



BP OIL

✓ March 13, 1994

Alameda County Health Care Services Agency
Division of Hazardous Materials
Attention Mr. Ron Owcarz
80 Swan Way, Room 200
Oakland, CA 94621

SH

LDP 3878

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

RE: BP Oil Site No. 11132
3201 35th Street
Oakland, CA

Greetings:

Attached please find a Groundwater Sampling and Monitoring Report dated January 10, 1994. You should note that we have lowered the elevation of the pump intake in RW-1, and this appears to have enlarged the associated cone of depression. This should enhance migration control, and may obviate the need for an additional recovery well. I have also directed Alisto Engineering Group to perform additional manual bailing as an interim measure. An oil-water separator is also being added to the remediation system.

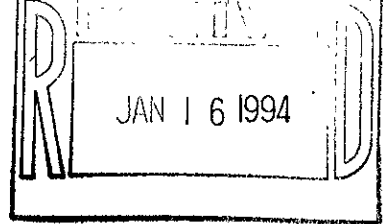
Please give me a call in the event you wish to discuss this matter further. I can be reached at (206) 251-0689.

Sincerely,

Scott T. Hooton
Environmental Resources Management

attachment

cc: site file
B. Nagle - Alisto



GROUNDWATER MONITORING AND SAMPLING REPORT

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

Project No. 10-024-03-002

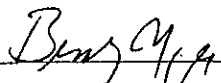
Prepared for:

**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 10, 1994



**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. 10-024-03-002

January 10, 1994

INTRODUCTION

This report presents the results and findings of the October 21, 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 relative 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.

FREE PRODUCT MONITORING AND RECOVERY

Passive product recovery systems have been installed in Monitoring Wells MW-2, MW-8, MW-9, and MW-10 to recover liquid-phase product. Product thicknesses as measured during this and previous monitoring events are presented in Table 1. The volume of free product recovered from the wells is presented in Table 2.



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) (Feet)	DEPTH TO WATER (Feet)	PRODUCT THICKNESS (Feet)	GROUNDWATER ELEVATION (b) (Feet)	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	--	--	--	--	--	--
RW-1	07/12/93	168.01	20.18	0.06	147.88	--	--	--	--	--	--
RW-1	10/21/93	168.01	25.70	0.56	142.73	--	--	--	--	--	--
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-1	07/12/93	169.75	22.02	0.49	148.10	--	--	--	--	--	--
MW-1	10/21/93	169.75	25.12	1.09	145.45	--	--	--	--	--	--
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	153.01	--	--	--	--	--	--
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	152.61	--	--	--	--	--	--
MW-2	04/23/93	168.14	16.54	0.21	151.76	--	--	--	--	--	--
MW-2	07/12/93	168.14	20.46	0.06	147.73	--	--	--	--	--	--
MW-2	10/21/93	168.14	24.91	0.31	143.46	--	--	--	--	--	--

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) (Feet)	DEPTH TO WATER (Feet)	PRODUCT THICKNESS (Feet)	GROUNDWATER ELEVATION (b) (Feet)	TPH-G (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	LAB
MW-3	07/09/90	167.17	---	---	---	140	5.3	4.6	2.0	3.8	---
MW-3	12/21/90	167.17	---	---	---	0.19	100	6.0	0.9	27	---
MW-3	03/07/91	167.17	17.40	---	149.77	0.4	69	22	6.1	57	---
MW-3	06/27/91	167.17	---	---	---	380	28	26	13	46	---
MW-3	09/27/91	167.17	---	---	---	0.07	7.9	ND	0.4	1.1	---
MW-3	12/18/91	167.17	---	---	---	0.26	34	24	0.8	28	---
MW-3	04/01/91	167.17	13.69	---	153.48	ND	ND	ND	ND	ND	---
MW-3	07/03/92	167.17	19.59	---	147.58	71	9.4	0.9	5.0	13	ANA
MW-3	10/05/92	167.17	21.22	---	145.95	67	5.1	1.1	6.1	8.1	ANA
QC-1 (c)	10/05/92	167.17	21.22	---	145.95	ND<50	2.2	ND<0.5	1.5	2.8	ANA
MW-3	01/13/93	167.17	13.63	---	153.54	830	50	34	42	89	PACE
MW-3	04/23/93	167.17	15.02	---	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	---	152.15	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	PACE
MW-3	07/12/93	167.17	19.16	---	148.01	250	12	4.2	12	16	PACE
MW-3	10/21/93	167.17	21.81	---	145.36	52	4.4	1.4	4.7	3.3	PACE
QC-1 (c)	10/21/93	167.17	21.81	---	145.36	65	7.4	1.0	6.9	4.2	PACE
MW-4	07/09/90	170.36	---	---	---	ND	ND	ND	ND	ND	---
MW-4	12/21/90	170.36	---	---	---	ND	ND	ND	ND	0.8	---
MW-4	03/07/91	170.36	20.72	---	149.64	ND	2.2	3.8	1.5	2.8	---
MW-4	06/27/91	170.36	---	---	---	ND	6.3	1.8	0.4	1.0	---
MW-4	09/27/91	170.36	---	---	---	ND	ND	ND	ND	ND	---
MW-4	12/18/91	170.36	---	---	---	ND	ND	ND	ND	ND	---
MW-4	04/01/91	170.36	17.49	---	152.87	ND	ND	ND	ND	ND	---
MW-4	07/03/92	170.36	22.16	---	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	---	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	---	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	---	154.64	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	PACE
MW-4	07/12/93	170.36	21.74	---	148.62	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	PACE
MW-4	10/21/93	170.36	23.84	---	146.52	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	PACE
MW-5	07/09/90	165.14	---	---	---	280	200	210	46	290	---
MW-5	12/21/90	165.14	---	---	---	0.69	300	34	8.4	39	---
MW-5	03/07/91	165.14	16.60	---	148.54	ND	17	0.9	0.7	1.6	---
MW-5	06/27/91	165.14	---	---	---	330	120	10	12	8	---
MW-5	09/27/91	165.14	---	---	---	0.73	230	16	20	22	---
MW-5	12/18/91	165.14	---	---	---	ND	ND	ND	ND	ND	---
MW-5	04/01/91	165.14	11.99	---	153.15	800	250	54	11	60	---
MW-5	07/03/92	165.14	18.65	---	146.49	150	36	ND<0.5	ND<0.5	1.1	ANA
MW-5	10/05/92	165.14	20.32	---	144.82	270	79	4	1.7	2.9	ANA
MW-5	01/13/93	165.14	13.03	---	152.11	180	59	6.0	1.8	7.6	PACE
MW-5	04/23/93	165.14	13.51	---	151.63	8700	440	96	35	136	PACE
MW-5	07/12/93	165.14	18.06	---	147.08	250	57	2.9	2.1	6.0	PACE
MW-5	10/21/93	165.14	20.41	---	144.73	210	82	1.5	ND<0.5	1.4	PACE

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

ALJSTO PROJECT NO. 10-024

WELL ID	DATE OF SAMPLING/ MONITORING	CASING ELEVATION (a) (Feet)	DEPTH TO WATER (Feet)	PRODUCT THICKNESS (Feet)	GROUNDWATER ELEVATION (b) (Feet)	TPH-G (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	LAB
MW-6	07/09/90	165.40	---	---	---	ND	ND	ND	ND	ND	---
MW-6	12/21/90	165.40	---	---	---	0.17	2.6	7.0	4.9	26	---
MW-6 (d)	03/07/91	165.40	---	---	---	---	---	---	---	---	---
MW-6 (d)	06/27/91	165.40	---	---	---	---	---	---	---	---	---
MW-6 (d)	09/27/91	165.40	---	---	---	---	---	---	---	---	---
MW-6	12/18/91	165.40	---	---	---	ND	1.3	22	ND	2.7	---
MW-6	04/01/91	165.40	11.79	---	153.61	ND	ND	ND	ND	ND	---
MW-6	07/03/92	165.40	17.77	---	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	---	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	---	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	---	152.48	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	PACE
MW-6	07/12/93	165.40	17.36	---	148.04	ND<50	ND<0.5	ND<0.5	ND<0.5	0.7	PACE
MW-6	10/21/93	165.40	19.98	---	145.42	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	PACE
MW-7	07/09/90	167.61	---	---	---	ND	ND	ND	ND	ND	---
MW-7	12/21/90	167.61	---	---	---	ND	ND	ND	ND	ND	---
MW-7	03/07/91	167.61	19.04	---	148.57	ND	ND	0.4	0.3	2.4	---
MW-7	06/27/91	167.61	---	---	---	70	17	4	0.8	2.2	---
MW-7	09/27/91	167.61	---	---	---	ND	0.4	ND	ND	0.4	---
MW-7	12/18/91	167.61	---	---	---	ND	0.7	2.9	0.8	3.3	---
MW-7	04/01/91	167.61	15.18	---	152.43	ND	ND	ND	ND	ND	---
MW-7	07/03/92	167.61	20.28	---	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	---	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	---	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	---	151.77	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	PACE
MW-7	07/12/93	167.61	19.84	---	147.77	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	PACE
MW-7	10/21/93	167.61	21.61	---	146.00	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	PACE
MW-8	03/07/91	165.74	16.72	---	149.02	2.7	780	450	64	310	---
MW-8	06/27/91	165.74	---	---	---	12000	3400	1100	240	750	---
MW-8	09/27/91	165.74	---	---	---	41	5700	5200	1100	4300	---
MW-8	12/18/91	165.74	---	---	---	3.2	990	150	120	250	---
MW-8	04/01/91	165.74	12.54	---	153.20	15000	3600	2600	410	1900	---
MW-8	07/03/92	165.74	18.78	---	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	---	---	---	---	---	---
MW-8	07/12/93	165.74	18.30	SHEEN	147.44	---	---	---	---	---	---
MW-8	10/21/93	165.74	21.91	0.95	144.54	---	---	---	---	---	---

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) (Feet)	DEPTH TO WATER (Feet)	PRODUCT THICKNESS (Feet)	GROUNDWATER ELEVATION (b) (Feet)	TPH-G (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	LAB
MW-9	03/07/91	166.20	16.79	---	149.41	7.1	220	4	2.4	2400	---
MW-9	06/27/91	166.20	---	---	---	3600	520	400	85	310	---
MW-9	09/27/91	166.20	---	---	---	3.2	720	150	50	180	---
MW-9	12/18/91	166.20	---	---	---	ND	2.5	1.1	0.3	5.8	---
MW-9	04/01/91	166.20	12.89	---	153.31	12000	2000	2600	360	1600	---
MW-9	07/03/92	166.20	18.89	---	147.31	5700	17000	840	230	800	ANA
MW-9	10/05/92	166.20	20.52	---	145.68	1400	440	17	14	100	ANA
MW-9	01/13/93	166.20	12.92	---	153.28	11000	1200	1700	340	1400	PACE
QC-1 (c)	01/13/93	166.20	12.92	---	153.28	11000	1200	1600	330	1300	PACE
MW-9	04/23/93	166.20	14.08	---	152.12	24000	2800	4500	730	3400	PACE
MW-9	07/12/93	166.20	18.44	---	147.76	13000	1400	1100	360	1400	PACE
QC-1 (c)	07/12/93	166.20	18.44	---	147.76	10000	1200	900	310	1200	PACE
MW-9	10/21/93	166.20	21.81	0.89	145.06	---	---	---	---	---	---
MW-10	03/07/91	167.01	18.09	---	148.92	1.6	120	190	32	230	---
MW-10	06/27/91	167.01	---	---	---	12000	7300	500	150	300	---
MW-10	09/27/91	167.01	---	---	---	57	12000	7200	1400	4600	---
MW-10	12/18/91	167.01	---	---	---	5.3	2500	120	36	79	---
MW-10	04/01/91	167.01	13.92	---	153.09	ND	ND	ND	ND	ND	---
MW-10	07/03/92	167.01	19.92	---	147.09	8600	5100	1300	180	690	ANA
MW-10	10/05/92	167.01	21.92	0.19	145.23	---	---	---	---	---	---
MW-10	01/13/93	167.01	14.43	0.03	152.60	---	---	---	---	---	---
MW-10	04/23/93	167.01	15.26	0.06	151.80	---	---	---	---	---	---
MW-10	07/12/93	167.01	19.78	0.45	147.57	---	---	---	---	---	---
MW-10	10/21/93	167.01	22.90	0.69	144.63	---	---	---	---	---	---
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
QC-2 (e)	07/12/93	---	---	---	---	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	PACE
QC-2 (e)	10/21/93	---	---	---	---	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/measurable
 ND Not detected above reported detection limit
 ANA Anamatrix, Inc.
 PACE Pace Inc.

NOTES:

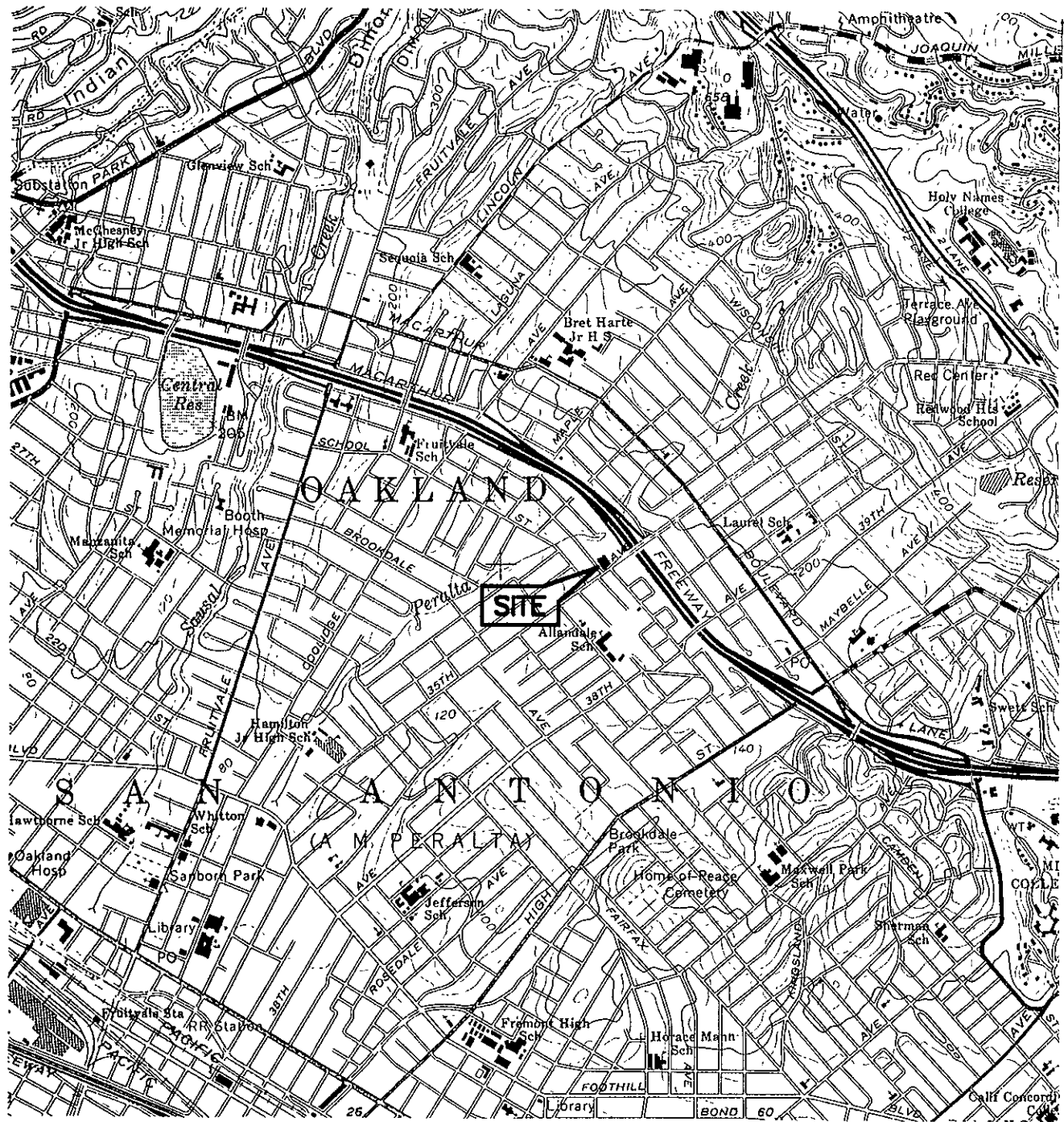
- (a) Casing elevations surveyed to the nearest 0.01 foot relative to mean sea level.
 (b) Groundwater elevations adjusted assuming a specific gravity of 0.75 for free product.
 (c) Blind duplicate.
 (d) Well not sampled due to an abandoned vehicle parked over well.
 (e) Travel blank.

TABLE 2
PRODUCT REMOVAL STATUS

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

ALISTO PROJECT NO. 10-024

WELL ID	DATE	PRODUCT REMOVED (Gallons)	PRODUCT REMOVED CUMULATIVE (Gallons)
MW-2	09/29/93	0.10	0.10
	10/05/93	0.10	0.20
	10/14/93	0.10	0.30
	10/20/93	0.25	0.55
	11/02/93	0.10	0.65
	12/07/93	0.05	0.70
MW-8	11/02/93	0.25	0.25
	11/10/93	0.10	0.35
	11/16/93	0.10	0.45
	11/23/93	0.10	0.55
	11/30/93	0.10	0.65
MW-9	11/02/93	0.10	0.10
	11/10/93	0.10	0.20
	11/16/93	0.10	0.30
MW-10	09/07/93	0.10	0.1
	09/14/93	0.10	0.2
	09/29/93	0.10	0.3
	10/05/93	1.60	1.9
	10/14/93	2.10	4
	10/20/93	1.00	5
	10/27/93	1.00	6
	11/02/93	0.35	6.35
	11/10/93	0.20	6.55
	11/16/93	0.10	6.65
	11/23/93	0.15	6.8
	11/30/93	0.36	7.16
	12/07/93	0.26	7.42
12/17/93	0.26	7.68	



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

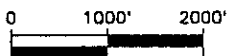
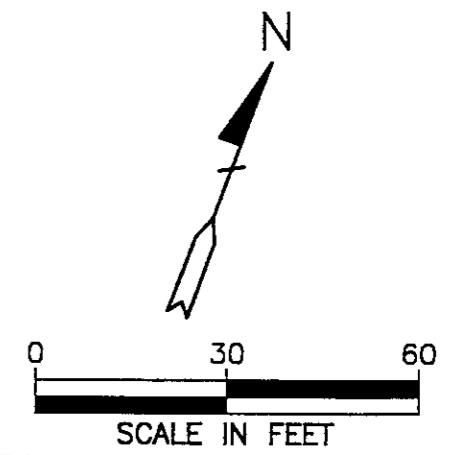
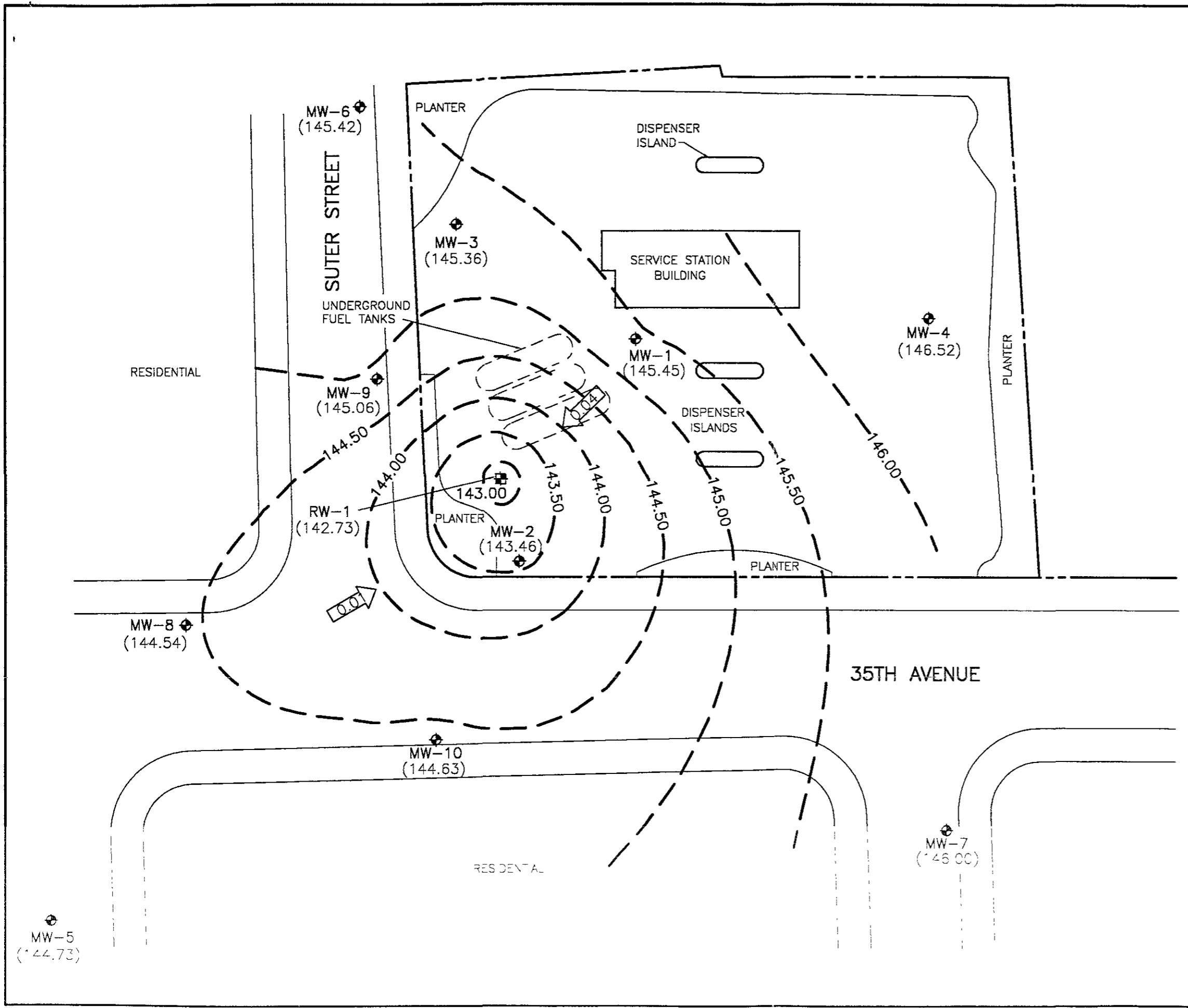


FIGURE 1
SITE VICINITY MAP

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

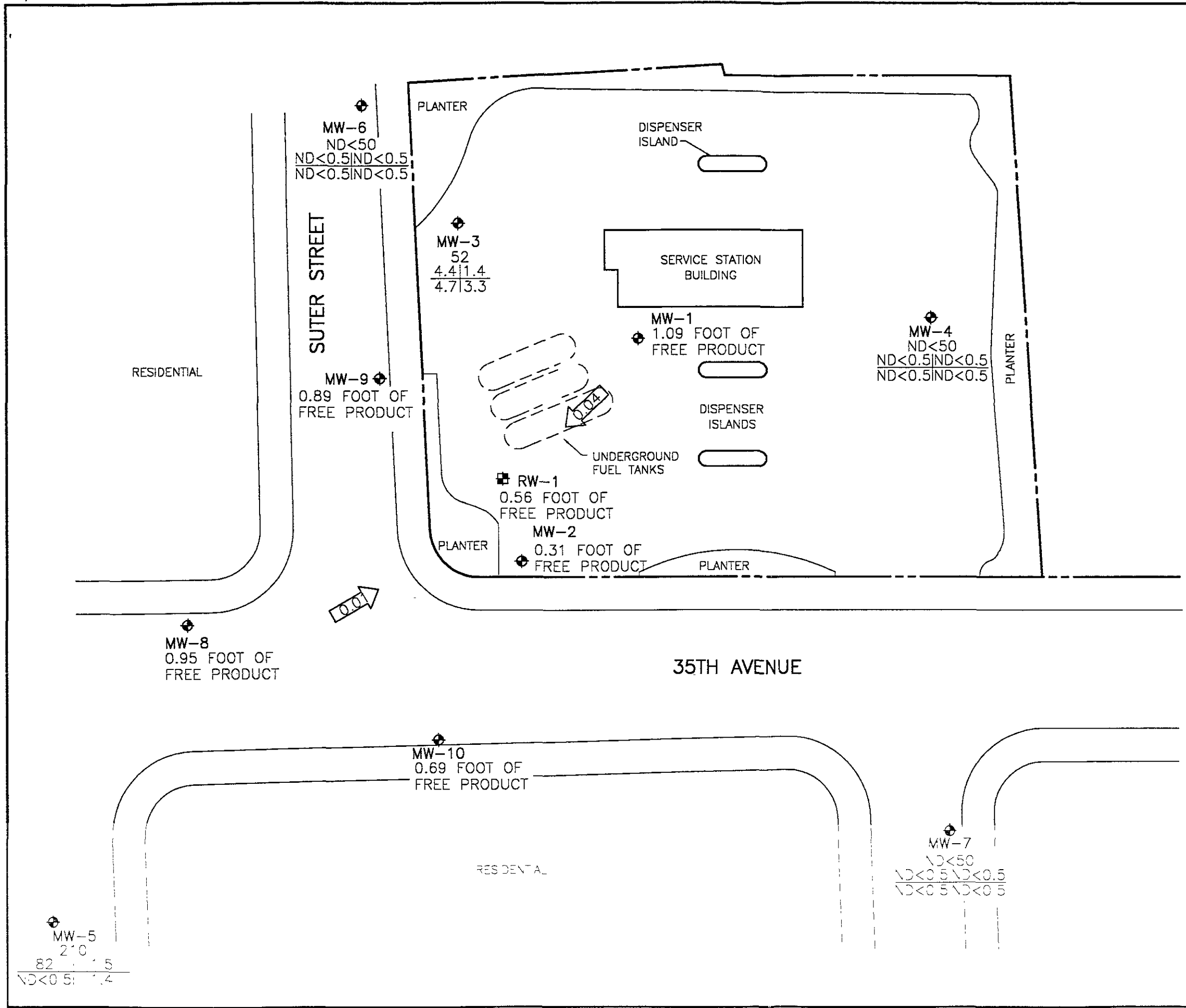


ALISTO ENGINEERING GROUP
 WALNUT CREEK, CALIFORNIA



- LEGEND**
- ◆ GROUNDWATER MONITORING WELL
 - ⊕ GROUNDWATER RECOVERY WELL
 - (145.45) GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL
 - 145.00 - GROUNDWATER ELEVATION CONTOUR IN FEET ABOVE MEAN SEA LEVEL (CONTOUR INTERVAL=0.50 FOOT)
 - ← 0.04 → CALCULATED GROUNDWATER GRADIENT DIRECTION AND MAGNITUDE IN FOOT PER FOOT

FIGURE 2
POTENTIOMETRIC GROUNDWATER ELEVATION CONTOUR MAP
 OCTOBER 21, 1993
 BP OIL SERVICE STATION NO. 11132
 3201 35TH STREET
 OAKLAND, CALIFORNIA
 PROJECT NO. 10-024



LEGEND

- ◆ GROUNDWATER MONITORING WELL
- ⊕ GROUNDWATER RECOVERY WELL
- TPH-G | B | T CONCENTRATION OF CONSTITUENTS IN PARTS PER BILLION
- E | X
- TPH-G TOTAL PETROLEUM HYDROCARBONS AS GASOLINE
- B BENZENE
- T TOLUENE
- E ETHYLBENZENE
- X TOTAL XYLENES
- ND NOT DETECTED ABOVE REPORTED DETECTION LIMIT
- ←0.04→ CALCULATED GROUNDWATER GRADIENT DIRECTION AND MAGNITUDE IN FOOT PER FOOT

FIGURE 3
CONCENTRATIONS OF PETROLEUM HYDROCARBONS IN GROUNDWATER
 OCTOBER 21, 1993
 BP OIL SERVICE STATION NO. 11132
 3201 35TH STREET
 OAKLAND, CALIFORNIA
 PROJECT NO. 10-024

DATE PLOTTED: 12/1/93 10:54 AM

APPENDIX A

WATER SAMPLING FIELD SURVEY FORMS

Birch
Technical
Services

Field Report / Data Sheet

OGroundwater Sampling OGroundwater Monitoring OWell Development ODrill Support OStockpile Sampling

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

Firm:
ALISTO
Project Number:
10-024-03-02

Date: **10/21/93**

Station #: **BP11132**

Day: M Tu W **(Th)** F

Field Technician:
DJ BIRCH

Address: **3201
35th STREET
OAKLAND**

Weather:
overcast

DTW Order	Well ID	Lock	Exp Cap	Total Depth (feet)	1st Depth to Water (feet)	2nd Depth to Water (feet)	Depth to Product (feet)	Product Thickness	Comments	WELL DIAM
10	MW-1	ok	ok	44.08	25.12	25.12	24.03	1.09	Product	2
11	MW-2	ok	ok	34.31	24.91	24.91	24.60	0.31	Product	2
5	MW-3	ok	ok	34.58	21.81	21.81		None	QC-1	2
3	MW-4	ok	ok	38.74	23.84	23.84		None		2
4	MW-5	ok	ok	30.88	20.41	20.41		None		2
1	MW-6	ok	ok	34.56	19.98	19.98		None		2
2	MW-7	ok	ok	31.49	21.61	21.61		None		2
7	MW-8	ok	ok	38.72	21.91	21.91	20.96	0.95	0.95' Product	2
6	MW-9	ok	ok	29.49	21.81	21.81	20.92	0.89	Product	2
8	MW10	ok	ok	34.00	22.90	22.90	22.21	0.69	Product	2
9	RW-1	ok	ok	38.41	25.70	25.70	25.14	0.56	Product	6

Notes:

CALIBRATION pH 7.00 7 pH 4.00 4 pH 10.00 10 at 69 °F

Birch Technical Services

GROUNDWATER SAMPLING FORM

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

Well Number: MW-3

Project Number: 10-024-03-02

Station Number: BP11132

Date: 10/21/93

Sample Type: Groundwater Trip Blank Duplicate of _____

Sampled by: Dan Birch

WELL PURGING

PURGE VOLUME

Casing Diameter (inches)
 Volume Factors:

2" 0.1632 3" 0.3672 4" 0.6528 4.5" 0.826 6" 1.469 _____

Total Depth of Well 34.58

Initial Water Level: 21.81

PURGE METHOD:

Total Volume Purged: 65.08

Time Elapsed: 5 min

Honda Pump
 Disposable Poly Tubing (37 ft)
 Speed Winch
 Disposable PVC Bailer(s) (____)
 Other _____

Calculated Purge Volume:

$$\frac{34.58}{\text{Total Depth}} - \frac{21.81}{\text{Water Level}} = 12.77 \times \frac{.16}{\text{Well Vol. Fac.}} = 2.04 \times \frac{3}{\text{\# of vol. to Purge}} = \frac{6.12}{\text{Calculated Purge Volume}} \text{ (gallons)}$$

COMMENTS:

Subjective Analysis Prior to Purging

SHEEN Yes No Depth to Product None (ft) Product Thickness None (ft)

SAMPLING METHOD

PVC Disposable Bailer Time Sampled (24 hour clock) 1512
 Teflon Bailer
 Other: _____

WELL SAMPLING PARAMETERS

Gallons Removed	Time	pH	Temp °F	Cond. (umhos/cm)
2	1508	7.11	68.9	0.67
4	1510	7.06	68.7	0.69
6	1512	7.05	68.5	0.69

Analysis Required	No. of	Container Type	Preservatives
EPA 601		VOA's	
<input checked="" type="checkbox"/> TPH-G/BTEX	3	VOA's	HCl
TPH- Diesel		Amber Liter	
TOG 5520 BF		Amber Liter	H ₂ SO ₄

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

November 01, 1993
 PACE Project Number: 431022520

Attn: Mr. Bill Howell

Client Reference: BP Station # 11132

PACE Sample Number: 70 0179327
 Date Collected: 10/21/93
 Date Received: 10/22/93
 Client Sample ID: MW-3

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>DATE ANALYZED</u>
------------------	--------------	------------	----------------------

ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS			
TOTAL FUEL HYDROCARBONS, (LIGHT):			10/27/93
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	10/27/93
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			10/27/93
Benzene	ug/L	0.5	10/27/93
Toluene	ug/L	0.5	10/27/93
Ethylbenzene	ug/L	0.5	10/27/93
Xylenes, Total	ug/L	0.5	10/27/93

Mr. Bill Howell
 Page 2

November 01, 1993
 PACE Project Number: 431022520

Client Reference: BP Station # 11132

PACE Sample Number: 70 0179513
 Date Collected: 10/21/93
 Date Received: 10/22/93
 Client Sample ID: MW-4

<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
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

Mr. Bill Howell
 Page 3

November 01, 1993
 PACE Project Number: 431022520

Client Reference: BP Station # 11132

PACE Sample Number: 70 0179521
 Date Collected: 10/21/93
 Date Received: 10/22/93
 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):			-	10/28/93
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	210	10/28/93
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	10/28/93
Benzene	ug/L	0.5	82	10/28/93
Toluene	ug/L	0.5	1.5	10/28/93
Ethylbenzene	ug/L	0.5	ND	10/28/93
Xylenes, Total	ug/L	0.5	1.4	10/28/93

Mr. Bill Howell
 Page 4

November 01, 1993
 PACE Project Number: 431022520

Client Reference: BP Station # 11132

PACE Sample Number: 70 0179530
 Date Collected: 10/21/93
 Date Received: 10/22/93
 Client Sample ID: MW-6

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>DATE ANALYZED</u>
------------------	--------------	------------	----------------------

ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS			
TOTAL FUEL HYDROCARBONS, (LIGHT):		-	10/28/93
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	ND 10/28/93
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			
Benzene	ug/L	0.5	ND 10/28/93
Toluene	ug/L	0.5	ND 10/28/93
Ethylbenzene	ug/L	0.5	ND 10/28/93
Xylenes, Total	ug/L	0.5	ND 10/28/93

Mr. Bill Howell
 Page 5

November 01, 1993
 PACE Project Number: 431022520

Client Reference: BP Station # 11132

PACE Sample Number: 70 0179548
 Date Collected: 10/21/93
 Date Received: 10/22/93
 Client Sample ID: MW-7

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>DATE ANALYZED</u>
------------------	--------------	------------	----------------------

ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS			
TOTAL FUEL HYDROCARBONS, (LIGHT):		-	10/28/93
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	ND 10/28/93
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			
Benzene	ug/L	0.5	ND 10/28/93
Toluene	ug/L	0.5	ND 10/28/93
Ethylbenzene	ug/L	0.5	ND 10/28/93
Xylenes, Total	ug/L	0.5	ND 10/28/93

Mr. Bill Howell
 Page 6

November 01, 1993
 PACE Project Number: 431022520

Client Reference: BP Station # 11132

PACE Sample Number: 70 0179556
 Date Collected: 10/21/93
 Date Received: 10/22/93
 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):			-	10/28/93
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	65	10/28/93
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	10/28/93
Benzene	ug/L	0.5	7.4	10/28/93
Toluene	ug/L	0.5	1.0	10/28/93
Ethylbenzene	ug/L	0.5	6.9	10/28/93
Xylenes, Total	ug/L	0.5	4.2	10/28/93

Mr. Bill Howell
 Page 7

November 01, 1993
 PACE Project Number: 431022520

Client Reference: BP Station # 11132

PACE Sample Number: 70 0179564
 Date Collected: 10/21/93
 Date Received: 10/22/93
 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):			-	10/28/93
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	ND	10/28/93
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	10/28/93
Benzene	ug/L	0.5	ND	10/28/93
Toluene	ug/L	0.5	ND	10/28/93
Ethylbenzene	ug/L	0.5	ND	10/28/93
Xylenes, Total	ug/L	0.5	ND	10/28/93

These data have been reviewed and are approved for release.


 Darrell C. Cain
 Regional Director

Mr. Bill Howell
Page 8

FOOTNOTES
for pages 1 through 7

November 01, 1993
PACE Project Number: 431022520

Client Reference: BP Station # 11132

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

REPORT OF LABORATORY ANALYSIS

Mr. Bill Howell
 Page 9

QUALITY CONTROL DATA

November 01, 1993
 PACE Project Number: 431022520

Client Reference: BP Station # 11132

PURGEABLE FUELS AND AROMATICS
 Batch: 70 25955
 Samples: 70 0179327

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	99%	97%	2%
Benzene	ug/L	0.5	40.0	100%	97%	3%
Toluene	ug/L	0.5	40.0	102%	98%	4%
Ethylbenzene	ug/L	0.5	40.0	107%	100%	6%
Xylenes, Total	ug/L	0.5	120	106%	101%	4%

REPORT OF LABORATORY ANALYSIS

Mr. Bill Howell
 Page 10

QUALITY CONTROL DATA

November 01, 1993
 PACE Project Number: 431022520

Client Reference: BP Station # 11132

PURGEABLE FUELS AND AROMATICS

Batch: 70 25992
 Samples: 70 0179513, 70 0179521, 70 0179530

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	99%	101%	2%
Benzene	ug/L	0.5	100	103%	107%	3%
Toluene	ug/L	0.5	100	109%	111%	1%
Ethylbenzene	ug/L	0.5	100	109%	110%	0%
Xylenes, Total	ug/L	0.5	300	110%	110%	0%

Mr. Bill Howell
 Page 11

QUALITY CONTROL DATA

November 01, 1993
 PACE Project Number: 431022520

Client Reference: BP Station # 11132

PURGEABLE FUELS AND AROMATICS

Batch: 70 26004
 Samples: 70 0179548, 70 0179556, 70 0179564

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	101%	101%	0%
Benzene	ug/L	0.5	40.0	99%	99%	0%
Toluene	ug/L	0.5	40.0	99%	98%	1%
Ethylbenzene	ug/L	0.5	40.0	98%	98%	0%
Xylenes, Total	ug/L	0.5	120	98%	99%	1%

Mr. Bill Howell
Page 12

FOOTNOTES
for pages 9 through 11

November 01, 1993
PACE Project Number: 431022520

Client Reference: BP Station # 11132

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



431022-520

CHAIN OF CUSTODY

No. 00278

Page 1 of 1

CONSULTANT'S NAME ALISTO ENGINEERING GROUP		ADDRESS 1777 OAKLAND BLVD., STE 200 WALNUT CREEK CA 94596		CITY	STATE	ZIP CODE
BP SITE NUMBER BP 11132	BP CORNER ADDRESS/CITY 3201 35th ST., OAKLAND			CONSULTANT PROJECT NUMBER 10-024-03-02		
CONSULTANT PROJECT MANAGER BILL HOWELL		PHONE NUMBER 510 295 1650	FAX NUMBER 510 295 1823		CONSULTANT CONTRACT NUMBER	
BP CONTACT	BP ADDRESS 16400 Southern Ln Pkwy 301	PHONE NUMBER 206 394 5243	FAX NO 206 394-5243			
LAB CONTACT JIM OYES	LABORATORY ADDRESS 11 Digital Dr NOVATO	PHONE NUMBER 415 883 6100	FAX NO 415 883 2673			
SAMPLED BY (Please Print Name) DANIEL J. BIRCH		SAMPLED BY (Signature) <i>[Signature]</i>		SHIPMENT DATE 10-22-93	SHIPMENT METHOD Pace Courier	

TAT: 24 Hours 48 Hours 1 Week Standard 2 Weeks

ANALYSIS REQUIRED

AIRBILL NUMBER

SAMPLE DESCRIPTION	COLLECTION DATE	MATRIX SOIL/WATER	CONTAINERS		PRESERVATIVE	Hcl	TPH6	BTEX	COMMENTS			
	COLLECTION TIME		NO.	TYPE (VOL.)	LAB SAMPLE #							
MW-3	1512	10-21-93	W	3	VOA	17932.7	X					
MW-4	1306	}	}	}	}	17951.3	X					
MW-5	1445					17952.1	X					
MW-6	1413					17953.0	X					
MW-7	1337					17954.8	X					
MW-9							X					NO MW9
QC-1	1515								17955.6	X		
QC-2								1	17956.4	X		

RELINQUISHED BY / AFFILIATION -	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	ADDITIONAL COMMENTS
<i>[Signature]</i> BTS	10/22/93	1525	<i>[Signature]</i> -PACO	10/22/93	1525	F973521 PACE#
<i>[Signature]</i> -PACO	10/23/93	1910	Janice McWhorter Pace	10/22	1910	10/2