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**By dehloptoxic at 1:10 pm, Feb 27, 2007**

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February 15, 2007

**BROWN AND  
CALDWELL**

Mr. Jerry Wickham  
Hazardous Materials Specialist  
Alameda County Environmental Health  
1131 Harbor Bay Parkway, Suite 250  
Alameda, California 94502

1011.131771-001

Subject: Results of Soil and Groundwater Investigation  
ACEH Fuel Leak Case No. RO0002858, Hanson Aggregates  
3000 Busch Road, Pleasanton, California

Dear Mr. Wickham:

On behalf of Hanson Aggregates West (Hanson), Brown and Caldwell is submitting this report documenting the results of a limited soil and groundwater investigation conducted at the Hanson Aggregates West Radum facility located at 3000 Bush Road, Pleasanton, California (Site), Figure 1. The scope of this investigation was provided in the *Work Plan for Soil and Groundwater Investigation* prepared by Brown and Caldwell on November 30, 2006 and submitted to the Alameda County Environmental Health Department (ACEH). The Work Plan was prepared in response to an ACEH letter dated September 21, 2006 that raised concerns regarding the previous detection of low level hydrocarbons in soil during removal of two underground storage tanks (UST) located as shown on Figure 2 (Fuel Leak Case No. RO0002858). ACEH requested that a Work Plan to further assess soil and groundwater quality in this area of the site.

## **BACKGROUND**

As documented in the *Baseline Environmental Consulting Report on Tank Removal Activities*, dated July 2003, (Baseline) two USTs (one 12,000-gallon diesel and one 10,000-gallon gasoline) were removed from the Site under permit from the Livermore/Pleasanton Fire Department. A Site layout with the general location of these tanks is provided in Figure 2. During the removal activities, eight in-situ soil characterization samples, one composite stockpile sample and one discrete stockpile sample were collected and analyzed for:

- Total petroleum hydrocarbons as diesel (TPHd) and as gasoline (TPHg) following United States Environmental Protection Agency (EPA) Method 8015M;

- Volatile organic compounds (VOCs), including benzene, toluene, ethylbenzene and xylenes (BTEX) and methyl-tertiary butyl ether (MtBE) following EPA Method 8260B; and
- Total lead following EPA Method 6010B.

The locations of the samples collected by Baseline are shown in Figure 2. TPHg, VOCs and lead were not detected in the soil samples collected at concentrations exceeding their respective laboratory reporting limit. Two samples collected during the removal activities however, detected TPHd at concentrations ranging from 10 parts per million (ppm) to 210 ppm. The Baseline report noted that minor fuel releases occurred during the UST pipeline removal activities in the areas these two soil samples represent, thus contributing to the detected TPHd concentrations. Following the UST removal activities, the stockpiled soil was apparently placed back into the excavated area.

Groundwater was not encountered in the excavation, which extended in depth to 17 feet below ground surface (bgs), and therefore, no groundwater samples were collected. Subsequently, ACEH submitted the request for further evaluation of groundwater quality as noted above.

### **SCOPE OF WORK**

In order to determine if Site groundwater located beneath the UST area has been affected by petroleum hydrocarbons, Brown and Caldwell conducted a limited subsurface investigation in the immediate area of the former tank excavation. The investigation consisted of the following tasks:

- 1) Brown and Caldwell subcontracted with Gregg Drilling and Testing who advanced borings with a cone penetration testing (CPT) rig immediately beyond the northeast, northwest, southeast and southwest corners of the former excavation extent. These borings were advanced to obtain detailed lithologic logs at each location and to identify the depth of first groundwater (Figure 3);
- 2) After completion of lithologic logging with the CPT rig, advance a second boring for soil and groundwater sample collection (a total of 8 borings at four locations);
- 3) Grout boreholes with neat cement after collection of soil and grab groundwater samples;

- 4) Submit soil and groundwater samples from the most appropriate lithologic units identified by the CPT boring to a STL of San Francisco, a State-accredited laboratory following proper chain of custody protocol.
- 5) Analyze the soil and groundwater samples for: Diesel Range Organics (DRO) following EPA Method 8015M, including silica gel cleanup (soil samples only) to remove naturally-occurring hydrocarbons; Gasoline Range Organics (GRO) following EPA Method 8015M, and benzene, toluene, ethylbenzene, xylenes (BTEX), and methyl tertiary butyl ether (MTBE) following EPA Method 8260; and
- 6) Present the findings of the investigation in written form and recommend further action if necessary.

## METHODOLOGY

**Health and Safety Plan.** As required by the Occupational Safety and Health Administration 29 CFR 1910.120, Hazardous Waste operations and Emergency Responses, Brown and Caldwell prepared a Site specific Health and Safety Plan (HSP) for the proposed field work prior to commencement of field activities. The HSP contained information, precautions, and procedures for the scope of work described in the Work Plan.

**Underground Utility Locating.** Prior to drilling, the proposed soil borings were marked in the field by Brown and Caldwell and inspected by a private underground utility location company. The private utility location company attempted to locate underground utilities in the vicinity of the marked drilling locations using a magnetometer, a live electrical detector, and/or other appropriate geophysical tools in order to select the safest locations possible to prevent accidental damage to underground utilities on site. Underground Services Alert (USA), a public utility marking service, was also notified so that public utility easements were marked at the surface prior to the drilling operations. In addition to these preventative measures, Brown and Caldwell required the drilling subcontractor to hand auger the first 5 feet of each borehole location as a further clearance method.

**Soil Sampling Methodology.** Soil samples were collected from the four sampling boreholes at approximately 17 feet bgs (the previous bottom of the excavation) and 27 feet bgs (the depth of the first deeper permeable layer encountered in the CPT borings). The samples were collected with the CPT rig by driving a clean, sealed, stainless steel piston sampler into the soil to the desired sampling interval. The piston sampler was fitted with clean brass tubes prior to each retrieval. After retrieval, the brass tubes were sealed with Teflon sheeting and plastic end caps. The

tubes were then labeled, placed into re-sealable plastic bags, stored in a cooler containing ice and delivered under chain-of-custody documentation to a California Department of Health Services certified analytical laboratory.

**Groundwater Sampling Methodology.** After collection of soil samples, grab-groundwater samples were collected by driving clean hollow sampling rods into the same borehole used to collect the soil samples. The hollow rods were fitted with a hydropunch type sampler that was driven into the soil in a closed, sealed position, to the bottom of the desired sampling interval. The rods were then retracted approximately 3 to 5 feet, to open the hydropunch sampler and allow formation water to enter the hollow steel rods. Grab groundwater samples were collected from the rods by lowering a clean stainless steel bailer into the water, and decanting the water into laboratory-supplied sample containers. The samples were then labeled, placed into resealable plastic bags, stored in a cooler containing ice and delivered under chain-of-custody documentation to Severn Trent Laboratories, Inc., a California Department of Health Services certified analytical laboratory located in Pleasanton, California.

## FINDINGS

**Site Geology.** The site lithology logged in the four CPT borings show that the subsurface in the vicinity of the former USTs consists of fine-grained silty sand to sandy silt, from the surface to approximately 25 feet bgs. A thin layer of silty sand and sand was encountered in the borings from approximately 25 to 30 feet bgs. The finer grained silty sand to sandy silt layer continued from approximately 30 feet to approximately 44 feet bgs. A thicker layer of clean sand interbedded with silty sand extends from the base of the fine-grained sediments to a depth of approximately 72 to 75 feet bgs. This unit is underlain by a layer of silty sand and sandy silt to a depth of approximately 82 to 85 feet bgs. This relatively impermeable layer is then underlain by another thick layer of clean sand which was encountered to approximately 90 bgs, at which point the CPT rig encountered refusal. The lithologic profiles logged at the 4 locations were relatively consistent. The CPT logs are included in Gregg Drilling and Testing's CPT Site Investigation Report (attached).

**Depth to First Groundwater.** To determine the depth to first groundwater, several pore water pressure dissipation tests (PPDT) were conducted with the CPT rig at depths of 47, 58 and 85 feet bgs at CPT-1, and at 70 feet bgs at CPT-2. The PPDT locations were selected to evaluate the higher permeability layers detected in the CPT borings. The PPDTs at 47 and 58 feet bgs returned pore pressure curves that remained below the zero intercept (negative pounds per square inch, "psi") over time, indicating that the unit was dry. At 70 feet bgs, the curve approached the zero

intercept after approximately one-half hour, and at 85 feet bgs, the curve reached a maximum of 7.52 psi after one-half hour. This value converts to approximately 17.4 feet of hydraulic head and suggests that the water table elevation was approximately 67 feet bgs, which correlates well to the data obtained in the test conducted at approximately 70 feet. Therefore, grab groundwater sample intervals were selected to gather water from approximately 65 to 70 feet bgs. The PPDT curves are also included in Gregg Drilling and Testing's CPT Site Investigation Report, dated January 8, 2007 (attached).

**Analytical Results.** Laboratory analysis results from this subsurface investigation are summarized in Table 1 with copies of the analytical reports (attached). The analytical information indicates that none of the targeted compounds were detected in the four grab groundwater samples. In addition, GRO, BTEX and MTBE were not detected in the soil samples collected.

Low concentrations of DRO were detected in six of the eight soil samples ranging in concentration from <0.91 ppm to 9.5 ppm. The chromatograms from these samples were reviewed by the analytical laboratory who indicated that they did not match the standard for diesel fuel however, which indicates that they may be naturally occurring organic compounds that elute within the same general carbon range as diesel fuel.

## CONCLUSIONS

Based on the results of this investigation it appears that first groundwater at the Site is found approximately 70 feet bgs, in a relatively thick clean sandy unit, which is overlain by approximately twenty feet of relatively impermeable silty sand and silt. Laboratory analytical results from four grab groundwater samples collected near the top of this water bearing unit did not contain DRO, GRO, MTBE, or BTEX above the laboratory method detection limits. In addition, except for DRO, the analytical results of the four soil samples collected from the approximate depth of the former UST tank excavation and the four soil samples collected approximately ten feet deeper in the next permeable unit were also free of these compounds. The detections of DRO in the soils samples were well below Environmental Screening Levels established by the San Francisco Regional Water Quality Control Board for the protection of groundwater and did not match the chromatogram pattern for diesel fuel, indicating that these may be naturally occurring organic compounds.

These results indicate that the previous use of the UST's in this area have not adversely affected Site soil or groundwater quality and do not pose a future threat to the groundwater resource underlying the Site.

Mr. Jerry Wickham  
February 15, 2007  
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## RECOMMENDATIONS

Based on the results of this subsurface investigation, and in consideration of the conclusions presented above, Brown and Caldwell does not recommend further investigation or remediation of soil or groundwater quality in the vicinity of these two former USTs. We recommend that the case be closed.

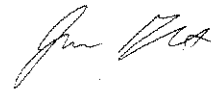
Thank you for reviewing this report of findings for the referenced Site. Please feel free to call me at (925) 210-2278 or Mr. Lee Cover of Hanson Aggregates at (925) 426-4170, should you have any questions.

Very truly yours,

BROWN AND CALDWELL

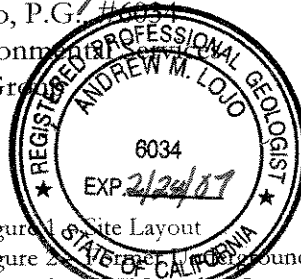


Andrew M. Lojo, P.G. #6034  
Manager, Environmental  
Walnut Creek Group



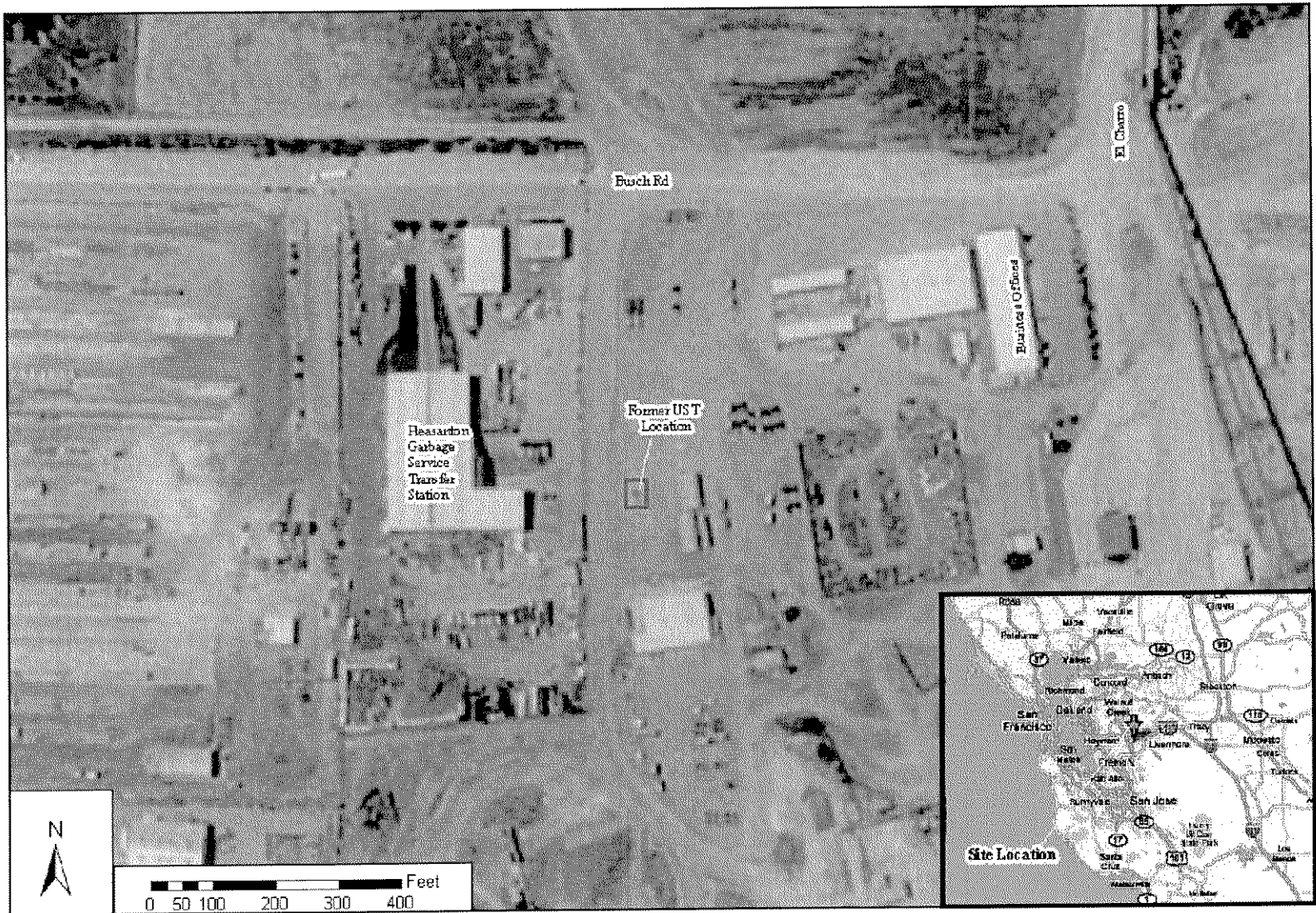
Jason Grant, P.E.  
Project Manager

JG:dem

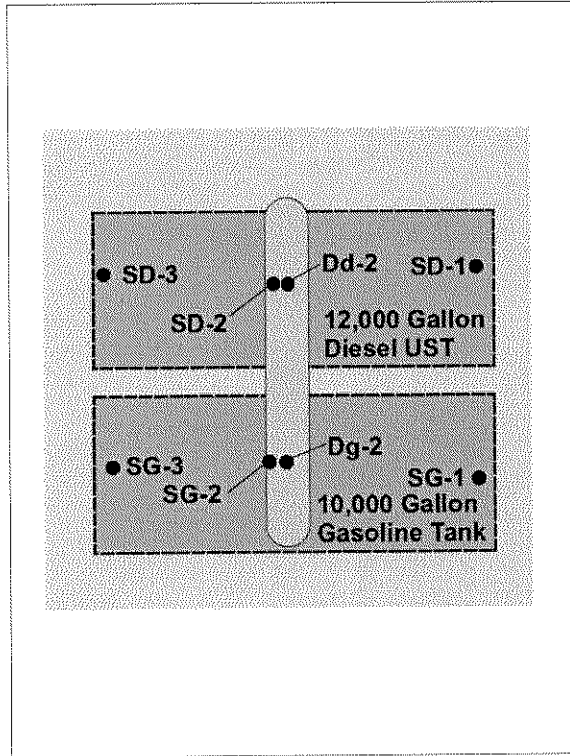


Attachments: Figure 1 - Site Layout  
Figure 2 - Proposed Ground Storage Tank and Sample Locations  
Figure 3 - CPT Sampling Locations  
Table 1 - Summary of Analytical Results  
(w/4 analytical reports dated 01/10/07, 01/15/07, 01/22/07, 01/22/07)  
Gregg Drilling and Testing's CPT Site Investigation Report, dated January 8, 2007

cc w/attach: Mr. L. Cover, Hanson Aggregates West  
Mr. M. Howell, Hanson Aggregates West  
Ms. B. Goodrich, Brown and Caldwell  
Mr. Wyman Hong, Zone 7 Water Agency



<b>BROWN AND CALDWELL</b>	DATE February 2007	SITE <b>Hanson Radum Plant, 3000 Busch Road, Pleasanton, California</b>	<b>Figure 1</b>
	PROJECT 131771	TITLE <b>Site Layout</b>	

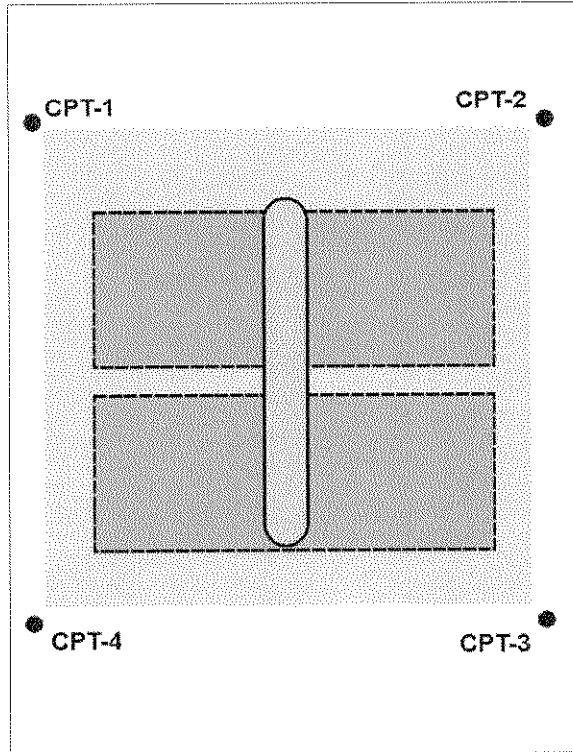


**LEGEND**

- Location of Former In-Situ Soil Characterization Sample
- ▨ Former Fuel Dispenser Island
- ▨ Extent of Excavation
- ▨ Former UST Location
- Former Concrete Pad

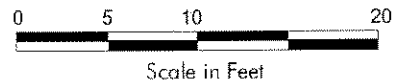
<b>BROWN AND CALDWELL</b>	DATE February 2007	SITE <b>Hanson Radum Plant, Pleasanton, California</b>	<b>Figure 2</b>
	PROJECT 131771	TITLE <b>Former Underground Storage Tank and Sample Locations</b>	





**LEGEND**

- CPT Sampling Location (Approximate)
- ▨ Former Fuel Dispenser Island
- ▨ Extent of Excavation
- ▨ Former UST Location
- Former Concrete Pad



<b>BROWN AND CALDWELL</b>	DATE February 2007	SITE Hanson Radum Plant, Pleasanton, California	<b>Figure 3</b>
	PROJECT 131771	TITLE CPT Sampling Locations	

**Table 1. Summary of Analytical Results**

Hanson Aggregates  
 3000 Busch Road  
 Pleasanton, CA

Boring ID	Location	Sample Type / Depth	DRO	GRO	BTEX	MTBE
CPT-1	NW corner of former tank excavation	Soil / 17-18 feet bgs	7.3 mg/kg	<0.25 mg/kg	<0.0050 mg/kg	<0.0050 mg/kg
		Soil / 27-28 feet bgs	9.5 mg/kg	<0.24 mg/kg	<0.0048 mg/kg	<0.0048 mg/kg
		Groundwater / 71 feet bgs	<50 µg/L	<50 µg/L	<1.0 * µg/L	<0.50 µg/L
CPT-2	NE corner of former tank excavation	Soil / 17-18 feet bgs	3.5 mg/kg	<0.25 mg/kg	<0.0050 mg/kg	<0.0050 mg/kg
		Soil / 26-27 feet bgs	<0.91 mg/kg	<0.25 mg/kg	<0.0049 mg/kg	<0.0049 mg/kg
		Groundwater / 66 feet bgs	<50 µg/L	<50 µg/L	<0.50 µg/L	<0.50 µg/L
CPT-3	SE corner of former tank excavation	Soil / 17-18 feet bgs	1.4 mg/kg	<0.25 mg/kg	<0.0049 mg/kg	<0.0049 mg/kg
		Soil / 22-23 feet bgs	1.4 mg/kg	<0.24 mg/kg	<0.0048 mg/kg	<0.0048 mg/kg
		Groundwater / 66 feet bgs	50 µg/L	50 µg/L	<1.0 * µg/L	<0.50 µg/L
CPT-4	SW corner of former tank excavation	Soil / 17-18 feet bgs	1.3 mg/kg	<0.25 mg/kg	<0.0049 mg/kg	<0.0049 mg/kg
		Soil / 24-25 feet bgs	<0.97 mg/kg	<0.25 mg/kg	<0.0049 mg/kg	<0.0049 mg/kg
		Groundwater / 67 feet bgs	50 µg/L	50 µg/L	<0.50 µg/L	<0.50 µg/L

**Notes**

DRO = Diesel Range Organics

GRO = Gasoline Range Organics

BTEX = Benzene, Toluene, Ethylbenzene, Xylenes

MTBE = Methyl Tertiary Butyl Ether

mg/kg = milligrams per kilogram

µg/L = micrograms per liter

&lt;n= not detected at a concentration greater than or equal to n mg/kg or n µg/L

\* Highest detection limit listed for this suite of compounds. See attached Laboratory data sheets for individual detection limits.



STL

## ANALYTICAL REPORT

Job Number: 720-7165-1

Job Description: Hanson

For:  
Brown and Caldwell  
201 North Civic Drive  
Suite 115  
Walnut Creek, CA 94596-3864

Attention: Mr. Joe Laplante

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

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Dimple Sharma  
Project Manager I  
dsharma@stl-inc.com  
01/10/2007

cc: Jason Grant

Project Manager: Dimple Sharma

**Severn Trent Laboratories, Inc.**

STL San Francisco 1220 Quarry Lane, Pleasanton, CA 94566  
Tel (925) 484-1919 Fax (925) 484-1096 [www.stl-inc.com](http://www.stl-inc.com)

## EXECUTIVE SUMMARY - Detections

Client: Brown and Caldwell

Job Number: 720-7165-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier	Reporting Limit	Units	Method
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No Detections

## METHOD SUMMARY

Client: Brown and Caldwell

Job Number: 720-7165-1

Description	Lab Location	Method	Preparation Method
<b>Matrix:</b> Water			
Volatile Organic Compounds by GC/MS	STL SF	SW846 8260B	
Purge-and-Trap	STL SF		SW846 5030B
Nonhalogenated Organics using GC/FID -Modified (Diesel Range Organics)	STL SF	SW846 8015B	
Organic Compounds in Water by Microextraction	STL SF		SW846 3511 SGC

### LAB REFERENCES:

STL SF = STL San Francisco

### METHOD REFERENCES:

SW846 - "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

## SAMPLE SUMMARY

Client: Brown and Caldwell

Job Number: 720-7165-1

<b>Lab Sample ID</b>	<b>Client Sample ID</b>	<b>Client Matrix</b>	<b>Date/Time Sampled</b>	<b>Date/Time Received</b>
720-7165-1	CPT-1	Water	01/03/2007 1250	01/03/2007 1720
720-7165-2	CPT-2	Water	01/03/2007 1655	01/03/2007 1720

**Analytical Data**

Client: Brown and Caldwell

Job Number: 720-7165-1

**Client Sample ID: CPT-1**

Lab Sample ID: 720-7165-1

Date Sampled: 01/03/2007 1250

Client Matrix: Water

Date Received: 01/03/2007 1720

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**8260B Volatile Organic Compounds by GC/MS**

Method: 8260B

Analysis Batch: 720-16996

Instrument ID: Varian 3900E

Preparation: 5030B

Lab File ID: c:\varianws\data\200701\01

Dilution: 1.0

Initial Weight/Volume: 10 mL

Date Analyzed: 01/04/2007 2045

Final Weight/Volume: 10 mL

Date Prepared: 01/04/2007 2045

Analyte	Result (ug/L)	Qualifier	RL
Benzene	ND		0.50
Ethylbenzene	ND		0.50
MTBE	ND		0.50
Toluene	ND		0.50
Xylenes, Total	ND		1.0
Gasoline Range Organics (GRO)-C5-C12	ND		50
Surrogate	%Rec		Acceptance Limits
Toluene-d8 (Surr)	94		77 - 121
1,2-Dichloroethane-d4 (Surr)	111		73 - 130





**Analytical Data**

Client: Brown and Caldwell

Job Number: 720-7165-1

**Client Sample ID: CPT-1**

Lab Sample ID: 720-7165-1

Date Sampled: 01/03/2007 1250

Client Matrix: Water

Date Received: 01/03/2007 1720

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**8015B Nonhalogenated Organics using GC/FID -Modified (Diesel Range Organics)**

Method:	8015B	Analysis Batch: 720-16990	Instrument ID: Varian DRO4
Preparation:	3511 SGC	Prep Batch: 720-16943	Lab File ID: N/A
Dilution:	1.0		Initial Weight/Volume: 35 mL
Date Analyzed:	01/04/2007 1838		Final Weight/Volume: 2 mL
Date Prepared:	01/04/2007 1251		Injection Volume:
			Column ID: PRIMARY

Analyte	Result (ug/L)	Qualifier	RL
Diesel Range Organics [C10-C28]	ND		50
Surrogate	%Rec		Acceptance Limits
o-Terphenyl	91		60 - 130

# Analytical Data

Client: Brown and Caldwell

Job Number: 720-7165-1

Client Sample ID: CPT-2

Lab Sample ID: 720-7165-2

Date Sampled: 01/03/2007 1655

Client Matrix: Water

Date Received: 01/03/2007 1720

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## 8015B Nonhalogenated Organics using GC/FID -Modified (Diesel Range Organics)

Method:	8015B	Analysis Batch: 720-16990	Instrument ID: Varian DRO4
Preparation:	3511 SGC	Prep Batch: 720-16943	Lab File ID: N/A
Dilution:	1.0		Initial Weight/Volume: 35 mL
Date Analyzed:	01/04/2007 1907		Final Weight/Volume: 2 mL
Date Prepared:	01/04/2007 1251		Injection Volume:
			Column ID: PRIMARY

Analyte	Result (ug/L)	Qualifier	RL
Diesel Range Organics [C10-C28]	ND		50
Surrogate	%Rec		Acceptance Limits
o-Terphenyl	90		60 - 130

## DATA REPORTING QUALIFIERS

Lab Section	Qualifier	Description
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## Quality Control Results

Client: Brown and Caldwell

Job Number: 720-7165-1

### QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
<b>GC/MS VOA</b>					
<b>Analysis Batch:720-16996</b>					
LCS 720-16996/2	Lab Control Spike	T	Water	8260B	
LCSD 720-16996/1	Lab Control Spike Duplicate	T	Water	8260B	
MB 720-16996/3	Method Blank	T	Water	8260B	
720-7165-1	CPT-1	T	Water	8260B	
720-7165-2	CPT-2	T	Water	8260B	
<b>Report Basis</b>					
T = Total					
<b>GC Semi VOA</b>					
<b>Prep Batch: 720-16943</b>					
LCS 720-16943/2-AA	Lab Control Spike	A	Water	3511 SGC	
LCSD 720-16943/3-AA	Lab Control Spike Duplicate	A	Water	3511 SGC	
MB 720-16943/1-AA	Method Blank	A	Water	3511 SGC	
720-7165-1	CPT-1	A	Water	3511 SGC	
720-7165-2	CPT-2	A	Water	3511 SGC	
<b>Analysis Batch:720-16990</b>					
LCS 720-16943/2-AA	Lab Control Spike	A	Water	8015B	720-16943
LCSD 720-16943/3-AA	Lab Control Spike Duplicate	A	Water	8015B	720-16943
MB 720-16943/1-AA	Method Blank	A	Water	8015B	720-16943
720-7165-1	CPT-1	A	Water	8015B	720-16943
720-7165-2	CPT-2	A	Water	8015B	720-16943

**Report Basis**

A = Silica Gel Cleanup

## Quality Control Results

Client: Brown and Caldwell

Job Number: 720-7165-1

**Method Blank - Batch: 720-16996**

**Method: 8260B**

**Preparation: 5030B**

Lab Sample ID: MB 720-16996/3  
Client Matrix: Water  
Dilution: 1.0  
Date Analyzed: 01/04/2007 1844  
Date Prepared: 01/04/2007 1844

Analysis Batch: 720-16996  
Prep Batch: N/A  
Units: ug/L

Instrument ID: Varian 3900E  
Lab File ID: c:\varianws\data\200701\01  
Initial Weight/Volume: 10 mL  
Final Weight/Volume: 10 mL

Analyte	Result	Qual	RL
Benzene	ND		0.50
Ethylbenzene	ND		0.50
MTBE	ND		0.50
Toluene	ND		0.50
Xylenes, Total	ND		1.0
Gasoline Range Organics (GRO)-C5-C12	ND		50

Surrogate	% Rec	Acceptance Limits
Toluene-d8 (Surr)	93	77 - 121
1,2-Dichloroethane-d4 (Surr)	116	73 - 130

Calculations are performed before rounding to avoid round-off errors in calculated results.

## Quality Control Results

Client: Brown and Caldwell

Job Number: 720-7165-1

**Lab Control Spike/  
Lab Control Spike Duplicate Recovery Report - Batch: 720-16996**

**Method: 8260B  
Preparation: 5030B**

LCS Lab Sample ID: LCS 720-16996/2  
Client Matrix: Water  
Dilution: 1.0  
Date Analyzed: 01/04/2007 1713  
Date Prepared: 01/04/2007 1713

Analysis Batch: 720-16996  
Prep Batch: N/A  
Units: ug/L

Instrument ID: Varian 3900E  
Lab File ID: c:\varianws\data\200701\0107  
Initial Weight/Volume: 10 mL  
Final Weight/Volume: 10 mL

LCSD Lab Sample ID: LCSD 720-16996/1  
Client Matrix: Water  
Dilution: 1.0  
Date Analyzed: 01/04/2007 1735  
Date Prepared: 01/04/2007 1735

Analysis Batch: 720-16996  
Prep Batch: N/A  
Units: ug/L

Instrument ID: Varian 3900E  
Lab File ID: c:\varianws\data\200701\0101  
Initial Weight/Volume: 10 mL  
Final Weight/Volume: 10 mL

Analyte	% Rec.		Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
	LCS	LCSD					
Benzene	96	90	69 - 129	6	25		
MTBE	84	82	65 - 165	2	25		
Toluene	98	95	70 - 130	3	25		
Surrogate	LCS % Rec		LCSD % Rec	Acceptance Limits			
Toluene-d8 (Surr)	95		95	77 - 121			
1,2-Dichloroethane-d4 (Surr)	102		107	73 - 130			

Calculations are performed before rounding to avoid round-off errors in calculated results.

## Quality Control Results

Client: Brown and Caldwell

Job Number: 720-7165-1

**Method Blank - Batch: 720-16943**

**Method: 8015B  
Preparation: 3511 SGC  
Silica Gel Cleanup**

Lab Sample ID: MB 720-16943/1-AA  
Client Matrix: Water  
Dilution: 1.0  
Date Analyzed: 01/04/2007 1712  
Date Prepared: 01/04/2007 1251

Analysis Batch: 720-16990  
Prep Batch: 720-16943  
Units: ug/L

Instrument ID: Varian DRO4  
Lab File ID: N/A  
Initial Weight/Volume: 35 mL  
Final Weight/Volume: 2 mL  
Injection Volume:  
Column ID: PRIMARY

Analyte	Result	Qual	RL
Diesel Range Organics [C10-C28]	ND		50

Surrogate	% Rec	Acceptance Limits
o-Terphenyl	91	60 - 130

**Lab Control Spike/  
Lab Control Spike Duplicate Recovery Report - Batch: 720-16943**

**Method: 8015B  
Preparation: 3511 SGC  
Silica Gel Cleanup**

LCS Lab Sample ID: LCS 720-16943/2-AA  
Client Matrix: Water  
Dilution: 1.0  
Date Analyzed: 01/04/2007 1740  
Date Prepared: 01/04/2007 1251

Analysis Batch: 720-16990  
Prep Batch: 720-16943  
Units: ug/L

Instrument ID: Varian DRO4  
Lab File ID: N/A  
Initial Weight/Volume: 35 mL  
Final Weight/Volume: 2 mL  
Injection Volume:  
Column ID: PRIMARY

LCSD Lab Sample ID: LCSD 720-16943/3-AA  
Client Matrix: Water  
Dilution: 1.0  
Date Analyzed: 01/04/2007 1809  
Date Prepared: 01/04/2007 1251

Analysis Batch: 720-16990  
Prep Batch: 720-16943  
Units: ug/L

Instrument ID: Varian DRO4  
Lab File ID: N/A  
Initial Weight/Volume: 35 mL  
Final Weight/Volume: 2 mL  
Injection Volume:  
Column ID: PRIMARY

Analyte	% Rec.		Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
	LCS	LCSD					
Diesel Range Organics [C10-C28]	79	82	50 - 150	4	25		
Surrogate	LCS % Rec		LCSD % Rec	Acceptance Limits			
o-Terphenyl	87		89	60 - 130			

Calculations are performed before rounding to avoid round-off errors in calculated results.

2701 Prospect Park Dr.  
Rancho Cordova, CA 95670  
916-444-0123 / FAX 916-633-8805

9665 Chesapeake Dr. / Suite 201  
San Diego, CA 92123  
858-514-8822 / FAX 858-514-8833

201 N. Civic Dr. / Suite 115  
Walnut Creek, CA 94596  
925-937-9010 / FAX 925-937-9026

400 Exchange / Suite 100  
Irvine, CA 92602  
714-730-7600 / FAX 714-734-0940

PROJECT NAME: Hanson Ranch PROJECT NUMBER: 131771 **720-7165** LABORATORY NAME & ADDRESS: STL  
Pleasanton, CA 103465

LINE NO.	SAMPLE - I.D.	COLLECTION DATE	COLLECTION TIME	SAMPLER'S INITIALS	NUMBER OF CONTAINERS	CONTAINER SIZE AND TYPE	PRESERVATIVE	MATRIX CODE	ANALYSES REQUESTED	FIELD FILTERED	DOC. REQ.	TAT	SAMPLING METHOD	DEPTH (FT) BEGIN	DEPTH (FT) END	PRO. READING (ppm)
01	CPT-1	1/3/07	12:50	JZ	6	40L WATS	HCE	W	TPH-d (2015) + Silica Gel Cleanup TPH-g (2015), BTEX + MTBE (260)			5-dy	B	---		
02	CPT-2	1/3/07	16:55	JZ	6	40L WATS	HCE	W	11			5-dy	B	---		
03														---		
04														---		
05														---		
06														---		
07														---		
08														---		
09														---		
10														---		

COLLECTED & RELEASED BY: [Signature] DATE: 1/3/07 TIME: 17:20 COOLER I.D.:

RECEIVED BY: [Signature] DATE: 1/3/07 TIME: 17:20 RELINQUISHED BY:

RECORD RETURNED BY: DATE: TIME:

COURIER: SHIPPING NUMBER:

COMMENTS (see note on back):  
CPT-1 > 40C, Analyze  
Results to Jason Grant  
Temp. 13°C



## LOGIN SAMPLE RECEIPT CHECK LIST

Client: Brown and Caldwell

Job Number: 720-7165-1

**Login Number: 7165**

Question	T/F/NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	NA	
The cooler's custody seal, if present, is intact.	NA	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	Insufficient ice for CPT-1
Cooler Temperature is acceptable.	False	CPT-1 out of temp, client approved to analyze
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	



STL

## ANALYTICAL REPORT

Job Number: 720-7216-1

Job Description: Hanson

For:  
Brown and Caldwell  
201 North Civic Drive  
Suite 115  
Walnut Creek, CA 94596-3864

Attention: Mr. Joe Laplante

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

---

Dimple Sharma  
Project Manager I  
dsharma@stl-inc.com  
01/15/2007

cc: Jason Grant

Project Manager: Dimple Sharma

**Severn Trent Laboratories, Inc.**

STL San Francisco 1220 Quarry Lane, Pleasanton, CA 94566  
Tel (925) 484-1919 Fax (925) 484-1096 www.stl-inc.com

## EXECUTIVE SUMMARY - Detections

Client: Brown and Caldwell

Job Number: 720-7216-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier	Reporting Limit	Units	Method
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No Detections

## METHOD SUMMARY

Client: Brown and Caldwell

Job Number: 720-7216-1

Description	Lab Location	Method	Preparation Method
<b>Matrix:</b> Water			
Volatile Organic Compounds by GC/MS	STL SF	SW846 8260B	
Purge-and-Trap	STL SF		SW846 5030B
Nonhalogenated Organics using GC/FID -Modified (Diesel Range Organics)	STL SF	SW846 8015B	
Organic Compounds in Water by Microextraction	STL SF		SW846 3511 SGC

### LAB REFERENCES:

STL SF = STL San Francisco

### METHOD REFERENCES:

SW846 - "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

## SAMPLE SUMMARY

Client: Brown and Caldwell

Job Number: 720-7216-1

<b>Lab Sample ID</b>	<b>Client Sample ID</b>	<b>Client Matrix</b>	<b>Date/Time Sampled</b>	<b>Date/Time Received</b>
720-7216-1	CPT-3	Water	01/05/2007 1215	01/08/2007 1415
720-7216-2	CPT-4	Water	01/05/2007 1450	01/08/2007 1415



# Analytical Data

Client: Brown and Caldwell

Job Number: 720-7216-1

Client Sample ID: CPT-4

Lab Sample ID: 720-7216-2

Date Sampled: 01/05/2007 1450

Client Matrix: Water

Date Received: 01/08/2007 1415

## 8260B Volatile Organic Compounds by GC/MS

Method: 8260B

Analysis Batch: 720-17103

Instrument ID: Saturn 2100

Preparation: 5030B

Lab File ID: c:\saturnws\data\200701\01

Dilution: 1.0

Initial Weight/Volume: 10 mL

Date Analyzed: 01/09/2007 1625

Final Weight/Volume: 10 mL

Date Prepared: 01/09/2007 1625

Analyte	Result (ug/L)	Qualifier	RL
Benzene	ND		0.50
Ethylbenzene	ND		0.50
MTBE	ND		0.50
Toluene	ND		0.50
Xylenes, Total	ND		1.0
Gasoline Range Organics (GRO)-C5-C12	ND		50
Surrogate	%Rec		Acceptance Limits
Toluene-d8 (Surr)	94		77 - 121
1,2-Dichloroethane-d4 (Surr)	95		73 - 130

# Analytical Data

Client: Brown and Caldwell

Job Number: 720-7216-1

Client Sample ID: CPT-3

Lab Sample ID: 720-7216-1

Client Matrix: Water

Date Sampled: 01/05/2007 1215

Date Received: 01/08/2007 1415

---

## 8015B Nonhalogenated Organics using GC/FID -Modified (Diesel Range Organics)

Method:	8015B	Analysis Batch: 720-17207	Instrument ID: Varian DRO4
Preparation:	3511 SGC	Prep Batch: 720-17110	Lab File ID: N/A
Dilution:	1.0		Initial Weight/Volume: 35 mL
Date Analyzed:	01/11/2007 1703		Final Weight/Volume: 2 mL
Date Prepared:	01/10/2007 1312		Injection Volume:
			Column ID: PRIMARY

Analyte	Result (ug/L)	Qualifier	RL
Diesel Range Organics [C10-C28]	ND		50
Surrogate	%Rec		Acceptance Limits
o-Terphenyl	100		60 - 130



**Analytical Data**

Client: Brown and Caldwell

Job Number: 720-7216-1

**Client Sample ID: CPT-4**

Lab Sample ID: 720-7216-2

Date Sampled: 01/05/2007 1450

Client Matrix: Water

Date Received: 01/08/2007 1415

---

**8015B Nonhalogenated Organics using GC/FID -Modified (Diesel Range Organics)**

Method:	8015B	Analysis Batch: 720-17207	Instrument ID: Varian DRO4
Preparation:	3511 SGC	Prep Batch: 720-17110	Lab File ID: N/A
Dilution:	1.0		Initial Weight/Volume: 35 mL
Date Analyzed:	01/11/2007 1341		Final Weight/Volume: 2 mL
Date Prepared:	01/10/2007 1312		Injection Volume:
			Column ID: PRIMARY

Analyte	Result (ug/L)	Qualifier	RL
Diesel Range Organics [C10-C28]	ND		50
Surrogate	%Rec		Acceptance Limits
o-Terphenyl	90		60 - 130

## DATA REPORTING QUALIFIERS

Lab Section	Qualifier	Description
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## Quality Control Results

Client: Brown and Caldwell

Job Number: 720-7216-1

### QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
<b>GC/MS VOA</b>					
<b>Analysis Batch:720-17103</b>					
LCS 720-17103/2	Lab Control Spike	T	Water	8260B	
LCSD 720-17103/1	Lab Control Spike Duplicate	T	Water	8260B	
MB 720-17103/3	Method Blank	T	Water	8260B	
720-7216-1	CPT-3	T	Water	8260B	
720-7216-2	CPT-4	T	Water	8260B	

**Report Basis**

T = Total

### GC Semi VOA

<b>Prep Batch: 720-17110</b>					
LCS 720-17110/2-AA	Lab Control Spike	A	Water	3511 SGC	
LCSD 720-17110/3-AA	Lab Control Spike Duplicate	A	Water	3511 SGC	
MB 720-17110/1-AA	Method Blank	A	Water	3511 SGC	
720-7216-1	CPT-3	A	Water	3511 SGC	
720-7216-2	CPT-4	A	Water	3511 SGC	
<b>Analysis Batch:720-17207</b>					
LCS 720-17110/2-AA	Lab Control Spike	A	Water	8015B	720-17110
LCSD 720-17110/3-AA	Lab Control Spike Duplicate	A	Water	8015B	720-17110
MB 720-17110/1-AA	Method Blank	A	Water	8015B	720-17110
720-7216-1	CPT-3	A	Water	8015B	720-17110
720-7216-2	CPT-4	A	Water	8015B	720-17110

**Report Basis**

A = Silica Gel Cleanup

## Quality Control Results

Client: Brown and Caldwell

Job Number: 720-7216-1

**Method Blank - Batch: 720-17103**

**Method: 8260B**  
**Preparation: 5030B**

Lab Sample ID: MB 720-17103/3  
Client Matrix: Water  
Dilution: 1.0  
Date Analyzed: 01/09/2007 1130  
Date Prepared: 01/09/2007 1130

Analysis Batch: 720-17103  
Prep Batch: N/A  
Units: ug/L

Instrument ID: Saturn 2100  
Lab File ID: c:\saturnws\data\200701\0  
Initial Weight/Volume: 10 mL  
Final Weight/Volume: 10 mL

Analyte	Result	Qual	RL
Benzene	ND		0.50
Ethylbenzene	ND		0.50
MTBE	ND		0.50
Toluene	ND		0.50
Xylenes, Total	ND		1.0

Surrogate	% Rec	Acceptance Limits
Toluene-d8 (Surr)	97	77 - 121
1,2-Dichloroethane-d4 (Surr)	82	73 - 130

**Lab Control Spike/  
Lab Control Spike Duplicate Recovery Report - Batch: 720-17103**

**Method: 8260B**  
**Preparation: 5030B**

LCS Lab Sample ID: LCS 720-17103/2  
Client Matrix: Water  
Dilution: 1.0  
Date Analyzed: 01/09/2007 0945  
Date Prepared: 01/09/2007 0945

Analysis Batch: 720-17103  
Prep Batch: N/A  
Units: ug/L

Instrument ID: Saturn 2100  
Lab File ID: c:\saturnws\data\200701\0  
Initial Weight/Volume: 10 mL  
Final Weight/Volume: 10 mL

LCSD Lab Sample ID: LCSD 720-17103/1  
Client Matrix: Water  
Dilution: 1.0  
Date Analyzed: 01/09/2007 1011  
Date Prepared: 01/09/2007 1011

Analysis Batch: 720-17103  
Prep Batch: N/A  
Units: ug/L

Instrument ID: Saturn 2100  
Lab File ID: c:\saturnws\data\200701\010  
Initial Weight/Volume: 10 mL  
Final Weight/Volume: 10 mL

Analyte	% Rec.		Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
	LCS	LCSD					
Benzene	105	104	69 - 129	1	25		
MTBE	99	94	65 - 165	5	25		
Toluene	107	107	70 - 130	0	25		
Surrogate	LCS % Rec		LCSD % Rec		Acceptance Limits		
Toluene-d8 (Surr)	94	92			77 - 121		
1,2-Dichloroethane-d4 (Surr)	83	82			73 - 130		

Calculations are performed before rounding to avoid round-off errors in calculated results.

## Quality Control Results

Client: Brown and Caldwell

Job Number: 720-7216-1

**Method Blank - Batch: 720-17110**

Lab Sample ID: MB 720-17110/1-AA  
 Client Matrix: Water  
 Dilution: 1.0  
 Date Analyzed: 01/11/2007 1633  
 Date Prepared: 01/10/2007 1312

Analysis Batch: 720-17207  
 Prep Batch: 720-17110  
 Units: ug/L

**Method: 8015B  
 Preparation: 3511 SGC  
 Silica Gel Cleanup**

Instrument ID: Varian DRO4  
 Lab File ID: N/A  
 Initial Weight/Volume: 35 mL  
 Final Weight/Volume: 2 mL  
 Injection Volume:  
 Column ID: PRIMARY

Analyte	Result	Qual	RL
Diesel Range Organics [C10-C28]	ND		50

Surrogate	% Rec	Acceptance Limits
o-Terphenyl	95	60 - 130

**Lab Control Spike/  
 Lab Control Spike Duplicate Recovery Report - Batch: 720-17110**

LCS Lab Sample ID: LCS 720-17110/2-AA  
 Client Matrix: Water  
 Dilution: 1.0  
 Date Analyzed: 01/11/2007 1210  
 Date Prepared: 01/10/2007 1312

Analysis Batch: 720-17207  
 Prep Batch: 720-17110  
 Units: ug/L

**Method: 8015B  
 Preparation: 3511 SGC  
 Silica Gel Cleanup**

Instrument ID: Varian DRO4  
 Lab File ID: N/A  
 Initial Weight/Volume: 35 mL  
 Final Weight/Volume: 2 mL  
 Injection Volume:  
 Column ID: PRIMARY

LCSD Lab Sample ID: LCSD 720-17110/3-AA  
 Client Matrix: Water  
 Dilution: 1.0  
 Date Analyzed: 01/11/2007 1241  
 Date Prepared: 01/10/2007 1312

Analysis Batch: 720-17207  
 Prep Batch: 720-17110  
 Units: ug/L

Instrument ID: Varian DRO4  
 Lab File ID: N/A  
 Initial Weight/Volume: 35 mL  
 Final Weight/Volume: 2 mL  
 Injection Volume:  
 Column ID: PRIMARY

Analyte	% Rec.		Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
	LCS	LCSD					
Diesel Range Organics [C10-C28]	88	88	50 - 150	0	25		
Surrogate	LCS % Rec		LCSD % Rec		Acceptance Limits		
o-Terphenyl	91		92		60 - 130		

Calculations are performed before rounding to avoid round-off errors in calculated results.

GW

720-7216

2701 Prospect Park Dr.  
Rancho Cordova, CA 95670  
916-444-0123 / FAX 916-633-8805

9665 Chesapeake Dr. / Suite 201  
San Diego, CA 92123  
858-514-8822 / FAX 858-514-8833

517 N. Civic Dr. / Suite 115  
Walnut Creek, CA 94596  
925-937-9010 / FAX 925-937-9026

400 Exchange / Suite 100  
Irvine, CA 92602  
714-730-7600 / FAX 714-734-0940

PROJECT NAME: Hansen Refinery LABORATORY NAME & ADDRESS: 103508  
PROJECT NUMBER: 131771 STL  
Pleasanton, CA 28

LINE NO.	SAMPLE - I.D.	COLLECTION DATE	TIME	SAMPLER'S INITIALS	NUMBER OF CONTAINERS	CONTAINER SIZE AND TYPE	PRESERVATIVE	MATRIX CODE	ANALYSES REQUESTED	FIELD FILTERED	OC - REQ	TAT	SAMPLING METHOD	DEPTH (FT) BEGIN	END	PREP REQUIRED (Y/N)
01	CPT-3	1/5/07	12:15	JR	6	40L WATS	Hce	W	TPH-3 (2015M) + Silica Gel Cleanup TPH-3 (2015M) BTEX+MTBE (8260)			5-day	B	----		
02	CPT-4	1/5/07	14:50	JR	6	40L WATS	Hce	W	"			5-day	B	----		
03														----		
04														----		
05														----		
06														----		
07														----		
08														----		
09														----		
10														----		

COLLECTED & RELIEVED BY: [Signature] DATE: 1/8/07 TIME: 09:20 COOLER I.D.:  
 RECEIVED BY: [Signature] DATE: 1/8/07 TIME: 9:53 RELINQUISHED BY: [Signature] DATE: 1/8/07 TIME: 9:57 COMMENTS (see note on back):  
STL-SF 1/8/07 9:57 STL-SF 1/8/07 14:15 Results to Tom Grant  
Leann Mullen STL-SF 1-8-7 1415  
 RECORD RETURNED BY: DATE: TIME: SHIPPING NUMBER:  
 COURIER: DATE: TIME: SHIPPING NUMBER:

## LOGIN SAMPLE RECEIPT CHECK LIST

Client: Brown and Caldwell

Job Number: 720-7216-1

**Login Number: 7216**

Question	T/F/NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	NA	
The cooler's custody seal, if present, is intact.	NA	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	



STL

## ANALYTICAL REPORT

Job Number: 720-7217-1

Job Description: Hanson

For:  
Brown and Caldwell  
201 North Civic Drive  
Suite 115  
Walnut Creek, CA 94596-3864

Attention: Mr. Joe Laplante

A handwritten signature in black ink, appearing to read "D Sharma", written over a horizontal line.

Dimple Sharma  
Project Manager I  
dsharma@stl-inc.com  
01/22/2007  
Revision: 1

cc: Jason Grant

Project Manager: Dimple Sharma

**Severn Trent Laboratories, Inc.**

STL San Francisco 1220 Quarry Lane, Pleasanton, CA 94566  
Tel (925) 484-1919 Fax (925) 484-1096 www.stl-inc.com



**Case Narrative for job: 720-J7217-1**

Date: 01/22/2007

The chromatogram pattern for DRO and MRO does not match the Standards.

## EXECUTIVE SUMMARY - Detections

Client: Brown and Caldwell

Job Number: 720-7217-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier	Reporting Limit	Units	Method
720-7217-2	CPT-3 (17.5-18.0')				
Diesel Range Organics [C10-C28]		1.4	0.99	mg/Kg	8015B
720-7217-4	CPT-3 (22.5-23.0')				
Diesel Range Organics [C10-C28]		1.4	0.98	mg/Kg	8015B
720-7217-9	CPT-4 (17.5-18.0')				
Diesel Range Organics [C10-C28]		1.3	0.94	mg/Kg	8015B

## METHOD SUMMARY

Client: Brown and Caldwell

Job Number: 720-7217-1

Description	Lab Location	Method	Preparation Method
<b>Matrix: Solid</b>			
Volatile Organic Compounds by GC/MS	STL SF	SW846 8260B	
Purge and Trap for Solids	STL SF		SW846 5030B
Nonhalogenated Organics using GC/FID -Modified (Diesel Range Organics)	STL SF	SW846 8015B	
Microscale Solvent Extraction (MSE)	STL SF		SW846 3570

### LAB REFERENCES:

STL SF = STL San Francisco

### METHOD REFERENCES:

SW846 - "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

## SAMPLE SUMMARY

Client: Brown and Caldwell

Job Number: 720-7217-1

<b>Lab Sample ID</b>	<b>Client Sample ID</b>	<b>Client Matrix</b>	<b>Date/Time Sampled</b>	<b>Date/Time Received</b>
720-7217-2	CPT-3 (17.5-18.0')	Solid	01/05/2007 1022	01/08/2007 1415
720-7217-4	CPT-3 (22.5-23.0')	Solid	01/05/2007 1035	01/08/2007 1415
720-7217-9	CPT-4 (17.5-18.0')	Solid	01/05/2007 1400	01/08/2007 1415
720-7217-10	CPT-4 (24.5-25.0')	Solid	01/05/2007 1405	01/08/2007 1415

# Analytical Data

Client: Brown and Caldwell

Job Number: 720-7217-1

Client Sample ID: CPT-3 (17.5-18.0')

Lab Sample ID: 720-7217-2

Client Matrix: Solid

Date Sampled: 01/05/2007 1022

Date Received: 01/08/2007 1415

## 8260B Volatile Organic Compounds by GC/MS

Method: 8260B

Analysis Batch: 720-17083

Instrument ID: Varian 3900A

Preparation: 5030B

Lab File ID: c:\saturnws\data\200701\01

Dilution: 1.0

Initial Weight/Volume: 5.08 g

Date Analyzed: 01/09/2007 1725

Final Weight/Volume: 10 mL

Date Prepared: 01/09/2007 1725

Analyte	DryWt Corrected: N	Result (mg/Kg)	Qualifier	RL
Benzene		ND		0.0049
Ethylbenzene		ND		0.0049
Toluene		ND		0.0049
MTBE		ND		0.0049
Xylenes, Total		ND		0.0098
Gasoline Range Organics (GRO)-C5-C12		ND		0.25
Surrogate		%Rec		Acceptance Limits
Toluene-d8 (Surr)		107		70 - 130
1,2-Dichloroethane-d4 (Surr)		117		60 - 140

# Analytical Data

Client: Brown and Caldwell

Job Number: 720-7217-1

Client Sample ID: CPT-3 (22.5-23.0')

Lab Sample ID: 720-7217-4

Date Sampled: 01/05/2007 1035

Client Matrix: Solid

Date Received: 01/08/2007 1415

## 8260B Volatile Organic Compounds by GC/MS

Method:	8260B	Analysis Batch: 720-17083	Instrument ID: Varian 3900A
Preparation:	5030B		Lab File ID: c:\satumws\data\200701\01
Dilution:	1.0		Initial Weight/Volume: 5.24 g
Date Analyzed:	01/09/2007 1810		Final Weight/Volume: 10 mL
Date Prepared:	01/09/2007 1810		

Analyte	DryWt Corrected: N	Result (mg/Kg)	Qualifier	RL
Benzene		ND		0.0048
Ethylbenzene		ND		0.0048
Toluene		ND		0.0048
MTBE		ND		0.0048
Xylenes, Total		ND		0.0095
Gasoline Range Organics (GRO)-C5-C12		ND		0.24
Surrogate		%Rec		Acceptance Limits
Toluene-d8 (Surr)		105		70 - 130
1,2-Dichloroethane-d4 (Surr)		121		60 - 140

# Analytical Data

Client: Brown and Caldwell

Job Number: 720-7217-1

Client Sample ID: CPT-4 (17.5-18.0')

Lab Sample ID: 720-7217-9

Date Sampled: 01/05/2007 1400

Client Matrix: Solid

Date Received: 01/08/2007 1415

## 8260B Volatile Organic Compounds by GC/MS

Method: 8260B

Analysis Batch: 720-17083

Instrument ID: Varian 3900A

Preparation: 5030B

Lab File ID: c:\saturnws\data\200701\01

Dilution: 1.0

Initial Weight/Volume: 5.08 g

Date Analyzed: 01/09/2007 1854

Final Weight/Volume: 10 mL

Date Prepared: 01/09/2007 1854

Analyte	DryWt Corrected: N	Result (mg/Kg)	Qualifier	RL
Benzene		ND		0.0049
Ethylbenzene		ND		0.0049
Toluene		ND		0.0049
MTBE		ND		0.0049
Xylenes, Total		ND		0.0098
Gasoline Range Organics (GRO)-C5-C12		ND		0.25
Surrogate		%Rec		Acceptance Limits
Toluene-d8 (Surr)		107		70 - 130
1,2-Dichloroethane-d4 (Surr)		118		60 - 140





# Analytical Data

Client: Brown and Caldwell

Job Number: 720-7217-1

Client Sample ID: CPT-3 (17.5-18.0')

Lab Sample ID: 720-7217-2

Date Sampled: 01/05/2007 1022

Client Matrix: Solid

Date Received: 01/08/2007 1415

---

## 8015B Nonhalogenated Organics using GC/FID -Modified (Diesel Range Organics)

Method:	8015B	Analysis Batch: 720-17214	Instrument ID:	Varian DRO2
Preparation:	3570	Prep Batch: 720-17067	Lab File ID:	N/A
Dilution:	1.0		Initial Weight/Volume:	5.07 g
Date Analyzed:	01/09/2007 2040		Final Weight/Volume:	5 mL
Date Prepared:	01/09/2007 1201		Injection Volume:	
			Column ID:	PRIMARY

Analyte	DryWt Corrected: N	Result (mg/Kg)	Qualifier	RL
Diesel Range Organics [C10-C28]		1.4		0.99
Surrogate		%Rec		Acceptance Limits
Capric Acid (Surr)		1		0 - 5
p-Terphenyl		98		50 - 130

# Analytical Data

Client: Brown and Caldwell

Job Number: 720-7217-1

Client Sample ID: CPT-3 (22.5-23.0')

Lab Sample ID: 720-7217-4

Date Sampled: 01/05/2007 1035

Client Matrix: Solid

Date Received: 01/08/2007 1415

---

## 8015B Nonhalogenated Organics using GC/FID -Modified (Diesel Range Organics)

Method:	8015B	Analysis Batch: 720-17214	Instrument ID:	Varian DRO2
Preparation:	3570	Prep Batch: 720-17067	Lab File ID:	N/A
Dilution:	1.0		Initial Weight/Volume:	5.10 g
Date Analyzed:	01/09/2007 2112		Final Weight/Volume:	5 mL
Date Prepared:	01/09/2007 1201		Injection Volume:	
			Column ID:	PRIMARY

Analyte	DryWt Corrected: N	Result (mg/Kg)	Qualifier	RL
Diesel Range Organics [C10-C28]		1.4		0.98
Surrogate		%Rec		Acceptance Limits
Capric Acid (Surr)		0		0 - 5
p-Terphenyl		104		50 - 130

# Analytical Data

Client: Brown and Caldwell

Job Number: 720-7217-1

Client Sample ID: CPT-4 (17.5-18.0')

Lab Sample ID: 720-7217-9

Date Sampled: 01/05/2007 1400

Client Matrix: Solid

Date Received: 01/08/2007 1415

---

## 8015B Nonhalogenated Organics using GC/FID -Modified (Diesel Range Organics)

Method:	8015B	Analysis Batch: 720-17214	Instrument ID:	Varian DRO2
Preparation:	3570	Prep Batch: 720-17067	Lab File ID:	N/A
Dilution:	1.0		Initial Weight/Volume:	5.33 g
Date Analyzed:	01/09/2007 2144		Final Weight/Volume:	5 mL
Date Prepared:	01/09/2007 1201		Injection Volume:	
			Column ID:	PRIMARY

Analyte	DryWt Corrected: N	Result (mg/Kg)	Qualifier	RL
Diesel Range Organics [C10-C28]		1.3		0.94
Surrogate		%Rec		Acceptance Limits
Capric Acid (Surr)		0		0 - 5
p-Terphenyl		94		50 - 130

**Analytical Data**

Client: Brown and Caldwell

Job Number: 720-7217-1

Client Sample ID: CPT-4 (24.5-25.0')

Lab Sample ID: 720-7217-10  
Client Matrix: Solid

Date Sampled: 01/05/2007 1405  
Date Received: 01/08/2007 1415

---

**8015B Nonhalogenated Organics using GC/FID -Modified (Diesel Range Organics)**

Method:	8015B	Analysis Batch: 720-17214	Instrument ID: Varian DRO2
Preparation:	3570	Prep Batch: 720-17067	Lab File ID: N/A
Dilution:	1.0		Initial Weight/Volume: 5.14 g
Date Analyzed:	01/09/2007 2215		Final Weight/Volume: 5 mL
Date Prepared:	01/09/2007 1201		Injection Volume:
			Column ID: PRIMARY

Analyte	DryWt Corrected: N	Result (mg/Kg)	Qualifier	RL
Diesel Range Organics [C10-C28]		ND		0.97
Surrogate		%Rec		Acceptance Limits
Capric Acid (Surr)		0		0 - 5
p-Terphenyl		95		50 - 130

## DATA REPORTING QUALIFIERS

<b>Lab Section</b>	<b>Qualifier</b>	<b>Description</b>
--------------------	------------------	--------------------

---

## Quality Control Results

Client: Brown and Caldwell

Job Number: 720-7217-1

### QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
<b>GC/MS VOA</b>					
<b>Analysis Batch:720-17083</b>					
LCS 720-17083/2	Lab Control Spike	T	Solid	8260B	
LCSD 720-17083/1	Lab Control Spike Duplicate	T	Solid	8260B	
MB 720-17083/3	Method Blank	T	Solid	8260B	
720-7217-2	CPT-3 (17.5-18.0')	T	Solid	8260B	
720-7217-4	CPT-3 (22.5-23.0')	T	Solid	8260B	
720-7217-9	CPT-4 (17.5-18.0')	T	Solid	8260B	
720-7217-10	CPT-4 (24.5-25.0')	T	Solid	8260B	

**Report Basis**

T = Total

### GC Semi VOA

<b>Prep Batch: 720-17067</b>					
LCS 720-17067/2-AA	Lab Control Spike	A	Solid	3570	
LCSD 720-17067/3-AA	Lab Control Spike Duplicate	A	Solid	3570	
MB 720-17067/1-AA	Method Blank	A	Solid	3570	
720-7217-2	CPT-3 (17.5-18.0')	A	Solid	3570	
720-7217-4	CPT-3 (22.5-23.0')	A	Solid	3570	
720-7217-9	CPT-4 (17.5-18.0')	A	Solid	3570	
720-7217-10	CPT-4 (24.5-25.0')	A	Solid	3570	
720-7217-10MS	Matrix Spike	A	Solid	3570	
720-7217-10MSD	Matrix Spike Duplicate	A	Solid	3570	
<b>Analysis Batch:720-17214</b>					
LCS 720-17067/2-AA	Lab Control Spike	A	Solid	8015B	720-17067
LCSD 720-17067/3-AA	Lab Control Spike Duplicate	A	Solid	8015B	720-17067
MB 720-17067/1-AA	Method Blank	A	Solid	8015B	720-17067
720-7217-2	CPT-3 (17.5-18.0')	A	Solid	8015B	720-17067
720-7217-4	CPT-3 (22.5-23.0')	A	Solid	8015B	720-17067
720-7217-9	CPT-4 (17.5-18.0')	A	Solid	8015B	720-17067
720-7217-10	CPT-4 (24.5-25.0')	A	Solid	8015B	720-17067
720-7217-10MS	Matrix Spike	A	Solid	8015B	720-17067
720-7217-10MSD	Matrix Spike Duplicate	A	Solid	8015B	720-17067

**Report Basis**

A = Silica Gel Cleanup

## Quality Control Results

Client: Brown and Caldwell

Job Number: 720-7217-1

**Method Blank - Batch: 720-17083**

**Method: 8260B**  
**Preparation: 5030B**

Lab Sample ID: MB 720-17083/3  
Client Matrix: Solid  
Dilution: 1.0  
Date Analyzed: 01/09/2007 0940  
Date Prepared: 01/09/2007 0940

Analysis Batch: 720-17083  
Prep Batch: N/A  
Units: mg/Kg

Instrument ID: Varian 3900A  
Lab File ID: c:\saturday\data\200701\0  
Initial Weight/Volume: 5 g  
Final Weight/Volume: 10 mL

Analyte	Result	Qual	RL
Benzene	ND		0.0050
Ethylbenzene	ND		0.0050
Toluene	ND		0.0050
MTBE	ND		0.0050
Xylenes, Total	ND		0.010
Gasoline Range Organics (GRO)-C5-C12	ND		0.25

Surrogate	% Rec	Acceptance Limits
Toluene-d8 (Surr)	103	70 - 130
1,2-Dichloroethane-d4 (Surr)	113	60 - 140

Calculations are performed before rounding to avoid round-off errors in calculated results.

## Quality Control Results

Client: Brown and Caldwell

Job Number: 720-7217-1

**Lab Control Spike/  
Lab Control Spike Duplicate Recovery Report - Batch: 720-17083**

**Method: 8260B  
Preparation: 5030B**

LCS Lab Sample ID: LCS 720-17083/2  
Client Matrix: Solid  
Dilution: 1.0  
Date Analyzed: 01/09/2007 0856  
Date Prepared: 01/09/2007 0856

Analysis Batch: 720-17083  
Prep Batch: N/A  
Units: mg/Kg

Instrument ID: Varian 3900A  
Lab File ID: c:\saturnws\data\200701\10  
Initial Weight/Volume: 5 g  
Final Weight/Volume: 10 mL

LCSD Lab Sample ID: LCSD 720-17083/1  
Client Matrix: Solid  
Dilution: 1.0  
Date Analyzed: 01/09/2007 0918  
Date Prepared: 01/09/2007 0918

Analysis Batch: 720-17083  
Prep Batch: N/A  
Units: mg/Kg

Instrument ID: Varian 3900A  
Lab File ID: c:\saturnws\data\200701\101  
Initial Weight/Volume: 5 g  
Final Weight/Volume: 10 mL

Analyte	% Rec.		Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
	LCS	LCSD					
Benzene	104	100	69 - 129	4	20		
Toluene	102	100	70 - 130	2	20		
MTBE	103	101	65 - 165	2	20		
Surrogate	LCS % Rec		LCSD % Rec		Acceptance Limits		
Toluene-d8 (Surr)	108		100		70 - 130		
1,2-Dichloroethane-d4 (Surr)	104		104		60 - 140		

Calculations are performed before rounding to avoid round-off errors in calculated results.



## Quality Control Results

Client: Brown and Caldwell

Job Number: 720-7217-1

**Method Blank - Batch: 720-17067**

**Method: 8015B  
Preparation: 3570  
Silica Gel Cleanup**

Lab Sample ID: MB 720-17067/1-AA  
Client Matrix: Solid  
Dilution: 1.0  
Date Analyzed: 01/09/2007 1905  
Date Prepared: 01/09/2007 1201

Analysis Batch: 720-17214  
Prep Batch: 720-17067  
Units: mg/Kg

Instrument ID: Varian DRO2  
Lab File ID: N/A  
Initial Weight/Volume: 5.12 g  
Final Weight/Volume: 5 mL  
Injection Volume:  
Column ID: PRIMARY

Analyte	Result	Qual	RL
Diesel Range Organics [C10-C28]	ND		0.98
<b>Surrogate</b>	<b>% Rec</b>		<b>Acceptance Limits</b>
Capric Acid (Surr)	0		0 - 5
<b>Surrogate</b>	<b>% Rec</b>		<b>Acceptance Limits</b>
p-Terphenyl	90		50 - 130

**Lab Control Spike/  
Lab Control Spike Duplicate Recovery Report - Batch: 720-17067**

**Method: 8015B  
Preparation: 3570  
Silica Gel Cleanup**

LCS Lab Sample ID: LCS 720-17067/2-AA  
Client Matrix: Solid  
Dilution: 1.0  
Date Analyzed: 01/09/2007 1937  
Date Prepared: 01/09/2007 1201

Analysis Batch: 720-17214  
Prep Batch: 720-17067  
Units: mg/Kg

Instrument ID: Varian DRO2  
Lab File ID: N/A  
Initial Weight/Volume: 5.30 g  
Final Weight/Volume: 5 mL  
Injection Volume:  
Column ID: PRIMARY

LCSD Lab Sample ID: LCSD 720-17067/3-AA  
Client Matrix: Solid  
Dilution: 1.0  
Date Analyzed: 01/09/2007 2009  
Date Prepared: 01/09/2007 1201

Analysis Batch: 720-17214  
Prep Batch: 720-17067  
Units: mg/Kg

Instrument ID: Varian DRO2  
Lab File ID: N/A  
Initial Weight/Volume: 5.31 g  
Final Weight/Volume: 5 mL  
Injection Volume:  
Column ID: PRIMARY

Analyte	<u>% Rec.</u>		Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
	LCS	LCSD					
Diesel Range Organics [C10-C28]	109	114	50 - 130	4	30		
<b>Surrogate</b>						<b>Acceptance Limits</b>	
p-Terphenyl	105	109				50 - 130	

Calculations are performed before rounding to avoid round-off errors in calculated results.

## Quality Control Results

Client: Brown and Caldwell

Job Number: 720-7217-1

**Matrix Spike/  
Matrix Spike Duplicate Recovery Report - Batch: 720-17067**

**Method: 8015B  
Preparation: 3570  
Silica Gel Cleanup**

MS Lab Sample ID: 720-7217-10  
Client Matrix: Solid  
Dilution: 1.0  
Date Analyzed: 01/09/2007 2247  
Date Prepared: 01/09/2007 1201

Analysis Batch: 720-17214  
Prep Batch: 720-17067

Instrument ID: Varian DRO2  
Lab File ID: N/A  
Initial Weight/Volume: 5.40 g  
Final Weight/Volume: 5 mL  
Injection Volume:  
Column ID: PRIMARY

MSD Lab Sample ID: 720-7217-10  
Client Matrix: Solid  
Dilution: 1.0  
Date Analyzed: 01/09/2007 2318  
Date Prepared: 01/09/2007 1201

Analysis Batch: 720-17214  
Prep Batch: 720-17067

Instrument ID: Varian DRO2  
Lab File ID: N/A  
Initial Weight/Volume: 5.21 g  
Final Weight/Volume: 5 mL  
Injection Volume:  
Column ID: PRIMARY

Analyte	% Rec.		Limit	RPD	RPD Limit	MS Qual	MSD Qual
	MS	MSD					
Diesel Range Organics [C10-C28]	111	105	50 - 130	2	30		
Surrogate		MS % Rec	MSD % Rec		Acceptance Limits		
p-Terphenyl		109	96		50 - 130		

Calculations are performed before rounding to avoid round-off errors in calculated results.

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Rancho Conejo, CA 95670  
916-444-0123 / FAX 916-635-8805

9665 Chesapeake Dr. / Suite 201  
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201 N. Civic Dr. / Suite 115  
Walnut Creek, CA 94596  
925-937-9010 / FAX 925-937-9026

400 Exchange / Suite 100  
Irvine, CA 92602  
714-730-7600 / FAX 714-734-0940

PROJECT NAME: Hanson Pad LABORATORY NAME & ADDRESS: 103517  
PROJECT NUMBER: 131771 **720-7217** STL  
Pleasanton, CA 72

LINE NO.	SAMPLE - I.D.	COLLECTION DATE	TIME	SAMPLER'S INITIALS	NUMBER OF CONTAINERS	CONTAINER SIZE AND TYPE	PRESERVATIVE	MATRIX CODE	ANALYSES REQUESTED	FIELD FILTERED	GC - FREQ	TAT	SAMPLING METHOD	DEPTH (FT) BEGIN	DEPTH (FT) END	PREP. METHOD (P/N)
01	CPT-3 (17.0-17.5')	1/5/07	10:22	92	1	SS 1x6	None	S	TPH-2 (8015 M) + Silica Gel Cleanup T4+3 (8015 M), BTEX+MTBE (3260)			Hold	DT	17.0	17.5	
02	CPT-3 (17.5-18.0')		10:22	92	1	SS 1x6	None	S	"			S-day	DT	17.5	18.0	
03	CPT-3 (22.0-22.5')		10:35	92	1	SS 1x6	None	S	"			Hold	DT	22.0	22.5	
04	CPT-3 (22.5-23.0')		10:35	92	1	SS 1x6	None	S	"			S-day	DT	22.5	23.0	
05	CPT-3 (30.5-31.0')		11:10	92	1	SS 1x6	None	S	"			Hold	DT	30.5	31.0	
06	CPT-3 (37.0-37.5')		11:21	92	1	SS 1x6	None	S	"			Hold	DT	37.0	37.5	
07	CPT-3 (37.5-38.0')		11:21	92	1	SS 1x6	None	S	"			Hold	DT	37.5	38.0	
08	CPT-4 (17.0-17.5')		14:00	92	1	SS 1x6	None	S	"			Hold	DT	17.0	17.5	
09	CPT-4 (17.5-18.0')		14:00	92	1	SS 1x6	None	S	"			S-day	DT	17.5	18.0	
10	CPT-4 (24.5-25.0')	1/5/07	14:05	92	1	SS 1x6	None	S	"			S-day	DT	24.5	25.0	

COLLECTED & RELEASED BY: [Signature] DATE: 1/8/07 TIME: 09:33 COOLER I.D.:  
RECEIVED BY: [Signature] DATE: 1/8/07 TIME: 9:55 RELINQUISHED BY: [Signature] DATE: 1/8/07 TIME: 9:57 COMMENTS (see note on back):  
[Signature] STL-SF 1/8/07 0957 [Signature] STL-SF 1/8/07 1415 Res-Its to Jason Grant  
[Signature] STL-SF 1-8-07 1415  
RECORD RETURNED BY: DATE: TIME: SHIPPING NUMBER:  
COURIER: SHIPPING NUMBER:

So. 1

2701 Prosper Park Dr.  
Rancho Cordova, CA 95670  
916-444-0123 / FAX 916-635-8805

9665 Chesapeake Dr. / Suite 201  
San Diego, CA 92123  
858-514-8822 / FAX 858-514-8833

201 N. Civic Dr. / Suite 115  
Walnut Creek, CA 94596  
925-937-9010 / FAX 925-937-9026

400 Exchange / Suite 100  
Irvine, CA 92602  
714-730-7600 / FAX 714-734-0940

PROJECT NAME: Hanson Adams LABORATORY NAME & ADDRESS: 103517  
 PROJECT NUMBER: 131771 **720-7217** STL  
Pleasanton, CA

LINE NO.	SAMPLE - I.D.	COLLECTION DATE	TIME	SAMPLER'S INITIALS	NUMBER OF CONTAINERS	CONTAINER SIZE AND TYPE	PRESERVATIVE	MATRIX CODE	ANALYSES REQUESTED	FIELD FILTERED	OC - REQ	TAT	SAMPLING METHOD	DEPTH (FT) BEGIN	END	NO. RESUBMIT (open)
01	CPT-4 (37.0-37.5)	1/5/07	14:12	DL	1	SS 1x6	None	S	TPH-d (2015 M) + Silica Gel Cleanup TPH-g (2015 M), BTEX / MTBE (9260)			Hold	DT	37.0	37.5	
02	CPT-4 (37.5-38.0)	1/5/07	14:12	DL	1	SS 1x6	None	S	"			Hold	DT	37.5	38.0	
03																
04																
05																
06																
07																
08																
09																
10																

COLLECTED & RELEASED BY: [Signature] DATE: 1/9/07 TIME: 09:00 COOLER I.D.:  
 RECEIVED BY: [Signature] DATE: 1/8/07 TIME: 7:51 FIELD INSPECTED BY: [Signature] DATE: 1/8/07 TIME: 9:57 COMMENTS (see note on back):  
Res - Hst to Jason Grant  
[Signature] STL-SF DATE: 1/8/07 TIME: 09:57 [Signature] STL-SF DATE: 1/8/07 TIME: 1415  
[Signature] STL-SF DATE: 1-8-7 TIME: 1415  
 RECORD RETURNED BY: DATE: TIME: SHIPPING NUMBER:  
 COURIER: SHIPPING NUMBER:

## LOGIN SAMPLE RECEIPT CHECK LIST

Client: Brown and Caldwell

Job Number: 720-7217-1

**Login Number: 7217**

Question	T/F/NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	NA	
The cooler's custody seal, if present, is intact.	NA	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs.	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	



STL

## ANALYTICAL REPORT

Job Number: 720-7166-1

Job Description: Hanson

For:  
Brown and Caldwell  
201 North Civic Drive  
Suite 115  
Walnut Creek, CA 94596-3864

Attention: Mr. Joe Laplante

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

---

Dimple Sharma  
Project Manager I  
dsharma@stl-inc.com  
01/22/2007  
Revision: 1

cc: Jason Grant

Project Manager: Dimple Sharma

**Severn Trent Laboratories, Inc.**

STL San Francisco 1220 Quarry Lane, Pleasanton, CA 94566  
Tel (925) 484-1919 Fax (925) 484-1096 www.stl-inc.com

**Case Narrative for job: 720-J7166-1**

Date: 01/22/2007

The chromatogram pattern for DRO and MRO does not match the Standards.

## EXECUTIVE SUMMARY - Detections

Client: Brown and Caldwell

Job Number: 720-7166-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier	Reporting Limit	Units	Method
<b>720-7166-1</b>	<b>CPT-1 (17'-18')</b>				
Diesel Range Organics [C10-C28]		7.3	0.97	mg/Kg	8015B
<b>720-7166-2</b>	<b>CPT-1 (27'-28')</b>				
Diesel Range Organics [C10-C28]		9.5	0.97	mg/Kg	8015B
<b>720-7166-4</b>	<b>CPT-2 (17'-18')</b>				
Diesel Range Organics [C10-C28]		3.5	0.92	mg/Kg	8015B



## METHOD SUMMARY

Client: Brown and Caldwell

Job Number: 720-7166-1

Description	Lab Location	Method	Preparation Method
<b>Matrix: Solid</b>			
Volatile Organic Compounds by GC/MS	STL SF	SW846 8260B	
Purge and Trap for Solids	STL SF		SW846 5030B
Nonhalogenated Organics using GC/FID -Modified (Diesel Range Organics)	STL SF	SW846 8015B	
Microscale Solvent Extraction (MSE)	STL SF		SW846 3570

### LAB REFERENCES:

STL SF = STL San Francisco

### METHOD REFERENCES:

SW846 - "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986  
And Its Updates.

## SAMPLE SUMMARY

Client: Brown and Caldwell

Job Number: 720-7166-1

<b>Lab Sample ID</b>	<b>Client Sample ID</b>	<b>Client Matrix</b>	<b>Date/Time Sampled</b>	<b>Date/Time Received</b>
720-7166-1	CPT-1 (17'-18')	Solid	01/03/2007 1213	01/03/2007 1720
720-7166-2	CPT-1 (27'-28')	Solid	01/03/2007 1221	01/03/2007 1720
720-7166-4	CPT-2 (17'-18')	Solid	01/03/2007 1628	01/03/2007 1720
720-7166-5	CPT-2 (26.5'-27.0')	Solid	01/03/2007 1632	01/03/2007 1720



# Analytical Data

Client: Brown and Caldwell

Job Number: 720-7166-1

Client Sample ID: CPT-1 (27'-28')

Lab Sample ID: 720-7166-2

Date Sampled: 01/03/2007 1221

Client Matrix: Solid

Date Received: 01/03/2007 1720

## 8260B Volatile Organic Compounds by GC/MS

Method: 8260B

Analysis Batch: 720-16946

Instrument ID: Varian 3900A

Preparation: 5030B

Lab File ID: c:\saturnws\data\200701\01

Dilution: 1.0

Initial Weight/Volume: 5.19 g

Date Analyzed: 01/04/2007 1335

Final Weight/Volume: 10 mL

Date Prepared: 01/04/2007 1335

Analyte	DryWt Corrected: N	Result (mg/Kg)	Qualifier	RL
Benzene		ND		0.0048
Ethylbenzene		ND		0.0048
Toluene		ND		0.0048
MTBE		ND		0.0048
Xylenes, Total		ND		0.0096
Gasoline Range Organics (GRO)-C5-C12		ND		0.24
Surrogate		%Rec		Acceptance Limits
Toluene-d8 (Surr)		104		70 - 130
1,2-Dichloroethane-d4 (Surr)		108		60 - 140

**Analytical Data**

Client: Brown and Caldwell

Job Number: 720-7166-1

**Client Sample ID: CPT-2 (17'-18')**

Lab Sample ID: 720-7166-4

Date Sampled: 01/03/2007 1628

Client Matrix: Solid

Date Received: 01/03/2007 1720

---

**8260B Volatile Organic Compounds by GC/MS**

Method: 8260B

Analysis Batch: 720-16946

Instrument ID: Varian 3900A

Preparation: 5030B

Lab File ID: c:\satumws\data\200701\01

Dilution: 1.0

Initial Weight/Volume: 5.05 g

Date Analyzed: 01/04/2007 1357

Final Weight/Volume: 10 mL

Date Prepared: 01/04/2007 1357

Analyte	DryWt Corrected: N	Result (mg/Kg)	Qualifier	RL
Benzene		ND		0.0050
Ethylbenzene		ND		0.0050
Toluene		ND		0.0050
MTBE		ND		0.0050
Xylenes, Total		ND		0.0099
Gasoline Range Organics (GRO)-C5-C12		ND		0.25
Surrogate		%Rec		Acceptance Limits
Toluene-d8 (Surr)		105		70 - 130
1,2-Dichloroethane-d4 (Surr)		109		60 - 140

# Analytical Data

Client: Brown and Caldwell

Job Number: 720-7166-1

Client Sample ID: CPT-2 (26.5'-27.0')

Lab Sample ID: 720-7166-5

Date Sampled: 01/03/2007 1632

Client Matrix: Solid

Date Received: 01/03/2007 1720

## 8260B Volatile Organic Compounds by GC/MS

Method: 8260B

Analysis Batch: 720-16946

Instrument ID: Varian 3900A

Preparation: 5030B

Lab File ID: c:\saturnws\data\200701\01

Dilution: 1.0

Initial Weight/Volume: 5.06 g

Date Analyzed: 01/04/2007 1419

Final Weight/Volume: 10 mL

Date Prepared: 01/04/2007 1419

Analyte	DryWt Corrected: N	Result (mg/Kg)	Qualifier	RL
Benzene		ND		0.0049
Ethylbenzene		ND		0.0049
Toluene		ND		0.0049
MTBE		ND		0.0049
Xylenes, Total		ND		0.0099
Gasoline Range Organics (GRO)-C5-C12		ND		0.25
Surrogate		%Rec		Acceptance Limits
Toluene-d8 (Surr)		109		70 - 130
1,2-Dichloroethane-d4 (Surr)		112		60 - 140

**Analytical Data**

Client: Brown and Caldwell

Job Number: 720-7166-1

**Client Sample ID: CPT-1 (17'-18')**

Lab Sample ID: 720-7166-1

Client Matrix: Solid

Date Sampled: 01/03/2007 1213

Date Received: 01/03/2007 1720

---

**8015B Nonhalogenated Organics using GC/FID -Modified (Diesel Range Organics)**

Method:	8015B	Analysis Batch: 720-17095	Instrument ID: Varian DRO2
Preparation:	3570	Prep Batch: 720-16945	Lab File ID: N/A
Dilution:	1.0		Initial Weight/Volume: 5.14 g
Date Analyzed:	01/08/2007 2129		Final Weight/Volume: 5 mL
Date Prepared:	01/04/2007 1316		Injection Volume:
			Column ID: PRIMARY

Analyte	DryWt Corrected: N	Result (mg/Kg)	Qualifier	RL
Diesel Range Organics [C10-C28]		7.3		0.97
Surrogate		%Rec		Acceptance Limits
Capric Acid (Surr)		0		0 - 5
p-Terphenyl		88		50 - 130

**Analytical Data**

Client: Brown and Caldwell

Job Number: 720-7166-1

**Client Sample ID: CPT-1 (27'-28')**

Lab Sample ID: 720-7166-2

Client Matrix: Solid

Date Sampled: 01/03/2007 1221

Date Received: 01/03/2007 1720

---

**8015B Nonhalogenated Organics using GC/FID -Modified (Diesel Range Organics)**

Method:	8015B	Analysis Batch: 720-17095	Instrument ID: Varian DRO2
Preparation:	3570	Prep Batch: 720-16945	Lab File ID: N/A
Dilution:	1.0		Initial Weight/Volume: 5.14 g
Date Analyzed:	01/08/2007 2201		Final Weight/Volume: 5 mL
Date Prepared:	01/04/2007 1316		Injection Volume:
			Column ID: PRIMARY

Analyte	DryWt Corrected: N	Result (mg/Kg)	Qualifier	RL
Diesel Range Organics [C10-C28]		9.5		0.97
Surrogate		%Rec		Acceptance Limits
Capric Acid (Surr)		0		0 - 5
p-Terphenyl		73		50 - 130



# Analytical Data

Client: Brown and Caldwell

Job Number: 720-7166-1

Client Sample ID: CPT-2 (17'-18')

Lab Sample ID: 720-7166-4

Date Sampled: 01/03/2007 1628

Client Matrix: Solid

Date Received: 01/03/2007 1720

## 8015B Nonhalogenated Organics using GC/FID -Modified (Diesel Range Organics)

Method:	8015B	Analysis Batch: 720-17095	Instrument ID: Varian DRO2
Preparation:	3570	Prep Batch: 720-16945	Lab File ID: N/A
Dilution:	1.0		Initial Weight/Volume: 5.44 g
Date Analyzed:	01/08/2007 2232		Final Weight/Volume: 5 mL
Date Prepared:	01/04/2007 1316		Injection Volume:
			Column ID: PRIMARY

Analyte	DryWt Corrected: N	Result (mg/Kg)	Qualifier	RL
Diesel Range Organics [C10-C28]		3.5		0.92
Surrogate		%Rec		Acceptance Limits
Capric Acid (Surr)		1		0 - 5
p-Terphenyl		93		50 - 130

# Analytical Data

Client: Brown and Caldwell

Job Number: 720-7166-1

Client Sample ID: CPT-2 (26.5'-27.0')

Lab Sample ID: 720-7166-5

Date Sampled: 01/03/2007 1632

Client Matrix: Solid

Date Received: 01/03/2007 1720

---

## 8015B Nonhalogenated Organics using GC/FID -Modified (Diesel Range Organics)

Method:	8015B	Analysis Batch: 720-17095	Instrument ID:	Varian DRO2
Preparation:	3570	Prep Batch: 720-16945	Lab File ID:	N/A
Dilution:	1.0		Initial Weight/Volume:	5.47 g
Date Analyzed:	01/09/2007 0816		Final Weight/Volume:	5 mL
Date Prepared:	01/04/2007 1316		Injection Volume:	
			Column ID:	PRIMARY

Analyte	DryWt Corrected: N	Result (mg/Kg)	Qualifier	RL
Diesel Range Organics [C10-C28]		ND		0.91
Surrogate		%Rec		Acceptance Limits
Capric Acid (Surr)		1		0 - 5
p-Terphenyl		92		50 - 130

## DATA REPORTING QUALIFIERS

Lab Section	Qualifier	Description
-------------	-----------	-------------

---

## Quality Control Results

Client: Brown and Caldwell

Job Number: 720-7166-1

### QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
<b>GC/MS VOA</b>					
<b>Analysis Batch:720-16946</b>					
LCS 720-16946/2	Lab Control Spike	T	Solid	8260B	
LCSD 720-16946/1	Lab Control Spike Duplicate	T	Solid	8260B	
MB 720-16946/3	Method Blank	T	Solid	8260B	
720-7166-1	CPT-1 (17'-18')	T	Solid	8260B	
720-7166-2	CPT-1 (27'-28')	T	Solid	8260B	
720-7166-4	CPT-2 (17'-18')	T	Solid	8260B	
720-7166-5	CPT-2 (26.5'-27.0')	T	Solid	8260B	

**Report Basis**

T = Total

### GC Semi VOA

<b>Prep Batch: 720-16945</b>					
LCS 720-16945/2-AA	Lab Control Spike	A	Solid	3570	
LCSD 720-16945/3-AA	Lab Control Spike Duplicate	A	Solid	3570	
MB 720-16945/1-AA	Method Blank	A	Solid	3570	
720-7166-1	CPT-1 (17'-18')	A	Solid	3570	
720-7166-1MS	Matrix Spike	A	Solid	3570	
720-7166-1MSD	Matrix Spike Duplicate	A	Solid	3570	
720-7166-2	CPT-1 (27'-28')	A	Solid	3570	
720-7166-4	CPT-2 (17'-18')	A	Solid	3570	
720-7166-5	CPT-2 (26.5'-27.0')	A	Solid	3570	
<b>Analysis Batch:720-17095</b>					
LCS 720-16945/2-AA	Lab Control Spike	A	Solid	8015B	720-16945
LCSD 720-16945/3-AA	Lab Control Spike Duplicate	A	Solid	8015B	720-16945
MB 720-16945/1-AA	Method Blank	A	Solid	8015B	720-16945
720-7166-1	CPT-1 (17'-18')	A	Solid	8015B	720-16945
720-7166-1MS	Matrix Spike	A	Solid	8015B	720-16945
720-7166-1MSD	Matrix Spike Duplicate	A	Solid	8015B	720-16945
720-7166-2	CPT-1 (27'-28')	A	Solid	8015B	720-16945
720-7166-4	CPT-2 (17'-18')	A	Solid	8015B	720-16945
720-7166-5	CPT-2 (26.5'-27.0')	A	Solid	8015B	720-16945

**Report Basis**

A = Silica Gel Cleanup

## Quality Control Results

Client: Brown and Caldwell

Job Number: 720-7166-1

**Method Blank - Batch: 720-16946**

**Method: 8260B**  
**Preparation: 5030B**

Lab Sample ID: MB 720-16946/3  
Client Matrix: Solid  
Dilution: 1.0  
Date Analyzed: 01/04/2007 1049  
Date Prepared: 01/04/2007 1049

Analysis Batch: 720-16946  
Prep Batch: N/A  
Units: mg/Kg

Instrument ID: Varian 3900A  
Lab File ID: c:\saturnws\data\200701\0  
Initial Weight/Volume: 5 g  
Final Weight/Volume: 10 mL

Analyte	Result	Qual	RL
Benzene	ND		0.0050
Ethylbenzene	ND		0.0050
Toluene	ND		0.0050
MTBE	ND		0.0050
Xylenes, Total	ND		0.010
Gasoline Range Organics (GRO)-C5-C12	ND		0.25

Surrogate	% Rec	Acceptance Limits
Toluene-d8 (Surr)	105	70 - 130
1,2-Dichloroethane-d4 (Surr)	117	60 - 140

Calculations are performed before rounding to avoid round-off errors in calculated results.

## Quality Control Results

Client: Brown and Caldwell

Job Number: 720-7166-1

**Lab Control Spike/  
Lab Control Spike Duplicate Recovery Report - Batch: 720-16946**

**Method: 8260B  
Preparation: 5030B**

LCS Lab Sample ID: LCS 720-16946/2  
Client Matrix: Solid  
Dilution: 1.0  
Date Analyzed: 01/04/2007 1004  
Date Prepared: 01/04/2007 1004

Analysis Batch: 720-16946  
Prep Batch: N/A  
Units: mg/Kg

Instrument ID: Varian 3900A  
Lab File ID: c:\saturnws\data\200701\010  
Initial Weight/Volume: 5 g  
Final Weight/Volume: 10 mL

LCSD Lab Sample ID: LCSD 720-16946/1  
Client Matrix: Solid  
Dilution: 1.0  
Date Analyzed: 01/04/2007 1027  
Date Prepared: 01/04/2007 1027

Analysis Batch: 720-16946  
Prep Batch: N/A  
Units: mg/Kg

Instrument ID: Varian 3900A  
Lab File ID: c:\saturnws\data\200701\010  
Initial Weight/Volume: 5 g  
Final Weight/Volume: 10 mL

Analyte	% Rec.		Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
	LCS	LCSD					
Benzene	97	99	69 - 129	2	20		
Toluene	105	107	70 - 130	2	20		
MTBE	90	103	65 - 165	13	20		
Surrogate	LCS % Rec		LCSD % Rec		Acceptance Limits		
Toluene-d8 (Surr)	105		108		70 - 130		
1,2-Dichloroethane-d4 (Surr)	94		99		60 - 140		

Calculations are performed before rounding to avoid round-off errors in calculated results.

## Quality Control Results

Client: Brown and Caldwell

Job Number: 720-7166-1

**Method Blank - Batch: 720-16945**

**Method: 8015B  
Preparation: 3570  
Silica Gel Cleanup**

Lab Sample ID: MB 720-16945/1-AA  
Client Matrix: Solid  
Dilution: 1.0  
Date Analyzed: 01/08/2007 2057  
Date Prepared: 01/04/2007 1316

Analysis Batch: 720-17095  
Prep Batch: 720-16945  
Units: mg/Kg

Instrument ID: Varian DRO2  
Lab File ID: N/A  
Initial Weight/Volume: 5.00 g  
Final Weight/Volume: 5 mL  
Injection Volume:  
Column ID: PRIMARY

Analyte	Result	Qual	RL
Diesel Range Organics [C10-C28]	ND		1.0
<b>Surrogate</b>	<b>% Rec</b>	<b>Acceptance Limits</b>	
Capric Acid (Surr)	1	0 - 5	
<b>Surrogate</b>	<b>% Rec</b>	<b>Acceptance Limits</b>	
p-Terphenyl	86	50 - 130	

**Lab Control Spike/  
Lab Control Spike Duplicate Recovery Report - Batch: 720-16945**

**Method: 8015B  
Preparation: 3570  
Silica Gel Cleanup**

LCS Lab Sample ID: LCS 720-16945/2-AA  
Client Matrix: Solid  
Dilution: 1.0  
Date Analyzed: 01/04/2007 1944  
Date Prepared: 01/04/2007 1316

Analysis Batch: 720-17095  
Prep Batch: 720-16945  
Units: mg/Kg

Instrument ID: Varian DRO2  
Lab File ID: N/A  
Initial Weight/Volume: 5.17 g  
Final Weight/Volume: 5 mL  
Injection Volume:  
Column ID: PRIMARY

LCSD Lab Sample ID: LCSD 720-16945/3-AA  
Client Matrix: Solid  
Dilution: 1.0  
Date Analyzed: 01/04/2007 2015  
Date Prepared: 01/04/2007 1316

Analysis Batch: 720-17095  
Prep Batch: 720-16945  
Units: mg/Kg

Instrument ID: Varian DRO2  
Lab File ID: N/A  
Initial Weight/Volume: 5.15 g  
Final Weight/Volume: 5 mL  
Injection Volume:  
Column ID: PRIMARY

Analyte	% Rec		Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
	LCS	LCSD					
Diesel Range Organics [C10-C28]	89	81	50 - 130	8	30		
<b>Surrogate</b>	<b>LCS % Rec</b>		<b>LCSD % Rec</b>	<b>Acceptance Limits</b>			
p-Terphenyl	80		72	50 - 130			

Calculations are performed before rounding to avoid round-off errors in calculated results.

## Quality Control Results

Client: Brown and Caldwell

Job Number: 720-7166-1

**Matrix Spike/  
Matrix Spike Duplicate Recovery Report - Batch: 720-16945**

**Method: 8015B  
Preparation: 3570  
Silica Gel Cleanup**

MS Lab Sample ID: 720-7166-1  
Client Matrix: Solid  
Dilution: 1.0  
Date Analyzed: 01/09/2007 0848  
Date Prepared: 01/04/2007 1316

Analysis Batch: 720-17095  
Prep Batch: 720-16945

Instrument ID: Varian DRO2  
Lab File ID: N/A  
Initial Weight/Volume: 5.23 g  
Final Weight/Volume: 5 mL  
Injection Volume:  
Column ID: PRIMARY

MSD Lab Sample ID: 720-7166-1  
Client Matrix: Solid  
Dilution: 1.0  
Date Analyzed: 01/09/2007 0919  
Date Prepared: 01/04/2007 1316

Analysis Batch: 720-17095  
Prep Batch: 720-16945

Instrument ID: Varian DRO2  
Lab File ID: N/A  
Initial Weight/Volume: 5.22 g  
Final Weight/Volume: 5 mL  
Injection Volume:  
Column ID: PRIMARY

Analyte	% Rec.		Limit	RPD	RPD Limit	MS Qual	MSD Qual
	MS	MSD					
Diesel Range Organics [C10-C28]	83	96	50 - 130	13	30		

Surrogate	MS % Rec	MSD % Rec	Acceptance Limits
p-Terphenyl	96	105	50 - 130

Calculations are performed before rounding to avoid round-off errors in calculated results.



201

2701 Prospect Park Dr.  
Rancho Cordova, CA 95670  
916-444-0123 / FAX 916-635-8805

9665 Chesapeake Dr. / Suite 201  
San Diego, CA 92123  
858-514-8822 / FAX 858-514-8833

201 N. Civic Dr. / Suite 115  
Walnut Creek, CA 94596  
925-937-9010 / FAX 925-937-9026

400 Exchange / Suite 100  
Irvine, CA 92602  
714-730-7600 / FAX 714-734-0940

PROJECT NAME: Hanson Random **720-7166** LABORATORY NAME & ADDRESS: STL **103466**  
 PROJECT NUMBER: 131771 Pleasanton, CA

LINE NO.	SAMPLE - I.D.	COLLECTION DATE	TIME	SAMPLER'S INITIALS	NUMBER OF CONTAINERS	CONTAINER SIZE AND TYPE	PRESERVE - VATIVE	MATRIX CODE	ANALYSES REQUESTED	FIELD FILTERED	QC - REQ	TAT	SAMPLING METHOD	DEPTH (FT.) BEGIN	END	PG. BEARING (BPT)
01	CPT-1 (17-18)	1/3/07	12:13	QZ	2	SS 1x6	None	S	TPH-2 (B015M) + Silica Gel cleanup TPH-3 (B015M), BTEX + MTBE (B26)			5-day	DT	17	19	✓
02	CPT-1 (27-28)	1/3/07	12:24	QZ	2	SS 1x6	None	S	"			5-day	DT	27	28	✓
03	CPT-1 (37-38)	1/3/07	12:30	QZ	2	SS 1x6	None	S	"			Hold	DT	37	38	✓
04	CPT-2 (17-18)	1/3/07	16:28	QZ	2	SS 1x6	None	S	"			5-day	DT	17	18	✓
05	CPT-2 (26-27) <del>(17-18)</del>	1/3/07	16:32	QZ	2	SS 1x6	None	S	"			5-day	DT	26.5	27.0	✓
06	CPT-2 (37-38)	1/3/07	16:37	QZ	2	SS 1x6	None	S	"			Hold	DT	37	38	✓
07																
08																
09																
10																

COLLECTED & RELEASED BY: [Signature] DATE: 1/3/07 TIME: 12:20 COOLER I.D.: \_\_\_\_\_

RECEIVED BY: [Signature] DATE: 1/3/07 TIME: 17:20 RELINQUISHED BY: \_\_\_\_\_ DATE: \_\_\_\_\_ TIME: \_\_\_\_\_

RECORD RETURNED BY: \_\_\_\_\_ DATE: \_\_\_\_\_ TIME: \_\_\_\_\_

COURIER: \_\_\_\_\_ SHIPPING NUMBER: \_\_\_\_\_

COMMENTS (see note on back):  
 Results to Jason Grant  
 CPT-1 29.0°C Analyze  
 Temp. 13°C

## LOGIN SAMPLE RECEIPT CHECK LIST

Client: Brown and Caldwell

Job Number: 720-7166-1

**Login Number: 7166**

Question	T/F/NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	NA	
The cooler's custody seal, if present, is intact.	NA	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	Insufficient ice for CPT-1 samples
Cooler Temperature is acceptable.	True	CPT-1 samples out of temp, client approved to analyze
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	



GREGG IN SITU, INC.

GEOTECHNICAL AND ENVIRONMENTAL INVESTIGATION SERVICES

January 8, 2007

Brown & Caldwell
Attn: Jason Grant
201 N. Civic Dr., Suite 115
Walnut Creek, California 94959

Subject: CPT Site Investigation
Hanson America
Pleasanton, California
GREGG Project Number: 07-004MA

Dear Mr. Grant:

The following report presents the results of GREGG Drilling & Testing's Cone Penetration Test investigation for the above referenced site. The following testing services were performed:

Table with 4 columns: Item Number, Test Name, Abbreviation, and Status (checkbox). Rows include Cone Penetration Tests (CPTU), Pore Pressure Dissipation Tests (PPD), Seismic Cone Penetration Tests (SCPTU), Resistivity Cone Penetration Tests (RCPTU), UVIF Cone Penetration Tests (UVIFCPTU), Groundwater Sampling (GWS), Soil Sampling (SS), Vapor Sampling (VS), Vane Shear Testing (VST), and SPT Energy Calibration (SPTE).

A list of reference papers providing additional background on the specific tests conducted is provided in the bibliography following the text of the report. If you would like a copy of any of these publications or should you have any questions or comments regarding the contents of this report, please do not hesitate to contact our office at (925) 313-5800.

Sincerely,
GREGG Drilling & Testing, Inc.

Mary Walden
Operations Manager

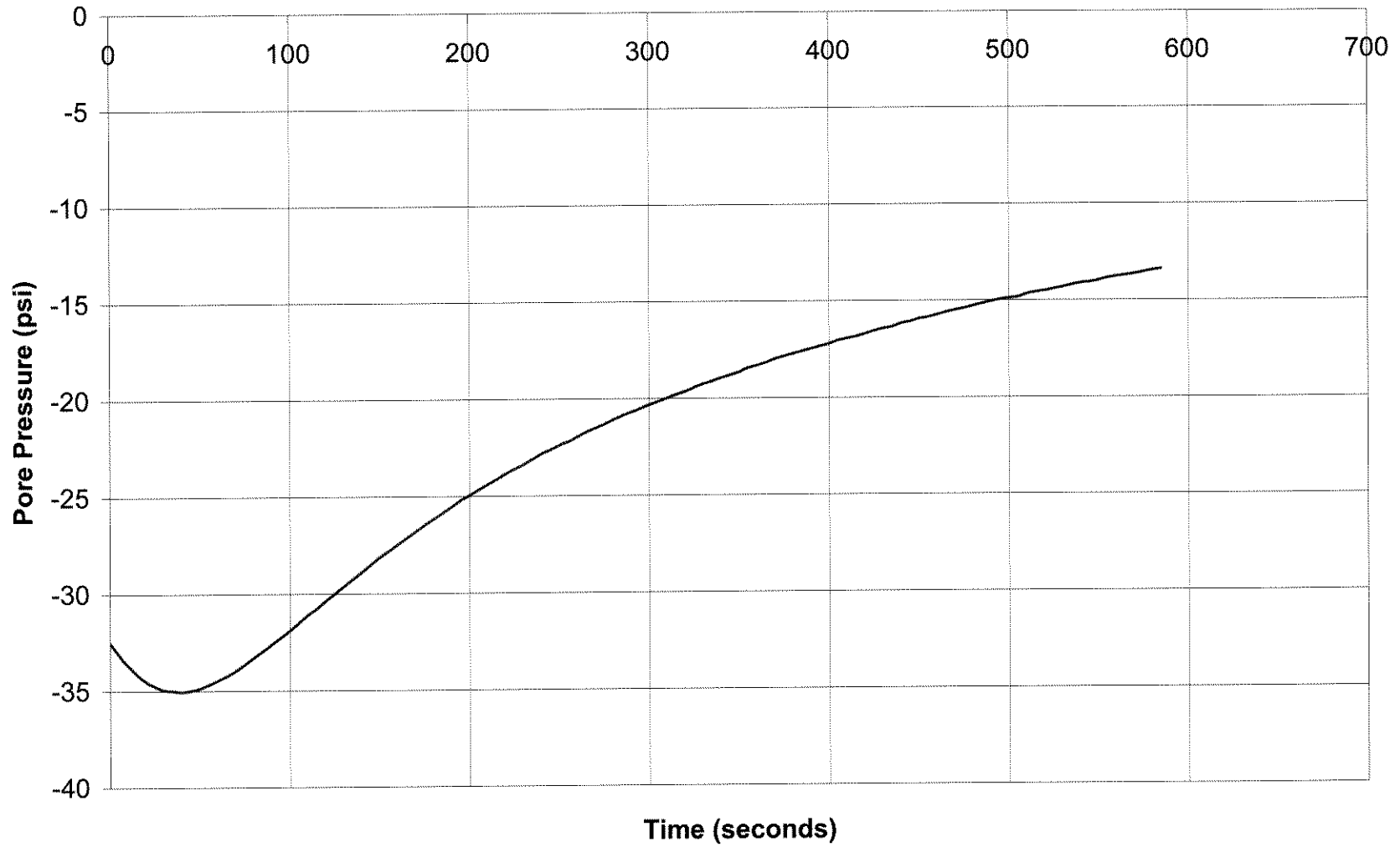




# GREGG DRILLING & TESTING

## Pore Pressure Dissipation Test

Sounding: CPT-1  
Depth: 58.235  
Site: HANSON  
Engineer: J.GRANT

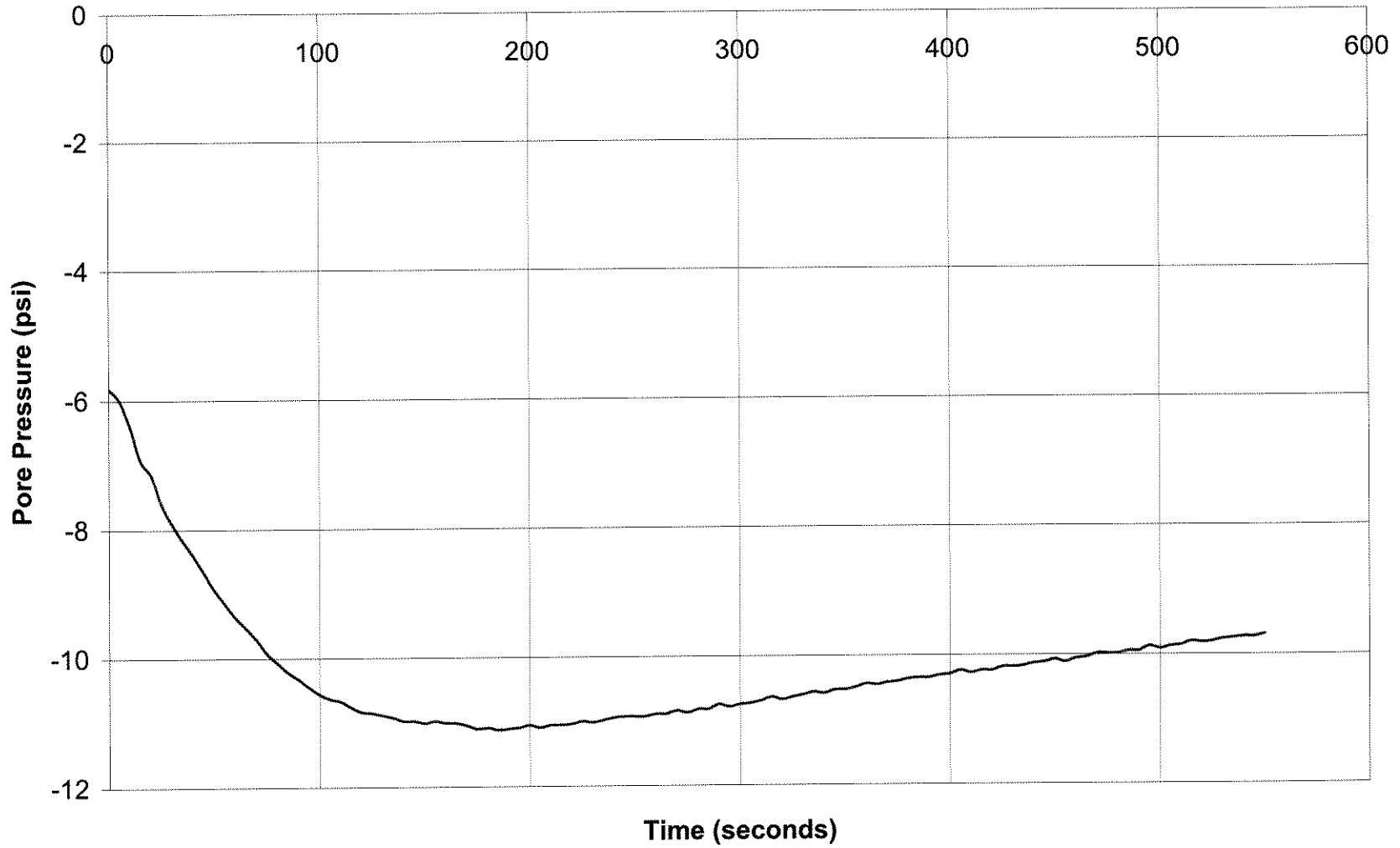




# GREGG DRILLING & TESTING

## Pore Pressure Dissipation Test

Sounding: CPT-1  
Depth: 47.244  
Site: HANSON  
Engineer: J.GRANT

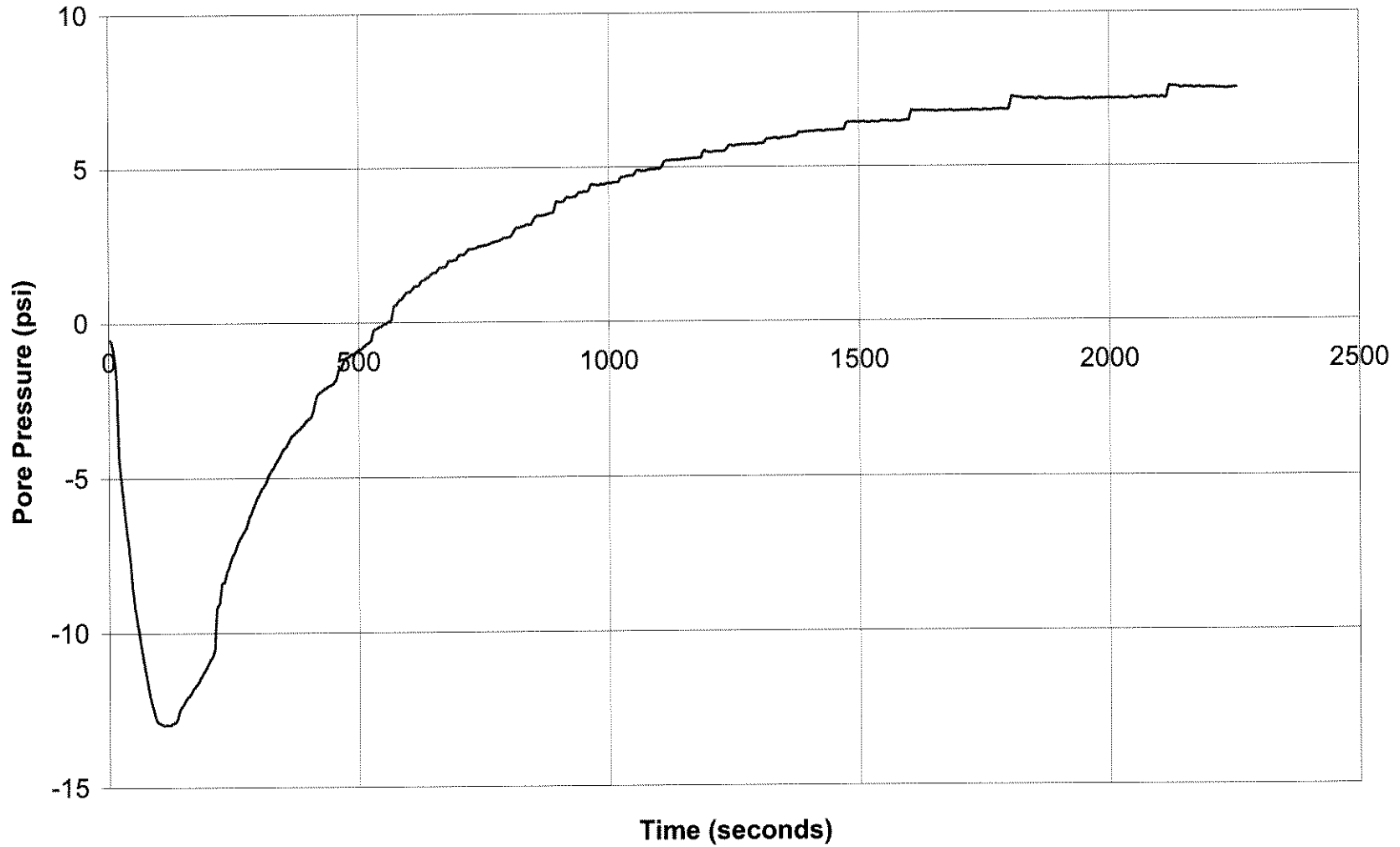




# GREGG DRILLING & TESTING

## Pore Pressure Dissipation Test

Sounding: CPT-1  
Depth: 84.481  
Site: HANSON  
Engineer: J.GRANT

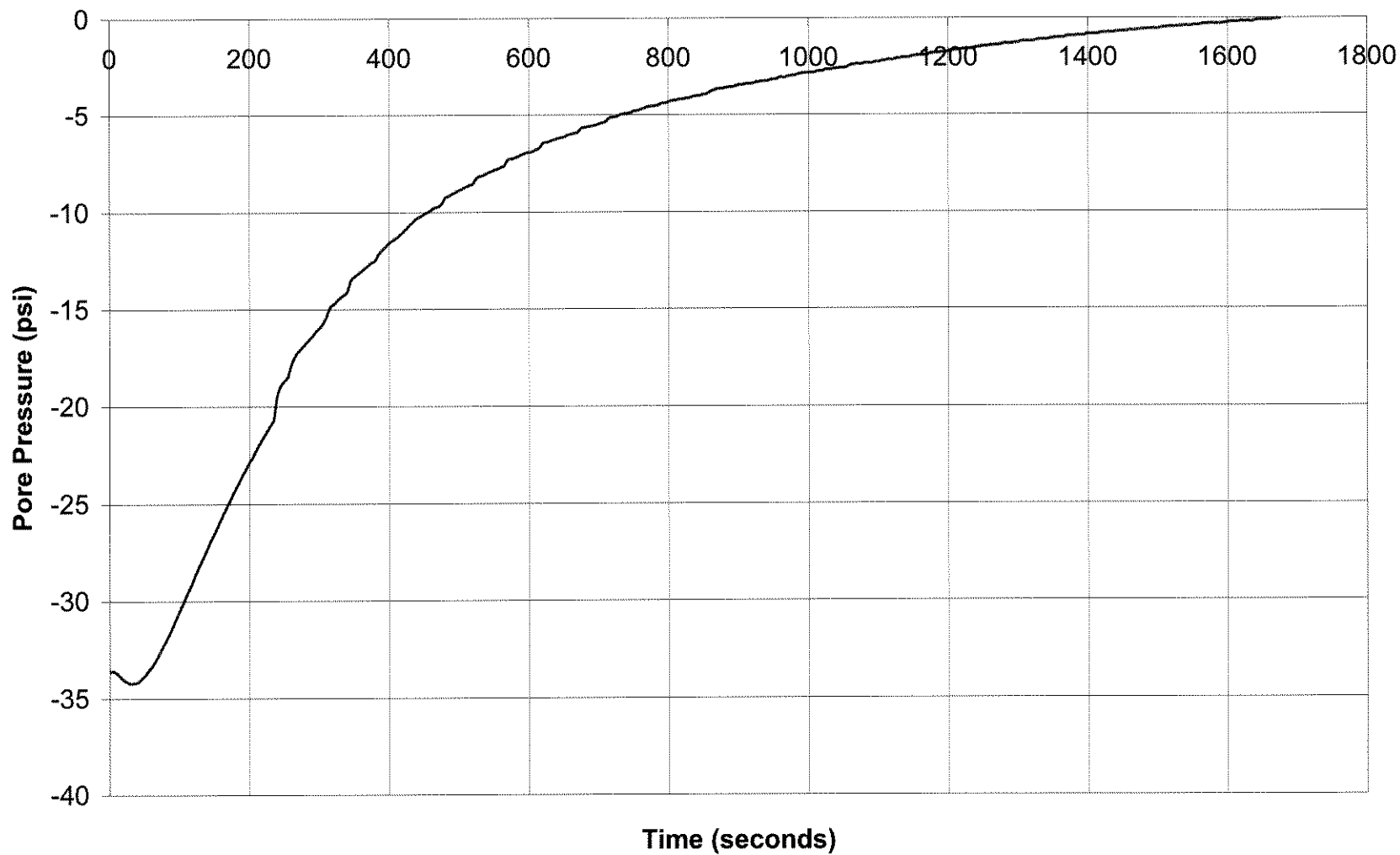




# GREGG DRILLING & TESTING

## Pore Pressure Dissipation Test

Sounding: CPT-2  
Depth: 70.046  
Site: HANSON  
Engineer: J.GRANT







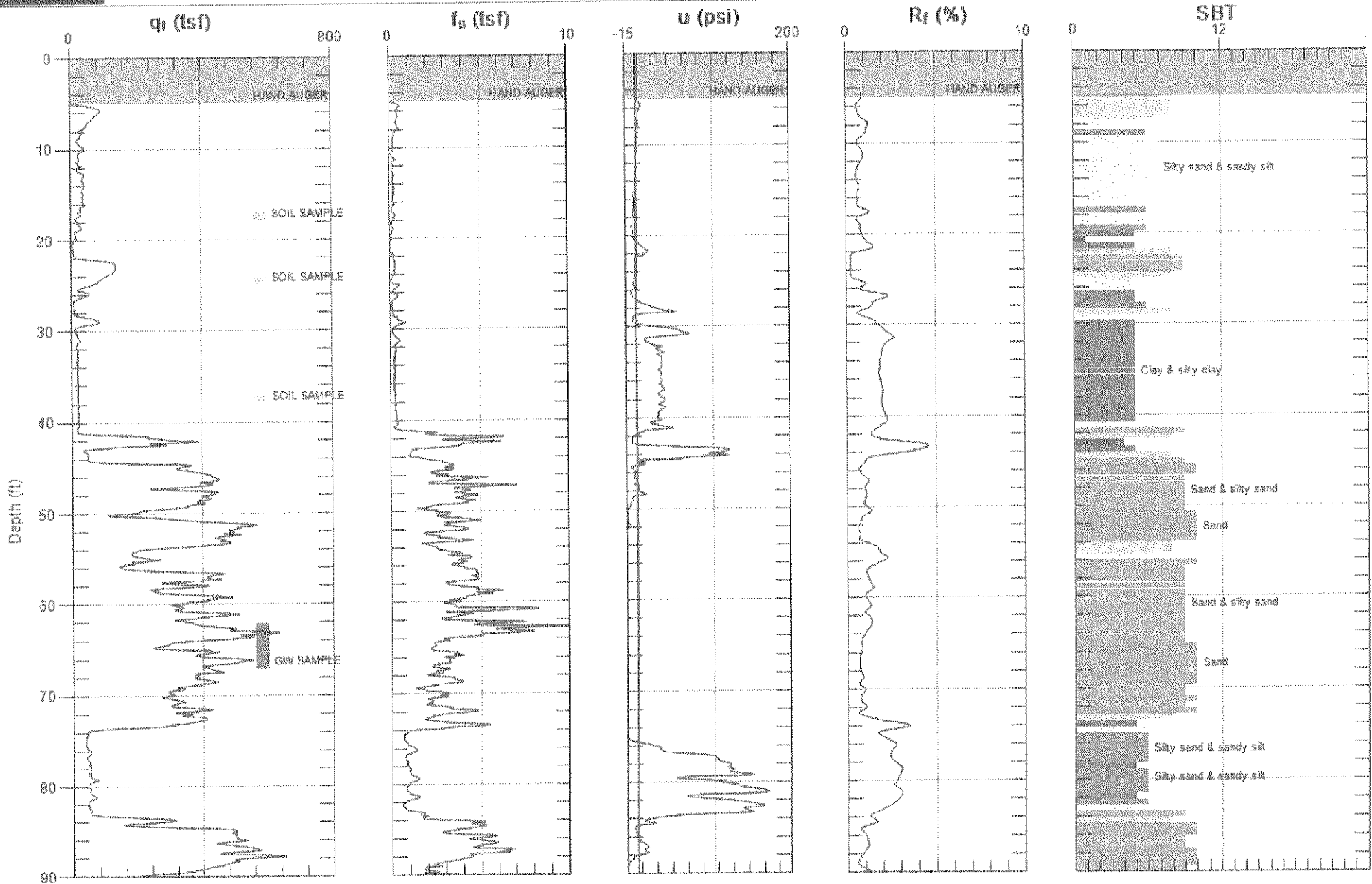
# BROWN & CALDWELL

Site: HANSON AMERICA

Engineer: J.GRANT

Sounding: CPT-4

Date: 1/5/2007 12:40



Max. Depth: 90.220 (ft)  
Avg. Interval: 0.656 (ft)

SBT: Soil Behavior Type (Robertson 1990)



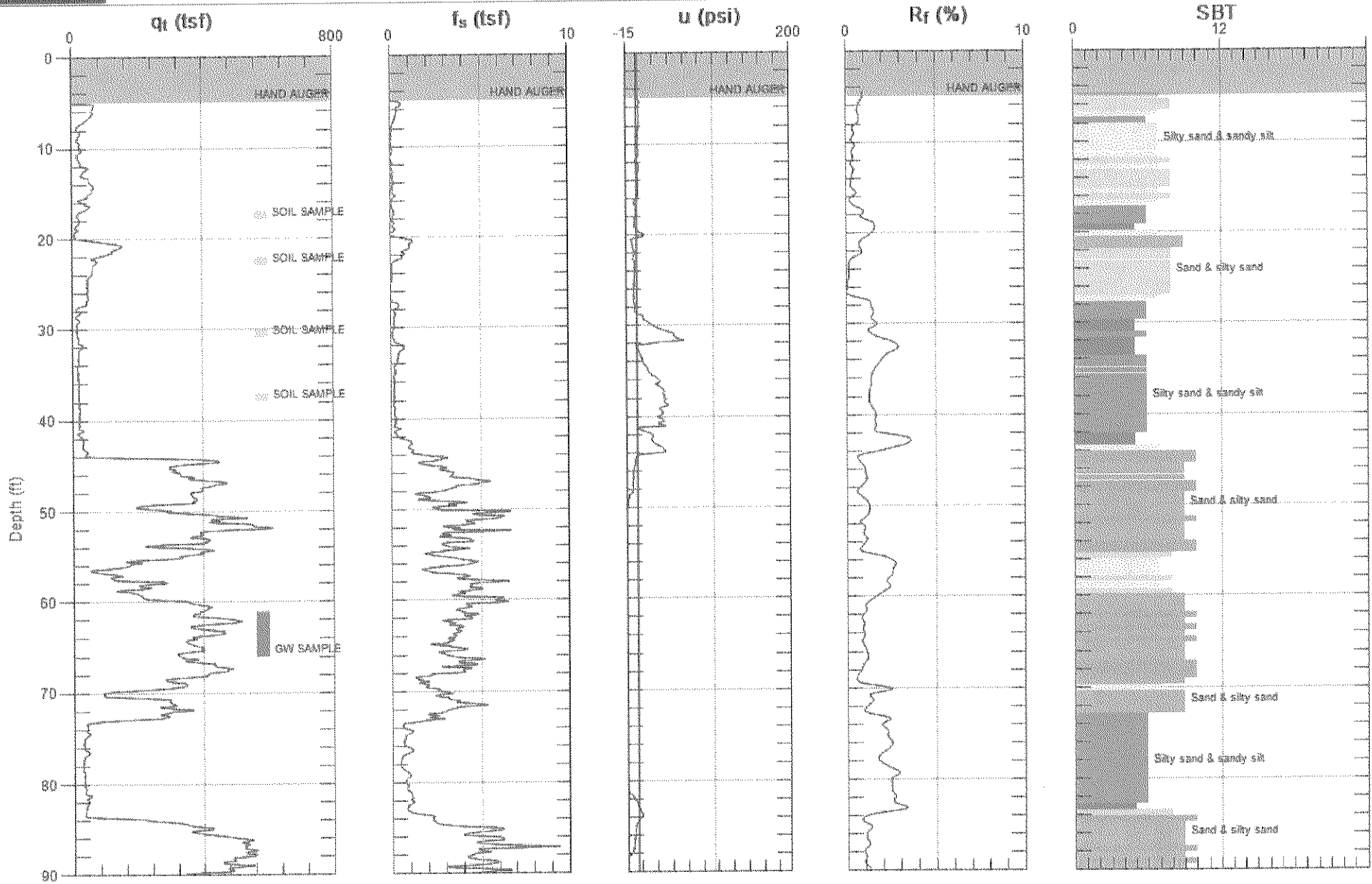
# BROWN & CALDWELL

Site: HANSON AMERICA

Engineer: J.GRANT

Sounding: CPT-3

Date: 1/6/2007 07:48



Max. Depth: 90.220 (ft)  
Avg. Interval: 0.656 (ft)

SBT: Soil Behavior Type (Robertson 1990)



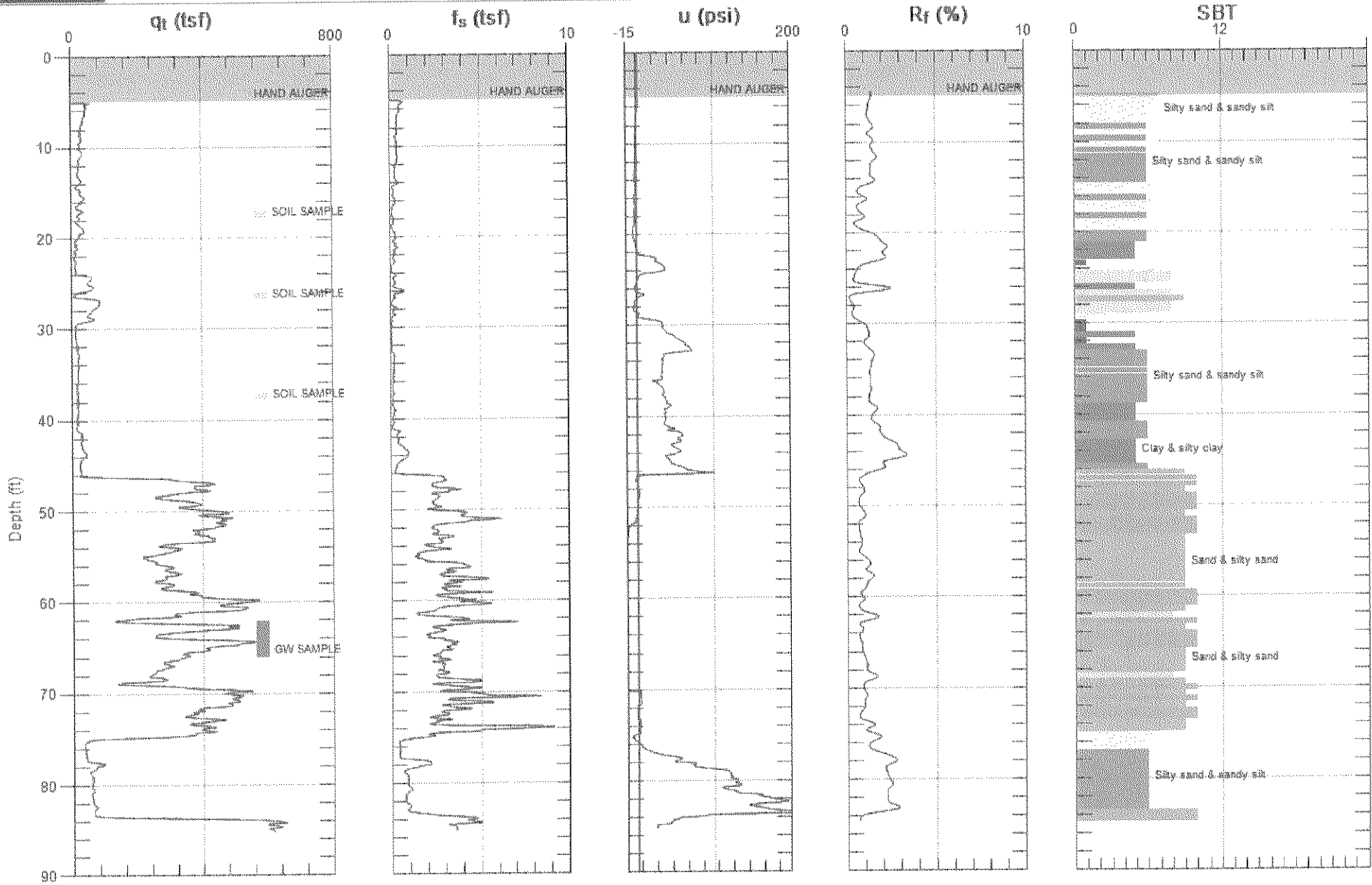
# BROWN & CALDWELL

Site: HANSON AMERICA

Engineer: J.GRANT

Sounding: CPT-2

Date: 1/3/2007 02:34



Max. Depth: 85.140 (ft)  
Avg. Interval: 0.656 (ft)

SBT: Soil Behavior Type (Robertson 1990)



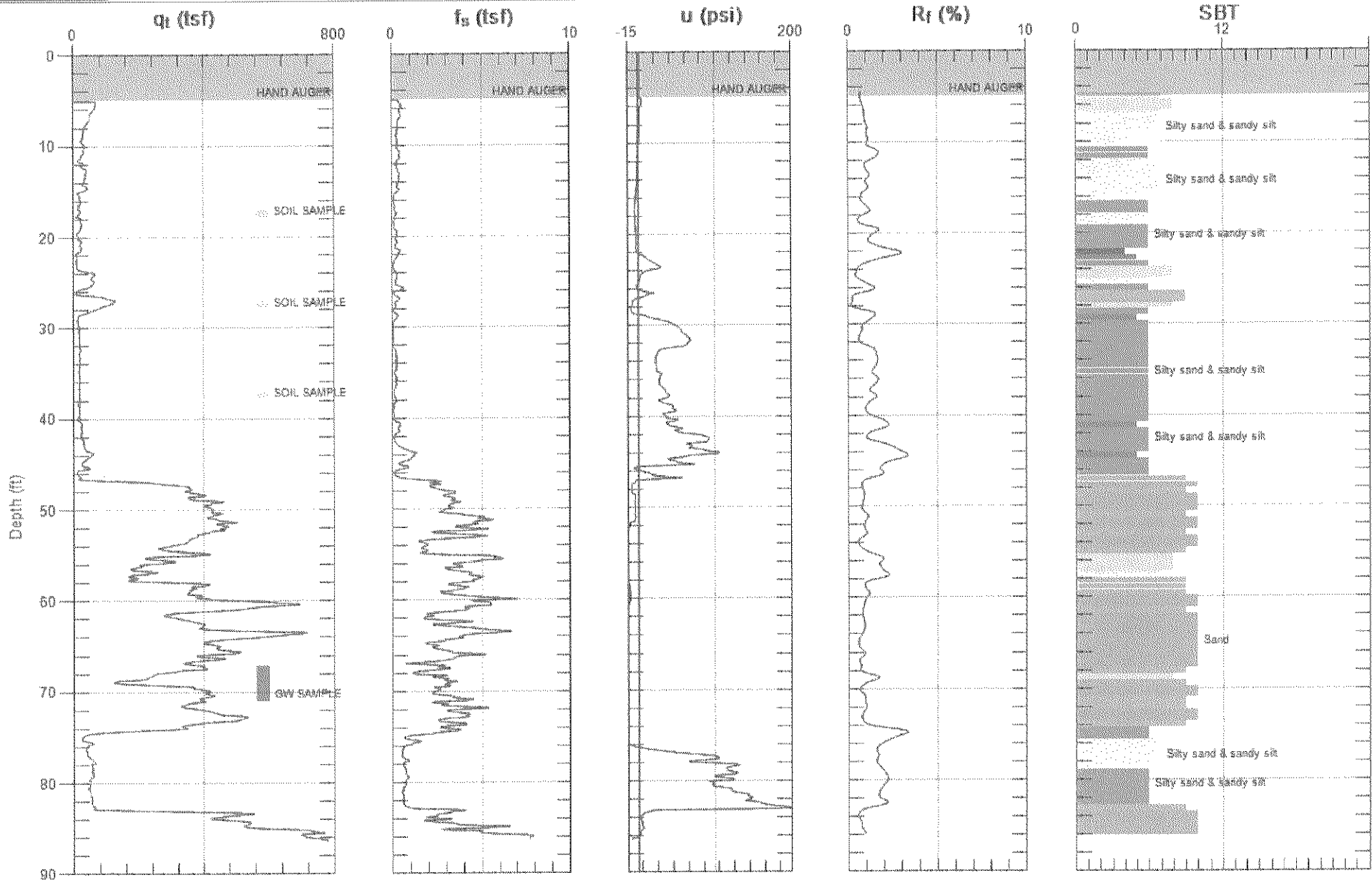
# BROWN & CALDWELL

Site: HANSON AMERICA

Engineer: J.GRANT

Sounding: CPT-1

Date: 1/3/2007 08:24



Max. Depth: 86.290 (ft)  
Avg. Interval: 0.656 (ft)

SBT: Soil Behavior Type (Robertson 1990)

# **APPENDIX CPT**



# Cone Penetration Test Data & Interpretation

Soil behavior type and stratigraphic interpretation is based on relationships between cone bearing ( $q_c$ ), sleeve friction ( $f_s$ ), and pore water pressure ( $u_2$ ). The friction ratio ( $R_f$ ) is a calculated parameter defined by  $100f_s/q_c$  and is used to infer soil behavior type. Generally:

Cohesive soils (clays)

- High friction ratio ( $R_f$ ) due to small cone bearing ( $q_c$ )
- Generate large excess pore water pressures ( $u_2$ )

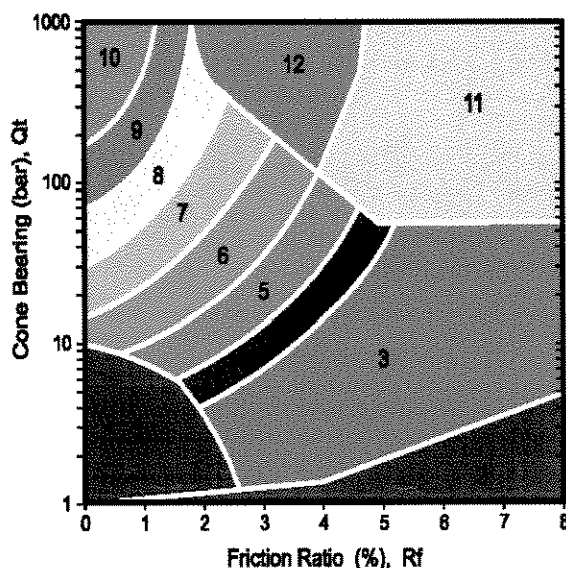
Cohesionless soils (sands)

- Low friction ratio ( $R_f$ ) due to large cone bearing ( $q_c$ )
- Generate very little excess pore water pressures ( $u_2$ )

A complete set of baseline readings are taken prior to and at the completion of each sounding to determine temperature shifts and any zero load offsets. Corrections for temperature shifts and zero load offsets can be extremely important, especially when the recorded loads are relatively small. In sandy soils, however, these corrections are generally negligible.

The cone penetration test data collected from your site is presented in graphical form in Appendix CPT. The data includes CPT logs of measured soil parameters, computer calculations of interpreted soil behavior types (SBT), and additional geotechnical parameters. A summary of locations and depths is available in Table 1. Note that all penetration depths referenced in the data are with respect to the existing ground surface.

Soil interpretation for this project was conducted using recent correlations developed by Robertson et al, 1990, *Figure SBT*. Note that it is not always possible to clearly identify a soil type based solely on  $q_c$ ,  $f_s$ , and  $u_2$ . In these situations, experience, judgment, and an assessment of the pore pressure dissipation data should be used to infer the soil behavior type.



ZONE	Qt/N	SBT
1	2	Sensitive, fine grained
2	1	Organic materials
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*

\*over consolidated or cemented

Figure SBT

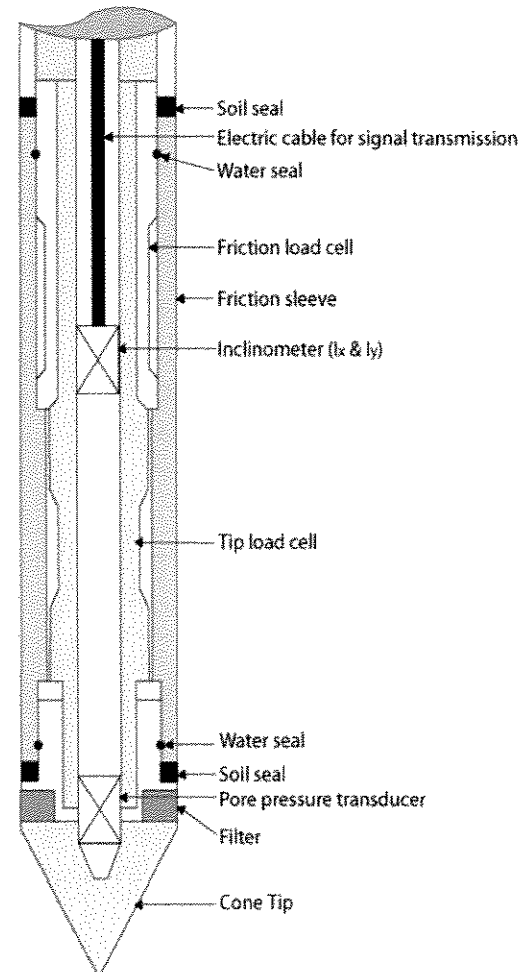


## Cone Penetration Testing Procedure (CPT)

Gregg Drilling & Testing, 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 penetration 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 stored on disk for further analysis and reference. All CPT soundings are performed in accordance with revised (2002) ASTM standards (D 5778-95).

The cone also contains a porous filter element located directly behind the cone tip ( $u_2$ ), *Figure CPT*. It consists of porous plastic and is 5.0mm thick. The filter element is used to obtain penetration pore pressure as the cone is advanced as well as Pore Pressure Dissipation Tests (PPD7's) 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 procedures generally consist 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.

# **APPENDIX PPD**





## 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 permeability ( $k_h$ )

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, *Figure PPDT*. This time is commonly referred to as  $t_{100}$ , the point at which 100% of the excess pore pressure has dissipated.

A complete reference on pore pressure dissipation tests is presented by Robertson et al. 1992.

A summary of the pore pressure dissipation tests is summarized in Table 1. Pore pressure dissipation data is presented in graphical form in Appendix PPDT.

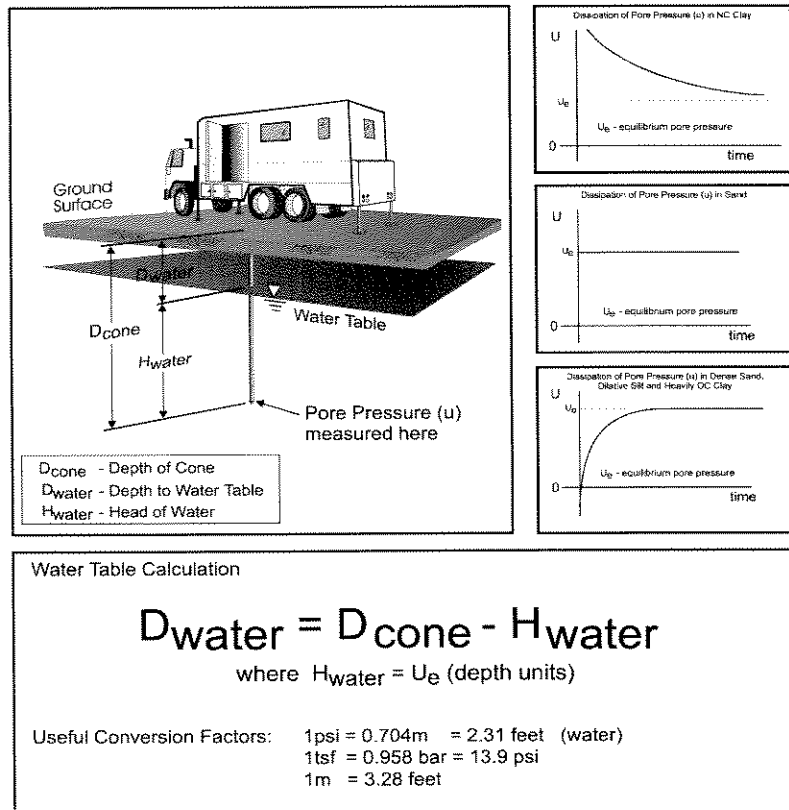


Figure PPDT

# **APPENDIX GWS**

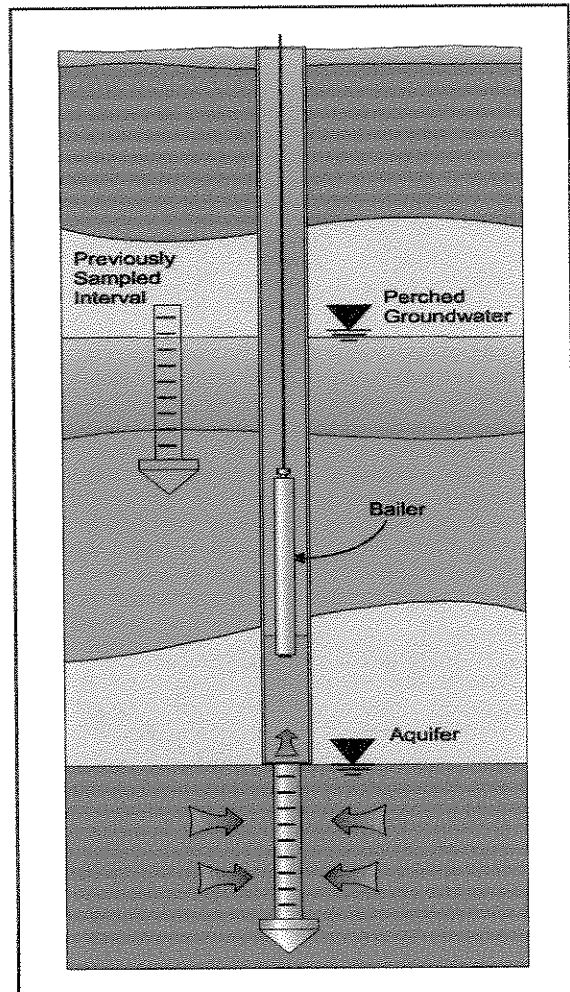


## Groundwater Sampling (GWS)

Gregg In Situ, Inc. conducts groundwater sampling using a Hydropunch<sup>®</sup> type groundwater sampler, *Figure GWS*. The groundwater sampler has a retrievable stainless steel or disposable PVC screen with steel drop off tip. This allows for samples to be taken at multiple depth intervals within the same sounding location. In areas of slower water recharge, provisions may be made to set temporary PVC well screens during sampling to allow the drill rig to advance to the next sample location while the groundwater is allowed to infiltrate.

The groundwater sampler operates by advancing 1 3/4 inch hollow push rods with the filter tip in a closed configuration to the base of the desired sampling interval. Once at the desired sample depth, the push rods are retracted; exposing the encased filter screen and allowing groundwater to infiltrate hydrostatically from the formation into the inlet screen. A small diameter bailer (approximately 1/2 or 3/4 inch) is lowered through the push rods into the screen section for sample collection. The number of downhole trips with the bailer and time necessary to complete the sample collection at each depth interval is a function of sampling protocols, volume requirements, and the yield characteristics and storage capacity of the formation. Upon completion of sample collection, the push rods and sampler, with the exception of the PVC screen and steel drop off tip are retrieved to the ground surface, decontaminated and prepared for the next sampling event.

A summary of the groundwater samples collected, including the sampling date, depth and location identification, is presented in Table 1 and the corresponding CPT plot.



*Figure GWS*

For a detailed reference on direct push groundwater sampling, refer to Zemo et. al., 1992.

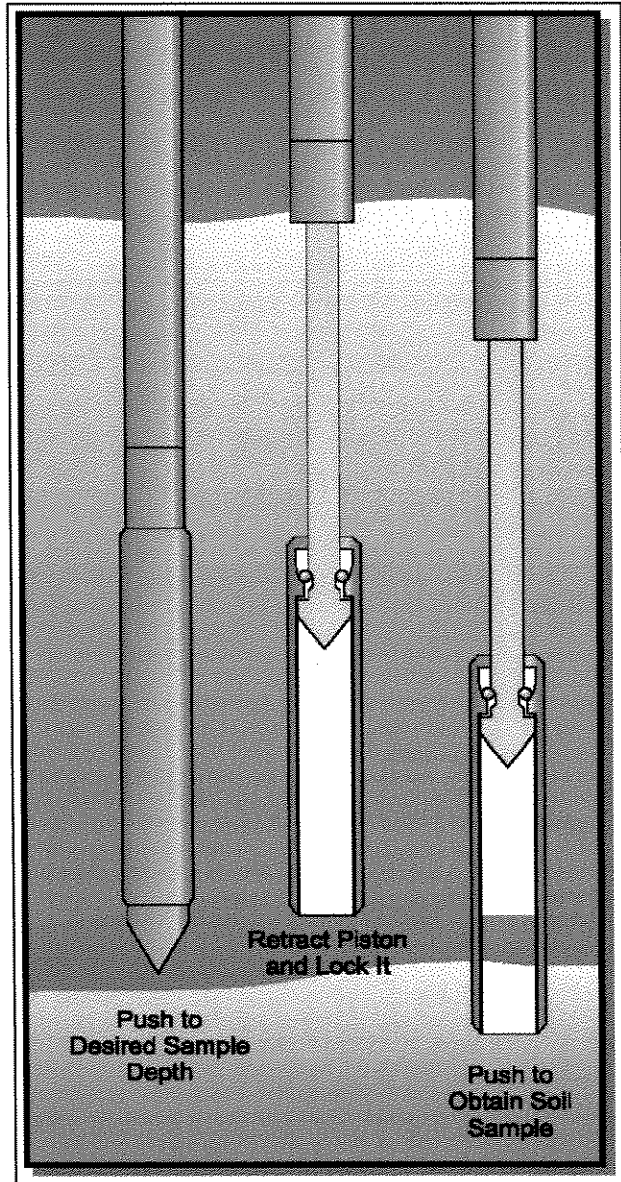
# **APPENDIX SS**



## Soil Sampling (SS)

Gregg In Situ, Inc. uses a piston-type sampler to obtain relatively undisturbed soil samples without generating any soil cuttings, *Figure SS*. Two different types of samplers (12 and 18 inch) are used depending on the soil type and density. The soil sampler is initially pushed in a "closed" position to the desired sampling interval using a hydraulic rig. Keeping the sampler closed minimizes the potential of cross contamination caused by sloughing. The inner tip of the sampler is then retracted 12 inches (or 18 inches if using the longer sampler) leaving a hollow soil sampler with two inner 1¼ inch diameter by 6 inch or four 3 inch long soil sample tubes. If using the 18 inch sampler, two 1½ inch diameter by 6 inch long tubes will be exposed. The hollow sampler is then pushed in a locked "open" position to collect a soil sample. The filled sampler and push rods are then retrieved to the ground surface. Because the soil enters the sampler at a constant rate, the opportunity for 100% recovery is increased. For environmental analysis, the soil sample tube ends are sealed with Teflon and plastic caps. Often, a longer "split tube" can be used for geotechnical sampling.

For a detailed reference on direct push soil sampling, refer to Robertson et al, 1998.



*Figure SS*

A summary of the soil samples collected, including the sampling date, depth and location identification, is presented in Table 1.



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