



BP OIL

ALCO  
HAZMAT

94 FEB 22 PM 2:33

February 17, 1994

Mr. Richard Hiett  
California Regional Water Quality Control Board  
San Francisco Bay Region  
2101 Webster Street, Suite 500  
Oakland, CA 94612

RE: BP OIL FACILITY #11102  
100 MacArthur Blvd.  
Oakland, California

Dear Mr. Hiett:

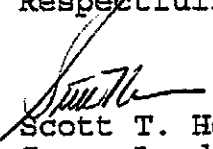
Enclosed please find our GROUNDWATER MONITORING AND SAMPLING  
DATED Jan. 27, 1993 for the above referenced facility.

We have moved, our new address is:

BP OIL  
Environmental Resources Management  
295 SW 41st Street, Suite N  
Renton, WA 98055

Please call me at (206) 251-0689 with questions regarding this  
submission.

Respectfully,

  
Scott T. Hooton  
Group Leader

STH:cj ERM11102

cc: Ms. Jennifer Eberle, Alameda County Health Care Service  
Agency, 80 Swan Way, Room 200, Oakland, CA 94621

Mr. Al Sevilla, Alisto, 1777 Oakland Blvd., Suite 200,  
Walnut Creek, CA 94596

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

Site file

**GROUNDWATER MONITORING AND SAMPLING REPORT**

**BP Oil Company Service Station No. 11102  
100 MacArthur Boulevard  
Oakland, California**

**Project No. 10-076-02-002**

**Prepared for:**

**BP Oil Company  
Environmental Resources Management  
295 S.W. 41st Street  
Building 13, Suite N  
Renton, Washington**

**Prepared by:**

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

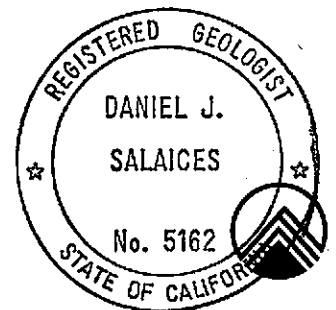
**January 27, 1994**

*William Howell*

**William Howell  
Project Manager**

*Dan Salaices*

**Dan Salaices  
Registered Geologist**



# GROUNDWATER MONITORING AND SAMPLING REPORT

BP Oil Company Service Station No. 11102  
100 MacArthur Boulevard  
Oakland, California

Project No. 10-076-02-002

January 27, 1994

## INTRODUCTION

This report presents the results and findings of the December 2, 1993 groundwater monitoring and sampling conducted by Alisto Engineering Group at BP Oil Company Service Station No. 11102, 100 MacArthur Boulevard, 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 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 in reference to mean sea level. 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 SAMPLING  
 BP OIL COMPANY SERVICE STATION NO.11102  
 100 MACARTHUR BOULEVARD, OAKLAND, CALIFORNIA

ALISTO PROJECT NO. 10-076

WELL ID	DATE OF SAMPLING/ MONITORING	CASING ELEVATION (a) (Feet)	DEPTH TO WATER (Feet)	GROUNDWATER ELEVATION (b) (Feet)	TPH-G (ppb)	TPH-D (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	1,1-DCA (ppb)	1,2-DCA (ppb)	TOG (ppb)	LAB
MW-1	11/04/89	90.20	13.21	78.99	ND<500	ND<50	3.4	0.8	ND<0.3	ND<0.3	--	0.9	ND<5000	SAL
MW-1	11/11/89	90.20	13.32	78.88	--	--	--	--	--	--	--	--	--	--
MW-1	04/03/90	90.20	12.48	77.74	820	--	64	1.9	23	34	--	--	--	ANA
MW-1	07/30/90	90.20	12.92	77.28	190	ND<50	11	ND<5.0	ND<5.0	ND<5.0	--	ND	ND<5000	ANA
MW-1	11/20/90	90.20	14.08	76.12	50	79	2.4	ND<0.3	ND<0.3	ND<0.3	--	4.0	ND<5000	SAL
MW-1	03/01/91	90.20	13.61	78.59	ND<100	ND<1000	0.9	ND<0.3	ND<0.3	0.3	--	ND	14000	SAL
MW-1	08/19/91	90.20	15.74	74.48	370	ND<50	35	0.73	6.4	5.6	--	1.4	ND<5000	SEQ
MW-1	11/13/91	90.20	14.08	76.12	60	ND<50	0.68	ND<0.3	ND<0.3	ND<0.3	--	1.0	ND<5000	SEQ
MW-1	02/24/92	90.20	12.52	77.68	140	100	3.9	0.66	1.2	3.8	--	1.7	ND<5000	SEQ
MW-1	05/18/92	90.20	11.80	78.40	4200	910	440	21	250	37	--	ND	ND<5000	SEQ
MW-1	06/17/92	90.20	12.01	78.19	4000	560	350	14	150	17	--	ND	ND<5000	SEQ
MW-1	07/22/92	90.20	12.42	77.78	4000	--	ND<5.0	19	210	61	--	--	--	ANA
MW-1	08/14/92	90.20	12.75	77.45	2400	1700	330	20	150	47	--	ND<2.5	ND<5000	SEQ
MW-1	11/11/92	90.20	13.69	76.51	260	92	30	3.4	7.6	6.8	--	ND<2.5	ND<5000	ANA
MW-1	06/07/93	90.20	10.93	79.27	3400	440	98	11	21	7.6	6.2	0.9	--	PACE
QC-1 (c)	06/07/93	--	--	--	3700	--	120	12	26	9.5	--	--	--	PACE
MW-1	12/02/93	90.20	12.72	77.48	1100	120	8.3	3.6	0.6	1.5	2.6	1.8	ND<5000	PACE
MW-2	11/04/89	87.91	15.84	72.07	ND<500	--	6.5	ND<0.3	ND<0.3	ND<0.3	--	--	--	SAL
MW-2	11/11/89	87.91	14.75	73.16	--	--	--	--	--	--	--	--	--	--
MW-2	04/03/90	87.91	15.25	72.66	ND<500	--	ND<0.5	ND<0.5	ND<0.5	ND<0.5	--	--	--	ANA
MW-2	07/30/90	87.91	15.59	72.32	61	--	6.5	ND<0.5	ND<0.5	ND<0.5	--	--	--	ANA
MW-2	11/20/90	87.91	17.81	70.10	ND<50	--	0.3	ND<0.3	ND<0.3	ND<0.3	--	--	--	SAL
MW-2	03/01/91	87.91	17.11	70.89	ND<100	--	0.4	ND<0.3	ND<0.3	ND<0.3	--	4.0	--	SAL
MW-2	08/19/91	87.91	17.97	69.94	ND<30	--	ND<0.3	ND<0.3	ND<0.3	ND<0.3	--	--	--	SEQ
MW-2	11/13/91	87.91	16.76	71.15	38	--	0.32	ND<0.3	ND<0.3	ND<0.3	--	--	--	SEQ
MW-2	02/24/92	87.91	15.07	72.84	ND<50	--	ND<0.50	ND<0.50	ND<0.50	0.68	--	16	--	SEQ
MW-2	05/19/92	87.91	14.70	73.21	ND<50	--	0.55	ND<0.50	ND<0.50	ND<0.50	--	--	--	SEQ
MW-2	07/22/92	87.91	15.60	72.31	90	--	1.3	0.6	0.9	1.9	--	--	--	ANA
MW-2	08/14/92	87.91	15.88	72.03	--	--	--	--	--	--	--	--	--	--
MW-2	11/11/92	87.91	16.19	71.72	52	--	2.8	ND<0.5	ND<0.5	0.9	--	--	--	ANA
QC-1 (c)	11/11/92	--	--	--	65	--	3.2	ND<0.5	ND<0.5	1.0	--	--	--	ANA
MW-2	06/07/93	87.91	14.42	73.49	1200	--	14	2.8	1.9	1.7	--	--	--	PACE
MW-2	12/02/93	87.91	14.94	72.97	790	--	3.4	0.5	10	ND<0.5	--	--	--	PACE
QC-1 (c)	12/02/93	--	--	--	770	--	3.6	0.6	11	ND<0.5	--	--	--	PACE

TABLE 1 - SUMMARY OF RESULTS OF GROUNDWATER SAMPLING  
 BP OIL COMPANY SERVICE STATION NO.11102  
 100 MACARTHUR BOULEVARD, OAKLAND, CALIFORNIA

ALISTO PROJECT NO. 10-076

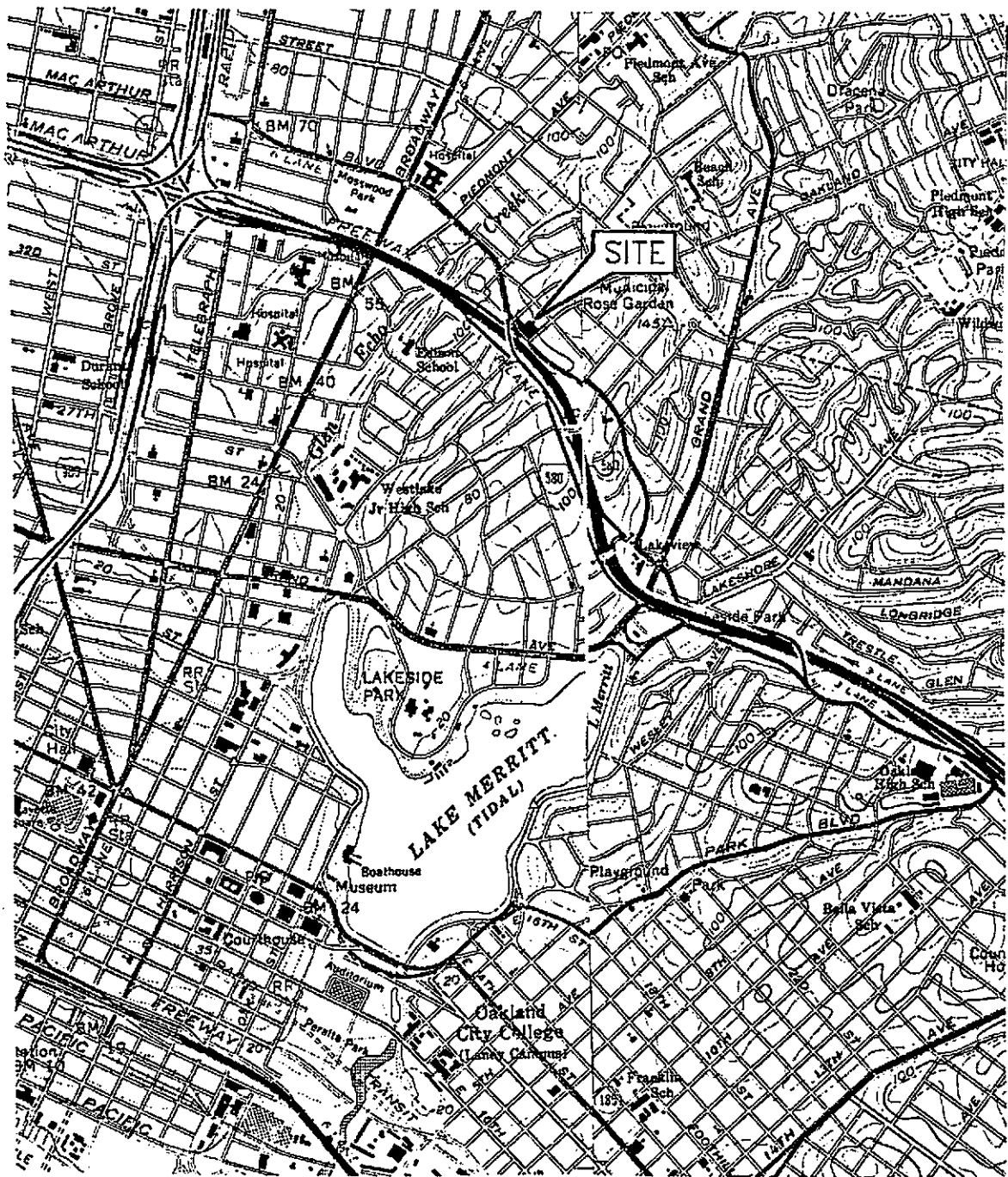
WELL ID	DATE OF SAMPLING/ MONITORING	CASING ELEVATION (a) (Feet)	DEPTH TO WATER (Feet)	GROUNDWATER ELEVATION (b) (Feet)	TPH-G (ppb)	TPH-D (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	1,1-DCA (ppb)	1,2-DCA (ppb)	TOG (ppb)	LAB
MW-3	11/04/89	87.02	15.40	71.62	ND<500	--	ND<0.3	ND<0.3	ND<0.3	ND<0.3	--	--	--	SAL
MW-3	11/11/89	87.02	14.10	72.92	--	--	--	--	--	--	--	--	--	--
MW-3	04/03/90	87.02	13.90	73.12	ND<100	--	ND<0.5	ND<0.5	ND<0.5	ND<0.5	--	--	--	ANA
MW-3	07/30/90	87.02	13.77	73.25	ND<50	--	ND<0.5	ND<0.5	ND<0.5	ND<0.5	--	--	ND<5000	ANA
MW-3	11/20/90	87.02	14.67	72.35	ND<50	--	0.3	0.8	0.4	1.5	--	--	--	SAL
MW-3	03/01/91	87.02	15.22	71.80	ND<100	--	0.4	ND<0.3	ND<0.3	ND<0.3	--	ND	--	SAL
MW-3	08/19/91	87.02	13.15	73.87	ND<30	--	ND<0.3	ND<0.3	ND<0.3	ND<0.3	--	--	--	SEQ
MW-3	11/13/91	87.02	15.66	71.36	ND<30	--	ND<0.3	ND<0.3	ND<0.3	ND<0.3	--	--	--	SEQ
MW-3	02/24/92	87.02	15.01	72.01	ND<50	--	0.65	1.4	0.66	4.4	--	ND	--	SEQ
MW-3	05/18/92	87.02	15.52	71.50	ND<50	--	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	--	--	SEQ
MW-3	07/22/92	87.02	15.63	71.39	ND<50	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	--	ND<0.50	ND<5000	ANA
MW-3	08/14/92	87.02	13.57	73.45	--	--	--	--	--	--	--	--	--	--
MW-3	11/11/92	87.02	14.13	72.89	ND<50	--	ND<0.5	0.7	ND<0.5	1.3	--	--	--	ANA
MW-3	06/07/93	87.02	12.13	74.89	ND<50	--	ND<0.5	ND<0.5	ND<0.5	ND<0.5	--	--	--	PACE
MW-3	12/02/93	87.02	13.29	73.73	ND<50	--	ND<0.5	ND<0.5	ND<0.5	ND<0.5	--	--	--	PACE
QC-2	(d) 11/11/92	--	--	--	ND<50	--	ND<0.5	ND<0.5	ND<0.5	ND<0.5	--	--	--	ANA
QC-2	(d) 06/07/93	--	--	--	ND<50	--	ND<0.5	ND<0.5	ND<0.5	ND<0.5	--	--	--	PACE
QC-2	(d) 12/02/93	--	--	--	ND<50	--	ND<0.5	ND<0.5	ND<0.5	ND<0.5	--	--	--	PAGE

ABBREVIATIONS:

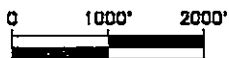
TPH-G Total petroleum hydrocarbons as gasoline  
 TPH-D Total petroleum hydrocarbons as diesel  
 B Benzene  
 T Toluene  
 E Ethylbenzene  
 X Total xylenes  
 1,1-DCA 1,1-dichloroethane  
 1,2-DCA 1,2-dichloroethane  
 TOG Total oil and grease  
 ppb Parts per billion  
 ND Not detected above reported detection limit  
 -- Not analyzed/available/measured  
 SAL Superior Analytical Laboratory  
 ANA Anamatrix, Inc.  
 SEQ Sequoia Analytical Laboratory  
 PACE Pace, Inc.

NOTES:

(a) Top of casing elevations surveyed to the nearest 0.01 foot above mean sea level.  
 (b) Groundwater elevations in feet above mean sea level.  
 (c) Blind duplicate.  
 (d) Travel blank.



SOURCE:  
 USGS MAP, OAKLAND EAST & WEST QUADRANGLES,  
 CALIFORNIA, 7.5 MINUTE SERIES, 1959.  
 PHOTOREVISED 1980.



**FIGURE 1**

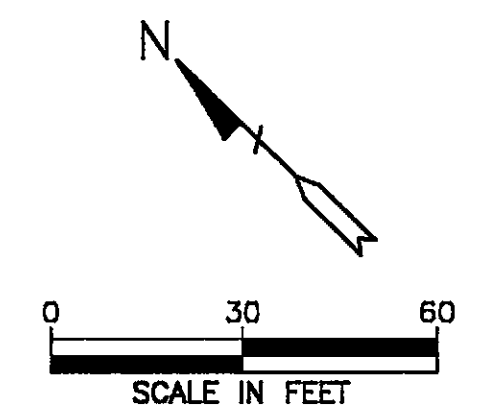
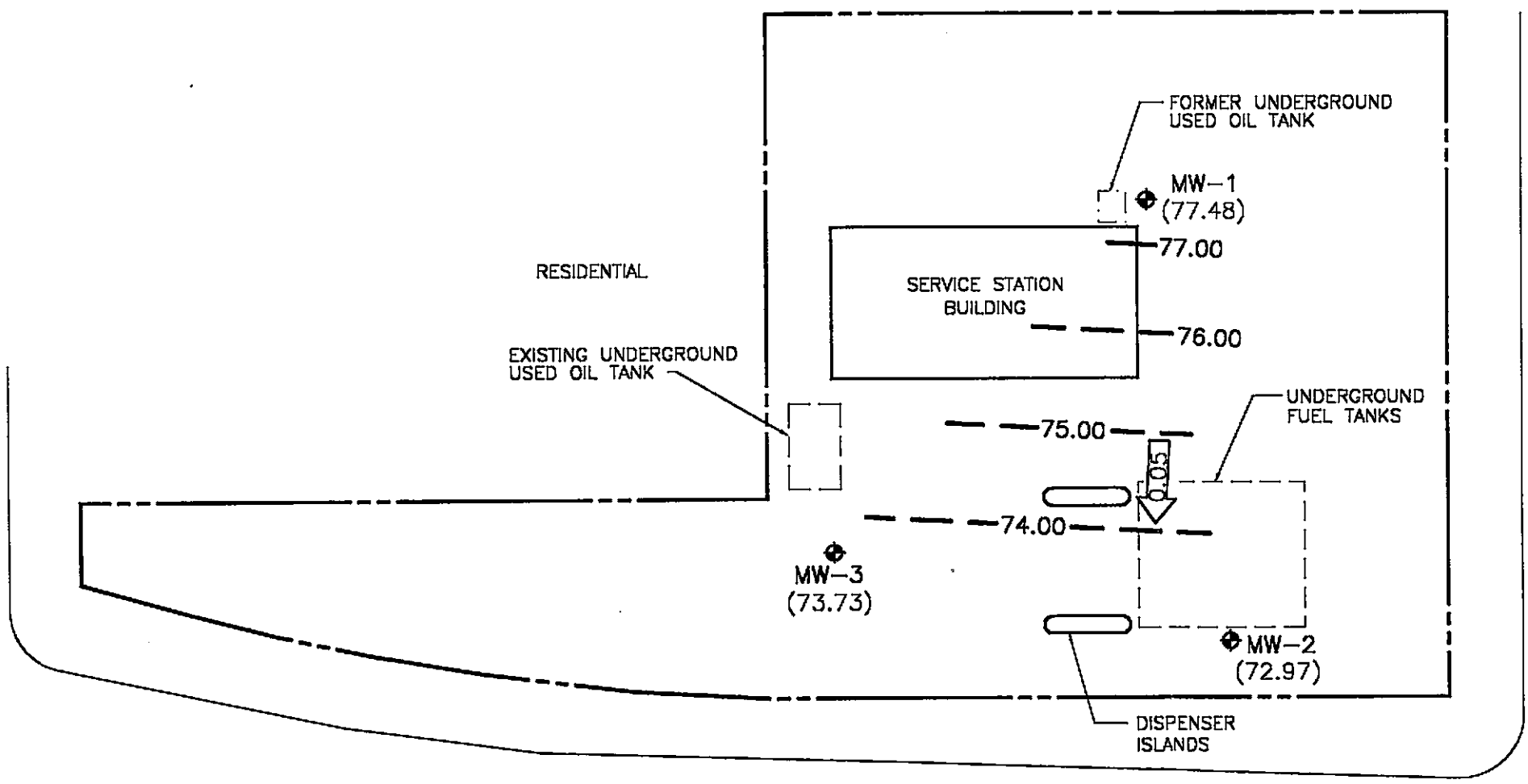
**SITE VICINITY MAP**

**BP OIL SERVICE STATION NO. 11102  
 100 MACARTHUR BOULEVARD  
 OAKLAND, CALIFORNIA**

**PROJECT NO. 10-076**

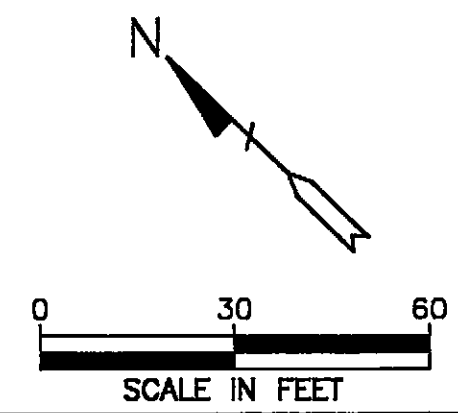
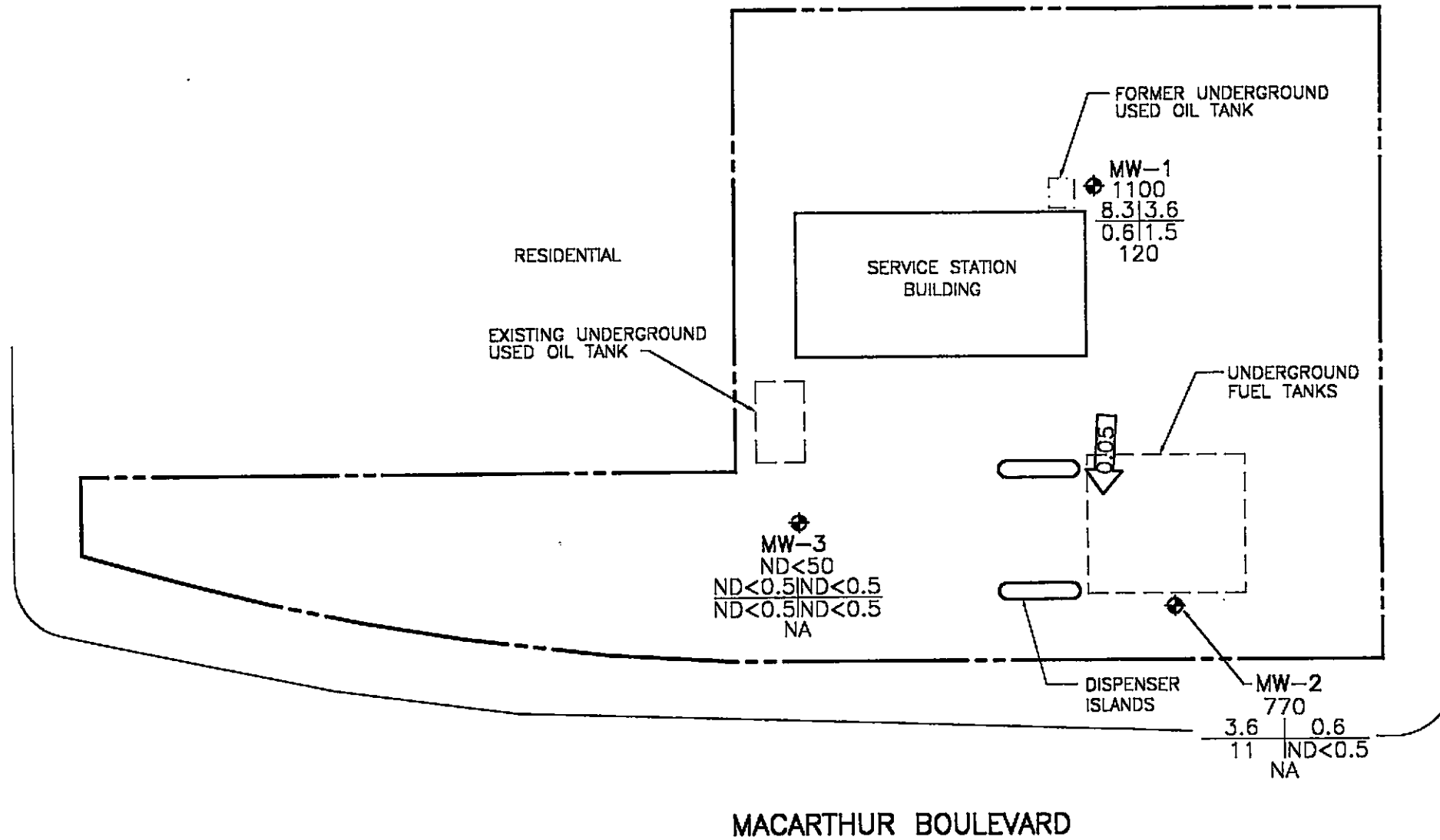


**ALISTO ENGINEERING GROUP**  
 WALNUT CREEK, CALIFORNIA



- LEGEND**
- ◆ GROUNDWATER MONITORING WELL
  - (77.48) GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL
  - 77.00 - GROUNDWATER ELEVATION CONTOUR IN FEET ABOVE MEAN SEA LEVEL (CONTOUR INTERVAL - 1.00 FOOT)
  - ← 0.05 → CALCULATED GROUNDWATER GRADIENT DIRECTION AND MAGNITUDE IN FOOT PER FOOT

**FIGURE 2**  
**POTENTIOMETRIC GROUNDWATER ELEVATION CONTOUR MAP**  
**DECEMBER 2, 1993**  
 BP OIL SERVICE STATION NO. 11102  
 100 MACARTHUR BOULEVARD  
 OAKLAND, CALIFORNIA  
 PROJECT NO. 10-076



**LEGEND**

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

**FIGURE 3**  
**CONCENTRATIONS OF PETROLEUM  
 HYDROCARBONS IN GROUNDWATER**  
**DECEMBER 2, 1993**  
 BP OIL SERVICE STATION NO. 11102  
 100 MACARTHUR BOULEVARD  
 OAKLAND, CALIFORNIA  
 PROJECT NO. 10-076

10076E-10-076-1 (REV) 11/93



**APPENDIX A**  
**WATER SAMPLING FIELD SURVEY FORMS**

# ALISTO ENGINEERING GROUP GROUNDWATER MONITORING

Client: BP  
 Alisto Project No: 10-076-02/002  
 Service Station No: 1102

Date: 12/2/93  
 Field Personnel: LCB  
 Site Address: Oakland

**FIELD ACTIVITY:**

- Groundwater Monitoring
- Groundwater Sampling
- Well Development

**QUALITY CONTROL SAMPLES:**

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

Well ID	Well Diam	Order Measured/Sampled	Total Depth	Depth to Water	Depth to Product	Product Thickness	Comments
MW-1	4"	3	23.20	12.72	Ø	Ø	
MW-2	4"	2	24.80	14.94	Ø	Ø	
MW-3	4"	1	23.60	13.29	Ø	Ø	Water Runoff in well

Notes:

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# ALISTO ENGINEERING GROUP

## Groundwater Development and Sampling Form

Client: BP  
 Alisto Project No: 10-076  
 Service Station No: 1102

Date: 12/2/93  
 Field Personnel: LCB  
 Address: Oakland, CA

Well ID: MW-1 Field Activity: Well Development  Well Sampling Product Bailing

Casing Diameter:

- 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)
- Disposable Bailers
- Other
- 1.66 PVC Standard Bailer
- 3.50 PVC Standard Bailer

Well Data:

- Depth to Product
- Product Thickness
- 12.72 Depth to Water

Sampling Method:

- Disposable Bailer
- Pump

Decontamination Method:

- Triple Rinse (Liquinox)
- Steam Cleaned

Calculated Purge Volume

$$\frac{23.20 - 12.72}{10.48 \text{ ft}} \times 0.65 \text{ Gal/Ft} = 6.81 \text{ Gal} \times 3 = 20.43$$

Total Depth of Well    Depth to Water    Water Column    Conversion Factor    Casing Vol    Vols to Purge    Total Volume

Well Development/Sampling Parameters

Time	Temp °F	pH	Cond. (umhos/cm) X/1000	Purge Vol (Gal)	Comments/Turbidity	Analysis Required	Container Type	Preserv
1459	69.9	7.48	.31	4	Clear	TPH-G/BTEX	VOA	HCL
1503	69.2	7.34	.31	8		TPH-Diesel	Amber Liter	Solvent Rinsed
1507	69.1	7.26	.29	12		EPA 601	VOA	
1511	68.7	7.21	.28	16		TOG 5520BF	Amber Liter	H <sub>2</sub> SO <sub>4</sub>
1515	68.3	7.15	.26	20.50	✓			

Begin 1455    Stop 1515    Sampled 1525

Dissolved O<sub>2</sub>  
 Begin 2.2 PPM  
 End 2.4 PPM

# ALISTO ENGINEERING GROUP

## Groundwater Development and Sampling Form

Client: BP  
 Alisto Project No: 10-076  
 Service Station No: 1102

Date: 12/2/93  
 Field Personnel: LCB  
 Address: Oakland, CA

Well ID: MW-2 Field Activity:  Well Development  Well Sampling  Product Bailing

Casing Diameter:

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)  
 Disposable Bailers  
 Other  
 1.66 PVC Standard Bailer  
 3.50 PVC Standard Bailer

Well Data:

Depth to Product  
 Product Thickness  
14.94 Depth to Water

Sampling Method:

Disposable Bailer  
 Pump

Decontamination Method:

Triple Rinse (Liquinox)  
 Steam Cleaned

Calculated Purge Volume

24.80 - 14.94 = 9.86 ft x .65 Gal/Ft = 6.41 Gal x 3 = 19.23

Total Depth of Well	Depth to Water	Water Column	Conversion Factor	Casing Vol	Vols to Purge	Total Volume
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Well Development/Sampling Parameters

Time	Temp °F	pH	Cond. (umhos/cm) X1000	Purge Vol (Gal)	Comments/Turbidity	Analysis Required	Container Type	Preserv	
1428	72.4	7.70	.26	4	clean	X	VOA	HCL	
1431	72.4	7.39	.29	8	↓		TPH-Diesel	Amber Liter	Solvent Rinsed
1434	72.1	7.29	.29	12			EPA 601	VOA	
1437	72.1	7.21	.27	16			TOG 5520BF	Amber Liter	H <sub>2</sub> SO <sub>4</sub>
1440	71.7	7.16	.27	19.50					

Begin 1425      Stop 1440      Sampled 1445

QC-1 taken from this well

Dissolved O<sub>2</sub>  
 Begin 2.0 PPM  
 End 2.2 PPM

# ALISTO ENGINEERING GROUP

## Groundwater Development and Sampling Form

Client: BP  
 Alisto Project No: 10-076-02/002  
 Service Station No: 1102

Date: 12/2/93  
 Field Personnel: LCB  
 Address: Oakland, CA

Well ID: MW-3 Field Activity:  Well Development  Well Sampling  Product Bailing

Casing Diameter:

- 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)  
 Disposable Bailers  
 Other  
 1.66 PVC Standard Bailer  
 3.50 PVC Standard Bailer

Well Data:

- Depth to Product  
 Product Thickness  
13.29 Depth to Water

Sampling Method:

- Disposable Bailer  
 Pump

Decontamination Method:

- Triple Rinse (Liquinox)  
 Steam Cleaned

Calculated Purge Volume

$$\frac{23.60 - 13.29}{10.31 \text{ ft}} \times 0.65 \text{ Gal/Ft} = 6.70 \text{ Gal} \times \frac{3}{1} = 20.10$$

Total Depth of Well    Depth to Water    Water Column    Conversion Factor    Casing Vol    Vols to Purge    Total Volume

Well Development/Sampling Parameters

Time	Temp °F	pH	Cond. (umhos/cm) X/1000	Purge Vol (Gal)	Comments/Turbidity	Analysis Required	Container Type	Preserv
1354	73.7	8.02	.26	4	Clean ↓	TPH-G/BTEX	VOA	HCL
1358	72.2	7.70	.26	8		TPH-Diesel	Amber Liter	Solvent Rinsed
1402	71.6	7.63	.24	12		EPA 601	VOA	
1406	71.2	7.57	.24	16		TOG 5520BF	Amber Liter	H <sub>2</sub> SO <sub>4</sub>
1410	70.7	7.52	.23	20.25				

Begin 1400  
1350

Stop 1410

Sampled 1420

Replaced 4" Cap

Dissolved O<sub>2</sub>  
 Begin 1.8 PPM  
 End 2.1 PPM

**APPENDIX B**

**LABORATORY REPORT AND CHAIN OF CUSTODY RECORD**



# REPORT OF LABORATORY ANALYSIS

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

December 15, 1993  
 PACE Project Number: 431206510

Attn: Mr. Bill Howell

Client Reference: BP Station # 11102

PACE Sample Number:			70 0204941	
Date Collected:			12/02/93	
Date Received:			12/06/93	
Client Sample ID:			QC-2	
<u>Parameter</u>	<u>Units</u>	<u>MDL</u>		<u>DATE ANALYZED</u>

ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):				
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	ND	12/08/93
PURGEABLE AROMATICS (BTXE BY EPA 8020M):				
Benzene	ug/L	0.5	ND	12/08/93
Toluene	ug/L	0.5	ND	12/08/93
Ethylbenzene	ug/L	0.5	ND	12/08/93
Xylenes, Total	ug/L	0.5	ND	12/08/93

**REPORT OF LABORATORY ANALYSIS**

Mr. Bill Howell  
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December 15, 1993  
 PACE Project Number: 431206510

Client Reference: BP Station # 11102

PACE Sample Number:  
 Date Collected:  
 Date Received:  
 Client Sample ID:  
 Parameter

70 0204950  
 12/02/93  
 12/06/93  
 QC-1

Units                      MDL                      DATE ANALYZED

ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):				
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	-	12/09/93
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			770	12/09/93
Benzene	ug/L	0.5	-	12/09/93
Toluene	ug/L	0.5	3.6	12/09/93
Ethylbenzene	ug/L	0.5	0.6	12/09/93
			11	12/09/93
Xylenes, Total	ug/L	0.5	ND	12/09/93



Mr. Bill Howell  
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December 15, 1993  
 PACE Project Number: 431206510

Client Reference: BP Station # 11102

PACE Sample Number: 70 0204968  
 Date Collected: 12/02/93  
 Date Received: 12/06/93  
 Client Sample ID: MW-1

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>DATE ANALYZED</u>
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ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS

TOTAL FUEL HYDROCARBONS, (LIGHT):		-		12/09/93
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	1100	12/09/93
PURGEABLE AROMATICS (BTXE BY EPA 8020M):		-		12/09/93
Benzene	ug/L	0.5	8.3	12/09/93
Toluene	ug/L	0.5	3.6	12/09/93
Ethylbenzene	ug/L	0.5	0.6	12/09/93
Xylenes, Total	ug/L	0.5	1.5	12/09/93

HALOGENATED VOLATILE COMPOUNDS EPA 8010

Dichlorodifluoromethane	ug/L	2.0	ND	12/07/93
Chloromethane	ug/L	2.0	ND	12/07/93
Vinyl Chloride	ug/L	2.0	ND	12/07/93
Bromomethane	ug/L	2.0	ND	12/07/93
Chloroethane	ug/L	2.0	ND	12/07/93
Trichlorofluoromethane (Freon 11)	ug/L	2.0	ND	12/07/93
1,1-Dichloroethene	ug/L	0.5	ND	12/07/93
Methylene Chloride	ug/L	2.0	ND	12/07/93
trans-1,2-Dichloroethene	ug/L	0.5	ND	12/07/93
cis-1,2-Dichloroethene	ug/L	0.5	ND	12/07/93
1,1-Dichloroethane	ug/L	0.5	2.6	12/07/93
Chloroform	ug/L	0.5	ND	12/07/93
1,1,1-Trichloroethane (TCA)	ug/L	0.5	ND	12/07/93
Carbon Tetrachloride	ug/L	0.5	ND	12/07/93
1,2-Dichloroethane (EDC)	ug/L	0.5	1.8	12/07/93
Trichloroethene (TCE)	ug/L	0.5	ND	12/07/93
1,2-Dichloropropane	ug/L	0.5	ND	12/07/93
Bromodichloromethane	ug/L	0.5	ND	12/07/93
2-Chloroethylvinyl ether	ug/L	0.5	ND	12/07/93
cis-1,3-Dichloropropene	ug/L	0.5	ND	12/07/93
trans-1,3-Dichloropropene	ug/L	0.5	ND	12/07/93
1,1,2-Trichloroethane	ug/L	0.5	ND	12/07/93
Tetrachloroethene	ug/L	0.5	ND	12/07/93

**REPORT OF LABORATORY ANALYSIS**

Mr. Bill Howell  
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December 15, 1993  
 PACE Project Number: 431206510

Client Reference: BP Station # 11102

PACE Sample Number:  
 Date Collected:  
 Date Received:  
 Client Sample ID:

70 0204968  
 12/02/93  
 12/06/93  
 MW-1

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>DATE ANALYZED</u>
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ORGANIC ANALYSIS

HALOGENATED VOLATILE COMPOUNDS EPA 8010

Dibromochloromethane	ug/L	0.5	ND	12/07/93
Chlorobenzene	ug/L	0.5	ND	12/07/93
Bromoform	ug/L	0.5	ND	12/07/93
1,1,2,2-Tetrachloroethane	ug/L	0.5	ND	12/07/93
1,3-Dichlorobenzene	ug/L	0.5	ND	12/07/93
1,4-Dichlorobenzene	ug/L	0.5	ND	12/07/93
1,2-Dichlorobenzene	ug/L	0.5	ND	12/07/93
Bromochloromethane (Surrogate Recovery)	%		129	12/07/93
1,4-Dichlorobutane (Surrogate Recovery)	%		114	12/07/93

EXTRACTABLE FUELS EPA 3510/8015

Extractable Fuels, as Diesel	mg/L	0.05	0.12	12/10/93
Date Extracted			12/09/93	

OIL AND GREASE, SILICA GEL (LUFT)

Oil and Grease, Gravimetric (SM5520)	mg/L	5.0	ND	12/13/93
Date Extracted			12/10/93	

**REPORT OF LABORATORY ANALYSIS**

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December 15, 1993  
 PACE Project Number: 431206510

Client Reference: BP Station # 11102

PACE Sample Number:  
 Date Collected:  
 Date Received:  
 Client Sample ID:  
 Parameter

70 0204976  
 12/02/93  
 12/06/93  
 MW-2

Units                      MDL                      DATE ANALYZED

ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):				
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	790	12/09/93
PURGEABLE AROMATICS (BTXE BY EPA 8020M):				
Benzene	ug/L	0.5	3.4	12/09/93
Toluene	ug/L	0.5	0.5	12/09/93
Ethylbenzene	ug/L	0.5	10	12/09/93
Xylenes, Total	ug/L	0.5	ND	12/09/93



# REPORT OF LABORATORY ANALYSIS

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December 15, 1993  
PACE Project Number: 431206510

Client Reference: BP Station # 11102

PACE Sample Number: 70 0204984  
Date Collected: 12/02/93  
Date Received: 12/06/93  
Client Sample ID: MW-3

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>DATE ANALYZED</u>
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### ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS			
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

These data have been reviewed and are approved for release.

*Darrell C. Cain*  
Darrell C. Cain  
Regional Director



# REPORT OF LABORATORY ANALYSIS

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FOOTNOTES  
for pages 1 through 6

December 15, 1993  
PACE Project Number: 431206510

Client Reference: BP Station # 11102

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

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QUALITY CONTROL DATA

December 15, 1993  
 PACE Project Number: 431206510

Client Reference: BP Station # 11102

EXTRACTABLE FUELS EPA 3510/8015  
 Batch: 70 26975  
 Samples: 70 0204968

METHOD BLANK:

Parameter	Units	MDL	Method Blank
Extractable Fuels, as Diesel	mg/L	0.05	ND
Extractable Fuels, as Kerosene	mg/L	0.05	DNRT

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	81%	80%	1%

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QUALITY CONTROL DATA

December 15, 1993  
 PACE Project Number: 431206510

Client Reference: BP Station # 11102

OIL AND GREASE, SILICA GEL (LUFT)  
 Batch: 70 26995  
 Samples: 70 0204968

METHOD BLANK:

Parameter	Units	MDL	Method Blank
Oil and Grease, Gravimetric (SM5520)	mg/L	5.0	ND

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

Parameter	Units	MDL	Reference Value	Recv	Dup1 Recv	RPD
Oil and Grease, Gravimetric (SM5520)	mg/L	5.0	20	95%	90%	5%

**REPORT OF LABORATORY ANALYSIS**

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QUALITY CONTROL DATA

December 15, 1993  
 PACE Project Number: 431206510

Client Reference: BP Station # 11102

PURGEABLE FUELS AND AROMATICS

Batch: 70 26897  
 Samples: 70 0204941, 70 0204950, 70 0204968, 70 0204976

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	86%	86%	0%
Benzene	ug/L	0.5	100	95%	98%	3%
Toluene	ug/L	0.5	100	95%	91%	4%
Ethylbenzene	ug/L	0.5	100	92%	88%	4%
Xylenes, Total	ug/L	0.5	300	95%	91%	4%



**REPORT OF LABORATORY ANALYSIS**

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QUALITY CONTROL DATA

December 15, 1993  
 PACE Project Number: 431206510

Client Reference: BP Station # 11102

PURGEABLE FUELS AND AROMATICS

Batch: 70 26935  
 Samples: 70 0204984

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	Dup1 Recv	RPD
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	1000	91%	89%	2%
Benzene	ug/L	0.5	100	88%	88%	0%
Toluene	ug/L	0.5	100	90%	88%	2%
Ethylbenzene	ug/L	0.5	100	87%	85%	2%
Xylenes, Total	ug/L	0.5	300	89%	87%	2%

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QUALITY CONTROL DATA

December 15, 1993  
 PACE Project Number: 431206510

Client Reference: BP Station # 11102

VOLATILE HALOCARBONS AND AROMATICS

Batch: 70 26866  
 Samples: 70 0204968

METHOD BLANK:

Parameter	Units	MDL	Method Blank
<b>VOLATILE HALOCARBONS BY EPA 8010</b>			
Dichlorodifluoromethane	ug/L	2.0	ND
Chloromethane	ug/L	2.0	ND
Vinyl Chloride	ug/L	2.0	ND
Bromomethane	ug/L	2.0	ND
Chloroethane	ug/L	2.0	ND
Trichlorofluoromethane (Freon 11)	ug/L	2.0	ND
1,1-Dichloroethene	ug/L	0.5	ND
Methylene Chloride	ug/L	2.0	ND
trans-1,2-Dichloroethene	ug/L	0.5	ND
cis-1,2-Dichloroethene	ug/L	0.5	ND
1,1-Dichloroethane	ug/L	0.5	ND
Chloroform	ug/L	0.5	ND
1,1,1-Trichloroethane (TCA)	ug/L	0.5	ND
Carbon Tetrachloride	ug/L	0.5	ND
1,2-Dichloroethane (EDC)	ug/L	0.5	ND
Trichloroethene (TCE)	ug/L	0.5	ND
1,2-Dichloropropane	ug/L	0.5	ND
Bromodichloromethane	ug/L	0.5	ND
2-Chloroethylvinyl ether	ug/L	0.5	ND
cis-1,3-Dichloropropene	ug/L	0.5	ND
trans-1,3-Dichloropropene	ug/L	0.5	ND
1,1,2-Trichloroethane	ug/L	0.5	ND
Tetrachloroethene	ug/L	0.5	ND
Dibromochloromethane	ug/L	0.5	ND
Chlorobenzene	ug/L	0.5	ND
Bromoform	ug/L	0.5	ND
1,1,2,2-Tetrachloroethane	ug/L	0.5	ND
1,3-Dichlorobenzene	ug/L	0.5	ND
1,4-Dichlorobenzene	ug/L	0.5	ND
1,2-Dichlorobenzene	ug/L	0.5	ND
Bromochloromethane (Surrogate Recovery) %			130

**REPORT OF LABORATORY ANALYSIS**

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QUALITY CONTROL DATA

December 15, 1993  
PACE Project Number: 431206510

Client Reference: BP Station # 11102

VOLATILE HALOCARBONS AND AROMATICS

Batch: 70 26866  
Samples: 70 0204968

METHOD BLANK:

Parameter	Units	MDL	Method Blank
1,4-Dichlorobutane (Surrogate Recovery)	%		111
VOLATILE AROMATICS BY EPA 8020			
Benzene	ug/L	0.3	ND
Toluene	ug/L	0.3	ND
Ethylbenzene	ug/L	0.5	ND
Xylenes, Total	ug/L	0.5	ND
Fluorobenzene (Surrogate Recovery)	%		99

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

Parameter	Units	MDL	Reference Value	Recv	Dupl Recv	RPD
1,1-Dichloroethane	ug/L	0.5	20	118%	113%	4%
Trichloroethene (TCE)	ug/L	0.5	20	105%	103%	1%
1,1,2-Trichloroethane	ug/L	0.5	20	114%	111%	2%
Tetrachloroethene	ug/L	0.5	20	104%	99%	4%
Benzene	ug/L	0.3	20	109%	109%	0%
Toluene	ug/L	0.3	20	107%	110%	2%
Xylenes, Total	ug/L	0.5	60	113%	112%	0%

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FOOTNOTES  
for pages 8 through 13

December 15, 1993  
PACE Project Number: 431206510

Client Reference: BP Station # 11102

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



431206-510

### CHAIN OF CUSTODY

No. 051308

Page 1 of 1

CONSULTANT'S NAME <b>Alisto Engineering</b>		ADDRESS <b>1777 Oakland Blvd #200</b>		CITY <b>Walnut Creek Ca</b>	STATE <b>Ca</b>	ZIP CODE <b>94596</b>
BP SITE NUMBER <b>11102</b>	BP CORNER ADDRESS/CITY <b>Oakland, Ca</b>			CONSULTANT PROJECT NUMBER <b>10-076-02/002</b>		
CONSULTANT PROJECT MANAGER <b>Bill Howell</b>		PHONE NUMBER <b>(510) 295-1650</b>	FAX NUMBER <b>295-1823</b>		CONSULTANT CONTRACT NUMBER <b>Pace F991735</b>	
BP CONTACT <b>Scott Hooton</b>	BP ADDRESS <b>Tukwila, WA</b>		PHONE NUMBER	FAX NO.		
LAB CONTACT <b>Pace Inc.</b>	LABORATORY ADDRESS <b>Novato, Ca</b>		PHONE NUMBER <b>(415) 883-6100</b>	FAX NO. <b>883-2673</b>		
SAMPLED BY (Please Print Name) <b>Larry Buerwald</b>		SAMPLED BY (Signature) <i>Jay B...</i>		SHIPMENT DATE		SHIPMENT METHOD <b>Carrier</b>

TAT:  24 Hours  48 Hours  1 Week  Standard 2 Weeks

#### ANALYSIS REQUIRED

SAMPLE DESCRIPTION	COLLECTION DATE	MATRIX SOIL/WATER	CONTAINERS		PRESERVATIVE	ANALYSIS REQUIRED				COMMENTS	
			NO.	TYPE (VOL.)	LAB SAMPLE #	TPH-G	BTXE	800/601	TPH-D		TPG
QC-2	12/2/93	W	2	HCL	20494.1	X					TPH-G/BTXE on all wells. 8010, TPH-D, TPG additional on MW-1
QC-1	↓	↓	3	↓	20495.0	X	X	X			
MW-1	↓	↓	3	↓	20496.8	X	X	X			
MW-2	↓	↓	3	↓	20497.6	X	X	X			
MW-3	↓	↓	3	↓	20498.4	X	X	X			

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	ADDITIONAL COMMENTS
<i>Jay B...</i>	12/6/93	1524	<b>Donald Jankshi Pace</b>	12/6/93	1524	
<b>Donald Jankshi Pace</b>	12/6/93	1700	<i>J. Dep / Pace</i>	12/6/93	1700	

1413, #13