GROUNDWATER MONITORING AND SAMPLING REPORT

BP Oil Company Service Station No. 11105
3519 Castro Valley Boulevard
Castro Valley, California

Project No. 10-138-05-004

Prepared for:

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September 17, 1996

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INTRODUCTION

This report presents the results and findings of the July 9, 1996 groundwater monitoring and sampling conducted by Alisto Engineering Group at BP Oil Company Service Station No. 11105, 3519 Castro Valley Boulevard, Castro Valley, 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.

Groundwater monitoring was performed concurrently at the neighboring Xtra Oil Company Service Station, 3495 Castro Valley Boulevard. The results are presented in Table 2.

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.

TABLE 1 - SUMMARY OF RESULTS OF GROUNDWATER SAMPLING
BP OIL COMPANY SERVICE STATION NO. 11105
3519 CASTRO VALLEY BOULEVARD, CASTRO VALLEY, CALIFORNIA

ALISTO PROJECT NO. 10-138

WELL ID	DATE OF SAMPLING/ MONITORING	CASING ELEVATION (a) (Feet)	DEPTH TO WATER (Feet)	GROUNDWATER ELEVATION (b) (Feet)	TPH-G (ug/l)	B (ug/l)	T (ug/l)	E (ug/l)	X (ug/l)	MTBE (ug/l)	DO (ppm)	LAB
ESE-1 (c)	10/05/92	177.69	11.22	166.47	2100	370	150	17	110	---	---	---
ESE-1D (d)	10/05/92	---	---	---	2300	370	160	16	110	---	---	---
ESE-1	04/01/93	177.69	8.79	168.90	5900	1500	410	110	390	---	---	PACE
ESE-1	06/29/93	177.69	10.34	167.35	7600	2900	390	130	460	---	---	PACE
ESE-1	09/23/93	177.69	10.91	166.78	2000	490	40	20	56	---	---	PACE
QC-1 (d)	09/23/93	---	---	---	1500	420	39	19	56	---	---	PACE
ESE-1	12/10/93	177.69	9.93	167.76	1800	480	42	19	66	---	3.2	PACE
QC-1 (d)	12/10/93	---	---	---	1500	380	38	17	55	---	---	PACE
ESE-1	02/17/94	177.69	9.64	168.05	1900	380	48	24	80	---	---	PACE
QC-1 (d)	02/17/94	---	---	---	2200	430	42	19	65	---	---	PACE
ESE-1	08/08/94	177.69	11.72	165.97	2100	450	46	16	50	---	5.1	PACE
ESE-1	10/12/94	177.69	10.48	167.21	760	240	16	51	39	---	3.5	PACE
ESE-1	01/19/95	177.69	7.77	169.92	840	600	120	22	58	---	8.0	ATI
ESE-1	05/02/95	177.69	8.69	169.00	2000	640	67	24	98	---	8.5	ATI
ESE-1	07/28/95	177.69	10.12	167.57	190	ND<0.50	ND<0.50	ND<0.50	ND<1.0	---	7.9	ATI
ESE-1	11/17/95	177.69	10.57	167.12	200	3.4	ND<1.0	1.0	ND<2.0	600	7.7	ATI
ESE-1	02/07/96	177.69	7.41	170.28	750	370	23	21	64	680	2.5	SPL
ESE-1	04/23/96	177.69	9.12	168.57	310	100	ND<1	ND<1	ND<1	1500	6.3	SPL
ESE-1	07/09/96	177.69	10.12	167.57	730	230	74	13	63	750	2.9	SPL
ESE-2	10/05/92	178.23	11.68	166.55	300	5.4	16	3.9	45	---	---	---
ESE-2	04/01/93	178.23	9.17	169.06	240	27	ND<0.5	17	2.6	---	---	PACE
ESE-2	06/29/93	178.23	10.88	167.35	1700	260	24	110	23	---	---	PACE
QC-1 (d)	06/29/93	---	---	---	1300	240	17	110	25	---	---	PACE
ESE-2	09/23/93	178.23	11.56	166.67	240	3.1	0.5	0.6	2.5	---	---	PACE
ESE-2	12/10/93	178.23	10.48	167.75	250	2.4	2.4	1.5	11	---	2.6	PACE
ESE-2	02/17/94	178.23	10.06	168.17	900	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	PACE
ESE-2	08/08/94	178.23	11.11	167.12	750	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	5.1	PACE
ESE-2	10/12/94	178.23	11.31	166.92	1700	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	3.6	PACE
ESE-2	01/19/95	178.23	8.25	169.98	300	2	0.9	0.7	1	---	8.1	ATI
ESE-2	05/02/95	178.23	9.21	169.02	1200	4.0	ND<2.5	ND<2.5	ND<5.0	---	8.4	ATI
ESE-2	07/28/95	178.23	10.64	167.59	2000	ND<2.5	ND<2.5	ND<2.5	ND<5.0	---	7.7	ATI
ESE-2	11/17/95	178.23	11.13	167.10	3600	ND<25	ND<25	ND<25	ND<50	12000	7.4	ATI
QC-1 (d)	11/17/95	---	---	---	3400	ND<25	ND<25	ND<25	ND<50	12000	---	ATI
ESE-2	02/07/96	178.23	7.94	170.29	450	ND<0.5	ND<1	ND<1	ND<1	2300	1.8	SPL
ESE-2	04/23/96	178.23	9.73	168.50	260	0.9	ND<1	ND<1	ND<1	8600	7.2	SPL
ESE-2	07/09/96	178.23	10.70	167.53	780	ND<2.5	ND<5	ND<5	ND<5	13393	3.0	SPL

TABLE 1 - SUMMARY OF RESULTS OF GROUNDWATER SAMPLING
BP OIL COMPANY SERVICE STATION NO. 11105
3519 CASTRO VALLEY BOULEVARD, CASTRO VALLEY, CALIFORNIA

ALISTO PROJECT NO. 10-138

WELL ID	DATE OF SAMPLING/ MONITORING	CASING ELEVATION (a) (Feet)		DEPTH TO WATER (Feet)	GROUNDWATER ELEVATION (b) (Feet)	TPH-G (ug/l)	B (ug/l)	T (ug/l)	E (ug/l)	X (ug/l)	MTBE (ug/l)	DO (ppm)	LAB
ESE-3	10/05/92	178.20		10.58	167.62	430	57	31	3.6	34	---	---	---
ESE-3	04/01/93	178.20		8.14	170.06	2400	460	220	74	210	---	---	PACE
ESE-3	06/29/93	178.20		9.72	168.48	280	56	14	15	13	---	---	PACE
ESE-3	09/23/93	178.20		10.46	167.74	72	13	3.5	1.7	4.1	---	---	PACE
ESE-3	12/10/93	178.20		9.30	168.90	270	71	32	6.1	33	---	2.7	PACE
ESE-3	02/17/94	178.20		8.97	169.23	520	140	10	20	33	---	---	PACE
ESE-3	08/08/94	178.20		10.02	168.18	ND<50	8.8	1.6	1.6	2.3	---	6.2	PACE
ESE-3	10/12/94	178.20		10.32	167.88	470	190	6.4	15	18	---	3.5	PACE
ESE-3	01/19/95	178.20		7.40	170.80	330	260	27	21	20	---	6.7	ATI
ESE-3	05/02/95	178.20		8.26	169.94	530	180	30	23	44	---	8.6	ATI
ESE-3	07/28/95	178.20		9.54	168.66	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	---	8.8	ATI
ESE-3	11/17/95	178.20		10.04	168.16	ND<50	1.7	ND<0.50	ND<0.50	ND<1.0	ND<5.0	7.3	ATI
ESE-3	02/07/96	178.20		7.08	171.12	ND<50	8.6	ND<1	ND<1	ND<1	ND<10	3.9	SPL
ESE-3	04/23/96	178.20		8.79	169.41	ND<50	7.6	ND<1	ND<1	ND<1	65	6.9	SPL
ESE-3	07/09/96	178.20		10.09	168.11	ND<50	12	2.6	2.0	3.9	26	3.4	SPL
ESE-4	10/05/92	177.73		10.33	167.40	98	7.2	1.3	1.1	6.1	---	---	---
ESE-4	04/01/93	177.73		7.88	169.85	550	93	20	23	33	---	---	PACE
ESE-4	06/29/93	177.66	(e)	8.33	169.33	150	23	0.6	5.4	0.5	---	---	PACE
ESE-4	09/23/93	177.66		10.05	167.61	110	14	1.7	3.2	4.6	---	---	PACE
ESE-4	12/10/93	177.66		8.95	168.71	110	21	7.2	4.2	10	---	2.8	PACE
ESE-4	02/17/94	177.66		8.65	169.01	210	26	1.2	4.7	11	---	---	PACE
ESE-4	08/08/94	177.66		9.76	167.90	76	9.6	ND<0.5	2.0	ND<0.5	---	7.0	PACE
ESE-4	10/12/94	177.66		9.62	168.04	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	3.2	PACE
ESE-4	01/19/95	177.66		6.97	170.69	140	56	14	24	23	---	6.9	ATI
ESE-4	05/02/95	177.66		7.85	169.81	130	21	2.8	8.6	8.2	---	9.1	ATI
ESE-4	07/28/95	177.66		9.20	168.46	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	---	8.1	ATI
ESE-4	11/17/95	177.66		9.68	167.98	ND<50	ND<0.50	0.60	ND<0.50	ND<1.0	18	5.7	ATI
ESE-4	02/07/96	177.66		6.59	171.07	100	2.6	ND<1	1.6	4.1	42	2.0	SPL
ESE-4	04/23/96	177.66		8.30	169.36	160	37	15	16	31	43	5.4	SPL
ESE-4	07/09/96	177.66		9.21	168.45	60	17	1.5	6.8	11.6	27	3.9	SPL

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BP OIL COMPANY SERVICE STATION NO. 11105
3519 CASTRO VALLEY BOULEVARD, CASTRO VALLEY, CALIFORNIA

ALISTO PROJECT NO. 10-138

WELL ID	DATE OF SAMPLING/ MONITORING	CASING ELEVATION (a) (Feet)	DEPTH TO WATER (Feet)	GROUNDWATER ELEVATION (b) (Feet)	TPH-G (ug/l)	B (ug/l)	T (ug/l)	E (ug/l)	X (ug/l)	MTBE (ug/l)	DO (ppm)	LAB
ESE-5	10/05/92	176.08	9.22	166.86	1300	200	3.8	1.2	18	---	---	---
ESE-5	04/01/93	176.08	7.02	169.06	13000	2200	26	730	1000	---	---	PACE
QC-1 (d)	04/01/93	---	---	---	13000	2500	25	740	1100	---	---	PACE
ESE-5	06/29/93	176.08	10.21	165.87	7600	1500	9.3	170	100	---	---	PACE
ESE-5	09/23/93	176.08	10.64	165.44	560	19	1.2	0.9	1.8	---	---	PACE
ESE-5	12/10/93	176.08	9.42	166.66	1700	300	3.0	76	110	---	2.5	PACE
ESE-5	02/07/94	176.08	9.35	166.73	3500	640	7.8	90	130	---	---	PACE
ESE-5	08/08/94	176.08	8.76	167.32	2600	210	4.6	9.4	4.4	---	5.8	PACE
QC-1 (d)	08/08/94	---	---	---	2500	230	4.6	13	4.8	---	---	PACE
ESE-5	10/12/94	176.08	8.95	167.13	5600	560	9.5	75	21	---	3.6	PACE
QC-1 (d)	10/12/94	---	---	---	6000	550	10	78	22	---	---	PACE
ESE-5	01/19/95	176.08	5.40	170.68	1900	620	ND<5	95	15	---	7.6	ATI
QC-1 (d)	01/19/95	---	---	---	1600	620	ND<5	93	17	---	---	ATI
ESE-5	05/02/95	176.08	6.48	169.60	5700	1100	ND<10	180	58	---	8.2	ATI
QC-1 (d)	05/02/95	---	---	---	5300	1100	ND<10	180	58	---	---	ATI
ESE-5	07/28/95	176.08	7.97	168.11	520	15	ND<0.50	1.7	1.3	---	8.2	ATI
QC-1 (d)	07/28/95	---	---	---	460	7.2	ND<0.50	1.9	1.5	---	---	ATI
ESE-5	11/17/95	176.08	8.39	167.69	850	39	1.8	7.6	2.7	24	6.3	ATI
ESE-5	02/07/96	176.08	4.71	171.37	4100	670	6.0	190	140	ND<50	1.5	SPL
ESE-5	04/23/96	176.08	7.35	168.73	3000	570	ND<5	79	100	84	6.5	SPL
ESE-5	07/09/96	176.08	9.40	166.68	620	150	1.7	9.3	6.4	25	3.7	SPL
MW-6	07/28/95	179.24	10.00	169.24	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	---	8.1	ATI
MW-6	11/17/95	179.24	10.44	168.80	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	ND<5.0	6.8	ATI
MW-6	02/07/96	179.24	7.68	171.56	ND<50	ND<0.5	ND<1	ND<1	ND<1	ND<10	2.4	SPL
MW-6	04/23/96	179.24	9.33	169.91	ND<50	ND<0.5	ND<1	ND<1	ND<1	ND<10	6.6	SPL
MW-6	07/09/96	179.24	10.10	169.14	ND<50	ND<0.5	ND<1	ND<1	ND<1	ND<10	2.7	SPL
MW-7	07/28/95	176.55	9.25	167.30	ND<50	0.54 (f)	0.54	ND<0.50	ND<1.0	---	7.1	ATI
MW-7	11/17/95	176.55	9.73	166.82	1100	ND<10	ND<10	ND<10	ND<20	4000	6.3	ATI
MW-7	02/07/96	176.55	6.48	170.07	610	ND<0.5	ND<1	ND<1	ND<1	2500	4.1	SPL
QC-1 (d)	02/07/96	---	---	---	280	ND<0.5	ND<1	ND<1	ND<1	2600	---	SPL
MW-7	04/23/96	176.55	8.37	168.18	110	ND<0.5	ND<1	ND<1	ND<1	3500	6.4	SPL
QC-1 (d)	04/23/96	---	---	---	230	ND<0.5	ND<1	ND<1	ND<1	3500	---	SPL
MW-7	07/09/96	176.55	9.24	167.31	230	ND<0.5	ND<1	ND<1	ND<1	4296	3.1	SPL
QC-1 (d)	07/09/96	---	---	---	220	ND<0.5	ND<1	ND<1	ND<1	4400	---	SPL
MW-8	07/28/95	176.34	7.80	168.54	1100	ND<2.5	ND<2.5	ND<2.5	ND<5.0	---	7.2	ATI
MW-8	11/17/95	176.34	8.29	168.05	8300	75	5.3	670	240	140	7.0	ATI
MW-8	02/07/96	176.34	4.99	171.35	2300	33	ND<10	190	216	ND<100	1.7	SPL
MW-8	04/23/96	176.34	6.09	170.25	2000	390	ND<20	150	26	ND<250	6.7	SPL
MW-8 (g)	07/09/96	---	---	---	---	---	---	---	---	---	---	---

TABLE 1 - SUMMARY OF RESULTS OF GROUNDWATER SAMPLING
BP OIL COMPANY SERVICE STATION NO. 11105
3519 CASTRO VALLEY BOULEVARD, CASTRO VALLEY, CALIFORNIA

ALISTO PROJECT NO. 10-138

WELL ID		DATE OF SAMPLING/ MONITORING	CASING ELEVATION (a) (Feet)	DEPTH TO WATER (Feet)	GROUNDWATER ELEVATION (b) (Feet)	TPH-G (ug/l)	B (ug/l)	T (ug/l)	E (ug/l)	X (ug/l)	MTBE (ug/l)	DO (ppm)	LAB
QC-2	(h)	04/01/93	---	---	---	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	PACE
QC-2	(h)	06/29/93	---	---	---	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	PACE
QC-2	(h)	09/23/93	---	---	---	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	PACE
QC-2	(h)	12/10/93	---	---	---	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	PACE
QC-2	(h)	02/17/94	---	---	---	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	PACE
QC-2	(h)	08/08/94	---	---	---	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	PACE
QC-2	(h)	10/12/94	---	---	---	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	PACE
QC-2	(h)	01/19/95	---	---	---	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<1	---	---	ATI
QC-2	(h)	05/02/95	---	---	---	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	---	---	ATI
QC-2	(h)	07/28/95	---	---	---	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	---	---	ATI
QC-2	(h)	11/17/95	---	---	---	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	ND<5.0	---	ATI
QC-2	(h)	02/07/96	---	---	---	ND<50	ND<0.5	ND<1	ND<1	ND<1	ND<10	---	SPL
QC-2	(h)	04/23/96	---	---	---	ND<50	ND<0.5	ND<1	ND<1	ND<1	ND<10	---	SPL
QC-2	(h)	07/09/96	---	---	---	ND<50	ND<0.5	ND<1	ND<1	ND<1	ND<10	---	SPL

ABBREVIATIONS:

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

NOTES:

(a) Top of casing elevations surveyed relative to mean sea level.

(b) Groundwater elevations in feet relative to mean sea level.

(c) Additional analysis of the sample collected from ESE-1 on 10/5/92 detected 96 ug/l total petroleum hydrocarbons as diesel and 1.8 ug/l 1,2-dichloroethane.

(d) Blind duplicate.

(e) Top of casing lowered by 0.07 foot after the monitoring event on 4/01/93.

(f) Sample result may be falsely elevated due to matrix interference.

(g) Well destroyed.

(h) Travel blank.

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TABLE 2 - SUMMARY OF RESULTS OF GROUNDWATER SAMPLING
XTRA OIL COMPANY SERVICE STATION
3495 CASTRO VALLEY BOULEVARD, CASTRO VALLEY, CALIFORNIA

ALISTO PROJECT NO. 10-138

WELL ID	DATE OF SAMPLING/ MONITORING	CASING ELEVATION (a) (Feet)	DEPTH TO WATER (Feet)	GROUNDWATER ELEVATION (b) (Feet)	TPH-G (ug/l)	TPH-D (ug/l)	B (ug/l)	T (ug/l)	E (ug/l)	X (ug/l)
MW-1	08/19/91	177.24	9.31	167.93	48	47	13	8.4	0.99	29
MW-1	09/17/91	177.24	9.50	167.74	39	19	4.9	4.1	1.2	5.9
MW-1	10/10/91	177.24	9.70	167.54	28	19	4.1	4.7	1.0	4.8
MW-1	11/25/91	177.24	9.41	167.83	170	36	5.6	5.6	1.6	8.4
MW-1	12/23/91	177.24	9.65	167.59	78	34	9.3	7.3	0.54	13
MW-1	01/14/92	177.24	8.57	168.67	39	19	7.3	8.7	1.3	8.9
MW-1	05/27/92	177.24	8.59	168.65	120	11	8.8	16	2.3	15
MW-1	11/13/92	177.24	9.13	168.11	120	4.4	5.8	10	2.1	13
MW-1	02/23/93	177.24	7.34	169.90	100	14	4.5	11	2.1	12
MW-1	05/18/93	177.24	8.12	169.12	92	30	4.0	11	2.5	15
MW-1	08/30/93	177.24	8.78	168.46	77	9.4	6.4	11	2.2	12
MW-1	11/24/93	177.24	8.74	168.50	66	8.2	8.3	8.9	2.0	11
MW-1	02/28/94	177.24	7.44	169.80	90	110	11	9.6	2.1	9.9
MW-1	05/19/94	177.24	8.05	169.19	---	---	—	---	---	---
MW-1	08/22/94	177.24	8.67	168.57	---	---	—	---	---	---
MW-1	11/18/94	177.24	7.14	170.10	---	---	—	---	---	---
MW-1	02/23/95	177.24	7.72	169.52	---	---	---	---	---	---
MW-1	05/02/95	177.24	6.96	170.28	---	---	---	—	—	---
MW-1	07/28/95	177.24	8.27	168.97	---	---	—	---	---	---
MW-1	10/26/95	177.24	8.45	168.79	---	---	—	—	---	---
MW-1	01/29/96	177.24	6.17	171.07	—	—	---	---	---	—
MW-1	02/07/96	177.24	6.09	171.15	—	—	—	---	---	---
MW-1	04/23/96	177.24	7.47	169.77	---	---	---	---	---	—
MW-1	07/09/96	177.24	8.16	169.08	---	---	—	—	---	---
MW-2	08/19/91	176.30	9.60	166.70	69	19	26	22	2.1	18
MW-2	09/17/91	176.30	10.23	166.07	74	56	10	11	1.4	8.1
MW-2	10/10/91	176.30	10.39	165.91	85	360	21	25	2.1	14
MW-2	11/25/91	176.30	9.81	166.49	230	130	11	9.7	1.4	9.7
MW-2	12/23/91	176.30	10.39	165.91	2100	700	36	130	79	560
MW-2	01/14/92	176.30	8.97	167.33	59	1600	17	14	1.8	15
MW-2	05/27/95	176.30	9.31	166.99	89	130	18	19	1.7	14
MW-2	11/13/92	176.30	8.70	167.60	79	8.2	10	13	1.4	8.6
MW-2	02/23/93	176.30	6.39	169.91	76	7.0	12	17	1.6	9.6
MW-2	05/18/93	176.30	7.73	168.57	67	44	9.2	12	1.4	9.3
MW-2	08/30/93	176.30	8.64	167.66	110	110	11	14	1.8	11
MW-2	11/24/93	176.30	8.47	167.83	12	79	13	17	2.5	17
MW-2	02/28/94	176.30	6.99	169.31	91	13	13	16	1.5	9.0
MW-2	05/19/94	176.30	7.70	168.60	---	—	—	---	---	---
MW-2	08/22/94	176.30	8.59	167.71	—	---	---	---	---	---
MW-2	11/18/94	176.30	6.92	169.38	—	—	---	---	---	---
MW-2	02/23/95	176.30	7.51	168.79	---	---	---	---	—	—
MW-2	05/02/95	176.30	6.79	169.51	—	—	—	---	---	---
MW-2	07/28/95	176.30	7.99	168.31	---	---	---	—	—	—
MW-2	10/26/95	176.30	8.21	168.09	---	---	---	—	---	---
MW-2	01/29/96	176.30	5.16	171.14	---	---	---	---	---	—
MW-2	02/07/96	176.30	5.70	170.60	---	---	—	—	---	---
MW-2 (c)	04/23/96	176.30	—	—	---	---	---	---	---	---

TABLE 2 - SUMMARY OF RESULTS OF GROUNDWATER SAMPLING
XTRA OIL COMPANY SERVICE STATION
3495 CASTRO VALLEY BOULEVARD, CASTRO VALLEY, CALIFORNIA

ALISTO PROJECT NO. 10-138

WELL ID	DATE OF SAMPLING/ MONITORING	CASING ELEVATION (a) (Feet)	DEPTH TO WATER (Feet)	GROUNDWATER ELEVATION (b) (Feet)	TPH-G (ug/l)	TPH-D (ug/l)	B (ug/l)	T (ug/l)	E (ug/l)	X (ug/l)
MW-3	08/19/91	178.07	8.95	169.12	170	150	82	31	4.4	22
MW-3	09/17/91	178.07	9.20	168.87	180	140	47	25	2.6	15
MW-3	10/10/91	178.07	9.43	168.64	140	39	57	31	2.2	14
MW-3	11/25/91	178.07	9.19	168.88	150	74	65	31	3.4	18
MW-3	12/23/91	178.07	9.37	168.70	740	540	30	61	31	180
MW-3	01/14/92	178.07	8.24	169.83	130	270	76	30	3.4	21
MW-3	05/27/92	178.07	8.45	169.62	370	27	91	57	3.0	21
MW-3	11/13/92	178.07	7.86	170.21	140	4.7	38	24	2.0	12
MW-3	02/23/93	178.07	8.01	170.06	110	8.1	31	18	1.9	11
MW-3	05/18/93	178.07	7.12	170.95	130	7.2	36	21	2.1	12
MW-3	08/30/93	178.07	7.64	170.43	130	32	36	21	1.9	8.2
MW-3	11/24/93	178.07	7.55	170.52	160	24	48	26	2.2	12
MW-3	02/28/94	178.07	6.68	171.39	110	210	36	21	1.9	11
MW-3	05/19/94	178.07	7.15	170.92	---	---	---	---	---	---
MW-3	08/22/94	178.07	7.65	170.42	---	---	---	---	---	---
MW-3	11/18/94	178.07	6.05	172.02	---	---	---	---	---	---
MW-3	02/23/95	178.07	7.24	170.83	---	---	---	---	---	---
MW-3	05/02/95	178.07	6.50	171.57	---	---	---	---	---	---
MW-3	07/28/95	178.07	7.80	170.27	---	---	---	---	---	---
MW-3	10/26/95	178.07	7.72	170.35	---	---	---	---	---	---
MW-3	01/29/96	178.07	5.77	172.30	---	---	---	---	---	---
MW-3	02/07/96	178.07	5.05	173.02	---	---	---	---	---	---
MW-3	04/23/96	178.07	6.81	171.26	---	---	---	---	---	---
MW-3	07/09/96	178.07	7.61	170.46	---	---	---	---	---	---

ABBREVIATIONS:

TPH-G	Total petroleum hydrocarbons as gasoline
TPH-D	Total petroleum hydrocarbons as diesel
B	Benzene
T	Toluene
E	Ethylbenzene
X	Total xylenes
ug/l	Micrograms per liter
---	Not available

NOTES:

(a) Top of casing elevations relative to mean sea level.

(b) Groundwater elevations in feet above mean sea level.

(c) Well destroyed February 7, 1996.

E:\10\10-138\138JOINT.WQ2

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

N

0 1000' 2000'

FIGURE 1

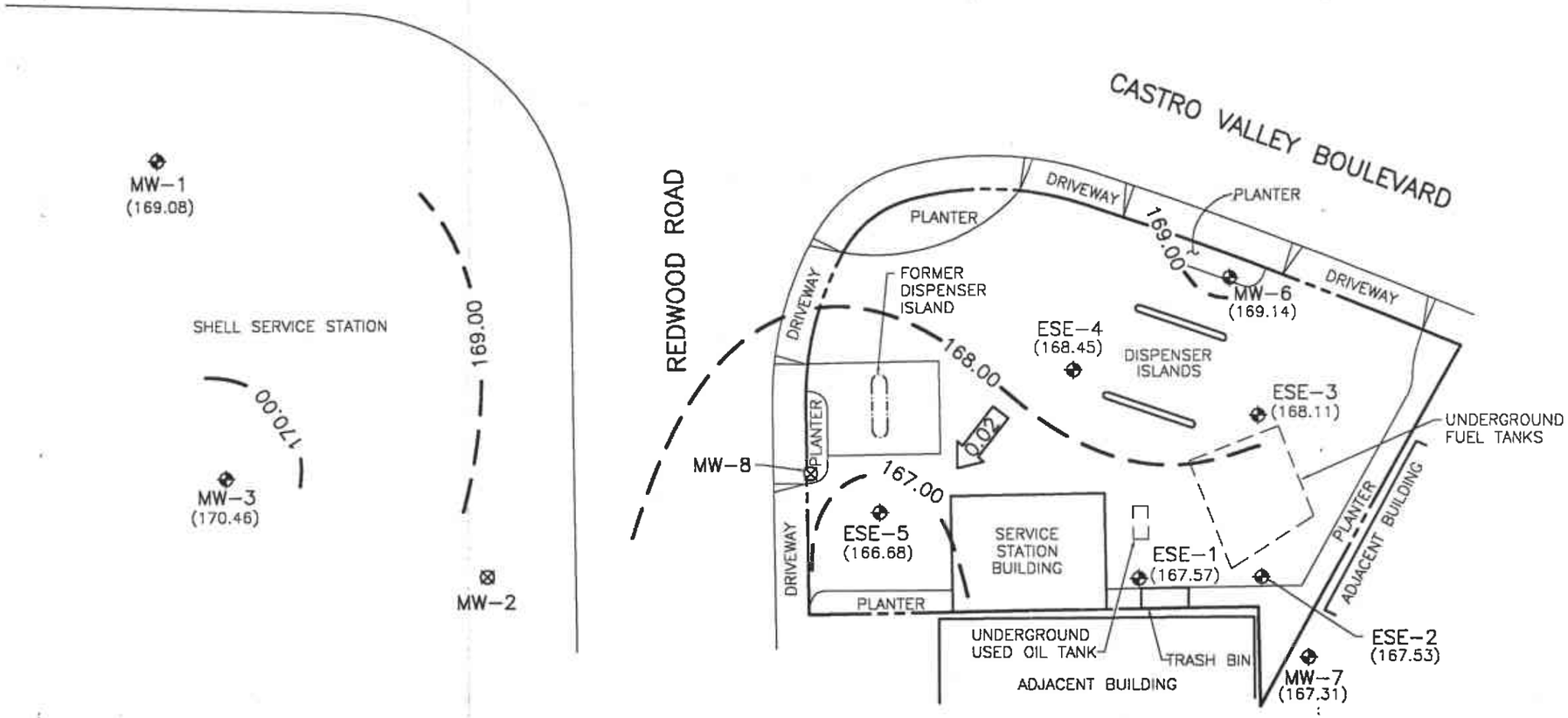
SITE VICINITY MAP

BP OIL SERVICE STATION NO. 11105
3519 CASTRO VALLEY BOULEVARD
CASTRO VALLEY, CALIFORNIA

PROJECT NO. 10-138

ALISTO ENGINEERING GROUP
WALNUT CREEK, CALIFORNIA

10138 — DWG 10-12-93 MAP 1-1



N

0 40 80

SCALE IN FEET

LEGEND

◆	GROUNDWATER MONITORING WELL
⊠	DESTROYED WELL
(166.68)	GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL
167.00	GROUNDWATER ELEVATION CONTOUR IN FEET ABOVE MEAN SEA LEVEL (CONTOUR INTERVAL–1.0 FOOT)
0.02	CALCULATED GROUNDWATER GRADIENT DIRECTION AND MAGNITUDE IN FOOT PER FOOT

FIGURE 2

POTENTIOMETRIC GROUNDWATER ELEVATION CONTOUR MAP

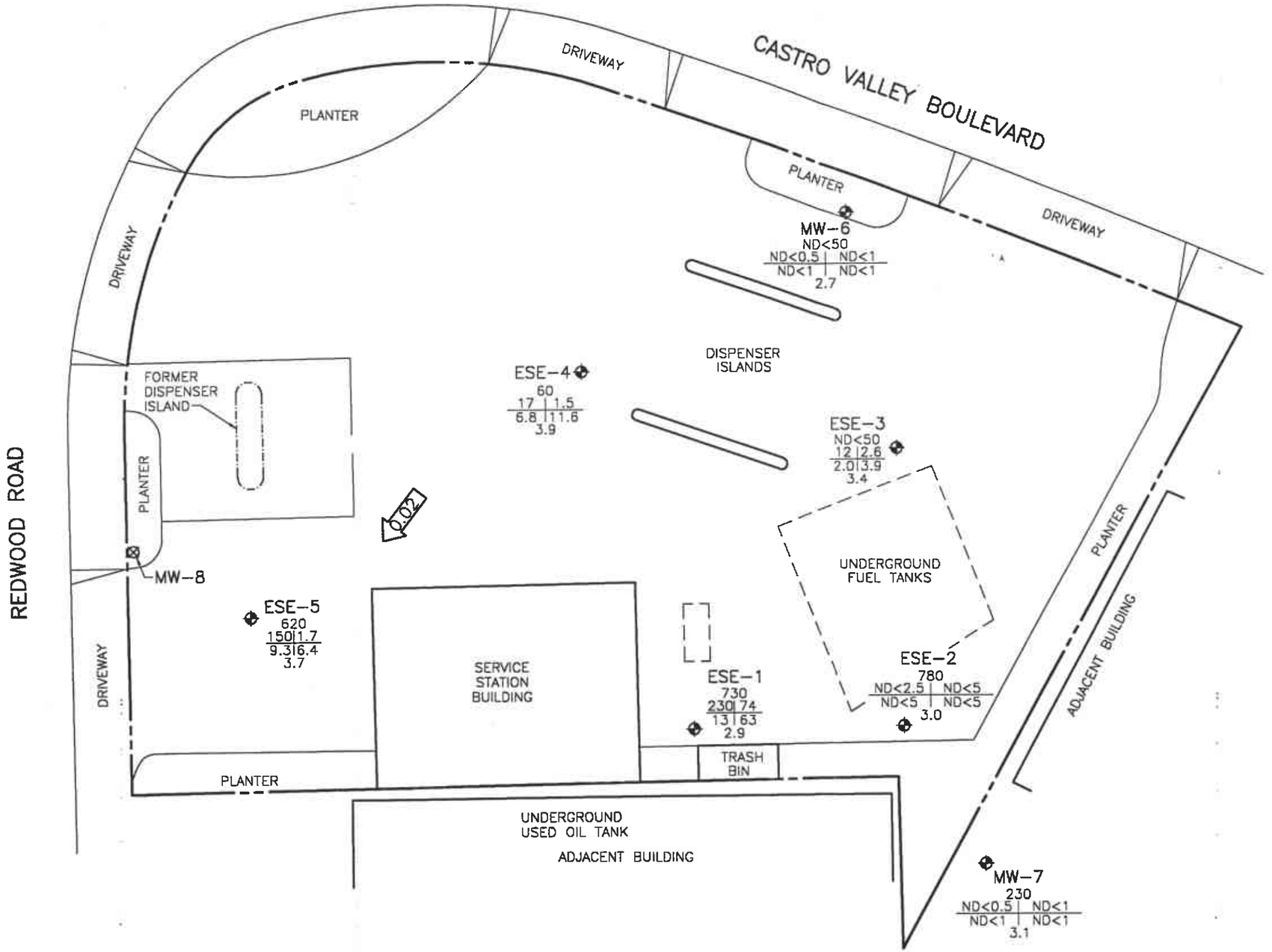
JULY 9, 1996

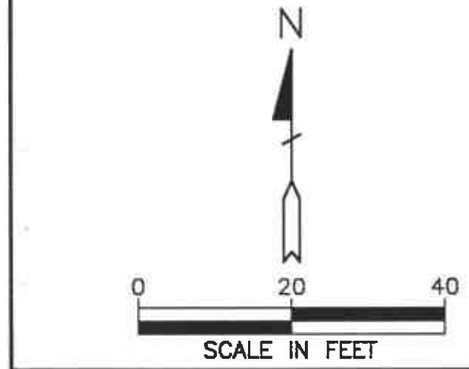
BP OIL SERVICE STATION NO. 11105
3519 CASTRO VALLEY BOULEVARD
CASTRO VALLEY, CALIFORNIA

PROJECT NO. 10–138

ALISTO ENGINEERING GROUP
WALNUT CREEK, CALIFORNIA

10138D-3.DWG 8-30-96 DDN 1"=40





LEGEND

◆	GROUNDWATER MONITORING WELL
⊠	DESTROYED WELL
TPH-G / B | T / E | X / DO	CONCENTRATION OF CONSTITUENTS IN MICROGRAMS PER LITER, EXCEPT DISSOLVED OXYGEN, WHICH IS IN PARTS PER MILLION
TPH-G	TOTAL PETROLEUM HYDROCARBONS AS GASOLINE
B	BENZENE
T	TOLUENE
E	ETHYLBENZENE
X	TOTAL XYLENES
DO	DISSOLVED OXYGEN
ND	NOT DETECTED ABOVE REPORTED DETECTION LIMIT
0.02	CALCULATED GROUNDWATER GRADIENT DIRECTION AND MAGNITUDE IN FOOT PER FOOT

FIGURE 3

CONCENTRATIONS OF PETROLEUM HYDROCARBONS IN GROUNDWATER

JULY 9, 1996

BP OIL SERVICE STATION NO. 11105
3519 CASTRO VALLEY BOULEVARD
CASTRO VALLEY, CALIFORNIA

PROJECT NO. 10-138

ALISTO ENGINEERING GROUP
WALNUT CREEK, CALIFORNIA

APPENDIX A

WATER SAMPLING FIELD SURVEY FORMS

ALISTO

Field Report / Sampling Data Sheet

ENGINEERING

GROUP

1575 TREAT BOULEVARD, SUITE 201

Project No. 10-138-05-004 Date: 7/9/96

Address 3515 Castro Valley Blvd Day: M (T) W TH F

Contract No. G602067 City: Castro Valley

Station No. BP 11105 Sampler: CB

DEPTH TO GROUNDWATER SUMMARY

WELL ID	SAMPLE ID	WELL DIAM	TOTAL DEPTH	DEPTH TO WATER	PRODUCT THICKNESS	TIME MONITORED	COMMENTS: S-9 = QC-2 (T.B.)
ESE-1	S-6	2"	30.00	10.12	Ø	0926	
ESE-2	S-4	"	30.00	10.70	"	0920	
ESE-3	S-2	"	30.00	10.09	"	0913	
ESE-4	S-3	"	25.00	9.21	"	0916	
ESE-5	S-5	"	24.00	9.40	"	0922	
MW-6	S-1	"	29.43	10.10	"	0910	
MW-7	S-7	"	19.85	9.24	"	0930	QC of S-8, from this well
MW-8	~~S-8~~	↓	~~28.38~~		↓		Well Abandoned

FIELD INSTRUMENT CALIBRATION DATA

pH METER Aqua Check 4.00 4 7.00 7 10.00 10 TEMPERATURE COMPENSATED (Y) N TIME 1000

D.O. METER Aqua Check ZERO d.O. SOLUTION 0 BAROMETRIC PRESSURE 760 TEMP 68 WEATHER clear

CONDUCTIVITY METER Aqua Check 10,000 _____ TURBIDITY METER _____ 5.0 NTU _____ OTHER X

Well ID	Depth to Water	Diam	Cap/Lock	Product Depth	Iridescence	Gal.	Time	Temp °F	pH	E.C.	D.O.
MW-6	10.10	2"	OIC	Ø	Y (N)	3	1110	71.1	7.71	836 µS	4.2
Total Depth - Water Level=	x Well Vol. Factor=	x#vol. to Purge	PurgeVol.			6		70.3	7.62	822 µS	3.1
29.43 - 10.10 = 19.33	X .16 = 3.09	X3 =	9.27			9.5	1117	69.4	7.62	751 µS	2.7

Purge Method: (X) Surface Pump O Disp.Tube O Winch O Disp. Bailer(s) ___ O Sys Port

Comments:

O EPA 601 _____

(X) TPH-G/BTEX HCl

O TPH Diesel _____

O TOG 5520 ___

TIME/SAMPLE ID 1122

Well ID	Depth to Water	Diam	Cap/Lock	Product Depth	Iridescence	Gal.	Time	Temp °F	pH	E.C.	D.O.
ESE-3	10.09	2"	OIC	Ø	Y (N)	3	1135	70.8	7.42	822 µS	4.9
Total Depth - Water Level=	x Well Vol. Factor=	x#vol. to Purge	PurgeVol.			6		69.2	7.22	802 µS	
30.00 - 10.09 = 19.91	X .16 = 3.19	X3 =	9.57			9.75	1145	69.0	7.17	763 µS	3.4

Purge Method: (X) Surface Pump O Disp.Tube O Winch O Disp. Bailer(s) ___ O Sys Port

Comments:

O EPA 601 _____

(X) TPH-G/BTEX HCl

O TPH Diesel _____

O TOG 5520 ___

TIME/SAMPLE ID 1152

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. 10-138-05-004 Date: 7/9/96
Address 3515 Castro Valley Blvd Day: M T W TH F
Contract No. G602067 City: Castro Valley
Station No. BP 11105 Sampler: LS

Well ID	Depth to Water	Diam	Cap/Lock	Product Depth	Iridescence	Gal.	Time	Temp °F	pH	E.C.	D.O.
ESE-4	9.21	2"	OK	Ø	Y (N)	3	1201	71.8	7.62	767 µS	4.7
						5		70.9	7.41	738 µS	
						8	1210	70.6	7.38	723 µS	3.9

Total Depth - Water Level= x Well Vol. Factor= x#vol. to Purge PurgeVol.
25.00 - 9.21 = 15.79 X .16 = 2.53 X 3 = 7.59
Purge Method: (S)Surface Pump ODisp.Tube OWinch ODisp. Bailer(s)___ OSys Port
Comments:

O EPA 601___ O TPH-G/BTEX HCl O TPH Diesel___ O TOG 5520___
TIME/SAMPLE ID: 1213

Well ID	Depth to Water	Diam	Cap/Lock	Product Depth	Iridescence	Gal.	Time	Temp °F	pH	E.C.	D.O.
ESE-2	10.70	2"	OK	Ø	Y (N)	3	1225	70.9	7.47	810 µS	4.1
						6		70.2	7.30	791 µS	
						9.5	1240	69.7	7.22	790 µS	3.0

Total Depth - Water Level= x Well Vol. Factor= x#vol. to Purge PurgeVol.
30.00 - 10.70 = 19.30 X .16 = 3.09 X 3 = 9.27
Purge Method: (S)Surface Pump ODisp.Tube OWinch ODisp. Bailer(s)___ OSys Port
Comments:

O EPA 601___ O TPH-G/BTEX HCl O TPH Diesel___ O TOG 5520___
TIME/SAMPLE ID: 1241

Well ID	Depth to Water	Diam	Cap/Lock	Product Depth	Iridescence	Gal.	Time	Temp °F	pH	E.C.	D.O.
ESE-5	9.40	2"	OK	Ø	Y (N)	3	1255	72.3	7.46	1.37 ms	4.6
						5		71.6	7.31	1.25 ms	
						7.5	1310	71.0	7.22	1.21 ms	3.7

Total Depth - Water Level= x Well Vol. Factor= x#vol. to Purge PurgeVol.
24.00 - 9.40 = 14.60 X .16 = 2.34 X 3 = 7.02
Purge Method: (S)Surface Pump ODisp.Tube OWinch ODisp. Bailer(s)___ OSys Port
Comments:

O EPA 601___ O TPH-G/BTEX HCl O TPH Diesel___ O TOG 5520___
TIME/SAMPLE ID: 1313

Well ID	Depth to Water	Diam	Cap/Lock	Product Depth	Iridescence	Gal.	Time	Temp °F	pH	E.C.	D.O.
ESE-1	10.12	2"	~~OK~~	Ø	Y (N)	3	1325	71.2	7.56	972 µS	4.7
						6		70.6	7.43	939 µS	
						10	1340	69.7	7.38	929 µS	2.9

Total Depth - Water Level= x Well Vol. Factor= x#vol. to Purge PurgeVol.
30.00 - 10.12 = 19.88 X .16 = 3.18 X 3 = 9.54
Purge Method: (S)Surface Pump ODisp.Tube OWinch ODisp. Bailer(s)___ OSys Port
Comments: Replaced 2" Cap + Lock

O EPA 601___ O TPH-G/BTEX HCl O TPH Diesel___ O TOG 5520___
TIME/SAMPLE ID: 1342

Well ID	Depth to Water	Diam	Cap/Lock	Product Depth	Iridescence	Gal.	Time	Temp °F	pH	E.C.	D.O.
MW-7	9.24	2"	OK	Ø	Y (N)	2	1350	~~73~~ 73	7.67	747 µS	4.2
						4		69.7	7.40	722 µS	
						5.5	1356	69.5	~~7.38~~	718 µS	3.1

Total Depth - Water Level= x Well Vol. Factor= x#vol. to Purge PurgeVol.
19.85 - 9.24 = 10.61 X .16 = 1.70 X 3 = 5.10
Purge Method: (S)Surface Pump ODisp.Tube OWinch ODisp. Bailer(s)___ OSys Port
Comments: QC-1 5-8 from this well

O EPA 601___ O TPH-G/BTEX HCl O TPH Diesel___ O TOG 5520___
TIME/SAMPLE ID: 1400

APPENDIX B

LABORATORY REPORT AND CHAIN OF CUSTODY RECORD

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

Southern Petroleum Laboratories, Inc.

Certificate of Analysis Number: 96-07-503

Approved for Release by:

Ed Fry, Project Manager — Date: 7/16/96

Greg Grandits
Laboratory Director

Idelis Williams
Quality Assurance Officer

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

Certificate of Analysis No. H9-9607503-01

Alisto Engineering
1575 Treat Blvd.
Walnut Creek, CA 94598
ATTN: Brady Nagle

P.O.# G602067,COC#082685
DATE: 07/16/96

PROJECT: BP Oil #11105
SITE: Castro Valley, CA
SAMPLED BY: Alisto Engineering
SAMPLE ID: S-1

PROJECT NO: 10-138-05/004
MATRIX: WATER
DATE SAMPLED: 07/09/96
DATE RECEIVED: 07/11/96

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
MTBE	ND	10 P	µg/L
Benzene	ND	0.5 P	µg/L
Toluene	ND	1 P	µg/L
Ethylbenzene	ND	1 P	µg/L
Total Xylene	ND	1 P	µg/L
Surrogate	**% Recovery**		
1,4-Difluorobenzene	87		
4-Bromofluorobenzene	87		
METHOD 8020***			
Analyzed by: VHZ			
Date: 07/12/96			
Total Petroleum Hydrocarbons-Gasoline	ND	0.05 P	mg/L
Surrogate	**% Recovery**		
1,4-Difluorobenzene	103		
4-Bromofluorobenzene	70		
CA LUFT - Gasoline			
Analyzed by: VHZ			
Date: 07/12/96 07:11:00			

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. H9-9607503-02

Alisto Engineering
1575 Treat Blvd.
Walnut Creek, CA 94598
ATTN: Brady Nagle

P.O.# G602067,COC#082685
DATE: 07/16/96

PROJECT: BP Oil #11105
SITE: Castro Valley, CA
SAMPLED BY: Alisto Engineering
SAMPLE ID: S-2

PROJECT NO: 10-138-05/004
MATRIX: WATER
DATE SAMPLED: 07/09/96
DATE RECEIVED: 07/11/96

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
MTBE	26	10 P	µg/L
Benzene	12	0.5 P	µg/L
Toluene	2.6	1 P	µg/L
Ethylbenzene	2.0	1 P	µg/L
Total Xylene	3.9	1 P	µg/L
Surrogate	**% Recovery**		
1,4-Difluorobenzene	90		
4-Bromofluorobenzene	87		
METHOD 8020***			
Analyzed by: VHZ			
Date: 07/12/96			
Total Petroleum Hydrocarbons-Gasoline	ND	0.05 P	mg/L
Surrogate	**% Recovery**		
1,4-Difluorobenzene	103		
4-Bromofluorobenzene	77		
CA LUFT - Gasoline			
Analyzed by: VHZ			
Date: 07/12/96 06:42:00			

(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. H9-9607503-03

Alisto Engineering
1575 Treat Blvd.
Walnut Creek, CA 94598
ATTN: Brady Nagle

P.O.# G602067,COC#082685
DATE: 07/16/96

PROJECT: BP Oil #11105
SITE: Castro Valley, CA
SAMPLED BY: Alisto Engineering
SAMPLE ID: S-3

PROJECT NO: 10-138-05/004
MATRIX: WATER
DATE SAMPLED: 07/09/96
DATE RECEIVED: 07/11/96

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
MTBE	27	10 P	µg/L
Benzene	17	0.5 P	µg/L
Toluene	1.5	1 P	µg/L
Ethylbenzene	6.8	1 P	µg/L
Total Xylene	11.6	1 P	µg/L
Surrogate	**% Recovery**		
1,4-Difluorobenzene	93		
4-Bromofluorobenzene	87		
METHOD 8020***			
Analyzed by: VHZ			
Date: 07/12/96			
Total Petroleum Hydrocarbons-Gasoline	0.060	0.05 P	mg/L
Surrogate	**% Recovery**		
1,4-Difluorobenzene	103		
4-Bromofluorobenzene	73		
CA LUFT - Gasoline			
Analyzed by: VHZ			
Date: 07/12/96 07:40:00			

(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. H9-9607503-04

Alisto Engineering
1575 Treat Blvd.
Walnut Creek, CA 94598
ATTN: Brady Nagle

P.O.# G602067,COC#082685
DATE: 07/16/96

PROJECT: BP Oil #11105
SITE: Castro Valley, CA
SAMPLED BY: Alisto Engineering
SAMPLE ID: S-4

PROJECT NO: 10-138-05/004
MATRIX: WATER
DATE SAMPLED: 07/09/96
DATE RECEIVED: 07/11/96

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
MTBE	13393	500 P	µg/L
Benzene	ND	2.5 P	µg/L
Toluene	ND	5 P	µg/L
Ethylbenzene	ND	5 P	µg/L
Total Xylene	ND	5 P	µg/L
Surrogate	**% Recovery**		
1,4-Difluorobenzene	87		
4-Bromofluorobenzene	87		
METHOD 8020***			
Analyzed by: fab			
Date: 07/13/96			
Total Petroleum Hydrocarbons-Gasoline	0.78	0.25 P	mg/L
Surrogate	**% Recovery**		
1,4-Difluorobenzene	107		
4-Bromofluorobenzene	67		
CA LUFT - Gasoline			
Analyzed by: VHZ			
Date: 07/12/96 08:10:00			

(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. H9-9607503-05

Alisto Engineering
1575 Treat Blvd.
Walnut Creek, CA 94598
ATTN: Brady Nagle

P.O.# G602067,COC#082685
DATE: 07/16/96

PROJECT: BP Oil #11105
SITE: Castro Valley, CA
SAMPLED BY: Alisto Engineering
SAMPLE ID: S-5

PROJECT NO: 10-138-05/004
MATRIX: WATER
DATE SAMPLED: 07/09/96
DATE RECEIVED: 07/11/96

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
MTBE	25	10 P	µg/L
Benzene	150	0.5 P	µg/L
Toluene	1.7	1 P	µg/L
Ethylbenzene	9.3	1 P	µg/L
Total Xylene	6.4	1 P	µg/L
Surrogate	**% Recovery**		
1,4-Difluorobenzene	137 «		
4-Bromofluorobenzene	110		
METHOD 8020***			
Analyzed by: fab			
Date: 07/13/96			
Total Petroleum Hydrocarbons-Gasoline	0.62	0.25 P	mg/L
Surrogate	**% Recovery**		
1,4-Difluorobenzene	120		
4-Bromofluorobenzene	87		
CA LUFT - Gasoline			
Analyzed by: VHZ			
Date: 07/12/96 08:39:00			

(P) - Practical Quantitation Limit « - Recovery beyond control limits.

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. H9-9607503-06

Alisto Engineering
1575 Treat Blvd.
Walnut Creek, CA 94598
ATTN: Brady Nagle

P.O.# G602067,COC#082685
DATE: 07/16/96

PROJECT: BP Oil #11105
SITE: Castro Valley, CA
SAMPLED BY: Alisto Engineering
SAMPLE ID: S-6

PROJECT NO: 10-138-05/004
MATRIX: WATER
DATE SAMPLED: 07/09/96
DATE RECEIVED: 07/11/96

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
MTBE	750	50 P	µg/L
Benzene	230	2.5 P	µg/L
Toluene	74	5 P	µg/L
Ethylbenzene	13	5 P	µg/L
Total Xylene	63	5 P	µg/L
Surrogate	**% Recovery**		
1,4-Difluorobenzene	100		
4-Bromofluorobenzene	87		
METHOD 8020***			
Analyzed by: VHZ			
Date: 07/12/96			
Total Petroleum Hydrocarbons-Gasoline	0.73	0.25 P	mg/L
Surrogate	**% Recovery**		
1,4-Difluorobenzene	113		
4-Bromofluorobenzene	80		
CA LUFT - Gasoline			
Analyzed by: VHZ			
Date: 07/12/96 09:08:00			

(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. H9-9607503-07

Alisto Engineering
1575 Treat Blvd.
Walnut Creek, CA 94598
ATTN: Brady Nagle

P.O.# G602067,COC#082685
DATE: 07/16/96

PROJECT: BP Oil #11105
SITE: Castro Valley, CA
SAMPLED BY: Alisto Engineering
SAMPLE ID: S-7

PROJECT NO: 10-138-05/004
MATRIX: WATER
DATE SAMPLED: 07/09/96
DATE RECEIVED: 07/11/96

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
MTBE	4296	100 P	µg/L
Benzene	ND	0.5 P	µg/L
Toluene	ND	1 P	µg/L
Ethylbenzene	ND	1 P	µg/L
Total Xylene	ND	1 P	µg/L
Surrogate	**% Recovery**		
1,4-Difluorobenzene	93		
4-Bromofluorobenzene	87		
METHOD 8020***			
Analyzed by: fab			
Date: 07/13/96			
Total Petroleum Hydrocarbons-Gasoline	0.23	0.05 P	mg/L
Surrogate	**% Recovery**		
1,4-Difluorobenzene	110		
4-Bromofluorobenzene	73		
CA LUFT - Gasoline			
Analyzed by: VHZ			
Date: 07/12/96 09:38:00			

(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. H9-9607503-08

Alisto Engineering
1575 Treat Blvd.
Walnut Creek, CA 94598
ATTN: Brady Nagle

P.O.# G602067,COC#082685
DATE: 07/16/96

PROJECT: BP Oil #11105
SITE: Castro Valley, CA
SAMPLED BY: Alisto Engineering
SAMPLE ID: S-8

PROJECT NO: 10-138-05/004
MATRIX: WATER
DATE SAMPLED: 07/09/96
DATE RECEIVED: 07/11/96

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
MTBE	4400	100 P	µg/L
Benzene	ND	0.5 P	µg/L
Toluene	ND	1 P	µg/L
Ethylbenzene	ND	1 P	µg/L
Total Xylene	ND	1 P	µg/L

Surrogate	% Recovery
1,4-Difluorobenzene	93
4-Bromofluorobenzene	87

METHOD 8020***
Analyzed by: fab
Date: 07/13/96

Total Petroleum Hydrocarbons-Gasoline	0.22	0.05 P	mg/L

Surrogate	% Recovery
1,4-Difluorobenzene	110
4-Bromofluorobenzene	73

CA LUFT - Gasoline
Analyzed by: VHZ
Date: 07/12/96 10:07:00

(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. H9-9607503-09

Alisto Engineering
1575 Treat Blvd.
Walnut Creek, CA 94598
ATTN: Brady Nagle

P.O.# G602067,COC#082685
DATE: 07/16/96

PROJECT: BP Oil #11105
SITE: Castro Valley, CA
SAMPLED BY: Alisto Engineering
SAMPLE ID: S-9

PROJECT NO: 10-138-05/004
MATRIX: WATER
DATE SAMPLED: 07/09/96
DATE RECEIVED: 07/11/96

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
MTBE	ND	10 P	µg/L
Benzene	ND	0.5 P	µg/L
Toluene	ND	1 P	µg/L
Ethylbenzene	ND	1 P	µg/L
Total Xylene	ND	1 P	µg/L
Surrogate	**% Recovery**		
1,4-Difluorobenzene	87		
4-Bromofluorobenzene	83		
METHOD 8020***			
Analyzed by: VHZ			
Date: 07/12/96			
Total Petroleum Hydrocarbons-Gasoline	ND	0.05 P	mg/L
Surrogate	**% Recovery**		
1,4-Difluorobenzene	103		
4-Bromofluorobenzene	67		
CA LUFT - Gasoline			
Analyzed by: VHZ			
Date: 07/12/96 05:38:00			

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

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_J960712070100

LABORATORY CONTROL SAMPLE

SPIKE COMPOUNDS	Method Blank Result <2>	Spike Added <3>	Blank Spike Result <1>	Blank Spike Recovery %	QC Limits(**) (Mandatory) % Recovery Range
MTBE	ND	50	49	98.0	20 - 110
Benzene	ND	50	43	86.0	62 - 121
Toluene	ND	50	44	88.0	66 - 136
EthylBenzene	ND	50	43	86.0	70 - 136
O Xylene	ND	50	45	90.0	74 - 134
M & P Xylene	ND	100	91	91.0	77 - 140

MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results <2>	Spike Added <3>	Matrix Spike Result <1>	Matrix Spike Recovery <4>	Matrix Spike Duplicate Result <1>	Matrix Spike Duplicate Recovery <5>	MS/MSD Relative % Difference	QC Limits(***) (Advisory) RPD Max.	QC Limits(***) (Advisory) Recovery Range
MTBE	ND	20	20	100	19	95.0	5.13	20	39 - 150
BENZENE	ND	20	19	95.0	19	95.0	0	25	39 - 150
TOLUENE	ND	20	18	90.0	18	90.0	0	26	56 - 134
ETHYLBENZENE	ND	20	17	85.0	18	90.0	5.71	38	61 - 128
O XYLENE	ND	20	16	80.0	17	85.0	6.06	29	40 - 130
M & P XYLENE	ND	40	34	85.0	35	87.5	2.90	20	43 - 152

Analyst: VHZ
Sequence Date: 07/13/96
SPL ID of sample spiked: 9607417-11A
Sample File ID: J___166.TX0
Method Blank File ID:
Blank Spike File ID: J___192.TX0
Matrix Spike File ID: J___160.TX0
Matrix Spike Duplicate File ID: J___161.TX0

* = Values Outside QC Range
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 (3rd Q '95)
(***) = Source: SPL-Houston Historical Data (2nd Q '95)

SAMPLES IN BATCH(SPL ID):

9607503-09A 9607417-11A 9607503-02A 9607503-01A
9607503-03A 9607503-04A 9607503-06A 9607503-07A
9607503-08A 9607417-07A 9607499-01A 9607499-02A
9607499-03A 9607499-04A 9607499-05A 9607499-06A
9607499-07A 9607499-08A 9607499-09A

QC Officer

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

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

Matrix: Aqueous
Units: µg/L

Batch Id: HP_J960713134000

LABORATORY CONTROL SAMPLE

SPIKE COMPOUNDS	Method Blank Result <2>	Spike Added <3>	Blank Spike Result <1>	Blank Spike Recovery %	QC Limits(**) (Mandatory) % Recovery Range
MTBE	ND	50	54	108	20 - 110
Benzene	ND	50	45	90.0	62 - 121
Toluene	ND	50	45	90.0	66 - 136
EthylBenzene	ND	50	45	90.0	70 - 136
O Xylene	ND	50	47	94.0	74 - 134
M & P Xylene	ND	100	94	94.0	77 - 140

MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results <2>	Spike Added <3>	Matrix Spike Result <1>	Matrix Spike Recovery <4>	Matrix Spike Duplicate Result <1>	Matrix Spike Duplicate Recovery <5>	MS/MSD Relative % Difference	QC Limits(***) (Advisory) RPD Max.	QC Limits(***) (Advisory) Recovery Range
MTBE	2.7	20	22	96.5	23	102	5.54	20	39 - 150
BENZENE	ND	20	19	95.0	19	95.0	0	25	39 - 150
TOLUENE	ND	20	18	90.0	18	90.0	0	26	56 - 134
ETHYLBENZENE	ND	20	18	90.0	17	85.0	5.71	38	61 - 128
O XYLENE	ND	20	18	90.0	17	85.0	5.71	29	40 - 130
M & P XYLENE	ND	40	38	95.0	36	90.0	5.41	20	43 - 152

Analyst: fab
Sequence Date: 07/13/96
SPL ID of sample spiked: 9607589-04A
Sample File ID: J___202.TX0
Method Blank File ID:
Blank Spike File ID: J___194.TX0
Matrix Spike File ID: J___197.TX0
Matrix Spike Duplicate File ID: J___198.TX0

* = Values Outside QC Range
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 (3rd Q '95)
(***) = Source: SPL-Houston Historical Data (2nd Q '95)

SAMPLES IN BATCH(SPL ID):

9607589-04A 9607503-04A 9607503-07A 9607503-08A
9607589-02A 9607589-03A 9607589-01A 9607589-05A
9607549-01A 9607549-02A 9607549-03A 9607549-04A
9607549-05A 9607549-06A 9607549-07A 9607549-08A
9607549-09A 9607549-10A 9607589-06A 9607503-05A

QC Officer

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

** SPL BATCH QUALITY CONTROL REPORT **
Modified 8015 - Gasoline

Matrix: Aqueous
Units: mg/L

Batch Id: HP_J960712112800

LABORATORY CONTROL SAMPLE

SPIKE COMPOUNDS	Method Blank Result <2>	Spike Added <3>	Blank Spike Result <1>	Blank Spike Recovery %	QC Limits(**) (Mandatory) % Recovery Range
Gasoline Petr. Hydrocarbon	ND	1.0	1.0	100	56 - 130

MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results <2>	Spike Added <3>	Matrix Spike Result <1>	Matrix Spike Recovery <4>	Matrix Spike Duplicate Result <1>	Matrix Spike Duplicate Recovery <5>	MS/MSD Relative % Difference	QC Limits(***) (Advisory) RPD Max.	QC Limits(***) (Advisory) Recovery Range
GASOLINE PETR. HYDROCARBON	ND	0.9	0.88	97.8	0.83	92.2	5.89	22	37 - 169

Analyst: VHZ
Sequence Date: 07/12/96
SPL ID of sample spiked: 9607503-02A
Sample File ID: JJ__167.TX0
Method Blank File ID:
Blank Spike File ID: JJ__158.TX0
Matrix Spike File ID: JJ__162.TX0
Matrix Spike Duplicate File ID: JJ__163.TX0

* = Values Outside QC Range
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 (3rd Q '95)
(***) = Source: SPL-Houston Historical Data (3rd Q '95)

SAMPLES IN BATCH(SPL ID):

9607503-09A 9607503-02A 9607503-01A 9607503-03A
9607503-04A 9607503-05A 9607503-06A 9607503-07A
9607503-08A 9607499-01A 9607499-02A 9607499-03A
9607499-04A 9607499-05A 9607499-06A 9607499-07A
9607499-08A 9607499-09A

QC Officer

CHAIN OF CUSTODY

AND

SAMPLE RECEIPT CHECKLIST

9607503 dg 7/11

CHAIN OF CUSTODY

No. 082685 Page 1 of 1

CONSULTANT'S NAME: Alisto Engineering	ADDRESS: 1575 Treat Blvd # 201	CITY: W.C.	STATE: Ca ZIP CODE: 94598
BP SITE NUMBER: 11105	BP CORNER ADDRESS/CITY: Castro Valley, Ca		CONSULTANT PROJECT NUMBER: 10-138-05/004
CONSULTANT PROJECT MANAGER: Brady Nagle	PHONE NUMBER: (510) 295-1650	FAX NUMBER: 295-1823	CONSULTANT CONTRACT NUMBER: G6[illegible]067
BP CONTACT: Scott Hooton	BP ADDRESS: Renton, WA	PHONE NUMBER: —	FAX NO.: —
LAB CONTACT: SPL	LABORATORY ADDRESS: Texas	PHONE NUMBER: —	FAX NO.: —
SAMPLED BY (Please Print Name): Larry Buenvenida	SAMPLED BY (Signature):	SHIPMENT DATE: 7/10/96	SHIPMENT METHOD: Fed Ex

TAT: ☐ 24 Hours ☐ 48 Hours ☐ 1 Week ☒ Standard 2 Weeks

ANALYSIS REQUIRED

AIRBILL NUMBER: 940477798[illegible]

SAMPLE DESCRIPTION	COLLECTION DATE / TIME	MATRIX SOIL/WATER	CONTAINERS NO.	CONTAINERS TYPE (VOL.)	PRESERVATIVE / LAB SAMPLE #	TPH-D	BTEX	COMMENTS
S-1	7/9/96	W	3	HCl		X	X	
S-2	"	"	"	"		"	"	
S-3	"	"	"	"		"	"	
S-4	"	"	"	"		"	"	
S-5	"	"	"	"		"	"	
S-6	"	"	"	"		"	"	
S-7	"	"	"	"		"	"	
S-8	"	"	"	"		"	"	
S-9	"	"	2	"		"	"	

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
[signature]	7/9/96	1700	P. Hooton	7/10/96	0800
P. Hooton	7/10/96	1500	E. Brown	7/11/96	10:00

ADDITIONAL COMMENTS: intact 4°C ROI

CLV-16722
PKG/50

Distribution: White - Original (with Data); Yellow - BP; Pink - Lab; Blue - Consultant Field Staff

SPL Houston Environmental Laboratory

Sample Login Checklist

Date: 7-11-96	Time: 10:00

SPL Sample ID: 9607503

			Yes	No
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:		4 C	
10	Method of sample delivery to SPL:	SPL Delivery		
		Client Delivery		
		FedEx Delivery (airbill #)	940477798/	
		Other:		
11	Method of sample disposal:	SPL Disposal	✓	
		HOLD		
		Return to Client		

Name: Elveta Brown	Date: 7/11/96

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

BP Site Number: 11105
ERM Contact: Scott Hooton
Sampling Date: 7/9/96
Matrix Desription: Water
Date Final Report Received: 7/22/96
Laboratory & Location: SPL, Houston

	Yes	No	NA
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 (ie. trip or equipment)?		X	
6. Are duplicate water samples within 10%?	X		
7. Are holding times met?	X		
8. Are surrogates within limits using laboratory criteria?	X		
9. Are MS/MSD acceptable using laboratory criteria?	X		
10. Are LCS results acceptable using laboratory criteria?	X		

Notes/Comments: _____

Data Validation Completed by (print): Brady Nagle
(signature): Brady Nagle
Date: 9/19/96