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BP OIL CO  
ENVIRONMENTAL  
WEST COAST REGION OFFICE

**GROUNDWATER MONITORING AND SAMPLING REPORT**

**BP Oil Company Service Station No. 11109  
4280 Foothill Boulevard  
Oakland, California**

**Project No. 10-014-02-001**

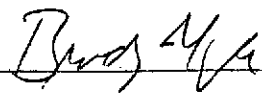
**Prepared for:**

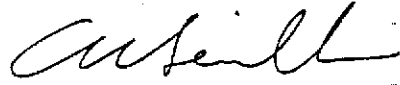
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**October 21, 1993**

  
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# GROUNDWATER MONITORING AND SAMPLING REPORT

BP Oil Company Service Station No. 11109  
4280 Foothill Boulevard  
Oakland, California

Project No. 10-014-02-001

October 21, 1993

## INTRODUCTION

This report presents the results and findings of the July 7, 1993 groundwater monitoring and sampling conducted by Alisto Engineering Group at BP Oil Company Service Station No. 11109, 4280 Foothill 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 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. Isoconcentration maps of total petroleum hydrocarbons as gasoline and benzene detected in the groundwater samples are shown in Figures 3 and 4. 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. 11109  
 4280 FOOTHILL BOULEVARD, OAKLAND, CALIFORNIA

ALISTO PROJECT NO. 10-014

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)	TOG (ppb)	HVOC (ppb)	LAB
MW-1	01/31/90	38.19	15.41	0.00	22.78	--	--	--	--	--	--	--	--	--
MW-1	(c) 02/05/90	--	--	0.00	--	--	--	--	--	--	--	--	--	--
MW-2	02/05/90	41.22	21.91	0.00	19.31	1300	--	14	ND<1.0	9	13	--	--	SUP
MW-2	02/14/91	41.22	21.16	0.00	20.06	ND<50	ND<10000	ND<0.3	ND<0.3	ND<0.3	ND<0.3	ND<5000	51 (d)	SUP
MW-2	05/13/91	41.22	21.32	0.00	19.90	ND<50	ND<50	ND<0.3	ND<0.3	ND<0.3	ND<0.3	6000	0.5 (e)	SUP
MW-2	07/24/91	41.22	22.92	0.00	18.90	--	--	--	--	--	--	--	--	--
MW-2	10/03/91	41.22	24.90	0.00	16.32	ND<50	ND<50	ND<0.3	0.8	ND<0.3	ND<0.3	ND<5000	0.7 (e)	SUP
MW-2	10/15/91	41.22	24.10	0.00	17.12	--	--	--	--	--	--	--	--	--
MW-2	12/04/91	41.22	INACCESSIBLE	--	--	--	--	--	--	--	--	--	--	--
MW-2	12/16/91	41.22	23.95	0.00	17.27	--	--	--	--	--	--	--	--	--
MW-2	01/06/92	41.22	23.30	0.00	17.92	ND<50	ND<50	ND<0.3	ND<0.3	ND<0.3	ND<0.3	ND<5000	ND	ANA
MW-2	01/22/92	41.22	23.14	0.00	18.08	--	--	--	--	--	--	--	--	--
MW-2	01/28/92	41.22	22.99	0.00	18.23	--	--	--	--	--	--	--	--	--
MW-2	02/05/92	41.22	22.63	0.00	18.59	--	--	--	--	--	--	--	--	--
MW-2	02/12/92	41.22	22.04	0.00	19.18	--	--	--	--	--	--	--	--	--
MW-2	02/17/92	41.22	20.84	0.00	20.38	--	--	--	--	--	--	--	--	--
MW-2	04/03/92	41.22	18.29	0.00	22.93	--	--	--	--	--	--	--	--	--
MW-2	04/08/92	41.22	18.86	0.00	22.36	ND<50	63	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5000	ND	ANA
MW-2	04/14/92	41.22	19.45	0.00	21.77	--	--	--	--	--	--	--	--	--
MW-2	04/29/92	41.22	20.35	0.00	20.87	--	--	--	--	--	--	--	--	--
MW-2	05/07/92	41.22	20.84	0.00	20.38	--	--	--	--	--	--	--	--	--
MW-2	07/03/92	41.22	22.34	0.00	18.88	ND<50	--	ND<0.5	ND<0.5	ND<0.5	ND<0.5	--	--	ANA
MW-2	10/08/92	41.22	23.73	0.00	17.49	ND<50	--	ND<0.5	ND<0.5	ND<0.5	ND<0.5	--	--	ANA
MW-2	12/31/92	41.22	21.12	0.00	20.10	ND<50	--	ND<0.5	ND<0.5	ND<0.5	ND<0.5	--	--	ANA
MW-2	04/21/93	41.22	17.68	0.00	23.54	ND<50	ND<50 (f)	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5000	ND	PACE
MW-2	07/07/93	41.22	20.30	0.00	20.92	ND<50	--	ND<0.5	ND<0.5	ND<0.5	ND<0.5	--	--	PACE
MW-2	07/12/93	41.22	--	--	--	--	ND<50	--	--	--	--	ND<5000	1.0 (a)	PACE
MW-3	02/05/90	40.74	17.45	0.00	23.29	1400	--	15	ND<2.5	11	8	--	--	SUP
MW-3	02/14/91	40.74	18.52	0.00	22.22	320	--	8	ND<0.3	8	1	--	--	SUP
MW-3	05/13/91	40.74	19.32	0.00	21.42	640	--	13	ND<0.3	18	1	--	--	SUP
MW-3	07/24/91	40.74	20.69	0.00	20.05	--	--	--	--	--	--	--	--	--
MW-3	10/03/91	40.74	19.47	0.00	21.27	940	--	21	ND<0.3	23	2.1	--	--	SUP
MW-3	10/15/91	40.74	20.46	0.00	20.28	--	--	--	--	--	--	--	--	--
MW-3	12/04/91	40.74	18.29	0.00	22.45	--	--	--	--	--	--	--	--	--
MW-3	12/16/91	40.74	18.34	0.00	22.40	--	--	--	--	--	--	--	--	--
MW-3	01/06/92	40.74	18.50	0.00	22.24	580	--	6.1	1	6.1	7.1	--	--	ANA
MW-3	01/22/92	40.74	17.86	0.00	22.88	--	--	--	--	--	--	--	--	--
MW-3	01/28/92	40.74	15.84	0.00	24.90	--	--	--	--	--	--	--	--	--
MW-3	02/05/92	40.74	17.53	0.00	23.21	--	--	--	--	--	--	--	--	--
MW-3	02/12/92	40.74	17.15	0.00	23.59	--	--	--	--	--	--	--	--	--
MW-3	02/17/92	40.74	16.18	0.00	24.58	--	--	--	--	--	--	--	--	--
MW-3	04/03/92	40.74	14.80	0.00	25.94	--	--	--	--	--	--	--	--	--
MW-3	04/08/92	40.74	17.06	0.00	23.68	1100	--	30	4.6	32	11	--	--	ANA
MW-3	04/14/92	40.74	15.22	0.00	25.52	--	--	--	--	--	--	--	--	--
MW-3	04/29/92	40.74	15.90	0.00	24.84	--	--	--	--	--	--	--	--	--
MW-3	05/07/92	40.74	16.35	0.00	24.39	--	--	--	--	--	--	--	--	--
MW-3	07/03/92	40.74	17.74	0.00	23.00	1200	--	38	ND<2.5	24	ND<2.5	--	--	ANA
MW-3	10/08/92	40.74	19.06	0.00	21.68	1400	--	31	ND<0.5	25	13	--	--	ANA
MW-3	12/31/92	40.74	16.61	0.00	24.13	820	--	12	4.1	13	5.9	--	--	ANA
QC-1	(g) 12/31/92	--	--	--	--	960	--	11	3.6	10	3.8	--	--	ANA
MW-3	04/21/93	40.74	14.24	0.00	26.50	420	--	5.6	ND<0.5	3.9	1.4	--	--	PACE
QC-1	(g) 04/21/93	--	--	--	--	390	--	5.0	ND<0.5	3.7	1.5	--	--	PACE
MW-3	07/07/93	40.13	(h) 15.19	0.00	24.94	54	--	0.6	0.6	ND<0.5	ND<0.5	--	--	PACE

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ALISTO PROJECT NO. 10-014

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)	TOG (ppb)	HVOC (ppb)	LAB
MW-4	02/05/90	40.11	20.75	0.00	19.36	620	---	ND<0.5	9	ND<0.5	10	---	---	SUP
MW-4	02/14/91	40.11	21.73	0.00	18.38	180	---	ND<0.3	ND<0.3	0.4	2	---	---	SUP
MW-4	05/13/91	40.11	18.55	0.00	21.56	72	---	0.7	ND<0.3	ND<0.3	ND<0.3	---	---	SUP
MW-4	07/24/91	40.11	21.31	0.00	18.80	---	---	---	---	---	---	---	---	---
MW-4	10/03/91	40.11	22.57	0.00	17.54	57	---	ND<0.3	ND<0.3	ND<0.3	ND<0.3	---	---	SUP
MW-4	10/15/91	40.11	22.88	0.00	17.23	---	---	---	---	---	---	---	---	---
MW-4	12/04/91	40.11	22.54	0.00	17.57	---	---	---	---	---	---	---	---	---
MW-4	12/16/91	40.11	22.59	0.00	17.52	---	---	---	---	---	---	---	---	---
MW-4	01/06/92	40.11	22.00	0.00	18.11	480	---	0.8	3.2	1.9	7.7	---	---	ANA
MW-4	01/22/92	40.11	21.58	0.00	18.53	---	---	---	---	---	---	---	---	---
MW-4	01/28/92	40.11	21.42	0.00	18.69	---	---	---	---	---	---	---	---	---
MW-4	02/05/92	40.11	21.10	0.00	19.01	---	---	---	---	---	---	---	---	---
MW-4	02/12/92	40.11	20.74	0.00	19.37	---	---	---	---	---	---	---	---	---
MW-4	02/17/92	40.11	19.78	0.00	20.33	---	---	---	---	---	---	---	---	---
MW-4	04/03/92	40.11	16.80	0.00	23.31	---	---	---	---	---	---	---	---	---
MW-4	04/08/92	40.11	17.13	0.00	22.98	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	ANA
MW-4	04/14/92	40.11	17.74	0.00	22.37	---	---	---	---	---	---	---	---	---
MW-4	04/29/92	40.11	18.56	0.00	21.55	---	---	---	---	---	---	---	---	---
MW-4	05/07/92	40.11	19.10	0.00	21.01	---	---	---	---	---	---	---	---	---
MW-4	07/03/92	40.11	20.71	0.00	19.40	ND<50	---	0.6	ND<0.5	ND<0.5	ND<0.5	---	---	ANA
MW-4	10/08/92	40.11	22.43	0.00	17.68	270	---	ND<0.5	2.1	2.5	3.2	---	---	ANA
MW-4	12/31/92	40.11	19.58	0.00	20.53	150	---	ND<0.5	ND<0.5	ND<0.5	1.3	---	---	ANA
MW-4	04/21/93	40.11	17.79	0.00	22.32	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	PAGE
MW-4	07/07/93	40.11	18.44	0.00	21.67	160	---	1.2	5.4	3.8	19	---	---	PAGE
MW-5	10/03/91	39.55	18.08	0.00	21.47	79000	---	13000	7400	1400	6200	---	---	SUP
MW-5	10/15/91	39.55	18.55	0.00	21.00	---	---	---	---	---	---	---	---	---
MW-5	12/04/91	39.55	18.44	0.13	21.21	---	---	---	---	---	---	---	---	---
MW-5	12/16/91	39.55	18.66	0.01	20.90	---	---	---	---	---	---	---	---	---
MW-5	01/06/92	39.55	19.12	0.11	20.51	---	---	---	---	---	---	---	---	---
MW-5	01/22/92	39.55	14.59	0.00	24.96	---	---	---	---	---	---	---	---	---
MW-5	01/28/92	39.55	15.25	0.00	24.30	---	---	---	---	---	---	---	---	---
MW-5	02/05/92	39.55	15.58	SHEEN	23.97	---	---	---	---	---	---	---	---	---
MW-5	02/12/92	39.55	15.54	0.01	24.02	---	---	---	---	---	---	---	---	---
MW-5	02/17/92	39.55	13.98	SHEEN	25.57	---	---	---	---	---	---	---	---	---
MW-5	04/03/92	39.55	13.63	0.04	25.95	---	---	---	---	---	---	---	---	---
MW-5	04/08/92	39.55	13.17	0.01	26.39	---	---	---	---	---	---	---	---	---
MW-5	04/14/92	39.55	13.45	0.01	26.11	---	---	---	---	---	---	---	---	---
MW-5	04/29/92	39.55	13.75	0.07	25.85	---	---	---	---	---	---	---	---	---
MW-5	05/07/92	39.55	16.15	0.04	23.43	---	---	---	---	---	---	---	---	---
MW-5	07/03/92	39.55	17.67	0.08	21.94	---	---	---	---	---	---	---	---	---
MW-5	09/01/92	39.55	17.83	0.50	22.10	---	---	---	---	---	---	---	---	---
MW-5	10/08/92	39.55	17.86	0.92	22.38	---	---	---	---	---	---	---	---	---
MW-5	12/31/92	39.55	15.20	SHEEN	24.35	---	---	---	---	---	---	---	---	---
MW-5	04/21/93	39.55	12.64	0.02	26.93	---	---	---	---	---	---	---	---	---
MW-5	07/07/93	39.14 (h)	12.68	0.82	27.08	---	---	---	---	---	---	---	---	---

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WELL ID	DATE OF SAMPLING/ MONITORING	CASING ELEVATION (a) (Feet)	DEPTH TO WATER (Feet)	PRODUCT THICKNESS (Feet)	GROUNDWATER ELEVATION (Feet)	TPH-G (ppb)	TPH-D (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	TOG (ppb)	HVOC (ppb)	LAB
MW-6	10/03/91	41.59	20.73	0.00	20.66	ND<50	---	0.7	0.8	ND<0.3	1.3	---	---	SUP
MW-6	10/15/91	41.59	21.20	0.00	20.39	---	---	---	---	---	---	---	---	---
MW-6	12/04/91	41.59	21.26	0.00	20.33	---	---	---	---	---	---	---	---	---
MW-6	12/16/91	41.59	21.12	0.00	20.47	---	---	---	---	---	---	---	---	---
MW-6	01/06/92	41.59	20.29	0.00	21.30	ND<50	---	ND<0.5	ND<0.5	ND<0.5	1.6	---	---	ANA
MW-6	01/22/92	41.59	20.12	0.00	21.47	---	---	---	---	---	---	---	---	---
MW-6	01/28/92	41.59	20.20	0.00	21.39	---	---	---	---	---	---	---	---	---
MW-6	02/05/92	41.59	20.09	0.00	21.50	---	---	---	---	---	---	---	---	---
MW-6	02/12/92	41.59	19.15	0.00	22.44	---	---	---	---	---	---	---	---	---
MW-6	02/17/92	41.59	18.02	0.00	23.57	---	---	---	---	---	---	---	---	---
MW-6	04/03/92	41.59	16.62	0.00	24.97	---	---	---	---	---	---	---	---	---
MW-6	04/08/92	41.59	17.06	0.00	24.53	ND<50	---	0.6	ND<0.5	0.8	ND<0.5	---	---	ANA
MW-6	04/14/92	41.59	17.23	0.00	24.36	---	---	---	---	---	---	---	---	---
MW-6	04/29/92	41.59	18.12	0.00	23.47	---	---	---	---	---	---	---	---	---
MW-6	05/07/92	41.59	18.52	0.00	23.07	---	---	---	---	---	---	---	---	---
MW-6	07/03/92	41.59	19.71	0.00	21.88	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	ANA
MW-6	10/08/92	41.59	21.22	0.00	20.37	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	ANA
QC-1	(g) 10/08/92	41.59	21.22	0.00	20.37	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	ANA
MW-6	12/31/92	41.59	21.33	0.00	20.26	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	ANA
MW-6	04/21/93	41.59	16.45	0.00	25.14	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	PACE
MW-6	07/07/93	41.59	18.68	0.00	22.91	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	PACE
MW-7	10/03/91	40.64	14.93	0.00	25.71	360	---	62	13	3.4	20	---	---	SUP
MW-7	10/15/91	40.64	15.16	0.00	25.48	---	---	---	---	---	---	---	---	---
MW-7	12/04/91	40.64	15.41	0.00	25.23	---	---	---	---	---	---	---	---	---
MW-7	12/16/91	40.64	15.21	0.00	25.43	---	---	---	---	---	---	---	---	---
MW-7	01/06/92	40.64	14.56	0.00	26.08	1100	---	170	ND<0.5	24	23	---	---	ANA
MW-7	01/22/92	40.64	14.63	0.00	26.01	---	---	---	---	---	---	---	---	---
MW-7	01/28/92	40.64	14.73	0.00	25.91	---	---	---	---	---	---	---	---	---
MW-7	02/05/92	40.64	14.58	0.00	26.06	---	---	---	---	---	---	---	---	---
MW-7	02/12/92	40.64	13.94	0.00	26.70	---	---	---	---	---	---	---	---	---
MW-7	02/17/92	40.64	13.10	0.00	27.54	---	---	---	---	---	---	---	---	---
MW-7	04/03/92	40.64	12.66	0.00	27.98	---	---	---	---	---	---	---	---	---
MW-7	04/08/92	40.64	12.77	0.00	27.87	750	---	150	ND<0.5	23	9.9	---	---	ANA
MW-7	04/14/92	40.64	13.02	0.00	27.62	---	---	---	---	---	---	---	---	---
MW-7	04/29/92	40.64	13.59	0.00	27.05	---	---	---	---	---	---	---	---	---
MW-7	05/07/92	40.64	13.95	0.00	26.69	---	---	---	---	---	---	---	---	---
MW-7	07/03/92	40.64	14.73	0.00	25.91	660	---	210	ND<2.5	33	8	---	---	ANA
MW-7	10/08/92	40.64	15.75	0.00	24.89	320	---	49	1.4	13	6.2	---	---	ANA
MW-7	12/31/92	40.64	13.57	0.00	27.07	900	---	100	ND<2.5	28	4.9	---	---	ANA
MW-7	04/21/93	40.64	14.56	0.00	26.08	510	---	83	1.2	10	5.8	---	---	PACE
MW-7	07/07/93	40.32	(h) 13.40	0.00	26.92	1100	---	160	2.0	27	4.0	---	---	PACE
QC-1	(g) 07/07/93	---	---	---	---	1100	---	170	1.9	29	2.8	---	---	PACE

TABLE 1 - SUMMARY OF RESULTS OF GROUNDWATER MONITORING AND SAMPLING  
 BP OIL COMPANY SERVICE STATION NO. 11109  
 4280 FOOTHILL BOULEVARD, OAKLAND, CALIFORNIA

ALISTO PROJECT NO. 10-014

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)	TOG (ppb)	HVOC (ppb)	LAB
MW-8	10/03/91	38.18	22.37	0.00	15.81	ND<50	---	ND<0.3	0.6	ND<0.3	0.9	---	---	SUP
MW-8	10/15/91	38.18	22.70	0.00	15.48	---	---	---	---	---	---	---	---	---
MW-8	12/04/91	38.18	22.44	0.00	15.74	---	---	---	---	---	---	---	---	---
MW-8	12/16/91	38.18	22.47	0.00	15.71	---	---	---	---	---	---	---	---	---
MW-8	01/06/92	38.18	21.94	0.00	16.24	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	ANA
MW-8	01/22/92	38.18	21.44	0.00	16.74	---	---	---	---	---	---	---	---	---
MW-8	01/28/92	38.18	21.20	0.00	16.98	---	---	---	---	---	---	---	---	---
MW-8	02/05/92	38.18	20.88	0.00	17.30	---	---	---	---	---	---	---	---	---
MW-8	02/12/92	38.18	20.54	0.00	17.64	---	---	---	---	---	---	---	---	---
MW-8	02/17/92	38.18	19.99	0.00	18.19	---	---	---	---	---	---	---	---	---
MW-8	04/03/92	38.18	16.75	0.00	21.43	---	---	---	---	---	---	---	---	---
MW-8	04/08/92	38.18	16.57	0.00	21.61	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	ANA
MW-8	04/14/92	38.18	INACCESSIBLE	---	---	---	---	---	---	---	---	---	---	---
MW-8	04/29/92	38.18	18.61	0.00	19.57	---	---	---	---	---	---	---	---	---
MW-8	05/07/92	38.18	18.41	0.00	19.77	---	---	---	---	---	---	---	---	---
MW-8	07/03/92	38.18	20.35	0.00	17.83	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	ANA
MW-8	(i) 10/08/92	38.18	21.74	0.00	16.44	---	---	---	---	---	---	---	---	---
MW-8	12/31/92	38.18	19.09	0.00	19.09	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	ANA
MW-8	04/21/93	38.18	18.92	0.00	19.26	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	PACE
MW-8	07/07/93	38.18	17.76	0.00	20.42	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	PACE
MW-9	10/03/91	41.25	14.12	0.00	27.13	ND<50	---	ND<0.3	0.4	ND<0.3	ND<0.3	---	---	SUP
MW-9	10/15/91	41.25	14.27	0.00	26.98	---	---	---	---	---	---	---	---	---
MW-9	12/04/91	41.25	13.84	0.00	27.41	---	---	---	---	---	---	---	---	---
MW-9	12/16/91	41.25	14.18	0.00	27.07	---	---	---	---	---	---	---	---	---
MW-9	01/06/92	41.25	13.42	0.00	27.83	ND<50	---	ND<0.5	ND<0.5	ND<0.5	0.9	---	---	ANA
MW-9	01/22/92	41.25	13.75	0.00	27.50	---	---	---	---	---	---	---	---	---
MW-9	01/28/92	41.25	14.76	0.00	26.49	---	---	---	---	---	---	---	---	---
MW-9	02/05/92	41.25	13.38	0.00	27.67	---	---	---	---	---	---	---	---	---
MW-9	02/12/92	41.25	11.86	0.00	29.39	---	---	---	---	---	---	---	---	---
MW-9	02/17/92	41.25	10.78	0.00	30.47	---	---	---	---	---	---	---	---	---
MW-9	04/03/92	41.25	11.63	0.00	29.62	---	---	---	---	---	---	---	---	---
MW-9	04/08/92	41.25	12.25	0.00	29.00	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	ANA
MW-9	04/14/92	41.25	12.32	0.00	28.93	---	---	---	---	---	---	---	---	---
MW-9	04/29/92	41.25	13.07	0.00	28.18	---	---	---	---	---	---	---	---	---
MW-9	05/07/92	41.25	14.43	0.00	26.82	---	---	---	---	---	---	---	---	---
MW-9	07/03/92	41.25	13.85	0.00	27.40	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	ANA
MW-9	10/08/92	41.25	14.89	0.00	26.36	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	ANA
MW-9	12/31/92	41.25	11.90	0.00	29.35	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	ANA
MW-9	04/21/93	41.25	13.68	0.00	27.57	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	PACE
MW-9	07/07/93	41.25	13.12	0.00	28.13	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	PACE

TABLE 1 - SUMMARY OF RESULTS OF GROUNDWATER MONITORING AND SAMPLING  
 BP OIL COMPANY SERVICE STATION NO. 11109  
 4280 FOOTHILL BOULEVARD, OAKLAND, CALIFORNIA

ALISTO PROJECT NO. 10-014

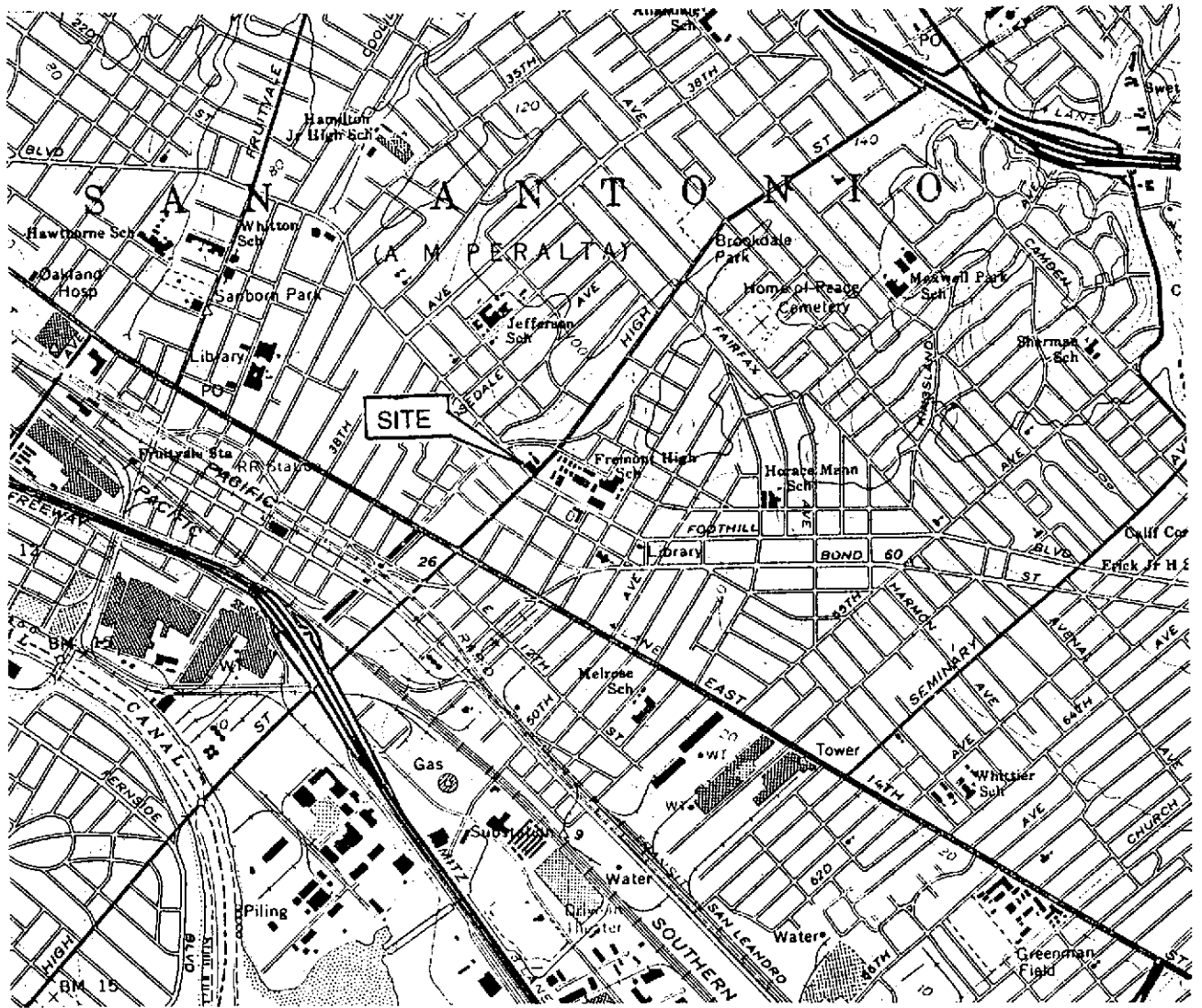
WELL ID	DATE OF SAMPLING/ MONITORING	CASING ELEVATION (a) (Feet)	DEPTH TO WATER (Feet)	PRODUCT THICKNESS (Feet)	GROUNDWATER ELEVATION (b) (Feet)	TPH-G (ppb)	TPH-D (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	TOG (ppb)	HVOC (ppb)	LAB
QC-2	(j) 10/08/92	---	---	---	---	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	ANA
QC-2	(j) 12/31/92	---	---	---	---	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	ANA
QC-2	(j) 04/21/93	---	---	---	---	---	---	---	---	---	---	---	ND	PACE
QC-2	(j) 07/07/93	---	---	---	---	ND<50	---	ND<0.5	ND<0.5	ND<0.5	0.6	---	---	PACE

ABBREVIATIONS:

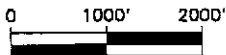
TPH-G Total petroleum hydrocarbons as gasoline  
 TPH-D Total petroleum hydrocarbons as diesel  
 B Benzene  
 T Toluene  
 E Ethylbenzene  
 X Total xylenes  
 TOG Total oil and grease  
 HVOC Halogenated volatile organic compounds  
 ppb Parts per billion  
 --- Not analyzed/applicable  
 ND Not detected above reported detection limit  
 SUP Superior Analytical Laboratory  
 ANA Anametrix, Inc.  
 PACE Pace, Inc.

NOTES:

- (a) Top of casing elevations surveyed relative to the NGVD (1929) in feet above mean sea level.
- (b) Groundwater elevations adjusted assuming a specific gravity of 0.75 for free product.
- (c) Well destroyed during tank removal in November 1990.
- (d) Methylene chloride.
- (e) 1,2-dichloroethane.
- (f) Sample collected from MW-2 for TPH-D analysis received in laboratory 7 days after collected; sample exceeded EPA-recommended holding time for TPH-D on a water matrix.
- (h) Top of casing lowered.
- (g) Blind duplicate.
- (i) Well not sampled due to abandoned vehicle parked over well.
- (j) Travel blank.



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



**FIGURE 1**

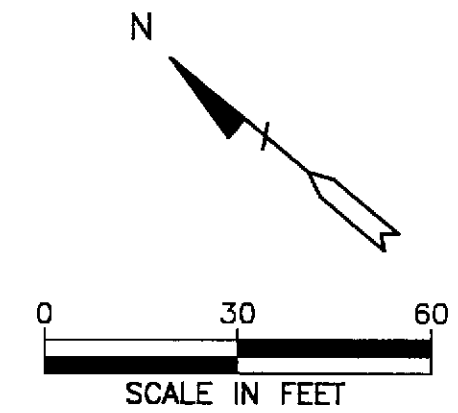
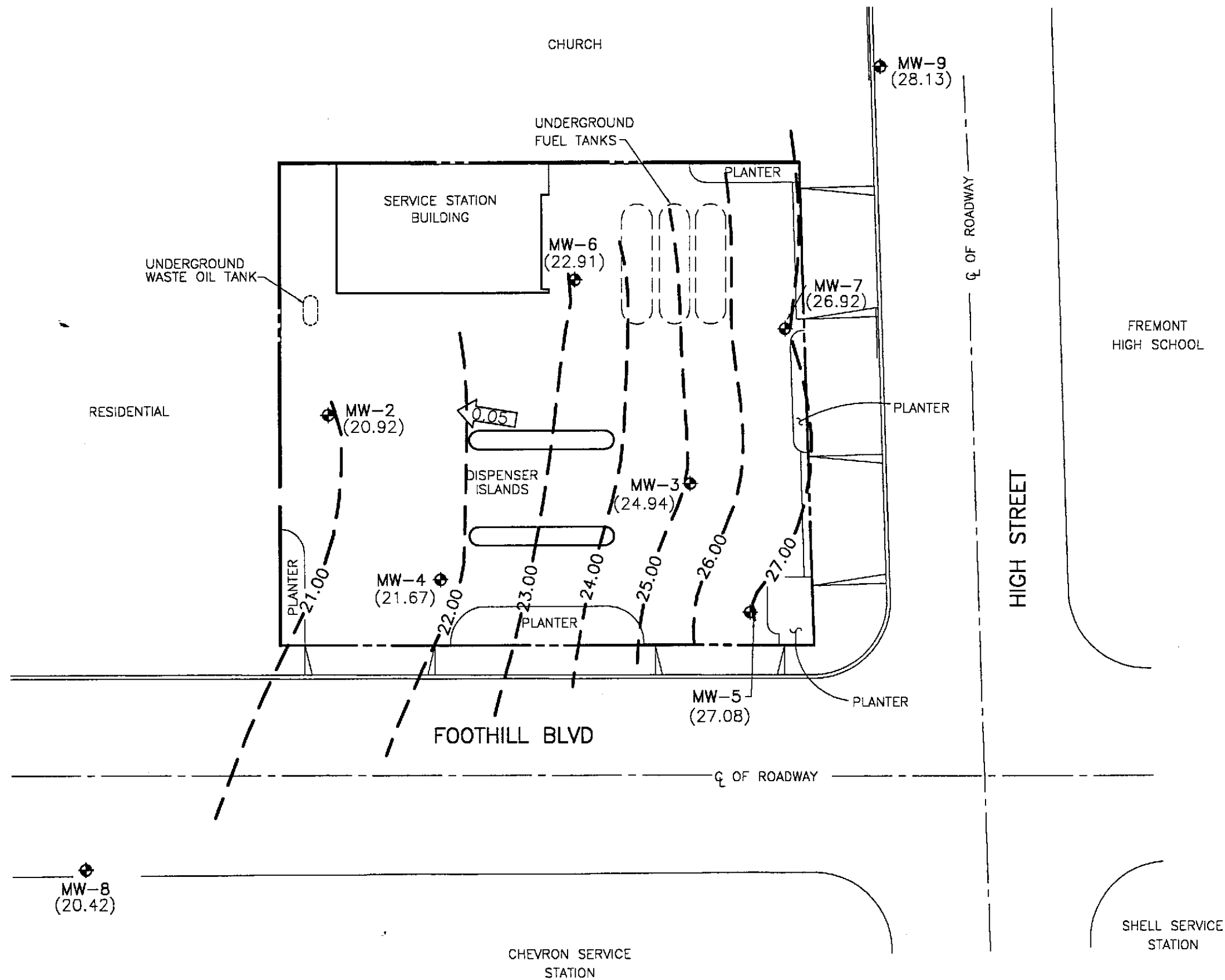
**SITE VICINITY MAP**

BP OIL SERVICE STATION NO. 11109  
 4280 FOOTHILL BOULEVARD  
 OAKLAND, CALIFORNIA  
 PROJECT NO. 10-014



**ALISTO ENGINEERING GROUP**  
 WALNUT CREEK, CALIFORNIA

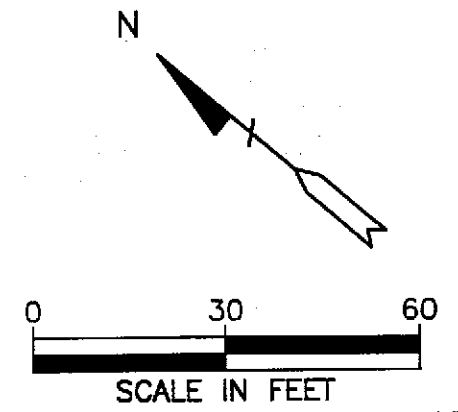
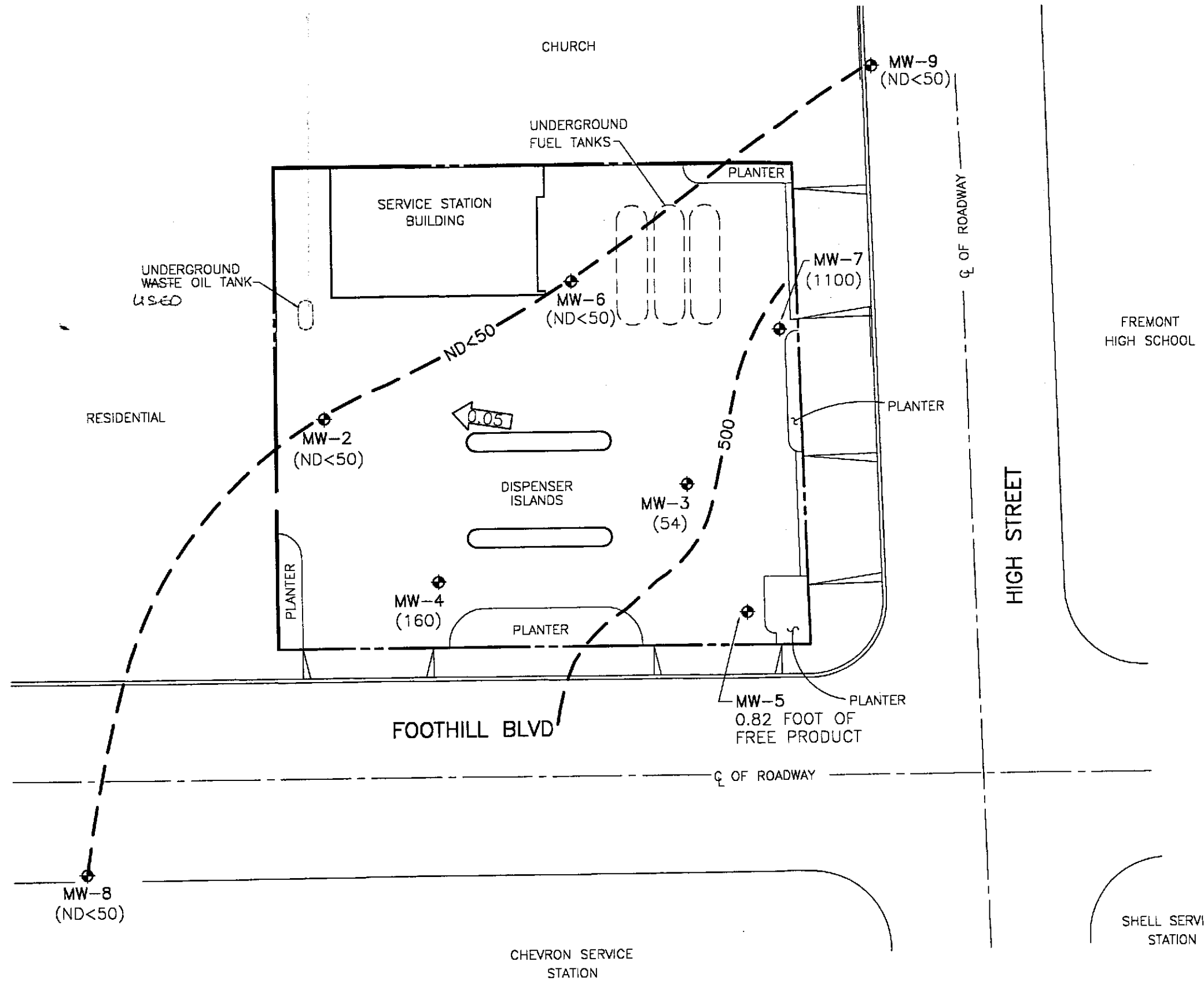




- LEGEND**
- ◆ GROUNDWATER MONITORING WELL
  - (24.94) GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL
  - 24.00 - GROUNDWATER ELEVATION CONTOUR IN FEET ABOVE MEAN SEA LEVEL (CONTOUR INTERVAL-1.00 FOOT)
  - ← 0.05 → CALCULATED GROUNDWATER GRADIENT DIRECTION AND MAGNITUDE IN FOOT PER FOOT

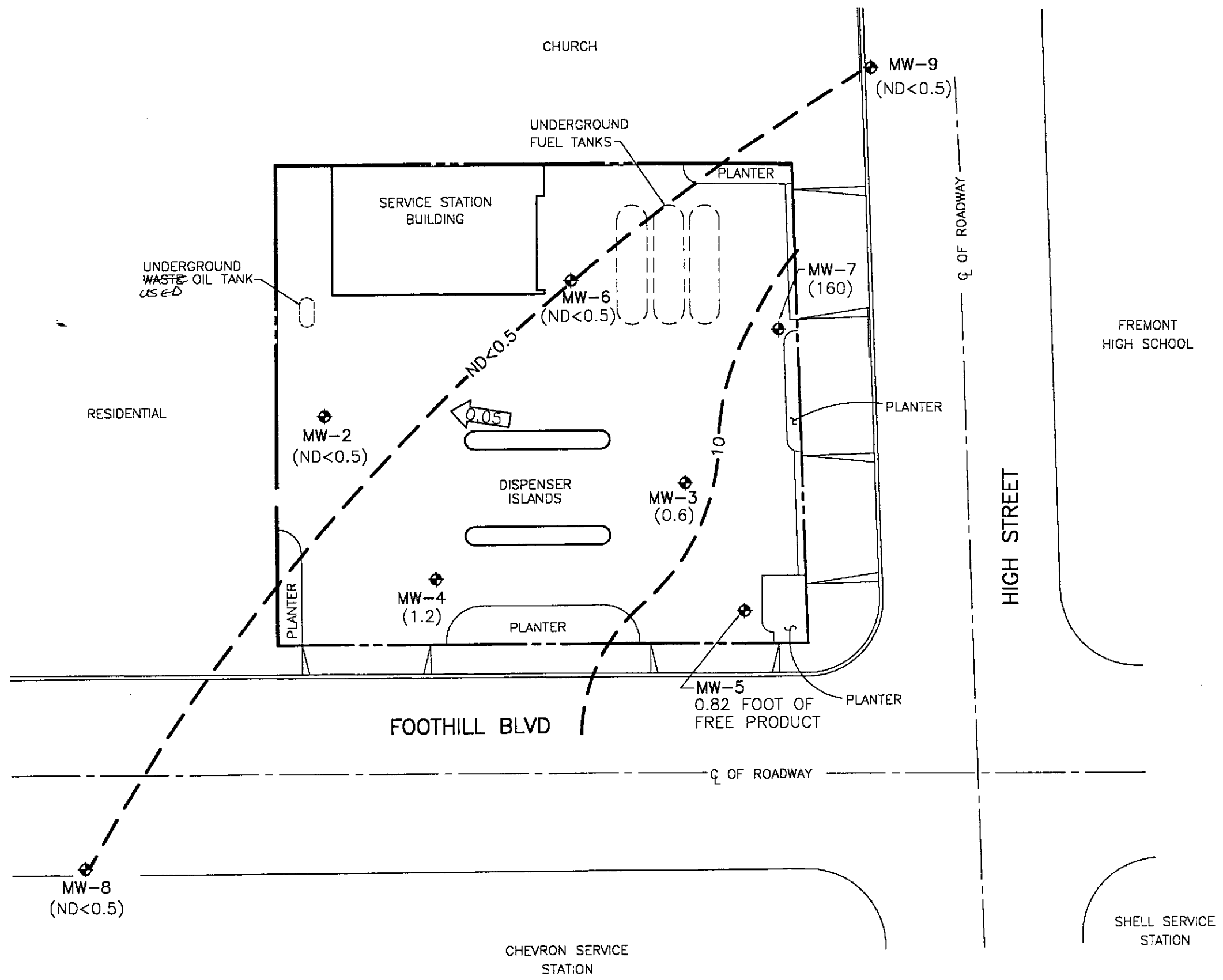
**FIGURE 2**  
**POTENTIOMETRIC GROUNDWATER ELEVATION CONTOUR MAP**  
**JULY 7, 1993**  
 BP OIL SERVICE STATION NO. 11109  
 4280 FOOTHILL BOULEVARD  
 OAKLAND, CALIFORNIA  
 PROJECT NO. 10-014





- LEGEND**
- ⊕ GROUNDWATER MONITORING WELL
  - (1100) TOTAL PETROLEUM HYDROCARBONS AS GASOLINE CONCENTRATION IN PARTS PER BILLION
  - 500 - TOTAL PETROLEUM HYDROCARBONS AS GASOLINE ISOCONCENTRATION CONTOUR IN PARTS PER BILLION
  - ← 0.05 CALCULATED GROUNDWATER GRADIENT DIRECTION AND MAGNITUDE IN FOOT PER FOOT

**FIGURE 3**  
**TOTAL PETROLEUM HYDROCARBONS AS GASOLINE ISOCONCENTRATION MAP**  
**JULY 7, 1993**  
 BP OIL SERVICE STATION NO. 11109  
 4280 FOOTHILL BOULEVARD  
 OAKLAND, CALIFORNIA  
 PROJECT NO. 10-014



- LEGEND**
- ◆ GROUNDWATER MONITORING WELL
  - (160) BENZENE CONCENTRATION IN PARTS PER BILLION
  - 10 - BENZENE ISOCONCENTRATION CONTOUR IN PARTS PER BILLION
  - ← 0.05 → CALCULATED GROUNDWATER GRADIENT DIRECTION AND MAGNITUDE IN FOOT PER FOOT

**FIGURE 4**  
**BENZENE ISOCONCENTRATION MAP**  
**JULY 7, 1993**  
 BP OIL SERVICE STATION NO. 11109  
 4280 FOOTHILL BOULEVARD  
 OAKLAND, CALIFORNIA  
 PROJECT NO. 10-014

**APPENDIX A**

**WATER SAMPLING FIELD SURVEY FORMS**

# Field Report / Data Sheet

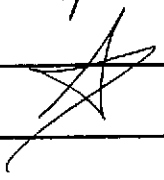
18.44

Groundwater Sampling  Groundwater Monitoring  Well Development  Drill Support  Stockpile Sampling

Firm: <b>ALISTO</b>	Date: <b>7/7/93</b>	Station #: <b>BP11109</b>	Day: M Tu <b>(W)</b> Th F
Project Number: <b>10-014-02-001</b>	Field Technician: <b>DAN BIRCH</b>	Address: <b>4280 FOOTHILL BLVD, OAKLAND</b>	Weather: <b>clear</b>
116 Liberty st Santa Cruz, Ca 95060 (408) 459-0718			Milage: _____ mi

DT/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
3	MW-2	OK	OK	30.1	20.30	20.30			
6	MW-3	OK	OK	31.8	15.19	15.19			*
4	MW-4	OK	OK	34.28	18.44	18.44			
8	MW-5	OK	OK	NM	12.68	12.68	11.86	0.82'	*
5	MW-6	OK	OK	34.28	18.68	18.68			
7	MW-7	OK	OK	33.42	13.40	13.40			*
2	MW-8	OK	OK	21.74	17.76	17.76			
1	MW-9	OK	OK	29.31	13.12	13.12			

**Notes:** \* It appears that the top of casing was cut-down for installation of pumps. These wells may need to be re-surveyed.



Inv#: \_\_\_\_\_



















# Birch Technical Services

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

# GROUNDWATER SAMPLING FORM

Project Number: 10-014  
 Station Number: BPI1109  
 Date: 7/7/93

Well Number: MW-9  
 Sample Type:  Groundwater  Trip Blank  Duplicate of \_\_\_\_\_  
 Sampled by: DAN BIRCH

## WELL PURGING

**PURGE VOLUME** Casing Diameter (inches) X 2" 03" 04" 04.5" 06" 0\_\_\_\_  
 Volume Factors: 0.1632 0.3672 0.6528 0.826 1.469 \_\_\_\_\_

Total Depth of Well 29.31 Initial Water Level: 4.59 **PURGE METHOD:**  
 Honda Pump  
 Disposable Poly Tubing (30 ft)  
 Speed Winch  
 Disposable PVC Bailer(s) (\_\_\_\_)  
 Other \_\_\_\_\_  
 Total Volume Purged: 12 Time Elapsed: 10

Calculated Purge Volume:

$$\frac{29.31 - 4.59}{29.31} = \frac{24.72}{29.31} \times 0.16 = 3.95 \times 3 = 11.8 \text{ (gallons)}$$

Total Depth    Water Level    Well Vol. Fac.    # of vol. to Purge    Calculated Purge Volume

### Subjective Analysis Prior to Purging

SHEEN    Depth to Product    Product Thickness  
 O Yes O No    \_\_\_\_\_ (ft)    \_\_\_\_\_ (ft)

### PARAMETER EQUIPMENT CALIBRATION

pH Meter #: 9112    Time: 0920  
 Solution    pH 7.00 7 at 70 °F  
 Solution    pH 4.00 4 at 70 °F  
 Solution    pH 10.00 10 at 70 °F  
 Water Level Meter#: 10307

COMMENTS:

### SAMPLING METHOD

PVC Disposable Bailer    Time Sampled  
 Teflon Bailer    (24 hour clock)  
 Other: \_\_\_\_\_    1347

### WELL SAMPLING PARAMETERS

Gallons Removed	Time	Temp °F	pH	Cond. (umhos/cm)
3	1339	72.3	7.23	0.71
7	1342	71.1	7.21	0.72
9	1344	71.0	7.25	0.73
12	1347	70.4	7.27	0.71

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 <sub>2</sub> SO <sub>4</sub>







**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

July 26, 1993  
PACE Project Number: 430709527

Attn: Mr. Bill Howell

Client Reference: BP Station # 11109

PACE Sample Number: 70 0110726  
Date Collected: 07/07/93  
Date Received: 07/09/93  
Client Sample ID: MW-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):		-	07/17/93
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	ND 07/17/93
PURGEABLE AROMATICS (BTXE BY EPA 8020M):		-	07/17/93
Benzene	ug/L	0.5	ND 07/17/93
Toluene	ug/L	0.5	ND 07/17/93
Ethylbenzene	ug/L	0.5	ND 07/17/93
Xylenes, Total	ug/L	0.5	ND 07/17/93

Mr. Bill Howell  
 Page 2

July 26, 1993  
 PACE Project Number: 430709527

Client Reference: BP Station # 11109

PACE Sample Number: 70 0110734  
 Date Collected: 07/07/93  
 Date Received: 07/09/93  
 Client Sample ID: MW-3  
 Parameter

Units      MDL      DATE ANALYZED

ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):				
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	-	07/16/93
PURGEABLE AROMATICS (BTXE BY EPA 8020M):				
Benzene	ug/L	0.5	0.6	07/16/93
Toluene	ug/L	0.5	0.6	07/16/93
Ethylbenzene	ug/L	0.5	ND	07/16/93
Xylenes, Total	ug/L	0.5	ND	07/16/93

Mr. Bill Howell  
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July 26, 1993  
 PACE Project Number: 430709527

Client Reference: BP Station # 11109

PACE Sample Number: 70 0110742  
 Date Collected: 07/07/93  
 Date Received: 07/09/93  
 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):		-	07/16/93
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	160
PURGEABLE AROMATICS (BTXE BY EPA 8020M):		-	07/16/93
Benzene	ug/L	0.5	1.2
Toluene	ug/L	0.5	5.4
Ethylbenzene	ug/L	0.5	3.8
Xylenes, Total	ug/L	0.5	19

Mr. Bill Howell  
 Page 4

July 26, 1993  
 PACE Project Number: 430709527

Client Reference: BP Station # 11109

PACE Sample Number: 70 0110750  
 Date Collected: 07/07/93  
 Date Received: 07/09/93  
 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):			-	07/16/93
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	ND	07/16/93
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	07/16/93
Benzene	ug/L	0.5	ND	07/16/93
Toluene	ug/L	0.5	ND	07/16/93
Ethylbenzene	ug/L	0.5	ND	07/16/93
Xylenes, Total	ug/L	0.5	ND	07/16/93

Mr. Bill Howell  
 Page 5

July 26, 1993  
 PACE Project Number: 430709527

Client Reference: BP Station # 11109

PACE Sample Number: 70 0110769  
 Date Collected: 07/07/93  
 Date Received: 07/09/93  
 Client Sample ID: MW-7

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

<u>PURGEABLE FUELS AND AROMATICS</u>			
TOTAL FUEL HYDROCARBONS, (LIGHT):			07/16/93
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	1100 07/16/93
<u>PURGEABLE AROMATICS (BTXE BY EPA 8020M):</u>			
Benzene	ug/L	0.5	160 07/16/93
Toluene	ug/L	0.5	2.0 07/16/93
Ethylbenzene	ug/L	0.5	27 07/16/93
Xylenes, Total	ug/L	0.5	4.0 07/16/93

Mr. Bill Howell  
 Page 6

July 26, 1993  
 PACE Project Number: 430709527

Client Reference: BP Station # 11109

PACE Sample Number: 70 0110777  
 Date Collected: 07/07/93  
 Date Received: 07/09/93  
 Client Sample ID: MW-8

<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	07/19/93
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			
Benzene	ug/L	0.5	07/19/93
Toluene	ug/L	0.5	07/19/93
Ethylbenzene	ug/L	0.5	07/19/93
Xylenes, Total	ug/L	0.5	07/19/93

**REPORT OF LABORATORY ANALYSIS**

Mr. Bill Howell  
 Page 7

July 26, 1993  
 PACE Project Number: 430709527

Client Reference: BP Station # 11109

PACE Sample Number: 70 0110785  
 Date Collected: 07/07/93  
 Date Received: 07/09/93  
 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):			-	07/19/93
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	ND	07/19/93
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	07/19/93
Benzene	ug/L	0.5	ND	07/19/93
Toluene	ug/L	0.5	ND	07/19/93
Ethylbenzene	ug/L	0.5	ND	07/19/93
Xylenes, Total	ug/L	0.5	ND	07/19/93



Mr. Bill Howell  
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July 26, 1993  
 PACE Project Number: 430709527

Client Reference: BP Station # 11109

PACE Sample Number: 70 0110793  
 Date Collected: 07/07/93  
 Date Received: 07/09/93  
 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):			-	07/19/93
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	1100	07/19/93
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	07/19/93
Benzene	ug/L	0.5	170	07/19/93
Toluene	ug/L	0.5	1.9	07/19/93
Ethylbenzene	ug/L	0.5	29	07/19/93
Xylenes, Total	ug/L	0.5	2.8	07/19/93

Mr. Bill Howell  
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July 26, 1993  
 PACE Project Number: 430709527

Client Reference: BP Station # 11109

PACE Sample Number: 70 0110807  
 Date Collected: 07/07/93  
 Date Received: 07/09/93  
 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):		-	07/19/93
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	ND 07/19/93
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			
Benzene	ug/L	0.5	ND 07/19/93
Toluene	ug/L	0.5	ND 07/19/93
Ethylbenzene	ug/L	0.5	ND 07/19/93
Xylenes, Total	ug/L	0.5	0.6 07/19/93

Mr. Bill Howell  
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July 26, 1993  
 PACE Project Number: 430709527

Client Reference: BP Station # 11109

PACE Sample Number: 70 0112370  
 Date Collected: 07/12/93  
 Date Received: 07/13/93  
 Client Sample ID: MW-2

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

EXTRACTABLE FUELS EPA 3510/8015				
Extractable Fuels, as Diesel	mg/L	0.05	ND	07/20/93
Date Extracted			07/15/93	

TOTAL PETRO HYDROCARBONS (IR, EPA 418.1)				
Total Petroleum Hydrocarbons, by IR	mg/L	5.0	ND	07/16/93
Date Extracted			07/15/93	

HALOGENATED VOLATILE COMPOUNDS EPA 8010				
Dichlorodifluoromethane	ug/L	2.0	ND	07/16/93
Chloromethane	ug/L	2.0	ND	07/16/93
Vinyl Chloride	ug/L	2.0	ND	07/16/93
Bromomethane	ug/L	2.0	ND	07/16/93
Chloroethane	ug/L	2.0	ND	07/16/93
Trichlorofluoromethane (Freon 11)	ug/L	2.0	ND	07/16/93

1,1-Dichloroethene	ug/L	0.5	ND	07/16/93
Methylene Chloride	ug/L	2.0	ND	07/16/93
trans-1,2-Dichloroethene	ug/L	0.5	ND	07/16/93
cis-1,2-Dichloroethene	ug/L	0.5	ND	07/16/93
1,1-Dichloroethane	ug/L	0.5	ND	07/16/93
Chloroform	ug/L	0.5	ND	07/16/93

1,1,1-Trichloroethane (TCA)	ug/L	0.5	ND	07/16/93
Carbon Tetrachloride	ug/L	0.5	ND	07/16/93
1,2-Dichloroethane (EDC)	ug/L	0.5	1.0	07/16/93
Trichloroethene (TCE)	ug/L	0.5	ND	07/16/93
1,2-Dichloropropane	ug/L	0.5	ND	07/16/93
Bromodichloromethane	ug/L	0.5	ND	07/16/93

2-Chloroethylvinyl ether	ug/L	0.5	ND	07/16/93
cis-1,3-Dichloropropene	ug/L	0.5	ND	07/16/93
trans-1,3-Dichloropropene	ug/L	0.5	ND	07/16/93
1,1,2-Trichloroethane	ug/L	0.5	ND	07/16/93
Tetrachloroethene	ug/L	0.5	ND	07/16/93
Dibromochloromethane	ug/L	0.5	ND	07/16/93

Chlorobenzene	ug/L	0.5	ND	07/16/93
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Mr. Bill Howell  
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July 26, 1993  
 PACE Project Number: 430709527

Client Reference: BP Station # 11109

PACE Sample Number: 70 0112370  
 Date Collected: 07/12/93  
 Date Received: 07/13/93  
 Client Sample ID: MW-2

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

HALOGENATED VOLATILE COMPOUNDS EPA 8010

Bromoform	ug/L	0.5	ND	07/16/93
1,1,2,2-Tetrachloroethane	ug/L	0.5	ND	07/16/93
1,3-Dichlorobenzene	ug/L	0.5	ND	07/16/93
1,4-Dichlorobenzene	ug/L	0.5	ND	07/16/93
1,2-Dichlorobenzene	ug/L	0.5	ND	07/16/93
Bromochloromethane (Surrogate Recovery)			119%	07/16/93
1,4-Dichlorobutane (Surrogate Recovery)			126%	07/16/93

These data have been reviewed and are approved for release.

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

Mr. Bill Howell  
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FOOTNOTES  
for pages 1 through 11

July 26, 1993  
PACE Project Number: 430709527

Client Reference: BP Station # 11109

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

Mr. Bill Howell  
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QUALITY CONTROL DATA

July 26, 1993  
 PACE Project Number: 430709527

Client Reference: BP Station # 11109

EXTRACTABLE FUELS EPA 3510/8015  
 Batch: 70 22985  
 Samples: 70 0112370

METHOD BLANK:

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>Method Blank</u>
Extractable Fuels, as Diesel	mg/L	0.05	ND

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>Reference Value</u>	<u>Recv</u>	<u>Dup1 Recv</u>	<u>RPD</u>
Extractable Fuels, as Diesel	mg/L	0.05	1.00	46%	51%	10%

Mr. Bill Howell  
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QUALITY CONTROL DATA

July 26, 1993  
PACE Project Number: 430709527

Client Reference: BP Station # 11109

HALOGENATED VOLATILE COMPOUNDS EPA 8010

Batch: 70 22873  
Samples: 70 0112370

METHOD BLANK:

Parameter	Units	MDL	Method Blank
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)			113%
1,4-Dichlorobutane (Surrogate Recovery)			107%

Mr. Bill Howell  
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QUALITY CONTROL DATA

July 26, 1993  
 PACE Project Number: 430709527

Client Reference: BP Station # 11109

HALOGENATED VOLATILE COMPOUNDS EPA 8010  
 Batch: 70 22873  
 Samples: 70 0112370

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

Parameter	Units	MDL	Reference	Dupl		
			Value	Recv	Recv	RPD
1,1-Dichloroethane	ug/L	0.5	10.00	101%	104%	2%
Trichloroethene (TCE)	ug/L	0.5	10.00	104%	105%	0%
1,1,2-Trichloroethane	ug/L	0.5	10.00	95%	98%	3%
Tetrachloroethene	ug/L	0.5	10.00	109%	109%	0%



Mr. Bill Howell  
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QUALITY CONTROL DATA

July 26, 1993  
 PACE Project Number: 430709527

Client Reference: BP Station # 11109

PURGEABLE FUELS AND AROMATICS

Batch: 70 22880  
 Samples: 70 0110734, 70 0110742, 70 0110750, 70 0110769, 70 0110777  
 70 0110785, 70 0110793

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	95%	101%	6%
Benzene	ug/L	0.5	40.0	99%	102%	2%
Toluene	ug/L	0.5	40.0	101%	104%	2%
Ethylbenzene	ug/L	0.5	40.0	107%	110%	2%
Xylenes, Total	ug/L	0.5	120	103%	105%	1%

Mr. Bill Howell  
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QUALITY CONTROL DATA

July 26, 1993  
 PACE Project Number: 430709527

Client Reference: BP Station # 11109

PURGEABLE FUELS AND AROMATICS

Batch: 70 22909  
 Samples: 70 0110726

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	92%	85%	7%
Benzene	ug/L	0.5	100	90%	89%	1%
Toluene	ug/L	0.5	100	91%	89%	2%
Ethylbenzene	ug/L	0.5	100	91%	86%	5%
Xylenes, Total	ug/L	0.5	300	89%	90%	1%

Mr. Bill Howell  
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QUALITY CONTROL DATA

July 26, 1993  
PACE Project Number: 430709527

Client Reference: BP Station # 11109

PURGEABLE FUELS AND AROMATICS

Batch: 70 22993  
Samples: 70 0110807

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	80%	86%	7%
Benzene	ug/L	0.5	100	91%	96%	5%
Toluene	ug/L	0.5	100	93%	99%	6%
Ethylbenzene	ug/L	0.5	100	92%	97%	5%
Xylenes, Total	ug/L	0.5	300	96%	101%	5%

Mr. Bill Howell  
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QUALITY CONTROL DATA

July 26, 1993  
 PACE Project Number: 430709527

Client Reference: BP Station # 11109

TOTAL PETRO HYDROCARBONS (IR, EPA 418.1)  
 Batch: 70 22852  
 Samples: 70 0112370

METHOD BLANK:

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>Method Blank</u>
Total Petroleum Hydrocarbons, by IR	mg/L	5.0	ND

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>Reference Value</u>	<u>Recv</u>	<u>Dupl Recv</u>	<u>RPD</u>
Total Petroleum Hydrocarbons, by IR	mg/L	5.0	16.0	92%	92%	0%

Mr. Bill Howell  
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FOOTNOTES  
for pages 13 through 19

July 26, 1993  
PACE Project Number: 430709527

Client Reference: BP Station # 11109

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



**B.P. OIL COMPANY**  
 16400 Southcenter Parkway, Suite 301, Tukwila, WA 98188  
**CHAIN OF CUSTODY**

430709.527

No 0099

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: <b>ALSTO ENGINEERING</b>		Consultant Project #: <b>10-014-02-001</b>		Page <b>1</b> of <b>1</b>
Address: <b>1777 DAKLAND BLVD., STE 200 WALNUT CREEK CA</b>				
Project Contact: <b>BILL HOWELL</b>		Phone #: <b>510 295-1650</b> Fax #:		Consultant Work Order #: <b>10-014-02-001</b>
Sampled by (print): <b>DAN BIRCH</b>		Sampler's Signature: <i>[Signature]</i>		B.P. Site Location #: <b>BP1109</b>
Shipment Method:		Airbill #:	Shipment Date: <b>7/9/93</b>	B.P. Site Location: <b>4280 Foothill Blvd., OAKLAND</b>

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 TIME	Prsv *	# of Cont	PACE Sample #	TPH/GAS/BTEX	TPH/Diesel	TRPH	HVOC					COMMENTS
						EPA 8015/8020	EPA 8015	EPA 418.1	8010					
MW-2	7/7/93	1240	HCL	3	11072.6	X	X	X	X	see # 1123 7.0				
MW-3	7/7/93	1749			73.4									all analytes per. B Howell 7/12 30
MW-4	7/7/93	1720			74.2									
MW-6	7/7/93	1629			75.0									
MW-7	7/7/93	1444			76.9									
MW-8	7/7/93	1311			77.7									
MW-9	7/7/93	1347			78.5									
QC-1	7/7/93	1449		1	79.3									
QC-2	7/7/93			2	80.7									
10/3														

Relinquished by/Affiliation	Date	Time	Accepted by/Affiliation	Date	Time	Additional Comments:
<i>[Signature]</i>			<i>[Signature]</i>			Pace F955411 * VOAS PRESERVED - PER LABELS - cc 7/10
<i>[Signature]</i>	7/9/93	1600	<i>[Signature]</i>	7/9/93	1600	



**B.P. OIL COMPANY**  
 16400 Southcenter Parkway, Suite 301, Tukwila, WA 98188  
**CHAIN OF CUSTODY**

430709.527

No 0104

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 #: **10-014-02-001** Page **1** of **1**

Address: **1777 OAKLAND BLVD., STE 200**

Project Contact: **Bill Howell** Phone #: \_\_\_\_\_ Fax #: \_\_\_\_\_ Consultant Work Order #: **10-014-02-001**

Sampled by (print): **Dan Birch** Sampler's Signature: *D. Birch* B.P. Site Location #: **BP1109**

Shipment Method: \_\_\_\_\_ Airbill #: \_\_\_\_\_ Shipment Date: **7/13/93** B.P. Site Location: **4280 Foothill Blvd, Oakland**

TAT: <input type="checkbox"/> 24 hr <input type="checkbox"/> 48 hr <input type="checkbox"/> 72 hr <input checked="" type="checkbox"/> 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
MW-2	7/12/93	W	none	?	11237-0		X	X	X														

Relinquished by/Affiliation	Date	Time	Accepted by/Affiliation	Date	Time	Additional Comments:
<i>D. Birch</i>	7/13/93	1310	<i>J. Dep / Pace</i>	7/13/93	1310	

Distribution: White - Original Yellow - B.P. Oil Pink - Lab Goldenrod - Consultant Field Use