**BP OIL**

BP Oil Company
16400 Southcenter Parkway, Suite 301
Tukwila, Washington 98188
(206) 575-4077

93 OCT 21 PM 2:29

October 8, 1993

Mr. Barney Chan J.S.
Alameda County Health Care Services Agency
80 Swan Way, Suite 200
Oakland, CA ~~94621~~ 605

RE: BP OIL FACILITY #11117
7210 Bancroft Avenue
Oakland, CA 94621

Dear Mr. Chan:

Attached please find our **GROUNDWATER MONITORING AND SAMPLING REPORT DATED SEPTEMBER 29, 1993** for the above referenced facility.

Please call me at (206) 394-5243 with questions regarding this submission.

Respectfully,

Scott T. Hooton
Environmental Resources Management

STH:j ERM11117

cc: Mr. Eddy So, California Regional Water Quality Control Board, San Francisco Bay Region, 2101 Webster Street, Suite 500, Oakland, CA 94612

Mr. Markus B. Niebanck, Hydro Environmental Tech., Inc., 2363 Mariner Square Drive, Suite 243, Alameda, Ca 94501

Mr. Robert Merriken, Mobil Oil Corp, 3225 Gallows Road, Fairfax, VA 22037

Mr. Robert K. Barth, Bancroft Oakland Investment Company, 9454 Wilshire Boulevard, Suite 901, Beverly Hills CA 90212

Site file

# GROUNDWATER MONITORING AND SAMPLING REPORT

BP Oil Company Service Station No. 11117
7210 Bancroft Avenue
Oakland, California

Project No. 10-018-01-004

OCT - 4 1993
BP OIL CO.
ENVIRONMENTAL DEPT.
WEST COAST REGION OFFICE

Prepared for:

BP Oil Company
Environmental Resource Management
16400 Southcenter Parkway, Suite 301
Tukwila, Washington

Prepared by:

Alisto Engineering Group
1777 Oakland Boulevard, Suite 200
Walnut Creek, California

September 29, 1993

Brady Nagle
Project Manager

Al Sevilla, P.E.
Principal

REGISTERED PROFESSIONAL ENGINEER
ALBERTO SANCHEZ SEVILLA
26392
Exp. Date 3/31/93
CIVIL
STATE OF CALIFORNIA

# GROUNDWATER MONITORING AND SAMPLING REPORT

**BP Oil Company Service Station No. 11117**
**7210 Bancroft Avenue**
**Oakland, California**

**Project No. 10-018-01-004**

**September 29, 1993**

## INTRODUCTION

This report presents the results and findings of the June 7, 1993 groundwater monitoring and sampling conducted by Alisto Engineering Group at BP Oil Company Service Station No. 11117, 7210 Bancroft Avenue, Oakland, California. A site vicinity map is shown in Figure 1.

## FIELD PROCEDURES

Field activities were performed in accordance with the procedures and guidelines of the Alameda County Health Care Services Agency and the California Regional Water Quality Control Board, San Francisco Bay Region.

Before purging and sampling, the groundwater level in each well was measured from a permanent mark on the top of the casing to the nearest 0.01 foot using an electronic sounder. The depth to groundwater and top of casing elevation data were used to calculate the groundwater elevation in each well. The survey data and groundwater elevation measurements collected to date are presented in Table 1.

Before sample collection, each well was purged of 3 casing volumes, while recording field readings of pH, temperature, and electrical conductivity. Groundwater samples were collected for laboratory analysis by lowering a bottom-fill, disposable bailer to just below the water level in the well. The samples were transferred from the bailer into laboratory-supplied containers. The water sampling field survey forms are presented in Appendix A.

## SAMPLING AND ANALYTICAL RESULTS

The results of monitoring and laboratory analysis of the groundwater samples for this and previous quarters are summarized in Table 1. The potentiometric groundwater elevations as interpreted from the results of this monitoring event are shown in Figure 2. The results of groundwater analysis are shown in Figure 3. The laboratory report and chain of custody record are presented in Appendix B.

TABLE 1 - SUMMARY OF RESULTS OF GROUNDWATER MONITORING AND SAMPLING
BP OIL COMPANY SERVICE STATION NO. 11117
7210 BANCROFT AVENUE, OAKLAND, CALIFORNIA

ALISTO PROJECT NO. 10-018

| WELL ID | DATE OF SAMPLING/ MONITORING | CASING ELEVATION (a) (Feet) | DEPTH TO WATER (Feet) | PRODUCT THICKNESS (Feet) | GROUNDWATER ELEVATION (b) (Feet) | TPH-G (ppb) | TPH-D (ppb) | B (ppb) | T (ppb) | E (ppb) | X (ppb) | Organic Lead (ppb) | LAB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-1 | 01/05/92 | 49.81 | 33.16 | 0.00 | 16.65 | 57000 | 50000 | 2400 | 1000 | 1100 | 3100 | ND | --- |
| MW-1 | 01/10/92 | 49.81 | 33.16 | 0.00 | 16.65 | --- | --- | --- | --- | --- | --- | --- | --- |
| MW-1 | 06/05/92 | 49.81 | 29.01 | 0.00 | 20.80 | 31000 | --- | 2800 | 2100 | 800 | 2300 | --- | --- |
| MW-1 | 07/24/92 | 49.80 | 29.45 | 0.00 | 20.35 | --- | --- | --- | --- | --- | --- | --- | --- |
| MW-1 | 07/27/92 | 49.80 | 29.45 | 0.00 | 20.35 | --- | --- | --- | --- | --- | --- | --- | --- |
| MW-1 | 09/15/92 | 49.80 | 30.53 | 0.00 | 19.27 | 40000 | 1200 (c) | 3400 | 3000 | 1300 | 3400 | --- | ANA |
| QC-1 (d) | 09/15/92 | --- | --- | --- | --- | 36000 | --- | 3800 | 3400 | 1400 | 3800 | --- | ANA |
| MW-1 | 12/15/92 | 49.80 | 31.26 | 0.00 | 18.54 | 27000 | 1100 (c) | 1700 | 580 | 700 | 1900 | --- | ANA |
| QC-1 (d) | 12/15/92 | --- | --- | --- | --- | 22000 | --- | 1500 | 440 | 510 | 1300 | --- | ANA |
| MW-1 | 03/15/93 | 49.80 | 24.80 | 0.00 | 25.00 | 17000 | 580 | 1700 | 1200 | 590 | 1800 | --- | PACE |
| QC-1 (d) | 03/15/93 | --- | --- | --- | --- | 15000 | --- | 1100 | 860 | 440 | 1400 | --- | PACE |
| MW-1 | 06/07/93 | 49.80 | 25.01 | 0.00 | 24.79 | 750 | 100 | 0.8 | 0.8 | ND<0.5 | ND<0.5 | --- | PACE |
| QC-1 (d) | 06/07/93 | --- | --- | --- | --- | 720 | --- | 0.7 | 0.7 | ND<0.5 | ND<0.5 | --- | PACE |
| MW-2 | 01/05/92 | 51.07 | Dry | --- | Dry | --- | --- | --- | --- | --- | --- | --- | --- |
| MW-2 | 01/10/92 | 51.06 | Dry | --- | Dry | --- | --- | --- | --- | --- | --- | --- | --- |
| MW-2 | 06/05/92 | 51.06 | 30.05 | 0.00 | 21.01 | 11000 | --- | 2000 | 180 | 490 | 1900 | --- | --- |
| MW-2 | 07/24/92 | 51.07 | 30.72 | 0.00 | 20.35 | --- | --- | --- | --- | --- | --- | --- | --- |
| MW-2 | 07/27/92 | 51.07 | 30.52 | 0.00 | 20.55 | --- | --- | --- | --- | --- | --- | --- | --- |
| MW-2 | 09/15/92 | 51.07 | 31.56 | 0.00 | 19.51 | 75000 | 3200 (c) | 2000 | 6500 | 2300 | 13000 | --- | ANA |
| MW-2 | 12/15/92 | 51.07 | 32.40 | 0.00 | 18.67 | 34000 | 1600 (c) | 6200 | 8900 | 2000 | 7900 | --- | ANA |
| MW-2 | 03/15/93 | 51.07 | 26.14 | 0.00 | 24.93 | 150000 | 8400 | 12000 | 18000 | 3200 | 22000 | --- | PACE |
| MW-2 (e) | 06/07/93 | 51.07 | 26.38 | Sheen | 24.69 | --- | --- | --- | --- | --- | --- | --- | --- |
| MW-3 | 01/05/92 | 49.95 | 33.69 | 0.00 | 16.26 | 7400 | 4000 | 790 | 23 | 210 | 40 | ND | --- |
| MW-3 | 01/10/92 | 50.00 | 33.74 | 0.00 | 16.26 | --- | --- | --- | --- | --- | --- | --- | --- |
| MW-3 | 06/05/92 | 50.00 | 29.65 | 0.00 | 20.35 | 2000 | --- | 130 | 5.3 | 93 | 20 | --- | --- |
| MW-3 | 07/24/92 | 49.95 | 30.14 | 0.00 | 19.81 | --- | --- | --- | --- | --- | --- | --- | --- |
| MW-3 | 07/27/92 | 49.95 | 30.14 | 0.00 | 19.81 | --- | --- | --- | --- | --- | --- | --- | --- |
| MW-3 | 09/15/92 | 49.95 | 31.07 | 0.00 | 18.88 | 450 | ND<50 | 55 | 3.1 | 34 | 7.1 | --- | ANA |
| MW-3 | 12/15/92 | 49.95 | 31.93 | 0.00 | 18.02 | 12000 | 710 (c) | 940 | ND<50 | 310 | 120 | --- | ANA |
| MW-3 | 03/15/93 | 49.95 | 25.71 | 0.00 | 24.24 | ND<50 | 60 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 | --- | PACE |
| MW-3 | 06/07/93 | 49.95 | 25.80 | 0.00 | 24.15 | 160 | ND<50 | 36 | ND<0.5 | 0.9 | 1.3 | --- | PACE |
| MW-4 | 07/24/92 | 50.76 | 30.02 | 0.00 | 20.74 | 42000 | --- | 3200 | 3600 | 1400 | 4100 | --- | --- |
| MW-4 | 07/27/92 | 50.76 | 30.02 | 0.00 | 20.74 | --- | --- | --- | --- | --- | --- | --- | --- |
| MW-4 | 09/15/92 | 50.76 | 31.14 | 0.00 | 19.62 | 55000 | 1700 (c) | 7600 | 13000 | 2800 | 9500 | --- | ANA |
| MW-4 | 12/15/92 | 50.76 | 31.98 | 0.00 | 18.78 | 36000 | 2200 (c) | 3700 | 4700 | 1200 | 4000 | --- | ANA |
| MW-4 | 03/15/93 | 50.76 | 25.34 | 0.00 | 25.42 | 69000 | 1200 | 7600 | 15000 | 2500 | 11000 | --- | PACE |
| MW-4 | 06/07/93 | 50.76 | 25.67 | 0.00 | 25.09 | 73000 | 2500 | 10000 | 19000 | 3400 | 14000 | --- | PACE |

TABLE 1 - SUMMARY OF RESULTS OF GROUNDWATER MONITORING AND SAMPLING
BP OIL COMPANY SERVICE STATION NO. 11117
7210 BANCROFT AVENUE, OAKLAND, CALIFORNIA

ALISTO PROJECT NO. 10-018

| WELL ID | DATE OF SAMPLING/ MONITORING | CASING ELEVATION (a) (Feet) | DEPTH TO WATER (Feet) | PRODUCT THICKNESS (Feet) | GROUNDWATER ELEVATION (b) (Feet) | TPH-G (ppb) | TPH-D (ppb) | B (ppb) | T (ppb) | E (ppb) | X (ppb) | Organic Lead (ppb) | LAB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-6 | 07/24/92 | 50.32 | 30.63 | 0.00 | 19.69 | ND | --- | 1.6 | ND | ND | ND | --- | --- |
| MW-6 | 07/27/92 | 50.32 | 30.63 | 0.00 | 19.69 | --- | --- | --- | --- | --- | --- | --- | --- |
| MW-6 | 09/15/92 | 50.32 | 31.52 | 0.00 | 18.80 | ND<50 | ND<50 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 | --- | ANA |
| MW-6 | 12/15/92 | 50.32 | 32.42 | 0.00 | 17.90 | 58 | ND<50 | 1.3 | ND<0.5 | ND<0.5 | ND<0.5 | --- | ANA |
| MW-6 | 03/15/93 | 50.32 | 26.29 | 0.00 | 24.03 | ND<50 | ND<50 | ND<0.5 | 0.6 | ND<0.5 | 0.7 | --- | PACE |
| MW-6 | 06/07/93 | 50.32 | 26.33 | 0.00 | 23.99 | ND<50 | ND<50 | ND<0.5 | ND<0.5 | ND<0.5 | 1.5 | --- | PACE |
| QC-2 (f) | 09/15/92 | --- | --- | --- | --- | ND<50 | --- | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 | --- | ANA |
| QC-2 (f) | 12/15/92 | --- | --- | --- | --- | ND<50 | --- | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 | --- | ANA |
| QC-2 (f) | 03/15/93 | --- | --- | --- | --- | ND<50 | --- | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 | --- | PACE |
| QC-2 (f) | 06/07/93 | --- | --- | --- | --- | ND<50 | --- | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 | --- | PACE |

ABBREVIATIONS:

| | |
|---|---|
| TPH-G | Total petroleum hydrocarbons as gasoline |
| TPH-D | Total petroleum hydrocarbons as diesel |
| B | Benzene |
| T | Toluene |
| E | Ethylbenzene |
| X | Total xylenes |
| ppb | Parts per billion |
| ND | Not detected above reported detection limit |
| --- | Not measured/analyzed/available |
| ANA | Anametrix, Inc. |
| PACE | Pace, Inc. |

NOTES:

(a) Casing elevations surveyed to the nearest 0.01 foot relative to mean sea level.

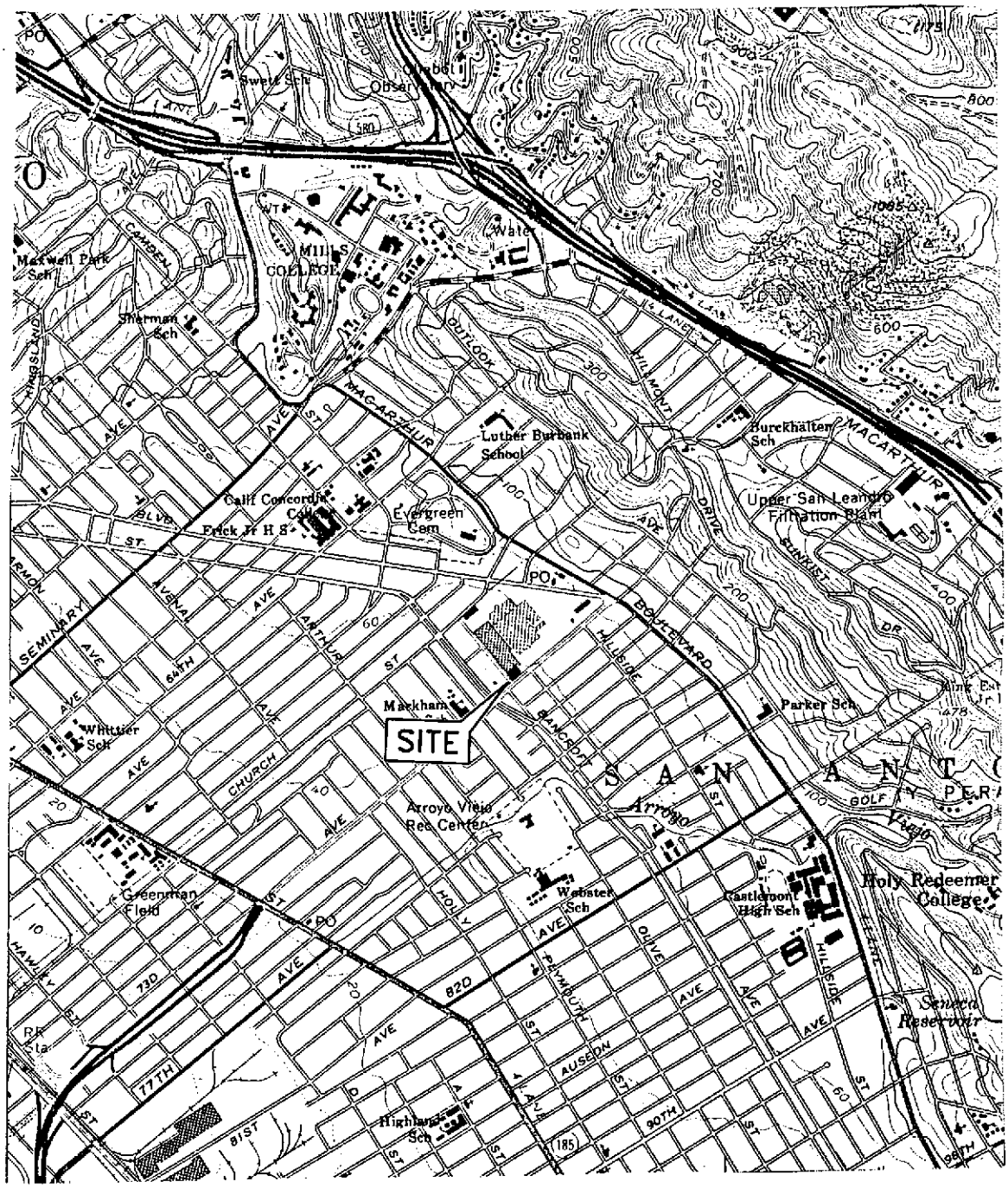
(b) Groundwater elevations in feet relative to mean sea level.

(c) Concentrations reported as diesel from MW-1, MW-2, and MW-4 are primarily due to the presence of a lighter petroleum product, possibly gasoline or kerosene.

(d) Blind duplicate of sample collected from MW-1.

(e) Well not sampled due to presence of free product.

(f) Travel blank.




SOURCE:
USGS MAP, OAKLAND EAST QUADRANGLE, CALIFORNIA.
7.5 MINUTE SERIES. 1959. PHOTOREVISED 1980.

# FIGURE 1

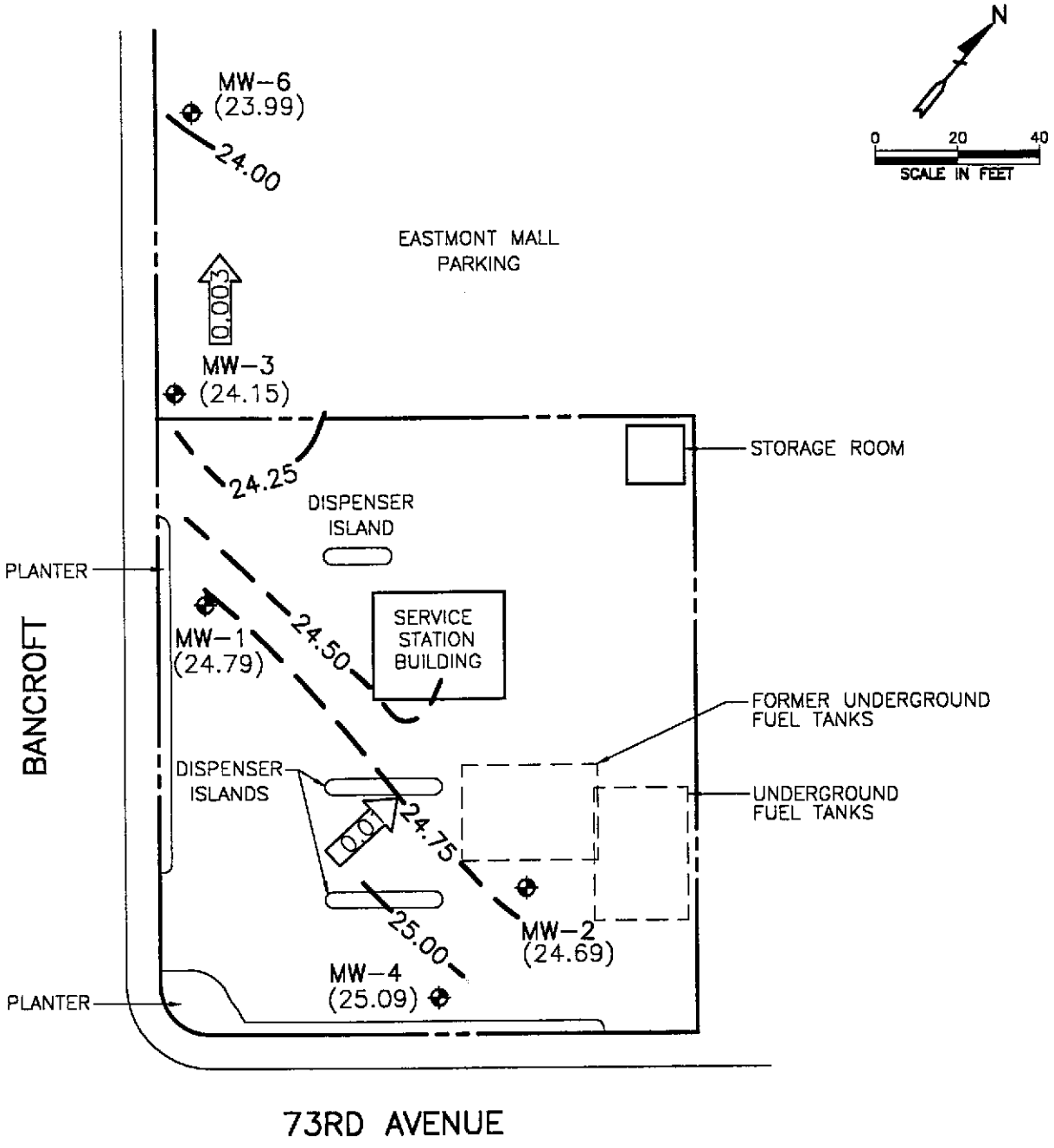
## SITE VICINITY MAP

BP OIL SERVICE STATION NO. 11117
7210 BANCROFT AVENUE
OAKLAND, CALIFORNIA

ALISTO PROJECT NO. 10-018

ALISTO ENGINEERING GROUP
WALNUT CREEK, CALIFORNIA

10018P.001 11-11-92 JNF 1st




## LEGEND

- ⊕ GROUNDWATER MONITORING WELL
- (24.79) GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL
- 25.00 GROUNDWATER ELEVATION CONTOUR IN FEET ABOVE MEAN SEA LEVEL (CONTOUR INTERVAL–0.25 FOOT)
- 0.003 CALCULATED GROUNDWATER GRADIENT DIRECTION AND MAGNITUDE IN FOOT PER FOOT

# FIGURE 2

## POTENTIOMETRIC GROUNDWATER ELEVATION CONTOUR MAP

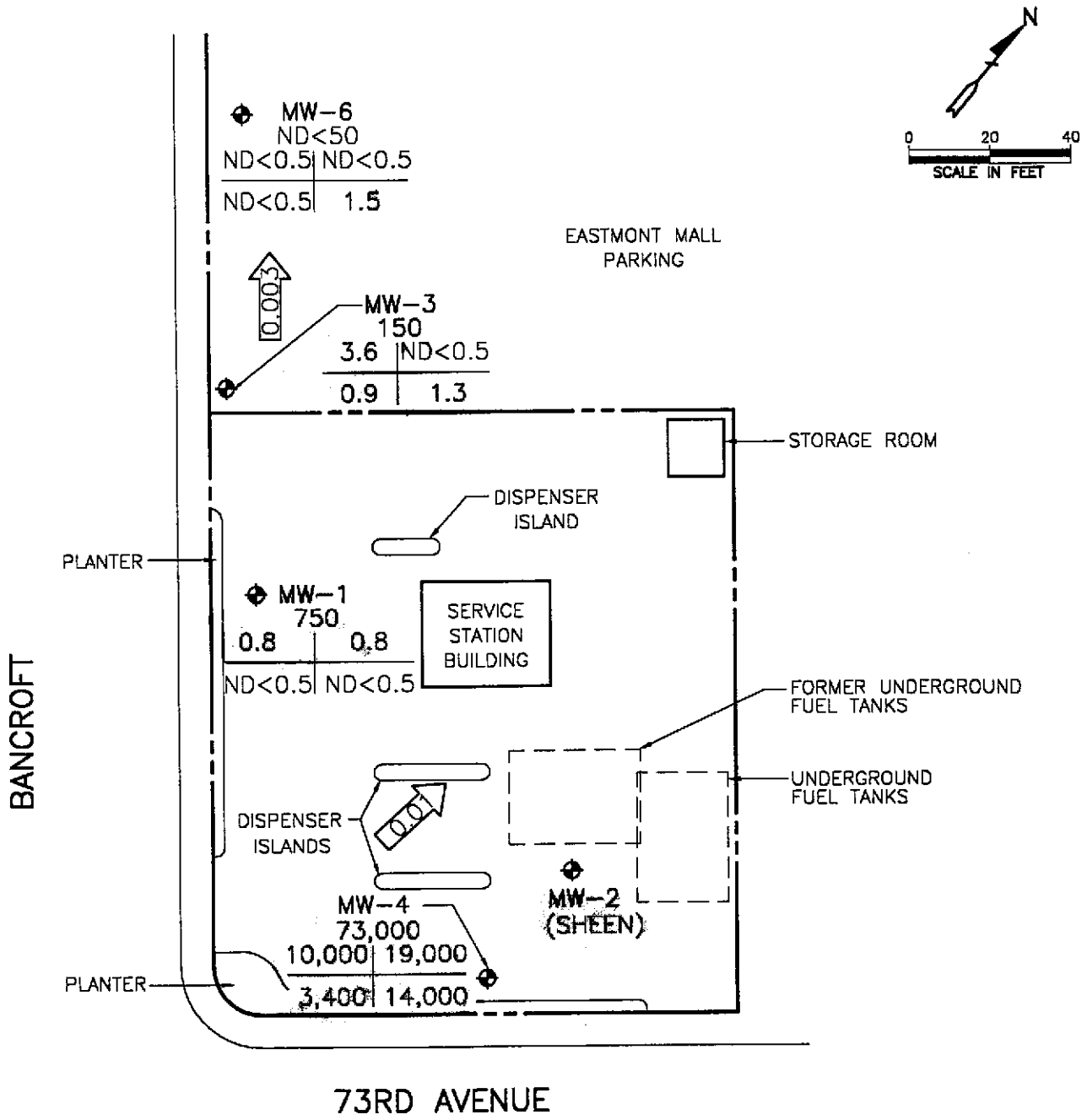
## JUNE 7, 1993

BP OIL SERVICE STATION NO. 11117
7210 BANCROFT AVENUE
OAKLAND, CALIFORNIA

PROJECT NO. 10–018

ALISTO ENGINEERING GROUP
WALNUT CREEK, CALIFORNIA

10018D-F.DWG 7-20-93 RKW 1=40




## LEGEND

| | |
|---|---|
| ◆ | GROUNDWATER MONITORING WELL |
| TPH-G / B \| T / E \| X | CONCENTRATION OF CONSTITUENTS IN PARTS PER BILLION |
| TPH-G | TOTAL PETROLEUM HYDROCARBONS AS GASOLINE |
| B | BENZENE |
| T | TOLUENE |
| E | ETHYLBENZENE |
| X | TOTAL XYLENES |
| ND | NOT DETECTED ABOVE REPORTED DETECTION LIMIT |
| 0.003 | CALCULATED GROUNDWATER GRADIENT DIRECTION AND MAGNITUDE IN FOOT PER FOOT |

# FIGURE 3

## CONCENTRATIONS OF PETROLEUM HYDROCARBONS IN GROUNDWATER

## JUNE 7, 1993

BP OIL SERVICE STATION NO. 11117
7210 BANCROFT AVENUE
OAKLAND, CALIFORNIA

PROJECT NO. 10-018

ALISTO ENGINEERING GROUP
WALNUT CREEK, CALIFORNIA

10018E-F.DWG 7-20-93 RKW 1=40

# APPENDIX A

# WATER SAMPLING FIELD SURVEY FORMS

10-018-01/004

# ALISTO ENGINEERING GROUP
# GROUNDWATER MONITORING

Client: BP
Alisto Project No: 10-018-01/004
Service Station No: _____

Date: 6/7/93
Field Personnel: LCB
Site Address: Oakland, CA

**FIELD ACTIVITY:**

___Groundwater Monitoring
X Groundwater Sampling
___Well Development

**QUALITY CONTROL SAMPLES:**

MW-1
___ QC-1 Sample Duplicate (Well ID)
X QC-2 Trip Blank
___ QC-3 Rinsate Blank

| Well ID | Well Diam | Order Measured/ Sampled | Total Depth | Depth to Water | Depth to Product | Product Thick-ness | Comments |
|---|---|---|---|---|---|---|---|
| MW-1 | 2" | 4 | 39.52 | 25.01 | Ø | Ø | |
| MW-2 | ↓ | 5 | 39.56 | 26.38 | Sheen | Sheen | * |
| MW-3 | ↓ | 2 | 43.36 | 25.80 | Ø | Ø | |
| MW-4 | ↓ | 3 | 40.00 | 25.67 | ↓ | ↓ | |
| MW-6 | ↓ | 1 | 40.00 | 26.33 | ↓ | ↓ | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**Notes:**

* Did not Sample due to presence of Sheen!

FORM: FS2/121592

# ALISTO ENGINEERING GROUP
## Groundwater Development and Sampling Form

Client: BP
Alisto Project No: 10-018
Service Station No: _____

Date: 6/7/93
Field Personnel: LCB
Address: Oakland, CA

Well ID: MW-1 Field Activity: ___Well Development X Well Sampling ___Product Bailing

**Casing Diameter:**
X 2 Inch (0.16 Gal/foot)
___3 Inch (0.37 Gal/foot)
___4 Inch (0.65 Gal/Foot)
___4.5 Inch (0.83 Gal/foot)
___6 Inch (1.47 Gal/foot)

**Purge Method:**
___Pump (dispos. Poly Tubing)
X Disposable Bailers
___Other
___1.66 PVC Standard Bailer
___3.50 PVC Standard Bailer

**Well Data:**
Ø Depth to Product
Ø Product Thickness
25.01 Depth to Water

**Sampling Method:**
X Disposable Bailer
___Pump

**Decontamination Method:**
X Triple Rinse (Liquinox)
___ Steam Cleaned

**Calculated Purge Volume**

39.52 (Total Depth of Well) - 25.01 (Depth to Water) = 14.51 ft (Water Column) X .16 Gal/Ft (Conversion Factor) = 2.32 Gal (Casing Vol) X 3 (Vols to Purge) = 6.96 (Total Volume)

**Well Development/Sampling Parameters**

| Time | Temp °F | pH | Cond. (umhos/cm) | Purge Vol (Gal) | Comments/ Turbidity | Analysis Required | Container Type | Preserv |
|---|---|---|---|---|---|---|---|---|
| 1506 | 73.9 | 7.56 | X1000 .63 | 1.50 | Clear | X TPH-G/BTEX | VOA | HCL |
| 1512 | 73.6 | 7.49 | .57 | 3.00 | | X TPH-Diesel | Amber Liter | Solvent Rinsed |
| 1518 | 73.2 | 7.42 | .57 | 4.25 | | EPA 601 | VOA | |
| 1524 | 72.8 | 7.36 | .55 | 5.75 | | TOG 5520BF | Amber Liter | $H_2SO_4$ |
| 1530 | 72.6 | 7.34 | .55 | 7.00 | | | | |

Begin 1500 Stop 1530 Sampled 1535

QC-1 dup taken from this well

FORM: FS3/121592

# ALISTO ENGINEERING GROUP
## Groundwater Development and Sampling Form

Client: BP
Alisto Project No: 10-018
Service Station No: _____

Date: 6/7/93
Field Personnel: LCB
Address: Oakland

Well ID: MW-3 Field Activity: ___Well Development X Well Sampling ___Product Bailing

**Casing Diameter:**

X 2 Inch (0.16 Gal/foot)
___3 Inch (0.37 Gal/foot)
___4 Inch (0.65 Gal/Foot)
___4.5 Inch (0.83 Gal/foot)
___6 Inch (1.47 Gal/foot)

**Purge Method:**

___Pump (dispos. Poly Tubing)
X Disposable Bailers
___Other
___1.66 PVC Standard Bailer
___3.50 PVC Standard Bailer

**Well Data:**

0 Depth to Product
0 Product Thickness
25.80 Depth to Water

**Sampling Method:**

X Disposable Bailer
___Pump

**Decontamination Method:**

X Triple Rinse (Liquinox)
___ Steam Cleaned

**Calculated Purge Volume**

43.36 (Total Depth of Well) - 25.80 (Depth to Water) = 17.56 ft (Water Column) X .16 Gal/Ft (Conversion Factor) = 2.81 Gal (Casing Vol) X 3 (Vols to Purge) = 8.43 (Total Volume)

**Well Development/Sampling Parameters**

| Time | Temp °F | pH | Cond. (umhos/cm) | Purge Vol (Gal) | Comments/ Turbidity | Analysis Required | Container Type | Preserv |
|---|---|---|---|---|---|---|---|---|
| 1411 | 73.2 | 7.76 | .60 x1000 | 1.75 | clear | X TPH-G/BTEX | VOA | HCL |
| 1417 | 73.0 | 7.70 | .58 | 3.50 | | X TPH-Diesel | Amber Liter | Solvent Rinsed |
| 1423 | 72.7 | 7.63 | .56 | 5.25 | | EPA 601 | VOA | |
| 1429 | 72.4 | 7.58 | .54 | 7.00 | | TOG 5520BF | Amber Liter | $H_2SO_4$ |
| 1435 | 72.1 | 7.54 | .54 | 8.50 | | | | |

Begin 1405 Stop 1435 Sampled 1500

FORM: FS3/121592

# ALISTO ENGINEERING GROUP
## Groundwater Development and Sampling Form

Client: BP
Alisto Project No: 10-018
Service Station No: _____

Date: 6/7/93
Field Personnel: LB
Address: Oakland, Ca

Well ID: MW-4 Field Activity: ___Well Development X Well Sampling ___Product Bailing

**Casing Diameter:**
- X 2 Inch (0.16 Gal/foot)
- ___3 Inch (0.37 Gal/foot)
- ___4 Inch (0.65 Gal/Foot)
- ___4.5 Inch (0.83 Gal/foot)
- ___6 Inch (1.47 Gal/foot)

**Purge Method:**
- ___Pump (dispos. Poly Tubing)
- X Disposable Bailers
- ___Other
- ___1.66 PVC Standard Bailer
- ___3.50 PVC Standard Bailer

**Well Data:**
- 0 Depth to Product
- 0 Product Thickness
- 25.67 Depth to Water

**Sampling Method:**
- X Disposable Bailer
- ___Pump

**Decontamination Method:**
- X Triple Rinse (Liquinox)
- ___ Steam Cleaned

**Calculated Purge Volume**

40.00 (Total Depth of Well) - 25.67 (Depth to Water) = 14.33 ft (Water Column) X .16 Gal/Ft (Conversion Factor) = 2.29 Gal (Casing Vol) X 3 (Vols to Purge) = 6.87 (Total Volume)

**Well Development/Sampling Parameters**

| Time | Temp °F | pH | Cond. (umhos/cm) | Purge Vol (Gal) | Comments/ Turbidity | Analysis Required | Container Type | Preserv |
|---|---|---|---|---|---|---|---|---|
| 1321 | 75.0 | 7.46 | X1000 .99 | 1.25 | Lt Brown | X TPH-G/BTEX | VOA | HCL |
| 1327 | 74.3 | 7.33 | .97 | 2.75 | | X TPH-Diesel | Amber Liter | Solvent Rinsed |
| 1333 | 74.0 | 7.26 | .94 | 4.00 | | EPA 601 | VOA | |
| 1339 | 73.6 | 7.23 | .92 | 5.50 | | TOG 5520BF | Amber Liter | $H_2SO_4$ |
| 1345 | 73.2 | 7.18 | .91 | 7.00 | | | | |

Begin 1315 Stop 1345 Sampled 1400

FORM: FS3/121592

# ALISTO ENGINEERING GROUP
## Groundwater Development and Sampling Form

Client: BP
Alisto Project No: 10-018
Service Station No:

Date: 6/7/93
Field Personnel: LCB
Address: Oakland, CA

Well ID: MW-6 Field Activity: ___Well Development X Well Sampling ___Product Bailing

**Casing Diameter:**

X 2 Inch (0.16 Gal/foot)
___3 Inch (0.37 Gal/foot)
___4 Inch (0.65 Gal/Foot)
___4.5 Inch (0.83 Gal/foot)
___6 Inch (1.47 Gal/foot)

**Purge Method:**

___Pump (dispos. Poly Tubing)
X Disposable Bailers
___Other
___1.66 PVC Standard Bailer
___3.50 PVC Standard Bailer

**Well Data:**

Ø Depth to Product
Ø Product Thickness
26.33 Depth to Water

**Sampling Method:**

X Disposable Bailer
___Pump

**Decontamination Method:**

X Triple Rinse (Liquinox)
___ Steam Cleaned

**Calculated Purge Volume**

40.00 (Total Depth of Well) - 26.33 (Depth to Water) = 13.67 ft (Water Column) X .16 Gal/Ft (Conversion Factor) = 2.19 Gal (Casing Vol) X 3 (Vols to Purge) = 6.57 (Total Volume)

**Well Development/Sampling Parameters**

| Time | Temp °F | pH | Cond. (umhos/cm) | Purge Vol (Gal) | Comments/ Turbidity | Analysis Required | Container Type | Preserv |
|---|---|---|---|---|---|---|---|---|
| | | | X1000 | | | | | |
| 1302 | 74.9 | 7.97 | .66 | 1.25 | clear | X TPH-G/BTEX | VOA | HCL |
| 1304 | 74.3 | 7.86 | .63 | 2.75 | | X TPH-Diesel | Amber Liter | Solvent Rinsed |
| 1306 | 74.0 | 7.81 | .61 | 4.25 | | EPA 601 | VOA | |
| 1308 | 73.4 | 7.77 | .59 | 5.75 | | TOG 5520BF | Amber Liter | $H_2SO_4$ |
| 1310 | 73.0 | 7.73 | .59 | 6.75 | | | | |

Begin 1300 Stop 1310 Sampled 1315

FORM: FS3/121592

# APPENDIX B

# LABORATORY REPORT AND CHAIN OF CUSTODY RECORD

pace INCORPORATED
THE ASSURANCE OF QUALITY

# REPORT OF LABORATORY ANALYSIS

Alisto Engineering Group
1777 Oakland Blvd, Ste. 200
Walnut Creek, CA 94596

June 24, 1993
PACE Project Number: 430608518

Attn: Mr. Brady Nagle

Client Reference: BP Station # 11117

| | | | | |
|---|---|---|---|---|
| PACE Sample Number: | | | 70 0088577 | |
| Date Collected: | | | 06/07/93 | |
| Date Received: | | | 06/08/93 | |
| | | | QC-2 | |
| Parameter | Units | MDL | | DATE ANALYZED |
| ORGANIC ANALYSIS | | | | |
| PURGEABLE FUELS AND AROMATICS | | | | |
| TOTAL FUEL HYDROCARBONS, (LIGHT): | | | - | 06/16/93 |
| Purgeable Fuels, as Gasoline (EPA 8015M) | ug/L | 50 | ND | 06/16/93 |
| PURGEABLE AROMATICS (BTXE BY EPA 8020M): | | | - | 06/16/93 |
| Benzene | ug/L | 0.5 | ND | 06/16/93 |
| Toluene | ug/L | 0.5 | ND | 06/16/93 |
| Ethylbenzene | ug/L | 0.5 | ND | 06/16/93 |
| Xylenes, Total | ug/L | 0.5 | ND | 06/16/93 |

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

An Equal Opportunity Employer

# REPORT OF LABORATORY ANALYSIS



June 24, 1993
PACE Project Number: 430608518

Client Reference: BP Station # 11117

| | | | | |
|---|---|---|---|---|
| PACE Sample Number: | | | 70 0088585 | |
| Date Collected: | | | 06/07/93 | |
| Date Received: | | | 06/08/93 | |
| Client Sample ID: | | | MW-6 | |
| Parameter | Units | MDL | | DATE ANALYZED |
| ORGANIC ANALYSIS | | | | |
| PURGEABLE FUELS AND AROMATICS | | | | |
| TOTAL FUEL HYDROCARBONS, (LIGHT): | | | - | 06/16/93 |
| Purgeable Fuels, as Gasoline (EPA 8015M) | ug/L | 50 | ND | 06/16/93 |
| PURGEABLE AROMATICS (BTXE BY EPA 8020M): | | | - | 06/16/93 |
| Benzene | ug/L | 0.5 | ND | 06/16/93 |
| Toluene | ug/L | 0.5 | ND | 06/16/93 |
| Ethylbenzene | ug/L | 0.5 | ND | 06/16/93 |
| Xylenes, Total | ug/L | 0.5 | 1.5 | 06/16/93 |
| EXTRACTABLE FUELS EPA 3510/8015 | | | | |
| Extractable Fuels, as Diesel | mg/L | 0.05 | ND | 06/11/93 |
| Date Extracted | | | 06/10/93 | |

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

An Equal Opportunity Employer

# REPORT OF LABORATORY ANALYSIS



June 24, 1993
PACE Project Number: 430608518

Client Reference: BP Station # 11117

| | | | | |
|---|---|---|---|---|
| PACE Sample Number: | | | 70 0088593 | |
| Date Collected: | | | 06/07/93 | |
| Date Received: | | | 06/08/93 | |
| Client Sample ID: | | | MW-3 | |
| Parameter | Units | MDL | | DATE ANALYZED |
| ORGANIC ANALYSIS | | | | |
| PURGEABLE FUELS AND AROMATICS | | | | |
| TOTAL FUEL HYDROCARBONS, (LIGHT): | | | - | 06/16/93 |
| Purgeable Fuels, as Gasoline (EPA 8015M) | ug/L | 50 | 150 | 06/16/93 |
| PURGEABLE AROMATICS (BTXE BY EPA 8020M): | | | - | 06/16/93 |
| Benzene | ug/L | 0.5 | 3.6 | 06/16/93 |
| Toluene | ug/L | 0.5 | ND | 06/16/93 |
| Ethylbenzene | ug/L | 0.5 | 0.9 | 06/16/93 |
| Xylenes, Total | ug/L | 0.5 | 1.3 | 06/16/93 |
| EXTRACTABLE FUELS EPA 3510/8015 | | | | |
| Extractable Fuels, as Diesel | mg/L | 0.05 | ND | 06/11/93 |
| Date Extracted | | | 06/10/93 | |

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

An Equal Opportunity Employer

pace INCORPORATED
THE ASSURANCE OF QUALITY

# REPORT OF LABORATORY ANALYSIS

Mr. Brady Nagle
Page 4

June 24, 1993
PACE Project Number: 430608518

Client Reference: BP Station # 11117

| | | | | |
|---|---|---|---|---|
| PACE Sample Number: | | | 70 0088607 | |
| Date Collected: | | | 06/07/93 | |
| Date Received: | | | 06/08/93 | |
| Client Sample ID: | | | MW-4 | |
| Parameter | Units | MDL | | DATE ANALYZED |
| ORGANIC ANALYSIS | | | | |
| PURGEABLE FUELS AND AROMATICS | | | | |
| TOTAL FUEL HYDROCARBONS, (LIGHT): | | | - | 06/17/93 |
| Purgeable Fuels, as Gasoline (EPA 8015M) | ug/L | 1000 | 73000 | 06/17/93 |
| PURGEABLE AROMATICS (BTXE BY EPA 8020M): | | | - | 06/17/93 |
| Benzene | ug/L | 10 | 10000 | 06/17/93 |
| Toluene | ug/L | 10 | 19000 | 06/17/93 |
| Ethylbenzene | ug/L | 10 | 3400 | 06/17/93 |
| Xylenes, Total | ug/L | 10 | 14000 | 06/17/93 |
| EXTRACTABLE FUELS EPA 3510/8015 | | | | |
| Extractable Fuels, as Diesel | mg/L | 0.05 | 2.5 | 06/11/93 |
| Date Extracted | | | 06/10/93 | |

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

An Equal Opportunity Employer

# REPORT OF LABORATORY ANALYSIS



June 24, 1993
PACE Project Number: 430608518

Client Reference: BP Station # 11117

| | | | | |
|---|---|---|---|---|
| PACE Sample Number: | | | 70 0088615 | |
| Date Collected: | | | 06/07/93 | |
| Date Received: | | | 06/08/93 | |
| Client Sample ID: | | | MW-1 | |
| Parameter | Units | MDL | | DATE ANALYZED |
| ORGANIC ANALYSIS | | | | |
| PURGEABLE FUELS AND AROMATICS | | | | |
| TOTAL FUEL HYDROCARBONS, (LIGHT): | | | - | 06/18/93 |
| Purgeable Fuels, as Gasoline (EPA 8015M) | ug/L | 50 | 750 | 06/18/93 |
| PURGEABLE AROMATICS (BTXE BY EPA 8020M): | | | - | 06/18/93 |
| Benzene | ug/L | 0.5 | 0.8 | 06/18/93 |
| Toluene | ug/L | 0.5 | 0.8 | 06/18/93 |
| Ethylbenzene | ug/L | 0.5 | ND | 06/18/93 |
| Xylenes, Total | ug/L | 0.5 | ND | 06/18/93 |
| EXTRACTABLE FUELS EPA 3510/8015 | | | | |
| Extractable Fuels, as Diesel | mg/L | 0.05 | 0.10 | 06/11/93 |
| Date Extracted | | | 06/10/93 | |

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

An Equal Opportunity Employer

pace INCORPORATED
THE ASSURANCE OF QUALITY

# REPORT OF LABORATORY ANALYSIS

Mr. Brady Nagle
Page 6

June 24, 1993
PACE Project Number: 430608518

Client Reference: BP Station # 11117

| | | | | |
|---|---|---|---|---|
| PACE Sample Number: | | | 70 0088623 | |
| Date Collected: | | | 06/07/93 | |
| Date Received: | | | 06/08/93 | |
| Client Sample ID: | | | QC-1 | |
| Parameter | Units | MDL | | DATE ANALYZED |
| ORGANIC ANALYSIS | | | | |
| PURGEABLE FUELS AND AROMATICS | | | | |
| TOTAL FUEL HYDROCARBONS, (LIGHT): | | | - | 06/18/93 |
| Purgeable Fuels, as Gasoline (EPA 8015M) | ug/L | 50 | 720 | 06/18/93 |
| PURGEABLE AROMATICS (BTXE BY EPA 8020M): | | | - | 06/18/93 |
| Benzene | ug/L | 0.5 | 0.7 | 06/18/93 |
| Toluene | ug/L | 0.5 | 0.7 | 06/18/93 |
| Ethylbenzene | ug/L | 0.5 | ND | 06/18/93 |
| Xylenes, Total | ug/L | 0.5 | ND | 06/18/93 |

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

An Equal Opportunity Employer

Mr. Brady Nagle
Page 7

FOOTNOTES
for pages 1 through 6

June 24, 1993
PACE Project Number: 430608518

Client Reference: BP Station # 11117

MDL Method Detection Limit
ND Not detected at or above the MDL.

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

An Equal Opportunity Employer

Mr. Brady Nagle
Page 8

QUALITY CONTROL DATA

June 24, 1993
PACE Project Number: 430608518

Client Reference: BP Station # 11117

EXTRACTABLE FUELS EPA 3510/8015
Batch: 70 21904
Samples: 70 0088585, 70 0088593, 70 0088607, 70 0088615

METHOD BLANK:

| Parameter | Units | MDL | Method Blank |
|---|---|---|---|
| Extractable Fuels, as Diesel | mg/L | 0.05 | ND |

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

| Parameter | Units | MDL | Reference Value | Recv | Dupl Recv | RPD |
|---|---|---|---|---|---|---|
| Extractable Fuels, as Diesel | mg/L | 0.05 | 1.00 | 93% | 89% | 4% |

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

An Equal Opportunity Employer

Mr. Brady Nagle
Page 9

QUALITY CONTROL DATA

June 24, 1993
PACE Project Number: 430608518

Client Reference: BP Station # 11117

PURGEABLE FUELS AND AROMATICS
Batch: 70 22009
Samples: 70 0088577, 70 0088585, 70 0088593

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 |

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

| Parameter | Units | MDL | Reference Value | Recv | Dupl Recv | RPD |
|---|---|---|---|---|---|---|
| Purgeable Fuels, as Gasoline (EPA 8015M | ug/L | 50 | 1000 | 96% | 99% | 3% |
| Benzene | ug/L | 0.5 | 40.0 | 93% | 99% | 6% |
| Toluene | ug/L | 0.5 | 40.0 | 86% | 93% | 7% |
| Ethylbenzene | ug/L | 0.5 | 40.0 | 88% | 96% | 8% |
| Xylenes, Total | ug/L | 0.5 | 120 | 89% | 97% | 8% |

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

An Equal Opportunity Employer

Mr. Brady Nagle
Page 10

QUALITY CONTROL DATA

June 24, 1993
PACE Project Number: 430608518

Client Reference: BP Station # 11117

PURGEABLE FUELS AND AROMATICS
Batch: 70 22049
Samples: 70 0088607

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 |

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

| Parameter | Units | MDL | Reference Value | Recv | Dupl Recv | RPD |
|---|---|---|---|---|---|---|
| Purgeable Fuels, as Gasoline (EPA 8015M | ug/L | 50 | 1000 | 94% | 91% | 3% |
| Benzene | ug/L | 0.5 | 40.0 | 100% | 108% | 7% |
| Toluene | ug/L | 0.5 | 40.0 | 95% | 99% | 4% |
| Ethylbenzene | ug/L | 0.5 | 40.0 | 99% | 103% | 3% |
| Xylenes, Total | ug/L | 0.5 | 120 | 99% | 103% | 3% |

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

An Equal Opportunity Employer

Mr. Brady Nagle
Page 11

QUALITY CONTROL DATA

June 24, 1993
PACE Project Number: 430608518

Client Reference: BP Station # 11117

PURGEABLE FUELS AND AROMATICS
Batch: 70 22143
Samples: 70 0088615, 70 0088623

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 |

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

| Parameter | Units | MDL | Reference Value | Recv | Dupl Recv | RPD |
|---|---|---|---|---|---|---|
| Purgeable Fuels, as Gasoline (EPA 8015M | ug/L | 50 | 1000 | 87% | 95% | 8% |
| Benzene | ug/L | 0.5 | 100 | 104% | 109% | 4% |
| Toluene | ug/L | 0.5 | 100 | 103% | 103% | 0% |
| Ethylbenzene | ug/L | 0.5 | 100 | 100% | 97% | 3% |
| Xylenes, Total | ug/L | 0.5 | 300 | 94% | 88% | 6% |

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

An Equal Opportunity Employer

Client Reference: BP Station # 11117

| | |
|---|---|
| MDL | Method Detection Limit |
| ND | Not detected at or above the MDL. |
| RPD | Relative Percent Difference |

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

An Equal Opportunity Employer

430608.5/8

pace INCORPORATED THE ASSURANCE OF QUALITY

# B.P. OIL COMPANY

**16400 Southcenter Parkway, Suite 301, Tukwila, WA 98188**

**CHAIN OF CUSTODY**

№ 0163

☒ Novato, CA, 11 Digital Drive, 94949
Phone: (415) 883-6100 Fax: (415) 883-2673

☐ Huntington Beach, CA, 5702 Bolsa Avenue, 92649
Phone: (714) 892-2565 Fax: (714) 890-4032

| | | |
|---|---|---|
| Consultant's Name: Alisto Engineering | Consultant Project #: 10-018 | Page 1 of 1 |
| Address: 1777 Oakland Blvd #200, Walnut Creek Ca 94596 | | |
| Project Contact: Brady Nagle | Phone #: 295-1650 Fax #: 295-1823 | Consultant Work Order #: |
| Sampled by (print): Larry Buenvenida | Sampler's Signature: | B.P. Site Location #: 11117 |
| Shipment Method: Courier Airbill #: | Shipment Date: | B.P. Site Location: Oakland |

TAT: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☒ Standard (10 day)

ANALYSIS REQUIRED

Sample Condition as Received
Temperature ° C: _____
Cooler #: _____
Inbound Seal Yes No
Outbound Seal Yes No

| Sample Description | Collection Date/Time | Matrix Soil/Water | Prsv | # of Cont | PACE Sample # | TPH/GAS/BTEX EPA 8015/8020 | TPH/Diesel EPA 8015 | TRPH EPA 418.1 | HVOC 8010 | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|
| QC-2 | 6/7/93 | W | HCL | 2 | 8857.7 | X | | | | 2 VOAs TB (6/9/93) |
| MW-6 | | | | 3 | 8858.5 | | X | | | 3 VOAs, 1 Liter |
| MW-3 | | | | | 8859.3 | | | | | |
| MW-4 | | | | | 8860.7 | | | | | |
| MW-1 | | | | | 8861.5 | | | | | |
| QC-1 | | | | 3 | 8862.3 | | | | | 3 VOAs |

| Relinquished by/Affiliation | Date | Time | Accepted by/Affiliation | Date | Time | Additional Comments: |
|---|---|---|---|---|---|---|
| | 6/8/93 | 15 10 | | 6/8 | 1571 | |
| | 6/8 | 1520 | | 6/8 | 1600 | |
| 5/2, C/5 | | | | | | |

White: Original Yellow: P.B. Oil Pink: Lab Goldenrod: Consultant Field Staff