): 46.78  
Duration: 490.0s  
U-min: 0.65 395.0s  
U-max: 3.70 0.0s



**SEISMIC CONE PENETROMETER TESTING PROCEDURES AND RESULTS**



## Seismic Cone Penetrometer Testing (SCPTu)

Gregg In Situ, Inc. uses a modified CPT cone that contains a built in seismometer to measure compression and shear wave velocities in addition to the standard piezocone parameters ( $q_c$ ,  $f_s$ , and  $u_2$ ). Therefore, four independent readings are compiled with depth in a single sounding. The standard CPT parameters are recorded continuously while the seismic test is usually performed at every rod change (typically 1m intervals).

Shear waves are generated by striking a seismic beam coupled to the ground surface by a hydraulic cylinder under the CPT rig, *Figure SCPTu*. Compression waves are generated by striking an auger in the ground. The sledgehammer that strikes the beam/auger acts as a trigger, initiating the recording of the seismic wave trace. Before measurements are taken, the rods are decoupled from the CPT rig to prevent energy transmission down the rods.

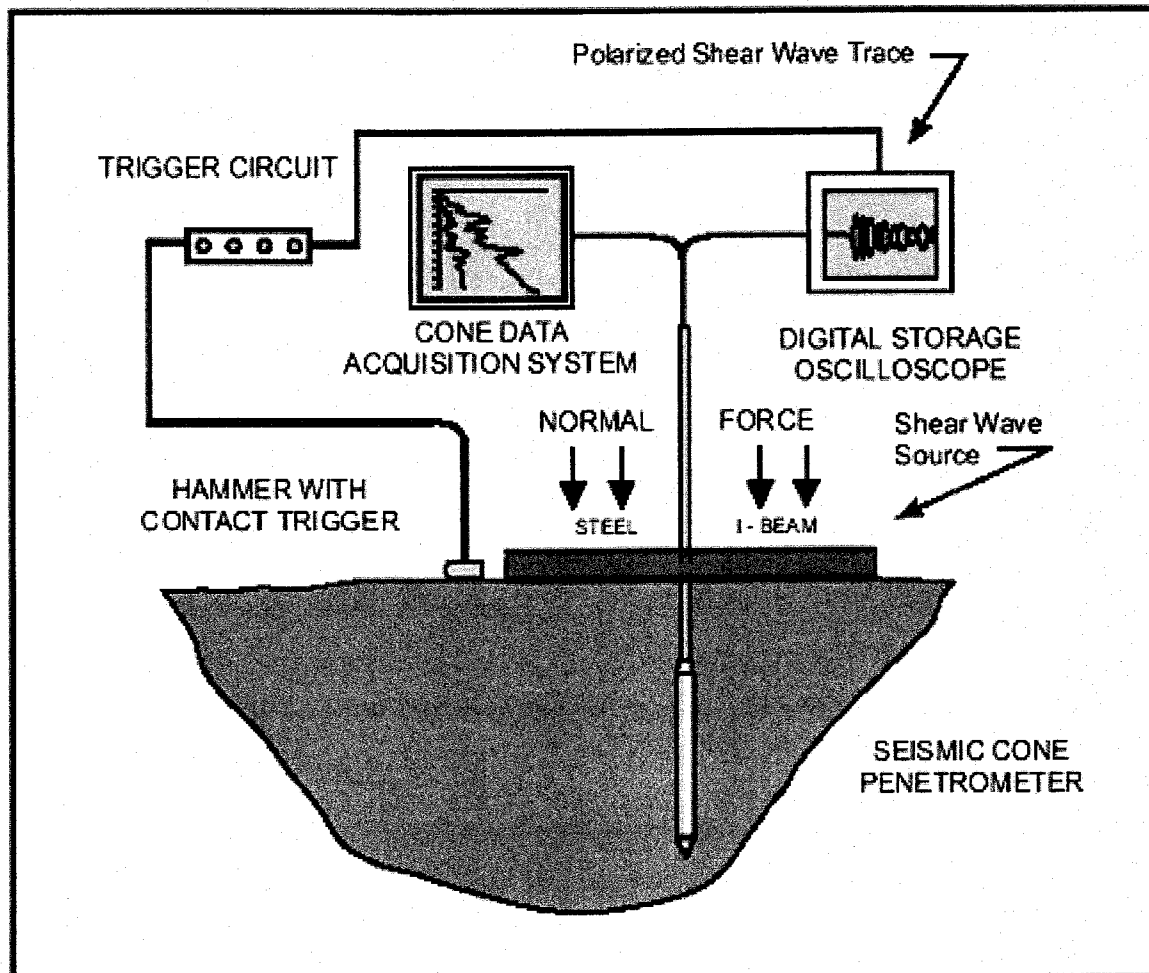
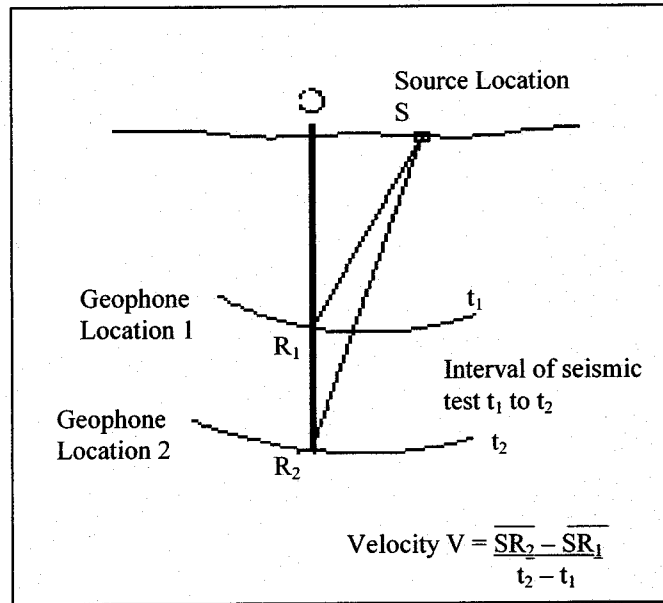


Figure SCPTu

Geophones in the body of the piezocone recognize the arriving waves generated at the ground surface, *Figure Seismic*. Any waves received by the geophones on the cone penetrometer are sent back up to the truck to be displayed on an oscilloscope. On site software then plots the wave amplitude versus time to calculate wave velocities.

At least two waves are recorded for each test depth so the operator can check consistency of the waveforms. Data is sampled at a frequency of 20kHz (20,000 samples per second). To maintain a desired signal resolution, the input sensitivity (gain) is increased with depth.



*Figure Seismic*

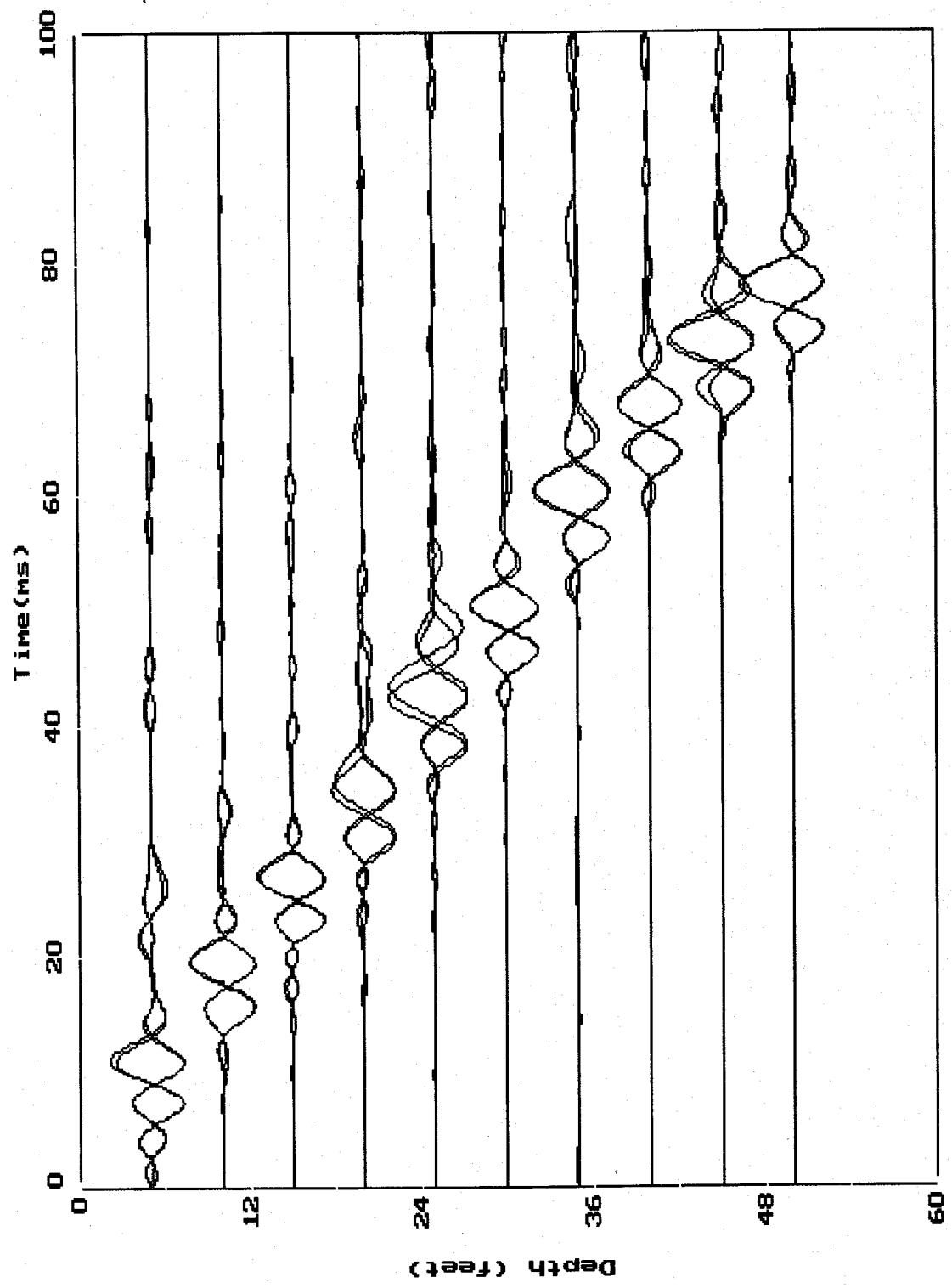
Offset distances of the beam from the cone and the location of the geophone are all taken into account in calculations.

The shear wave velocity ( $V_s$ ) provides information about small-strain stiffness while the penetration data provides information about large-strain failures. From interval shear wave velocity ( $V_s$ ) and the mass density ( $\rho$ ) of a soil layer, the dynamic shear modulus ( $G_o$ ) of the soil can be calculated in a specific depth interval. The dynamic shear modulus ( $G_o$ ) is a key parameter for the analysis of soil behavior in response to dynamic loading from earthquakes, ice, vibrating machine foundations, waves and wind.

A summary of the data collected including the depth and location identification is displayed in chart and graphical formats and can be found in Appendix: SCPTu.

For a detailed reference on seismic CPT, refer to Robertson et. al., 1986.





MACTEC CPT-05 Shear Waveforms



# Shear Wave Velocity Calculations

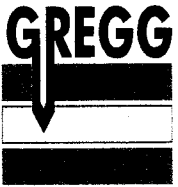
*Allen Fossil Plant*  
Memphis, Tennessee

**CPT-05**

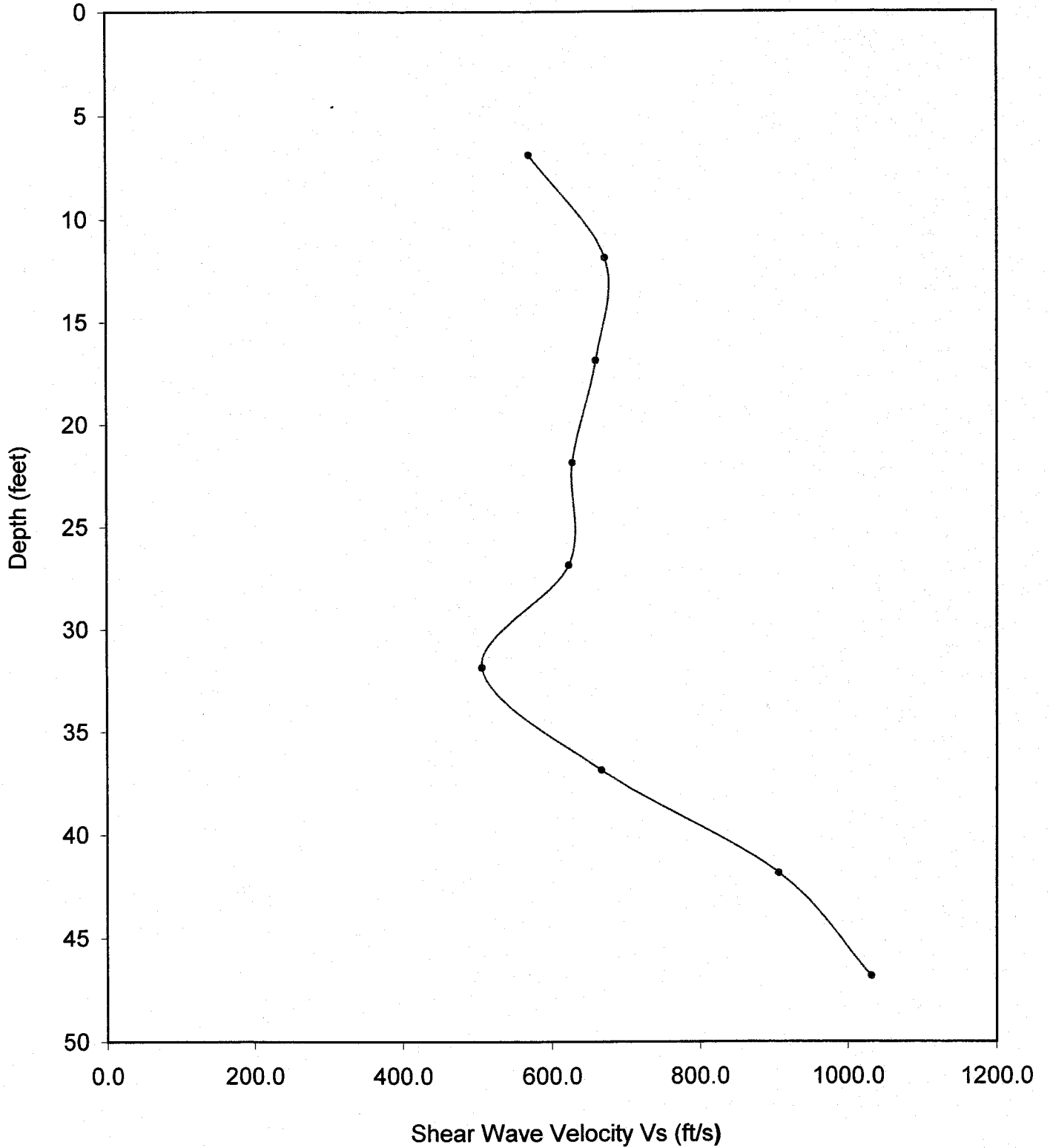
Geophone Offset: 0.66 Feet

Source Offset: 1.67 Feet

Test Depth (feet)	Geophone Depth (feet)	Waveform Ray Path (feet)	Incremental Distance (feet)	Characteristic Arrival Time (ms)	Incremental Time Interval (ms)	Interval Velocity (ft/s)	Interval Depth (feet)
5.05	4.39	4.70	4.70	9.02	8.46	571.1	6.89
10.04	9.38	9.53	4.83	17.48	7.33	672.5	11.87
15.02	14.36	14.46	4.93	24.81	7.52	660.3	16.86
20.01	19.35	19.43	4.97	32.33	7.90	628.5	21.84
24.99	24.33	24.39	4.97	40.23	8.08	623.8	26.86
30.04	29.38	29.43	5.04	48.31	9.77	507.0	31.86
35.00	34.34	34.38	4.95	58.08	7.52	666.9	36.85
40.02	39.36	39.40	5.01	65.60	5.45	907.5	41.84
44.97	44.31	44.35	4.95	71.05	4.89	1032.1	46.84
50.02	49.36	49.39	5.05	75.94			



Shear Wave Velocity Profile  
Allen Fossil Plant  
CPT-05



**APPENDIX D**

**LABORATORY TEST PROCEDURES**

**LABORATORY TEST RESULTS**

## LABORATORY TEST PROCEDURES

### Moisture Content

The moisture content in a given mass of soil is the ratio, expressed as a percentage, of the weight of the water to the weight of the solid particles. This test was conducted in accordance with ASTM D-2216.

### Atterberg Limits (Plasticity Index)

Originally, the Atterberg Limits consisted of seven "limits of consistency" of fine-grained soils. In current engineering usage, the term usually refers only to the liquid limit (LL) and plastic limit (PL). The LL (between the liquid and plastic states) is the water content at which a trapezoidal groove of specified shape, cut in moist soil held in a special cup, is closed after 25 taps on a hard rubber plate. The PL (between plastic and semi-solid states) is the water content at which the soil crumbles when rolled into threads of 1/8-inch in diameter.

The LL has been found to be proportional to the compressibility of the normally consolidated soil. The Plasticity Index (PI) is the calculated difference in water contents between the LL and PL. Together the LL and PI are used to classify silts and clays according to the Unified Soils Classification System (ASTM D 2487). The PI is used to predict the potential for volume changes in confined soils beneath foundations or grade slabs. The LL, PL, and PI are determined in accordance with ASTM D 4318.

### Triaxial Shear Tests

Triaxial shear tests are used to determine the strength characteristics (cohesion and friction angle) of a given soil sample. Triaxial tests are also used to determine the elastic properties of the soil specimen.

Triaxial shear tests are performed on several sections of a relatively undisturbed sample extruded from the sampling tube or on remolded samples. The samples are trimmed into cylinders 1.4 to 2.8 inches in diameter and encased in rubber membranes. Each is then placed in a compression chamber and confined by all-around air pressure. The test results are presented in the form of

stress-strain curves and Mohr envelopes, or p-q plots on the accompanying Triaxial Shear Test Sheets.

One of three types of triaxial tests is normally performed, the most suitable type being determined by the loading conditions imposed on the soil in the field and the soil characteristics.

1. Consolidated-Undrained (Designated as a CU or R Test)
2. Consolidated-Drained (designated as a CD or S Test)
3. Unconsolidated-Undrained (designated as a UU or Q Test)

### **Grain Size Distribution**

Grain size tests are performed to aid in determining the soil classification and the grain size distribution. The soil samples are prepared for testing according to ASTM D 421 (dry preparation) or ASTM D 2217 (wet preparation). If only the grain size distribution of soils coarser than a number 200 sieve (0.074-mm opening) is desired, the grain size distribution is determined by washing the sample over a number 200 sieve and, after drying, passing the samples through a standard set of nested sieves. If the grain size distribution of the soils finer than the number 200 sieve is also desired, the grain size distribution of the soils coarser than the number 10 sieve is determined by passing the sample through a set of nested sieves. Materials passing the number 10 sieve are dispersed with a dispersing agent and suspended in water, and the grain size distribution calculated from the measured settlement rate of the particles. These tests are conducted in accordance with ASTM D 422. The percentage of clay, silt, sand, and gravel which are given on the individual particle size analysis sheets presented later in this appendix, were obtained on particle size boundaries in accordance with AASHTO M145-94 (1995).

### **Specific Gravity**

The specific gravity of soil solids is the ratio of the mass of a unit volume of a soil solids to the mass of the same volume of gas-free distilled water at 20C. The test method for determining the specific gravity of soil solids that passes the 4.75-mm (No. 4) sieve using a water pycnometer is described in ASTM D 854, Method B, "Test Methods for Specific Gravity of Soil Solids by Water Pycnometer".

**TABLE D-1**

**Natural Moisture Content and Atterberg Limits Laboratory Test Results**

TVA Allen East and West Ash Disposal Areas

MACTEC Project 3043041037/01

Boring Number	Sample Number	Sample Type	Sample Depth (Feet)	Moisture Content (%)	Atterberg Limits		
					Liquid Limit (LL)	Plastic Limit (PL)	Plasticity Index (PI)
EAD-1	S-1	SPT	1 - 2.5	101.5	Not Tested	Not Tested	Not Tested
EAD-1	S-2	SPT	4 - 5.5	139.3	Not Tested	Not Tested	Not Tested
EAD-1	S-3	SPT	7 - 8.5	24.7	Not Tested	Not Tested	Not Tested
EAD-1	S-4	SPT	10 - 11.5	24.8	Not Tested	Not Tested	Not Tested
EAD-1	S-5	SPT	13 - 14.5	135.7	Not Tested	Not Tested	Not Tested
EAD-1	S-6	SPT	16 - 17.5	65.2	Not Tested	Not Tested	Not Tested
EAD-1	S-7	SPT	20 - 21.5	19.8	Not Tested	Not Tested	Not Tested
EAD-1	S-8	SPT	25 - 26.5	12.8	Not Tested	Not Tested	Not Tested
EAD-1	S-9	SPT	28 - 29.5	23.8	Not Tested	Not Tested	Not Tested
EAD-1	S-10	SPT	34 - 35.5	36.8	Not Tested	Not Tested	Not Tested
EAD-1	S-11	SPT	40 - 41.5	29.2	Not Tested	Not Tested	Not Tested
EAD-1	S-12	SPT	45 - 46.5	26.9	Not Tested	Not Tested	Not Tested
EAD-1	S-13	SPT	50 - 51.5	20.1	Not Tested	Not Tested	Not Tested
EAD-1	S-14	SPT	55 - 56.5	21.6	Not Tested	Not Tested	Not Tested
EAD-3	S-1	SPT	1 - 2.5	2.9	Not Tested	Not Tested	Not Tested
EAD-3	S-2	SPT	4 - 5.5	3.8	Not Tested	Not Tested	Not Tested
EAD-3	S-3	SPT	10 - 11.5	19.3	Not Tested	Not Tested	Not Tested
EAD-3	S-5	SPT	19 - 20.5	16.2	Not Tested	Not Tested	Not Tested
EAD-3	S-6	SPT	22 - 23.5	14.4	Not Tested	Not Tested	Not Tested
EAD-3	S-8	SPT	32 - 33.5	36.9	Not Tested	Not Tested	Not Tested
EAD-3	S-9	SPT	35 - 36.5	34.7	Not Tested	Not Tested	Not Tested
EAD-3	S-10	SPT	40 - 41.5	25.2	Not Tested	Not Tested	Not Tested
EAD-3	S-11	SPT	45 - 46.5	28.6	Not Tested	Not Tested	Not Tested
EAD-3	S-12	SPT	50 - 51.5	35.3	Not Tested	Not Tested	Not Tested
WAD-3	S-1	SPT	1 - 2.5	6.4	Not Tested	Not Tested	Not Tested
WAD-3	S-2	SPT	4 - 5.5	31.8	Non-Plastic	Non-Plastic	Non-Plastic
WAD-3	S-3	SPT	7 - 8.5	29.4			
WAD-3	S-4	SPT	10 - 11.5	30.8	Not Tested	Not Tested	Not Tested
WAD-3	S-5	SPT	13 - 14.5	33.4	Not Tested	Not Tested	Not Tested
WAD-3	S-6	SPT	16 - 17.5	24.4	Not Tested	Not Tested	Not Tested
WAD-3	S-7	SPT	20 - 21.5	30.7	Not Tested	Not Tested	Not Tested
WAD-3	S-8	SPT	25 - 26.5	33.2	56	24	32
WAD-3	S-9	SPT	30 - 31.5	42.7			
WAD-3	S-10	SPT	35 - 36.5	38.0	Not Tested	Not Tested	Not Tested
WAD-3	S-11	SPT	40 - 41.5	13.9	Not Tested	Not Tested	Not Tested

Prepared/Date: REF 8/5/04

Checked/Date: HAB 8/5/04

**TABLE D-2**

**Unit Weight and Natural Moisture Content Laboratory Test Results**

**TVA Allen East and West Ash Disposal Areas**

**MACTEC Project 3043041037/01**

Boring Number	Depth (Feet)	Sample Type	Natural Moisture Content (%)	Dry Unit Weight (pcf)	Wet Unit Weight (pcf)
EAD-1	29.5 - 31.5	UD	37.4	80.8	111.0
EAD-3	15.0 - 17.0	UD	8.9	100.4	109.4
EAD-3	30.0 - 32.0	UD	39.1	81.9	113.9
WAD-2	6.0 - 8.0	UD	10.9	113.7	126.1
WAD-2	12.0 - 14.0	UD	12.8	113.5	128.0
WAD-2	33.0 - 35.0	UD	25.3	95.6	119.8

Prepared/Date: REF 8/5/04

Checked/Date: HAB 8/5/04



**TABLE D-3**  
**Triaxial Compression Laboratory Test Results**  
**TVA Allen East and West Ash Disposal Areas**  
**MACTEC Project 3043041037/01**

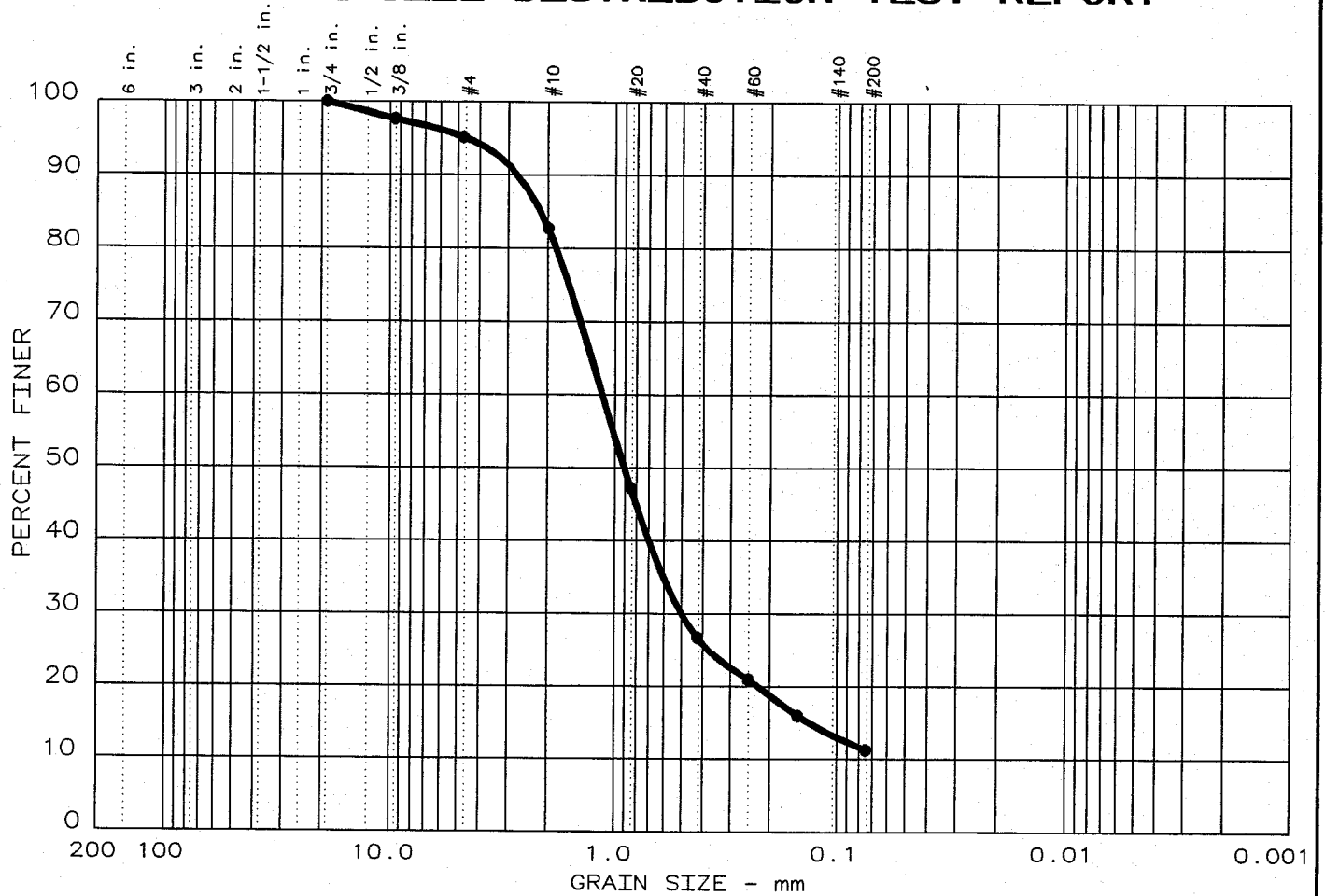
Boring Number	Depth (Feet)	Sample Type	Material Type	Average Dry Density (pcf)	Average Moisture Content (%)	CU Triaxial Test			
						Total		Effective	
						Cohesion, C (ksf)	Friction Angle, $\Phi$ (degrees)	Cohesion, C' (ksf)	Friction Angle, $\Phi'$ (degrees)
EAD-1	14 - 16	Undisturbed Sample	Ash	89.8	22.2	2.53	26.60	0.00	36.80
EAD-3	6 - 8	Undisturbed Sample	Ash	110.2	6.8	3.70	26.50	1.01	35.50
WAD-2	14 - 16	Undisturbed Sample	Ash and Coal	97.8	6.3	1.95	31.90	0.00	39.80
WAD-2	30 - 32	Undisturbed Sample	Alluvium	94.6	28.3	1.05	19.70	0.00	35.80

Prepared/Date: REF 8/16/04  
Checked/Date: HAB 8/16/04

**GRAIN SIZE ANALYSIS TEST RESULTS**

**EAST DISPOSAL AREA**

# PARTICLE SIZE DISTRIBUTION TEST REPORT



Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	LL	PI
● 1	0.0	4.8	83.9	11.3		NT	NT	NT

SIEVE inches size	PERCENT FINER	
0.75	●	100.0
0.375		97.7
GRAIN SIZE		
D <sub>60</sub>		1.14
D <sub>30</sub>		
D <sub>10</sub>		
COEFFICIENTS		
C <sub>c</sub>		
C <sub>u</sub>		

SIEVE number size	PERCENT FINER	
4	●	95.2
10		82.7
20		47.2
40		26.7
60		21.0
100		16.0
200		11.3

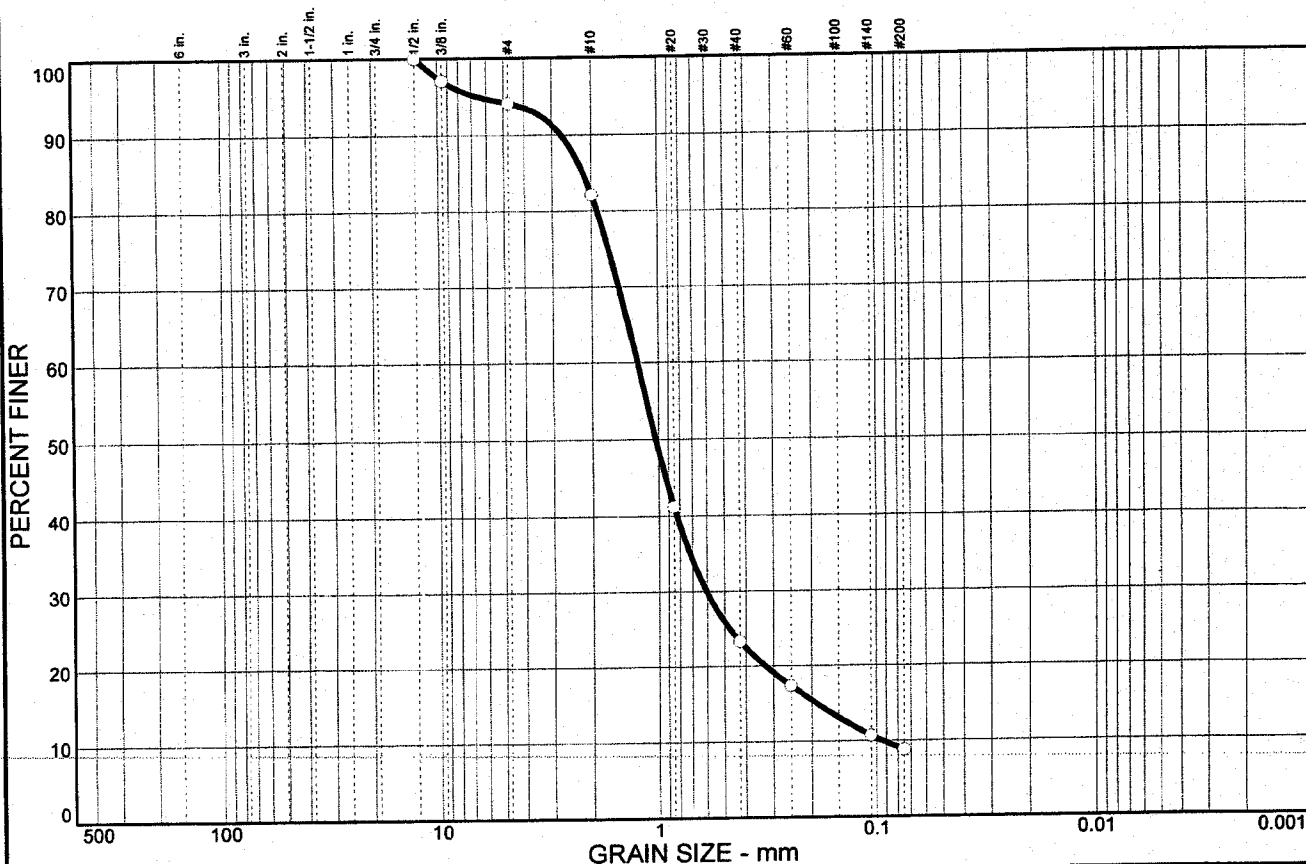
Sample information:  
 ● EAD-1, SPT 7-8.5'  
 Black ash

Remarks:  
 Methods: Particle Size:  
 ASTM D 422-63(2002);  
 % < No. 200: ASTM D1140-00;  
 Sieve Analysis: T 29-99

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 Date: August 11, 2004 *HAR* Fig. No.: EAD

# Grain Size Analysis



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	5.9	12.0	58.8	14.5	8.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.5 in.	100.0		
0.375 in.	97.1		
#4	94.1		
#10	82.1		
#20	41.2		
#40	23.3		
#60	17.4		
#140	10.7		
#200	8.8		

**Soil Description**

Gray Ash

**Atterberg Limits**

PL= NP      LL= NP      PI= NP

**Coefficients**

D<sub>85</sub>= 2.19      D<sub>60</sub>= 1.25      D<sub>50</sub>= 1.03  
D<sub>30</sub>= 0.603      D<sub>15</sub>= 0.190      D<sub>10</sub>= 0.0940  
C<sub>u</sub>= 13.28      C<sub>c</sub>= 3.10

**Classification**

USCS=      AASHTO=

**Remarks**

Sampled from top section of tube  
Specific Gravity: 2.53

\* (no specification provided)

Sample No.:      Source of Sample:  
Location: EAD-1 UD @ 14'-16'

Date: 08-12-04  
Elev./Depth:

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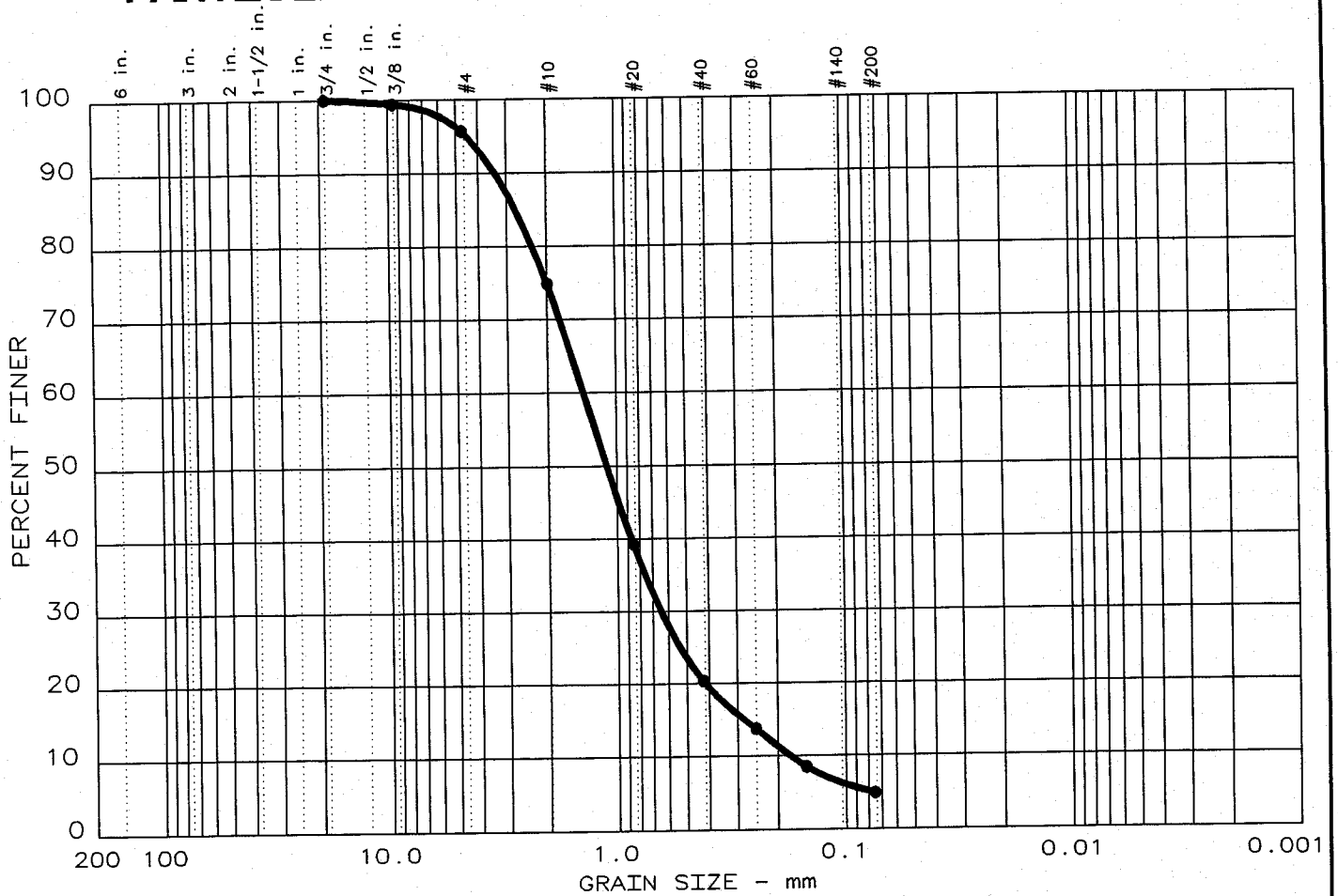
Client: TVA  
Project: Ash Disposal Area - TVA Allen Fossil Plant

Project No: 3043-04-1037

HAB

Figure

# PARTICLE SIZE DISTRIBUTION TEST REPORT



Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	LL	PI
● 3	0.0	4.3	90.8		4.9	NT	NT	NT

SIEVE inches size	PERCENT FINER	
	●	
0.75	100.0	
0.375	99.4	
X GRAIN SIZE		
D <sub>60</sub>	1.39	
D <sub>30</sub>		
D <sub>10</sub>	0.175	
X COEFFICIENTS		
C <sub>c</sub>	1.70	
C <sub>u</sub>	7.9	

SIEVE number size	PERCENT FINER	
	●	
4	95.7	
10	74.9	
20	39.2	
40	20.4	
60	13.7	
100	8.5	
200	4.9	

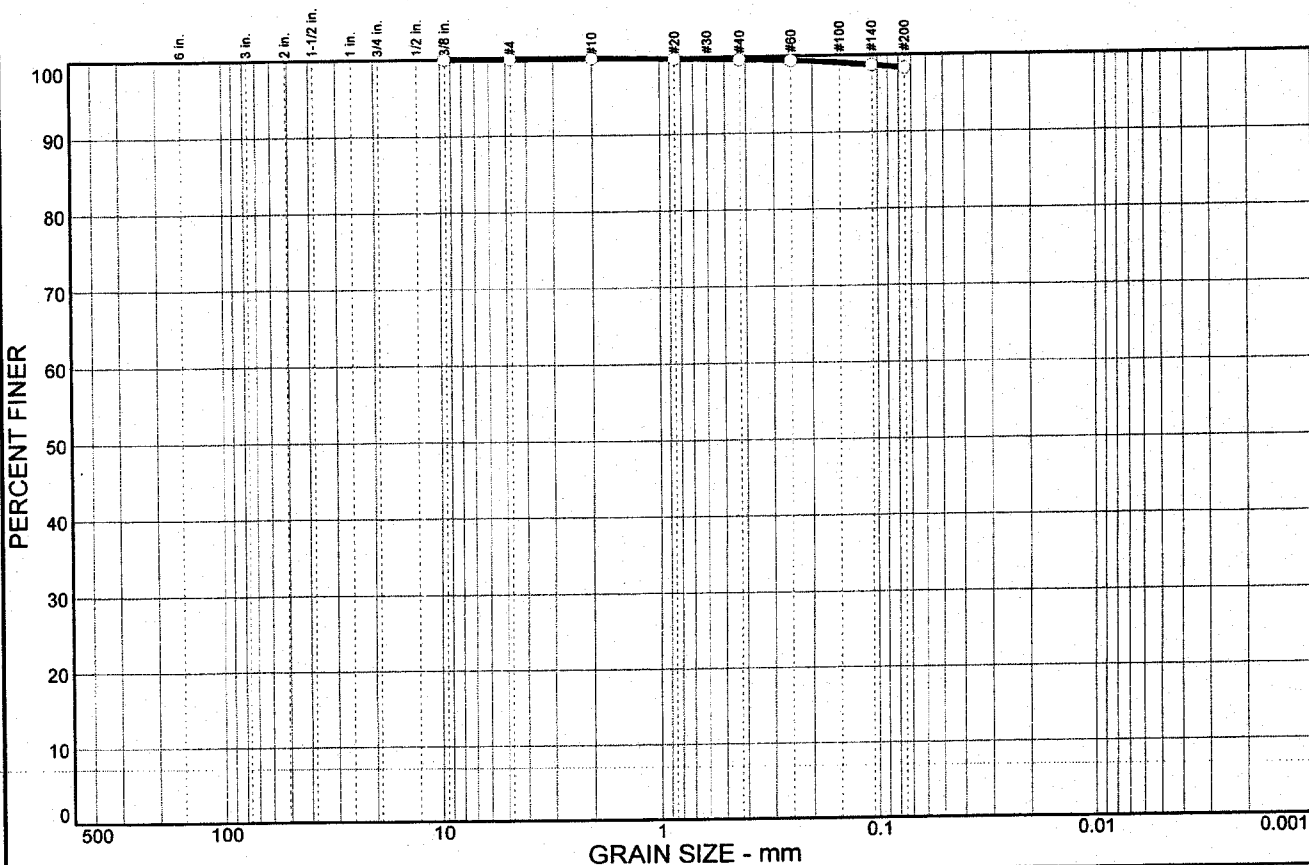
Sample information:  
 ● EAD-1, SPT 25-26.5'  
 Black ash

Remarks:  
 Methods: Particle Size:  
 ASTM D 422-63(2002);  
 % < No. 200: ASTM D1140-00;  
 Sieve Analysis: T 29-99

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 Project: TVA Allen Ash Disposal Areas  
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# Grain Size Analysis



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.4	1.3	98.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.375 in.	100.0		
#4	100.0		
#10	100.0		
#20	99.8		
#40	99.6		
#60	99.4		
#140	98.7		
#200	98.3		

**Soil Description**

Grey-Brown Silty Clay

**Atterberg Limits**

PL=                      LL=                      PI=

**Coefficients**

D<sub>85</sub>=                      D<sub>60</sub>=                      D<sub>50</sub>=

D<sub>30</sub>=                      D<sub>15</sub>=                      D<sub>10</sub>=

C<sub>u</sub>=                      C<sub>c</sub>=

**Classification**

USCS=                      AASHTO=

**Remarks**

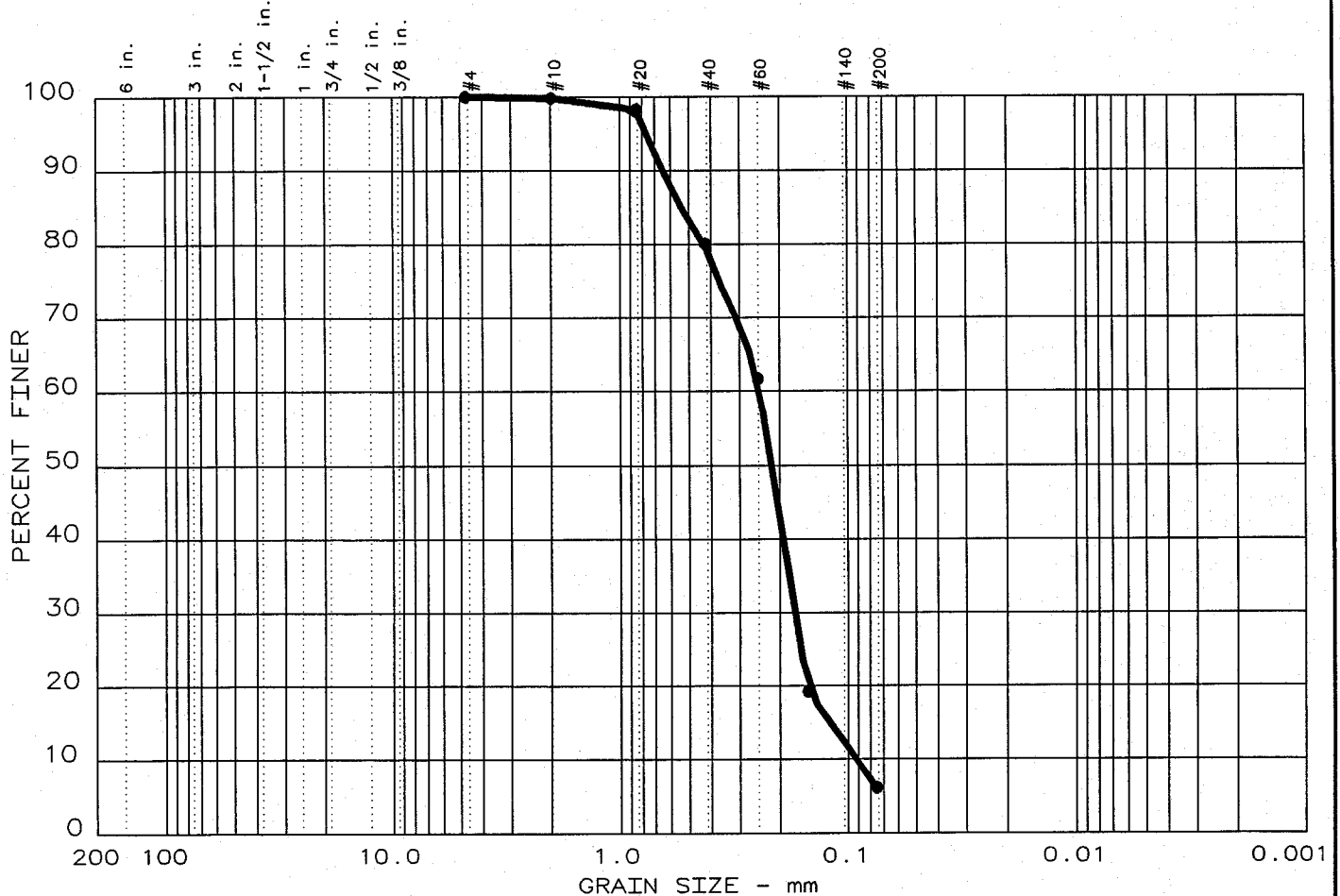
\* (no specification provided)

Sample No.:                      Source of Sample:  
 Location: EAD-1 UD @ 29.5'-31.5'

Date: 08-10-04  
 Elev./Depth:

<b>MACTEC ENGINEERING AND CONSULTING, INC.</b>	Client: TVA Project: Ash Disposal Area - TVA Allen Fossil Plant Project No: 3043-04-1037 <i>HAB</i> Figure
--	--

# PARTICLE SIZE DISTRIBUTION TEST REPORT



Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	LL	PI
● 4	0.0	0.0	93.8	6.2		NT	NT	NT

SIEVE inches size	PERCENT FINER	
	●	
X	GRAIN SIZE	
D <sub>60</sub>	0.245	
D <sub>30</sub>		
D <sub>10</sub>	0.0915	
X	COEFFICIENTS	
C <sub>c</sub>	1.30	
C <sub>u</sub>	2.7	

SIEVE number size	PERCENT FINER	
	●	
4	100.0	
10	99.8	
20	98.2	
40	80.1	
60	61.7	
100	19.2	
200	6.2	

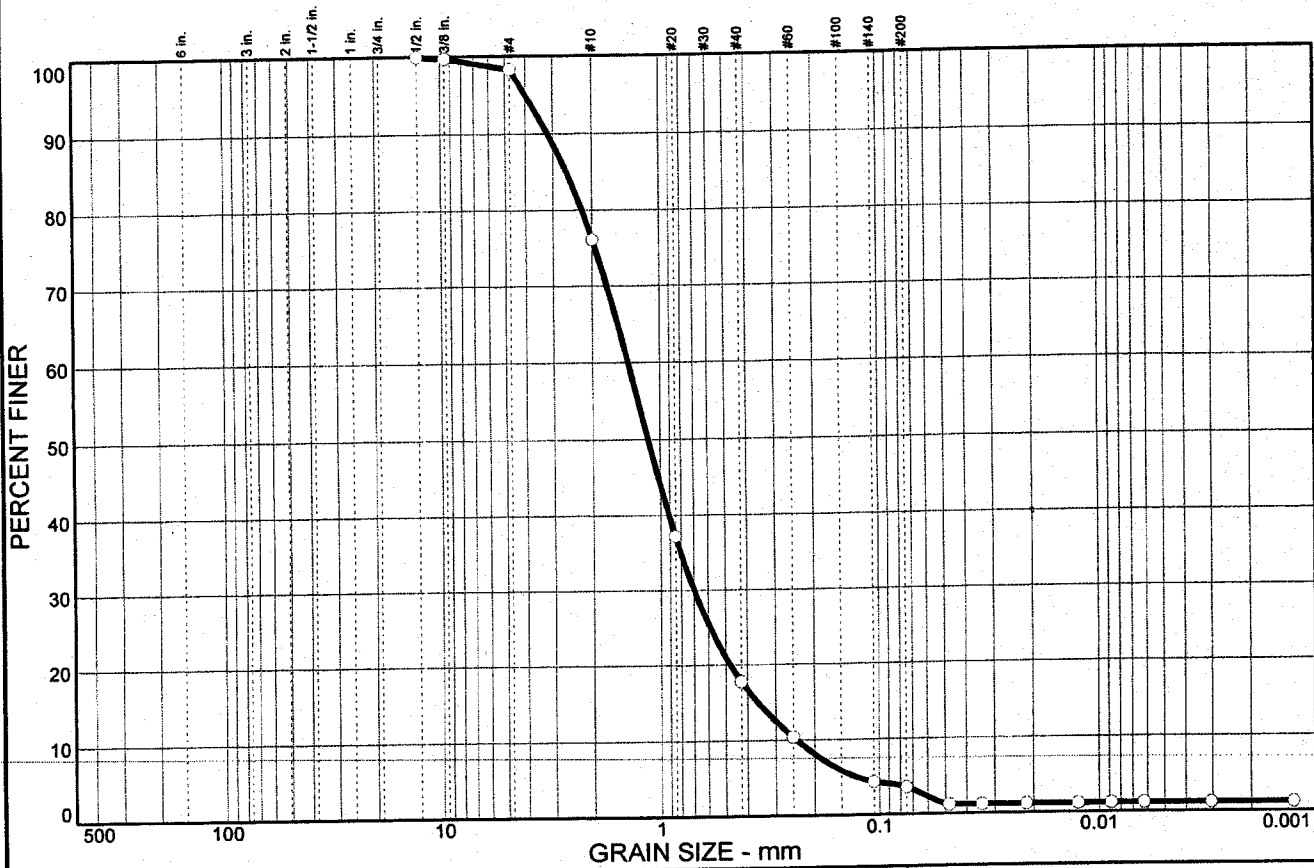
Sample information:  
 ● EAD-1, SPT 50-51.5'  
 Gray sand

Remarks:  
 Methods: Particle Size:  
 ASTM D 422-63(2002);  
 % < No. 200: ASTM D1140-00;  
 Sieve Analysis: T 29-99

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Project No.: 3043041037.0001  
 Project: TVA Allen Ash Disposal Areas  
 Date: August 11, 2004 *HAB* Fig. No.: EAD

# Grain Size Analysis



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	1.7	22.2	58.3	14.2	2.4	1.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.5 in.	100.0		
0.375 in.	99.7		
#4	98.3		
#10	76.1		
#20	37.2		
#40	17.8		
#60	10.4		
#140	4.4		
#200	3.6		

**Soil Description**

Black Ash

**Atterberg Limits**

PL= NP      LL= NP      PI= NP

**Coefficients**

D<sub>85</sub>= 2.61      D<sub>60</sub>= 1.39      D<sub>50</sub>= 1.13  
 D<sub>30</sub>= 0.696      D<sub>15</sub>= 0.359      D<sub>10</sub>= 0.241  
 C<sub>u</sub>= 5.78      C<sub>c</sub>= 1.45

**Classification**

USCS=      AASHTO=

**Remarks**

Specific Gravity: 2.80

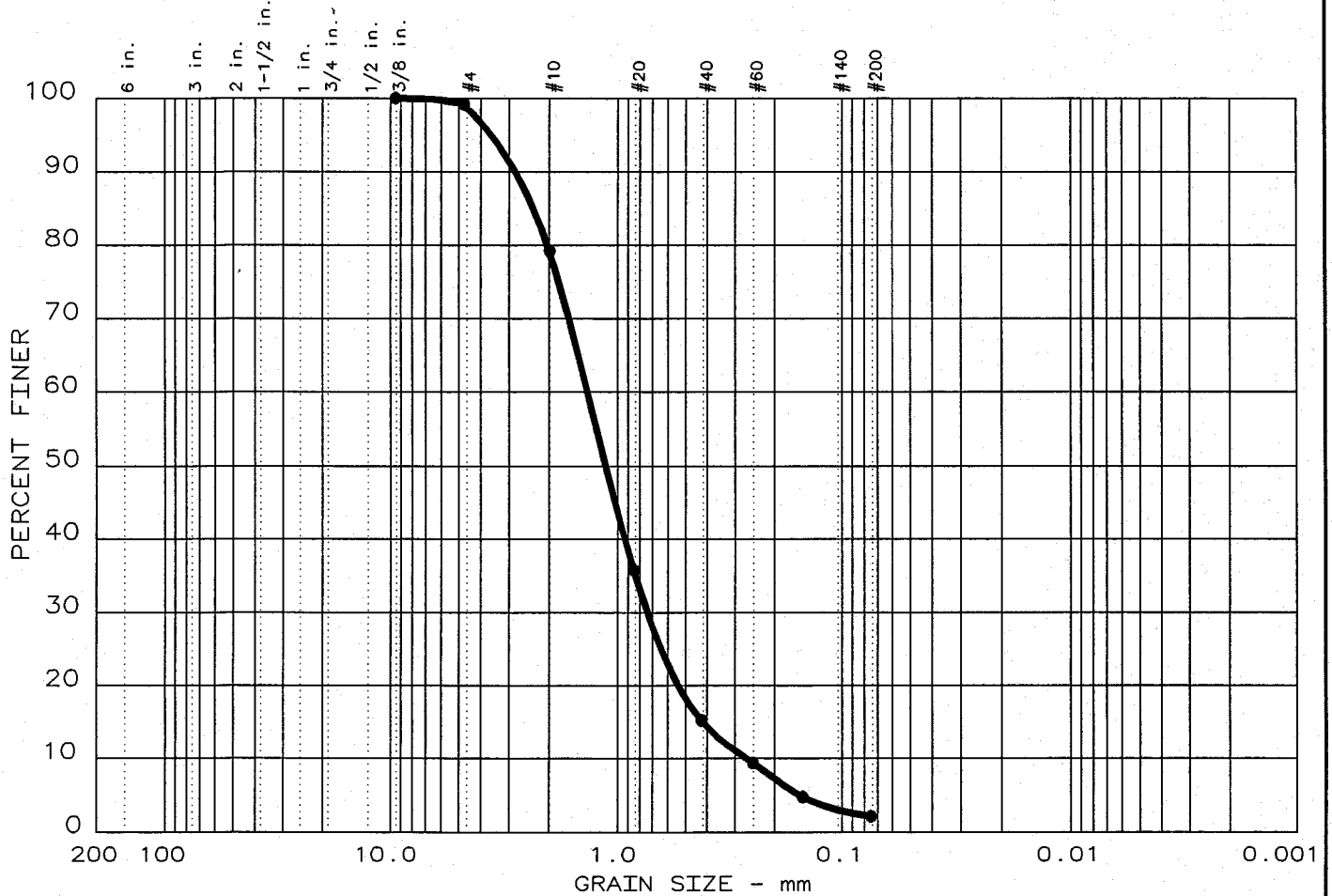
\* (no specification provided)

Sample No.:      Source of Sample:      Date: 08-10-04  
 Location: EAD-3 UD @ 6'-8'      Elev./Depth:

<b>MACTEC ENGINEERING AND CONSULTING, INC.</b>	Client: TVA Project: Ash Disposal Area - TVA Allen Fossil Plant Project No: 3043-04-1037 <i>HAB</i> Figure
--	--



# PARTICLE SIZE DISTRIBUTION TEST REPORT



Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	LL	PI
5	0.0	0.8	97.1	2.1		NT	NT	NT

SIEVE inches size	PERCENT FINER	
	●	
0.375	100.0	
X GRAIN SIZE		
D <sub>60</sub>	1.36	
D <sub>30</sub>		
D <sub>10</sub>	0.262	
X COEFFICIENTS		
C <sub>c</sub>	1.53	
C <sub>u</sub>	5.2	

SIEVE number size	PERCENT FINER	
	●	
4	99.2	
10	79.3	
20	35.8	
40	15.2	
60	9.4	
100	4.8	
200	2.1	

Sample information:  
 ● EAD-3, SPT 10-11.5'  
 Black ash

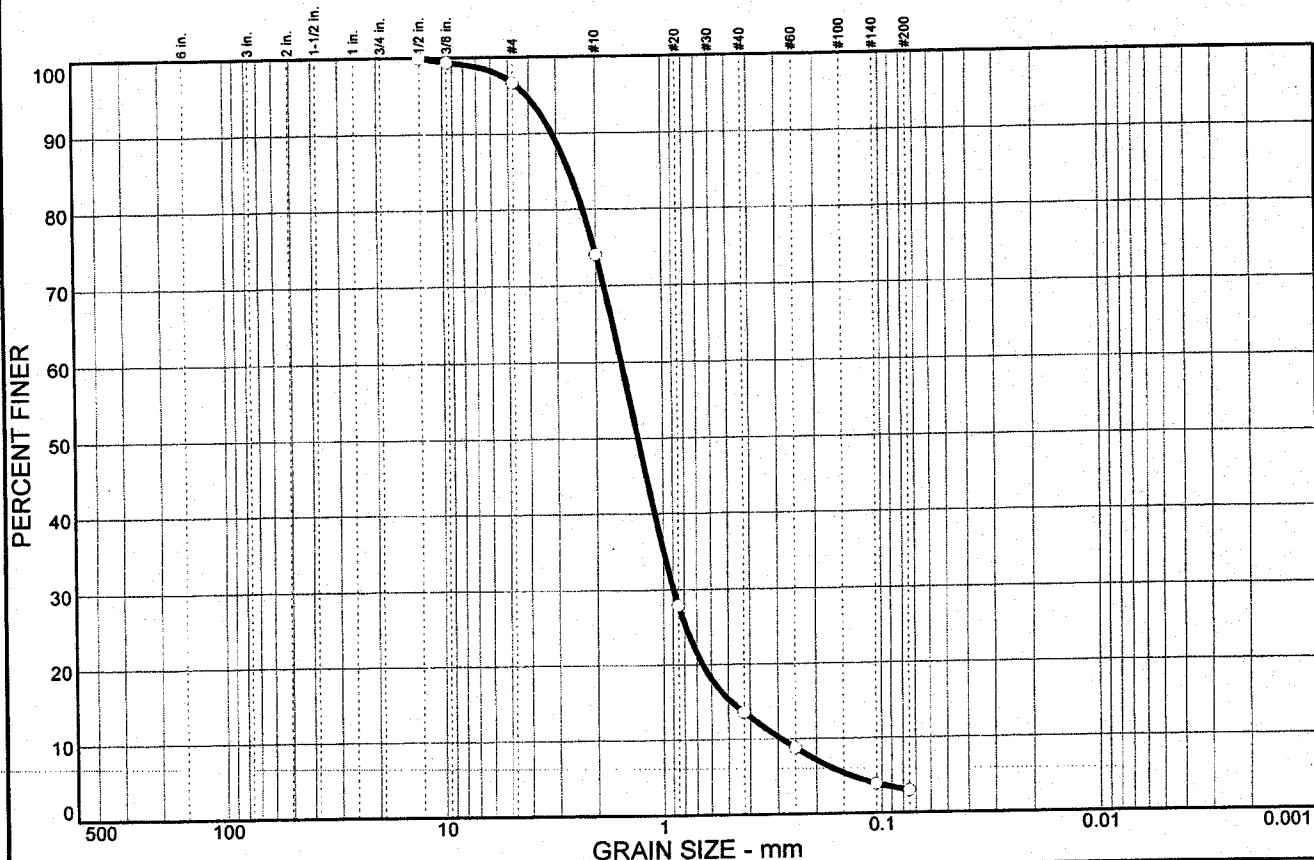
Remarks:  
 Methods: Particle Size:  
 ASTM D 422-63(2002);  
 % < No. 200: ASTM D1140-00;  
 Sieve Analysis: T 29-99

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Project No.: 3043041037.0001  
 Project: TVA Allen Ash Disposal Areas  
 Date: August 11, 2004 *HAB*

Fig. No.: EAD

# Grain Size Analysis



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	3.3	22.6	60.5	10.6	3.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.5 in.	100.0		
0.375 in.	99.4		
#4	96.7		
#10	74.1		
#20	27.9		
#40	13.6		
#60	8.8		
#140	3.9		
#200	3.0		

**Soil Description**

Dark-Grey Bottom Ash

**Atterberg Limits**

PL= NP      LL= NP      PI= NP

**Coefficients**

D<sub>85</sub>= 2.63      D<sub>60</sub>= 1.54      D<sub>50</sub>= 1.30  
D<sub>30</sub>= 0.894      D<sub>15</sub>= 0.484      D<sub>10</sub>= 0.289  
C<sub>u</sub>= 5.32      C<sub>c</sub>= 1.79

**Classification**

USCS=      AASHTO=

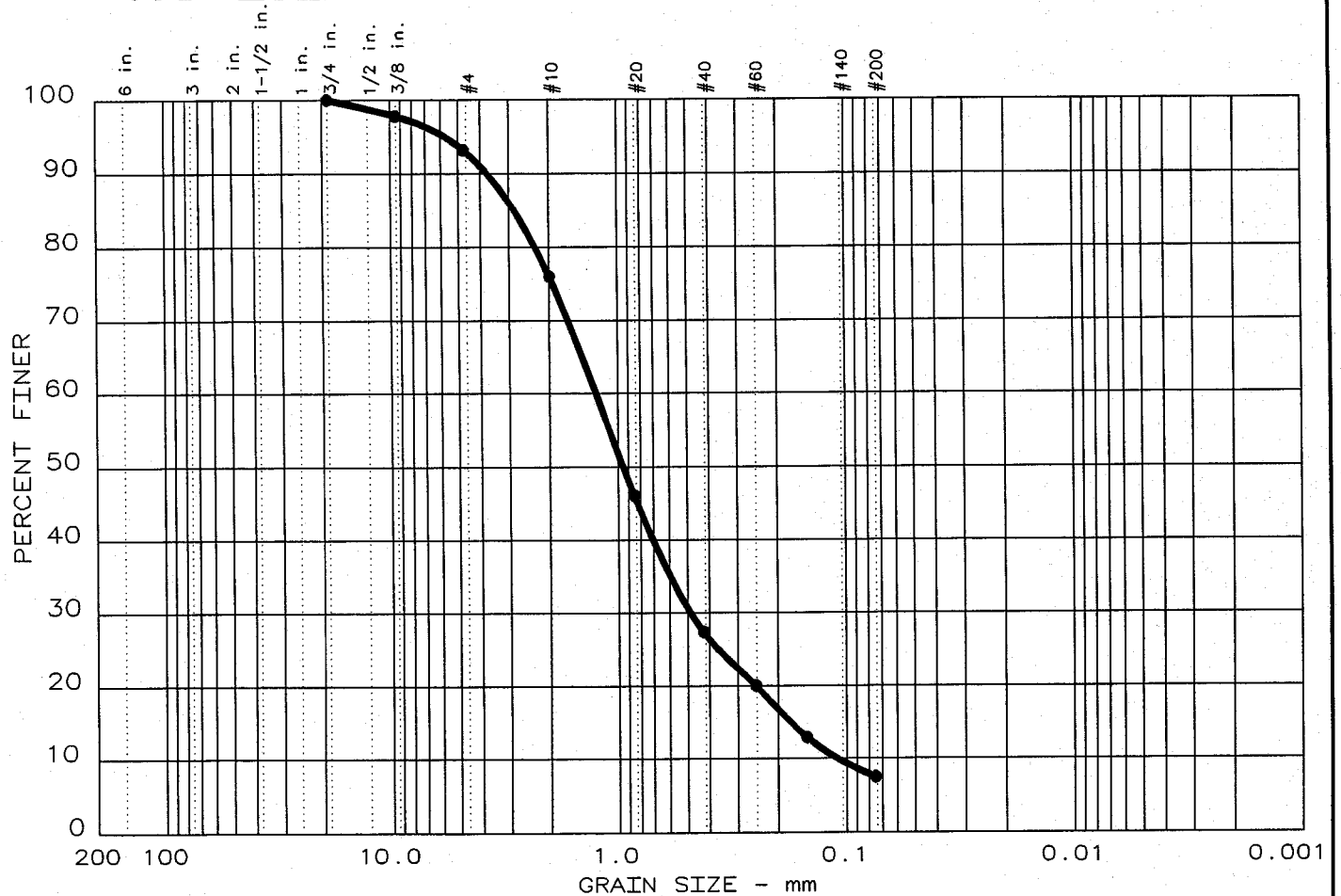
**Remarks**

\* (no specification provided)

Sample No.:      Source of Sample:      Date: 08-10-04  
Location: EAD-3 UD @ 15'-17'      Elev./Depth:

<b>MACTEC ENGINEERING AND CONSULTING, INC.</b>	Client: TVA Project: Ash Disposal Area - TVA Allen Fossil Plant Project No: 3043-04-1037 <i>HAS</i>
Figure	

# PARTICLE SIZE DISTRIBUTION TEST REPORT



Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	LL	PI
● 6	0.0	6.8	85.7		7.5	NT	NT	NT

SIEVE inches size	PERCENT FINER		
	●		
0.75	100.0		
0.375	97.8		
GRAIN SIZE			
D <sub>60</sub>	1.24		
D <sub>30</sub>			
D <sub>10</sub>	0.110		
COEFFICIENTS			
C <sub>c</sub>	1.69		
C <sub>u</sub>	11.3		

SIEVE number size	PERCENT FINER		
	●		
4	93.2		
10	76.0		
20	46.1		
40	27.4		
60	20.0		
100	12.9		
200	7.5		

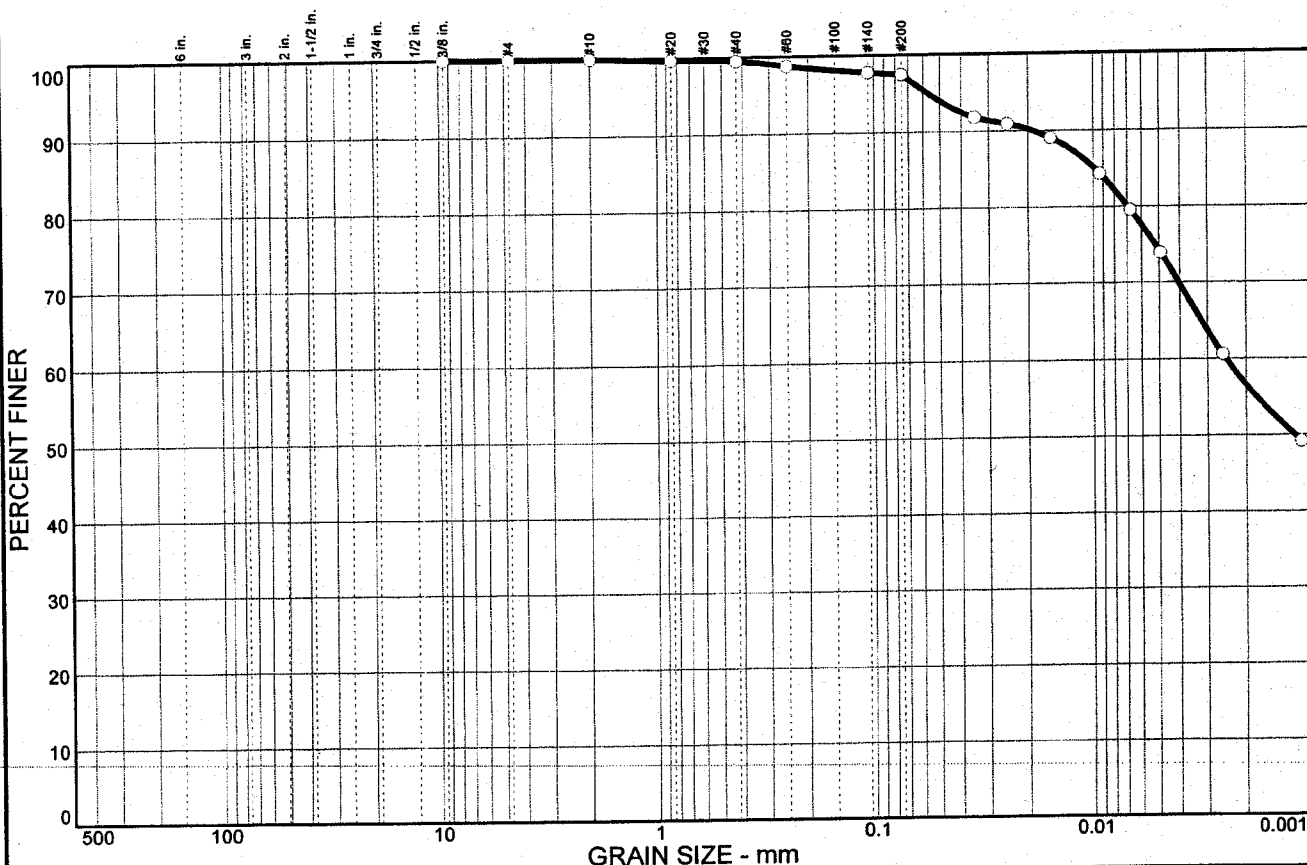
Sample information:  
 ● EAD-3, 19-20.5 & 22-23.5'  
 Black ash

Remarks:  
 Methods: Particle Size:  
 ASTM D 422-63(2002);  
 < No. 10 Spec. Gr.: 2.83;  
 Sieve Analysis: T 29-99

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 SERVICES, INC.**

Project No.: 3043041037.0001  
 Project: TVA Allen Ash Disposal Areas  
 Date: August 11, 2004 *HAB* Fig. No.: EAD

# Grain Size Analysis



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.5	2.0	23.3	74.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.375 in.	100.0		
#4	100.0		
#10	100.0		
#20	99.7		
#40	99.5		
#60	98.8		
#140	97.8		
#200	97.5		

**Soil Description**

Brown and Gray Silty Clay

PL= 34

D<sub>85</sub>= 0.0099

D<sub>30</sub>=

C<sub>u</sub>=

USCS= CH

**Atterberg Limits**

LL= 76

**Coefficients**

D<sub>60</sub>= 0.0025

D<sub>15</sub>=

C<sub>c</sub>=

**Classification**

AASHTO=

PI= 42

D<sub>50</sub>= 0.0012

D<sub>10</sub>=

**Remarks**

Specific Gravity: 2.71

\* (no specification provided)

Sample No.:

Source of Sample:

Date: 08-10-04

Location: EAD-3 UD @ 30'-32'

Elev./Depth:

**MACTEC ENGINEERING  
AND  
CONSULTING, INC.**

Client: TVA

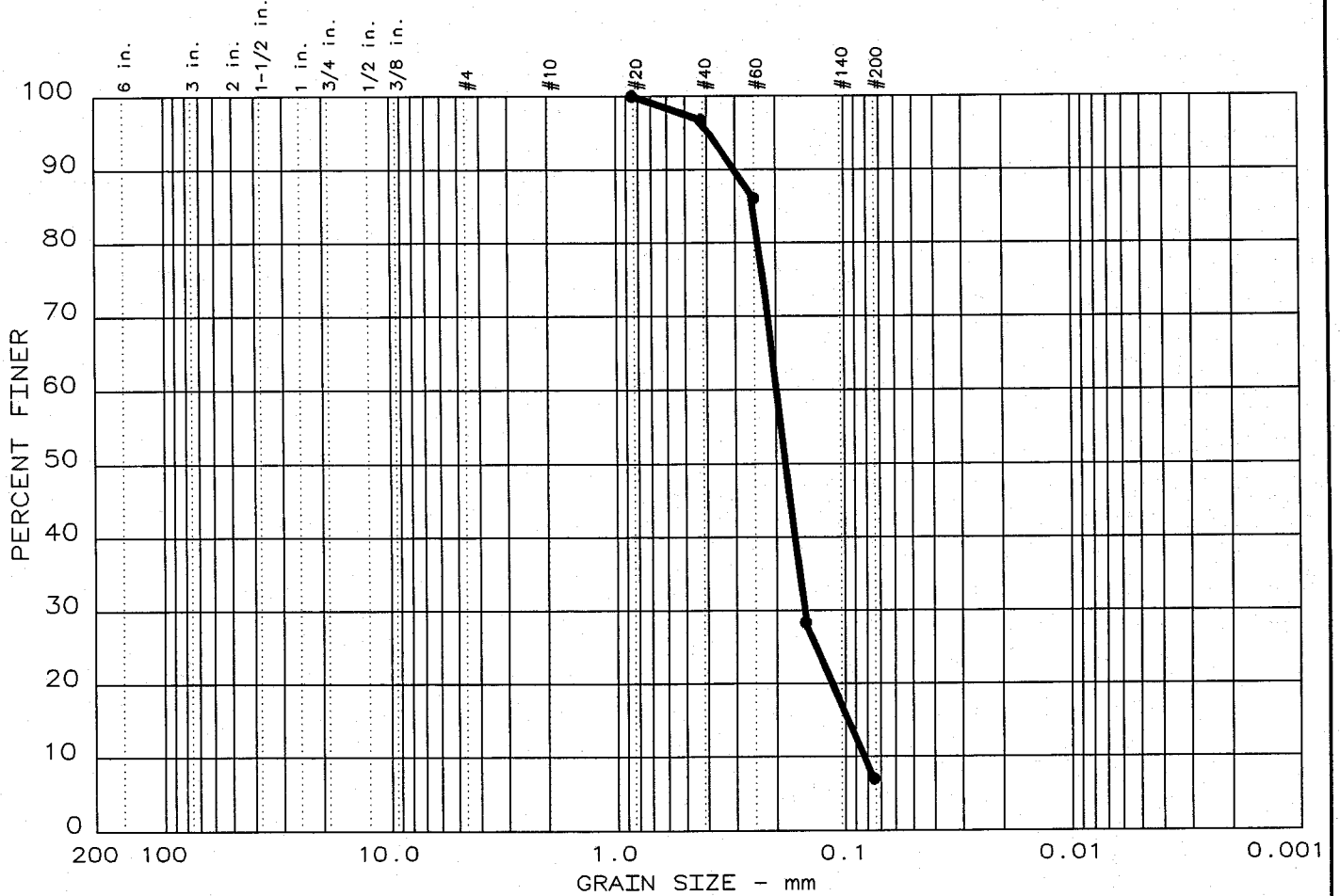
Project: Ash Disposal Area - TVA Allen Fossil Plant

Project No: 3043-04-1037

*HAB*

Figure

# PARTICLE SIZE DISTRIBUTION TEST REPORT



Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	LL	PI
7	0.0	0.0	93.0		7.0	NT	NT	NT

SIEVE inches size	PERCENT FINER		
	●		
<del>X</del>	GRAIN SIZE		
D <sub>60</sub>	0.198		
D <sub>30</sub>			
D <sub>10</sub>	0.0826		
<del>X</del>	COEFFICIENTS		
C <sub>c</sub>	1.41		
C <sub>u</sub>	2.4		

SIEVE number size	PERCENT FINER		
	●		
20	100.0		
40	96.7		
60	86.1		
100	28.4		
200	7.0		

Sample information:  
 ● EAD-3, SPT 40-41.5'  
 Gray to brown silty sand

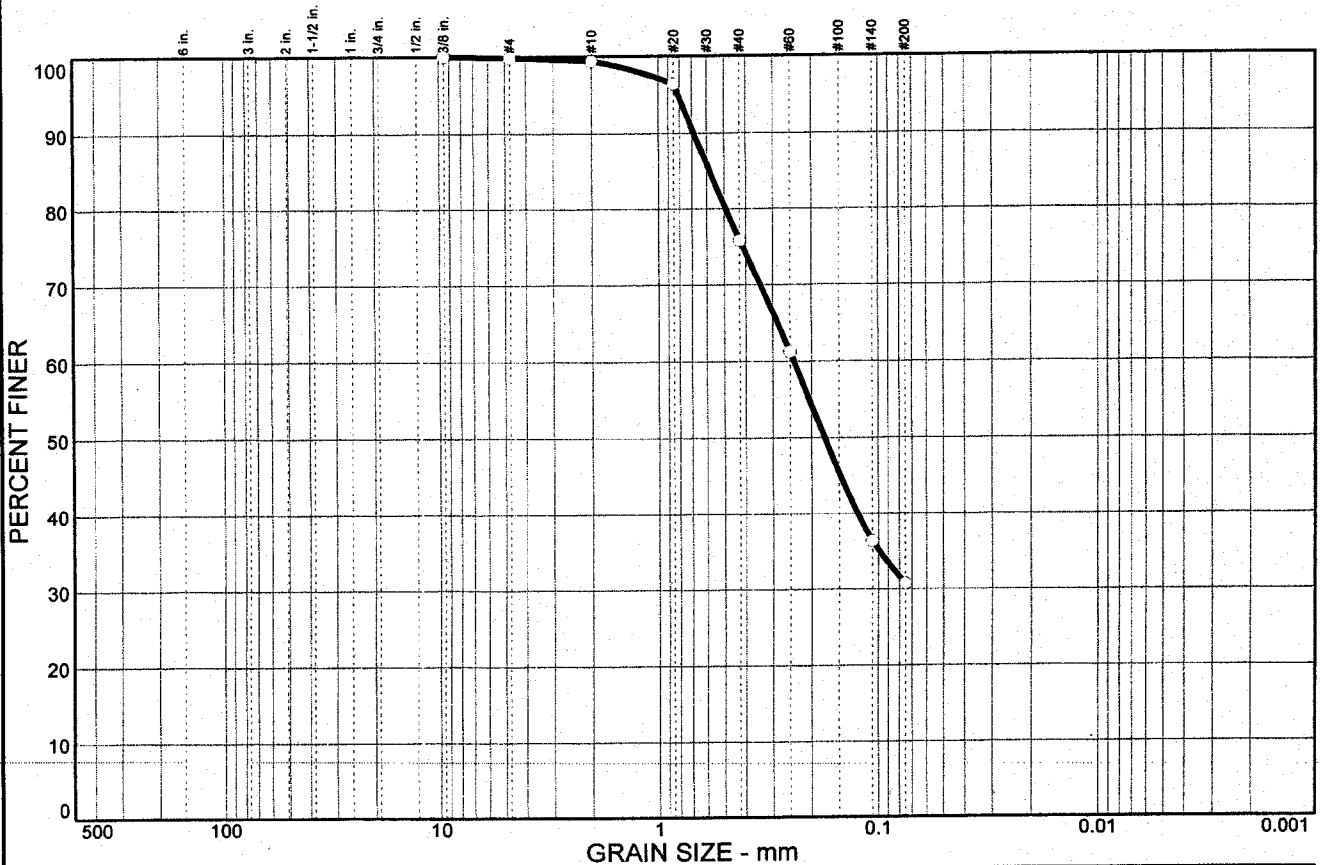
Remarks:  
 Methods: Particle Size:  
 ASTM D 422-63(2002);  
 % < No. 200: ASTM D1140-00;  
 Sieve Analysis: T 29-99

<b>LAW ENGINEERING AND ENVIRONMENTAL SERVICES, INC.</b>	Project No.: 3043041037.0001 Project: TVA Allen Ash Disposal Areas Date: August 11, 2004 <i>HAR</i>
	Fig. No.: EAD

**GRAIN SIZE ANALYSIS TEST RESULTS**

**WEST DISPOSAL AREA**

# Grain Size Analysis



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.2	0.4	23.6	45.1	30.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.375 in.	100.0		
#4	99.8		
#10	99.4		
#20	96.4		
#40	75.8		
#60	61.2		
#140	36.4		
#200	30.7		

**Soil Description**

Grey Silty Sand - Fly Ash

**Atterberg Limits**

PL=                      LL=                      PI=

**Coefficients**

D<sub>85</sub>= 0.583              D<sub>60</sub>= 0.240              D<sub>50</sub>= 0.174

D<sub>30</sub>=                      D<sub>15</sub>=                      D<sub>10</sub>=

C<sub>u</sub>=                      C<sub>c</sub>=

**Classification**

USCS=                      AASHTO=

**Remarks**

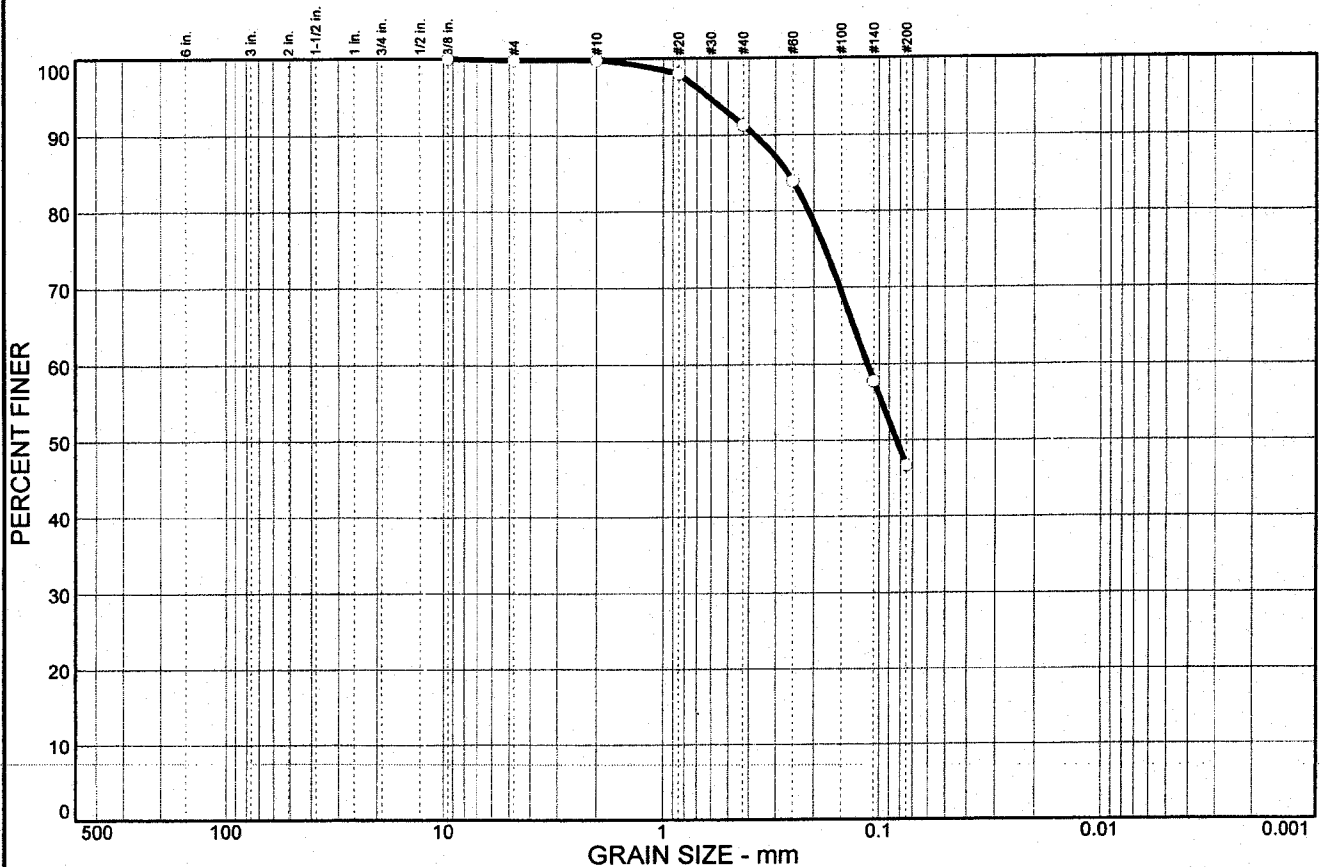
\* (no specification provided)

Sample No.:                      Source of Sample:  
 Location: WAD-2 UD @ 6'-8'

Date: 08-10-04  
 Elev./Depth:

<b>MACTEC ENGINEERING AND CONSULTING, INC.</b>	Client: TVA Project: Ash Disposal Area - TVA Allen Fossil Plant Project No: 3043-04-1037 <i>HAB</i> Figure
--	--

# Grain Size Analysis



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.2	0.0	8.5	44.6	46.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.375 in.	100.0		
#4	99.8		
#10	99.8		
#20	98.0		
#40	91.3		
#60	83.9		
#140	57.8		
#200	46.7		

**Soil Description**

Black Fly Ash with Clay Seams

**Atterberg Limits**

PL=                      LL=                      PI=

**Coefficients**

D<sub>85</sub>= 0.264              D<sub>60</sub>= 0.113              D<sub>50</sub>= 0.0833

D<sub>30</sub>=                      D<sub>15</sub>=                      D<sub>10</sub>=

C<sub>u</sub>=                      C<sub>c</sub>=

**Classification**

USCS=                      AASHTO=

**Remarks**

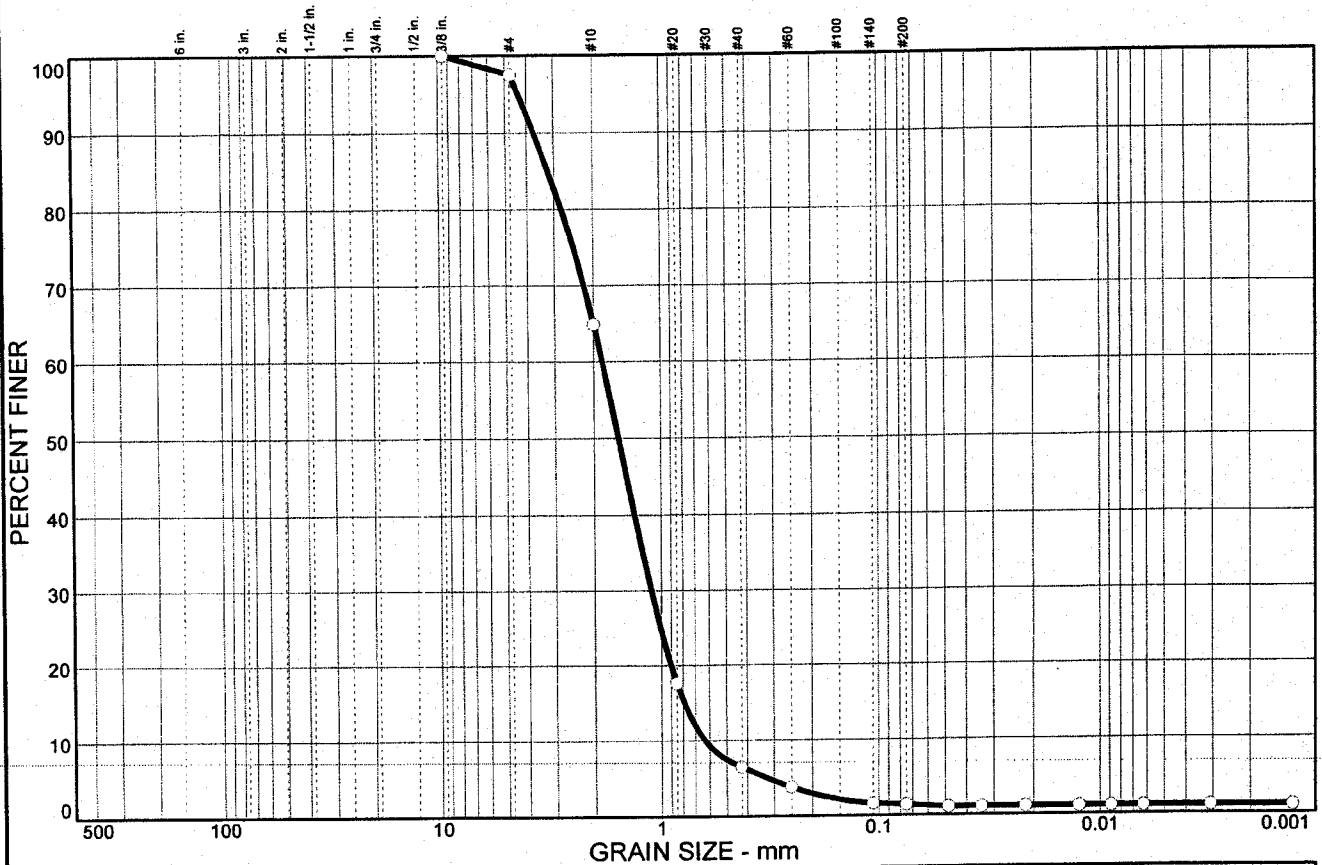
\* (no specification provided)

Sample No.:                      Source of Sample:                      Date: 08-10-04  
 Location: WAD-2 UD @ 12'-14'                      Elev./Depth:

<b>MACTEC ENGINEERING AND CONSULTING, INC.</b>	Client: TVA Project: Ash Disposal Area - TVA Allen Fossil Plant Project No: 3043-04-1037 <i>HAR</i> Figure
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# Grain Size Analysis



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	2.5	32.6	58.4	5.1	0.3	1.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.375 in.	100.0		
#4	97.5		
#10	64.9		
#20	17.6		
#40	6.5		
#60	3.8		
#140	1.6		
#200	1.4		

**Soil Description**

Black Ash Coal Fragments

**Atterberg Limits**

PL= NP      LL= NP      PI= NP

**Coefficients**

D<sub>85</sub>= 3.20      D<sub>60</sub>= 1.83      D<sub>50</sub>= 1.55  
D<sub>30</sub>= 1.11      D<sub>15</sub>= 0.787      D<sub>10</sub>= 0.630  
C<sub>u</sub>= 2.91      C<sub>c</sub>= 1.06

**Classification**

USCS=      AASHTO=

**Remarks**

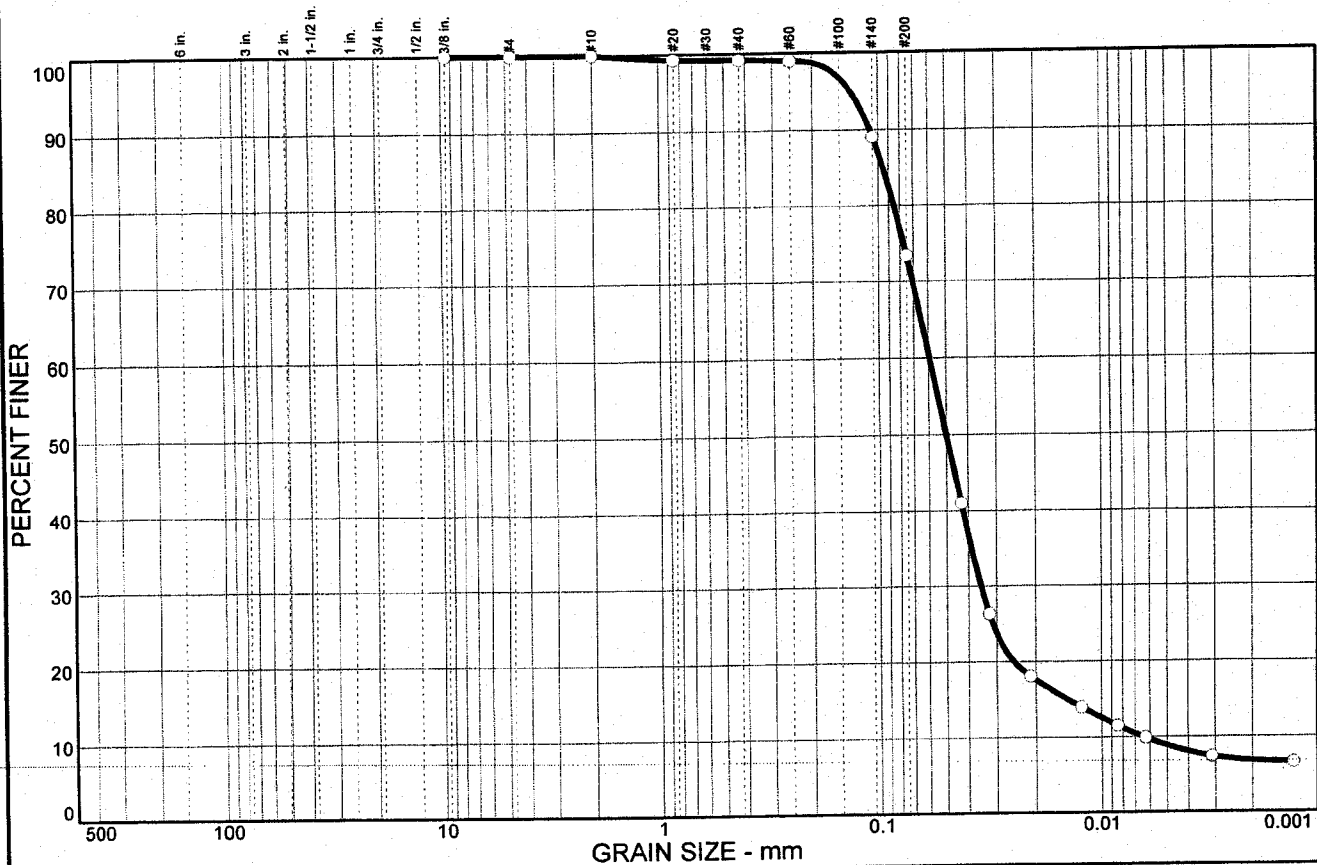
Specific Gravity: 2.78

\* (no specification provided)

Sample No.:      Source of Sample:      Date: 08-10-04  
Location: WAD-2 UD @ 14'-16'      Elev./Depth:

<b>MACTEC ENGINEERING AND CONSULTING, INC.</b>	Client: TVA Project: Ash Disposal Area - TVA Allen Fossil Plant Project No: 3043-04-1037 <i>HAB</i> Figure
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# Grain Size Analysis



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.8	25.8	64.5	8.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.375 in.	100.0		
#4	100.0		
#10	100.0		
#20	99.3		
#40	99.2		
#60	99.0		
#140	89.0		
#200	73.4		

**Soil Description**

Olive-Brown Silt with Sand

**Atterberg Limits**

PL= NP      LL= NP      PI= NP

**Coefficients**

D<sub>85</sub>= 0.0954      D<sub>60</sub>= 0.0592      D<sub>50</sub>= 0.0501  
D<sub>30</sub>= 0.0353      D<sub>15</sub>= 0.0143      D<sub>10</sub>= 0.0064  
C<sub>u</sub>= 9.24      C<sub>c</sub>= 3.28

**Classification**

USCS= ML      AASHTO=

**Remarks**

Specific Gravity: 2.69

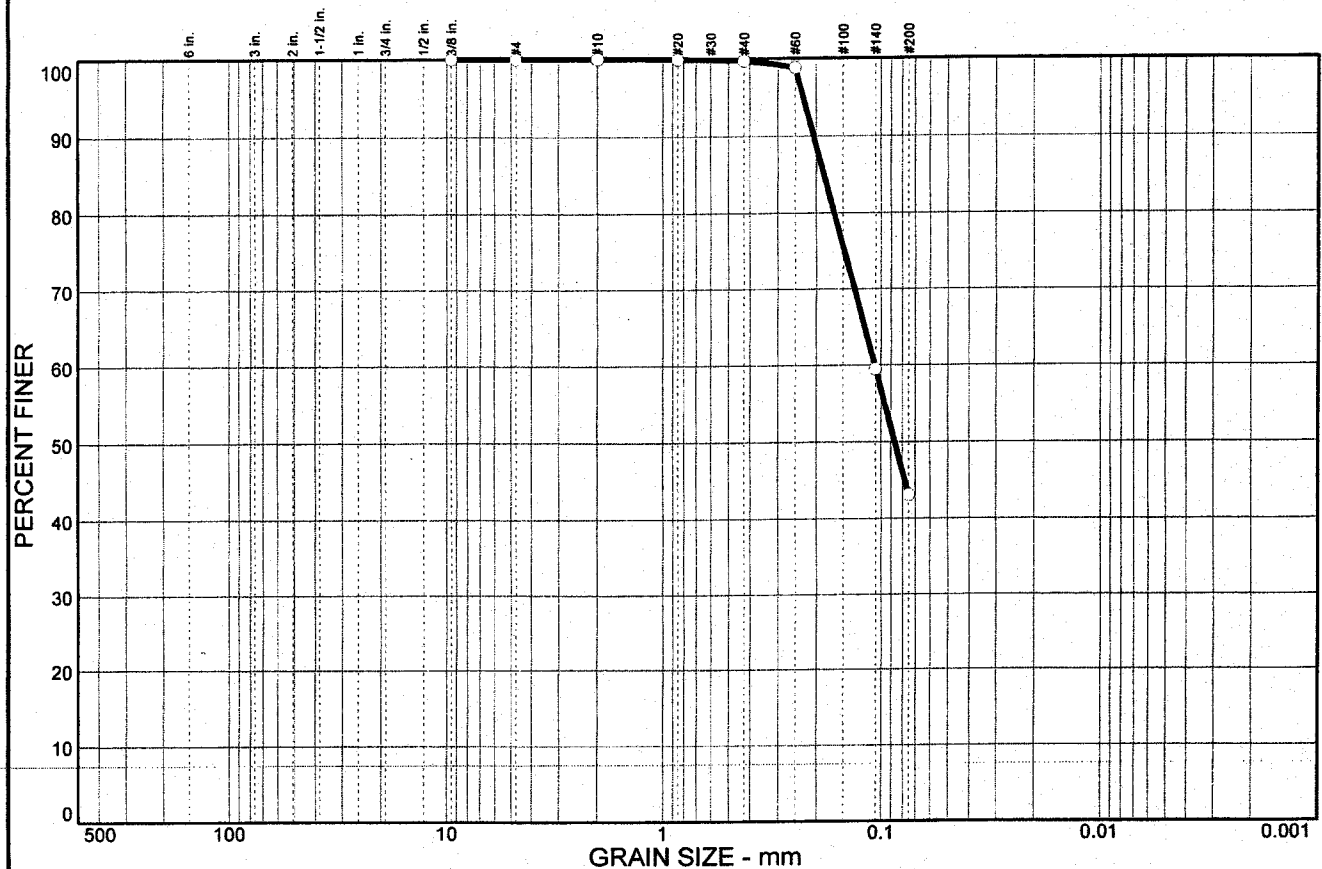
\* (no specification provided)

Sample No.:      Source of Sample:  
Location: WAD-2 UD @ 30'-32

Date: 08-10-04  
Elev./Depth:

<b>MACTEC ENGINEERING AND CONSULTING, INC.</b>	Client: TVA Project: Ash Disposal Area - TVA Allen Fossil Plant Project No: 3043-04-1037 <i>HAB</i> Figure
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# Grain Size Analysis



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.3	56.6	43.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.375 in.	100.0		
#4	100.0		
#10	100.0		
#20	99.9		
#40	99.7		
#60	98.8		
#140	59.5		
#200	43.1		

**Soil Description**

Olive Brown Silty Sand

PL=	<b>Atterberg Limits</b>	PI=
	LL=	

D <sub>85</sub> = 0.184	<b>Coefficients</b>	D <sub>50</sub> = 0.0867
D <sub>30</sub> =	D <sub>60</sub> = 0.107	D <sub>10</sub> =
C <sub>u</sub> =	D <sub>15</sub> =	
	C <sub>c</sub> =	

USCS=	<b>Classification</b>	AASHTO=
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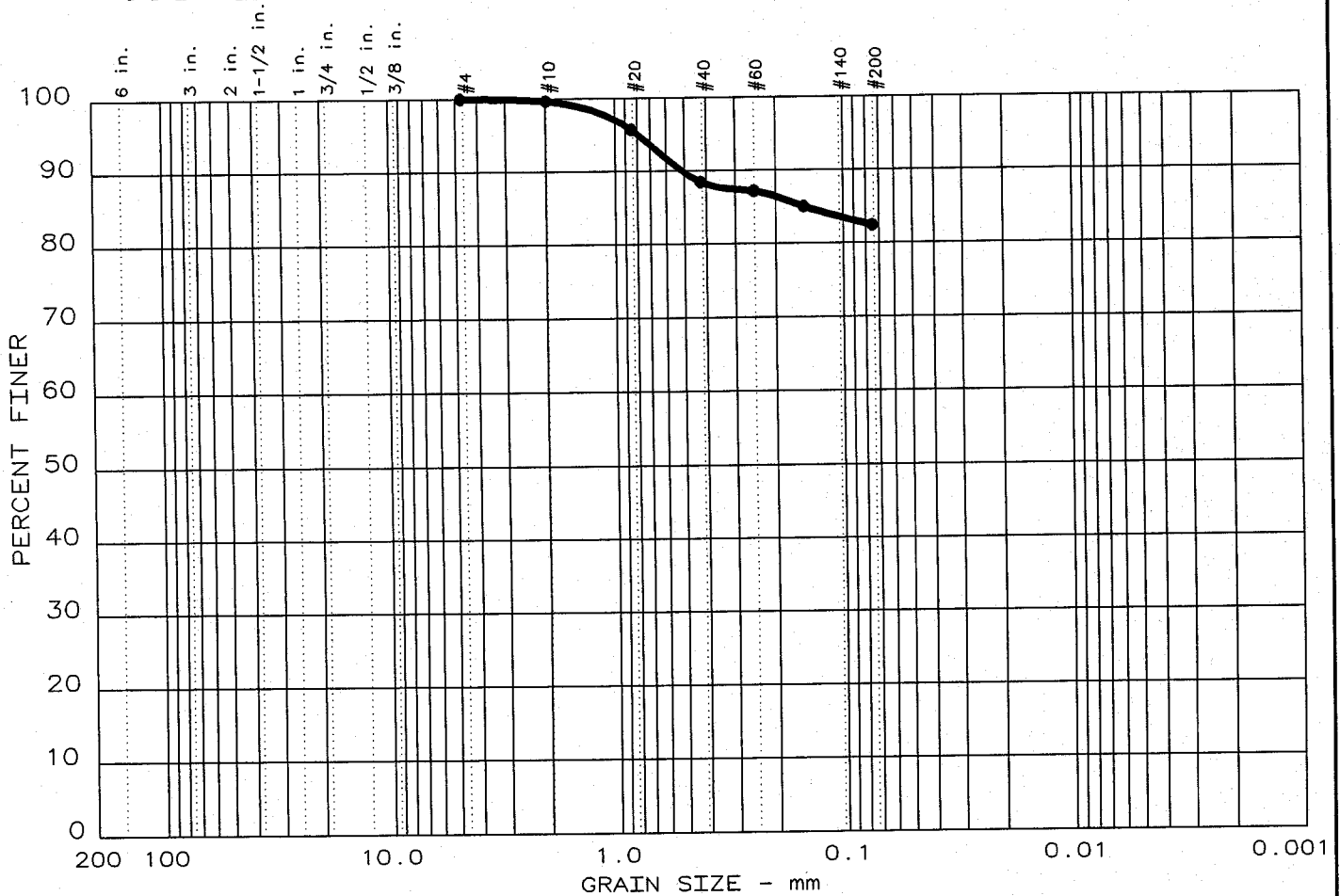
**Remarks**

\* (no specification provided)

Sample No.: \_\_\_\_\_ Source of Sample: \_\_\_\_\_ Date: 08-10-04  
 Location: WAD-2 UD @ 33'-35' Elev./Depth: \_\_\_\_\_

<b>MACTEC ENGINEERING AND CONSULTING, INC.</b>	Client: TVA Project: Ash Disposal Area - TVA Allen Fossil Plant Project No: 3043-04-1037 <i>HAB</i> Figure _____
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# PARTICLE SIZE DISTRIBUTION TEST REPORT



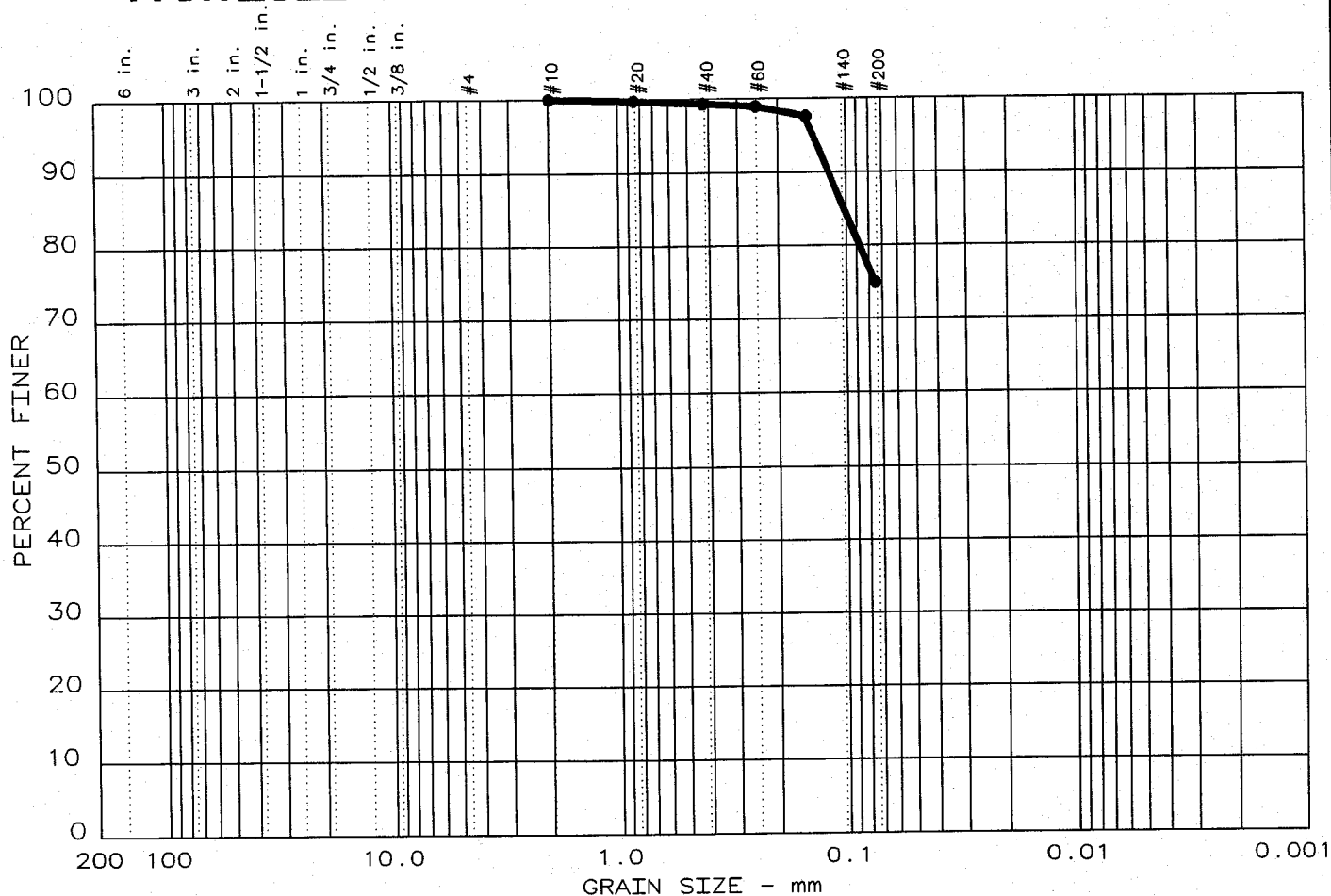
Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	LL	PI
● 8	0.0	0.0	17.6	82.4		NT	NT	NT

SIEVE inches size	PERCENT FINER			SIEVE number size	PERCENT FINER		
	●				●		
				4	100.0		
				10	99.6		
				20	95.7		
				40	88.4		
				60	87.2		
				100	85.0		
				200	82.4		
X GRAIN SIZE							
D <sub>60</sub>							
D <sub>30</sub>							
D <sub>10</sub>							
X COEFFICIENTS							
C <sub>c</sub>							
C <sub>u</sub>							

Sample information:  
 ● WAD-3, 4-5.5' & 7-8.5'  
 Brown/black sandy clay/  
 soil and ash

Remarks:  
 Methods: Particle Size:  
 ASTM D 422-63(2002);  
 < No.40 Spec. Gr.: 2.64;  
 Sieve Analysis: T 29-99

# PARTICLE SIZE DISTRIBUTION TEST REPORT



Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	LL	PI
● 9	0.0	0.0	25.1	74.9		NT	NT	NT

SIEVE inches size	PERCENT FINER		
	●		
<del>X</del>	GRAIN SIZE		
D <sub>60</sub> D <sub>30</sub> D <sub>10</sub>			
<del>X</del>	COEFFICIENTS		
C <sub>c</sub> C <sub>u</sub>			

SIEVE number size	PERCENT FINER	
	●	
10	100.0	
20	99.7	
40	99.3	
60	98.9	
100	97.5	
200	74.9	

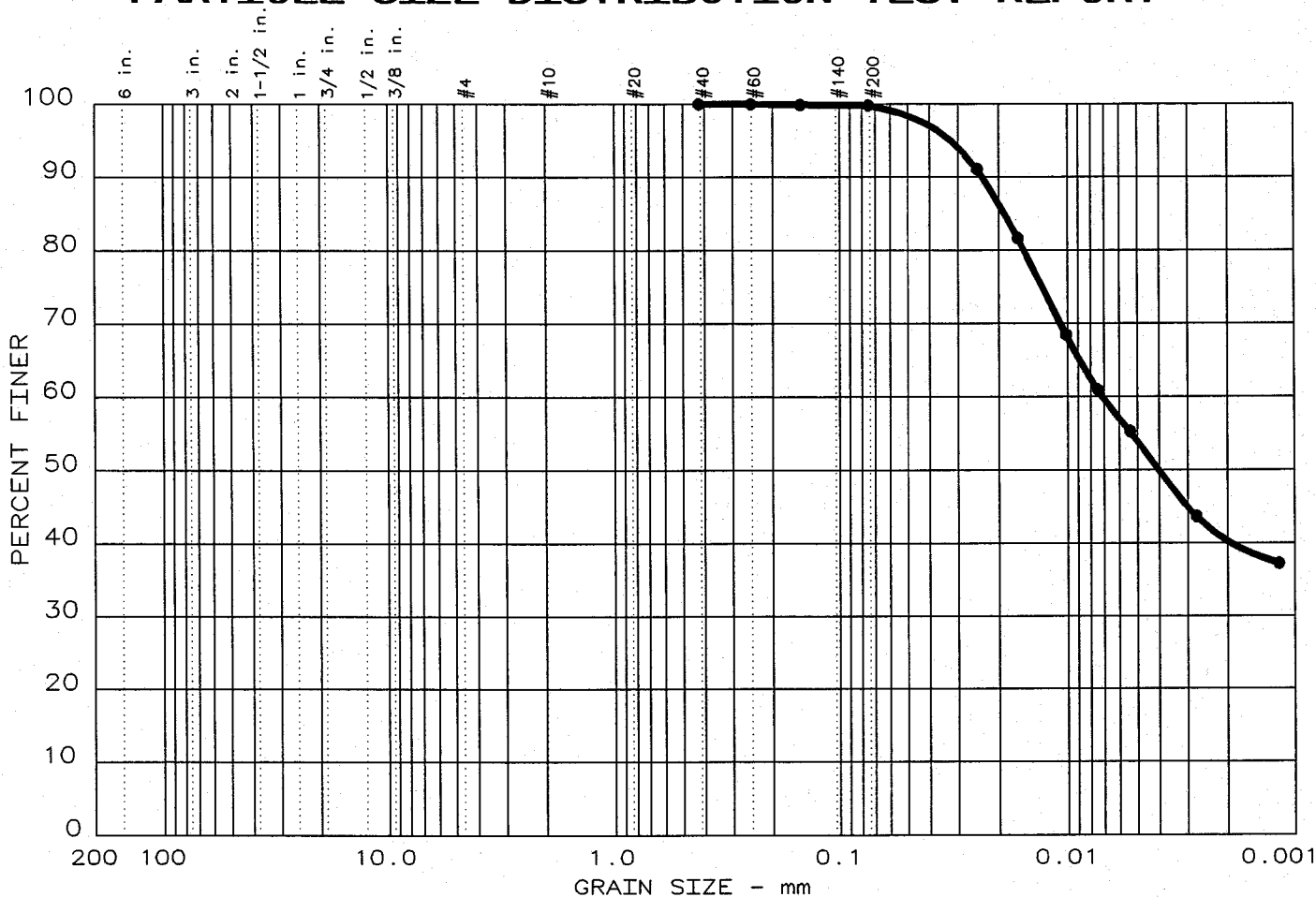
Sample information:  
 ● WAD-3, 16-17.5'  
 Black and brown ash

Remarks:  
 Methods: Particle Size:  
 ASTM D 422-63(2002);  
 %< No.200:ASTM D1140-00;  
 Sieve Analysis: T 29-99

**LAW ENGINEERING  
AND ENVIRONMENTAL  
SERVICES, INC.**

Project No.: 3043041037.0001  
 Project: TVA Allen Ash Disposal Areas  
 Date: August 11, 2004 *HAB* Fig. No.: WAD

# PARTICLE SIZE DISTRIBUTION TEST REPORT



Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	LL	PI
● 2	0.0	0.0	0.2	45.8	54.0	CH	52	32

SIEVE inches size	PERCENT FINER		
	●		
GRAIN SIZE			
D <sub>60</sub>	0.0071		
D <sub>30</sub>			
D <sub>10</sub>			
COEFFICIENTS			
C <sub>c</sub>			
C <sub>u</sub>			

SIEVE number size	PERCENT FINER		
	●		
40	100.0		
60	100.0		
100	99.9		
200	99.8		

Sample information:  
 ● WAD-3, SPT 30-31.5'  
 Gray and brown fat clay

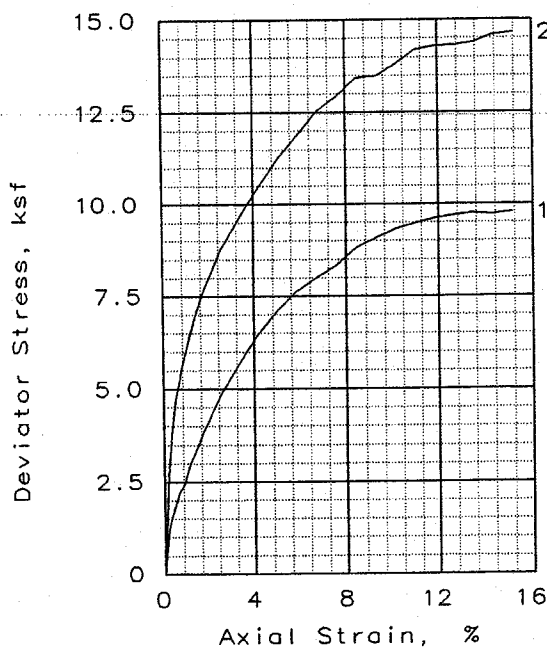
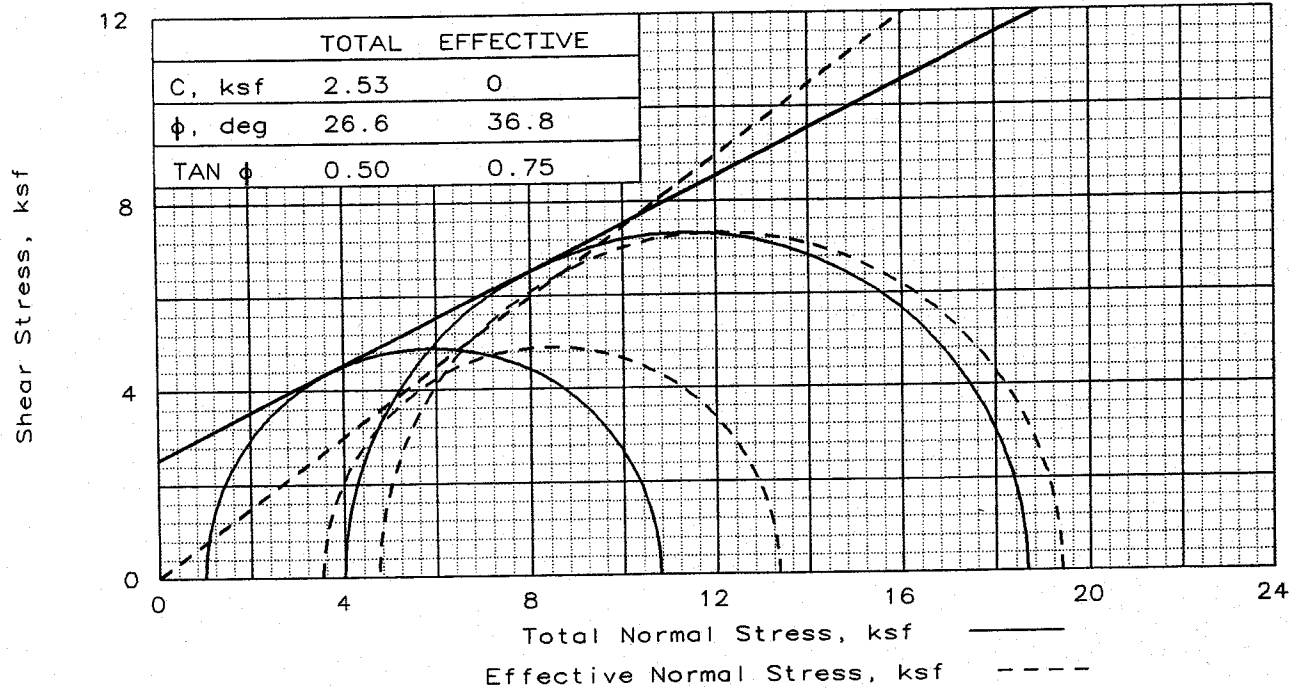
Remarks:  
 Methods: Particle Size:  
 ASTM D 422-63(2002);  
 % < No. 200: ASTM D1140-00;  
 Sieve Analysis: T 29-99

**LAW ENGINEERING  
AND ENVIRONMENTAL  
SERVICES, INC.**

Project No.: 3043041037.0001  
 Project: TVA Allen Ash Disposal Areas  
 Date: August 11, 2004 *HAB* Fig. No.: WAD

**TRIAxIAL COMPRESSION TEST RESULTS**

**EAST DISPOSAL AREA**



	1	2	
SAMPLE NO.:	1	2	
INITIAL	WATER CONTENT, %	25.9	18.4
	DRY DENSITY, pcf	88.6	91.0
	SATURATION, %	83.5	63.2
	VOID RATIO	0.783	0.735
	DIAMETER, in	2.88	2.88
	HEIGHT, in	5.98	5.93
AT TEST	WATER CONTENT, %	28.0	26.4
	DRY DENSITY, pcf	92.5	94.7
	SATURATION, %	100.0	100.0
	VOID RATIO	0.708	0.667
	DIAMETER, in	2.83	2.83
	HEIGHT, in	5.95	5.91
Strain rate, %/min	0.17	0.17	
BACK PRESSURE, ksf	7.2	7.2	
CELL PRESSURE, ksf	8.2	11.2	
FAIL. STRESS, ksf	9.8	14.7	
TOTAL PORE PR., ksf	4.7	6.5	
ULT. STRESS, ksf			
TOTAL PORE PR., ksf			
$\bar{\sigma}_1$ FAILURE, ksf	13.3	19.4	
$\bar{\sigma}_3$ FAILURE, ksf	3.5	4.7	

TYPE OF TEST:  
CU with Pore Pressures  
SAMPLE TYPE: Shelby Tube Sample  
DESCRIPTION: Gray Ash

SPECIFIC GRAVITY= 2.53  
REMARKS: Specimen 3 was not plotted because it was a different material from samples 1 and 2

Fig. No.: \_\_\_\_\_

HAB

CLIENT: TVA

PROJECT: Ash Disposal Areas - TVA Allen Fossil Plant

SAMPLE LOCATION: EAD-1 UD @ 14'-16'

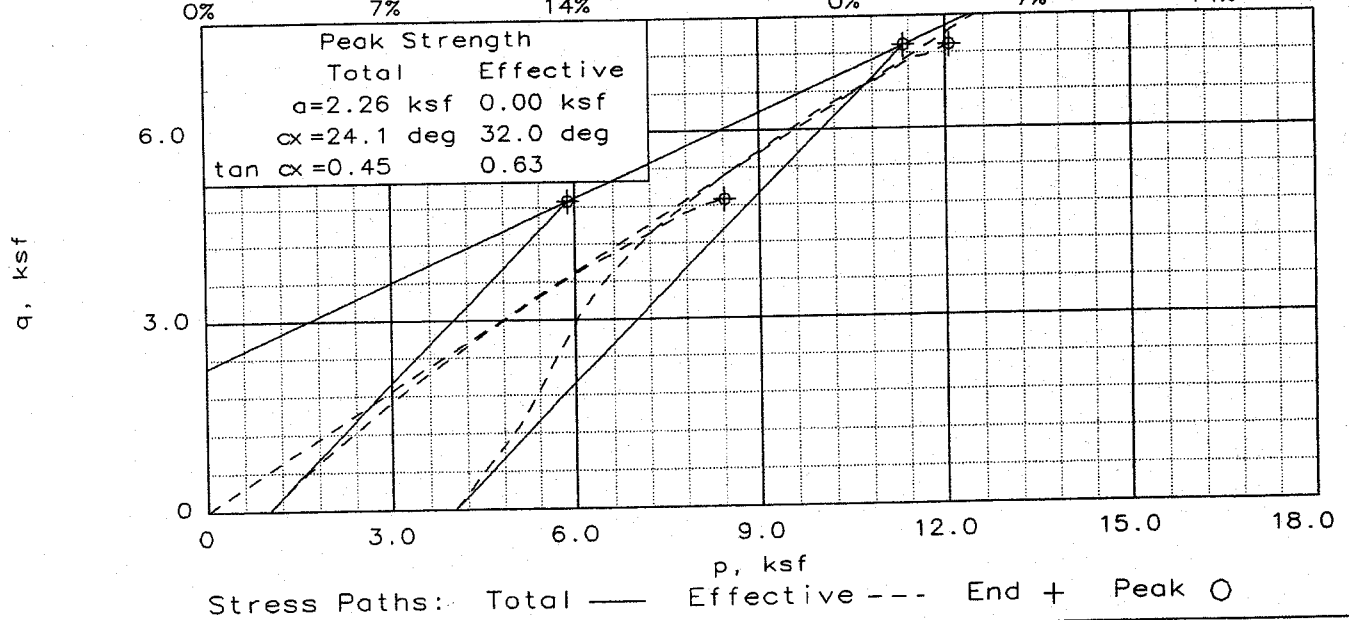
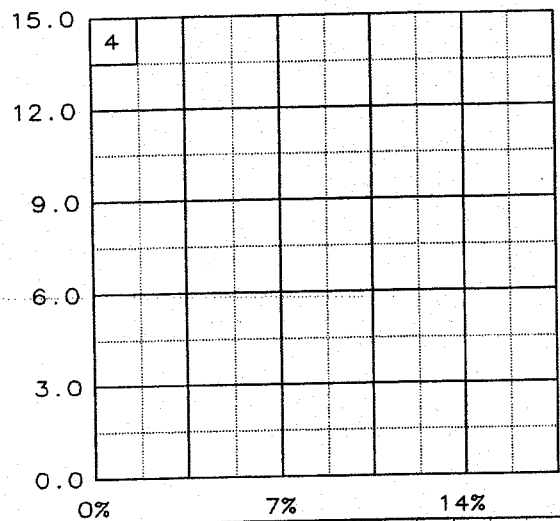
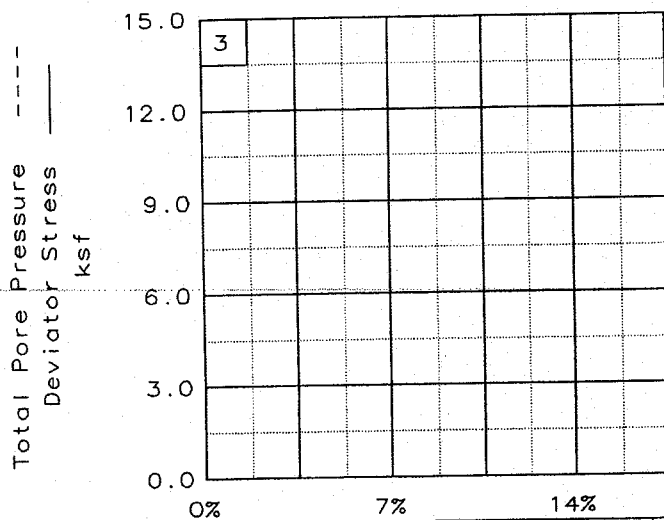
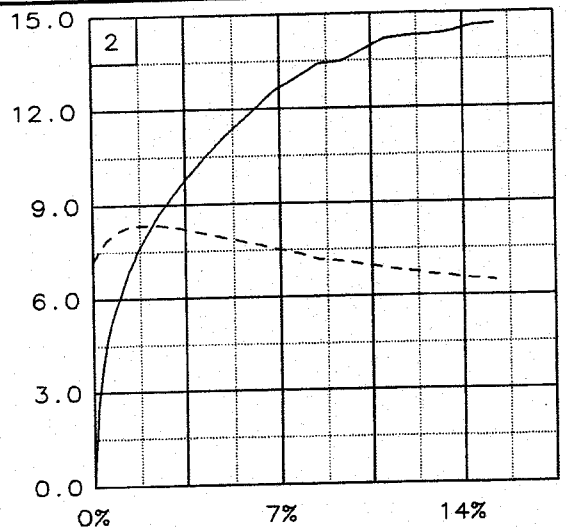
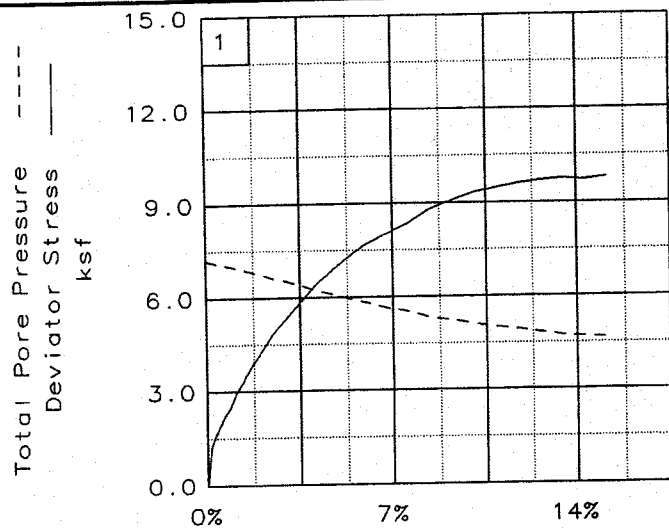
PROJ. NO.: 3043-04-1037.0001

DATE: 08-10-04

TRIAxIAL SHEAR TEST REPORT

LAW ENGINEERING AND ENVIRONMENTAL SERVICES





Client: TVA

Project: Ash Disposal Areas - TVA Allen Fossil Plant

Location: EAD-1 UD @ 14'-16'

File: ALLEN-4

Project No.: 3043-04-1037.0001

Fig. No.: \_\_\_\_\_

TRIAXIAL COMPRESSION TEST  
CU with Pore Pressures

8-13-2004  
1:38 pm

Project and Sample Data

Date: 08-10-04  
Client: TVA  
Project: Ash Disposal Areas - TVA Allen Fossil Plant  
Sample location: EAD-1 UD @ 14'-16'  
Sample description: Gray Ash  
Remarks: Specimen 3 was not plotted because it was a  
different material from samples 1 and 2  
Fig no.: 2nd page Fig no. (if applicable):  
Type of sample: Shelby Tube Sample  
Specific gravity= 2.53 LL= NV PL= NP PI=  
Test method: Corps of Eng. - saturation assumed

Specimen Parameters for Specimen No. 1

Specimen Parameter	Initial	Saturated	Consolidated	Final
Wt. moist soil and tare:	1143.350			1158.630
Wt. dry soil and tare:	908.410			908.410
Wt. of tare:	0.000			0.000
Weight, gms:	1143.4			
Diameter, in:	2.884	2.830	2.831	
Area, in <sup>2</sup> :	6.533	6.291	6.294	
Height, in:	5.981	5.981	5.946	
Net decrease in height, in:		0.000	0.035	
Net decrease in water volume, cc:		-22.600	3.300	
% Moisture:	25.9	28.4	28.0	27.5
Wet density, pcf:	111.5	118.0	118.3	
Dry density, pcf:	88.6	92.0	92.5	
Void ratio:	0.7832	0.7173	0.7081	
% Saturation:	83.5	100.0	100.0	

Test Readings Data for Specimen No. 1

Deformation dial constant= 1 in per input unit  
Primary load ring constant= 2.8 lbs per input unit  
Secondary load ring constant= 0 lbs per input unit  
Crossover reading for secondary load ring= 0 input units  
Membrane modulus = 0.14000 kN/cm<sup>2</sup>  
Membrane thickness = 0.012 cm  
Consolidation cell pressure = 56.90 psi = 8.19 ksf  
Consolidation back pressure = 50.00 psi = 7.20 ksf  
Consolidation effective confining stress = 0.99 ksf  
Strain rate, %/min = 0.17  
FAIL. STRESS = 9.79 ksf at reading no. 26  
ULT. STRESS = not selected

Test Readings Data for Specimen No. 1

No.	Def. Dial Units	Def. in	Load Dial Units	Load lbs	Strain %	Deviator Stress ksf	Effective Stresses			Pore Pres. psi	P ksf	Q ksf
							Minor ksf	Major ksf	1:3 Ratio			
0	0.0000	0.000	0.00	0.0	0.0	0.00	0.99	0.99	1.00	50.00	0.99	0.00
1	0.0100	0.010	19.00	53.2	0.2	1.22	1.02	2.24	2.19	49.80	1.63	0.61
2	0.0200	0.020	25.00	70.0	0.3	1.60	1.07	2.66	2.50	49.50	1.86	0.80
3	0.0300	0.030	30.00	84.0	0.5	1.91	1.09	3.01	2.75	49.30	2.05	0.96
4	0.0400	0.040	35.00	98.0	0.7	2.23	1.14	3.36	2.96	49.00	2.25	1.11
5	0.0500	0.050	38.00	106.4	0.8	2.41	1.17	3.58	3.07	48.80	2.37	1.21
6	0.0600	0.060	43.00	120.4	1.0	2.73	1.21	3.94	3.25	48.50	2.57	1.36
7	0.0700	0.070	48.00	134.4	1.2	3.04	1.25	4.29	3.43	48.20	2.77	1.52
8	0.0800	0.080	52.00	145.6	1.3	3.29	1.28	4.57	3.56	48.00	2.92	1.64
9	0.0900	0.090	56.00	156.8	1.5	3.53	1.32	4.86	3.67	47.70	3.09	1.77
10	0.1000	0.100	60.00	168.0	1.7	3.78	1.35	5.13	3.79	47.50	3.24	1.89
11	0.1500	0.150	78.00	218.4	2.5	4.87	1.57	6.44	4.10	46.00	4.00	2.44
12	0.2000	0.200	92.00	257.6	3.4	5.70	1.74	7.44	4.27	44.80	4.59	2.85
13	0.2500	0.250	106.00	296.8	4.2	6.50	1.99	8.49	4.27	43.10	5.24	3.25
14	0.3000	0.300	117.00	327.6	5.0	7.12	2.17	9.29	4.27	41.80	5.73	3.56
15	0.3500	0.350	127.00	355.6	5.9	7.66	2.35	10.00	4.26	40.60	6.18	3.83
16	0.4000	0.400	134.00	375.2	6.7	8.01	2.53	10.54	4.16	39.30	6.54	4.00
17	0.4500	0.450	141.00	394.8	7.6	8.35	2.66	11.01	4.13	38.40	6.84	4.17
18	0.5000	0.500	150.00	420.0	8.4	8.80	2.87	11.67	4.07	37.00	7.27	4.40
19	0.5500	0.550	156.00	436.8	9.2	9.07	2.97	12.04	4.06	36.30	7.50	4.53
20	0.6000	0.600	162.00	453.6	10.1	9.33	3.10	12.43	4.01	35.40	7.76	4.67
21	0.6500	0.650	166.00	464.8	10.9	9.47	3.20	12.67	3.96	34.70	7.93	4.74
22	0.7000	0.700	170.00	476.0	11.8	9.61	3.27	12.88	3.94	34.20	8.07	4.80
23	0.7500	0.750	173.00	484.4	12.6	9.68	3.37	13.05	3.87	33.50	8.21	4.84
24	0.8000	0.800	176.00	492.8	13.5	9.76	3.46	13.21	3.82	32.90	8.33	4.88
25	0.8500	0.850	177.00	495.6	14.3	9.72	3.50	13.22	3.78	32.60	8.36	4.86
26	0.9000	0.900	180.00	504.0	15.1	9.79	3.54	13.33	3.76	32.30	8.44	4.89

### Specimen Parameters for Specimen No. 2

Specimen Parameter	Initial	Saturated	Consolidated	Final
Wt. moist soil and tare:	1096.040			1139.350
Wt. dry soil and tare:	925.920			925.920
Wt. of tare:	0.000			0.000
Weight, gms:	1096.0			
Diameter, in:	2.884	2.845	2.831	
Area, in <sup>2</sup> :	6.533	6.358	6.296	
Height, in:	5.933	5.933	5.914	
Net decrease in height, in:		0.000	0.019	
Net decrease in water volume, cc:		-82.100	8.000	
% Moisture:	18.4	27.2	26.4	23.1
Wet density, pcf:	107.7	119.0	119.7	
Dry density, pcf:	91.0	93.5	94.7	
Void ratio:	0.7354	0.6892	0.6673	
% Saturation:	63.2	100.0	100.0	

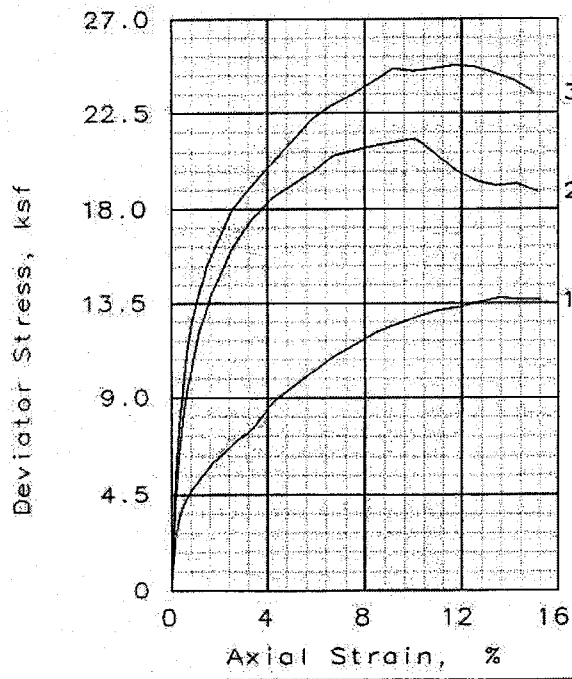
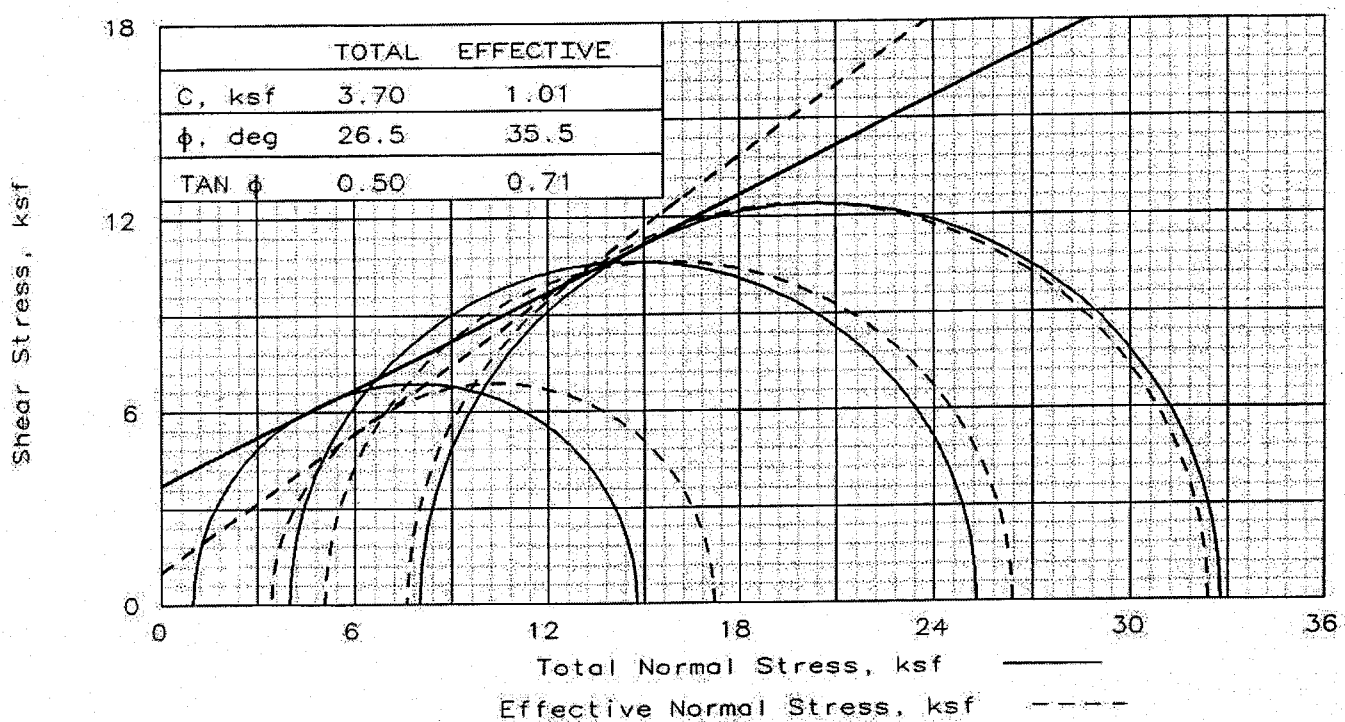
### Test Readings Data for Specimen No. 2

Deformation dial constant= 1 in per input unit  
 Primary load ring constant= 2.8 lbs per input unit  
 Secondary load ring constant= 0 lbs per input unit  
 Crossover reading for secondary load ring= 0 input units  
 Membrane modulus = 0.14000 kN/cm<sup>2</sup>  
 Membrane thickness = 0.012 cm  
 Consolidation cell pressure = 77.80 psi = 11.20 ksf  
 Consolidation back pressure = 50.00 psi = 7.20 ksf  
 Consolidation effective confining stress = 4.00 ksf  
 Strain rate, %/min = 0.17  
 FAIL. STRESS = 14.66 ksf at reading no. 26  
 ULT. STRESS = not selected

No.	Def.	Def.	Load	Load	Strain	Deviator	Effective Stresses			Pore	P ksf	Q ksf
	Dial	in	Dial	lbs	%	Stress	Minor	Major	1:3	Pres.		
	Units		Units			ksf	ksf	ksf	Ratio	psi		
0	0.0000	0.000	0.00	0.0	0.0	0.00	4.00	4.00	1.00	50.00	4.00	0.00
1	0.0100	0.010	42.00	117.6	0.2	2.69	3.74	6.43	1.72	51.80	5.09	1.34
2	0.0200	0.020	59.00	165.2	0.3	3.77	3.54	7.31	2.06	53.20	5.43	1.88
3	0.0300	0.030	73.00	204.4	0.5	4.65	3.33	7.98	2.40	54.70	5.65	2.33
4	0.0400	0.040	82.00	229.6	0.7	5.22	3.21	8.43	2.62	55.50	5.82	2.61
5	0.0500	0.050	90.00	252.0	0.8	5.71	3.11	8.83	2.84	56.20	5.97	2.86
6	0.0600	0.060	96.00	268.8	1.0	6.09	3.01	9.09	3.02	56.90	6.05	3.04
7	0.0700	0.070	103.00	288.4	1.2	6.52	2.95	9.47	3.21	57.30	6.21	3.26
8	0.0800	0.080	109.00	305.2	1.4	6.89	2.89	9.78	3.38	57.70	6.34	3.44
9	0.0900	0.090	114.00	319.2	1.5	7.19	2.87	10.05	3.51	57.90	6.46	3.59
10	0.1000	0.100	120.00	336.0	1.7	7.55	2.85	10.41	3.65	58.00	6.63	3.78
11	0.1500	0.150	140.00	392.0	2.5	8.74	2.85	11.59	4.06	58.00	7.22	4.37
12	0.2000	0.200	156.00	436.8	3.4	9.65	2.98	12.63	4.24	57.10	7.81	4.83
13	0.2500	0.250	171.00	478.8	4.2	10.49	3.14	13.63	4.34	56.00	8.38	5.24
14	0.3000	0.300	185.00	518.0	5.1	11.25	3.31	14.56	4.40	54.80	8.93	5.62
15	0.3500	0.350	197.00	551.6	5.9	11.87	3.47	15.34	4.42	53.70	9.40	5.93
16	0.4000	0.400	210.00	588.0	6.8	12.54	3.64	16.18	4.44	52.50	9.91	6.27
17	0.4500	0.450	219.00	613.2	7.6	12.96	3.80	16.76	4.41	51.40	10.28	6.48
18	0.5000	0.500	229.00	641.2	8.5	13.42	4.00	17.43	4.35	50.00	10.72	6.71
19	0.5500	0.550	232.00	649.6	9.3	13.48	4.08	17.55	4.31	49.50	10.81	6.74
20	0.6000	0.600	240.00	672.0	10.1	13.81	4.19	18.00	4.30	48.70	11.10	6.90

### Test Readings Data for Specimen No. 2

No.	Def.	Def.	Load	Load	Strain	Deviator	Effective Stresses			Pore	P ksf	Q ksf
	Dial	in	Dial	lbs	%	Stress	Minor	Major	1:3	Pres.		
	Units		Units			ksf	ksf	ksf	Ratio	psi		
21	0.6500	0.650	249.00	697.2	11.0	14.19	4.32	18.51	4.29	47.80	11.42	7.10
22	0.7000	0.700	253.00	708.4	11.8	14.28	4.41	18.69	4.24	47.20	11.55	7.14
23	0.7500	0.750	256.00	716.8	12.7	14.31	4.52	18.84	4.17	46.40	11.68	7.16
24	0.8000	0.800	260.00	728.0	13.5	14.40	4.59	18.99	4.13	45.90	11.79	7.20
25	0.8500	0.850	266.00	744.8	14.4	14.59	4.68	19.27	4.12	45.30	11.97	7.29
26	0.9000	0.900	270.00	756.0	15.2	14.66	4.74	19.40	4.09	44.90	12.07	7.33

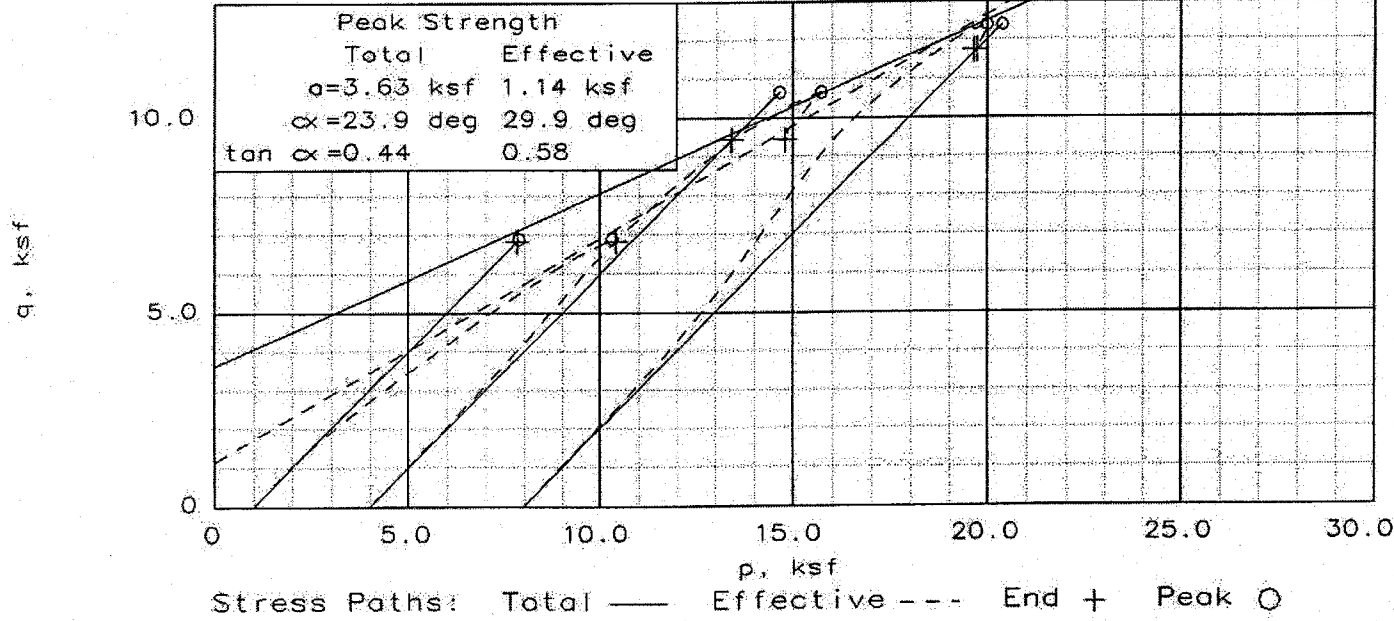
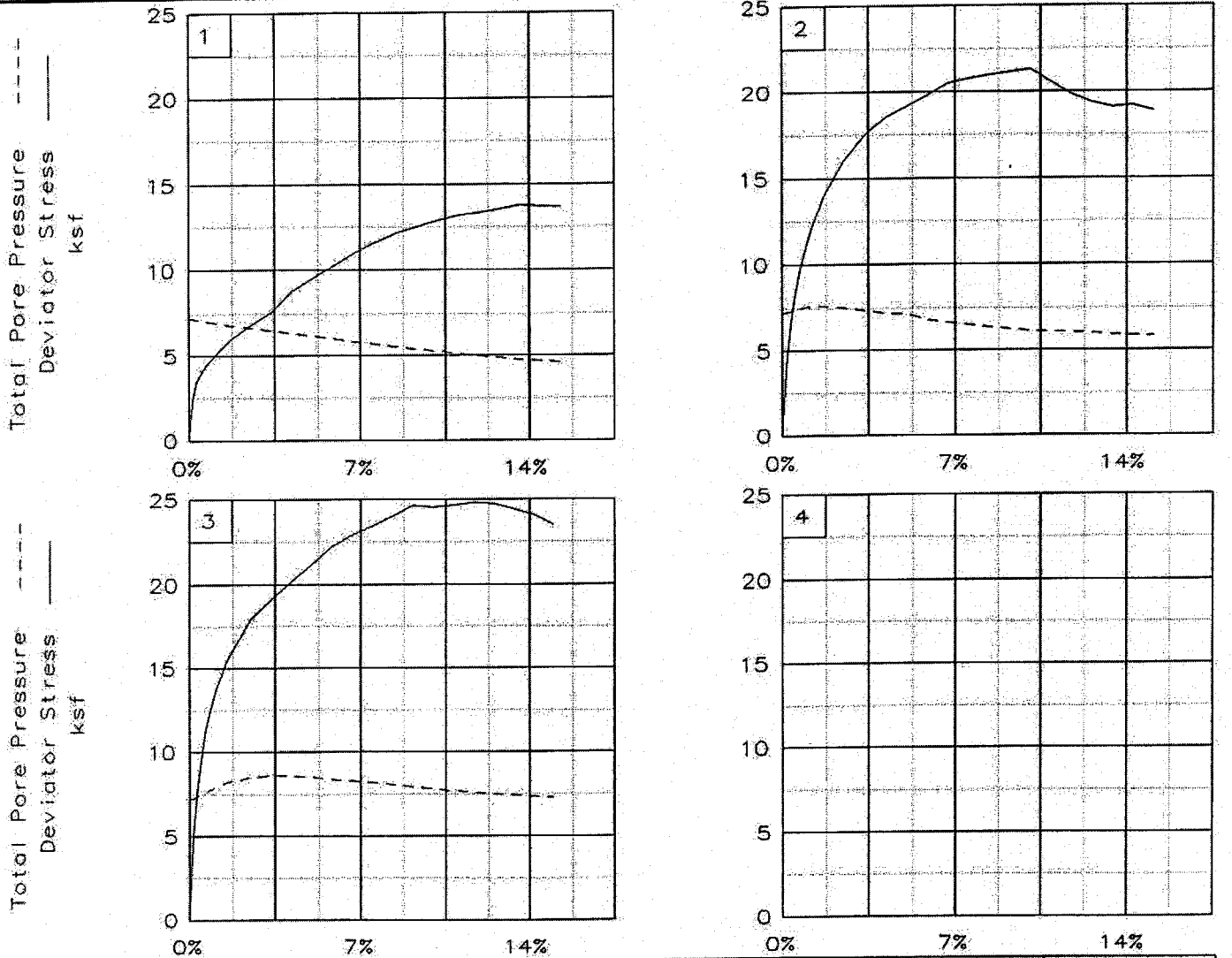


	1	2	3	
SAMPLE NO.:				
INITIAL	WATER CONTENT, %	5.5	5.6	9.4
	DRY DENSITY, pcf	106.3	111.3	113.1
	SATURATION, %	24.1	27.2	48.1
	VOID RATIO	0.644	0.571	0.545
	DIAMETER, in	2.84	2.84	2.84
	HEIGHT, in	5.98	5.96	6.02
AT TEST	WATER CONTENT, %	19.5	19.1	20.2
	DRY DENSITY, pcf	113.0	113.8	111.6
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	0.547	0.536	0.567
	DIAMETER, in	2.78	2.81	2.86
	HEIGHT, in	5.89	5.96	6.02
Strain rate, %/min	0.17	0.17	0.17	
BACK PRESSURE, ksf	7.2	7.2	7.2	
CELL PRESSURE, ksf	8.2	11.2	15.2	
FAIL. STRESS, ksf	13.8	21.3	24.8	
TOTAL PORE PR., ksf	4.8	6.1	7.6	
ULT. STRESS, ksf				
TOTAL PORE PR., ksf				
$\bar{\sigma}_1$ FAILURE, ksf	17.2	26.4	32.4	
$\bar{\sigma}_3$ FAILURE, ksf	3.4	5.1	7.6	

TYPE OF TEST:  
 CU with Pore Pressures  
 SAMPLE TYPE: Shelby Tube  
 DESCRIPTION: Black Ash  
 SPECIFIC GRAVITY= 2.8  
 REMARKS:

CLIENT: TVA  
 PROJECT: Ash Disposal Areas - TVA Allen Fossil Plant  
 SAMPLE LOCATION: EAD-3 UD @ 6'-8'  
 PROJ. NO.: 3043-04-1037.0001      DATE: 08-10-04  
 TRIAXIAL SHEAR TEST REPORT  
 LAW ENGINEERING AND ENVIRONMENTAL SERVICES

Fig. No.: \_\_\_\_\_ *HAB*



Client: TVA  
 Project: Ash Disposal Areas - TVA Allen Fossil Plant  
 Location: EAD-3 UD @ 6'-8'  
 File: ALLEN-1

Project No.: 3043-04-1037.0001 Fig. No.: \_\_\_\_\_

TRIAXIAL COMPRESSION TEST  
CU with Pore Pressures

8-11-2004  
4:51 pm

Project and Sample Data

Date: 08-10-04

Client: TVA

Project: Ash Disposal Areas - TVA Allen Fossil Plant

Sample location: EAD-3 UD @ 6'-8'

Sample description: Black Ash

Remarks:

Fig no.: 2nd page Fig no. (if applicable):

Type of sample: Shelby Tube

Specific gravity= 2.80 LL= NV PL= NP PI=

Test method: Corps of Eng. - saturation assumed

Specimen Parameters for Specimen No. 1

Specimen Parameter	Initial	Saturated	Consolidated	Final
Wt. moist soil and tare:	1114.990			1155.170
Wt. dry soil and tare:	1056.380			1056.380
Wt. of tare:	0.000			0.000
Weight, gms:	1115.0			
Diameter, in:	2.840	2.763	2.775	
Area, in <sup>2</sup> :	6.335	5.997	6.048	
Height, in:	5.975	5.975	5.887	
Net decrease in height, in:		0.000	0.088	
Net decrease in water volume, cc:		-151.300	3.700	
% Moisture:	5.5	19.9	19.5	9.4
Wet density, pcf:	112.2	134.6	135.1	
Dry density, pcf:	106.3	112.3	113.0	
Liquid ratio:	0.6440	0.5564	0.5466	
% Saturation:	24.1	100.0	100.0	

Test Readings Data for Specimen No. 1

Deformation dial constant= 1 in per input unit  
Primary load ring constant= 2.8 lbs per input unit  
Secondary load ring constant= 0 lbs per input unit  
Crossover reading for secondary load ring= 0 input units  
Membrane modulus = 0.14000 kN/cm<sup>2</sup>  
Membrane thickness = 0.012 cm  
Consolidation cell pressure = 56.90 psi = 8.19 ksf  
Consolidation back pressure = 50.00 psi = 7.20 ksf  
Consolidation effective confining stress = 0.99 ksf  
Strain rate, %/min = 0.17  
FAIL. STRESS = 13.77 ksf at reading no. 24  
ULT. STRESS = not selected



### Test Readings Data for Specimen No. 1

Def. Dial Units	Def. in	Load Dial Units	Load lbs.	Strain %	Deviator Stress ksf	Effective Stresses Minor ksf	Major ksf	1:3 Ratio	Pore Pres. psi	P ksf	Q ksf	
0	0.0000	0.000	0.00	0.0	0.00	0.99	0.99	1.00	50.00	0.99	0.00	
1	0.0100	0.010	37.00	103.6	0.2	2.46	0.99	3.46	3.48	50.00	2.22	1.23
2	0.0200	0.020	53.00	148.4	0.3	3.52	1.07	4.59	4.30	49.50	2.83	1.76
3	0.0300	0.030	60.00	168.0	0.5	3.98	1.11	5.09	4.59	49.20	3.10	1.99
4	0.0400	0.040	66.00	184.8	0.7	4.37	1.17	5.54	4.75	48.80	3.35	2.18
5	0.0500	0.050	71.00	198.8	0.8	4.69	1.21	5.90	4.88	48.50	3.56	2.35
6	0.0600	0.060	75.00	210.0	1.0	4.95	1.24	6.19	5.00	48.30	3.71	2.47
7	0.0700	0.070	79.00	221.2	1.2	5.20	1.28	6.49	5.06	48.00	3.88	2.60
8	0.0800	0.080	83.00	232.4	1.4	5.46	1.31	6.77	5.17	47.80	4.04	2.73
9	0.0900	0.090	87.00	243.6	1.5	5.71	1.35	7.06	5.22	47.50	4.21	2.86
10	0.1000	0.100	91.00	254.8	1.7	5.96	1.40	7.36	5.27	47.20	4.38	2.98
11	0.1500	0.150	105.00	294.0	2.5	6.82	1.54	8.36	5.43	46.20	4.95	3.41
12	0.2000	0.200	118.00	330.4	3.4	7.60	1.70	9.30	5.47	45.10	5.50	3.80
13	0.2500	0.250	138.00	386.4	4.2	8.81	1.90	10.71	5.63	43.70	6.31	4.40
14	0.3000	0.300	151.00	422.8	5.1	9.55	2.04	11.60	5.67	42.70	6.82	4.78
15	0.3500	0.350	164.00	459.2	5.9	10.28	2.20	12.49	5.67	41.60	7.34	5.14
16	0.4000	0.400	177.00	495.6	6.8	11.00	2.39	13.39	5.60	40.30	7.89	5.50
17	0.4500	0.450	188.00	526.4	7.6	11.57	2.53	14.11	5.57	39.30	8.32	5.79
18	0.5000	0.500	199.00	557.2	8.5	12.14	2.69	14.83	5.51	38.20	8.76	6.07
19	0.5500	0.550	207.00	579.6	9.3	12.51	2.82	15.33	5.43	37.30	9.08	6.26
20	0.6000	0.600	215.00	602.0	10.2	12.87	2.97	15.84	5.34	36.30	9.40	6.44
21	0.6500	0.650	222.00	621.6	11.0	13.17	3.11	16.28	5.23	35.30	9.69	6.58
22	0.7000	0.700	227.00	635.6	11.9	13.33	3.23	16.56	5.13	34.50	9.89	6.67
23	0.7500	0.750	233.00	652.4	12.7	13.55	3.33	16.88	5.07	33.80	10.10	6.78
24	0.8000	0.800	239.00	669.2	13.6	13.77	3.44	17.21	5.00	33.00	10.33	6.88
25	0.8500	0.850	240.00	672.0	14.4	13.69	3.53	17.22	4.88	32.40	10.37	6.84
26	0.9000	0.900	242.00	677.6	15.3	13.67	3.59	17.25	4.81	32.00	10.42	6.83

### Specimen Parameters for Specimen No. 2

Specimen Parameter	Initial	Saturated	Consolidated	Final
Wt. moist soil and tare:	1163.620			1221.690
Wt. dry soil and tare:	1102.410			1102.410
Wt. of tare:	0.000			0.000
Weight, gms:	1163.6			
Diameter, in:	2.840	2.831	2.808	
Area, in <sup>2</sup> :	6.335	6.293	6.193	
Height, in:	5.958	5.958	5.958	
Net decrease in height, in:		0.000	0.000	
Net decrease in water volume, cc:		-159.500	9.800	
Moisture:	5.6	20.0	19.1	10.8
Wet density, pcf:	117.5	134.4	135.6	
Dry density, pcf:	111.3	112.0	113.8	
Liquid ratio:	0.5709	0.5606	0.5357	
% Saturation:	27.2	100.0	100.0	

### Test Readings Data for Specimen No. 2

Deformation dial constant = 1 in per input unit  
 Primary load ring constant = 2.8 lbs per input unit  
 Secondary load ring constant = 0 lbs per input unit  
 Crossover reading for secondary load ring = 0 input units  
 Membrane modulus = 0.14000 kN/cm<sup>2</sup>  
 Membrane thickness = 0.012 cm  
 Consolidation cell pressure = 77.80 psi = 11.20 ksf  
 Consolidation back pressure = 50.00 psi = 7.20 ksf  
 Consolidation effective confining stress = 4.00 ksf  
 Strain rate, %/min = 0.17  
 FAIL. STRESS = 21.31 ksf at reading no. 20  
 HLT. STRESS = not selected

No.	Def.	Def.	Load	Load	Strain	Deviator	Effective Stresses			Pore	P ksf	Q ksf
	Dial	in	Dial	lbs	%	Stress	Minor	Major	1:3	Pres.		
	Units		Units			ksf	ksf	ksf	Ratio	psi		
0	0.0000	0.000	0.00	0.0	0.0	0.00	4.00	4.00	1.00	50.00	4.00	0.00
1	0.0100	0.010	64.00	179.2	0.2	4.16	3.96	8.12	2.05	50.30	6.04	2.08
2	0.0200	0.020	100.00	280.0	0.3	6.49	3.87	10.36	2.68	50.90	7.12	3.24
3	0.0300	0.030	125.00	350.0	0.5	8.10	3.80	11.90	3.13	51.40	7.85	4.05
4	0.0400	0.040	144.00	403.2	0.7	9.31	3.73	13.04	3.50	51.90	8.39	4.66
5	0.0500	0.050	160.00	448.0	0.8	10.33	3.69	14.02	3.80	52.20	8.85	5.16
6	0.0600	0.060	175.00	490.0	1.0	11.28	3.63	14.91	4.11	52.60	9.27	5.64
7	0.0700	0.070	189.00	529.2	1.2	12.16	3.60	15.76	4.38	52.80	9.68	6.08
8	0.0800	0.080	199.00	557.2	1.3	12.78	3.59	16.37	4.56	52.90	9.98	6.39
9	0.0900	0.090	208.00	582.4	1.5	13.34	3.57	16.91	4.73	53.00	10.24	6.67
10	0.1000	0.100	218.00	610.4	1.7	13.96	3.59	17.54	4.89	52.90	10.56	6.98
11	0.1500	0.150	254.00	711.2	2.5	16.12	3.69	19.81	5.37	52.20	11.75	8.06
12	0.2000	0.200	279.00	781.2	3.4	17.56	3.84	21.40	5.57	51.10	12.62	8.78
13	0.2500	0.250	297.00	831.6	4.2	18.53	4.03	22.56	5.59	49.80	13.29	9.26
14	0.3000	0.300	310.00	868.0	5.0	19.17	4.06	23.23	5.72	49.60	13.64	9.58
15	0.3500	0.350	323.00	904.4	5.9	19.79	4.39	24.19	5.51	47.30	14.29	9.90
16	0.4000	0.400	338.00	946.4	6.7	20.53	4.56	25.09	5.50	46.10	14.83	10.26
17	0.4500	0.450	345.00	966.0	7.6	20.77	4.69	25.46	5.42	45.20	15.08	10.38
18	0.5000	0.500	352.00	985.6	8.4	20.99	4.85	25.85	5.33	44.10	15.35	10.50
19	0.5500	0.550	358.00	1002.4	9.2	21.16	4.97	26.13	5.26	43.30	15.55	10.58
20	0.6000	0.600	364.00	1019.2	10.1	21.31	5.08	26.40	5.19	42.50	15.74	10.66

### Test Readings Data for Specimen No. 2

No.	Def.	Def.	Load	Load	Strain	Deviator	Effective Stresses			Pore	P ksf	q ksf
	Dial	in	Dial	lbs	%	Stress	Minor	Major	1:3	Pres.		
	Units		Units			ksf	ksf	ksf	Ratio	psi		
21	0.6500	0.650	355.00	994.0	10.9	20.59	5.11	25.70	5.03	42.30	15.41	10.30
22	0.7000	0.700	345.00	966.0	11.7	19.82	5.16	24.98	4.85	42.00	15.07	9.91
23	0.7500	0.750	340.00	952.0	12.6	19.35	5.20	24.55	4.72	41.70	14.87	9.68
24	0.8000	0.800	339.00	949.2	13.4	19.11	5.30	24.41	4.61	41.00	14.85	9.55
25	0.8500	0.850	344.00	963.2	14.3	19.20	5.34	24.54	4.59	40.70	14.94	9.60
26	0.9000	0.900	341.00	954.8	15.1	18.85	5.37	24.22	4.51	40.50	14.80	9.42

### Specimen Parameters for Specimen No. 3

Specimen Parameter	Initial	Saturated	Consolidated	Final
Wt. moist soil and tare:	1238.180			1289.430
Wt. dry soil and tare:	1132.060			1132.060
Wt. of tare:	0.000			0.000
Weight, gms:	1238.2			
Diameter, in:	2.840	2.771	2.860	
Area, in <sup>2</sup> :	6.335	6.029	6.426	
Height, in:	6.019	6.019	6.016	
Net decrease in height, in:		0.000	0.003	
Net decrease in water volume, cc:		-84.200	-38.900	
% Moisture:	9.4	16.8	20.2	13.9
Wet density, pcf:	123.7	138.8	134.1	
Dry density, pcf:	113.1	118.9	111.6	
Liquid ratio:	0.5454	0.4707	0.5669	
% Saturation:	48.1	100.0	100.0	

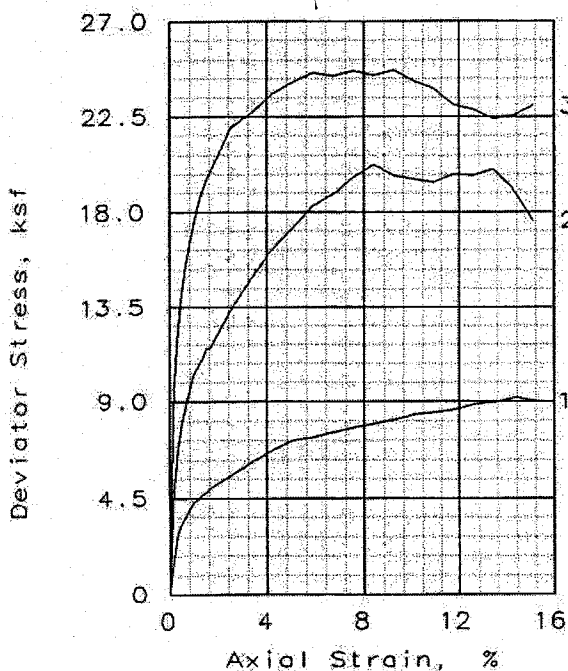
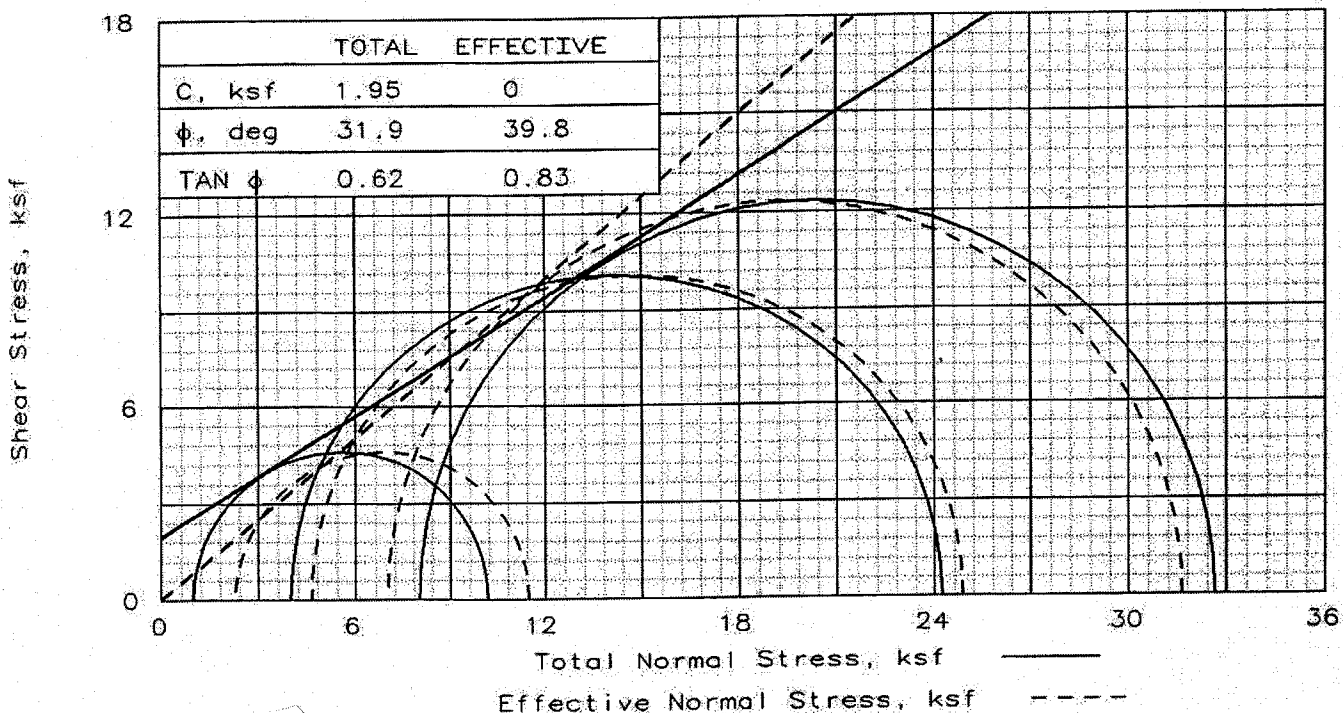
### Test Readings Data for Specimen No. 3

Deformation dial constant= 1 in per input unit  
 Primary load ring constant= 2.8 lbs per input unit  
 Secondary load ring constant= 0 lbs per input unit  
 Crossover reading for secondary load ring= 0 input units  
 Membrane modulus = 0.14000 kN/cm<sup>2</sup>  
 Membrane thickness = 0.012 cm  
 Consolidation cell pressure = 105.50 psi = 15.19 ksf  
 Consolidation back pressure = 50.00 psi = 7.20 ksf  
 Consolidation effective confining stress = 7.99 ksf  
 Strain rate, %/min = 0.17  
 FAIL. STRESS = 24.78 ksf at reading no. 22  
 LT. STRESS = not selected

No.	Def.	Def.	Load	Load	Strain	Deviator	Effective Stresses			Pore	P ksf	Q ksf
	Dial	in	Dial	lbs	%	Stress	Minor	Major	1:3	Pres.		
	Units		Units			ksf	ksf	ksf	Ratio	psi		
0	0.0000	0.000	0.00	0.0	0.0	0.00	7.99	7.99	1.00	50.00	7.99	0.00
1	0.0100	0.010	81.00	226.8	0.2	5.07	7.92	12.99	1.64	50.50	10.46	2.54
2	0.0200	0.020	125.00	350.0	0.3	7.82	7.80	15.62	2.00	51.30	11.71	3.91
3	0.0300	0.030	153.00	428.4	0.5	9.55	7.68	17.23	2.24	52.20	12.45	4.78
4	0.0400	0.040	180.00	504.0	0.7	11.22	7.53	18.75	2.49	53.20	13.14	5.61
5	0.0500	0.050	199.00	557.2	0.8	12.38	7.42	19.80	2.67	54.00	13.61	6.19
6	0.0600	0.060	214.00	599.2	1.0	13.29	7.29	20.58	2.82	54.90	13.93	6.65
7	0.0700	0.070	226.00	632.8	1.2	14.01	7.19	21.20	2.95	55.60	14.19	7.01
8	0.0800	0.080	236.00	660.8	1.3	14.61	7.10	21.71	3.06	56.20	14.40	7.31
9	0.0900	0.090	248.00	694.4	1.5	15.33	7.01	22.34	3.19	56.80	14.68	7.66
10	0.1000	0.100	256.00	716.8	1.7	15.80	6.94	22.74	3.28	57.30	14.84	7.90
11	0.1500	0.150	293.00	820.4	2.5	17.93	6.70	24.62	3.68	59.00	15.66	8.96
12	0.2000	0.200	315.00	882.0	3.3	19.11	6.60	25.70	3.90	59.70	16.15	9.55
13	0.2500	0.250	335.00	938.0	4.2	20.15	6.61	26.76	4.05	59.60	16.68	10.07
14	0.3000	0.300	355.00	994.0	5.0	21.16	6.68	27.84	4.17	59.10	17.26	10.58
15	0.3500	0.350	376.00	1052.8	5.8	22.22	6.83	29.04	4.26	58.10	17.94	11.11
16	0.4000	0.400	391.00	1094.8	6.6	22.90	6.91	29.81	4.31	57.50	18.36	11.45
17	0.4500	0.450	403.00	1128.4	7.5	23.39	7.01	30.41	4.34	56.80	18.71	11.70
18	0.5000	0.500	417.00	1167.6	8.3	23.99	7.14	31.13	4.36	55.90	19.14	11.99
19	0.5500	0.550	432.00	1209.6	9.1	24.63	7.27	31.90	4.39	55.00	19.59	12.31
20	0.6000	0.600	434.00	1215.2	10.0	24.51	7.39	31.90	4.32	54.20	19.64	12.26

Test Readings Data for Specimen No. 3

No.	Def. Dial Units	Def. in	Load Dial Units	Load lbs	Strain %	Deviator Stress ksf	Effective Stresses Minor ksf	Major ksf	1:3 Ratio	Pore Pres. psi	P ksf	Q ksf
	0.6500	0.650	440.00	1232.0	10.8	24.62	7.52	32.14	4.28	53.30	19.83	12.31
	0.7000	0.700	447.00	1251.6	11.6	24.78	7.60	32.39	4.26	52.70	19.99	12.39
23	0.7500	0.750	450.00	1260.0	12.5	24.71	7.69	32.40	4.21	52.10	20.05	12.36
	0.8000	0.800	449.00	1257.2	13.3	24.43	7.76	32.19	4.15	51.60	19.97	12.21
	0.8500	0.850	447.00	1251.6	14.1	24.08	7.83	31.92	4.07	51.10	19.88	12.04
26	0.9000	0.900	440.00	1232.0	15.0	23.48	7.91	31.38	3.97	50.60	19.64	11.74



SAMPLE NO.:		1	2	3
INITIAL	WATER CONTENT, %	3.4	2.7	12.7
	DRY DENSITY, pcf	95.4	101.6	96.5
	SATURATION, %	11.6	10.7	44.2
	VOID RATIO	0.819	0.708	0.798
	DIAMETER, in	2.88	2.88	2.88
	HEIGHT, in	5.96	5.96	5.96
AT TEST	WATER CONTENT, %	21.5	18.1	20.1
	DRY DENSITY, pcf	108.6	115.4	111.3
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	0.598	0.504	0.560
	DIAMETER, in	2.71	2.71	2.69
	HEIGHT, in	5.91	5.96	5.96
Strain rate, %/min		0.17	0.17	0.17
BACK PRESSURE, ksf		7.2	7.2	7.2
CELL PRESSURE, ksf		8.2	11.2	15.2
FAIL. STRESS, ksf		9.2	20.2	24.7
TOTAL PORE PR., ksf		5.9	6.6	8.2
ULT. STRESS, ksf				
TOTAL PORE PR., ksf				
$\bar{\sigma}_1$ FAILURE, ksf		11.5	24.9	31.7
$\bar{\sigma}_3$ FAILURE, ksf		2.3	4.7	7.0

TYPE OF TEST:  
 CU with Pore Pressures  
 SAMPLE TYPE: Shelby Tube  
 DESCRIPTION: Black Ash Coal  
 Fragments

SPECIFIC GRAVITY= 2.78

REMARKS:

CLIENT: TVA

PROJECT: Ash Disposal Areas - TVA Allen  
 Fossil Plant

SAMPLE LOCATION: WAD-2 UD @ 14'-16'

PROJ. NO.: 3043-04-1037.0001

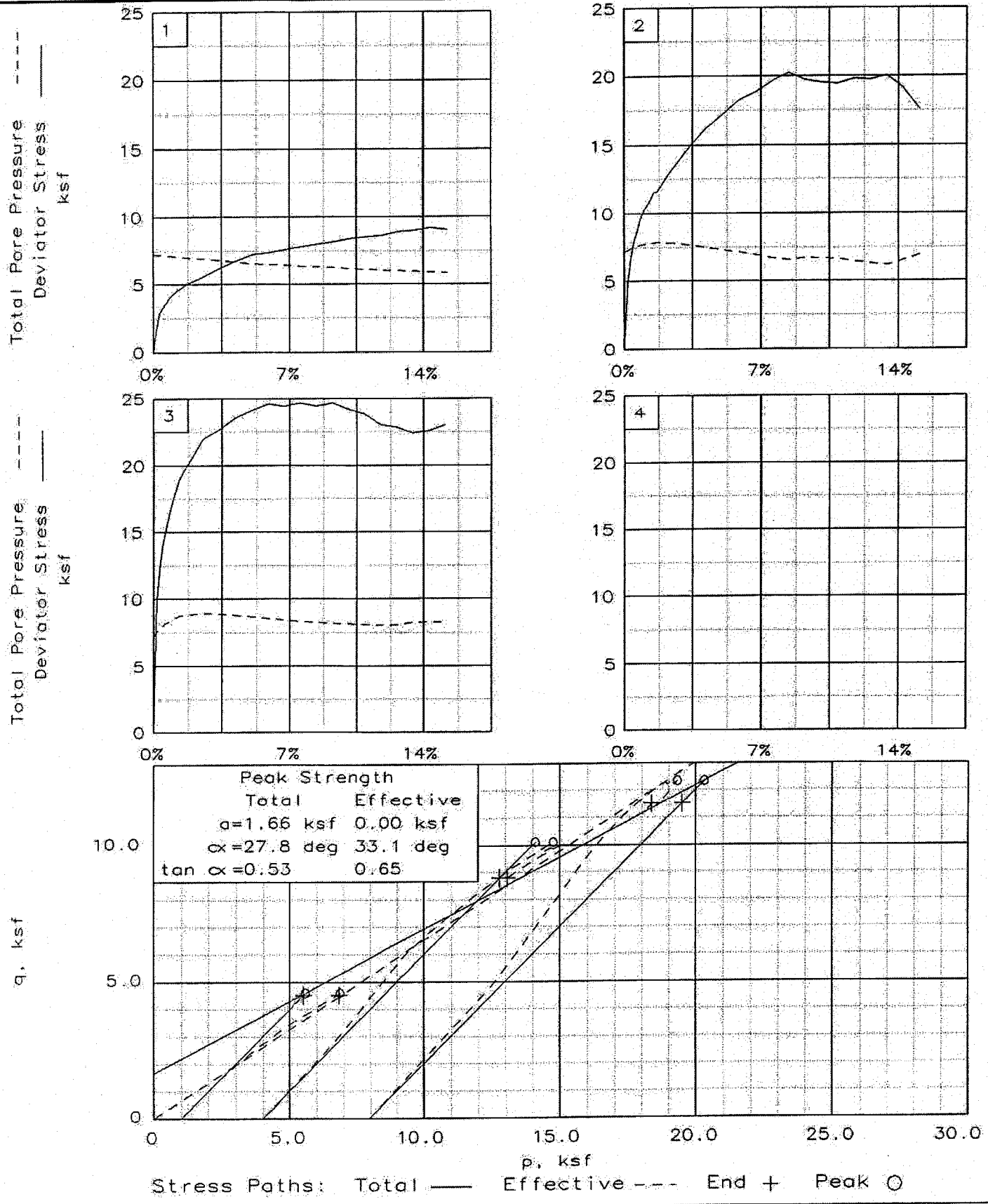
DATE: 08-10-04

TRIAXIAL SHEAR TEST REPORT

LAW ENGINEERING AND ENVIRONMENTAL SERVICES

Fig. No.: \_\_\_\_\_

HAB



Client: TVA

Project: Ash Disposal Areas - TVA Allen Fossil Plant

Location: WAD-2 UD @ 14'-16'

File: ALLEN-2

Project No.: 3043-04-1037.0001

Fig. No.: \_\_\_\_\_

TRIAXIAL COMPRESSION TEST  
CU with Pore Pressures

8-11-2004  
4:58 pm

Project and Sample Data

Date: 08-10-04  
Client: TVA  
Project: Ash Disposal Areas - TVA Allen Fossil Plant  
Sample location: WAD-2 UD @ 14'-16'  
Sample description: Black Ash Coal Fragments  
Remarks:

Fig no.: 2nd page Fig no. (if applicable):  
Type of sample: Shelby Tube  
Specific gravity= 2.78 LL= NV PL= NP PI=  
Test method: Corps of Eng. - saturation assumed

Specimen Parameters for Specimen No. 1

Specimen Parameter	Initial	Saturated	Consolidated	Final
Wt. moist soil and tare:	1008.960			1075.850
Wt. dry soil and tare:	975.570			975.570
Wt. of tare:	0.000			0.000
Weight, gms:	1009.0			
Diameter, in:	2.884	2.711	2.714	
Area, in <sup>2</sup> :	6.533	5.773	5.785	
Height, in:	5.962	5.962	5.914	
Net decrease in height, in:		0.000	0.048	
Net decrease in water volume, cc:		-179.700	3.400	
Moisture:	3.4	21.8	21.5	10.3
Wet density, pcf:	98.7	131.6	132.0	
Dry density, pcf:	95.4	108.0	108.6	
Void ratio:	0.8187	0.6072	0.5975	
% Saturation:	11.6	100.0	100.0	

Test Readings Data for Specimen No. 1

Deformation dial constant= 1 in per input unit  
Primary load ring constant= 2.8 lbs per input unit  
Secondary load ring constant= 0 lbs per input unit  
Crossover reading for secondary load ring= 0 input units  
Membrane modulus = 0.14000 kN/cm<sup>2</sup>  
Membrane thickness = 0.012 cm  
Consolidation cell pressure = 56.90 psi = 8.19 ksf  
Consolidation back pressure = 50.00 psi = 7.20 ksf  
Consolidation effective confining stress = 0.99 ksf  
Strain rate, %/min = 0.17  
FAIL. STRESS = 9.19 ksf at reading no. 25  
ULT. STRESS = not selected



### Test Readings Data for Specimen No. 1

No.	Def. Dial Units	Def. in	Load Dial Units	Load lbs	Strain %	Deviator Stress ksf	Effective Stresses			Pore Pres. psi	P ksf	Q ksf
							Minor ksf	Major ksf	1:3 Ratio			
0	0.0000	0.000	0.00	0.0	0.0	0.00	0.99	0.99	1.00	50.00	0.99	0.00
1	0.0100	0.010	24.00	67.2	0.2	1.67	0.99	2.66	2.68	50.00	1.83	0.83
2	0.0200	0.020	41.00	114.8	0.3	2.85	0.99	3.84	3.87	50.00	2.42	1.42
3	0.0300	0.030	48.00	134.4	0.5	3.33	1.02	4.35	4.26	49.80	2.69	1.66
4	0.0400	0.040	53.00	148.4	0.7	3.67	1.05	4.72	4.49	49.60	2.89	1.83
5	0.0500	0.050	58.00	162.4	0.8	4.01	1.08	5.09	4.71	49.40	3.08	2.00
6	0.0600	0.060	62.00	173.6	1.0	4.28	1.09	5.37	4.91	49.30	3.23	2.14
7	0.0700	0.070	65.00	182.0	1.2	4.48	1.12	5.60	4.99	49.10	3.36	2.24
8	0.0800	0.080	68.00	190.4	1.4	4.68	1.15	5.83	5.06	48.90	3.49	2.34
9	0.0900	0.090	70.00	196.0	1.5	4.80	1.17	5.97	5.12	48.80	3.57	2.40
10	0.1000	0.100	73.00	204.4	1.7	5.00	1.20	6.20	5.19	48.60	3.70	2.50
11	0.1500	0.150	82.00	229.6	2.5	5.57	1.30	6.87	5.30	47.90	4.08	2.79
12	0.2000	0.200	92.00	257.6	3.4	6.20	1.41	7.61	5.39	47.10	4.51	3.10
13	0.2500	0.250	101.00	282.8	4.2	6.74	1.53	8.27	5.42	46.30	4.90	3.37
14	0.3000	0.300	109.00	305.2	5.1	7.21	1.64	8.85	5.39	45.50	5.25	3.61
15	0.3500	0.350	112.00	313.6	5.9	7.34	1.71	9.06	5.29	45.00	5.39	3.67
16	0.4000	0.400	117.00	327.6	6.8	7.60	1.77	9.37	5.29	44.60	5.57	3.80
17	0.4500	0.450	121.00	338.8	7.6	7.79	1.86	9.65	5.19	44.00	5.75	3.90
18	0.5000	0.500	125.00	350.0	8.5	7.98	1.90	9.88	5.20	43.70	5.89	3.99
19	0.5500	0.550	129.00	361.2	9.3	8.16	1.94	10.10	5.20	43.40	6.02	4.08
20	0.6000	0.600	134.00	375.2	10.1	8.39	2.03	10.42	5.13	42.80	6.23	4.20
21	0.6500	0.650	137.00	383.6	11.0	8.50	2.09	10.59	5.07	42.40	6.34	4.25
22	0.7000	0.700	140.00	392.0	11.8	8.60	2.16	10.76	4.98	41.90	6.46	4.30
23	0.7500	0.750	146.00	408.8	12.7	8.89	2.20	11.09	5.03	41.60	6.65	4.44
24	0.8000	0.800	149.00	417.2	13.5	8.98	2.23	11.21	5.02	41.40	6.72	4.49
25	0.8500	0.850	154.00	431.2	14.4	9.19	2.29	11.48	5.01	41.00	6.89	4.60
26	0.9000	0.900	153.00	428.4	15.2	9.04	2.33	11.37	4.88	40.70	6.85	4.52

**Specimen Parameters for Specimen No. 2**

Specimen Parameter	Initial	Saturated	Consolidated	Final
Wt. moist soil and tare:	1066.980			1197.060
Wt. dry soil and tare:	1038.570			1038.570
Wt. of tare:	0.000			0.000
Weight, gms:	1067.0			
Diameter, in:	2.884	2.726	2.706	
Area, in <sup>2</sup> :	6.533	5.837	5.753	
Height, in:	5.959	5.959	5.959	
Net decrease in height, in:		0.000	0.000	
Net decrease in water volume, cc:		-168.000	8.200	
% Moisture:	2.7	18.9	18.1	15.3
Wet density, pcf:	104.4	135.3	136.3	
Dry density, pcf:	101.6	113.7	115.4	
Liquid ratio:	0.7075	0.5257	0.5038	
% Saturation:	10.7	100.0	100.0	

**Test Readings Data for Specimen No. 2**

Deformation dial constant= 1 in per input unit  
 Primary load ring constant= 2.8 lbs per input unit  
 Secondary load ring constant= 0 lbs per input unit  
 Crossover reading for secondary load ring= 0 input units  
 Membrane modulus = 0.14000 kN/cm<sup>2</sup>  
 Membrane thickness = 0.012 cm  
 Consolidation cell pressure = 77.80 psi = 11.20 ksf  
 Consolidation back pressure = 50.00 psi = 7.20 ksf  
 Consolidation effective confining stress = 4.00 ksf  
 Strain rate, %/min = 0.17  
 FAIL. STRESS = 20.22 ksf at reading no. 18  
 ALT. STRESS = not selected

No.	Def. Dial	Def. in	Load Dial	Load lbs	Strain %	Deviator Stress	Effective Stresses			Pore Pres.	P ksf	Q ksf
	Units		Units			ksf	Minor ksf	Major ksf	1:3 Ratio	psi		
0	0.0000	0.000	0.00	0.0	0.0	0.00	4.00	4.00	1.00	50.00	4.00	0.00
1	0.0100	0.010	69.00	193.2	0.2	4.83	3.90	8.73	2.24	50.70	6.32	2.41
2	0.0200	0.020	96.00	268.8	0.3	6.71	3.79	10.49	2.77	51.50	7.14	3.35
3	0.0300	0.030	114.00	319.2	0.5	7.95	3.69	11.64	3.16	52.20	7.66	3.97
4	0.0400	0.040	125.00	350.0	0.7	8.70	3.59	12.29	3.43	52.90	7.94	4.35
5	0.0500	0.050	138.00	386.4	0.8	9.59	3.53	13.12	3.72	53.30	8.32	4.80
6	0.0600	0.060	148.00	414.4	1.0	10.27	3.48	13.75	3.95	53.60	8.62	5.13
7	0.0700	0.070	153.00	428.4	1.2	10.60	3.44	14.04	4.08	53.90	8.74	5.30
8	0.0800	0.080	159.00	445.2	1.3	10.99	3.40	14.39	4.23	54.20	8.90	5.50
9	0.0900	0.090	167.00	467.6	1.5	11.53	3.37	14.90	4.42	54.40	9.13	5.76
10	0.1000	0.100	168.00	470.4	1.7	11.58	3.33	14.90	4.48	54.70	9.11	5.79
11	0.1500	0.150	196.00	548.8	2.5	13.39	3.40	16.79	4.94	54.20	10.09	6.70
12	0.2000	0.200	220.00	616.0	3.4	14.90	3.54	18.44	5.21	53.20	10.99	7.45
13	0.2500	0.250	242.00	677.6	4.2	16.25	3.73	19.98	5.36	51.90	11.85	8.12
14	0.3000	0.300	259.00	725.2	5.0	17.24	3.89	21.13	5.43	50.80	12.51	8.62
15	0.3500	0.350	277.00	775.6	5.9	18.27	4.09	22.36	5.47	49.40	13.23	9.14
16	0.4000	0.400	288.00	806.4	6.7	18.83	4.26	23.09	5.42	48.20	13.68	9.41
17	0.4500	0.450	303.00	848.4	7.6	19.63	4.49	24.12	5.37	46.60	14.31	9.82
18	0.5000	0.500	315.00	882.0	8.4	20.22	4.65	24.88	5.35	45.50	14.76	10.11
19	0.5500	0.550	310.00	868.0	9.2	19.72	4.49	24.21	5.39	46.60	14.35	9.86
20	0.6000	0.600	310.00	868.0	10.1	19.54	4.54	24.07	5.31	46.30	14.31	9.77

### Test Readings Data for Specimen No. 2

No.	Def. Dial Units	Def. in	Load Dial Units	Load lbs	Strain %	Deviator Stress ksf	Effective Stresses			Pore Pres. psi	P ksf	Q ksf
							Minor ksf	Major ksf	1:3 Ratio			
1	0.6500	0.650	311.00	870.8	10.9	19.42	4.58	24.00	5.24	46.00	14.29	9.71
2	0.7000	0.700	320.00	896.0	11.7	19.79	4.80	24.59	5.13	44.50	14.69	9.90
23	0.7500	0.750	322.00	901.6	12.6	19.73	4.90	24.62	5.03	43.80	14.76	9.86
24	0.8000	0.800	330.00	924.0	13.4	20.02	5.04	25.06	4.97	42.80	15.05	10.01
5	0.8500	0.850	318.00	890.4	14.3	19.11	4.68	23.79	5.08	45.30	14.23	9.55
26	0.9000	0.900	296.00	828.8	15.1	17.61	4.28	21.89	5.12	48.10	13.08	8.81

### Specimen Parameters for Specimen No. 3

Specimen Parameter	Initial	Saturated	Consolidated	Final
Wt. moist soil and tare:	1111.430			1122.020
Wt. dry soil and tare:	986.380			986.380
Wt. of tare:	0.000			0.000
Weight, gms:	1111.4			
Diameter, in:	2.884	2.711	2.686	
Area, in <sup>2</sup> :	6.533	5.772	5.668	
Height, in:	5.958	5.958	5.958	
Net decrease in height, in:		0.000	0.000	
Net decrease in water volume, cc:		-83.700	10.200	
Moisture:	12.7	21.2	20.1	13.8
Wet density, pcf:	108.8	132.4	133.7	
Dry density, pcf:	96.5	109.3	111.3	
Liquid ratio:	0.7976	0.5883	0.5596	
% Saturation:	44.2	100.0	100.0	

### Test Readings Data for Specimen No. 3

Deformation dial constant = 1 in per input unit  
 Primary load ring constant = 2.8 lbs per input unit  
 Secondary load ring constant = 0 lbs per input unit  
 Crossover reading for secondary load ring = 0 input units  
 Membrane modulus = 0.14000 kN/cm<sup>2</sup>  
 Membrane thickness = 0.012 cm  
 Consolidation cell pressure = 105.50 psi = 15.19 ksf  
 Consolidation back pressure = 50.00 psi = 7.20 ksf  
 Consolidation effective confining stress = 7.99 ksf  
 Strain rate, %/min = 0.17  
 FAIL. STRESS = 24.67 ksf at reading no. 19  
 HLT. STRESS = not selected

No.	Def. Dial	Def. in	Load Dial	Load lbs	Strain %	Deviator Stress	Effective Stresses			Pore Pres.	P ksf	Q ksf
	Units		Units			ksf	Minor ksf	Major ksf	1:3 Ratio	psi		
0	0.0000	0.000	0.00	0.0	0.0	0.00	7.99	7.99	1.00	50.00	7.99	0.00
1	0.0100	0.010	136.00	380.8	0.2	9.66	7.65	17.31	2.26	52.40	12.48	4.83
2	0.0200	0.020	174.00	487.2	0.3	12.34	7.36	19.70	2.68	54.40	13.53	6.17
3	0.0300	0.030	200.00	560.0	0.5	14.16	7.11	21.27	2.99	56.10	14.19	7.08
4	0.0400	0.040	219.00	613.2	0.7	15.48	6.93	22.40	3.23	57.40	14.66	7.74
5	0.0500	0.050	235.00	658.0	0.8	16.58	6.80	23.37	3.44	58.30	15.09	8.29
6	0.0600	0.060	248.00	694.4	1.0	17.47	6.67	24.13	3.62	59.20	15.40	8.73
7	0.0700	0.070	260.00	728.0	1.2	18.28	6.55	24.83	3.79	60.00	15.69	9.14
8	0.0800	0.080	271.00	758.8	1.3	19.02	6.45	25.47	3.95	60.70	15.96	9.51
9	0.0900	0.090	279.00	781.2	1.5	19.55	6.41	25.96	4.05	61.00	16.18	9.77
10	0.1000	0.100	285.00	798.0	1.7	19.93	6.36	26.30	4.13	61.30	16.33	9.97
11	0.1500	0.150	317.00	887.6	2.5	21.98	6.28	28.26	4.50	61.90	17.27	10.99
12	0.2000	0.200	330.00	924.0	3.4	22.69	6.29	28.98	4.61	61.80	17.64	11.34
13	0.2500	0.250	346.00	968.8	4.2	23.58	6.41	29.99	4.68	61.00	18.20	11.79
14	0.3000	0.300	357.00	999.6	5.0	24.12	6.49	30.61	4.71	60.40	18.55	12.06
15	0.3500	0.350	367.00	1027.6	5.9	24.57	6.62	31.20	4.71	59.50	18.91	12.29
16	0.4000	0.400	368.00	1030.4	6.7	24.42	6.75	31.18	4.62	58.60	18.96	12.21
17	0.4500	0.450	375.00	1050.0	7.6	24.66	6.84	31.50	4.61	58.00	19.17	12.33
18	0.5000	0.500	375.00	1050.0	8.4	24.44	6.91	31.35	4.54	57.50	19.13	12.22
19	0.5500	0.550	382.00	1069.6	9.2	24.67	7.00	31.67	4.52	56.90	19.33	12.33
20	0.6000	0.600	378.00	1058.4	10.1	24.18	7.04	31.22	4.43	56.60	19.13	12.09

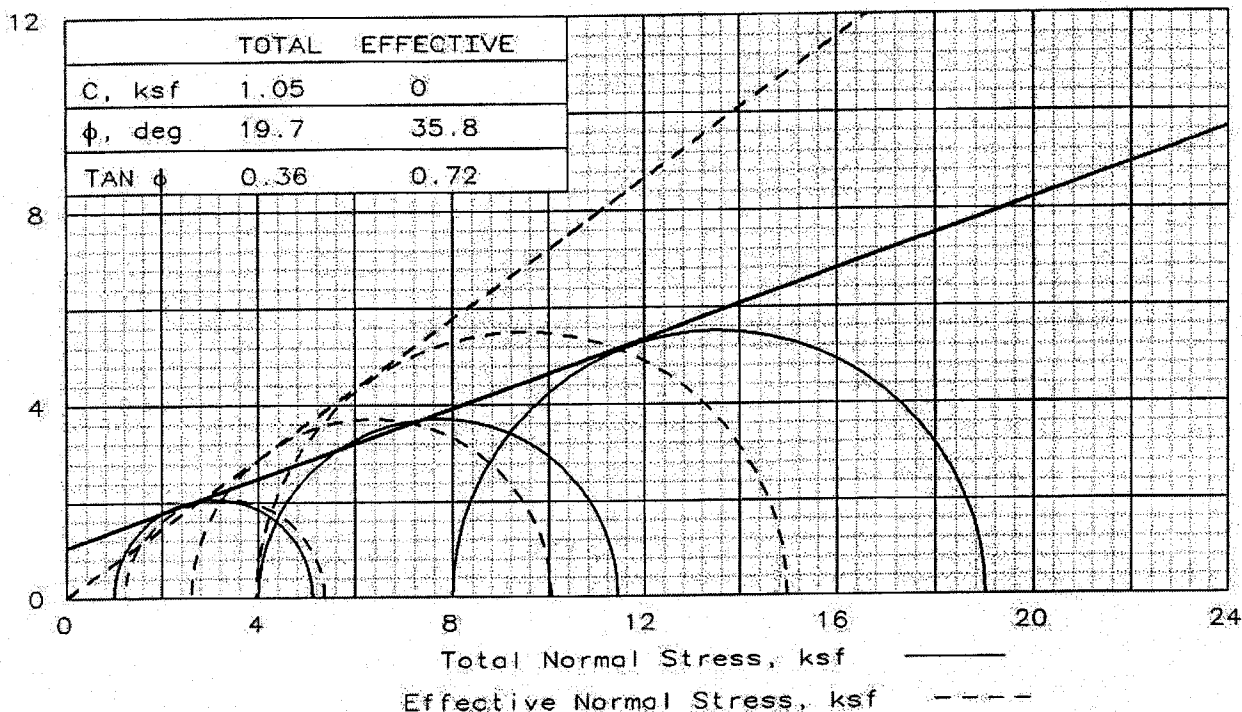
Test Readings Data for Specimen No. 3

No.	Def.	Def.	Load	Load	Strain	Deviator	Effective Stresses			Pore	P ksf	Q ksf
	Dial	in	Dial	Lbs			%	Stress	Minor			
	Units		Units			ksf	ksf	ksf	Ratio	psi		
21	0.6500	0.650	376.00	1052.8	10.9	23.83	7.10	30.93	4.36	56.20	19.01	11.92
22	0.7000	0.700	367.00	1027.6	11.7	23.04	7.13	30.17	4.23	56.00	18.65	11.52
23	0.7500	0.750	367.00	1027.6	12.6	22.82	7.13	29.95	4.20	56.00	18.54	11.41
24	0.8000	0.800	364.00	1019.2	13.4	22.42	6.94	29.36	4.23	57.30	18.15	11.21
25	0.8500	0.850	370.00	1036.0	14.3	22.57	6.91	29.48	4.26	57.50	18.20	11.28
26	0.9000	0.900	381.00	1066.8	15.1	23.01	6.88	29.89	4.34	57.70	18.39	11.51

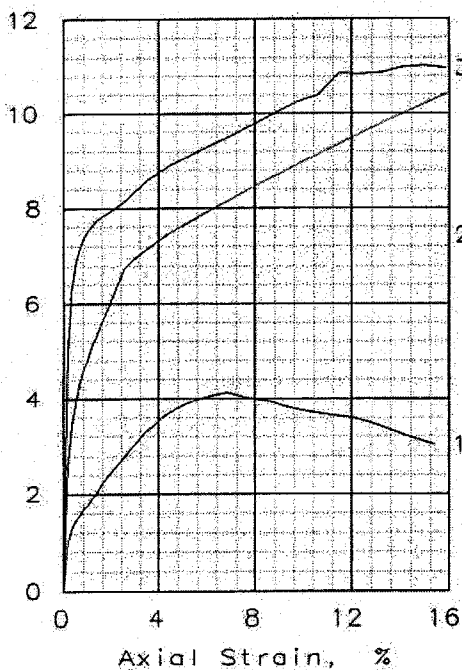
**TRIAxIAL COMPRESSION TEST RESULTS**

**WEST DISPOSAL AREA**

Shear Stress, ksf



Deviator Stress, ksf



SAMPLE NO.:		1	2	3
INITIAL	WATER CONTENT, %	24.2	28.7	32.0
	DRY DENSITY, pcf	98.7	94.8	90.2
	SATURATION, %	92.6	100.0	100.0
	VOID RATIO	0.702	0.771	0.862
	DIAMETER, in	2.83	2.82	2.86
	HEIGHT, in	5.86	5.83	5.89
AT TEST	WATER CONTENT, %	22.8	27.1	28.5
	DRY DENSITY, pcf	104.0	97.1	95.1
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	0.614	0.729	0.766
	DIAMETER, in	2.75	2.79	2.84
	HEIGHT, in	5.85	5.81	5.68
Strain rate, %/min		0.17	0.17	0.17
BACK PRESSURE, ksf		7.2	7.2	7.2
CELL PRESSURE, ksf		8.2	11.2	15.2
FAIL. STRESS, ksf		4.1	7.4	11.0
TOTAL PORE PR., ksf		7.0	8.6	11.2
ULT. STRESS, ksf				
TOTAL PORE PR., ksf				
$\sigma_1$ FAILURE, ksf		5.4	10.1	15.0
$\sigma_3$ FAILURE, ksf		1.2	2.6	4.0

**TYPE OF TEST:**

CU with Pore Pressures

**SAMPLE TYPE:** Shelby Tube

**DESCRIPTION:** Olive-Brown Silt  
with Sand

**SPECIFIC GRAVITY=** 2.69

**REMARKS:**

**CLIENT:** TVA

**PROJECT:** TVA Allen Fossil Plant

**SAMPLE LOCATION:** WAD-2 UD @ 30'-32'

**PROJ. NO.:** 3043-04-1037.0001

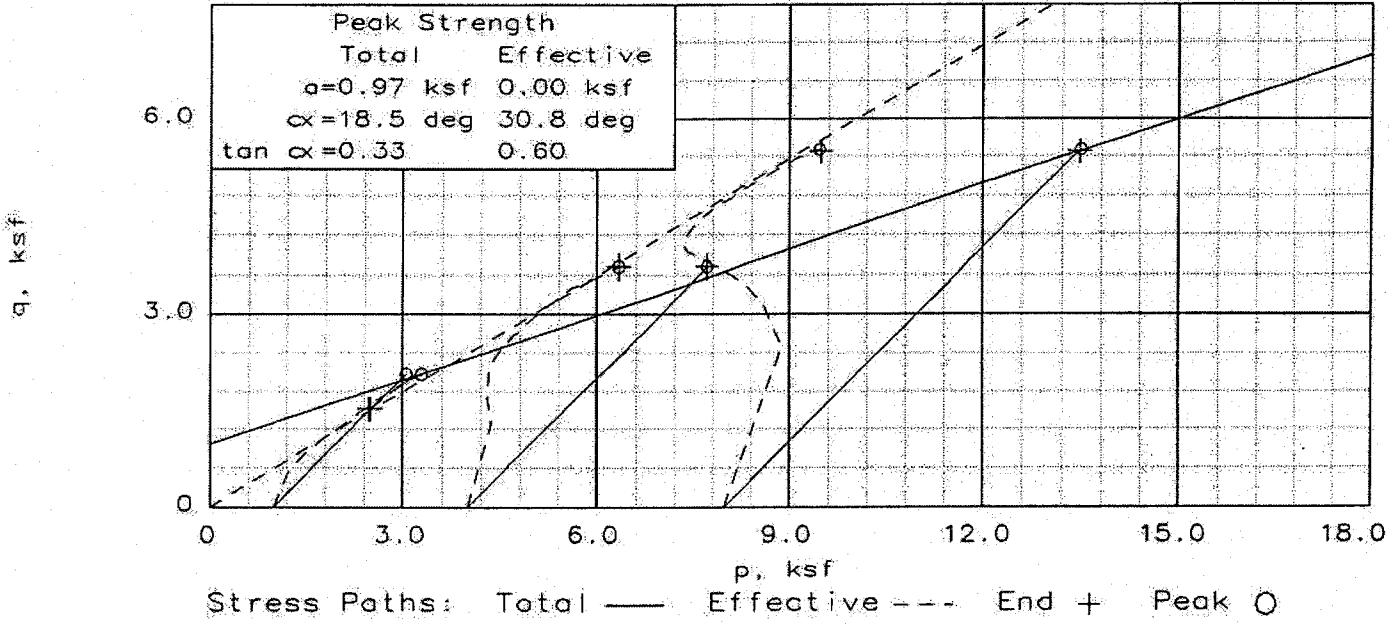
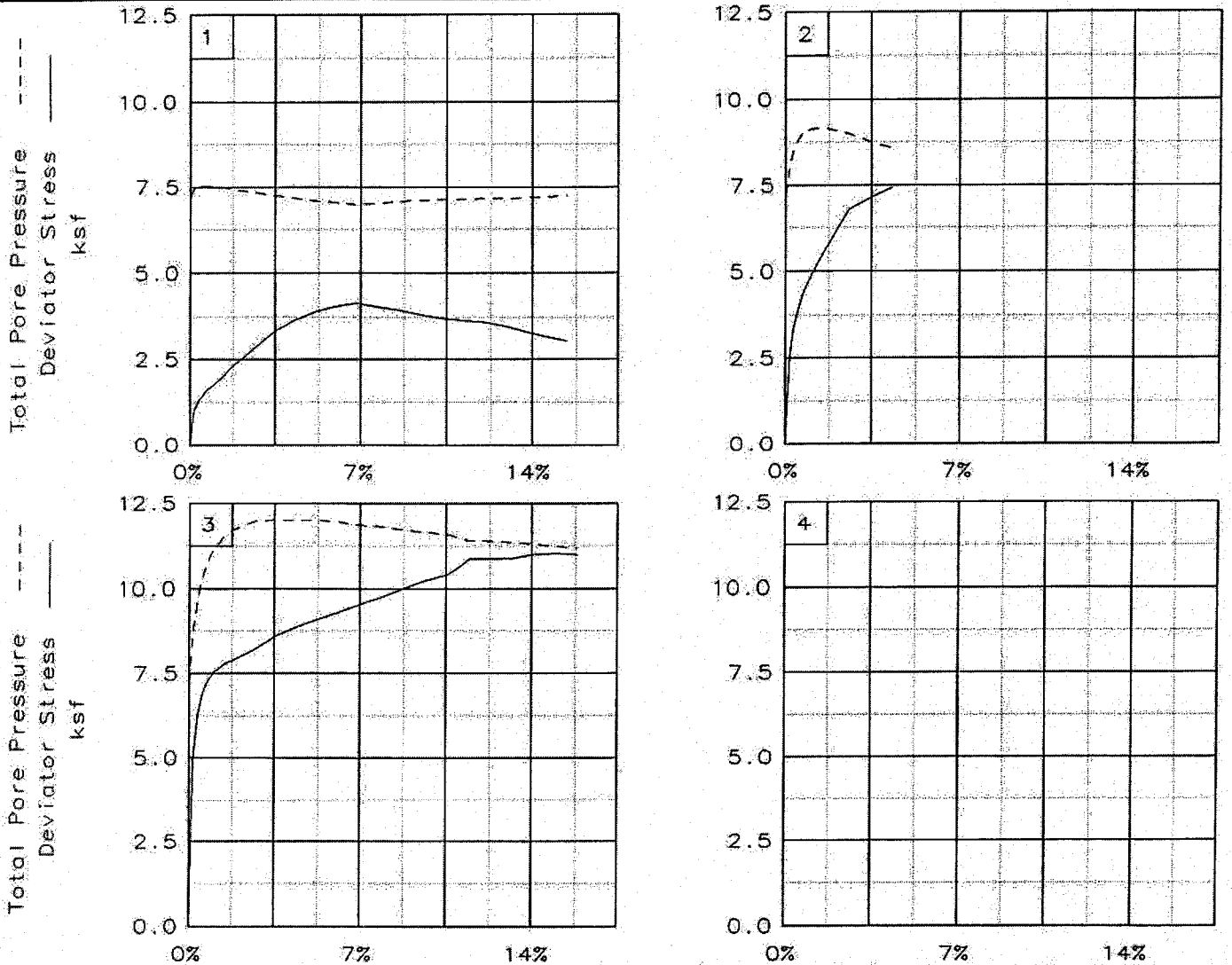
**DATE:** 08-10-04

**TRIAXIAL SHEAR TEST REPORT**

**LAW ENGINEERING AND ENVIRONMENTAL SERVICES**

Fig. No.: \_\_\_\_\_

*HAB*



Client: TVA

Project: TVA Allen Fossil Plant

Location: WAD-2 UD @ 30'-32'

File: ALLEN-3

Project No.: 3043-04-1037.0001

Fig. No.: \_\_\_\_\_



TRIAXIAL COMPRESSION TEST  
CU with Pore Pressures

8-12-2004  
10:07 am

Project and Sample Data

Date: 08-10-04  
Client: TVA  
Project: TVA Allen Fossil Plant  
Sample location: WAD-2 UD @ 30'-32'  
Sample description: Olive-Brown Silt with Sand  
Remarks:

Fig no.: 2nd page Fig no. (if applicable):  
Type of sample: Shelby Tube  
Specific gravity= 2.69 LL= NV PL= NP PI=  
Test method: Corps of Eng. - saturation assumed

Specimen Parameters for Specimen No. 1

Specimen Parameter	Initial	Saturated	Consolidated	Final
Wt. moist soil and tare:	1180.670			1199.900
Wt. dry soil and tare:	950.960			950.960
Wt. of tare:	0.000			0.000
Weight, gms:	1180.7			
Diameter, in:	2.825	2.781	2.753	
Area, in <sup>2</sup> :	6.268	6.076	5.955	
Height, in:	5.858	5.858	5.849	
Net decrease in height, in:		0.000	0.009	
Net decrease in water volume, cc:		0.000	12.500	
Moisture:	24.2	24.2	22.8	26.2
Wet density, pcf:	122.5	126.4	127.8	
Dry density, pcf:	98.7	101.8	104.0	
Void ratio:	0.7020	0.6498	0.6144	
% Saturation:	92.6	100.0	100.0	

Test Readings Data for Specimen No. 1

Deformation dial constant= 1 in per input unit  
Primary load ring constant= 0.72 lbs per input unit  
Secondary load ring constant= 0 lbs per input unit  
Crossover reading for secondary load ring= 0 input units  
Membrane modulus = 0.14000 kN/cm<sup>2</sup>  
Membrane thickness = 0.012 cm  
Consolidation cell pressure = 56.90 psi = 8.19 ksf  
Consolidation back pressure = 50.00 psi = 7.20 ksf  
Consolidation effective confining stress = 0.99 ksf  
Strain rate, %/min = 0.17  
FAIL. STRESS = 4.14 ksf at reading no. 16  
ULT. STRESS = not selected

Test Readings Data for Specimen No. 1

Def. Dial Units	Def. in	Load Dial Units	Load lbs	Strain %	Deviator Stress ksf	Effective Stresses			Pore Pres. psi	P ksf	Q ksf	
						Minor ksf	Major ksf	1:3 Ratio				
0	0.0000	0.000	0.0	0.0	0.00	0.99	0.99	1.00	50.00	0.99	0.00	
1	0.0100	0.010	58.0	41.8	0.2	1.01	0.71	1.71	2.43	52.00	1.21	0.50
2	0.0200	0.020	74.0	53.3	0.3	1.28	0.68	1.96	2.90	52.20	1.32	0.64
3	0.0300	0.030	83.0	59.8	0.5	1.44	0.66	2.10	3.17	52.30	1.38	0.72
4	0.0400	0.040	91.0	65.5	0.7	1.57	0.66	2.24	3.38	52.30	1.45	0.79
5	0.0500	0.050	98.0	70.6	0.9	1.69	0.68	2.37	3.50	52.20	1.52	0.85
6	0.0600	0.060	104.0	74.9	1.0	1.79	0.69	2.48	3.59	52.10	1.59	0.90
7	0.0700	0.070	110.0	79.2	1.2	1.89	0.71	2.60	3.68	52.00	1.65	0.95
8	0.0800	0.080	118.0	85.0	1.4	2.03	0.72	2.75	3.81	51.90	1.73	1.01
9	0.0900	0.090	126.0	90.7	1.5	2.16	0.73	2.89	3.94	51.80	1.81	1.08
10	0.1000	0.100	133.0	95.8	1.7	2.28	0.76	3.04	3.98	51.60	1.90	1.14
11	0.1500	0.150	164.0	118.1	2.6	2.78	0.85	3.63	4.27	51.00	2.24	1.39
12	0.2000	0.200	195.0	140.4	3.4	3.28	0.94	4.22	4.50	50.40	2.58	1.64
13	0.2500	0.250	219.0	157.7	4.3	3.65	1.02	4.67	4.57	49.80	2.85	1.83
14	0.3000	0.300	236.0	169.9	5.1	3.90	1.11	5.01	4.52	49.20	3.06	1.95
15	0.3500	0.350	247.0	177.8	6.0	4.04	1.17	5.21	4.47	48.80	3.19	2.02
16	0.4000	0.400	255.0	183.6	6.8	4.14	1.22	5.36	4.38	48.40	3.29	2.07
17	0.4500	0.450	250.0	180.0	7.7	4.02	1.18	5.20	4.40	48.70	3.19	2.01
18	0.5000	0.500	248.0	178.6	8.5	3.95	1.12	5.07	4.52	49.10	3.10	1.97
19	0.5500	0.550	242.0	174.2	9.4	3.82	1.09	4.91	4.49	49.30	3.00	1.91
20	0.6000	0.600	238.0	171.4	10.3	3.72	1.08	4.80	4.44	49.40	2.94	1.86
21	0.6500	0.650	236.0	169.9	11.1	3.65	1.07	4.72	4.43	49.50	2.89	1.83
22	0.7000	0.700	235.0	169.2	12.0	3.60	1.05	4.65	4.43	49.60	2.85	1.80
23	0.7500	0.750	229.0	164.9	12.8	3.48	1.05	4.53	4.31	49.60	2.79	1.74
24	0.8000	0.800	221.0	159.1	13.7	3.32	1.02	4.34	4.25	49.80	2.68	1.66
25	0.8500	0.850	213.0	153.4	14.5	3.17	0.99	4.16	4.19	50.00	2.58	1.58
26	0.9000	0.900	206.0	148.3	15.4	3.03	0.96	4.00	4.15	50.20	2.48	1.52

### Specimen Parameters for Specimen No. 2

Specimen Parameter	Initial	Saturated	Consolidated	Final
Wt. moist soil and tare:	1165.370			1151.340
Wt. dry soil and tare:	905.790			905.790
Wt. of tare:	0.000			0.000
Weight, gms:	1165.4			
Diameter, in:	2.820	2.820	2.790	
Area, in <sup>2</sup> :	6.246	6.246	6.113	
Height, in:	5.826	5.826	5.812	
Net decrease in height, in:		0.000	0.014	
Net decrease in water volume, cc:		0.000	14.100	
% Moisture:	28.7	28.7	27.1	27.1
Wet density, pcf:	122.0	122.0	123.4	
Dry density, pcf:	94.8	94.8	97.1	
Liquid ratio:	0.7709	0.7709	0.7290	
% Saturation:	100.0	100.0	100.0	

### Test Readings Data for Specimen No. 2

Deformation dial constant= 1 in per input unit  
 Primary load ring constant= 0.72 lbs per input unit  
 Secondary load ring constant= 0 lbs per input unit  
 Crossover reading for secondary load ring= 0 input units  
 Membrane modulus = 0.14000 kN/cm<sup>2</sup>  
 Membrane thickness = 0.012 cm  
 Consolidation cell pressure = 77.80 psi = 11.20 ksf  
 Consolidation back pressure = 50.00 psi = 7.20 ksf  
 Consolidation effective confining stress = 4.00 ksf  
 Strain rate, %/min = 0.17  
 FAIL. STRESS = 7.43 ksf at reading no. 13  
 LT. STRESS = not selected

No.	Def.	Def.	Load	Load	Strain	Deviator	Effective Stresses			Pore	P ksf	Q ksf
	Dial	in	Dial	lbs	%	Stress	Minor	Major	1:3	Pres.		
	Units		Units			ksf	ksf	ksf	Ratio	psi		
0	0.0000	0.000	0.0	0.0	0.0	0.00	4.00	4.00	1.00	50.00	4.00	0.00
1	0.0100	0.010	151.0	108.7	0.2	2.56	3.10	5.65	1.83	56.30	4.37	1.28
2	0.0200	0.020	202.0	145.4	0.3	3.41	2.61	6.02	2.31	59.70	4.31	1.71
3	0.0300	0.030	233.0	167.8	0.5	3.93	2.36	6.29	2.66	61.40	4.33	1.97
4	0.0400	0.040	257.0	185.0	0.7	4.33	2.17	6.50	2.99	62.70	4.34	2.16
5	0.0500	0.050	274.0	197.3	0.9	4.61	2.12	6.72	3.18	63.10	4.42	2.30
6	0.0600	0.060	289.0	208.1	1.0	4.85	2.07	6.92	3.34	63.40	4.50	2.43
7	0.0700	0.070	304.0	218.9	1.2	5.09	2.06	7.15	3.47	63.50	4.61	2.55
8	0.0800	0.080	318.0	229.0	1.4	5.32	2.04	7.36	3.60	63.60	4.70	2.66
9	0.0900	0.090	332.0	239.0	1.5	5.54	2.06	7.60	3.69	63.50	4.83	2.77
10	0.1000	0.100	344.0	247.7	1.7	5.73	2.06	7.79	3.78	63.50	4.93	2.87
11	0.1500	0.150	410.0	295.2	2.6	6.77	2.20	8.98	4.07	62.50	5.59	3.39
12	0.2000	0.200	435.0	313.2	3.4	7.12	2.45	9.57	3.91	60.80	6.01	3.56
13	0.2500	0.250	458.0	329.8	4.3	7.43	2.62	10.05	3.84	59.60	6.34	3.72

**Specimen Parameters for Specimen No. 3**

Specimen Parameter	Initial	Saturated	Consolidated	Final
Wt. moist soil and tare:	1182.470			1146.920
Wt. dry soil and tare:	895.480			895.480
Wt. of tare:	0.000			0.000
Weight, gms:	1182.5			
Diameter, in:	2.860	2.860	2.837	
Area, in <sup>2</sup> :	6.424	6.423	6.322	
Height, in:	5.889	5.889	5.676	
Net decrease in height, in:		0.000	0.213	
Net decrease in water volume, cc:		0.000	31.900	
Moisture:	32.0	32.0	28.5	28.1
Wet density, pcf:	119.1	119.1	122.2	
Dry density, pcf:	90.2	90.2	95.1	
Liquid ratio:	0.8623	0.8621	0.7663	
% Saturation:	100.0	100.0	100.0	

**Test Readings Data for Specimen No. 3**

Deformation dial constant= 1 in per input unit  
 Primary load ring constant= 0.72 lbs per input unit  
 Secondary load ring constant= 0 lbs per input unit  
 Crossover reading for secondary load ring= 0 input units  
 Membrane modulus = 0.14000 kN/cm<sup>2</sup>  
 Membrane thickness = 0.012 cm  
 Consolidation cell pressure = 105.50 psi = 15.19 ksf  
 Consolidation back pressure = 50.00 psi = 7.20 ksf  
 Consolidation effective confining stress = 7.99 ksf  
 Strain rate, %/min = 0.17  
 FAIL. STRESS = 11.02 ksf at reading no. 25  
 ULT. STRESS = not selected

No.	Def. Dial Units	Def. in	Load Dial Units	Load lbs	Strain %	Deviator Stress ksf	Effective Stresses Minor ksf	Effective Stresses Major ksf	Effective Stresses 1:3 Ratio	Pore Pres. psi	P ksf	Q ksf
0	0.0000	0.000	0.0	0.0	0.0	0.00	7.99	7.99	1.00	50.00	7.99	0.00
1	0.0100	0.010	304.0	218.9	0.2	4.98	6.39	11.37	1.78	61.10	8.88	2.49
2	0.0200	0.020	384.0	276.5	0.4	6.28	5.47	11.75	2.15	67.50	8.61	3.14
3	0.0300	0.030	421.0	303.1	0.5	6.87	4.91	11.78	2.40	71.40	8.34	3.43
4	0.0400	0.040	441.0	317.5	0.7	7.18	4.51	11.69	2.59	74.20	8.10	3.59
5	0.0500	0.050	455.0	327.6	0.9	7.40	4.22	11.62	2.75	76.20	7.92	3.70
6	0.0600	0.060	465.0	334.8	1.1	7.55	3.97	11.52	2.90	77.90	7.75	3.77
7	0.0700	0.070	472.0	339.8	1.2	7.65	3.84	11.49	2.99	78.80	7.67	3.82
8	0.0800	0.080	479.0	344.9	1.4	7.75	3.66	11.40	3.12	80.10	7.53	3.87
9	0.0900	0.090	485.0	349.2	1.6	7.83	3.57	11.40	3.19	80.70	7.49	3.91
10	0.1000	0.100	488.0	351.4	1.8	7.86	3.48	11.35	3.26	81.30	7.42	3.93
11	0.1500	0.150	512.0	368.6	2.6	8.18	3.24	11.42	3.52	83.00	7.33	4.09
12	0.2000	0.200	543.0	391.0	3.5	8.59	3.18	11.77	3.70	83.40	7.48	4.30
13	0.2500	0.250	566.0	407.5	4.4	8.87	3.20	12.07	3.78	83.30	7.63	4.44
14	0.3000	0.300	586.0	421.9	5.3	9.10	3.20	12.30	3.85	83.30	7.75	4.55
15	0.3500	0.350	606.0	436.3	6.2	9.33	3.25	12.58	3.87	82.90	7.92	4.66
16	0.4000	0.400	626.0	450.7	7.0	9.54	3.34	12.88	3.86	82.30	8.11	4.77
17	0.4500	0.450	647.0	465.8	7.9	9.77	3.40	13.17	3.87	81.90	8.28	4.89
18	0.5000	0.500	670.0	482.4	8.8	10.02	3.48	13.51	3.88	81.30	8.50	5.01
19	0.5500	0.550	691.0	497.5	9.7	10.24	3.56	13.79	3.88	80.80	8.67	5.12
20	0.6000	0.600	709.0	510.5	10.6	10.40	3.61	14.01	3.88	80.40	8.81	5.20

Test Readings Data for Specimen No. 3

No.	Def. Dial Units	Def. in	Load Dial Units	Load lbs	Strain %	Deviator Stress ksf	Effective Stresses			Pore Pres. psi	P ksf	Q ksf
							Minor ksf	Major ksf	1:3 Ratio			
21	0.6500	0.650	748.0	538.6	11.5	10.86	3.79	14.65	3.87	79.20	9.22	5.43
22	0.7000	0.700	755.0	543.6	12.3	10.86	3.80	14.66	3.86	79.10	9.23	5.43
23	0.7500	0.750	764.0	550.1	13.2	10.87	3.84	14.72	3.83	78.80	9.28	5.44
24	0.8000	0.800	780.0	561.6	14.1	10.99	3.89	14.88	3.83	78.50	9.38	5.49
25	0.8500	0.850	790.0	568.8	15.0	11.02	3.96	14.98	3.78	78.00	9.47	5.51
26	0.9000	0.900	795.0	572.4	15.9	10.97	4.00	14.97	3.74	77.70	9.49	5.49