



BP OIL

BP Oil Company
Environmental Remediation Management
295 SW 41st Street
Renton, Washington 98055-4931
(425) 251-0667
Fax No: (425) 251-0736

April 9, 1998

Alameda County Health Care Services Agency
Attention Mr. Brian Oliva
1131 Harbour Bay Parkway, Room 250
Alameda, CA 94502-6577

STID 780

RE: Former BP Oil Site No. 11107
18501 Hesperian Boulevard (at Bockman)
San Lorenzo, CA
STID 780

Dear Mr. Oliva:

Enclosed find the 5 February 1998 Groundwater Monitoring and Sampling Report prepared on behalf of BP by Alisto Engineering Group.

The petroleum release at this site was documented during 1992 when BP performed a site assessment in support of plans to withdraw from the California retail market.

The enclosed report shows the aromatic petroleum hydrocarbons were detected in samples obtained from two of the seven wells sampled on 8 December 1997. The highest benzene concentration (11 ug/l) was detected in a sample obtained from well MW-4. MTBE was also detected in samples obtained from wells MW-4,5,6, and 7.

Plans for the next quarter include groundwater monitoring and sampling. Since petroleum hydrocarbon concentrations reported for wells MW-1, MW-2, and MW-3 appear to be very low or non-detected, it appears that chemical data from these wells is providing little beneficial information. We plan to sample these three well on an annual basis at this time.

Please give me a call at (425) 251-0689 if you have any comments or questions regarding this matter.

Sincerely,


Scott Hooton

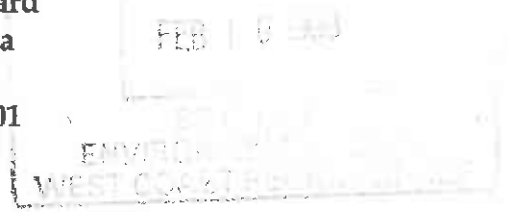
attachment

cc: site file
B. Nagle - AEG
T. Berry - Tosco (w/attachment)

GROUNDWATER MONITORING AND SAMPLING REPORT

**BP Oil Company Service Station No. 11107
18501 Hesperian Boulevard
San Lorenzo, California**

Project No. 10-060-07-001



Prepared for:

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


Prepared by:

**Alisto Engineering Group
1575 Treat Boulevard, Suite 201
Walnut Creek, California**

February 5, 1998



**Brady Nagle
Project Manager**



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



GROUNDWATER MONITORING AND SAMPLING REPORT

BP Oil Company Service Station No. 11107
18501 Hesperian Boulevard
San Lorenzo, California

Project No. 10-060-07-001

February 5, 1998

INTRODUCTION

This report presents the results of the December 8, 1997 groundwater monitoring and sampling conducted by Alisto Engineering Group at BP Oil Company Service Station No. 11107, 18501 Hesperian Boulevard, San Lorenzo, California. A site vicinity map is shown on Figure 1.

FIELD PROCEDURES

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

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

Before sample collection, each well was purged of 3 casing volumes while recording field readings of pH, temperature, electrical conductivity, and dissolved oxygen. 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 collected during this and previous quarters are summarized in Table 1. The potentiometric groundwater elevations as interpreted from the results of this monitoring event are shown on Figure 2. The results of laboratory analysis are shown on Figure 3. The laboratory report and chain of custody record are presented in Appendix B. Historical methyl tert butyl ether (MTBE) not previously tabulated is now included in Table 1. Copies of the MTBE laboratory analysis documentation are included in Appendix C of this report only.



TABLE 1 - SUMMARY OF RESULTS OF GROUNDWATER SAMPLING
 BP OIL COMPANY SERVICE STATION NO. 11107
 18501 HESPERIAN BOULEVARD, SAN LORENZO, CALIFORNIA

AJISTO PROJECT NO. 10-060

WELL ID	DATE OF SAMPLING/ MONITORING	CASING ELEVATION (Feet)	DEPTH TO WATER (Feet)	GROUNDWATER ELEVATION (Feet)	TPH-G (ug/l)	TPH-D (ug/l)	B (ug/l)	T (ug/l)	E (ug/l)	X (ug/l)	MTBE (ug/l)	TOG (ug/l)	1,1,1-TCA (ug/l)	PCE (ug/l)	DO (ppm)	LAB
MW-1	11/04/92	41.07	20.78	20.29	ND<50	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	ND<5000	2.8	ND	---	PACE
QC-1 (c)	11/04/92	---	---	---	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	---	---	---	PACE
MW-1	02/24/94	41.07	20.70	20.37	ND<50	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	ND<5000	1.5	0.9	---	PACE
MW-1	05/12/94	41.07	18.12	22.95	ND<50	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	ND<5000	1.0	ND<0.5	7.0	PACE
MW-1	09/09/94	41.07	21.74	19.33	ND<50	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	ND<5000	ND<0.5	ND<0.5	2.3	PACE
MW-1	11/03/94	41.07	20.01	21.06	ND<50	50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	ND<5000	ND<0.5	ND<0.5	4.3	PACE
MW-1	03/01/95	41.07	17.44	23.63	ND<50	ND<500	ND<0.5	ND<0.50	ND<0.50	ND<1.0	---	420	0.54	0.3	2.3	ATI
MW-1	06/06/95	41.07	17.55	23.52	---	---	---	---	---	---	---	---	---	---	---	---
MW-1	09/01/95	41.07	18.19	22.88	ND<50	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	ND<5.0	60	---	---	8.8	ATI
MW-1	11/29/95	41.07	18.84	22.23	---	---	---	---	---	---	---	---	---	---	---	---
MW-1	03/23/96	41.07	16.97	24.10	ND<50	---	ND<0.5	ND<1	ND<1	ND<1	ND<10	---	---	---	9.6	SPL
MW-1	09/05/96	41.07	17.74	23.33	110	---	ND<0.5	ND<1.0	ND<1.0	ND<1.0	ND<10	---	---	---	3.6	SPL
MW-1	03/11/97	41.07	17.62	23.45	ND<50	---	ND<0.5	ND<1.0	ND<1.0	ND<1.0	ND<10	---	---	---	5.2	SPL
MW-1	12/08/97	41.07	16.30	24.77	ND<50	---	ND<0.5	ND<1.0	ND<1.0	ND<1.0	ND<10	---	---	---	5.3	SPL
MW-2	11/04/92	40.56	20.16	20.40	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	---	---	---	PACE
MW-2	02/24/94	40.56	20.12	20.44	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	---	---	---	PACE
MW-2	05/12/94	40.56	17.49	23.07	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	---	---	7.4	PACE
MW-2	09/09/94	40.56	21.12	19.44	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	---	---	2.1	PACE
MW-2	11/03/94	40.56	19.36	21.20	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	---	---	4.2	PACE
MW-2	03/01/95	40.56	16.83	23.73	ND<50	---	ND<0.50	ND<0.50	ND<0.50	ND<1.0	---	---	---	---	2.2	ATI
MW-2	06/06/95	40.56	16.96	23.60	---	---	---	---	---	---	---	---	---	---	---	---
MW-2	09/01/95	40.56	17.54	23.02	ND<50	---	ND<0.50	ND<0.50	ND<0.50	ND<1.0	ND<5.0	---	---	---	7.9	ATI
MW-2	11/29/95	40.56	18.19	22.37	---	---	---	---	---	---	---	---	---	---	---	---
MW-2	03/23/96	40.56	16.35	24.21	ND<50	---	ND<0.5	ND<1	ND<1	ND<1	ND<10	---	---	---	8.5	SPL
MW-2	09/05/96	40.56	17.55	23.01	ND<50	---	ND<0.5	ND<1.0	ND<1.0	ND<1.0	ND<10	---	---	---	3.2	SPL
MW-2	03/11/97	40.56	16.95	23.61	ND<50	---	ND<0.5	ND<1.0	ND<1.0	ND<1.0	ND<10	---	---	---	2.9	SPL
MW-2	12/08/97	40.56	16.01	24.55	ND<50	---	ND<0.5	ND<1.0	ND<1.0	ND<1.0	ND<10	---	---	---	3.0	SPL
MW-3	11/04/92	40.45	20.23	20.22	760	---	3.7	15	1.9	57	---	---	---	---	---	PACE
MW-3	02/24/94	40.45	20.24	20.21	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	---	---	---	PACE
MW-3	05/12/94	40.45	17.61	22.84	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	---	---	7.3	PACE
MW-3	09/09/94	40.45	21.22	19.23	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	---	---	2.0	PACE
MW-3	11/03/94	40.45	19.48	20.97	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	---	---	3.6	PACE
MW-3	03/01/95	40.45	17.08	23.37	ND<50	---	ND<0.50	ND<0.50	ND<0.50	ND<1.0	---	---	---	---	1.9	ATI
MW-3	06/06/95	40.45	17.21	23.24	---	---	---	---	---	---	---	---	---	---	---	---
MW-3	09/01/95	40.45	17.69	22.76	200	---	2.7	33	7.2	43	ND<5.0	---	---	---	7.8	ATI
MW-3	09/01/95	40.45	18.29	22.16	---	---	---	---	---	---	---	---	---	---	---	---
MW-3	03/23/96	40.45	16.59	23.86	ND<50	---	ND<0.5	ND<1	ND<1	ND<1	ND<10	---	---	---	7.3	SPL
MW-3	09/05/96	40.45	17.71	22.74	ND<50	---	ND<0.5	ND<1.0	ND<1.0	ND<1.0	ND<10	---	---	---	3.2	SPL
MW-3	03/11/97	40.45	17.17	23.28	ND<50	---	ND<0.5	ND<1.0	ND<1.0	ND<1.0	ND<10	---	---	---	1.5	SPL
MW-3	12/08/97	40.45	16.12	24.33	ND<50	---	ND<0.5	ND<1.0	ND<1.0	ND<1.0	ND<10	---	---	---	1.9	SPL

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 BP OIL COMPANY SERVICE STATION NO. 11107
 18501 HESPERIAN BOULEVARD, SAN LORENZO, CALIFORNIA

ALISTO PROJECT NO. 10-060

WELL ID	DATE OF SAMPLING/ MONITORING	CASING ELEVATION (Feet)	DEPTH TO WATER (Feet)	GROUNDWATER ELEVATION (Feet)	TPH-G (ug/l)	TPH-D (ug/l)	B (ug/l)	T (ug/l)	E (ug/l)	X (ug/l)	MTBE (ug/l)	TOG (ug/l)	1,1,1-TCA (ug/l)	PCE (ug/l)	DO (ppm)	LAB
MW-4	11/04/92	39.24	19.18	20.06	900	---	150	4.1	0.8	53	---	---	---	---	---	PACE
MW-4	02/24/94	39.24	19.22	20.02	240	---	110	3.8	1.8	11	1400	(d)	---	---	---	PACE
QC-1 (c)	02/24/94	---	---	---	310	---	95	5.3	2.2	17	1500	(d)	---	---	---	PACE
MW-4	05/12/94	39.24	16.62	22.62	ND<50	---	2.2	1.0	ND<0.5	ND<0.5	860	(d)	---	---	7.3	PACE
QC-1 (c)	05/12/94	---	---	---	430	---	2.6	1.3	ND<0.5	ND<0.5	780	(d)	---	---	---	PACE
MW-4	09/09/94	39.24	20.27	18.97	240	---	9.1	1.3	0.6	2.5	---	---	---	---	2.2	PACE
QC-1 (c)	09/09/94	---	---	---	57	---	1.7	ND<0.5	ND<0.5	0.5	---	---	---	---	---	PACE
MW-4	11/03/94	39.24	18.46	20.78	250	---	3.1	2.8	1.0	3.3	---	---	---	---	3.2	PACE
QC-1 (c)	11/03/94	---	---	---	110	---	2.4	ND<0.5	ND<0.5	ND<0.5	---	---	---	---	---	PACE
MW-4	03/01/95	39.24	16.15	23.09	8900	---	1800	26	450	400	---	---	---	---	2.0	ATI
QC-1 (c)	03/01/95	---	---	---	7600	---	1700	25	410	370	---	---	---	---	---	ATI
MW-4	06/06/95	39.24	16.28	22.96	3100	(e)	530	25	170	85	---	---	---	---	---	ATI
QC-1 (c)	06/06/95	---	---	---	3000	---	530	27	170	92	---	---	---	---	---	ATI
MW-4 (f)	09/01/95	39.24	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-4	11/29/95	39.24	17.31	21.93	ND<50	---	1.8	ND<0.50	ND<0.50	ND<1.0	440	---	---	---	3.2	ATI
QC-1 (c)	11/29/95	---	---	---	ND<50	---	1.5	ND<0.50	ND<0.50	ND<1.0	490	---	---	---	---	ATI
MW-4	03/23/96	39.24	15.74	23.50	2700	---	480	ND<25	180	176	13000	---	---	---	7.8	SPL
MW-4	09/05/96	39.24	16.75	22.49	1100	---	ND<12	ND<25	ND<25	ND<25	3200	---	---	---	4.0	SPL
MW-4	03/11/97	39.24	16.10	23.14	2400	---	46	ND<10	66	106	3400	---	---	---	4.0	SPL
MW-4	12/08/97	39.24	15.96	23.28	590	---	11	ND<1.0	ND<1.0	ND<1.0	1200	---	---	---	4.4	SPL
QC-1 (c)	12/08/97	---	---	---	620	---	11	ND<1.0	ND<1.0	ND<1.0	1100	---	---	---	---	SPL
MW-5	06/06/95	39.07	16.16	22.91	1100	(e)	42	ND<2.5	15	4.0	---	---	---	---	---	ATI
MW-5	09/01/95	39.07	16.63	22.44	1600	---	55	ND<2.5	15	8.0	1200	---	---	---	7.4	ATI
QC-1 (c)	09/01/95	---	---	---	1200	---	64	ND<2.5	14	3.1	---	---	---	---	---	ATI
MW-5	11/29/95	39.07	17.19	21.88	2300	---	140	4.0	36	11	1500	---	---	---	4.1	ATI
MW-5	03/23/96	39.07	15.54	23.53	90	---	2.8	ND<1	ND<1	ND<1	1500	---	---	---	7.5	SPL
MW-5	09/05/96	39.07	16.72	22.35	2300	---	5.1	ND<1.0	ND<1.0	ND<1.0	3300	---	---	---	3.2	SPL
QC-1 (c)	09/05/96	---	---	---	2000	---	4.9	ND<1.0	ND<1.0	ND<1.0	2900	---	---	---	---	SPL
MW-5	03/11/97	39.07	16.12	22.95	470	---	ND<5.0	ND<5.0	ND<5.0	ND<5.0	580	---	---	---	3.0	SPL
QC-1 (c)	03/11/97	---	---	---	460	---	ND<5.0	ND<5.0	ND<5.0	ND<5.0	540	---	---	---	---	SPL
MW-5	12/08/97	39.07	15.85	23.22	370	---	ND<0.5	ND<1.0	ND<1.0	ND<1.0	840	---	---	---	3.0	SPL
MW-6	03/01/95	38.46	15.66	22.80	270	---	11	ND<0.50	ND<0.50	ND<1.0	---	---	---	---	1.6	ATI
MW-6	06/06/95	38.46	15.82	22.64	220	(e)	2.3	ND<0.50	ND<0.50	ND<1.0	---	---	---	---	---	ATI
MW-6	09/01/95	38.46	16.25	22.21	780	---	ND<2.5	ND<2.5	ND<2.5	ND<5.0	2800	---	---	---	7.5	ATI
MW-6	11/29/95	38.46	16.80	21.66	ND<50	---	ND<0.50	ND<0.50	ND<0.50	ND<1.0	1100	---	---	---	3.9	ATI
MW-6	03/23/96	38.46	15.27	23.19	50	---	ND<0.5	ND<1	ND<1	ND<1	910	---	---	---	8.0	SPL
MW-6	09/05/96	38.46	16.30	22.16	4400	---	ND<0.5	ND<1.0	ND<1.0	ND<1.0	7400	---	---	---	3.0	SPL
MW-6	03/11/97	38.46	15.75	22.71	1100	---	ND<5.0	ND<5.0	ND<5.0	ND<5.0	2000	---	---	---	3.1	SPL
MW-6	12/08/97	38.46	15.51	22.95	150	---	ND<0.5	ND<1.0	ND<1.0	ND<1.0	140	---	---	---	3.4	SPL

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ALISTO PROJECT NO. 10-060

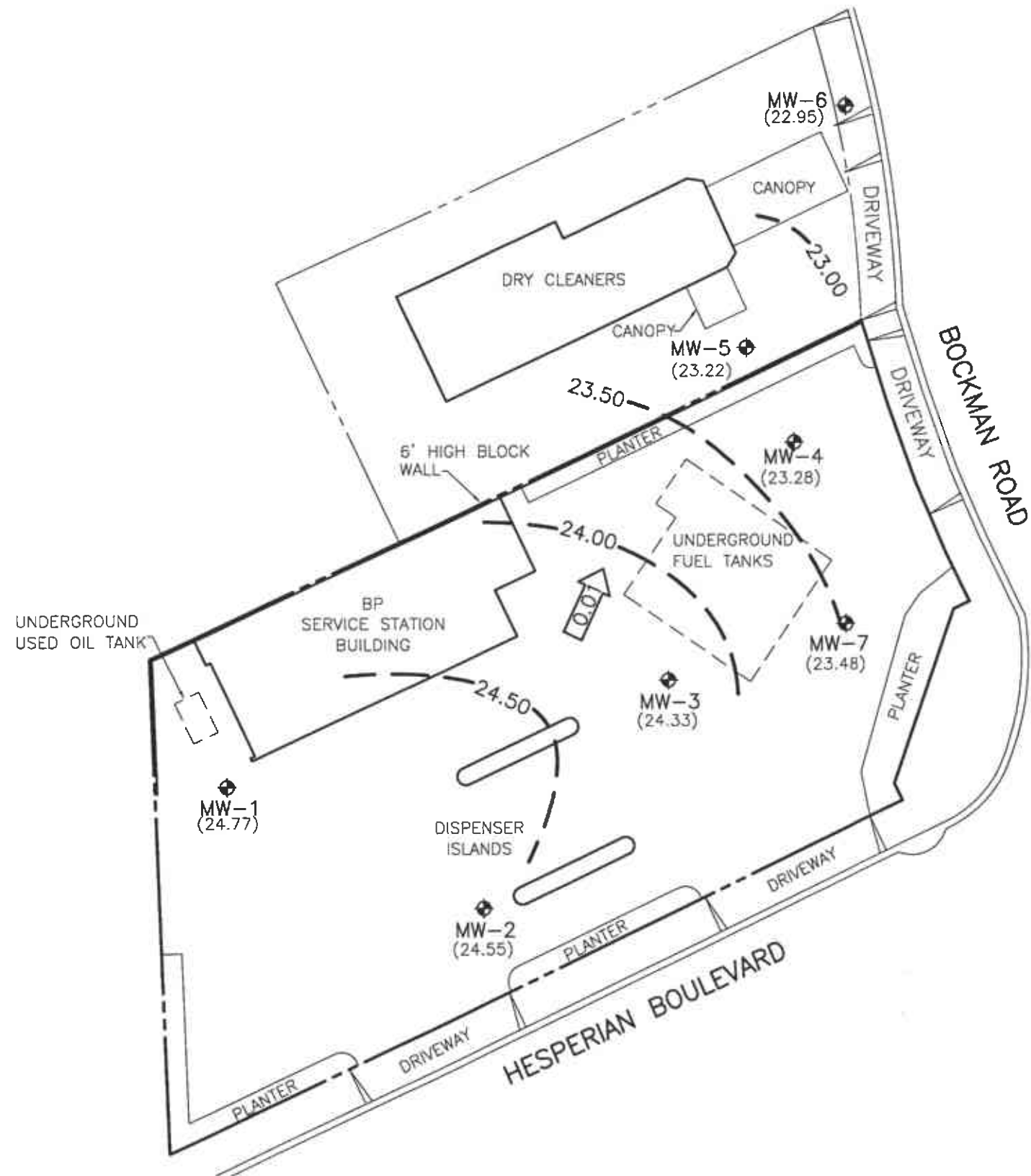
WELL ID	DATE OF SAMPLING/ MONITORING	CASING ELEVATION (Feet)	DEPTH TO WATER (Feet)	GROUNDWATER ELEVATION (Feet)	TPH-G (ug/l)	TPH-D (ug/l)	B (ug/l)	T (ug/l)	E (ug/l)	X (ug/l)	MTBE (ug/l)	TOG (ug/l)	1,1,1-TCA (ug/l)	PCE (ug/l)	DO (ppm)	LAB
MW-7	03/01/95	39.50	16.21	23.29	1400	---	14	ND<1.0	14	27	---	---	---	---	1.8	ATI
MW-7	06/06/95	39.50	16.34	23.16	540	---	(e) 5.5	ND<0.50	15	1.1	---	---	---	---	---	ATI
MW-7	09/01/95	39.50	16.74	22.76	190	---	2.8	ND<0.50	5.0	ND<1.0	10	---	---	---	7.5	ATI
MW-7	11/29/95	39.50	17.33	22.17	230	---	31	ND<0.50	3.8	1.9	ND<5.0	---	---	---	4.6	ATI
MW-7	03/23/96	39.50	15.86	23.64	ND<50	---	5.0	ND<1	ND<1	ND<1	330	---	---	---	7.2	SPL
QC-1	(c) 03/23/96	---	---	---	---	---	60	ND<1	ND<1	ND<1	360	---	---	---	---	SPL
MW-7	09/05/96	39.50	16.80	22.70	200	---	ND<0.5	ND<1.0	ND<1.0	ND<1.0	430	---	---	---	3.1	SPL
MW-7	03/11/97	39.50	18.32	21.18	120	---	ND<0.5	ND<1.0	ND<1.0	ND<1.0	140	---	---	---	4.7	SPL
MW-7	12/08/97	39.50	16.02	23.48	240	---	0.8	ND<1.0	ND<1.0	ND<1.0	200	---	---	---	5.2	SPL
QC-2	(g) 11/04/92	---	---	---	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	---	---	---	PACE
QC-2	(g) 11/04/92	---	---	---	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	---	---	---	PACE
QC-2	(g) 03/01/95	---	---	---	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<1.0	---	---	---	---	---	PACE
QC-2	(g) 05/12/94	---	---	---	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	---	---	---	PACE
QC-2	(g) 09/09/94	---	---	---	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	---	---	---	PACE
QC-2	(g) 11/03/94	---	---	---	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	---	---	---	PACE
QC-2	(g) 06/06/95	---	---	---	ND<50	---	ND<0.50	ND<0.50	ND<0.50	ND<1.0	---	---	---	---	---	ATI
QC-2	(g) 09/01/95	---	---	---	ND<50	---	ND<0.50	ND<0.50	ND<0.50	ND<1.0	ND<5.0	---	---	---	---	ATI
QC-2	(g) 11/29/95	---	---	---	ND<50	---	ND<0.50	ND<0.50	ND<0.50	ND<1.0	ND<5.0	---	---	---	---	ATI
QC-2	(g) 03/23/96	---	---	---	ND<50	---	ND<0.5	ND<1	ND<1	ND<1	ND<10	---	---	---	---	SPL

ABBREVIATIONS:

TPH-G	Total petroleum hydrocarbons as gasoline
TPH-D	Total petroleum hydrocarbons as diesel
B	Benzene
T	Toluene
E	Ethylbenzene
X	Total xylenes
MTBE	Methyl tert butyl ether
TOG	Total oil and grease
1,1,1-TCA	1,1,1-Trichloroethane
PCE	Tetrachloroethene
DO	Dissolved oxygen
ug/l	Micrograms per liter
ppm	Parts per million
ND	Not detected above reported detection limit
---	Not measured/analyzed/applicable
PACE	Pace, Inc.
ATI	Analytical Technologies, Inc.
SPL	Southern Petroleum Laboratories

NOTES:

- (a) Top of casing elevations surveyed relative to an established benchmark with an elevation of 39.95 feet above mean sea level.
- (b) Groundwater elevations in feet above mean sea level.
- (c) Blind duplicate.
- (d) A copy of the documentation for this data is included in Appendix C of Alisto report 10-060-07-001.
- (e) MTBE peak present. See documentation in Appendix C of Alisto report 10-060-07-001.
- (f) Well inaccessible.
- (g) Travel blank.

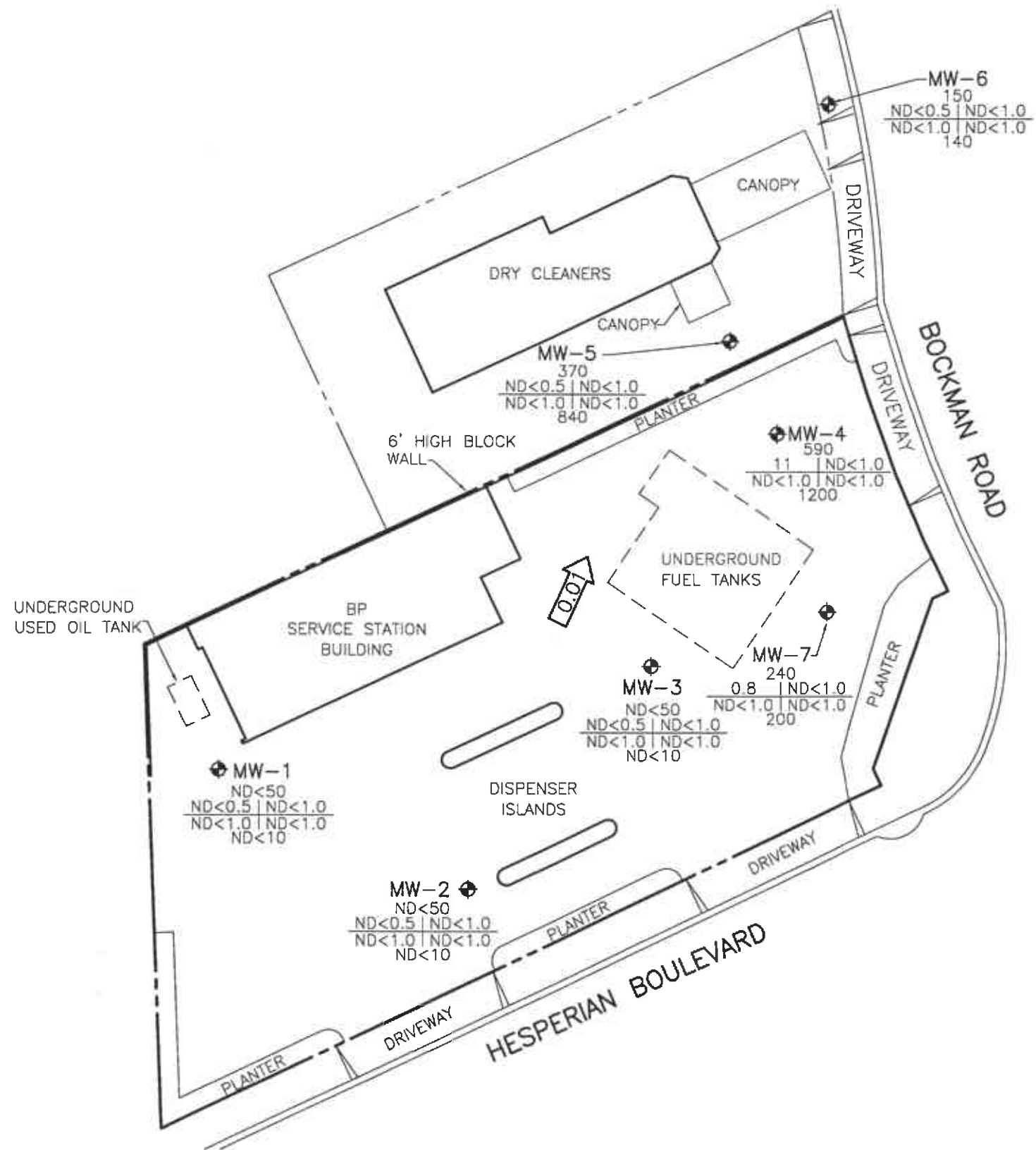


LEGEND

- ◆ GROUNDWATER MONITORING WELL
- (22.95) GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL
- 23.00 - GROUNDWATER ELEVATION CONTOUR IN FEET ABOVE MEAN SEA LEVEL (CONTOUR INTERVAL - 0.50 FOOT)
- ← 0.01 ← CALCULATED GROUNDWATER GRADIENT DIRECTION AND MAGNITUDE IN FOOT PER FOOT

FIGURE 2
POTENTIOMETRIC GROUNDWATER ELEVATION CONTOUR MAP
DECEMBER 8, 1997
 BP OIL SERVICE STATION NO. 11107
 18501 HESPERIAN BOULEVARD
 SAN LORENZO, CALIFORNIA
 PROJECT NO. 10-060

10000-Y-060 1-2-98 TWH 1-30



LEGEND

- ◆ GROUNDWATER MONITORING WELL
- TPH-G CONCENTRATION OF CONSTITUENTS IN MICROGRAMS PER LITER
- B I T E X MTBE TOTAL PETROLEUM HYDROCARBONS AS GASOLINE
- B BENZENE
- T TOLUENE
- E ETHYLBENZENE
- X TOTAL XYLENES
- MTBE METHYL TERT BUTYL ETHER
- ND NOT DETECTED ABOVE REPORTED DETECTION LIMIT
- ←0.01 CALCULATED GROUNDWATER GRADIENT DIRECTION AND MAGNITUDE IN FOOT PER FOOT

FIGURE 3
CONCENTRATIONS OF PETROLEUM HYDROCARBONS IN GROUNDWATER
DECEMBER 8, 1997
 BP OIL SERVICE STATION NO. 11107
 18501 HESPERIAN BOULEVARD
 SAN LORENZO, CALIFORNIA
 PROJECT NO. 10-060

LUDWIG-7.DWG 11-27-98 TWH 1 of 20

APPENDIX A
WATER SAMPLING FIELD SURVEY FORMS

ALISTO

Field Report / Sampling Data Sheet

ENGINEERING

GROUP

1575 TREAT BOULEVARD, SUITE 201

WALNUT CREEK CA 94598 (510) 295-1650 FAX 295-1823

Project No. 10-060-07-001

Address 18501 Hesperian Blvd

Contract No. H176921

Station No. BP 11107

Date: 12/8/97

Day: M T W T H F

City: San Lorenzo

Sampler: W

DEPTH TO GROUNDWATER SUMMARY

WELL ID	SAMPLE ID	WELL DIAM	TOTAL DEPTH	DEPTH TO WATER	PRODUCT THICKNESS	TIME MONITORED	COMMENTS:
MW-1	S-1	2"	30.70	16.30	Ø	1422	
MW-2	S-2	2"	25.00	16.01		1424	
MW-3	S-3	2"	25.00	16.12		1426	
MW-4	S-7	2"	26.00	15.96		1443	QC-1 (S-8) From this well
MW-5	S-5	2"	26.00	15.85		1434	
MW-6	S-6	2"	26.00	15.51		1439	
MW-7	S-4	2"	26.00	16.02	↓	1430	

FIELD INSTRUMENT CALIBRATION DATA

pH METER Jim 4.00 4 7.00 7 10.00 10 TEMPERATURE COMPENSATED N TIME 1415 WEATHER Cloudy/Rain

D.O. METER Jim ZERO d.O. SOLUTION _____ BAROMETRIC PRESSURE _____ TEMP 63

CONDUCTIVITY METER Jim 10,000 _____ TURBIDITY METER _____ 5.0 NTU _____ OTHER X

Well ID	Depth to Water	Diam	Cap/Lock	Product Dept	Iridescence	Gal.	Time	Temp *F	pH	E.C.	D.O.	
MW-1	16.30	2"	OK	Ø	Y (N)	2	1432	58.7	6.71	1.27ms	5.2	<input type="radio"/> EPA 601 _____
Total Depth - Water Level=						4		59.4	6.60	1.41ms		<input checked="" type="radio"/> TPH-G/BTEX _____
30.70 - 16.30 = 14.40 x .16 = 2.30 x 3 = 6.90						7	1440	59.9	6.54	1.47ms	5.3	<input type="radio"/> TPH Diesel _____
Purge Method: <input checked="" type="checkbox"/> Surface Pump ODisp. Tube OWinch ODisp. Baller(s) _____ OSys Port												<input type="radio"/> TOG 5520 _____
Comments:												TIME/SAMPLE ID
												1445

Well ID	Depth to Water	Diam	Cap/Lock	Product Dept	Iridescence	Gal.	Time	Temp *F	pH	E.C.	D.O.	
MW-2	16.01	2"	OK	Ø	Y (N)	1	1501	59.1	7.03	1.03ms	3.1	<input type="radio"/> EPA 601 _____
Total Depth - Water Level=						3		60.4	6.92	1.10ms		<input checked="" type="radio"/> TPH-G/BTEX _____
25.00 - 16.01 = 8.99 x .16 = 1.44 x 3 = 4.32						5	1510	60.4	6.88	1.14ms	3.0	<input type="radio"/> TPH Diesel _____
Purge Method: <input checked="" type="checkbox"/> Surface Pump ODisp. Tube OWinch ODisp. Baller(s) _____ OSys Port												<input type="radio"/> TOG 5520 _____
Comments:												TIME/SAMPLE ID
												1514

ALISTO

Field Report / Sampling Data Sheet

ENGINEERING

GROUP

1575 TREAT BOULEVARD, SUITE 201

WALNUT CREEK CA 94598 (510) 295-1650 FAX 295-1823

Project No.

10-060-07-001

Date:

12/8/97

Address

18501 Hesperian Blvd

Day:

MTWTHF

Contract No.

H176921

City:

San Lorenzo

Station No.

BP 11107

Sampler:

WB

Well ID	Depth to Water	Diam	Cap/Lock	Product Dept	Iridescence	Gal.	Time	Temp *F	pH	E.C.	D.O.	
MW-3	16.12	2"	OK	Ø	Y (N)	1	1526	67.3	6.74	876µs	1.4	<input type="radio"/> EPA 601 _____
Total Depth - Water Level= x Well Vol. Factor= x#vol. to Purge PurgeVol.						3		68.5	6.70	892µs		<input checked="" type="radio"/> TPH-G/BTEX _____
25.00 - 16.12 = 8.88 x .16 = 1.42 x 3 = 4.26						5	1533	69.1	6.61	897µs	1.9	<input type="radio"/> TPH Diesel _____
Purge Method: <input checked="" type="checkbox"/> Surface Pump ODisp. Tube OWinch ODisp. Baller(s) ___ OSys Port												<input type="radio"/> TOG 5520 _____
Comments:												TIME/SAMPLE ID
												1527

Well ID	Depth to Water	Diam	Cap/Lock	Product Dept	Iridescence	Gal.	Time	Temp *F	pH	E.C.	D.O.	
MW-7	16.02	2"	OK	Ø	Y (N)	2	1546	67.7	7.01	.97ms	5.0	<input type="radio"/> EPA 601 _____
Total Depth - Water Level= x Well Vol. Factor= x#vol. to Purge PurgeVol.						4		68.9	6.80	1.04ms		<input checked="" type="radio"/> TPH-G/BTEX _____
26.00 - 16.02 = 9.98 x .16 = 1.60 x 3 = 4.80						5	1555	69.4	6.70	1.10ms	5.2	<input type="radio"/> TPH Diesel _____
Purge Method: <input checked="" type="checkbox"/> Surface Pump ODisp. Tube OWinch ODisp. Baller(s) ___ OSys Port												<input type="radio"/> TOG 5520 _____
Comments:												TIME/SAMPLE ID
												1600

Well ID	Depth to Water	Diam	Cap/Lock	Product Dept	Iridescence	Gal.	Time	Temp *F	pH	E.C.	D.O.	
MW-5	15.85	2"	OK	Ø	Y (N)	2	1615	67.1	6.92	1.00ms	2.7	<input type="radio"/> EPA 601 _____
Total Depth - Water Level= x Well Vol. Factor= x#vol. to Purge PurgeVol.						4		68.4	6.71	1.07ms		<input checked="" type="radio"/> TPH-G/BTEX _____
26.00 - 15.85 = 10.15 x .16 = 1.62 x 3 = 4.86						5	1627	68.4	6.66	1.12ms	3.0	<input type="radio"/> TPH Diesel _____
Purge Method: <input checked="" type="checkbox"/> Surface Pump ODisp. Tube OWinch ODisp. Baller(s) ___ OSys Port												<input type="radio"/> TOG 5520 _____
Comments:												TIME/SAMPLE ID
												1631

Well ID	Depth to Water	Diam	Cap/Lock	Product Dept	Iridescence	Gal.	Time	Temp *F	pH	E.C.	D.O.	
MW-6	15.51	2"	OK	Ø	Y (N)	2	1639	66.7	6.87	.99ms	3.4	<input type="radio"/> EPA 601 _____
Total Depth - Water Level= x Well Vol. Factor= x#vol. to Purge PurgeVol.						4		67.9	6.61	1.04ms		<input checked="" type="radio"/> TPH-G/BTEX _____
26.00 - 15.51 = 10.49 x .16 = 1.68 x 3 = 5.04						6	1644	68.7	6.63	1.18ms	3.4	<input type="radio"/> TPH Diesel _____
Purge Method: <input checked="" type="checkbox"/> Surface Pump ODisp. Tube OWinch ODisp. Baller(s) ___ OSys Port												<input type="radio"/> TOG 5520 _____
Comments:												TIME/SAMPLE ID
												1650

Well ID	Depth to Water	Diam	Cap/Lock	Product Dept	Iridescence	Gal.	Time	Temp *F	pH	E.C.	D.O.	
MW-4	15.96	2"	OK	Ø	Y (N)	2	1656	67.7	6.97	1.11ms	4.3	<input type="radio"/> EPA 601 _____
Total Depth - Water Level= x Well Vol. Factor= x#vol. to Purge PurgeVol.						4		68.3	6.80	1.17ms		<input checked="" type="radio"/> TPH-G/BTEX _____
26.00 - 15.96 = 10.04 x .16 = 1.61 x 3 = 4.83						5	1703	69.0	6.73	1.21ms	4.4	<input type="radio"/> TPH Diesel _____
Purge Method: <input checked="" type="checkbox"/> Surface Pump ODisp. Tube OWinch ODisp. Baller(s) ___ OSys Port												<input type="radio"/> TOG 5520 _____
Comments: AC-1 (S-8) From this well												TIME/SAMPLE ID
												1710

APPENDIX B

LABORATORY REPORT AND CHAIN OF CUSTODY RECORD



HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

December 23, 1997

Mr. Scott Hooton
BP OIL COMPANY
295 SW 41st St, Bldg 13 Ste N
Renton, WA 98055


The following report contains analytical results for samples received at Southern Petroleum Laboratories (SPL) on December 12, 1997. The samples were assigned to Certificate of Analysis No.(s) 9712676 and analyzed for all parameters as listed on the chain of custody.

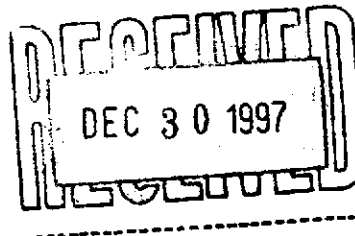
Any data flag or quality control exception associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s).

If you have any questions or comments pertaining to this data report, please do not hesitate to contact me. Please reference the above Certificate of Analysis No. during any inquiries.

Again, SPL is pleased to be of service to you. We anticipate working with you in fulfilling all your current and future analytical needs.

Southern Petroleum Laboratories

for 
James P. Adams
Client Services Manager





HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Southern Petroleum Laboratories, Inc.

Certificate of Analysis Number: 97-12-676

Approved for Release by:

for: Benedette G. Smith
James P. Adams, Client Services Manager

12-23-97
Date:

Greg Grandits
Laboratory Director

Idelis Williams
Quality Assurance Officer

The attached analytical data package may not be reproduced except in full without the express written approval of this laboratory.



HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TEXAS 77054
 PHONE (713) 660-0901

Certificate of Analysis No. H9-9712676-02

BP Oil Company
 295 SW 41st St, Bldg 13, Ste N
 Renton, WA 98055
 ATTN: Scott Hooton

P.O.#
 H176921, COC#081078
 DATE: 12/23/97

PROJECT: #11107, 18501 Hesperian Blvd
 SITE: San Lorenzo, CA
 SAMPLED BY: Alisto Engineering
 SAMPLE ID: S-2

PROJECT NO: 10-060-07-001
 MATRIX: WATER
 DATE SAMPLED: 12/08/97
 DATE RECEIVED: 12/12/97

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
MTBE	ND	10 P	µg/L
Benzene	ND	0.5 P	µg/L
Toluene	ND	1.0 P	µg/L
Ethylbenzene	ND	1.0 P	µg/L
Total Xylene	ND	1.0 P	µg/L

Surrogate

% Recovery

1,4-Difluorobenzene
 4-Bromofluorobenzene

100
 97

Method 8020A***

Analyzed by: MF

Date: 12/20/97

Gasoline Range Organics

ND

0.05 P

mg/L

Surrogate

% Recovery

1,4-Difluorobenzene
 4-Bromofluorobenzene

77
 107

California LUFT Manual for Gasoline

Analyzed by: MF

Date: 12/20/97 04:22:00

ND - Not detected.

(P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
 **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
 ***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.
 SPL California License # 1903



HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TEXAS 77054
 PHONE (713) 660-0901

Certificate of Analysis No. H9-9712676-03

BP Oil Company
 295 SW 41st St, Bldg 13, Ste N
 Renton, WA 98055
 ATTN: Scott Hooton

P.O.#
 H176921, COC#081078
 DATE: 12/23/97

PROJECT: #11107, 18501 Hesperian Blvd
 SITE: San Lorenzo, CA
 SAMPLED BY: Alisto Engineering
 SAMPLE ID: S-3

PROJECT NO: 10-060-07-001
 MATRIX: WATER
 DATE SAMPLED: 12/08/97
 DATE RECEIVED: 12/12/97

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
MTBE	ND	10 P	µg/L
Benzene	ND	0.5 P	µg/L
Toluene	ND	1.0 P	µg/L
Ethylbenzene	ND	1.0 P	µg/L
Total Xylene	ND	1.0 P	µg/L

Surrogate	% Recovery
1,4-Difluorobenzene	100
4-Bromofluorobenzene	93
Method 8020A***	
Analyzed by: MF	
Date: 12/20/97	

Gasoline Range Organics	ND	0.05 P	mg/L
-------------------------	----	--------	------

Surrogate	% Recovery
1,4-Difluorobenzene	73
4-Bromofluorobenzene	107
California LUFT Manual for Gasoline	
Analyzed by: MF	
Date: 12/20/97 04:49:00	

ND - Not detected.

(P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
 **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
 ***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.
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HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TEXAS 77054
 PHONE (713) 660-0901

Certificate of Analysis No. H9-9712676-04

BP Oil Company
 295 SW 41st St, Bldg 13, Ste N
 Renton, WA 98055
 ATTN: Scott Hooton

P.O.#
 H176921, COC#081078
 DATE: 12/23/97

PROJECT: #11107, 18501 Hesperian Blvd
 SITE: San Lorenzo, CA
 SAMPLED BY: Alisto Engineering
 SAMPLE ID: S-4

PROJECT NO: 10-060-07-001
 MATRIX: WATER
 DATE SAMPLED: 12/08/97
 DATE RECEIVED: 12/12/97

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
MTBE	200	10 P	µg/L
Benzene	0.8	0.5 P	µg/L
Toluene	ND	1.0 P	µg/L
Ethylbenzene	ND	1.0 P	µg/L
Total Xylene	ND	1.0 P	µg/L
Method 8020A***			
Analyzed by: MF			
Date: 12/21/97			
Gasoline Range Organics	0.24	0.05 P	mg/L
Surrogate			
1,4-Difluorobenzene	% Recovery		77
4-Bromofluorobenzene			100
California LUFT Manual for Gasoline			
Analyzed by: MF			
Date: 12/21/97 10:02:00			

(P) - Practical Quantitation Limit ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
 **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
 ***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.
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HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TEXAS 77054
 PHONE (713) 660-0901

Certificate of Analysis No. H9-9712676-05

BP Oil Company
 295 SW 41st St, Bldg 13, Ste N
 Renton, WA 98055
 ATTN: Scott Hooton

P.O.#
 H176921, COC#081078
 DATE: 12/23/97

PROJECT: #11107, 18501 Hesperian Blvd
 SITE: San Lorenzo, CA
 SAMPLED BY: Alisto Engineering
 SAMPLE ID: S-5

PROJECT NO: 10-060-07-001
 MATRIX: WATER
 DATE SAMPLED: 12/08/97
 DATE RECEIVED: 12/12/97

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
MTBE	840	250 P	µg/L
Benzene	ND	0.5 P	µg/L
Toluene	ND	1.0 P	µg/L
Ethylbenzene	ND	1.0 P	µg/L
Total Xylene	ND	1.0 P	µg/L

Surrogate % Recovery
 1,4-Difluorobenzene 100
 4-Bromofluorobenzene 97
 Method 8020A***
 Analyzed by: MF
 Date: 12/20/97

Gasoline Range Organics 0.37 0.25 P mg/L

Surrogate % Recovery
 1,4-Difluorobenzene 73
 4-Bromofluorobenzene 100
 California LUFT Manual for Gasoline
 Analyzed by: MF
 Date: 12/22/97 04:17:00

(P) - Practical Quantitation Limit ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
 **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
 ***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.
 SPL California License # 1903



HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TEXAS 77054
 PHONE (713) 660-0901

Certificate of Analysis No. H9-9712676-06

BP Oil Company
 295 SW 41st St, Bldg 13, Ste N
 Renton, WA 98055
 ATTN: Scott Hooton

P.O.#
 H176921, COC#081078
 DATE: 12/23/97

PROJECT: #11107, 18501 Hesperian Blvd
 SITE: San Lorenzo, CA
 SAMPLED BY: Alisto Engineering
 SAMPLE ID: S-6

PROJECT NO: 10-060-07-001
 MATRIX: WATER
 DATE SAMPLED: 12/08/97
 DATE RECEIVED: 12/12/97

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
MTBE	140	10 P	µg/L
Benzene	ND	0.5 P	µg/L
CHLOROBENZENE	ND	1.0 P	µg/L
Toluene	ND	1.0 P	µg/L
Ethylbenzene	ND	1.0 P	µg/L
Total Xylene	ND	1.0 P	µg/L

Surrogate	% Recovery
1,4-Difluorobenzene	100
4-Bromofluorobenzene	97

Method 8020A***

Analyzed by: MF

Date: 12/20/97

Gasoline Range Organics	0.15	0.05 P	mg/L
-------------------------	------	--------	------

Surrogate	% Recovery
1,4-Difluorobenzene	73
4-Bromofluorobenzene	103

California LUFT Manual for Gasoline

Analyzed by: MF

Date: 12/20/97 11:02:00

(P) - Practical Quantitation Limit ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
 **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
 ***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.
 SPL California License # 1903



HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TEXAS 77054
 PHONE (713) 660-0901

Certificate of Analysis No. H9-9712676-07

BP Oil Company
 295 SW 41st St, Bldg 13, Ste N
 Renton, WA 98055
 ATTN: Scott Hooton

P.O.#
 H176921, COC#081078
 DATE: 12/23/97

PROJECT: #11107, 18501 Hesperian Blvd
 SITE: San Lorenzo, CA
 SAMPLED BY: Alisto Engineering
 SAMPLE ID: S-7

PROJECT NO: 10-060-07-001
 MATRIX: WATER
 DATE SAMPLED: 12/08/97
 DATE RECEIVED: 12/12/97

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
MTBE	1200	500 P	µg/L
Benzene	11	0.5 P	µg/L
Toluene	ND	1.0 P	µg/L
Ethylbenzene	ND	1.0 P	µg/L
Total Xylene	ND	1.0 P	µg/L

Surrogate	% Recovery
1,4-Difluorobenzene	100
4-Bromofluorobenzene	100

Method 8020A***
 Analyzed by: MF
 Date: 12/21/97

Gasoline Range Organics	0.59	0.25 P	mg/L
-------------------------	------	--------	------

Surrogate	% Recovery
1,4-Difluorobenzene	73
4-Bromofluorobenzene	100

California LUFT Manual for Gasoline
 Analyzed by: MF
 Date: 12/22/97 04:44:00

(P) - Practical Quantitation Limit ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
 **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
 ***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.
 SPL California License # 1903



HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TEXAS 77054
 PHONE (713) 660-0901

Certificate of Analysis No. H9-9712676-08

BP Oil Company
 295 SW 41st St, Bldg 13, Ste N
 Renton, WA 98055
 ATTN: Scott Hooton

P.O.#
 H176921, COC#081078
 DATE: 12/23/97

PROJECT: #11107, 18501 Hesperian Blvd
 SITE: San Lorenzo, CA
 SAMPLED BY: Alisto Engineering
 SAMPLE ID: S-8

PROJECT NO: 10-060-07-001
 MATRIX: WATER
 DATE SAMPLED: 12/08/97
 DATE RECEIVED: 12/12/97

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
MTBE	1100	500 P	µg/L
Benzene	11	0.5 P	µg/L
Toluene	ND	1.0 P	µg/L
Ethylbenzene	ND	1.0 P	µg/L
Total Xylene	ND	1.0 P	µg/L

Surrogate	% Recovery
1,4-Difluorobenzene	100
4-Bromofluorobenzene	100

Method 8020A***
 Analyzed by: MF
 Date: 12/21/97

Gasoline Range Organics	0.62	0.25 P	mg/L
-------------------------	------	--------	------

Surrogate	% Recovery
1,4-Difluorobenzene	73
4-Bromofluorobenzene	107

California LUFT Manual for Gasoline
 Analyzed by: MF
 Date: 12/22/97 05:11:00

(P) - Practical Quantitation Limit ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
 **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
 ***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.
 SPL California License # 1903

QUALITY CONTROL

DOCUMENTATION



**** SPL BATCH QUALITY CONTROL REPORT ****
METHOD 8020/602

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Matrix: Aqueous
Units: µg/L

Batch Id: HP_S971220174200

LABORATORY CONTROL SAMPLE

S P I K E C O M P O U N D S	Method Blank Result <2>	Spike Added <3>	Blank Spike		QC Limits(**) (Mandatory) % Recovery Range
			Result <1>	Recovery %	
MTBE	ND	50	41	82.0	72 - 128
Benzene	ND	50	45	90.0	61 - 119
Toluene	ND	50	44	88.0	65 - 125
EthylBenzene	ND	50	43	86.0	70 - 118
O Xylene	ND	50	44	88.0	72 - 117
M & P Xylene	ND	100	88	88.0	72 - 116

MATRIX SPIKES

S P I K E C O M P O U N D S	Sample Results <2>	Spike Added <3>	Matrix Spike		Matrix Spike Duplicate		MS/MSD Relative % Difference	QC Limits(***) (Advisory)	
			Result <1>	Recovery <4>	Result <1>	Recovery <5>		RPD Max.	Recovery Range
MTBE	870	20	780	NC	790	NC	NC	20	39 - 150
BENZENE	ND	20	18	90.0	19	95.0	5.41	21	32 - 164
TOLUENE	ND	20	18	90.0	18	90.0	0	20	38 - 159
ETHYLBENZENE	ND	20	17	85.0	16	80.0	6.06	19	52 - 142
O XYLENE	ND	20	18	90.0	18	90.0	0	18	53 - 143
M & P XYLENE	ND	40	35	87.5	35	87.5	0	17	53 - 144

Analyst: MF
Sequence Date: 12/20/97
SPL ID of sample spiked: 9712676-05A
Sample File ID: S_L3624.TX0
Method Blank File ID:
Blank Spike File ID: S_L3615.TX0
Matrix Spike File ID: S_L3618.TX0
Matrix Spike Duplicate File ID: S_L3619.TX0

* = Values Outside QC Range. < = Data outside Method Specification limits.
NC = Not Calculated (Sample exceeds spike by factor of 4 or more)
ND = Not Detected/Below Detection Limit
% Recovery = [(<1> - <2>) / <3>] x 100
LCS % Recovery = (<1> / <3>) x 100
Relative Percent Difference = | (<4> - <5>) | / [(<4> + <5>) x 0.5] x 100
(**) = Source: SPL-Houston Historical Data (1st Q '97)
(***) = Source: SPL-Houston Historical Data (1st Q '97)

SAMPLES IN BATCH(SPL ID):

9712482-27A	9712482-28A	9712482-29A	9712590-01A
9712590-02A	9712590-03A	9712676-04A	9712676-07A
9712676-08A	9712676-01A	9712674-02A	9712676-05A
9712676-06A	9712676-07A	9712676-08A	



** SPL BATCH QUALITY CONTROL REPORT **
METHOD 8020/602

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Matrix: Aqueous
Units: µg/L

Batch Id: HP_5971220014200

LABORATORY CONTROL SAMPLE

SPIKE COMPOUNDS	Method Blank Result <2>	Spike Added <3>	Blank Spike		QC Limits(**) (Mandatory) % Recovery Range
			Result <1>	Recovery %	
MTBE	ND	50	41	82.0	72 - 128
Benzene	ND	50	45	90.0	61 - 119
Toluene	ND	50	44	88.0	65 - 125
EthylBenzene	ND	50	43	86.0	70 - 118
O Xylene	ND	50	43	86.0	72 - 117
M & P Xylene	ND	100	85	85.0	72 - 116

MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results <2>	Spike Added <3>	Matrix Spike		Matrix Spike Duplicate		MS/MSD Relative % Difference	QC Limits(***) (Advisory)	
			Result <1>	Recovery <4>	Result <1>	Recovery <5>		RPD Max.	Recovery Range
MTBE	ND	20	16	80.0	16	80.0	0	20	39 - 150
BENZENE	ND	20	17	85.0	17	85.0	0	21	32 - 164
TOLUENE	ND	20	16	80.0	16	80.0	0	20	38 - 159
ETHYLBENZENE	ND	20	16	80.0	15	75.0	6.45	19	52 - 142
O XYLENE	ND	20	17	85.0	17	85.0	0	18	53 - 143
M & P XYLENE	ND	40	33	82.5	32	80.0	3.08	17	53 - 144

Analyst: MF

Sequence Date: 12/20/97

SPL ID of sample spiked: 9712548-03C

Sample File ID: S_L3590.TX0

Method Blank File ID:

Blank Spike File ID: S_L3582.TX0

Matrix Spike File ID: S_L3584.TX0

Matrix Spike Duplicate File ID: S_L3585.TX0

* = Values Outside QC Range. « = Data outside Method Specification Limits.

NC = Not Calculated (Sample exceeds spike by factor of 4 or more)

ND = Not Detected/Below Detection Limit

% Recovery = [(<1> - <2>) / <3>] x 100

LCS % Recovery = (<1> / <3>) x 100

Relative Percent Difference = [(<4> - <5>) / [(<4> + <5>) x 0.5]] x 100

(**) = Source: SPL-Houston Historical Data (1st Q '97)

(***) = Source: SPL-Houston Historical Data (1st Q '97)

SAMPLES IN BATCH(SPL ID):

9712537-02A 9712537-01A 9712675-01A 9712676-02A
9712676-03A 9712437-03A 9712675-01A 9712674-03A



**** SPL BATCH QUALITY CONTROL REPORT ****
Method Modified 8015A*** for Gasoline

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Matrix: Aqueous
Units: mg/L

Batch Id: HP_S971220180900

LABORATORY CONTROL SAMPLE

S P I K E C O M P O U N D S	Method Blank Result <2>	Spike Added <3>	Blank Spike		QC Limits(**) (Mandatory) % Recovery Range
			Result <1>	Recovery %	
Gasoline Range Organics	ND	1.0	0.97	97.0	64 - 131

MATRIX SPIKES

S P I K E C O M P O U N D S	Sample Results <2>	Spike Added <3>	Matrix Spike		Matrix Spike Duplicate		MS/MSD Relative % Difference	QC Limits(***) (Advisory)	
			Result <1>	Recovery <4>	Result <1>	Recovery <5>		RPD Max.	Recovery Range
			GASOLINE RANGE ORGANICS	0.15	0.9	1.05		100	1.04

Analyst: MF
Sequence Date: 12/20/97
SPL ID of sample spiked: 9712676-06A
Sample File ID: SSL3625.TX0
Method Blank File ID:
Blank Spike File ID: SSL3616.TX0
Matrix Spike File ID: SSL3620.TX0
Matrix Spike Duplicate File ID: SSL3621.TX0

* = Values Outside QC Range. « = Data outside Method Specification limits.
NC = Not Calculated (Sample exceeds spike by factor of 4 or more)
ND = Not Detected/Below Detection Limit
% Recovery = [(<1> - <2>) / <3>] x 100
LCS % Recovery = (<1> / <3>) x 100
Relative Percent Difference = [(<4> - <5>) / [(<4> + <5>) x 0.5]] x 100
(**) = Source: SPL-Houston Historical data (1st Q '97)
(***) = Source: SPL-Houston Historical Data (1st Q '97)

SAMPLES IN BATCH(SPL ID): 9712590-01A 9712590-02A 9712590-03A 9712676-04A
 9712676-01A 9712676-06A 9712482-28A 9712482-29A



**** SPL BATCH QUALITY CONTROL REPORT ****
California LUFT Manual for Gasoline

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Matrix: Aqueous
Units: mg/L

Batch Id: HP_S971220020801

LABORATORY CONTROL SAMPLE

S P I K E C O M P O U N D S	Method Blank Result <2>	Spike Added <3>	Blank Spike		QC Limits(**) (Mandatory) % Recovery Range
			Result <1>	Recovery %	
Gasoline Range Organics	ND	1.0	0.91	91.0	64 - 131

MATRIX SPIKES

S P I K E C O M P O U N D S	Sample Results <2>	Spike Added <3>	Matrix Spike		Matrix Spike Duplicate		MS/MSD Relative % Difference	QC Limits(***) (Advisory)	
			Result <1>	Recovery <4>	Result <1>	Recovery <5>		RPD Max.	Recovery Range
GASOLINE RANGE ORGANICS	ND	0.90	0.79	87.8	0.80	88.9	1.25	36	36 - 160

Analyst: MF

Sequence Date: 12/20/97

SPL ID of sample spiked: 9712548-04C

Sample File ID: SSL3591.TX0

Method Blank File ID:

Blank Spike File ID: SSL3583.TX0

Matrix Spike File ID: SSL3586.TX0

Matrix Spike Duplicate File ID: SSL3587.TX0

* = Values Outside QC Range. « = Data outside Method Specification Limits.

NC = Not Calculated (Sample exceeds spike by factor of 4 or more)

ND = Not Detected/Below Detection Limit

% Recovery = $[(<1> - <2>) / <3>] \times 100$

LCS % Recovery = $(<1> / <3>) \times 100$

Relative Percent Difference = $|(<4> - <5> | / [(<4> + <5>) / 2] \times 100$

(**) = Source: SPL-Houston Historical data (1st Q '97)

(***) = Source: SPL-Houston Historical Data (1st Q '97)

SAMPLES IN BATCH(SPL ID):

9712675-01A 9712676-02A 9712676-03A 9712674-03A
9712674-02A



** SPL BATCH QUALITY CONTROL REPORT **
 Method Modified 8015A*** for Gasoline

HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TEXAS 77054
 PHONE (713) 660-0901

Matrix: Aqueous
 Units: mg/L

Batch Id: HP_S971222090700

LABORATORY CONTROL SAMPLE

SPIKE COMPOUNDS	Method Blank Result <2>	Spike Added <3>	Blank Spike		QC Limits(**) (Mandatory) % Recovery Range
			Result <1>	Recovery %	
Gasoline Range Organics	ND	1.0	0.96	96.0	64 - 131

MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results <2>	Spike Added <3>	Matrix Spike		Matrix Spike Duplicate		MS/MSD Relative % Difference	QC Limits(***) (Advisory)	
			Result <1>	Recovery <4>	Result <1>	Recovery <5>		RPD Max.	Recovery Range
GASOLINE RANGE ORGANICS	ND	0.9	1.08	120	0.97	108	10.5	36	36 - 160

Analyst: MF
 Sequence Date: 12/22/97
 SPL ID of sample spiked: 9712717-08C
 Sample File ID: SSL4015.TX0
 Method Blank File ID:
 Blank Spike File ID: SSL4004.TX0
 Matrix Spike File ID: SSL4012.TX0
 Matrix Spike Duplicate File ID: SSL4013.TX0

* = Values Outside QC Range. « = Data outside Method Specification limits.
 NC = Not Calculated (Sample exceeds spike by factor of 4 or more)
 ND = Not Detected/Below Detection Limit
 $\% \text{ Recovery} = [(\text{<1>} - \text{<2>}) / \text{<3>}] \times 100$
 $\text{LCS } \% \text{ Recovery} = (\text{<1>} / \text{<3>}) \times 100$
 $\text{Relative Percent Difference} = [(\text{<4>} - \text{<5>}) / ((\text{<4>} + \text{<5>}) \times 0.5)] \times 100$
 (***) = Source: SPL-Houston Historical data (1st Q '97)
 (***) = Source: SPL-Houston Historical Data (1st Q '97)

SAMPLES IN BATCH(SPL ID): 9712717-08C 9712676-05A 9712676-07A 9712676-08A

CHAIN OF CUSTODY
AND
SAMPLE RECEIPT CHECKLIST

SPL Houston Environmental Laboratory

Sample Login Checklist

Date: <div style="text-align: center; font-size: 1.2em;">12/12/97</div>	Time: <div style="text-align: center; font-size: 1.2em;">1000</div>
--	--

SPL Sample ID:

9712676

		<u>Yes</u>	<u>No</u>
1	Chain-of-Custody (COC) form is present.	✓	
2	COC is properly completed.	✓	
3	If no, Non-Conformance Worksheet has been completed.		
4	Custody seals are present on the shipping container.	✓	
5	If yes, custody seals are intact.	✓	
6	All samples are tagged or labeled.	✓	
7	If no, Non-Conformance Worksheet has been completed.		
8	Sample containers arrived intact	✓	
9	Temperature of samples upon arrival:	2° C	
10	Method of sample delivery to SPL:	SPL Delivery	
		Client Delivery	
		FedEx Delivery (airbill #)	3848471911
		Other:	
11	Method of sample disposal:	SPL Disposal	✓
		HOLD	
		Return to Client	

Name: <div style="text-align: center; font-size: 1.5em; font-family: cursive;">[Signature]</div>	Date: <div style="text-align: center; font-size: 1.2em;">12/12/97</div>
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9712676

CHAIN OF CUSTODY

No.081078

Page _____ of _____

CONSULTANT'S NAME Misto Engineering Group		ADDRESS 1575 Treat Blvd #201 Walnut Creek CA		CITY CA	STATE CA	ZIP CODE 94598
BP SITE NUMBER 11107	BP CORNER ADDRESS/CITY 18501 Hesperian Blvd San Lorenzo		CONSULTANT PROJECT NUMBER 10-060-07-001			
CONSULTANT PROJECT MANAGER Bill Howell		PHONE NUMBER (510) 295-1650	FAX NUMBER (510) 295-1823		CONSULTANT CONTRACT NUMBER H176921	
BP CONTACT Scott Hooton	BP ADDRESS Renton, WA		PHONE NUMBER -		FAX NO. -	
LAB CONTACT Jim Adams	LABORATORY ADDRESS Houston, Texas		PHONE NUMBER -		FAX NO. -	
SAMPLED BY (Please Print Name) L. Buenvenida		SAMPLED BY (Signature)		SHIPMENT DATE 12/11/97		SHIPMENT METHOD Fed Ex

TAT: 24 Hours 48 Hours 1 Week Standard 2 Weeks

ANALYSIS REQUIRED

AIRBILL NUMBER
3848471 911

SAMPLE DESCRIPTION	COLLECTION DATE 12/18/97 COLLECTION TIME	MATRIX SOIL/WATER	CONTAINERS		PRESERVATIVE	COMMENTS
			NO.	TYPE (VOL.)	LAB SAMPLE #	
S-1		Water	3	VOAS	X	
S-2		↓	3		X	
S-3			3		X	
S-4			3		X	
S-5			3		X	
S-6			3		X	
S-7			3		X	
S-8			3		X	

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	ADDITIONAL COMMENTS
P. Yelton for L. Buenvenida	12/11/97		[Signature]	12/12/97	1000	20L

**BP EXPLORATION & OIL, INC.
ENVIRONMENTAL REMEDIATION MANAGEMENT
DATA REVIEW CHECKLIST**

BP Site Number: 11107
ERM Contact: H176921
Sampling Date: 12/08/97
Matrix Description: Water
Date Final Report Received: 12/30/97
Laboratory & Location: SPL, Houston, Texas

	Yes	No	N/A
1. Is BP contract release number consistent with analytical report?	_X_	___	___
2. Was report submitted within the specified timeframe?	_X_	___	___
3. Does report agree with the COC?	_X_	___	___
4. Are units consistent with the given matrix?	_X_	___	___
5. Were any target analytes/compounds detected in blanks (i.e., trip or equipment)?	___	___	_X_
6. Are duplicate water samples within 30%?	_X_	___	___
7. Are holding times met?	_X_	___	___
8. Are surrogates within limits using laboratory criteria?	_X_	___	___
9. Are MS/MSD acceptable using laboratory criteria?	See Below	___	___
10. Are LCS results acceptable using laboratory criteria?	_X_	___	___

Note:

MS/MSD recovery and relative % difference for MTBE not calculated due to sample exceeding spike by a factor of 4 or more. MS/MSD limits are advisory only; as stated in SW-846, Section 8.7 to 8.8, if the MS/MSD results fall outside the advisable ranges, a laboratory control samples (LCS) must be analyzed and fall within those ranges. LCS results are within quality control limits.

Data Validation Completed by: Brady Nagle

(signature):

Date:

Brady Nagle
2/7/99