



BP OIL

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

April 5, 1993

*June 31, 1993  
Report*

Mr. Ron Owcarz  
Alameda County Health Care Services Agency  
80 Swan Way  
Oakland, Ca 94621

RE: BP OIL Facility #11132  
3201 35th Avenue 94619  
Oakland, California

Dear Mr. Owcarz:

Attached please find our GROUNDWATER MONITORING AND SAMPLING REPORT 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:jc ERM11132

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

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

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

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

Site file



**GROUNDWATER MONITORING AND SAMPLING REPORT**

**BP Oil Company Service Station No. 11132  
3201 35th Street  
Oakland, California**

**Project No. 10-024**

**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**

June 3, 1993

**Brady Nagle  
Project Manager**

**Al Sevilla, P.E.  
Principal**



# GROUNDWATER MONITORING AND SAMPLING REPORT

BP Oil Company Service Station No. 11132  
3201 35th Street  
Oakland, California

Project No. 10-024

June 3, 1993

## INTRODUCTION

This report presents the results and findings of the April 23, 1993 groundwater monitoring and sampling conducted by Alisto Engineering Group at BP Oil Company Service Station No. 11132, 3201 35th Street, 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 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. 11132  
 3201 35TH AVENUE, OAKLAND, CALIFORNIA

ALISTO PROJECT NO. 10-024

WELL ID	DATE OF SAMPLING/ MONITORING	CASING ELEVATION (a)	DEPTH TO WATER	PRODUCT THICKNESS	GROUNDWATER ELEVATION (b)	TPH-G (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	LAB
RW-1	07/09/90	168.01	--	1.21	--	--	--	--	--	--	--
RW-1	12/21/90	168.01	--	0.01	--	--	--	--	--	--	--
RW-1	03/07/91	168.01	17.62	SHEEN	150.39	--	--	--	--	--	--
RW-1	06/27/91	168.01	--	0.04	--	--	--	--	--	--	--
RW-1	09/27/91	168.01	--	0.02	--	--	--	--	--	--	--
RW-1	12/18/91	168.01	--	0.02	--	--	--	--	--	--	--
RW-1	04/01/91	168.01	14.40	0.11	153.69	--	--	--	--	--	--
RW-1	07/03/92	168.01	20.66	SHEEN	147.35	--	--	--	--	--	--
RW-1	10/05/92	168.01	23.34	0.08	144.73	--	--	--	--	--	--
RW-1	01/13/93	168.01	16.59	0.05	151.46	--	--	--	--	--	--
RW-1	04/23/93	168.01	16.17	0.18	151.98	--	--	--	--	--	--
MW-1	07/09/90	169.75	--	0.22	--	--	--	--	--	--	--
MW-1	12/21/90	169.75	--	0.58	--	--	--	--	--	--	--
MW-1	03/07/91	169.75	20.59	--	--	--	--	--	--	--	--
MW-1	06/27/91	169.75	--	0.18	--	--	--	--	--	--	--
MW-1	09/27/91	169.75	--	0.27	--	--	--	--	--	--	--
MW-1	12/18/91	169.75	--	0.28	--	--	--	--	--	--	--
MW-1	04/01/91	169.75	16.51	0.15	153.35	--	--	--	--	--	--
MW-1	07/03/92	169.75	22.30	0.27	147.65	--	--	--	--	--	--
MW-1	10/05/92	169.75	23.98	0.24	145.95	--	--	--	--	--	--
MW-1	01/13/93	169.75	17.03	0.24	152.90	--	--	--	--	--	--
MW-1	04/23/93	169.75	18.10	0.42	151.97	--	--	--	--	--	--
MW-2	07/09/90	168.14	--	0.10	--	--	--	--	--	--	--
MW-2	12/21/90	168.14	--	0.48	--	--	--	--	--	--	--
MW-2	03/07/91	168.14	19.18	--	--	--	--	--	--	--	--
MW-2	06/27/91	168.14	--	0.19	--	--	--	--	--	--	--
MW-2	09/27/91	168.14	--	0.15	--	--	--	--	--	--	--
MW-2	12/18/91	168.14	--	0.36	--	--	--	--	--	--	--
MW-2	04/01/91	168.14	15.21	0.10	153.00	--	--	--	--	--	--
MW-2	07/03/92	168.14	20.93	0.03	147.23	--	--	--	--	--	--
MW-2	10/05/92	168.14	22.74	0.21	145.56	--	--	--	--	--	--
MW-2	01/13/93	168.14	15.55	0.02	152.60	--	--	--	--	--	--
MW-2	04/23/93	168.14	16.54	0.21	151.76	--	--	--	--	--	--

TABLE 1 - SUMMARY OF RESULTS OF GROUNDWATER SAMPLING  
 BP OIL COMPANY SERVICE STATION NO. 11132  
 3201 35TH AVENUE, OAKLAND, CALIFORNIA

ALISTO PROJECT NO. 10-024

WELL ID	DATE OF SAMPLING/ MONITORING	CASING ELEVATION (a)	DEPTH TO WATER	PRODUCT THICKNESS	GROUNDWATER ELEVATION (b)	TPH-G (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	LAB
MW-3	07/09/90	167.17	---	0.00	---	140	5.3	4.6	2.0	3.8	---
MW-3	12/21/90	167.17	---	0.00	---	0.19	100	6.0	0.9	27	---
MW-3	03/07/91	167.17	17.40	0.00	149.77	0.4	69	22	6.1	57	---
MW-3	06/27/91	167.17	---	0.00	---	380	28	26	13	46	---
MW-3	09/27/91	167.17	---	0.00	---	0.07	7.9	ND	0.4	1.1	---
MW-3	12/18/91	167.17	---	0.00	---	0.26	34	24	0.8	28	---
MW-3	04/01/91	167.17	13.69	0.00	153.48	ND	ND	ND	ND	ND	---
MW-3	07/03/92	167.17	19.59	0.00	147.58	71	9.4	0.9	5.0	13	ANA
MW-3	10/05/92	167.17	21.22	0.00	145.95	67	5.1	1.1	6.1	8.1	ANA
QC-1 (c)	10/05/92	167.17	21.22	0.00	145.95	ND<50	2.2	ND<0.5	1.5	2.8	ANA
MW-3	01/13/93	167.17	13.63	0.00	153.54	830	50	34	42	89	PACE
MW-3	04/23/93	167.17	15.02	0.00	152.15	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	PACE
QC-1 (c)	04/23/93	167.17	15.02	0.00	152.15	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	PACE
MW-4	07/09/90	170.36	---	0.00	---	ND	ND	ND	ND	ND	---
MW-4	12/21/90	170.36	---	0.00	---	ND	ND	ND	ND	0.8	---
MW-4	03/07/91	170.36	20.72	0.00	149.64	ND	2.2	3.8	1.5	2.8	---
MW-4	06/27/91	170.36	---	0.00	---	ND	6.3	1.8	0.4	1.0	---
MW-4	09/27/91	170.36	---	0.00	---	ND	ND	ND	ND	ND	---
MW-4	12/18/91	170.36	---	0.00	---	ND	ND	ND	ND	ND	---
MW-4	04/01/91	170.36	17.49	0.00	152.87	ND	ND	ND	ND	ND	---
MW-4	07/03/92	170.36	22.16	0.00	148.20	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ANA
MW-4	10/05/92	170.36	23.38	0.00	146.98	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ANA
MW-4	01/13/93	170.36	17.58	0.00	152.78	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	PACE
MW-4	04/23/93	170.36	15.72	0.00	154.64	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	PACE
MW-5	07/09/90	165.14	---	0.00	---	280	200	210	46	290	---
MW-5	12/21/90	165.14	---	0.00	---	0.69	300	34	8.4	39	---
MW-5	03/07/91	165.14	16.60	0.00	148.54	ND	17	0.9	0.7	1.6	---
MW-5	06/27/91	165.14	---	0.00	---	330	120	10	12	8	---
MW-5	09/27/91	165.14	---	0.00	---	0.73	230	16	20	22	---
MW-5	12/18/91	165.14	---	0.00	---	ND	ND	ND	ND	ND	---
MW-5	04/01/91	165.14	11.99	0.00	153.15	800	250	54	11	60	---
MW-5	07/03/92	165.14	18.65	0.00	146.49	150	36	ND<0.5	ND<0.5	1.1	ANA
MW-5	10/05/92	165.14	20.32	0.00	144.82	270	79	4	1.7	2.9	ANA
MW-5	01/13/93	165.14	13.03	0.00	152.11	180	59	6.0	1.8	7.6	PACE
MW-5	04/23/93	165.14	13.51	0.00	151.63	8700	440	96	35	136	PACE

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 BP OIL COMPANY SERVICE STATION NO. 11132  
 3201 35TH AVENUE, OAKLAND, CALIFORNIA

ALISTO PROJECT NO. 10-024

WELL ID	DATE OF SAMPLING/ MONITORING	CASING ELEVATION (a)	DEPTH TO WATER	PRODUCT THICKNESS	GROUNDWATER ELEVATION (b)	TPH-G (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	LAB
MW-6	07/09/90	165.40	--	0.00	--	ND	ND	ND	ND	ND	--
MW-6	12/21/90	165.40	--	0.00	--	0.17	2.6	7.0	4.9	26	--
MW-6 (d)	03/07/91	165.40	--	0.00	--	--	--	--	--	--	--
MW-6 (d)	06/27/91	165.40	--	0.00	--	--	--	--	--	--	--
MW-6 (d)	09/27/91	165.40	--	0.00	--	--	--	--	--	--	--
MW-6	12/18/91	165.40	--	0.00	--	ND	1.3	22	ND	2.7	--
MW-6	04/01/91	165.40	11.79	0.00	153.61	ND	ND	ND	ND	ND	--
MW-6	07/03/92	165.40	17.77	0.00	147.63	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ANA
MW-6	10/05/92	165.40	19.46	0.00	145.94	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ANA
MW-6	01/13/93	165.40	11.34	0.00	154.06	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	PACE
MW-6	04/23/93	165.40	12.92	0.00	152.48	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	PACE
MW-7	07/09/90	167.61	--	0.00	--	ND	ND	ND	ND	ND	--
MW-7	12/21/90	167.61	--	0.00	--	ND	ND	ND	ND	ND	--
MW-7	03/07/91	167.61	19.04	0.00	148.57	ND	ND	0.4	0.3	2.4	--
MW-7	06/27/91	167.61	--	0.00	--	70	17	4	0.8	2.2	--
MW-7	09/27/91	167.61	--	0.00	--	ND	0.4	ND	ND	0.4	--
MW-7	12/18/91	167.61	--	0.00	--	ND	0.7	2.9	0.8	3.3	--
MW-7	04/01/91	167.61	15.18	0.00	152.43	ND	ND	ND	ND	ND	--
MW-7	07/03/92	167.61	20.28	0.00	147.33	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ANA
MW-7	10/05/92	167.61	21.56	0.00	146.05	ND<50	ND<0.5	ND<0.5	ND<0.5	1.5	ANA
MW-7	01/13/93	167.61	15.41	0.00	152.20	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	PACE
MW-7	04/23/93	167.61	15.84	0.00	151.77	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	PACE
MW-8	03/07/91	165.74	16.72	0.00	149.02	2.7	780	450	64	310	--
MW-8	06/27/91	165.74	--	0.00	--	12000	3400	1100	240	750	--
MW-8	09/27/91	165.74	--	0.00	--	41	5700	5200	1100	4300	--
MW-8	12/18/91	165.74	--	0.00	--	3.2	990	150	120	250	--
MW-8	04/01/91	165.74	12.54	0.00	153.20	15000	3600	2600	410	1900	--
MW-8	07/03/92	165.74	18.78	0.00	146.96	72000	19000	32000	3000	15000	ANA
MW-8	10/05/92	165.74	20.48	0.01	145.27	--	--	--	--	--	--
MW-8	01/13/93	165.74	12.87	0.01	152.88	--	--	--	--	--	--
MW-8	04/23/93	165.74	13.90	SHEEN	151.84	--	--	--	--	--	--

TABLE 1 - SUMMARY OF RESULTS OF GROUNDWATER SAMPLING  
 BP OIL COMPANY SERVICE STATION NO. 11132  
 3201 35TH AVENUE, OAKLAND, CALIFORNIA

ALISTO PROJECT NO. 10-024

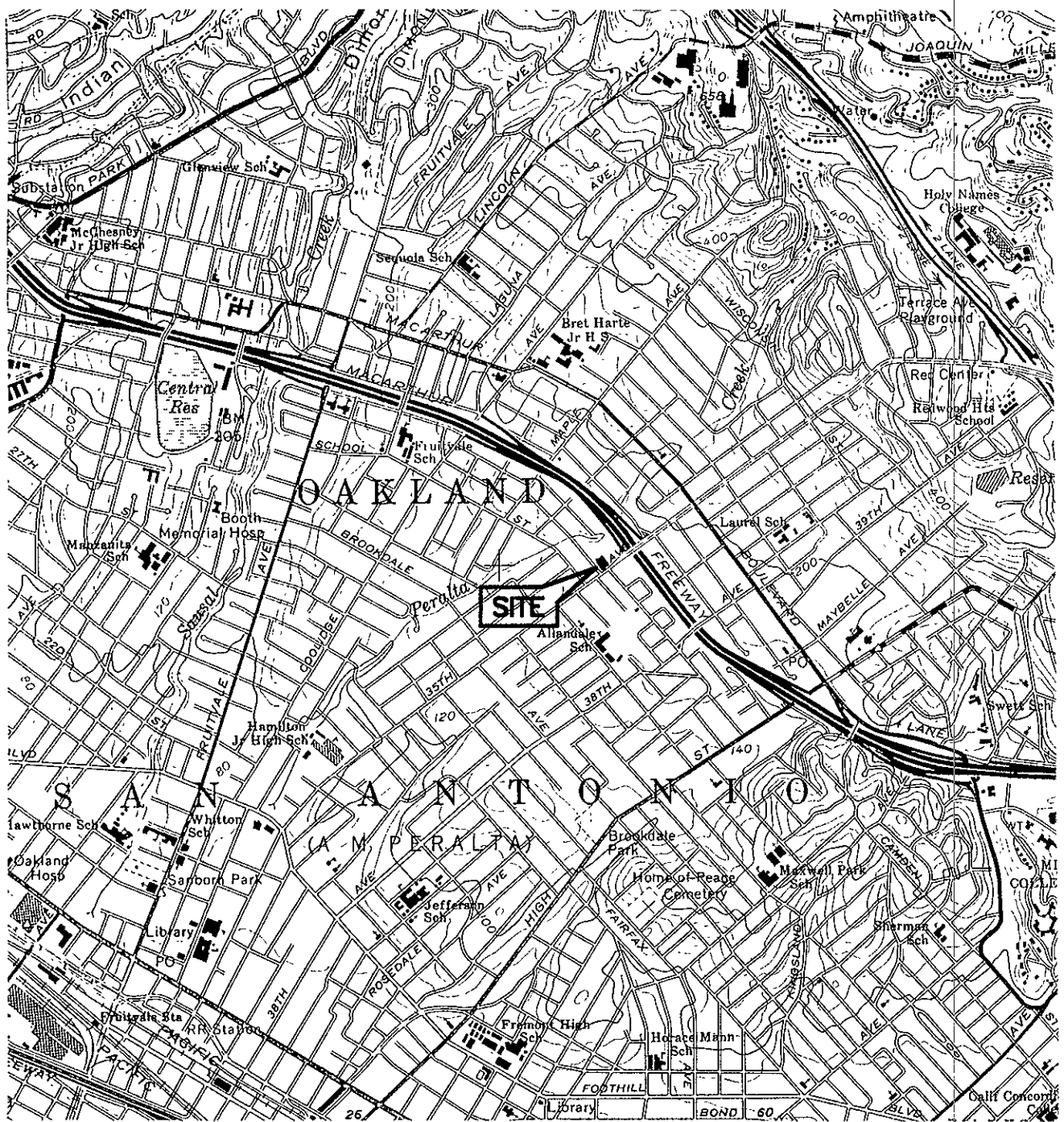
WELL ID	DATE OF SAMPLING/ MONITORING	CASING ELEVATION (a)	DEPTH TO WATER	PRODUCT THICKNESS	GROUNDWATER ELEVATION (b)	TPH-G (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	LAB
MW-9	03/07/91	166.20	16.79	0.00	149.41	7.1	220	4	2.4	2400	---
MW-9	06/27/91	166.20	---	0.00	---	3600	520	400	85	310	---
MW-9	09/27/91	166.20	---	0.00	---	3.2	720	150	50	180	---
MW-9	12/18/91	166.20	---	0.00	---	ND	2.5	1.1	0.3	5.8	---
MW-9	04/01/91	166.20	12.89	0.00	153.31	12000	2000	2600	360	1600	---
MW-9	07/03/92	166.20	18.89	0.00	147.31	5700	17000	840	230	800	ANA
MW-9	10/05/92	166.20	20.52	0.00	145.68	1400	440	17	14	100	ANA
MW-9	01/13/93	166.20	12.92	0.00	153.28	11000	1200	1700	340	1400	PACE
QC-1 (c)	01/13/93	166.20	12.92	0.00	153.28	11000	1200	1600	330	1300	PACE
MW-9	04/23/93	166.20	14.08	0.00	152.12	24000	2800	4500	730	3400	PACE
MW-10	03/07/91	167.01	18.09	0.00	148.92	1.6	120	190	32	230	---
MW-10	06/27/91	167.01	---	0.00	---	12000	7300	500	150	300	---
MW-10	09/27/91	167.01	---	0.00	---	57	12000	7200	1400	4600	---
MW-10	12/18/91	167.01	---	0.00	---	5.3	2500	120	36	79	---
MW-10	04/01/91	167.01	13.92	0.00	153.09	ND	ND	ND	ND	ND	---
MW-10	07/03/92	167.01	19.92	0.00	147.09	8600	5100	1300	180	690	ANA
MW-10	10/05/92	167.01	21.92	0.19	145.09	FP	---	---	---	---	---
MW-10	01/13/93	167.01	14.43	0.03	152.60	FP	---	---	---	---	---
MW-10	04/23/93	167.01	15.26	0.06	151.80	FP	---	---	---	---	PACE
QC-2 (e)	10/05/92	---	---	---	---	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ANA
QC-2 (e)	01/13/93	---	---	---	---	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	PACE
QC-2 (e)	04/23/93	---	---	---	---	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	PACE

ABBREVIATIONS:

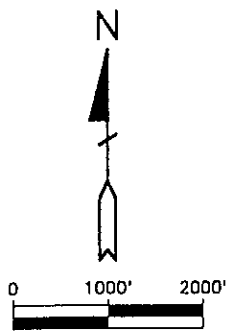
TPH-G Total petroleum hydrocarbons as gasoline  
 B Benzene  
 T Toluene  
 E Ethylbenzene  
 X Total xylenes  
 ppb Parts per billion  
 --- Not analyzed/available  
 ND Not detected above reported detection limits  
 ANA Anamatrix, Inc.  
 PACE Pace Inc.

NOTES:

- (a) Casing elevation were surveyed to the nearest 0.01 foot relative to mean sea level.
- (b) Groundwater elevations adjusted assuming a specific gravity of 0.75 for free product.
- (c) Blind duplicate.
- (d) Well not sampled due to an abandoned vehicle parked over well.
- (e) Travel blank.



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



**FIGURE 1**

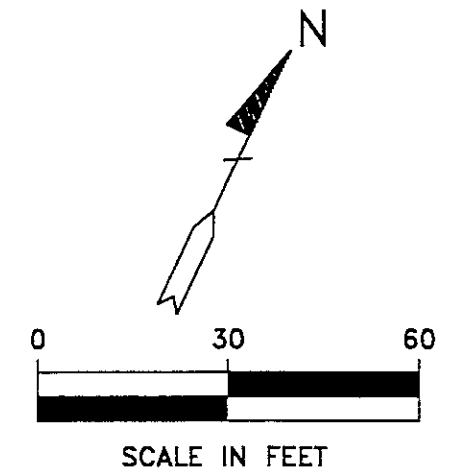
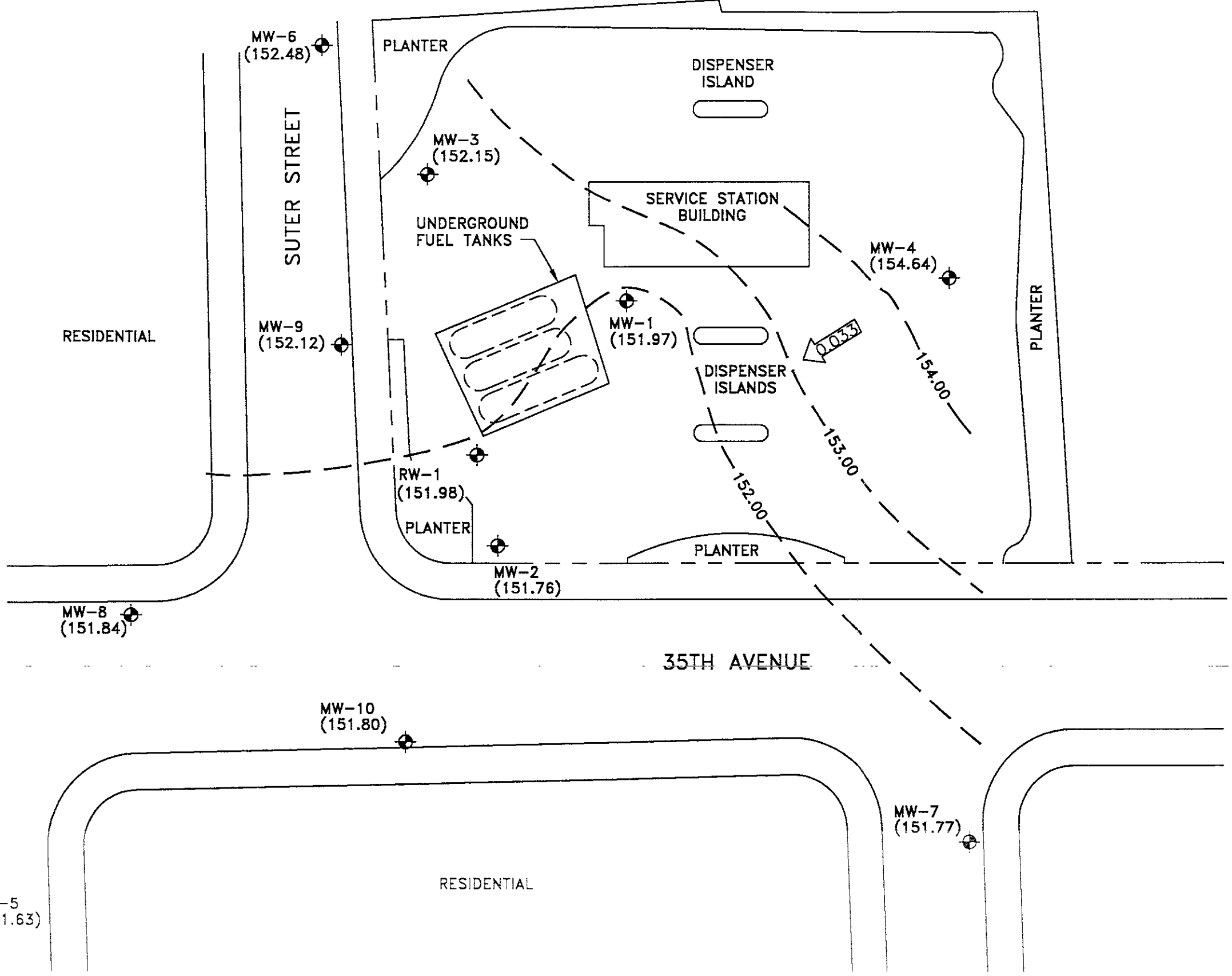
**SITE VICINITY MAP**


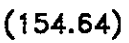
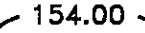

BP OIL SERVICE STATION NO. 11132  
 3201 35TH AVENUE  
 OAKLAND, CALIFORNIA  
 PROJECT NO. 10-024



**ALISTO ENGINEERING GROUP**  
 WALNUT CREEK, CALIFORNIA



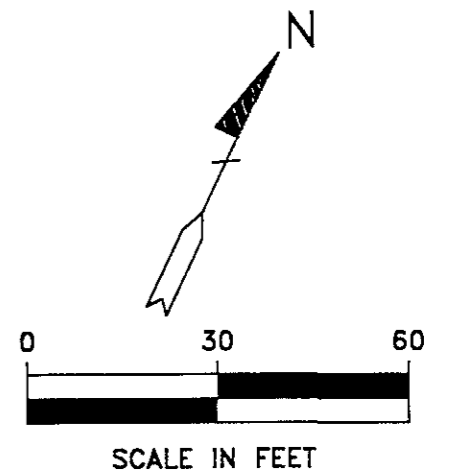
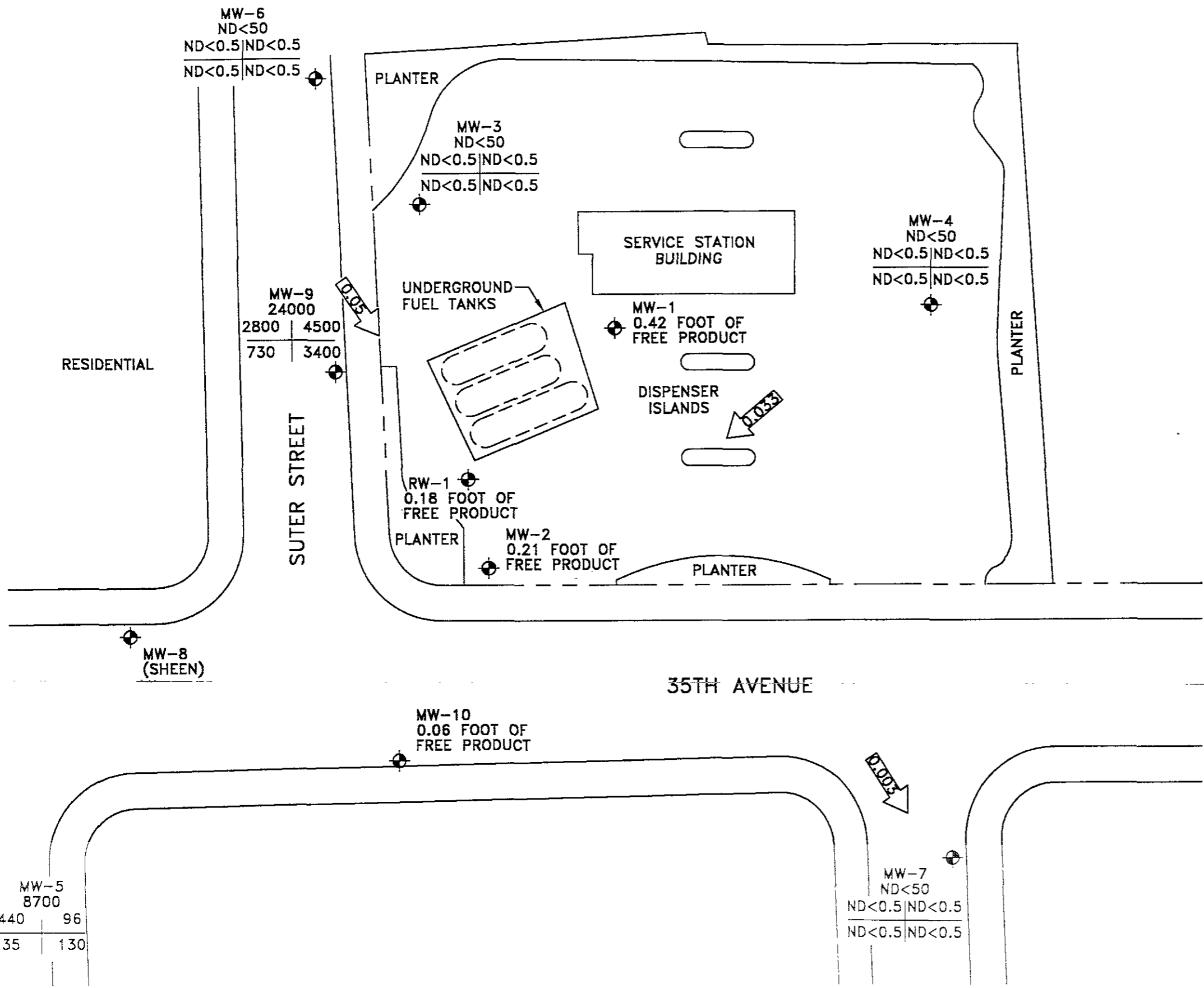


- LEGEND:**
-  GROUNDWATER MONITORING WELL
  -  (154.64) GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL
  -  154.00 GROUNDWATER ELEVATION CONTOUR IN FEET ABOVE MEAN SEA LEVEL (CONTOUR INTERVAL - 1.00 FOOT)
  -  0.033 CALCULATED GROUNDWATER GRADIENT DIRECTION AND MAGNITUDE



**FIGURE 2**  
**POTENTIOMETRIC GROUNDWATER ELEVATION CONTOUR MAP**  
 (APRIL 23, 1993)

BP OIL SERVICE STATION NO. 11132  
 3201 35TH STREET  
 OAKLAND, CALIFORNIA  
 PROJECT NO. 10-024

100240-E.DWG 5-25-93 DR 1-30



**LEGEND:**

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

**FIGURE 3**  
**CONCENTRATIONS OF PETROLEUM HYDROCARBONS IN GROUNDWATER (APRIL 23, 1993)**  
 BP OIL SERVICE STATION NO. 11132  
 3201 35TH STREET  
 OAKLAND, CALIFORNIA  
 PROJECT NO. 10-024

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

Birch  
Technical  
Services

# Field Report / Data Sheet

10-024-01/004

4-23-93

Groundwater Sampling  Groundwater Monitoring  Well Development  Drill Support  Stockpile Sampling

116 Liberty St  
Santa Cruz, Ca 95060  
(408) 459-0718

Firm: <b>ALISTO</b>	Date: <b>4/23/93</b>	Station #: <b>BD1132</b>	Day: M Tu W Th <b>F</b>
Project Number: <b>10-024</b>	Field Technician: <b>DAN BIRCH</b>	Address: <b>3201 35th Ave., DALLAND</b>	Weather: <b>overcast</b>

Well ID	Dim.	Lock	Cap	Exp	Total Depth (feet)	1st Depth to Water (feet)	2nd Depth to Water (feet)	Depth to Product (feet)	Product Thickness	Comments
9 MW-1	2	ok	ok		44.08	18.10	18.10	17.68	0.42	PRODUCT.
10 MW-2	2	ok	ok		34.31	16.54	16.54	16.33	0.21	Product.
2 MW-3	2	ok	ok		34.58	15.02	15.02			
3 MW-4	2	ok	ok		38.74	15.72	15.72			
6 MW-5	2	ok	ok		30.88	13.51	13.51			Well near Quick-stop
1 MW-6	2	ok	ok		34.56	12.92	12.92			
4 MW-7	2	ok	ok		34.49	15.84	15.84			
8 MW-9	2	ok	ok		29.49	14.08	14.08			
5 MW-10	2	ok	ok		34.00	15.26	15.26	15.20	0.06'	Product.
11 RW-1	6	ok	ok		38.41	16.17	16.17	15.99	0.18	Product.
7 MW-8	2	ok	ok		38.72	13.90	13.90	Shear	Shear	Shear

Notes:

The passive product recovery systems were all empty of water or product. Rope lengths were adjusted to place system slotted zone in product layer.



# Birch Technical Services

# GROUNDWATER SAMPLING FORM

116 Liberty Street  
 Santa Cruz, Ca 95060  
 (408) 459-0718

Well Number: MW-2

Project Number: 10-02J

Sample Type:  Groundwater  Trip Blank  Duplicate of \_\_\_\_\_

Station Number: BP11132

Sampled by: DAW BIRCH

Date: 4/23/93

## WELL PURGING

**PURGE VOLUME** Casing Diameter (inches)  2"  3"  4"  4.5"  6"  \_\_\_\_\_  
 Volume Factors: 0.1632 0.3672 0.6528 0.826 1.469 \_\_\_\_\_

Total Depth of Well \_\_\_\_\_ Initial Water Level: 16.54 **PURGE METHOD:**  
 Honda Pump  
 Disposable Poly Tubing (\_\_\_\_\_ ft)  
 Speed Winch  
 Disposable PVC Bailer(s) (\_\_\_\_)  
 Other \_\_\_\_\_

Total Volume Purged: \_\_\_\_\_ Time Elapsed: \_\_\_\_\_

Calculated Purge Volume:

16.54 = \_\_\_\_\_ x \_\_\_\_\_ = \_\_\_\_\_ x \_\_\_\_\_ = \_\_\_\_\_ (gallons)  
 Total Depth Water Level Well Vol. Fac. #of vol. to Purge Calculated Purge Volume

### Subjective Analysis Prior to Purging

SHEEN  Yes  No Depth to Product 16.33 (ft) Product Thickness 0.21 (ft)

### PARAMETER EQUIPMENT CALIBRATION

pH Meter #: \_\_\_\_\_ Time: \_\_\_\_\_  
 Solution pH 7.00 \_\_\_\_\_ at \_\_\_\_\_ °F  
 Solution pH 4.00 \_\_\_\_\_ at \_\_\_\_\_ °F  
 Solution pH 10.00 \_\_\_\_\_ at \_\_\_\_\_ °F  
 Water Level Meter#: \_\_\_\_\_

### COMMENTS:

*0.21' product well not sampled. Passive product recovery system was empty. Rope length adjusted.*

### SAMPLING METHOD

PVC Disposable Bailer  Teflon Bailer  Other: \_\_\_\_\_  
 Time Sampled (24 hour clock) NOT

### WELL SAMPLING PARAMETERS

Gallons Removed	Time	Temp °F	pH	Cond. (umhos/cm)

Analysis Required	No. of	Container Type	Preservatives
EPA 601		VOA's	
TPH-G/BTEX		VOA's	HCl
TPH- Diesel		Amber Liter	
TOG 5520 BF		Amber Liter	H <sub>2</sub> SO <sub>4</sub>























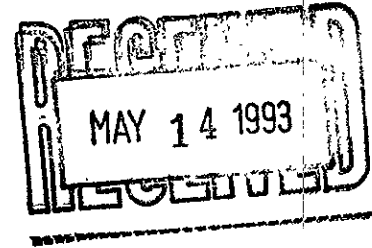


**APPENDIX B**

**LABORATORY REPORT AND CHAIN OF CUSTODY RECORD**

**REPORT OF LABORATORY ANALYSIS**

May 12, 1993



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

RE: PACE Project No. 430428.510  
Client Reference: BP Station # 11132

Dear Mr. Nagle:

Enclosed is the report of laboratory analyses for samples received April 28, 1993.

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



# REPORT OF LABORATORY ANALYSIS

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

May 12, 1993  
 PACE Project Number: 430428510

Attn: Mr. Brady Nagle

Client Reference: BP Station # 11132

PACE Sample Number: 70 0059429  
 Date Collected: 04/23/93  
 Date Received: 04/28/93  
 Client Sample ID: MW-3

Parameter	Units	MDL		DATE ANALYZED
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ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):				
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	ND	05/04/93
PURGEABLE AROMATICS (BTXE BY EPA 8020M):				
Benzene	ug/L	0.5	ND	05/04/93
Toluene	ug/L	0.5	ND	05/04/93
Ethylbenzene	ug/L	0.5	ND	05/04/93
Xylenes, Total	ug/L	0.5	ND	05/04/93



# REPORT OF LABORATORY ANALYSIS

Mr. Brady Nagle  
Page 2

May 12, 1993  
PACE Project Number: 430428510

Client Reference: BP Station # 11132

PACE Sample Number: 70 0059437  
Date Collected: 04/23/93  
Date Received: 04/28/93  
Client Sample ID: MW-4

<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):			-	05/04/93
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	ND	05/04/93
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	05/04/93
Benzene	ug/L	0.5	ND	05/04/93
Toluene	ug/L	0.5	ND	05/04/93
Ethylbenzene	ug/L	0.5	ND	05/04/93
Xylenes, Total	ug/L	0.5	ND	05/04/93

**REPORT OF LABORATORY ANALYSIS**

Mr. Brady Nagle  
 Page 3

May 12, 1993  
 PACE Project Number: 430428510

Client Reference: BP Station # 11132

PACE Sample Number: 70 0059445  
 Date Collected: 04/23/93  
 Date Received: 04/28/93  
 Client Sample ID: MW-5

<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	250	8700
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			
Benzene	ug/L	2.5	440
Toluene	ug/L	2.5	96
Ethylbenzene	ug/L	2.5	35
Xylenes, Total	ug/L	2.5	130



# REPORT OF LABORATORY ANALYSIS

Mr. Brady Nagle  
Page 4

May 12, 1993  
PACE Project Number: 430428510

Client Reference: BP Station # 11132

PACE Sample Number: 70 0059453  
Date Collected: 04/23/93  
Date Received: 04/28/93  
Client Sample ID: MW-6

<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):			-	05/04/93
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	ND	05/04/93
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	05/04/93
Benzene	ug/L	0.5	ND	05/04/93
Toluene	ug/L	0.5	ND	05/04/93
Ethylbenzene	ug/L	0.5	ND	05/04/93
Xylenes, Total	ug/L	0.5	ND	05/04/93



# REPORT OF LABORATORY ANALYSIS

Mr. Brady Nagle  
Page 5

May 12, 1993  
PACE Project Number: 430428510

Client Reference: BP Station # 11132

PACE Sample Number: 70 0059461  
Date Collected: 04/23/93  
Date Received: 04/28/93  
Client Sample ID: MW-7

<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):			-	05/04/93
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	ND	05/04/93
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	05/04/93
Benzene	ug/L	0.5	ND	05/04/93
Toluene	ug/L	0.5	ND	05/04/93
Ethylbenzene	ug/L	0.5	ND	05/04/93
Xylenes, Total	ug/L	0.5	ND	05/04/93



# REPORT OF LABORATORY ANALYSIS

Mr. Brady Nagle  
Page 6

May 12, 1993  
PACE Project Number: 430428510

Client Reference: BP Station # 11132

PACE Sample Number: 70 0059470  
Date Collected: 04/23/93  
Date Received: 04/28/93  
Client Sample ID: MW-9

<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	250	-	05/05/93
PURGEABLE AROMATICS (BTXE BY EPA 8020M):				
Benzene	ug/L	2.5	2800	05/05/93
Toluene	ug/L	2.5	4500	05/05/93
Ethylbenzene	ug/L	2.5	730	05/05/93
Xylenes, Total	ug/L	2.5	3400	05/05/93





# REPORT OF LABORATORY ANALYSIS

Mr. Brady Nagle  
Page 7

May 12, 1993  
PACE Project Number: 430428510

Client Reference: BP Station # 11132

PACE Sample Number: 70 0059488  
Date Collected: 04/23/93  
Date Received: 04/28/93  
Client Sample ID: QC-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):			-	05/04/93
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	ND	05/04/93
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	05/04/93
Benzene	ug/L	0.5	ND	05/04/93
Toluene	ug/L	0.5	ND	05/04/93
Ethylbenzene	ug/L	0.5	ND	05/04/93
Xylenes, Total	ug/L	0.5	ND	05/04/93

**REPORT OF LABORATORY ANALYSIS**

Mr. Brady Nagle  
 Page 8

May 12, 1993  
 PACE Project Number: 430428510

Client Reference: BP Station # 11132

PACE Sample Number: 70 0059496  
 Date Collected: 04/23/93  
 Date Received: 04/28/93  
 Client Sample ID: QC-2

<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):			-	05/04/93
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	ND	05/04/93
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	05/04/93
Benzene	ug/L	0.5	ND	05/04/93
Toluene	ug/L	0.5	ND	05/04/93
Ethylbenzene	ug/L	0.5	ND	05/04/93
Xylenes, Total	ug/L	0.5	ND	05/04/93

These data have been reviewed and are approved for release.

*Darrell C. Cain*

Darrell C. Cain  
 Regional Director



# REPORT OF LABORATORY ANALYSIS

Mr. Brady Nagle  
Page 9

FOOTNOTES  
for pages 1 through 8

May 12, 1993  
PACE Project Number: 430428510

Client Reference: BP Station # 11132

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



# REPORT OF LABORATORY ANALYSIS

Mr. Brady Nagle  
Page 10

QUALITY CONTROL DATA

May 12, 1993  
PACE Project Number: 430428510

Client Reference: BP Station # 11132

PURGEABLE FUELS AND AROMATICS

Batch: 70 20920  
Samples: 70 0059429, 70 0059437, 70 0059445, 70 0059453, 70 0059461  
70 0059488, 70 0059496

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	82%	86%	4%
Benzene	ug/L	0.5	100	91%	95%	4%
Toluene	ug/L	0.5	100	88%	91%	3%
Ethylbenzene	ug/L	0.5	100	100%	104%	3%
Xylenes, Total	ug/L	0.5	300	102%	109%	6%



# REPORT OF LABORATORY ANALYSIS

Mr. Brady Nagle  
Page 11

## QUALITY CONTROL DATA

May 12, 1993  
PACE Project Number: 430428510

Client Reference: BP Station # 11132

### PURGEABLE FUELS AND AROMATICS

Batch: 70 21047  
Samples: 70 0059470

#### 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%	85%	12%
Benzene	ug/L	0.5	100	97%	93%	4%
Toluene	ug/L	0.5	100	94%	89%	5%
Ethylbenzene	ug/L	0.5	100	93%	86%	7%
Xylenes, Total	ug/L	0.5	300	95%	88%	7%



# REPORT OF LABORATORY ANALYSIS

Mr. Brady Nagle  
Page 12

FOOTNOTES  
for pages 10 through 11

May 12, 1993  
PACE Project Number: 430428510

Client Reference: BP Station # 11132

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

