BP OIL

MTBE detected dg site

BP Oil Company
Environmental Resources Management
Building 13, Suite N
295 SW 41st Street
Renton, Washington 98055-4931
(206) 251-0667
Fax No: (206) 251-0736

December 17, 1996

Ms. Amy Leech
Alameda County Health Care Services Agency
1131 Harbour Bay Parkway, Room 250
Alameda CA 94502-6577

RE: BP OIL FACILITY #11107
18501 Hesperian Boulevard
San Lorenzo, CA

Dear Ms. Leech:

Attached please find our **GROUNDWATER MONITORING AND SAMPLING REPORT DATED OCTOBER 29, 1996** for the above referenced facility. Plans for the following quarter include additional groundwater monitoring.

If you should have any questions regarding this site, I may be reached at (206) 251-0689.

Respectfully,

Scott T. Hooton
Environmental Resources Management
Corrective Action Manager

STH:sb mswordERM11107

cc: Mr. Ed So, CRWQCB, San Francisco Bay Region, 2101 Webster Street, Suite 500 Oakland CA 94612

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

Mr. Ron Gehrke, Kwik G Enterprises, Inc. 19231 Lake Chabot Road, Castro Valley, CA 94612

TOSCO Northwest, 601 Union Street, Suite 2500, Seattle WA 98101

Site File

GROUNDWATER MONITORING AND SAMPLING REPORT

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

Project No. 10-060-06-001

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

October 29, 1996

William Howell
Project Manager

Dan Salaices
Registered Geologist

REGISTERED GEOLOGIST
DANIEL J.
SALAICES
No. 5162
STATE OF CALIFORNIA

GROUNDWATER MONITORING AND SAMPLING REPORT

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

Project No. 10-060-06-001

October 29, 1996

INTRODUCTION

This report presents the results of the September 5, 1996 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.

TABLE 1 - SUMMARY OF RESULTS OF GROUNDWATER SAMPLING
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 (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)	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<50	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-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-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

TABLE 1 - SUMMARY OF RESULTS OF GROUNDWATER SAMPLING
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 (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)	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	---	---	---	---	---	PACE
QC-1 (c)	02/24/94	---	---	---	310	---	95	5.3	2.2	17	---	---	---	---	---	PACE
MW-4	05/12/94	39.24	16.62	22.62	ND<50	---	2.2	1.0	ND<0.5	ND<0.5	---	---	---	---	7.3	PACE
QC-1 (c)	05/12/94	---	---	---	430	---	2.6	1.3	ND<0.5	ND<0.5	---	---	---	---	---	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	---	530	25	170	85	---	---	---	---	---	ATI
QC-1 (c)	06/06/95	---	---	---	3000	---	530	27	170	92	---	---	---	---	---	ATI
MW-4 (d)	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-5	06/06/95	39.07	16.16	22.91	1100	---	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-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	---	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

TABLE 1 - SUMMARY OF RESULTS OF GROUNDWATER SAMPLING
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 (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)	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	---	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	---	7.6	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
QC-2 (e)	11/04/92	---	---	---	ND<50	—	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	---	---	---	PACE
QC-2 (e)	11/04/92	---	---	---	ND<50	—	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	---	---	---	PACE
QC-2 (e)	03/01/95	---	---	---	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<1.0	---	---	---	---	---	PACE
QC-2 (e)	05/12/94	---	---	---	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	---	---	---	PACE
QC-2 (e)	09/09/94	---	---	---	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	---	---	---	PACE
QC-2 (e)	11/03/94	---	---	---	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	---	---	---	PACE
QC-2 (e)	06/06/95	---	---	---	ND<50	---	ND<0.50	ND<0.50	ND<0.50	ND<1.0	—	---	---	---	---	ATI
QC-2 (e)	09/01/95	---	---	---	ND<50	---	ND<0.50	ND<0.50	ND<0.50	ND<1.0	ND<5.0	---	---	---	---	ATI
QC-2 (e)	11/29/95	---	---	---	ND<50	---	ND<0.50	ND<0.50	ND<0.50	ND<1.0	ND<5.0	---	---	---	---	ATI
QC-2 (e)	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.

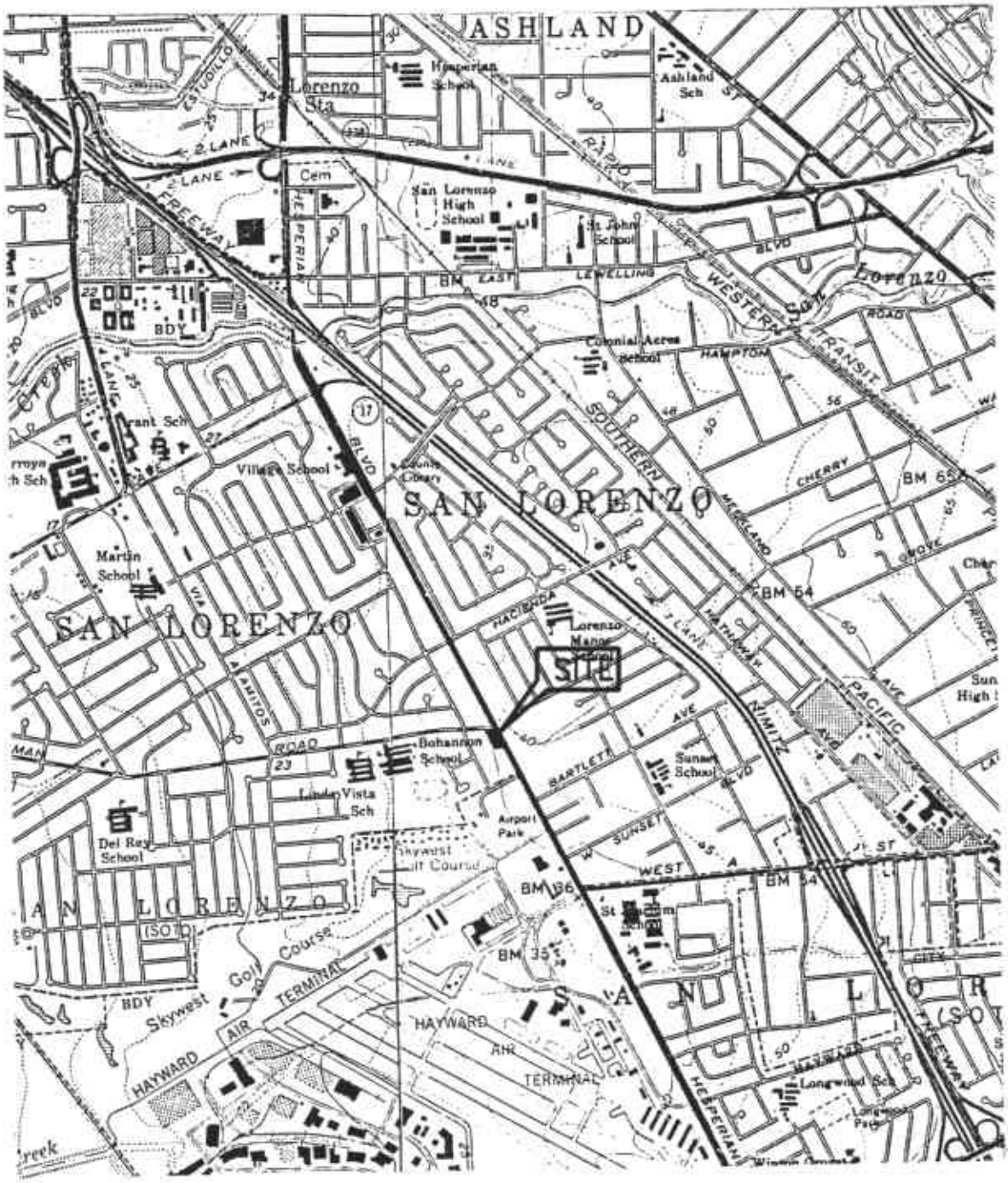
(b) Groundwater elevations in feet above mean sea level.

(c) Blind duplicate.

(d) Well inaccessible.

(e) Travel blank.

F:\0\10-060\060-6-1.WQ2



SOURCE:
USGS MAP, HAYWARD & SAN LEANDRO QUADRANGLES,
7.5 MINUTE SERIES. 1959.
PHOTOREVISED 1980.

N

0 1000' 2000'

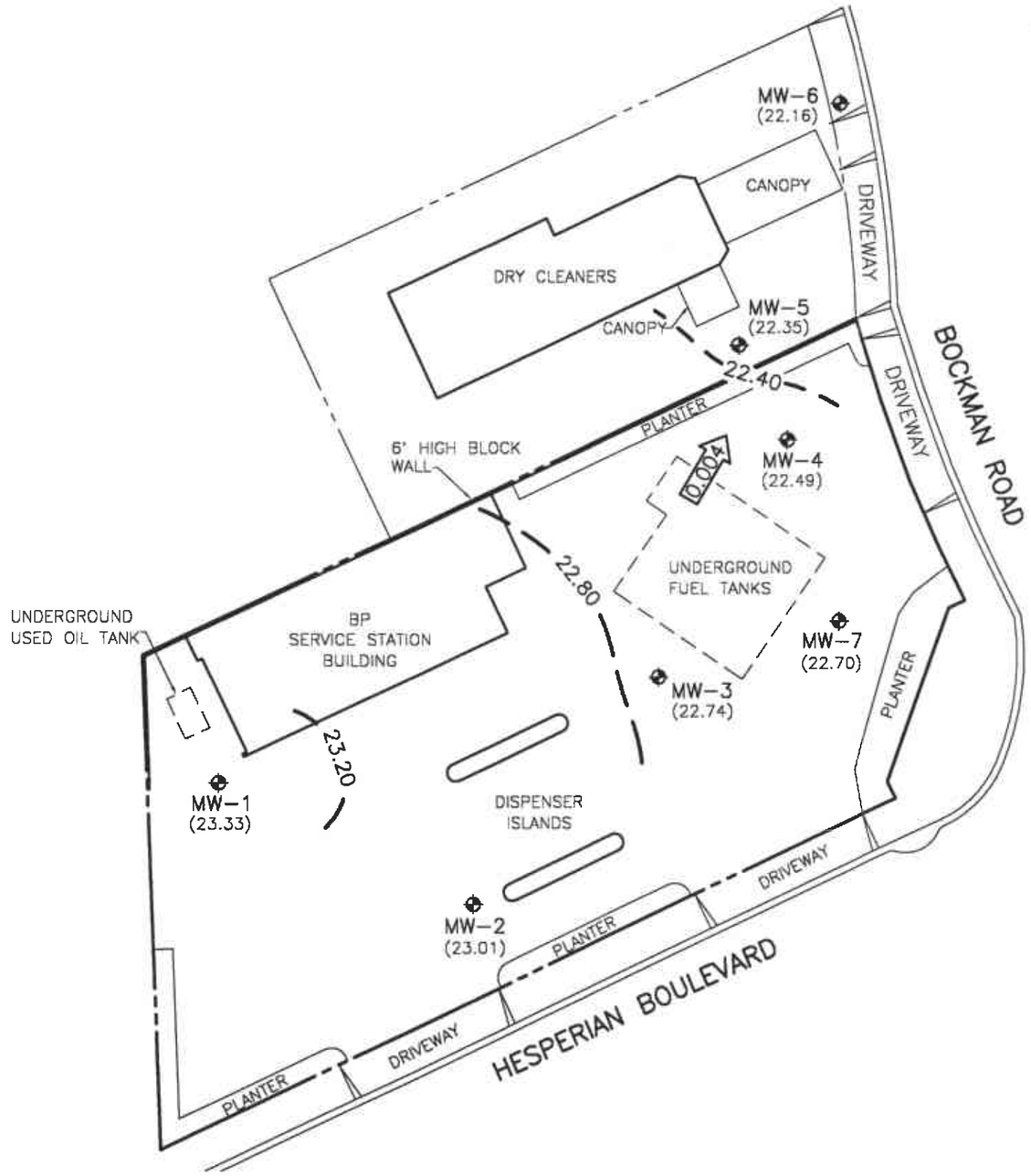
FIGURE 1

VICINITY MAP

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

PROJECT NO. 10-060

ALISTO ENGINEERING GROUP
WALNUT CREEK, CALIFORNIA



N

0 30 60

SCALE IN FEET

LEGEND

- ◆ GROUNDWATER MONITORING WELL
- (22.74) GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL
- 22.80 GROUNDWATER ELEVATION CONTOUR IN FEET ABOVE MEAN SEA LEVEL (CONTOUR INTERVAL–0.40 FOOT)
- 0.004 CALCULATED GROUNDWATER GRADIENT DIRECTION AND MAGNITUDE IN FOOT PER FOOT

FIGURE 2

POTENTIOMETRIC GROUNDWATER ELEVATION CONTOUR MAP

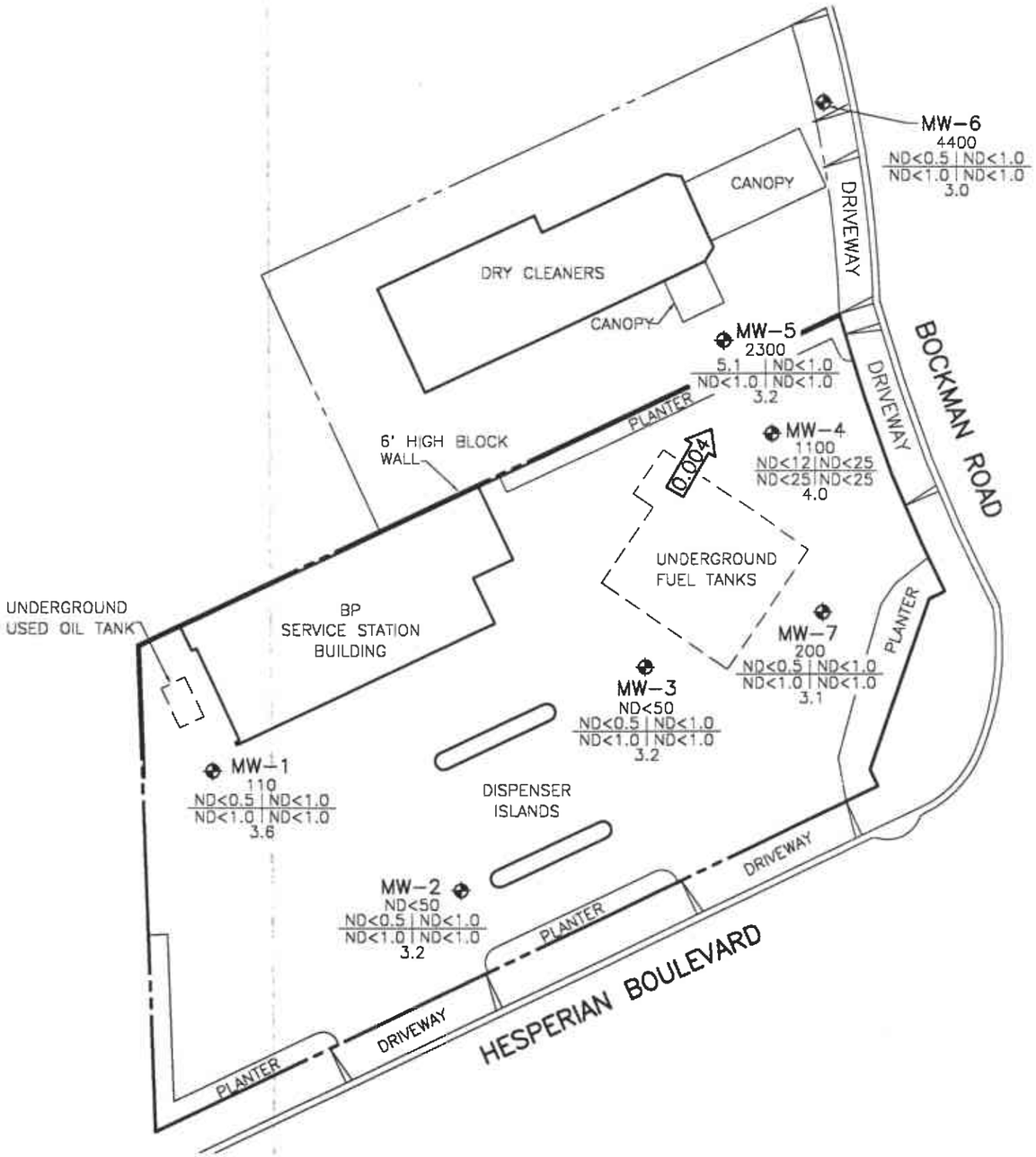
SEPTEMBER 5, 1996

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

PROJECT NO. 10–060

ALISTO ENGINEERING GROUP
WALNUT CREEK, CALIFORNIA

10060D-5.DWG 10-11-96 DSM 1=30



N

0 30 60

SCALE IN FEET

LEGEND

◆	GROUNDWATER MONITORING 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
⇦ 0.004	CALCULATED GROUNDWATER GRADIENT DIRECTION AND MAGNITUDE IN FOOT PER FOOT

FIGURE 3

CONCENTRATIONS OF PETROLEUM HYDROCARBONS IN GROUNDWATER

SEPTEMBER 5, 1996

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

PROJECT NO. 10-060

ALISTO ENGINEERING GROUP
WALNUT CREEK, CALIFORNIA

10060R-3.DWG 10-11-96 DDN 1=30

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. 10-060-06-01 Date: 9-5-96
Address 18501 Hesperian Blvd Day: M T W TH F
Contract No. G797439 City: San Lorenzo
Station No. BP 11107 Sampler: HTB

DEPTH TO GROUNDWATER SUMMARY

WELL ID	SAMPLE ID	WELL DIAM	TOTAL DEPTH	DEPTH TO WATER	PRODUCT THICKNESS	TIME MONITORED	COMMENTS: Semi=Mar/Sept
MW-1	S-3	2	20.70	17.74		1516	SEMI
MW-2	S-4	2	25.0	17.55		1527	SEMI
MW-3	S-2	2	25.2	17.71		1505	SEMI
MW-4	S-1	2	26	16.75		1449	
MW-5	S-6,S-7	2	26	16.72		1553	
MW-6	S-8	2	26	16.30		1608	
MW-7	S-5	2	26	16.8		1547	

FIELD INSTRUMENT CALIBRATION DATA

pH METER AV 4.00 ✓ 7.00 ✓ 10.00 ✓ TEMPERATURE COMPENSATED Y (N) TIME ____ WEATHER ____

D.O. METER ____ ZERO d.O. SOLUTION ____ BAROMETRIC PRESSURE ____ TEMP ____

CONDUCTIVITY METER ____ 10,000 ____ TURBIDITY METER ____ 5.0 NTU ____ OTHER ____

Well ID MW-4 | Depth to Water 16.75 | Diam 2 | Cap/Lock | Product Depth | Iridescence Y / N

Total Depth - Water Level= x Well Vol. Factor= x#vol. to Purge PurgeVol.

26 - 16.75 = 5

Purge Method: OSurface Pump ODisp.Tube OWinch ODisp. Bailer(s)___ OSys Port

Comments:

Gal.	Time	Temp *F	pH	E.C.	D.O.
4	1451	71.6	7.08	676	5.1
6	1456	71.5	7.07	676	4.2
8	1459	71.2	7.07	671	4.0

O EPA 601 ____ O TPH-G/BTEX ✓ O TPH Diesel ____ O TOG 5520 ____

TIME/SAMPLE ID: 1459 / S-1

Well ID MW-3 | Depth to Water 17.71 | Diam 2 | Cap/Lock | Product Depth | Iridescence Y / N

Total Depth - Water Level= x Well Vol. Factor= x#vol. to Purge PurgeVol.

25.2 - 17.71 = 8. x .16 = 4

Purge Method: OSurface Pump ODisp.Tube OWinch ODisp. Bailer(s)___ OSys Port

Comments:

Gal.	Time	Temp *F	pH	E.C.	D.O.
2	1506	72.8	6.99	688	3.7
4	1507	71.5	6.99	690	3.3
6	1508	71.2	6.96	691	3.2

O EPA 601 ____ O TPH-G/BTEX ✓ O TPH Diesel ____ O TOG 5520 ____

TIME/SAMPLE ID: 1508 / S-2

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. 10-060-06-01 | Date: 9-5-96
Address 18501 Hesperian Blvd | Day: M T W TH F
Contract No. G797439 | City: San Lorenzo
Station No. BP 11107 | Sampler: [illegible]

MW-1 | Depth to Water: 17.74 | Diam: 2 | Cap/Lock: dk | Product Depth: | Iridescence: Y (N)
Total Depth - Water Level= 30-7-17.74 | x Well Vol. Factor= 13 x .16 x 3 | x#vol. to Purge= 6.5 | Purge Vol.
Purge Method: OSurface Pump ODisp.Tube OWinch ODisp. Bailer(s)___ OSys Port
Comments:

Gal.	Time	Temp °F	pH	E.C.	D.O.
2	1518	69.0	6.97	594	3.6
4	1520	69.1	6.91	599	3.6
6	1521	69.2	6.89	596	3.6

EPA 601___ TPH-G/BTEX HP | TPH Diesel___ | TOG 5520___
TIME/SAMPLE ID: 5-3 / 1521

MW-2 | Depth to Water: 17.55 | Diam: 2 | Cap/Lock: dk | Product Depth: | Iridescence: Y (N)
Total Depth - Water Level= 25-17.5 = 8.5 x .16 x 3 = 4.1 | x Well Vol. Factor= | x#vol. to Purge= | Purge Vol.
Purge Method: OSurface Pump ODisp.Tube OWinch ODisp. Bailer(s)___ OSys Port
Comments:

Gal.	Time	Temp °F	pH	E.C.	D.O.
2	1528	70.8	7.01	671 µS/cm	3.4
4		70.1	7.00	682	3.6
6	1532	70.2	7.02	680	3.2

EPA 601___ TPH-G/BTEX HP | TPH Diesel___ | TOG 5520___
TIME/SAMPLE ID: 5-4 / 1532

MW-7 | Depth to Water: 16.80 | Diam: 2 | Cap/Lock: dk | Product Depth: | Iridescence: Y (N)
Total Depth - Water Level= 26 - 16.80 = 9.2 x .16 x 3 = 4.7 | x Well Vol. Factor= | x#vol. to Purge= | Purge Vol.
Purge Method: OSurface Pump ODisp.Tube OWinch ODisp. Bailer(s)___ OSys Port
Comments:

Gal.	Time	Temp °F	pH	E.C.	D.O.
2	1542	70.7	6.97	694 µS/cm	3.1
4	1543	70.4	6.99	691	3.2
6	1544	70.5	6.91	690	3.1

EPA 601___ TPH-G/BTEX HP | ~~TPH Diesel~~ | TOG 5520___
TIME/SAMPLE ID: 5-5 / 1544

MW-5 | Depth to Water: 16.72 | Diam: 2 | Cap/Lock: dk | Product Depth: | Iridescence: Y (N)
Total Depth - Water Level= 26 - 16.72 = 9.28 x .16 x 3 = 4.7 | x Well Vol. Factor= | x#vol. to Purge= | Purge Vol.
Purge Method: OSurface Pump ODisp.Tube OWinch ODisp. Bailer(s)___ OSys Port
Comments:

Gal.	Time	Temp °F	pH	E.C.	D.O.
2	1554	73.3	6.96	682	3.4
4	1557	70.1	6.94	680	3.6
6	1601	70.0	6.90	681	3.2

EPA 601___ TPH-G/BTEX HP | TPH Diesel___ | TOG 5520___
TIME/SAMPLE ID: 5-6, 5-7 / 1601, 1606

MW-6 | Depth to Water: 16.30 | Diam: 2 | Cap/Lock: dk | Product Depth: | Iridescence: Y (N)
Total Depth - Water Level= 26 - 16.30 = 10 x .16 x 3 = 5 | x Well Vol. Factor= | x#vol. to Purge= | Purge Vol.
Purge Method: OSurface Pump ODisp.Tube OWinch ODisp. Bailer(s)___ OSys Port
Comments:

Gal.	Time	Temp °F	pH	E.C.	D.O.
2	1610	71.1	6.91	685	3.1
4	1615	71.2	6.94	688	3.0
5	1620	71.0	6.96	685	3.0

EPA 601___ TPH-G/BTEX HP | TPH Diesel___ | TOG 5520___
TIME/SAMPLE ID: 5-8 / 1625

PAGE_____ OF_____

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: 96-09-307

Approved for Release by:

Ed Fry, Project Manager

Date: 9/20/96

Greg Grandits
Laboratory Director

Idelis Williams
Quality Assurance Officer

CASE NARRATIVE

WORKORDER NO.: 9609307

Southern Petroleum Laboratories (SPL) is pleased to present the results of this project to BP Oil and their consultant Alisto Engineering. The samples received intact at our Houston facility with a temperature of 4 degrees Celsius on September 6, 1996. Nine water samples were analyzed for test and methods as specified on the Chain of Custody document. The following is a description of analytical exception which are associated with this sample delivery group.

Based on the conditions of the sample, procedures performed and quality controls implemented for this project, the following exception was noted for this data package.

In the batch HP_R960914103300 for BTEX , the MS/MSD Relative % Difference recoveries values were outside of QC range for MTBE and Benzene.

In the batch HP_R960915035300 for BTEX, the Matrix Spike Duplicate recovery and MS/MSD Relative % Difference were outside QC range for Petroleum Hydrocarbons-Gas.

Please refer to this project by 9609307 to expedite any further discussions. I will be happy to address any questions or concerns you may have.

Edward Fry
Project Manager

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

Certificate of Analysis No. H9-9609307-01

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

P.O.# G797439,COC#070607
DATE: 09/17/96

PROJECT: BP Oil #11107
SITE: Hespeian San Lorenzo
SAMPLED BY: Alisto Engineering
SAMPLE ID: S-1

PROJECT NO: 10-60-6-1
MATRIX: WATER
DATE SAMPLED: 09/05/96 14:59:00
DATE RECEIVED: 09/06/96

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
MTBE	3200	250 P	µg/L
Benzene	ND	12 P	µg/L
Toluene	ND	25 P	µg/L
Ethylbenzene	ND	25 P	µg/L
Total Xylene	ND	25 P	µg/L
Surrogate	**% Recovery**		
1,4-Difluorobenzene	101		
4-Bromofluorobenzene	101		
METHOD 8020***			
Analyzed by: VHZ			
Date: 09/14/96			
Total Petroleum Hydrocarbons-Gasoline	1.1	0.05 P	mg/L
Surrogate	**% Recovery**		
1,4-Difluorobenzene	137		
4-Bromofluorobenzene	103		
CA LUFT - Gasoline			
Analyzed by: YN			
Date: 09/13/96 11:01:00			

(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. H9-9609307-02

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

P.O.# G797439,COC#070607
DATE: 09/17/96

PROJECT: BP Oil #11107
SITE: Hespeian San Lorenzo
SAMPLED BY: Alisto Engineering
SAMPLE ID: S-2

PROJECT NO: 10-60-6-1
MATRIX: WATER
DATE SAMPLED: 09/05/96 15:08:00
DATE RECEIVED: 09/06/96

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	103		
4-Bromofluorobenzene	100		
METHOD 8020***			
Analyzed by: VHZ			
Date: 09/14/96			
Total Petroleum Hydrocarbons-Gasoline	ND	0.05 P	mg/L
Surrogate	**% Recovery**		
1,4-Difluorobenzene	123		
4-Bromofluorobenzene	107		
CA LUFT - Gasoline			
Analyzed by: YN			
Date: 09/13/96 11:28:00			

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.

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

Certificate of Analysis No. H9-9609307-03

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

P.O.# G797439,COC#070607
DATE: 09/17/96

PROJECT: BP Oil #11107
SITE: Hespeian San Lorenzo
SAMPLED BY: Alisto Engineering
SAMPLE ID: S-3

PROJECT NO: 10-60-6-1
MATRIX: WATER
DATE SAMPLED: 09/05/96 15:21:00
DATE RECEIVED: 09/06/96

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	103
4-Bromofluorobenzene	100

METHOD 8020***
Analyzed by: VHZ
Date: 09/14/96

Total Petroleum Hydrocarbons-Gasoline	0.11	0.05 P	mg/L

Surrogate	% Recovery
1,4-Difluorobenzene	117
4-Bromofluorobenzene	103

CA LUFT - Gasoline
Analyzed by: YN
Date: 09/13/96 11:56:00

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.

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

Certificate of Analysis No. H9-9609307-04

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

P.O.# G797439,COC#070607
DATE: 09/17/96

PROJECT: BP Oil #11107
SITE: Hespeian San Lorenzo
SAMPLED BY: Alisto Engineering
SAMPLE ID: S-4

PROJECT NO: 10-60-6-1
MATRIX: WATER
DATE SAMPLED: 09/05/96 15:32:00
DATE RECEIVED: 09/06/96

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	103		
4-Bromofluorobenzene	103		
METHOD 8020***			
Analyzed by: VHZ			
Date: 09/14/96			
Total Petroleum Hydrocarbons-Gasoline	ND	0.05 P	mg/L
Surrogate	**% Recovery**		
1,4-Difluorobenzene	117		
4-Bromofluorobenzene	103		
CA LUFT - Gasoline			
Analyzed by: YN			
Date: 09/14/96 12:23:00			

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.

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

Certificate of Analysis No. H9-9609307-05

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

P.O.# G797439,COC#070607
DATE: 09/17/96

PROJECT: BP Oil #11107
SITE: Hespeian San Lorenzo
SAMPLED BY: Alisto Engineering
SAMPLE ID: S-5

PROJECT NO: 10-60-6-1
MATRIX: WATER
DATE SAMPLED: 09/05/96 15:40:00
DATE RECEIVED: 09/06/96

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
MTBE	430	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	107		
4-Bromofluorobenzene	103		
METHOD 8020***			
Analyzed by: VHZ			
Date: 09/14/96			
Total Petroleum Hydrocarbons-Gasoline	0.20	0.05 P	mg/L
Surrogate	**% Recovery**		
1,4-Difluorobenzene	130		
4-Bromofluorobenzene	103		
CA LUFT - Gasoline			
Analyzed by: YN			
Date: 09/14/96 12:51:00			

(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.

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

Certificate of Analysis No. H9-9609307-06

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

P.O.# G797439,COC#070607
DATE: 09/17/96

PROJECT: BP Oil #11107
SITE: Hespeian San Lorenzo
SAMPLED BY: Alisto Engineering
SAMPLE ID: S-6

PROJECT NO: 10-60-6-1
MATRIX: WATER
DATE SAMPLED: 09/05/96 16:01:00
DATE RECEIVED: 09/06/96

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
MTBE	3300	250 P	µg/L
Benzene	5.1	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	105		
4-Bromofluorobenzene	101		
METHOD 8020***			
Analyzed by: VHZ			
Date: 09/15/96			
Total Petroleum Hydrocarbons-Gasoline	2.3	1.2 P	mg/L
Surrogate	**% Recovery**		
1,4-Difluorobenzene	115		
4-Bromofluorobenzene	103		
CA LUFT - Gasoline			
Analyzed by: VHZ			
Date: 09/15/96 01:46:00			

(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.

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

Certificate of Analysis No. H9-9609307-07

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

P.O.# G797439,COC#070607
DATE: 09/17/96

PROJECT: BP Oil #11107
SITE: Hespeian San Lorenzo
SAMPLED BY: Alisto Engineering
SAMPLE ID: S-7

PROJECT NO: 10-60-6-1
MATRIX: WATER
DATE SAMPLED: 09/05/96 16:06:00
DATE RECEIVED: 09/06/96

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
MTBE	2900	250 P	µg/L
Benzene	4.9	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	103		
4-Bromofluorobenzene	100		
METHOD 8020***			
Analyzed by: VHZ			
Date: 09/15/96			
Total Petroleum Hydrocarbons-Gasoline	2.0	1.2 P	mg/L
Surrogate	**% Recovery**		
1,4-Difluorobenzene	123		
4-Bromofluorobenzene	108		
CA LUFT - Gasoline			
Analyzed by: VHZ			
Date: 09/15/96 02:41:00			

(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.

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

Certificate of Analysis No. H9-9609307-08

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

P.O.# G797439,COC#070607
DATE: 09/17/96

PROJECT: BP Oil #11107
SITE: Hespeian San Lorenzo
SAMPLED BY: Alisto Engineering
SAMPLE ID: S-8

PROJECT NO: 10-60-6-1
MATRIX: WATER
DATE SAMPLED: 09/05/96 16:25:00
DATE RECEIVED: 09/06/96

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
MTBE	7400	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	107		
4-Bromofluorobenzene	100		
METHOD 8020***			
Analyzed by: VHZ			
Date: 09/15/96			
Total Petroleum Hydrocarbons-Gasoline	4.4	1.2 P	mg/L
Surrogate	**% Recovery**		
1,4-Difluorobenzene	121		
4-Bromofluorobenzene	101		
CA LUFT - Gasoline			
Analyzed by: VHZ			
Date: 09/15/96 02:14:00			

(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_R960914103300

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	50.0	45	90.0	63 - 120
Benzene	ND	50.0	54	108	62 - 121
Toluene	ND	50.0	55	110	66 - 136
EthylBenzene	ND	50.0	58	116	70 - 136
O Xylene	ND	50.0	57	114	74 - 134
M & P Xylene	ND	100.0	112	112	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	15	75.0	12	60.0	22.2 *	20	39 - 150
BENZENE	ND	20	17	85.0	22	110	25.6 *	25	39 - 150
TOLUENE	ND	20	17	85.0	21	105	21.1	26	56 - 134
ETHYLBENZENE	ND	20	17	85.0	22	110	25.6	38	61 - 128
O XYLENE	ND	20	17	85.0	21	105	21.1	29	40 - 130
M & P XYLENE	ND	40	34	85.0	43	108	23.8 *	20	43 - 152

Analyst: VHZ
Sequence Date: 09/13/96
SPL ID of sample spiked: 9609307-04A
Sample File ID: R_I6359.TX0
Method Blank File ID:
Blank Spike File ID: R_I6338.TX0
Matrix Spike File ID: R_I6365.TX0
Matrix Spike Duplicate File ID: R_I6366.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): 9609307-02A 9609307-03A 9609307-04A 9609307-05A
9609307-01A

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_R960915020300

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	35	70.0	63 - 120
Benzene	ND	50	42	84.0	62 - 121
Toluene	ND	50	44	88.0	66 - 136
EthylBenzene	ND	50	47	94.0	70 - 136
O Xylene	ND	50	46	92.0	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	15	75.0	16	80.0	6.45	20	39 - 150
BENZENE	ND	20	20	100	21	105	4.88	25	39 - 150
TOLUENE	ND	20	20	100	19	95.0	5.13	26	56 - 134
ETHYLBENZENE	ND	20	20	100	21	105	4.88	38	61 - 128
O XYLENE	ND	20	20	100	20	100	0	29	40 - 130
M & P XYLENE	ND	40	40	100	41	102	1.98	20	43 - 152

Analyst: VHZ
Sequence Date: 09/15/96
SPL ID of sample spiked: 9609248-01A
Sample File ID: R_I6399.TX0
Method Blank File ID:
Blank Spike File ID: R_I6378.TX0
Matrix Spike File ID: R_I6403.TX0
Matrix Spike Duplicate File ID: R_I6404.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):

9609307-06A 9609307-08A 9609307-07A 9609222-03A
9609222-13A 9609222-05A 9609307-06A 9609307-08A
9609307-07A 9609248-01A 9609601-01A 9609601-03A
9609583-01A 9609583-03A 9609583-04A 9609583-05A
9609604-01A 9609604-02A

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

** SPL BATCH QUALITY CONTROL REPORT **

CA LUFT

Matrix: Aqueous

Batch Id: HP_R960913220600

Units: mg/L

LABORATORY CONTROL SAMPLE

SPIKE COMPOUNDS	Method Blank Result <2>	Spike Added <3>	Blank Spike Result <1>	Blank Spike Recovery %	QC Limits(**) (Mandatory) % Recovery Range
Petroleum Hydrocarbons-Gas	ND	1.0	1.06	106	50 - 150

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
PETROLEUM HYDROCARBONS-GAS	ND	0.9	0.71	78.9	0.77	85.6	8.15	50	50 - 150

Analyst: VHZ

Sequence Date: 09/13/96

SPL ID of sample spiked: 9609307-02A

Sample File ID: RRI6346.TX0

Method Blank File ID:

Blank Spike File ID: RRI6341.TX0

Matrix Spike File ID: RRI6354.TX0

Matrix Spike Duplicate File ID: RRI6355.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: Temporary Limits

(***) = Source: Temporary Limits

SAMPLES IN BATCH(SPL ID): 9609307-01A 9609307-02A 9609307-03A 9609307-04A 9609307-05A

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

** SPL BATCH QUALITY CONTROL REPORT **

CA LUFT

Matrix: Aqueous

Units: mg/L

Batch Id: HP_R960915035300

LABORATORY CONTROL SAMPLE

SPIKE COMPOUNDS	Method Blank Result <2>	Spike Added <3>	Blank Spike Result <1>	Blank Spike Recovery %	QC Limits(**) (Mandatory) % Recovery Range
Petroleum Hydrocarbons-Gas	ND	1.0	0.95	95.0	50 - 150

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
PETROLEUM HYDROCARBONS-GAS	2.43	0.9	3.18	83.3	2.87	48.9 *	52.0 *	50	50 - 150

Analyst: VHZ

Sequence Date: 09/15/96

SPL ID of sample spiked: 9609307-08A

Sample File ID: RRI6390.TX0

Method Blank File ID:

Blank Spike File ID: RRI6381.TX0

Matrix Spike File ID: RRI6386.TX0

Matrix Spike Duplicate File ID: RRI6387.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: Temporary Limits

(***) = Source: Temporary Limits

SAMPLES IN BATCH(SPL ID): 9609307-06A 9609307-08A 9609307-07A 9609248-01A

CHAIN OF CUSTODY

AND

SAMPLE RECEIPT CHECKLIST

9609307

TC 8B 9/7

CHAIN OF CUSTODY

No. 070607 Page 1 of 1

CONSULTANT'S NAME: ALISTO	ADDRESS: 1575 Treat blvd	CITY: Walnut Creek	STATE / ZIP CODE: 94596
BP SITE NUMBER: BP 11107	BP CORNER ADDRESS/CITY: Hesperian San Lorenzo		CONSULTANT PROJECT NUMBER: 10-00-6-1
CONSULTANT PROJECT MANAGER: Brady	PHONE NUMBER: 510-295-1650	FAX NUMBER:	CONSULTANT CONTRACT NUMBER: 6797439
BP CONTACT: Scott	BP ADDRESS:	PHONE NUMBER:	FAX NO.
LAB CONTACT: SPL	LABORATORY ADDRESS:	PHONE NUMBER:	FAX NO.
SAMPLED BY (Please Print Name): DJB	SAMPLED BY (Signature): [signature]	SHIPMENT DATE: 9/5/96	SHIPMENT METHOD: FedEx

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

AIRBILL NUMBER: 93607/8186

ANALYSIS REQUIRED

SAMPLE DESCRIPTION	COLLECTION DATE	COLLECTION TIME	MATRIX SOIL/WATER	CONTAINERS NO.	TYPE (VOL.)	PRESERVATIVE LAB SAMPLE #	TPHG BTEX MTBE	pH	COMMENTS
S-1	9/5/96	1459	GW	3	VOA		X	!	
S-2	↓	1508	↓	↓	↓		X	!	
S-3	↓	1521	↓	↓	↓		X	!	
S-4	↓	1532	↓	↓	↓		X	!	
S-5	↓	1544	↓	↓	↓		X	!	
S-6	↓	1601	↓	↓	↓		X	!	
S-7	↓	1606	↓	↓	↓		X	!	
S-8	↓	1625	↓	↓	↓		X	!	

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	ADDITIONAL COMMENTS
[signature]	9/5/96	1630	Ruben Estrada	9/6/96	0945	intact ROT 4c

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:	Time:
9/6/96	1800

SPL Sample ID:
9609307

			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 #)	936071618 6	
		Other:		
11	Method of sample disposal:	SPL Disposal	✓	
		HOLD		
		Return to Client		

Name:	Date:
Ruben Estrada	9/6/96

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

BP Site Number: 11107
ERM Contact: 6792439
Sampling Date: 9/5/96
Matrix Desription: Groundwater
Date Final Report Received: 9/26/96
Laboratory & Location: SPL - TX

	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 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?		X (1)	
10. Are LCS results acceptable using laboratory criteria?	X		

Notes/Comments: RPD exceeds lab QC for MTBE, benzene & xylenes.

Data Validation Completed by (print): Bill Howell
(signature): Bill Howell
Date: 10/22/96