BP OIL

ENVIRONMENTAL PROTECTION
95 MAR -6 PM 4:03

BP Oil Company
Environmental Resources Management
Building 13, Suite N
295 SW 41st Street
Renton, Washington 98055-4931
(206) 251-0667

February 28, 1995

Alameda County Health Care Services Agency
Attention Ms. Eva Chu
1131 Harbor Bay Parkway #250
Alameda, CA 94502-6577

RE: Former BP Site 11104
1716 Webster Street
Alameda, CA

Dear Ms. Chu:

Enclosed please find a report titled Subsurface Investigation Report, dated February 27, 1995. Based on the results contained in the report, it appears that further investigation of the sewer line in not necessary or warranted.

Please give me a call if you have any questions or concerns. My direct dial extension is (206) 251-0689.

Sincerely,

Scott T. Hooton
Environmental Resources Management

attachment

cc: site file
CRWQCB - SFBR, 2101 Webster Street, Ste. 500, Oakland, CA 94612
(w/attachment)

FUGRO WEST, INC.

1050 Melody Lane, Suite 160
Roseville, California 95678
Tel: (916) 782-2110
FAX: (916) 786-7830



February 22, 1995
Project No. 9447-8592

Mr. Scott Hooton
BP Oil Company
Environmental Resources Management
295 SW 41st Street
Renton, Washington 98055-4931

**Subsurface Investigation Report**
BP Facility No. 11104
1716 Webster Street
Alameda, California

Dear Mr. Hooton,

Fugro West, Inc., (Fugro), is pleased to provide BP Oil Company (BP) this report of a subsurface investigation at the subject site (Figure 1).

## PURPOSE

The purpose of the investigation was to obtain subsurface information and groundwater samples to assess whether petroleum hydrocarbons in groundwater are present in the sewer line backfill in the middle of Webster Street (California State Highway 61) and Buena Vista Avenue (Figure 2).

## FIELD WORK

All work was conducted according to the Fugro standard operating procedures (SOP) included as Appendix A.

On November 29, 1994, four 2-inch diameter soil borings (H-1, H-2, H-3, and H-4) were created by advancing drilling rods with a cone penetrometer (CPT) rig adjacent to the sewer line trenches located in Webster Street and Buena Vista Avenue (Figure 2). A utility locating company (CU Surveys) and Underground Service Alert were used to locate the borings. According to Mr. Otis Haskins of CU Surveys, the sewer lines were approximately eight to ten inches in diameter and were located approximately eight to ten feet below ground surface (bgs). In consideration of the possibility of damaging the sewer lines, Fugro field personnel sited the borings approximately 18-inches off the marked locations of the center of the lines. The first five feet of each boring were augered by hand. The borings were advanced to groundwater. The depth of first encountered groundwater was calculated using CPT pore pressure dissipation data (Appendix B). Groundwater was encountered at depths of approximately five to seven feet bgs in each borehole. Due to extremely slow recharge of the Hydropunch™ sampling device in the upper three to four feet of the calculated saturated zone, the borings were advanced to approximately 10 to 13 feet total depth to enable collection of a sufficient quantity of

does this mean samples were collected below the sewer line buddy

FUGRO WEST, INC.

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February 22, 1995
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does this mean samples were collected from the sewer line backfill

groundwater for analysis. Using a Hydropunch™ tool, a grab groundwater sample was collected from each boring. No soil samples were collected. Soil types and properties were assessed from in-situ CPT measurements. Refer to Appendix B for copies of CPT cone bearing and sleeve friction measurements, and soil behavior/type interpretations.

No soil cuttings were generated. Steam cleaner water used to decontaminate the drill rods was stored onsite in a Department of Transportation-approved drum pending transport by a licensed hazardous waste hauler for offsite recycling. After removing the drilling rods, the holes were grouted and finished to grade with a bentonite\cement slurry.

## LABORATORY ANALYSES

Groundwater samples were delivered under chain-of-custody to Pace Inc. of Novato, California, a State-certified analytical laboratory, for chemical analysis of total petroleum hydrocarbons as gasoline (TPH-g) by EPA Method 8015M, and benzene, toluene, ethylbenzene, and total xylenes (BTEX), by EPA Method 8020.

Laboratory quality assurance and control is addressed in Fugro SOP-5 (Appendix A). Analytical results are summarized in Table 1. Copies of laboratory reports and chain-of-custody forms are included in Appendix C.

## FINDINGS

- Soil types encountered in the borings consisted generally of sand to silty sand to a depth of one to two feet bgs (probably road base or fill); silty sand, sandy silt, and clayey silt to depths of eight to ten feet bgs; and a one to three foot thick layer of sand or silty sand at a depth of eight to ten feet bgs.

- Groundwater was calculated to exist at depths of approximately five to seven feet bgs.

- Laboratory analytical results indicate that concentrations of TPH-g were not detected in groundwater samples collected from the four borings. Concentrations of BTEX were not detected in groundwater samples collected from borings H-2 and H-4. Low concentrations of benzene and toluene were detected in groundwater samples collected from boring H-1 (0.6 and 0.7 parts per billion (ppb), respectively). Low concentrations of toluene were detected in groundwater samples collected from boring H-3 (0.8 ppb).

## CONCLUSIONS

- It is not certain whether any of the four borings penetrated the backfill of the sewer lines as proposed. However, the sand and/or silty sand indicated by CPT measurements at approximately eight to ten feet bgs may be the backfill material. Even if the borings were not located in the sewer line backfill, it is our opinion that they were located close enough to effectively assess whether backfill associated with the sewer lines contain petroleum hydrocarbon concentrations above applicable action levels.

- Based on the lack of TPH-g in groundwater samples collected from the four borings, and the low concentrations of toluene and/or benzene detected in samples collected from borings H-1 and H-3, the sewer line trenches do not appear to contain concentrations of fuel constituents exceeding applicable action levels, or to act as preferential flow paths for hydrocarbon-affected groundwater.

**REMARKS\SIGNATURES**

The information contained within this report reflects our professional opinions, and was developed in accordance with currently available information and accepted geologic, hydrogeologic, and/or engineering practices at this time and for this site. This report has been prepared solely for the use of BP Oil Company. Any reliance on this report by parties other than BP shall be at such parties' sole risk.

The work performed herein was conducted under the review and supervision of the professional geologist, registered with the State of California, whose signature appears below.

Sincerely,

**FUGRO WEST, INC.**

Paul Graff FOR

William E. Bassett, Jr.
Environmental Scientist

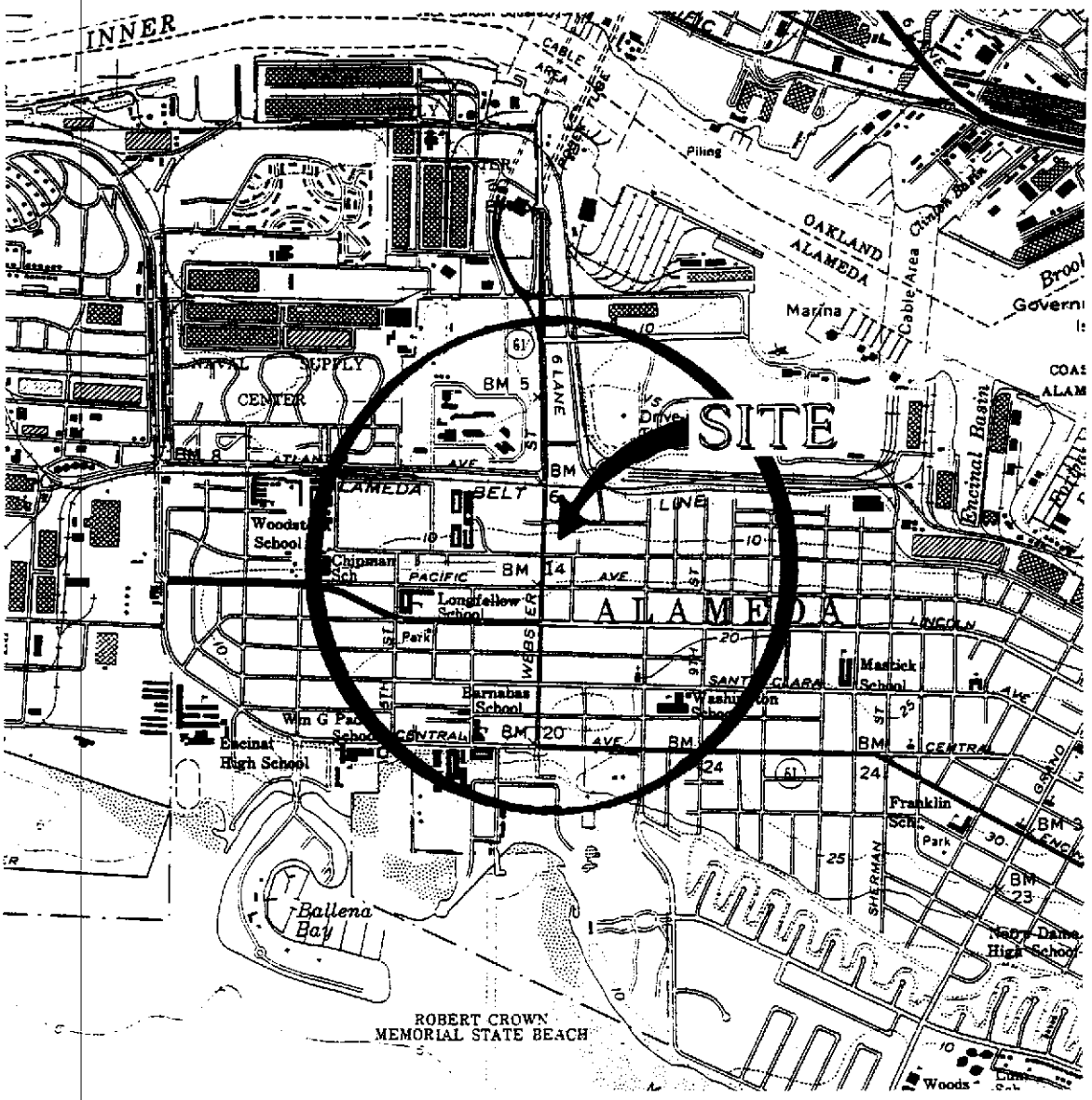
Paul Graff
Senior Geologist
CRG # 5600

2/22/95
Date

REGISTERED GEOLOGIST
PAUL GRAFF
No. 5600
Exp. 6/30/95
STATE OF CALIFORNIA

WEB/PKG:sh

Attachments

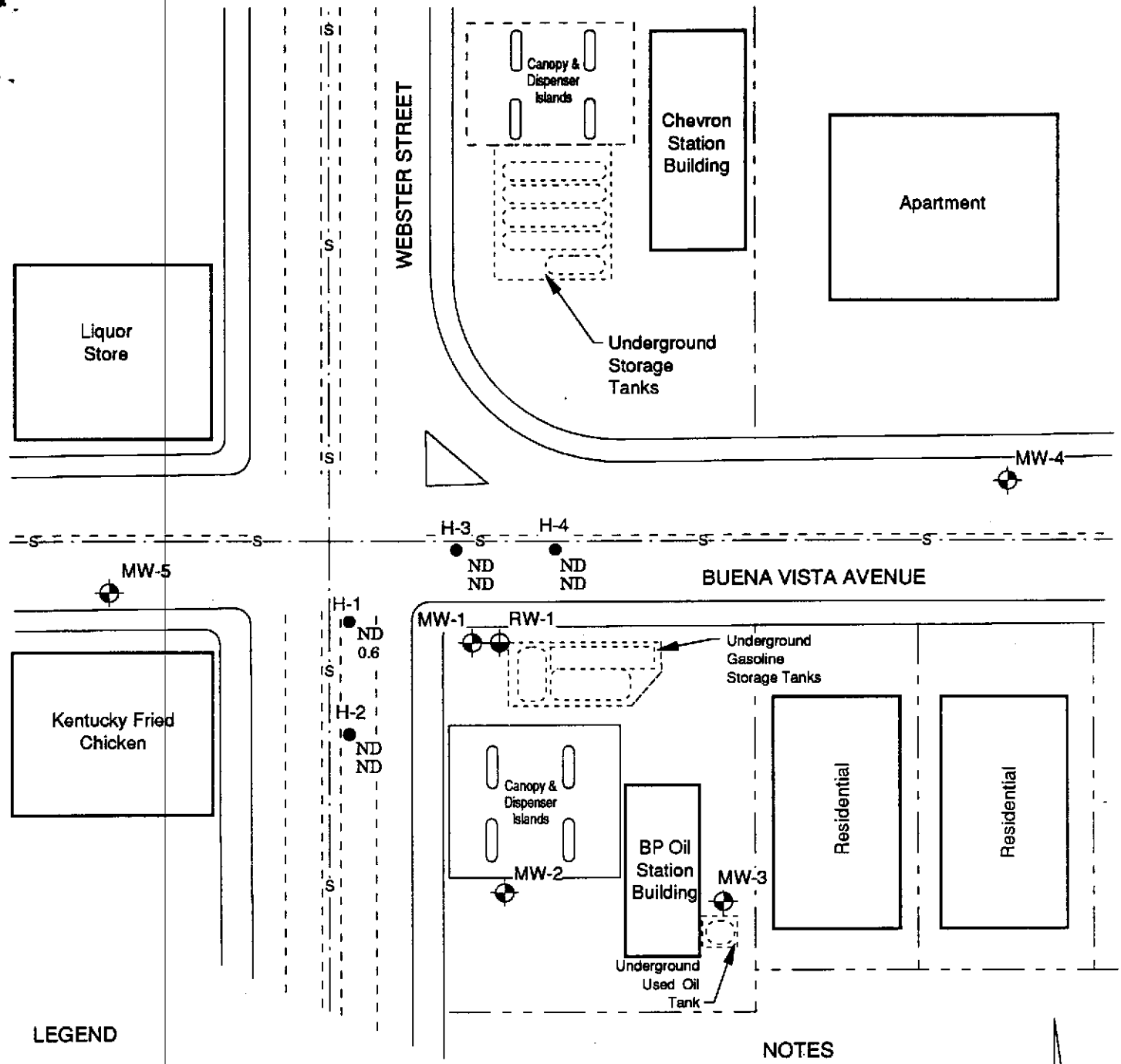



GENERAL NOTES:

BASE MAP FROM USGS
7.5 MINUTE TOPOGRAPHIC
OAKLAND WEST, CA

0 2000 4000
Approximate Scale in Feet

| | | | |
|---|---|---|---|
| FUGRO | DRAWN BY: J. Paradis | SITE LOCATION MAP | FIGURE 1 |
| | DATE: September 21, 1994 | BP Oil Facility NO. 11104<br>1716 Webster Street<br>Alameda, CA | PROJECT NUMBER: 94-47-8592 |
| | REVISED BY: | | |
| | DATE: | | |




LEGEND

- Monitoring Well
- Recovery Well
- ND / 0.6 — Cone Penetrometer/HydroPunch® Location; Concentration of TPH-G (parts-per-billion); Concentration of Benzene (parts-per-billion)
- ND — Not Detected
- —S— Sanitary Sewer Line

NOTES

Site Map after Site Plan By Hydro-Environmental Technologies, Inc. 5/94

All Locations Are Approximate

0 50 100

Approximate Scale In Feet

FUGRO

| | |
|---|---|
| DRAWN BY: J. Paradis | |
| DATE: September 21, 1994 | |
| REVISED BY: J. Paradis | |
| DATE: January 17, 1995 | |

# SITE MAP WITH BORING LOCATIONS

BP Oil Facility NO. 11104
1716 Webster Street
Alameda, CA

FIGURE 2

PROJECT NUMBER: 94-47-8592

## TABLE 1. GROUNDWATER ANALYTICAL RESULTS

**BP FACILITY NO. 11104**
**1716 WEBSTER STREET, ALAMEDA, CALIFORNIA**

| Boring | Calculated Depth to Groundwater (feet bgs) | Laboratory Analytical Results | | | | |
|---|---|---|---|---|---|---|
| | | TPH-g µ/L | Benzene µ/L | Toluene µ/L | Ethylbenzene µ/L | Total Xylenes µ/L |
| H-1 | 6.00 | ND (50) | 0.6 | 0.7 | ND (0.5) | ND (0.5) |
| H-2 | 5.41 | ND (50) | ND (0.5) | ND (0.5) | ND (0.5) | ND (0.5) |
| H-3 | 5.56 | ND (50) | ND (0.5) | 0.8 | ND (0.5) | ND (0.5) |
| H-4 | 5.87 | ND (50) | ND (0.5) | ND (0.5) | ND (0.5) | ND (0.5) |

NOTES:
TPH-g = Total Petroleum Hydrocarbon as gasoline
µ/L = micrograms per liter, or parts per billion (ppb)
ND = Not Detected (laboratory detection limits in parentheses)
bgs = Below ground surface
Samples collected November 29, 1994

# APPENDIX A

# STANDARD OPERATING PROCEDURES

**FUGRO WEST, INC.**
**STANDARD OPERATING PROCEDURES**
**RE: SOIL CLASSIFICATION**
**SOP-3**

Soil samples are classified according to the Unified Soil Classification System. Representative portions of the samples may be submitted under strict chain-of-custody to an analytical laboratory for further examination and verification of the in-field classification, and analysis of soil mechanical and/or petrophysical properties. The soil types are indicated on logs of either excavations or borings together with depths corresponding to the sampling points, and other pertinent information.

**FUGRO WEST, INC.**
**STANDARD OPERATING PROCEDURES**
**SAMPLE IDENTIFICATION AND CHAIN-OF-CUSTODY PROCEDURES**
**SOP-4**

Sample identification and chain-of-custody procedures ensure sample integrity, and document sample possession from the time of collection to its ultimate disposal. Each sample container submitted for analysis is labeled to identify the job number, date, time of sample collection, a sample number unique to the sample, any name(s) of on-site personnel and any other pertinent field observations also recorded on the field excavation or boring log.

Chain-of-custody forms are used to record possession of the sample from time of collection to its arrival at the laboratory. During shipment, the person with custody of the samples will relinquish them to the next person by signing the chain-of-custody form(s) and noting the date and time. The sample-control officer at the laboratory will verify sample integrity, correct preservation, confirm collection in the proper container(s), and ensure adequate volume for analysis.

If these conditions are met, the samples will be assigned unique laboratory log numbers for identification throughout analysis and reporting. The log numbers will be recorded on the chain-of-custody forms and in the legally-required log book maintained in the laboratory. The sample description, date received, client's name, and any other relevant information will also be recorded.

**FUGRO WEST, INC.**
**STANDARD OPERATING PROCEDURES**
**LABORATORY ANALYTICAL QUALITY ASSURANCE AND CONTROL**
**SOP-5**

In addition to routine instrument calibration, replicates, spikes, blanks, spiked blanks, and certified reference materials are routinely analyzed at method-specific frequencies to monitor precision and bias. Additional components of the laboratory Quality Assurance/Quality Control program include:

1. Participation in state and federal laboratory accreditation/certification programs;
2. Participation in both U.S. EPA Performance Evaluation studies (WS and WP studies) and inter-laboratory performance evaluation programs;
3. Standard operating procedures describing routine and periodic instrument maintenance;
4. "Out-of-Control"/Corrective Action documentation procedures; and,
5. Multi-level review of raw data and client reports.

**FUGRO WEST, INC.**
**STANDARD OPERATING PROCEDURE**
**RE: HYDROPUNCH SAMPLING**
**SOP-14**

Starting from the capillary fringe, the hydropunch is pushed so that the tip is approximately 3 feet below the water table. The sleeve protecting the 4-foot PVC screened interval is then pulled up 3.5 feet, exposing the screened interval to the capillary fringe and the saturated zone. The system is left undisturbed for approximately 15 minutes to allow formation water to infiltrate the screen, and fines to settle out.

The sampling equipment consists of either a "Teflon" or stainless steel bailer. In general and depending on the intended laboratory analysis, 40-milliliter glass, volatile organic analysis (VOA) vials, with "Teflon" septa, are used as sample containers.

The groundwater sample is decanted into each VOA vial in such a manner that there is no meniscus at the top of the vial. A cap is quickly secured to the top of the vial. The vial is then inverted and gently tapped to see if air bubbles are present. If none are present, the vial is labeled and refrigerated for delivery, under strict chain-of-custody, to the analytical laboratory. Label information includes a unique sample identification number, job identification number, date, time, type of analysis requested, and the sampler's name.

For quality control purposes, a field blank may be prepared in the field. The field blank is prepared after a bailer has been either steam cleaned or properly washed, prior to use in the next well, and is analyzed along with the other samples. The field blank analysis demonstrates the effectiveness of the in-field cleaning procedures to prevent cross-contamination.

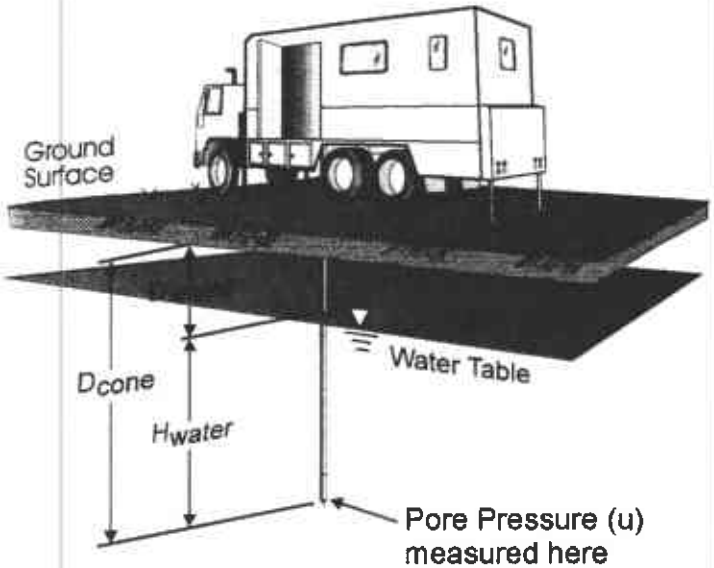
To minimize the potential for cross-contamination between wells, all well development and water sampling equipment not dedicated to a well is either steam cleaned or properly washed between use.

In the event the water samples cannot be submitted to the analytical laboratory on the same day they are collected (e.g., due to weekends or holidays), the samples are temporarily stored until the first opportunity for submittal either on ice in a cooler, such as when in the field, or in a refrigerator at Fugro's office.

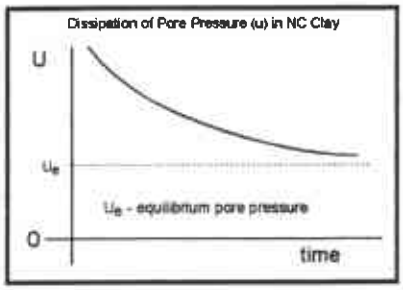
# APPENDIX B

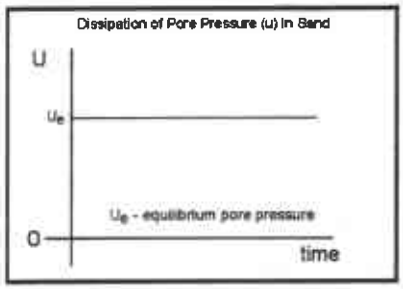
# CPT DATA

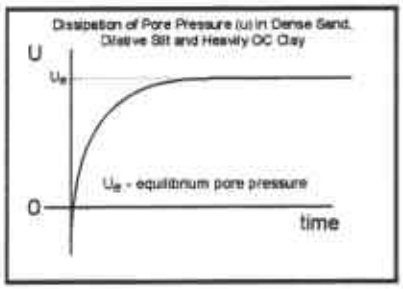
# Estimation of Ground Water Table from CPT Dissipation Tests




$D_{cone}$ - Depth of Cone
$D_{water}$ - Depth to Water Table
$H_{water}$ - Head of Water




Water Table Calculation

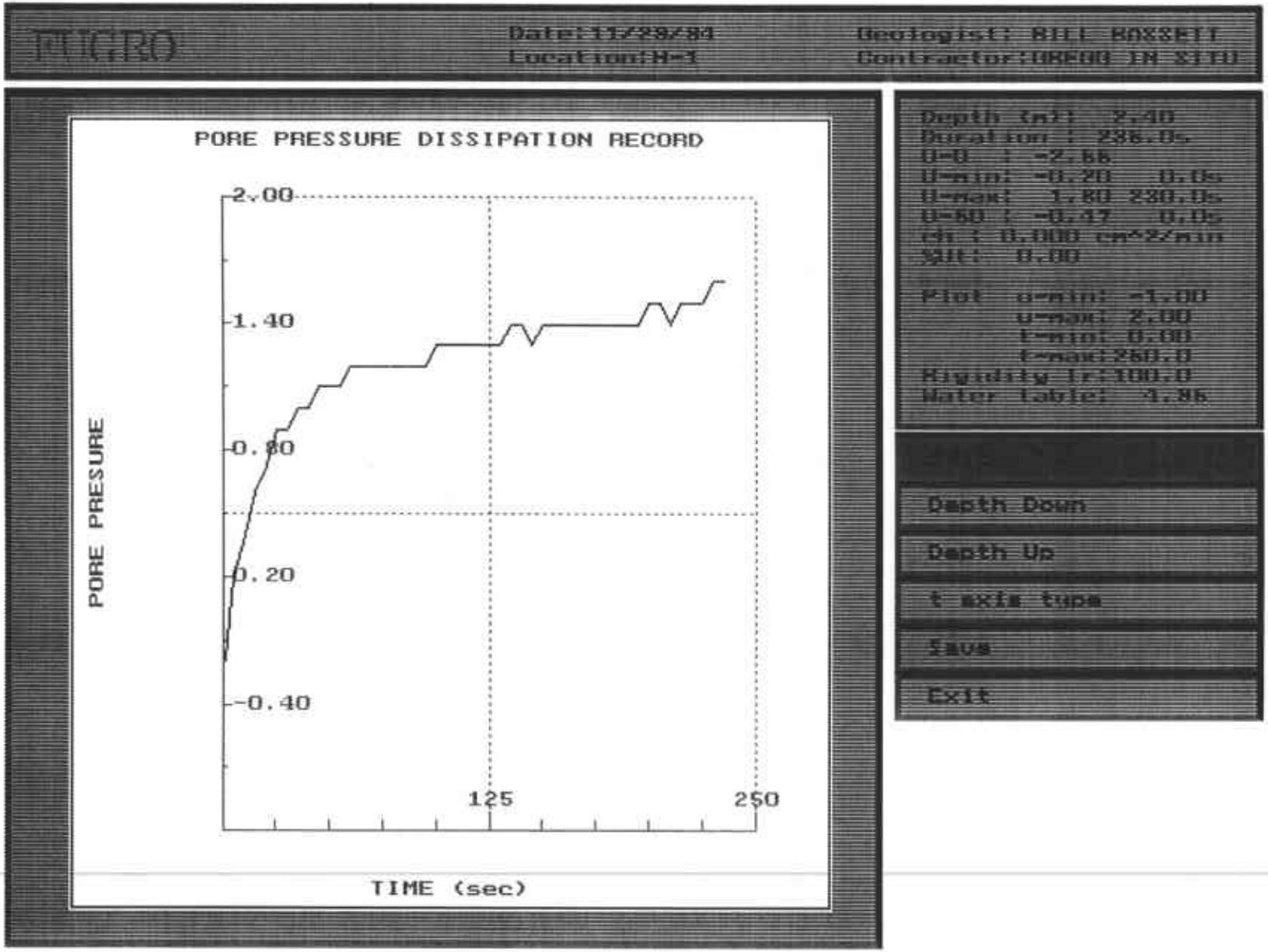
$$D_{water} = D_{cone} - H_{water}$$

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

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

GREGG

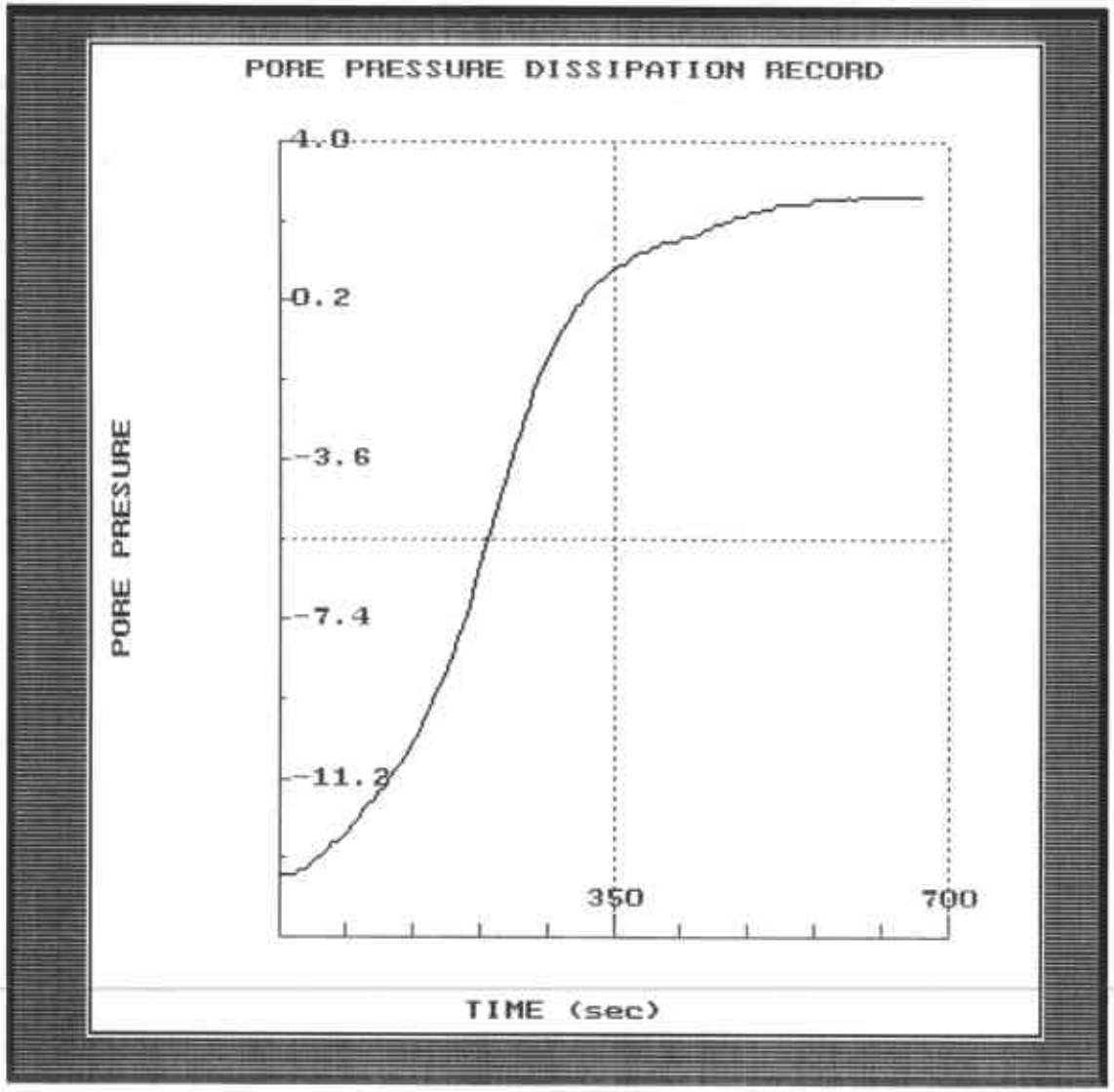
Gregg In Situ, Inc.


FUGRO
Date:11/28/84
Location:H-1
Geologist: BILL ROSSETT
Contractor:OREGO IN SITU
PORE PRESSURE DISSIPATION RECORD
2.00
1.40
0.80
0.20
-0.40
PORE PRESURE
125
250
TIME (sec)
Depth (m): 2.40
Decalcon : 238.0s
U=0 : -2.66
U=min: -0.20 0.0s
U=max: 1.80 230.0s
U=50 : -0.47 0.0s
Ch : 0.000 cm^2/min
Shift: 0.00
Plot u=min: -1.00
u=max: 2.00
t=min: 0.00
t=max:250.0
Rigidity Ir:100.0
Water table: 3.86
Depth Down
Depth Up
t axis type
Save
Exit

FUGRO

Date:11/28/84
Location:H-2

Geologist: BILL BASSETT
Contractor:GREGG IN SITU




Depth (m): 3.05
Duration : 870.0s
U=0 : -2.05
U=min: -13.60 16.0s
U=max: 2.70 886.0s
U=50 : -7.77 0.0s
ch : 0.000 cm^2/min
MRI: 0.00

Plot u-min: -16.00
u-max: 4.00
t-min: 0.00
t-max: 700.0
Rigidity Ir: 100.0
Water table: 6.10

Depth Down

Depth Up

t axis type

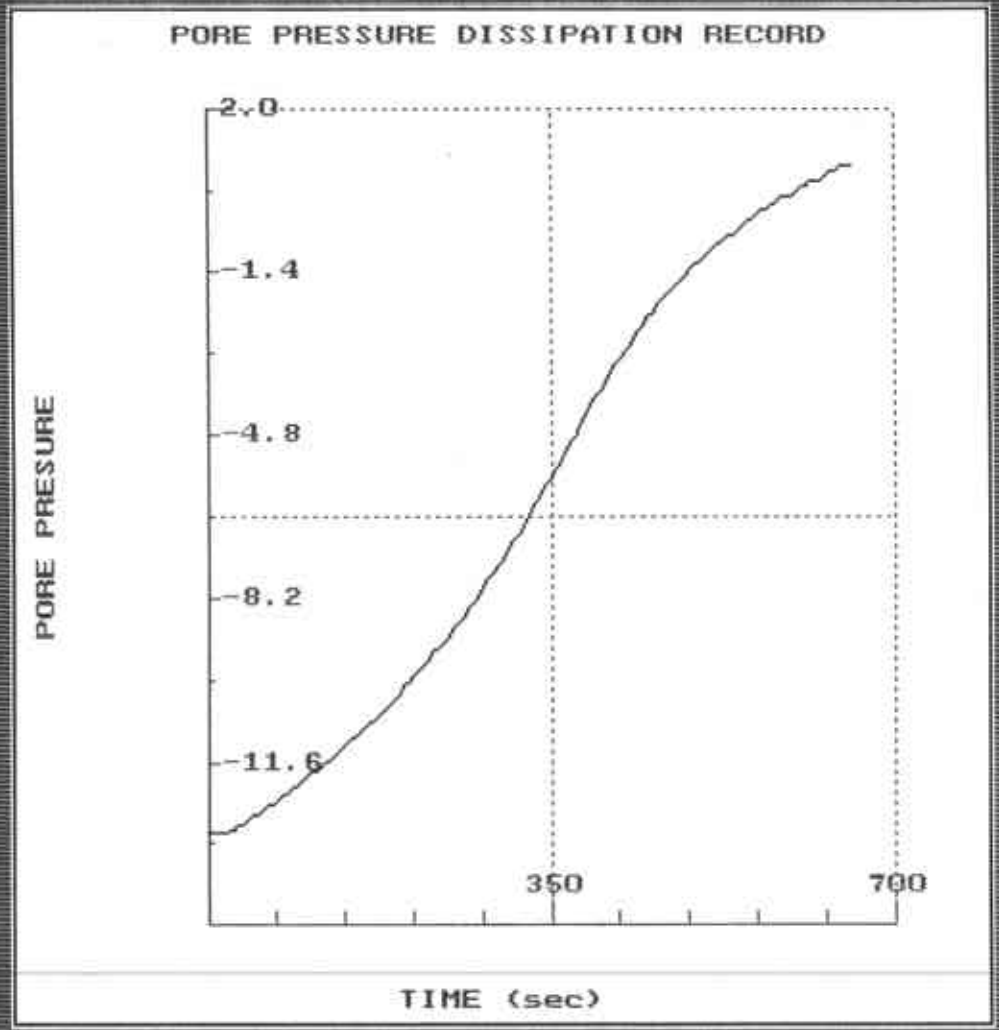
Save

Exit

FUGRO

Date:11/28/93
Location:M-3

Geologist: BILL RASSETT
Contractor:OREGON IN SITU




Depth (m): 3.80
Duration : 868.0s
U-0 : -2.78
U-min: -13.30 16.0s
U-max: 0.30 860.0s
U-50 : -7.86 0.0s
ch : 0.000 cm^2/min
MIT: 0.00

Plot u-min: -16.00
u-max: 2.00
t-min: 0.00
t-max: 700.0
Rigidity Ir: 100.0
Water table: 8.88

Depth Down

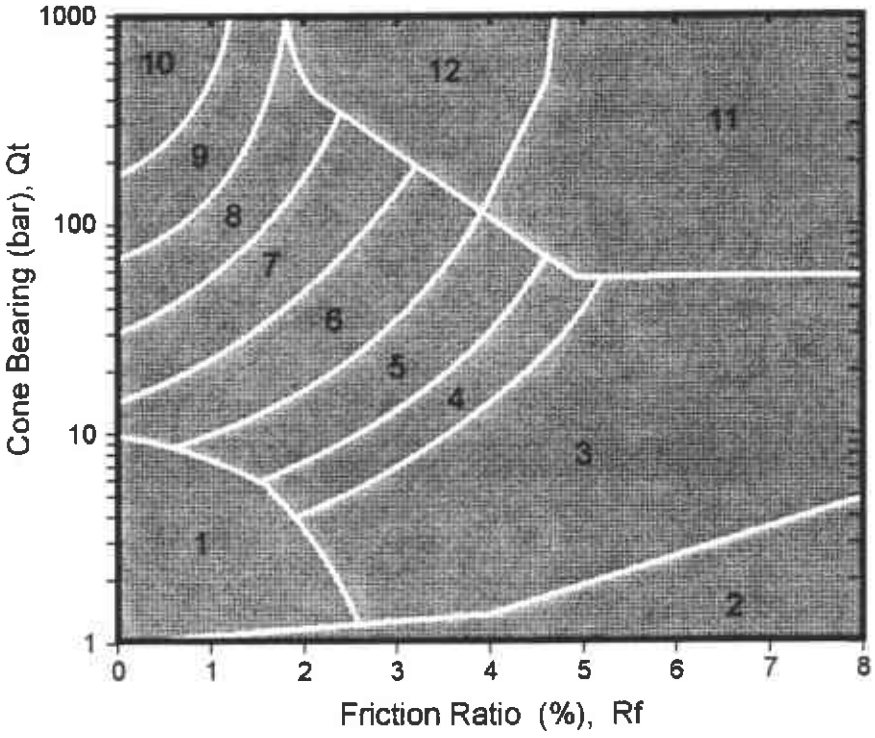
Depth Up

t axis type

Save

Exit

# CPT Classification Chart
(after Robertson and Campanella, 1988)



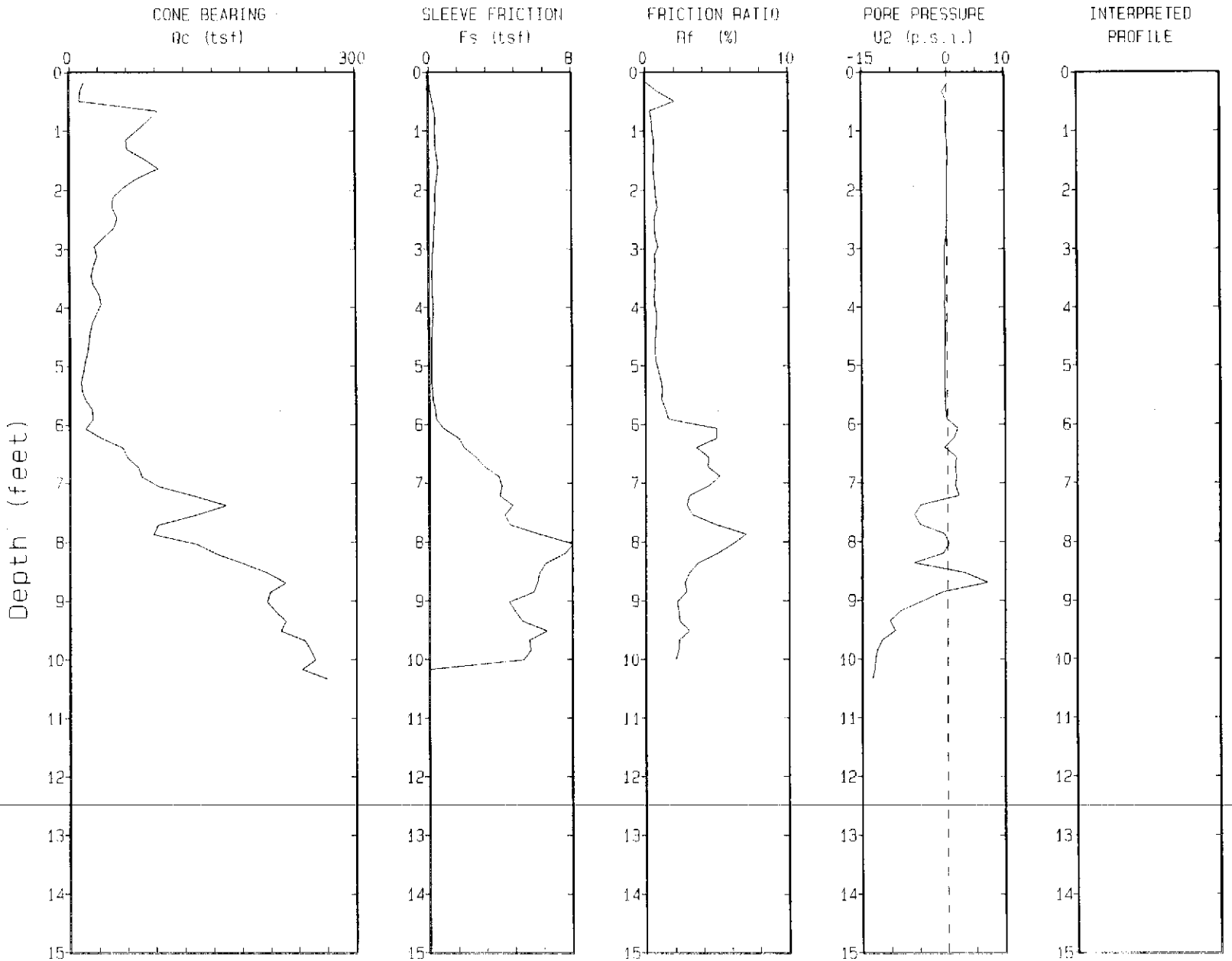

| Zone | $Q_t$ / N | Soil Behaviour Type |
|---|---|---|
| 1 | 2 | sensitive fine grained |
| 2 | 1 | organic material |
| 3 | 1 | clay |
| 4 | 1.5 | silty clay to clay |
| 5 | 2 | clayey silt to silty clay |
| 6 | 2.5 | sandy silt to clayey silt |
| 7 | 3 | silty sand to sandy silt |
| 8 | 4 | sand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

* overconsolidated or cemented

FUGRO

Project : BP #11104 Contractor : GREGG IN SITU File Name : 153H-1.DAT

Location : H-1 Geologist : BILL BASSETT CPT Date : 11/29/94




Depth Increment : .164 ft

Max Depth 10.33 ft

FUGRO

PROJECT : BP #11104 CONTRACTOR :GREGG IN SITU

LOCATION : H-1 GEOLOGIST : BILL BASSETT

CPT DATE : 11/29/94 Water table ( feet ) : 6.003937

Tot. Unit Wt. (avg) : 115 pcf

| DEPTH (feet) | Qc (avg) (tsf) | Fs (avg) (tsf) | Rf (avg) (%) | SIGV' (tsf) | SOIL BEHAVIOUR TYPE | Eq - Dr (%) | PHI deg. | SPT N | Su tsf |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 47.74 | 0.23 | 0.47 | 0.03 | sand to silty sand | >90 | >48 | 11 | UNDEFINED |
| 2 | 70.31 | 0.43 | 0.61 | 0.08 | sand to silty sand | >90 | >48 | 17 | UNDEFINED |
| 3 | 39.91 | 0.28 | 0.71 | 0.15 | silty sand to sandy silt | 60-70 | 42-44 | 13 | UNDEFINED |
| 4 | 27.11 | 0.18 | 0.66 | 0.21 | silty sand to sandy silt | 50-60 | 38-40 | 9 | UNDEFINED |
| 5 | 18.79 | 0.13 | 0.72 | 0.26 | sandy silt to clayey silt | UNDFND | UNDFD | 7 | 1.2 |
| 6 | 17.01 | 0.32 | 1.86 | 0.32 | sandy silt to clayey silt | UNDFND | UNDFD | 7 | 1.1 |
| 7 | 64.79 | 2.87 | 4.43 | 0.36 | clayey silt to silty clay | UNDFND | UNDFD | 31 | 4.2 |
| 8 | 122.96 | 5.25 | 4.27 | 0.39 | very stiff fine grained (*) | UNDFND | UNDFD | >50 | UNDEFINED |
| 9 | 197.24 | 6.10 | 3.09 | 0.41 | silty sand to sandy silt | >90 | 46-48 | >50 | UNDEFINED |
| 10 | 236.49 | 5.51 | 2.33 | 0.44 | silty sand to sandy silt | >90 | 46-48 | >50 | UNDEFINED |

Dr - All sands (Jamiolkowski et al. 1985) PHI - Durgunoglu and Mitchell 1975 Su: Nk= 15

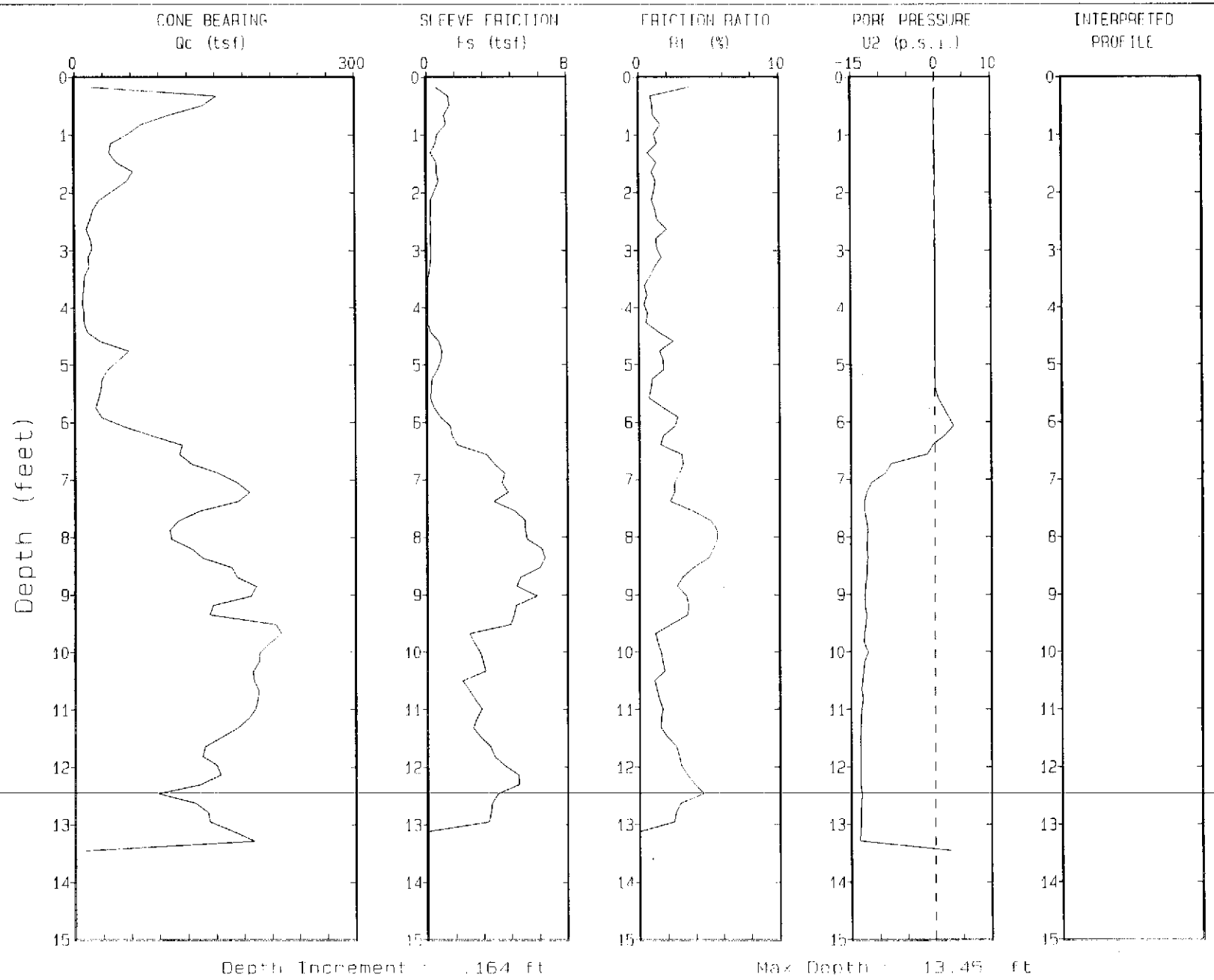
(*) overconsolidated or cemented

**** Note: For interpretation purposes the PLOTTED CPT PROFILE should be used with the TABULATED OUTPUT from CPTINTR1 (v 3.02) ****

# FUGRO

Project : BP #11104 | Contractor : GREGG IN SITU | File Name : 153H-2.DAT

Location : H-2 | Geologist : BILL BASSETT | CPT Date : 11/29/94




Depth Increment : .164 ft

Max Depth : 13.45 ft

FUGRO

PROJECT : BP #11104 CONTRACTOR :GREGG IN SITU

LOCATION : H-2 GEOLOGIST : BILL BASSETT

CPT DATE : 11/29/94 Water table ( feet ) : 5.413386

Tot. Unit Wt. (avg) : 115 pcf

| DEPTH (feet) | Qc (avg) (tsf) | Fs (avg) (tsf) | Rf (avg) (%) | SIGV' (tsf) | SOIL BEHAVIOUR TYPE | Eq - Dr (%) | PHI deg. | SPT N | Su tsf |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 88.87 | 0.97 | 1.10 | 0.03 | sand to silty sand | >90 | >48 | 21 | UNDEFINED |
| 2 | 46.74 | 0.49 | 1.05 | 0.08 | silty sand to sandy silt | 80-90 | 46-48 | 15 | UNDEFINED |
| 3 | 17.86 | 0.23 | 1.27 | 0.15 | sandy silt to clayey silt | UNDFND | UNDFD | 7 | 1.1 |
| 4 | 10.70 | 0.07 | 0.67 | 0.21 | sandy silt to clayey silt | UNDFND | UNDFD | 4 | .6 |
| 5 | 31.44 | 0.52 | 1.64 | 0.26 | sandy silt to clayey silt | UNDFND | UNDFD | 12 | 2.0 |
| 6 | 30.45 | 0.51 | 1.68 | 0.32 | sandy silt to clayey silt | UNDFND | UNDFD | 12 | 2.0 |
| 7 | 126.44 | 3.16 | 2.50 | 0.34 | silty sand to sandy silt | 80-90 | 44-46 | 40 | UNDEFINED |
| 8 | 134.32 | 5.04 | 3.75 | 0.37 | sandy silt to clayey silt | UNDFND | UNDFD | >50 | 8.9 |
| 9 | 163.52 | 6.07 | 3.71 | 0.39 | sand to clayey sand (*) | UNDFND | UNDFD | >50 | UNDEFINED |
| 10 | 188.18 | 3.81 | 2.03 | 0.42 | sand to silty sand | >90 | 46-48 | 45 | UNDEFINED |
| 11 | 193.19 | 2.77 | 1.43 | 0.44 | sand to silty sand | >90 | 46-48 | 46 | UNDEFINED |
| 12 | 156.33 | 3.36 | 2.15 | 0.47 | silty sand to sandy silt | >90 | 44-46 | 50 | UNDEFINED |
| 13 | 131.28 | 4.20 | 3.20 | 0.50 | sandy silt to clayey silt | UNDFND | UNDFD | >50 | 8.7 |

Dr - All sands (Jamiolkowski et al. 1985) PHI - Durgunoglu and Mitchell 1975 Su: Nk= 15

(*) overconsolidated or cemented

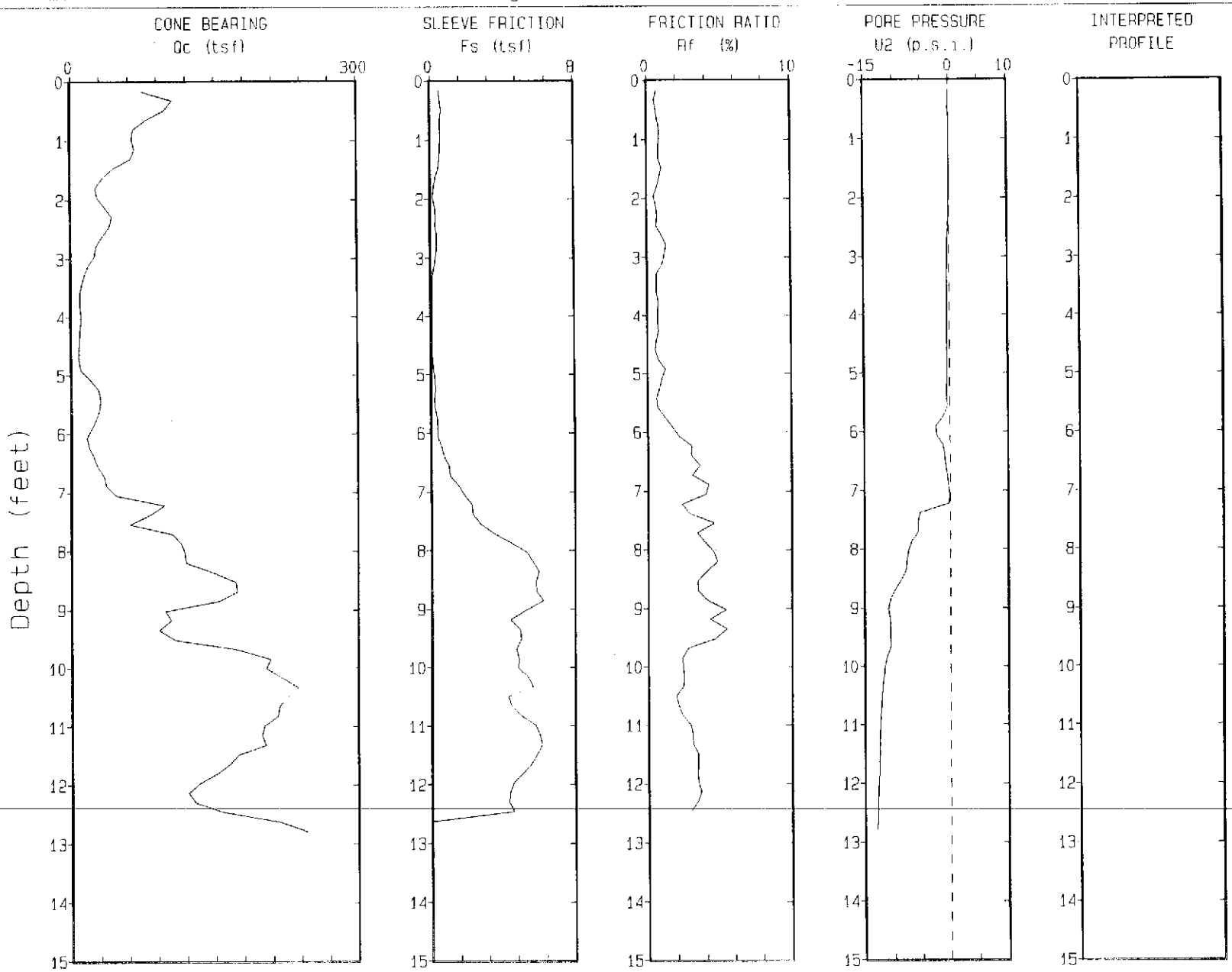
**** Note: For interpretation purposes the PLOTTED CPT PROFILE should be used with the TABULATED OUTPUT from CPTINTR1 (v 3.02) ****

FUGRO

Project : BP #11104
Location : H-3

Contractor : GREGG IN SITU
Geologist : BILL BASSETT

File Name : 153H-3.DAT
CPT Date : 11/29/94




Depth Increment : .164 ft

Max Depth : 12.79 ft

FUGRO

PROJECT : BP #11104 CONTRACTOR :GREGG IN SITU

LOCATION : H-3 GEOLOGIST : BILL BASSETT

CPT DATE : 11/29/94 Water table ( feet ) : 6.56168

Tot. Unit Wt. (avg) : 115 pcf

| DEPTH (feet) | Qc (avg) (tsf) | Fs (avg) (tsf) | Rf (avg) (%) | SIGV' (tsf) | SOIL BEHAVIOUR TYPE | Eq - Dr (%) | PHI deg. | SPT N | Su tsf |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 80.81 | 0.56 | 0.69 | 0.03 | sand to silty sand | >90 | >48 | 19 | UNDEFINED |
| 2 | 43.40 | 0.35 | 0.80 | 0.08 | silty sand to sandy silt | 70-80 | 46-48 | 14 | UNDEFINED |
| 3 | 31.61 | 0.28 | 0.88 | 0.15 | silty sand to sandy silt | 60-70 | 42-44 | 10 | UNDEFINED |
| 4 | 10.63 | 0.07 | 0.67 | 0.21 | sandy silt to clayey silt | UNDFND | UNDFD | 4 | .6 |
| 5 | 10.63 | 0.09 | 0.83 | 0.26 | sandy silt to clayey silt | UNDFND | UNDFD | 4 | .6 |
| 6 | 25.15 | 0.27 | 1.06 | 0.32 | silty sand to sandy silt | 40-50 | 36-38 | 8 | UNDEFINED |
| 7 | 30.58 | 1.09 | 3.57 | 0.38 | clayey silt to silty clay | UNDFND | UNDFD | 15 | 2.0 |
| 8 | 95.78 | 3.43 | 3.58 | 0.40 | sandy silt to clayey silt | UNDFND | UNDFD | 37 | 6.3 |
| 9 | 143.32 | 5.81 | 4.06 | 0.43 | very stiff fine grained (*) | UNDFND | UNDFD | >50 | UNDEFINED |
| 10 | 147.30 | 4.80 | 3.26 | 0.45 | sandy silt to clayey silt | UNDFND | UNDFD | >50 | 9.7 |
| 11 | 219.11 | 5.10 | 2.33 | 0.48 | silty sand to sandy silt | >90 | 46-48 | >50 | UNDEFINED |
| 12 | 170.58 | 5.55 | 3.25 | 0.51 | sandy silt to clayey silt | UNDFND | UNDFD | >50 | 11.3 |

Dr - All sands (Jamiolkowski et al. 1985) PHI - Durgunoglu and Mitchell 1975 Su: Nk= 15

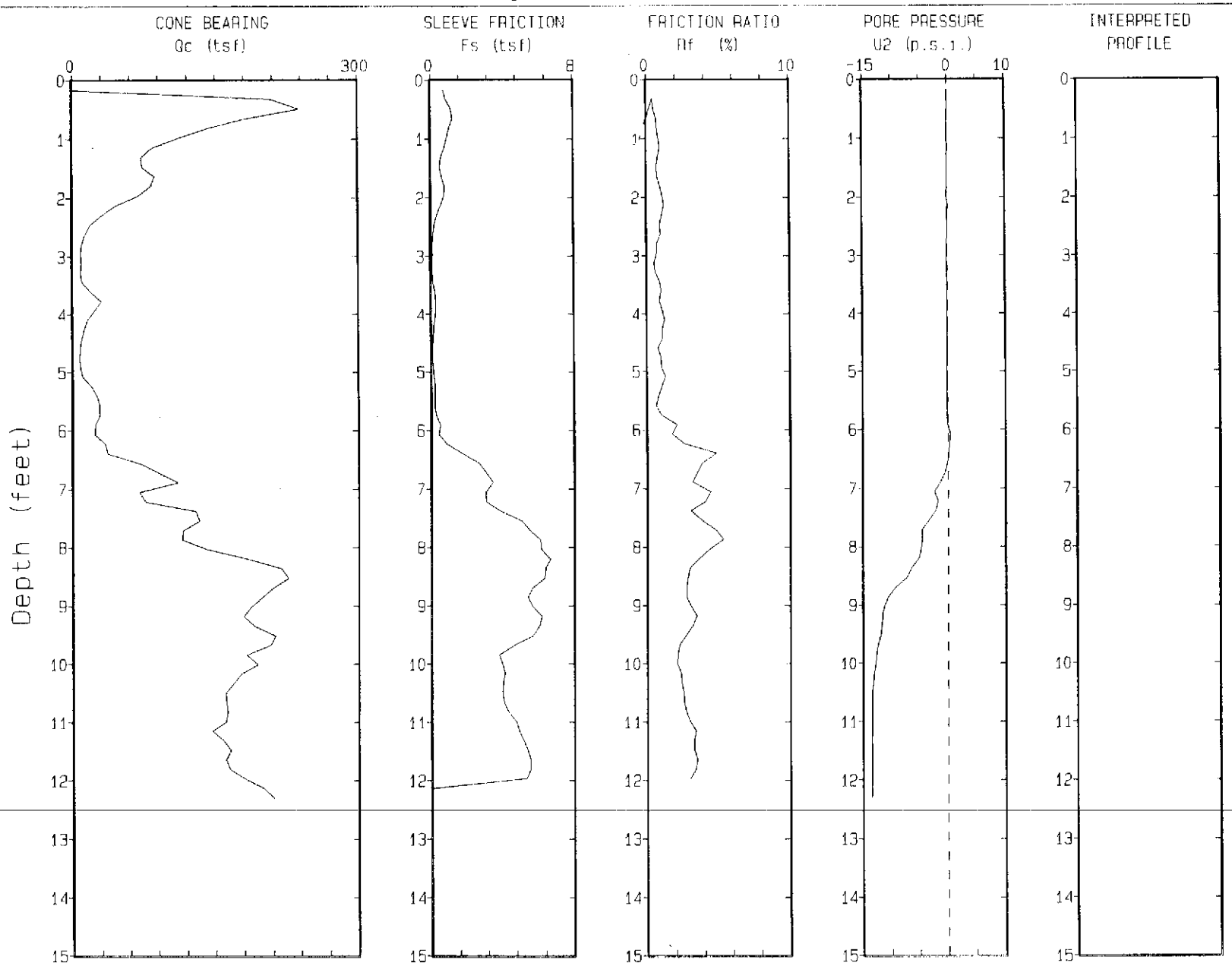
(*) overconsolidated or cemented

**** Note: For interpretation purposes the PLOTTED CPT PROFILE should be used with the TABULATED OUTPUT from CPTINTR1 (v 3.02) ****

# FUGRO

Project : BP #11104 | Contractor : GREGG IN SITU | File Name : 153H-4.DAT

Location : H-4 | Geologist : BILL BASSETT | CPT Date : 11/29/94




Depth Increment : .164 ft

Max Depth . 12.30 ft

FUGRO

PROJECT : BP #11104 CONTRACTOR :GREGG IN SITU

LOCATION : H-4 GEOLOGIST : BILL BASSETT

CPT DATE : 11/29/94 Water table ( feet ) : 5.872703

Tot. Unit Wt. (avg) : 115 pcf

| DEPTH (feet) | Qc (avg) (tsf) | Fs (avg) (tsf) | Rf (avg) (%) | SIGV' (tsf) | SOIL BEHAVIOUR TYPE | Eq - Dr (%) | PHI deg. | SPT N | Su tsf |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 147.13 | 0.99 | 0.68 | 0.03 | sand | >90 | >48 | 28 | UNDEFINED |
| 2 | 77.80 | 0.67 | 0.87 | 0.08 | sand to silty sand | >90 | >48 | 19 | UNDEFINED |
| 3 | 19.63 | 0.20 | 1.00 | 0.15 | sandy silt to clayey silt | UNDFND | UNDFD | 8 | 1.2 |
| 4 | 17.73 | 0.17 | 0.98 | 0.21 | sandy silt to clayey silt | UNDFND | UNDFD | 7 | 1.1 |
| 5 | 9.24 | 0.10 | 1.05 | 0.26 | clayey silt to silty clay | UNDFND | UNDFD | 4 | .5 |
| 6 | 24.58 | 0.29 | 1.17 | 0.32 | sandy silt to clayey silt | UNDFND | UNDFD | 9 | 1.6 |
| 7 | 68.08 | 2.49 | 3.66 | 0.36 | clayey silt to silty clay | UNDFND | UNDFD | 33 | 4.5 |
| 8 | 117.84 | 4.97 | 4.21 | 0.38 | very stiff fine grained (*) | UNDFND | UNDFD | >50 | UNDEFINED |
| 9 | 203.70 | 6.03 | 2.96 | 0.41 | silty sand to sandy silt | >90 | 46-48 | >50 | UNDEFINED |
| 10 | 194.05 | 5.07 | 2.61 | 0.43 | silty sand to sandy silt | >90 | 46-48 | >50 | UNDEFINED |
| 11 | 164.38 | 4.21 | 2.56 | 0.46 | silty sand to sandy silt | >90 | 44-46 | >50 | UNDEFINED |
| 12 | 162.26 | 5.32 | 3.28 | 0.49 | sandy silt to clayey silt | UNDFND | UNDFD | >50 | 10.7 |

Dr - All sands (Jamiolkowski et al. 1985) PHI - Durgunoglu and Mitchell 1975 Su: Nk= 15

(*) overconsolidated or cemented

**** Note: For interpretation purposes the PLOTTED CPT PROFILE should be used with the TABULATED OUTPUT from CPTINTR1 (v 3.02) ****

pace INCORPORATED
ENVIRONMENTAL LABORATORIES

# REPORT OF LABORATORY ANALYSIS

December 13, 1994

RECEIVED
DEC 16 1994
Ans'd_____

Mr. Paul Graff
Fugro-West Inc.
1050 Melody Lane, Suite 160
Roseville, CA 95678

RE: PACE Project No. 441202.514
Client Reference: BP Site #11104 9447-8592

Dear Mr. Graff:

Enclosed is the report of laboratory analyses for samples received December 02, 1994.

Please note unidentified peaks were present in the chromatogram of sample H2.

Footnotes are given at the end of the report.

If you have any questions concerning this report, please feel free to contact us.

Sincerely,

Stephanie Matzo
Project Manager

Enclosures

'' Digital Drive
Novato, CA 94949
TEL: 415-883-6100
FAX 415-883-2873

pace INCORPORATED
ENVIRONMENTAL LABORATORIES

# REPORT OF LABORATORY ANALYSIS

Fugro-West Inc.
1050 Melody Lane, Suite 160
Roseville, CA 95678

December 13, 1994
PACE Project Number: 441202514

Attn: Mr. Paul Graff

Client Reference: BP Site #11104 9447-8592

| | | | | |
|---|---|---|---|---|
| PACE Sample Number: | | | 70 0450101 | |
| Date Collected: | | | 11/30/94 | |
| Date Received: | | | 12/02/94 | |
| | | | H1 | |
| Parameter | Units | MDL | | DATE ANALYZED |
| ORGANIC ANALYSIS | | | | |
| PURGEABLE FUELS AND AROMATICS | | | | |
| TOTAL FUEL HYDROCARBONS, (LIGHT): | | | - | 12/08/94 |
| Purgeable Fuels, as Gasoline (EPA 8015M) | ug/L | 50 | ND | 12/08/94 |
| PURGEABLE AROMATICS (BTXE BY EPA 8020M): | | | - | 12/08/94 |
| Benzene | ug/L | 0.5 | 0.6 CO | 12/08/94 |
| Toluene | ug/L | 0.5 | 0.7 CO | 12/08/94 |
| Ethylbenzene | ug/L | 0.5 | ND | 12/08/94 |
| Xylenes, Total | ug/L | 0.5 | ND | 12/08/94 |

11 Digital Drive
Novato, CA 94949
**TEL: 415-883-6100**
FAX 415-883-2673

pace INCORPORATED
ENVIRONMENTAL LABORATORIES

# REPORT OF LABORATORY ANALYSIS



December 13, 1994
PACE Project Number: 441202514

Client Reference: BP Site #11104 9447-8592

| | | | | |
|---|---|---|---|---|
| PACE Sample Number: | | | 70 0450110 | |
| Date Collected: | | | 11/30/94 | |
| Date Received: | | | 12/02/94 | |
| Client Sample ID: | | | H2 | |
| Parameter | Units | MDL | | DATE ANALYZED |
| ORGANIC ANALYSIS | | | | |
| PURGEABLE FUELS AND AROMATICS | | | | |
| TOTAL FUEL HYDROCARBONS, (LIGHT): | | | - | 12/07/94 |
| Purgeable Fuels, as Gasoline (EPA 8015M) | ug/L | 50 | ND | 12/07/94 |
| PURGEABLE AROMATICS (BTXE BY EPA 8020M): | | | - | 12/07/94 |
| Benzene | ug/L | 0.5 | ND | 12/07/94 |
| Toluene | ug/L | 0.5 | ND | 12/07/94 |
| Ethylbenzene | ug/L | 0.5 | ND | 12/07/94 |
| Xylenes, Total | ug/L | 0.5 | ND | 12/07/94 |

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FAX:415-883-2673

# REPORT OF LABORATORY ANALYSIS



December 13, 1994
PACE Project Number: 441202514

Client Reference: BP Site #11104 9447-8592

| | | | | |
|---|---|---|---|---|
| PACE Sample Number: | | | 70 0450128 | |
| Date Collected: | | | 11/30/94 | |
| Date Received: | | | 12/02/94 | |
| Client Sample ID: | | | H3 | |
| Parameter | Units | MDL | | DATE ANALYZED |
| ORGANIC ANALYSIS | | | | |
| PURGEABLE FUELS AND AROMATICS | | | | |
| TOTAL FUEL HYDROCARBONS, (LIGHT): | | | - | 12/08/94 |
| Purgeable Fuels, as Gasoline (EPA 8015M) | ug/L | 50 | ND | 12/08/94 |
| PURGEABLE AROMATICS (BTXE BY EPA 8020M): | | | - | 12/08/94 |
| Benzene | ug/L | 0.5 | ND | 12/08/94 |
| Toluene | ug/L | 0.5 | 0.8 CO | 12/08/94 |
| Ethylbenzene | ug/L | 0.5 | ND | 12/08/94 |
| Xylenes, Total | ug/L | 0.5 | ND | 12/08/94 |

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pace INCORPORATED
ENVIRONMENTAL LABORATORIES

# REPORT OF LABORATORY ANALYSIS

Mr. Paul Graff
Page 4

December 13, 1994
PACE Project Number: 441202514

Client Reference: BP Site #11104 9447-8592

| | | | | |
|---|---|---|---|---|
| PACE Sample Number: | | | 70 0450136 | |
| Date Collected: | | | 11/30/94 | |
| Date Received: | | | 12/02/94 | |
| Client Sample ID: | | | H4 | |
| Parameter | Units | MDL | | DATE ANALYZED |
| ORGANIC ANALYSIS | | | | |
| PURGEABLE FUELS AND AROMATICS | | | | |
| TOTAL FUEL HYDROCARBONS, (LIGHT): | | | - | 12/09/94 |
| Purgeable Fuels, as Gasoline (EPA 8015M) | ug/L | 50 | ND | 12/09/94 |
| PURGEABLE AROMATICS (BTXE BY EPA 8020M): | | | - | 12/09/94 |
| Benzene | ug/L | 0.5 | ND | 12/09/94 |
| Toluene | ug/L | 0.5 | ND | 12/09/94 |
| Ethylbenzene | ug/L | 0.5 | ND | 12/09/94 |
| Xylenes, Total | ug/L | 0.5 | ND | 12/09/94 |

These data have been reviewed and are approved for release.

Darrell C. Cain
Regional Director

11 Digital Drive
Novato, CA 94949
**TEL: 415-883-6100**
FAX 415-883-2673

# REPORT OF LABORATORY ANALYSIS



FOOTNOTES
for pages 1 through 4



Client Reference: BP Site #11104 9447-8592

| | |
|---|---|
| CO | Compound confirmed by secondary column. |
| MDL | Method Detection Limit |
| ND | Not detected at or above the MDL. |

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**TEL: 415-883-6100**
FAX:415-883-2673

# REPORT OF LABORATORY ANALYSIS



QUALITY CONTROL DATA

December 13, 1994
PACE Project Number: 441202514

Client Reference: BP Site #11104 9447-8592

PURGEABLE FUELS AND AROMATICS
Batch: 70 36967
Samples: 70 0450101, 70 0450110, 70 0450128

METHOD BLANK:

| Parameter | Units | MDL | Method Blank |
|---|---|---|---|
| TOTAL FUEL HYDROCARBONS, (LIGHT): | | | - |
| Purgeable Fuels, as Gasoline (EPA 8015M | ug/L | 50 | ND |
| PURGEABLE AROMATICS (BTXE BY EPA 8020M) | | | - |
| Benzene | ug/L | 0.5 | ND |
| Toluene | ug/L | 0.5 | ND |
| Ethylbenzene | ug/L | 0.5 | ND |
| Xylenes, Total | ug/L | 0.5 | ND |

SPIKE AND SPIKE DUPLICATE:

| Parameter | Units | MDL | 700450160 | Spike | Spike Recv | Spike Dupl Recv | RPD |
|---|---|---|---|---|---|---|---|
| Benzene | ug/L | 0.5 | ND | 100 | 101% | 97% | 4% |
| Toluene | ug/L | 0.5 | ND | 100 | 103% | 99% | 4% |
| Ethylbenzene | ug/L | 0.5 | ND | 100 | 103% | 100% | 3% |
| Xylenes, Total | ug/L | 0.5 | ND | 300 | 109% | 104% | 5% |

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

| Parameter | Units | MDL | Reference Value | Recv | Dupl Recv | RPD |
|---|---|---|---|---|---|---|
| Benzene | ug/L | 0.5 | 100 | 94% | 95% | 1% |
| Toluene | ug/L | 0.5 | 100 | 97% | 98% | 1% |
| Ethylbenzene | ug/L | 0.5 | 100 | 99% | 99% | 0% |
| Xylenes, Total | ug/L | 0.5 | 300 | 103% | 104% | 1% |

441202.514

# CHAIN OF CUSTODY

No. ·

Page 1 of 1

| CONSULTANT'S NAME | ADDRESS | CITY | STATE | ZIP CODE |
|---|---|---|---|---|
| Fugro West | 44 Montgomery West | San Francisco, CA | 94104 | |

| BP SITE NUMBER | BP CORNET ADDRESS CITY | CONSULTANT PROJECT NUMBER |
|---|---|---|
| 11104 | 1716 Webster St., Alameda, CA | 9447-8592 |

| CONSULTANT PROJECT MANAGER | PHONE NUMBER | FAX NUMBER | CONSULTANT CONTRACT NUMBER |
|---|---|---|---|
| Bill Bassett | (415) 296-1041 | (415) 296-0944 | |

| BP CONTACT | BP ADDRESS | PHONE NUMBER | FAX NO |
|---|---|---|---|
| | | | |

| LAB CONTACT | LABORATORY ADDRESS | PHONE NUMBER | FAX NO |
|---|---|---|---|
| | | | |

| SAMPLED BY (Please Print Name) | SAMPLED BY (Signature) | SHIPMENT DATE | SHIPMENT METHOD |
|---|---|---|---|
| Bill Bassett | Bill Bassett | 12/2/94 | PACE pickup |

TAT: ☐ 24 Hours ☐ 48 Hours ☐ 1 Week ☒ Standard 2 Weeks

AIRBILL NUMBER

ANALYSIS REQUIRED

| SAMPLE DESCRIPTION | COLLECTION DATE / TIME | MATRIX SOIL WATER | CONTAINERS NO. | CONTAINERS TYPE (VOL.) | PRESERVATIVE LAB SAMPLE # | TPH-G BTEX | COMMENTS |
|---|---|---|---|---|---|---|---|
| H1 | 11/30/94 | water | 2 | VOA | 45010 | X | |
| H2 | ↓ | ↓ | 2 | ↓ | 45011.0 | X | |
| H3 | | | 2 | | 45012.8 | X | |
| H4 | | | 2 | | 45013.6 | X | |

| RELINQUISHED BY / AFFILIATION | DATE | TIME | ACCEPTED BY / AFFILIATION | DATE | TIME |
|---|---|---|---|---|---|
| Bill Bassett / Fugro | 12/2/94 | 10:05 | Elizabeth Lacy | 12/2/94 | 1005 |
| Ed Oattes / Fugro | 12/2/94 | 1730 | Heather Peters | 12/2/94 | 1730 |

ADDITIONAL COMMENTS

CTV 16722

Distribution: White - Original (with Data)
Yellow - BP
Pink - Lab
Blue - Consultant Field Staff

4/4