

S. T. Hooton  
Team Leader  
Environmental Remediation Management



ENVIRONMENTAL  
PROTECTION

00 JAN -3 PM 4: 47

BP OIL

BP Exploration & Oil Inc.  
295 SW 41<sup>st</sup> Street, Bldg., 13, STE N  
Renton, WA 98065-4931  
Phone: 425-251-0889  
Fax: 425-251-0736

December 28, 1999

Alameda County Health Care Services Agency  
Attention Ms. Juliet Shin - Hazardous Materials Specialist  
1131 Harbor Bay Parkway, STE 250  
Alameda, CA 94502-6577

STH 01108

RE: Former BP Oil Site No. 11102  
100 McArthur Boulevard (at Oakland)  
Oakland, CA

Dear Ms. Shin:

This transmits the *Third Quarter 1999 Groundwater Monitoring* report prepared by Blaine Tech Services on behalf of BP. The report summarizes chemical data obtained since 1989, including results associated with samples recently collected on 28 September and 14 October 1999. In addition to 8015/8020 testing, the report includes<sup>1</sup>:

- Sampling wells MW-1 and MW-2 for chlorinated solvents by US EPA Method 8010
- Sampling wells MW-1 and MW-2 for TPH as diesel

Cambria Environmental is completing a report describing other activities, including:

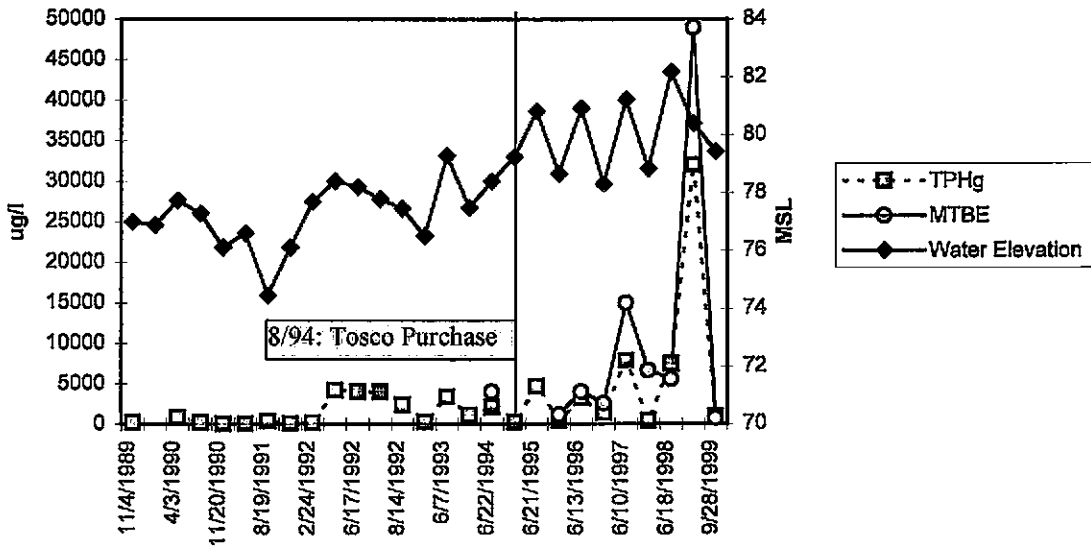
- Performing slug tests on all of the monitoring wells to measure hydraulic conductivity and estimate the horizontal rate of groundwater migration
- Identify, locate and map onsite and offsite utilities to assess the potential preferential migration pathways

I expect that the report will be completed soon.

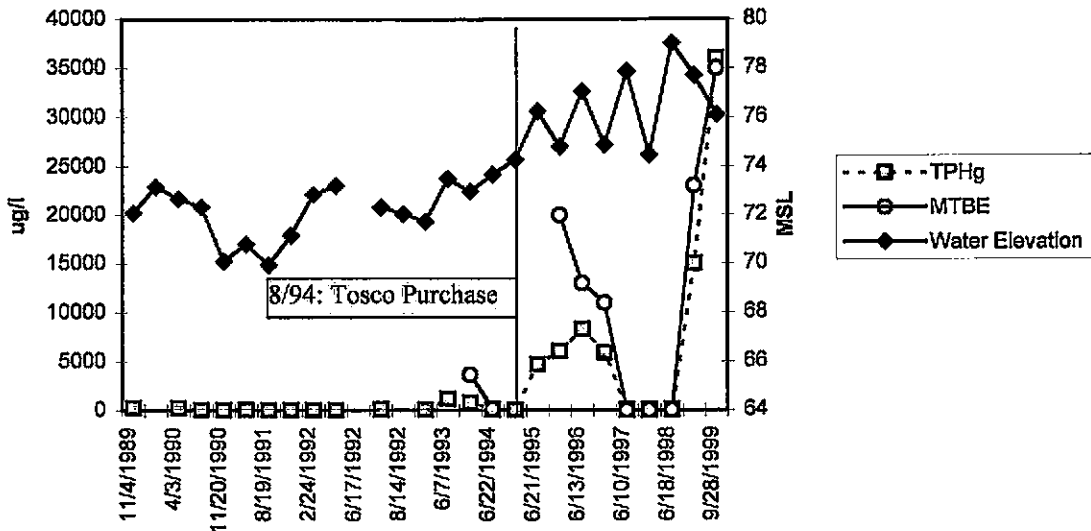
The enclosed report shows that TPHg and MTBE were detected in samples obtained from wells MW-1 and MW-2 on 28 September 1999. Chemical data and water elevation measurements for both of these wells is graphed below.

<sup>1</sup> Sampling wells MW-1 and MW-2 for MTBE and other oxygenates by US EPA Method 8260B will be performed during the next sampling event in March, 2000.

**MW-1 TPHg, MTBE & Water Elevation**



**MW-2 TPHg, MTBE & Water Elevation**



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

Sincerely,

*Scott Hooton*  
 Scott Hooton

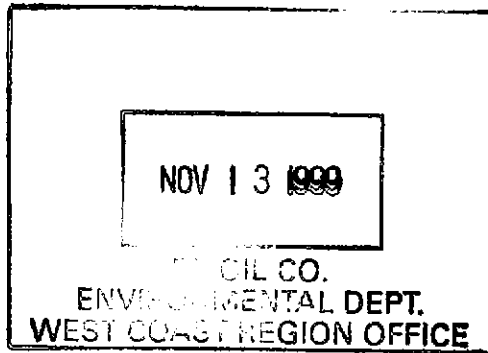
cc: site file  
 David Camille - Tosco (w/attachment)



1680 ROGERS AVENUE  
SAN JOSE, CALIFORNIA 95112-1105  
(408) 573-7771 FAX  
(408) 573-0556 PHONE

November 5, 1999

Scott Hooton  
BP Oil Company  
295 SW 41st Street, Bldg. 13, Suite N  
Renton, WA 98055-4931



### 3rd Quarter 1999 Monitoring at 11102

Third Quarter 1999 Groundwater Monitoring  
BP Service Station Number 11102  
100 MacArthur Blvd.  
Oakland, CA

Monitoring Performed on September 28 and October 14, 1999

---

### Groundwater Sampling Report 990928-P-1

This report covers the routine monitoring of groundwater wells at this BP facility. Blaine Tech Services, Inc.'s work at the site includes inspection, gauging, evacuation, purgewater containment, sample collection and sample handling in accordance with standard procedures that conform to Regional Water Quality Control Board requirements. At no charge, Blaine Tech Services, Inc. returned to the site on October 14, 1999 to resample for Diesel due to the loss of the samples collected on September 28, 1999.

Routine field data collection includes depth to water, total well depth, thickness of any separate immiscible layer, water column volume, the appropriate calculated purge volume, elapsed evacuation time, total volume of water removed, and standard water parameter instrument readings. Sample material is collected, contained, stored, and transported to the laboratory in conformance with EPA standards. Purgewater is, likewise, collected and transported to Seaport Petroleum Corporation for disposal.

Basic field information is presented alongside analytical values excerpted from the laboratory report in the cumulative table of **WELL DATA AND ANALYTICAL RESULTS**. The full analytical report for the most recent samples is located in the **Analytical Appendix**. The

**Professional Engineering Appendix contains a Groundwater Elevation Map and a Dissolved Petroleum Hydrocarbon Concentration Map.**

At a minimum, Blaine Tech Services, Inc. field personnel are certified upon completion of a forty-hour Hazardous Materials and Emergency Response training course per 29 CFR 1910.120. Field personnel are also enrolled in annual eight hour refresher courses.

Blaine Tech Services, Inc. conducts sampling and documentation assignments of this type as an independent third party. In order to avoid compromising the objectivity necessary for the proper and disinterested performance of this work, Blaine Tech Services, Inc. concentrates on objective data collection and does not participate in the interpretation of analytical results, the definition of geological or hydrological conditions, the formulation of recommendations, or the marketing of remedial systems.

Please call if you have any questions.

Yours truly,

Francis Thie  
Vice President

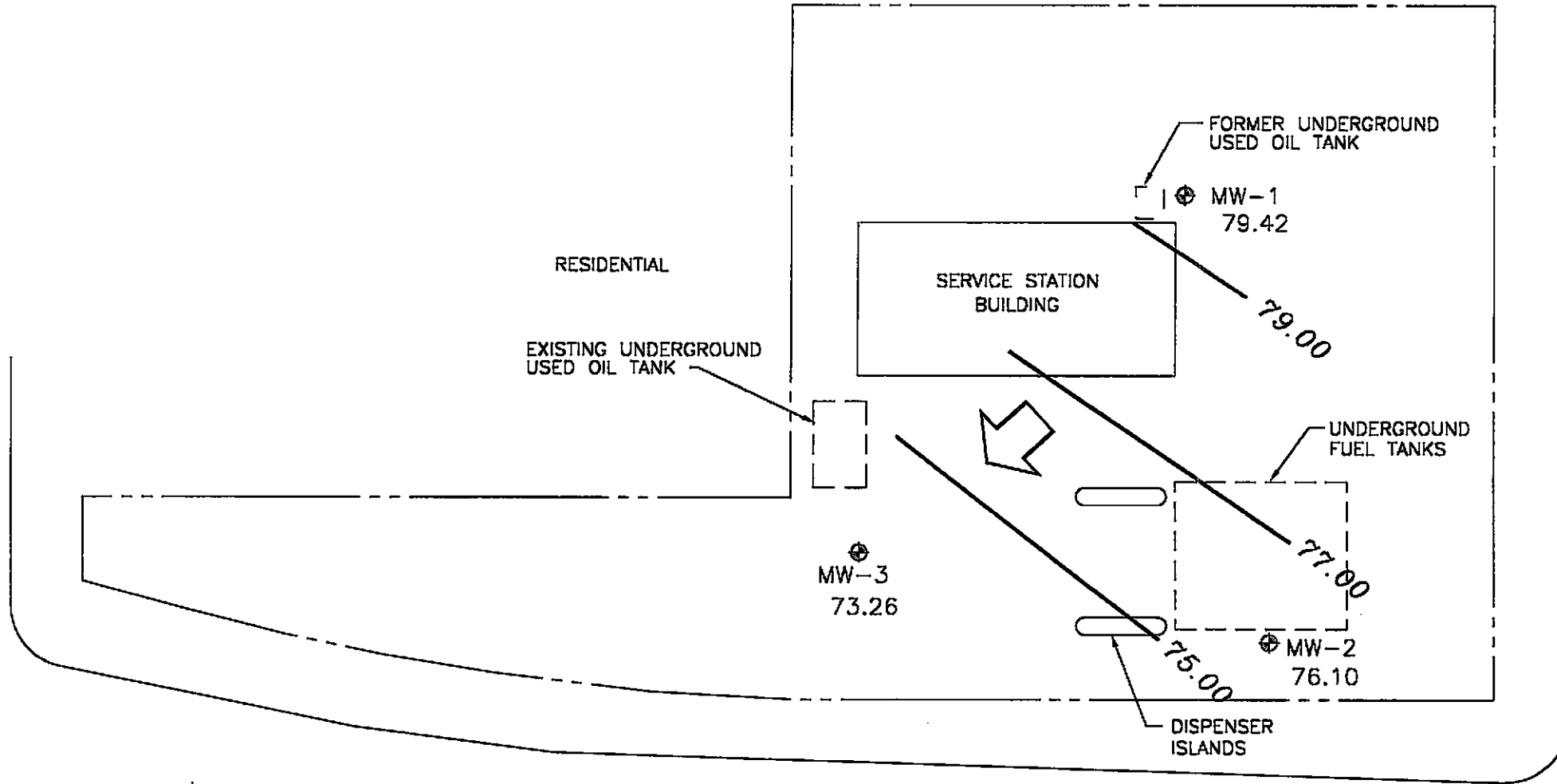
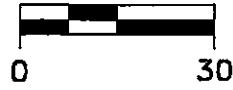
FPT/cm

attachments: Professional Engineering Appendix  
Cumulative Table of Well Data and Analytical Results  
Analytical Appendix  
Field Data Sheets

# **Professional Engineering Appendix**



SCALE (FT.)



- EXPLANATION**
- GROUNDWATER MONITORING WELL
  - 79.42 GROUNDWATER ELEVATION (FT, MSL)
  - 25.00 — GROUNDWATER ELEVATION CONTOUR (FT, MSL)
  - APPROXIMATE GROUNDWATER FLOW DIRECTION;  
APPROXIMATE GRADIENT = 0.07

OAKLAND AVENUE

MACARTHUR BOULEVARD



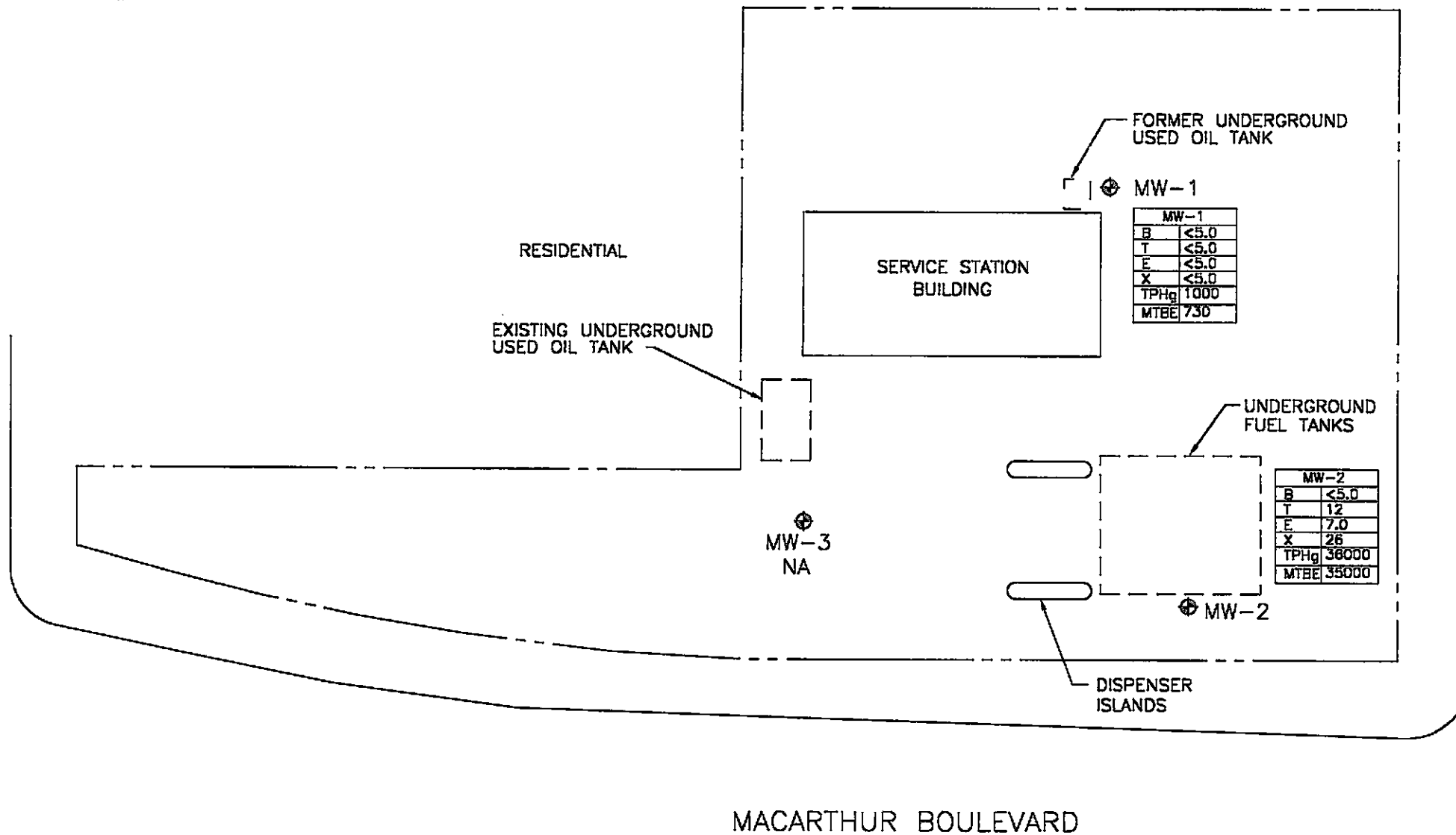
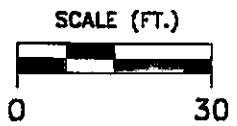
PREPARED BY

**RRM**  
engineering contracting firm

GROUNDWATER ELEVATION CONTOUR MAP,  
SEPTEMBER 28, 1999

BP Oil Service Station No. 11102  
100 MacArthur Boulevard  
Oakland, California

FIGURE:  
1  
PROJECT:  
DAC04



**EXPLANATION**

- ⊕ GROUNDWATER MONITORING WELL
- TPHg TOTAL PETROLEUM HYDROCARBON CALCULATED AS GASOLINE IN PARTS PER BILLION (ppb)
- B BENZENE, ppb
- T TOLUENE, ppb
- E ETHYLBENZENE, ppb
- X XYLENE, ppb
- MTBE METHYL-TERT-BUTYL-ETHER, ppb
- NA DATA NOT AVAILABLE

# **Table of Well Data and Analytical Results**



TABLE 1 - SUMMARY OF RESULTS OF GROUNDWATER RESULTS

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-DCA (ug/l)	1,2-DCA (ug/l)	HVOC's (ug/l)	DO (ppm)	LAB	
MW-1	11/04/89	90.20	13.21	76.99	ND<500	ND<50	3.4	0.6	ND<0.3	ND<0.3	--	ND<5000	--	0.9	---	---	SAL	
MW-1	11/11/89	90.20	13.32	76.88	--	--	--	--	--	--	--	--	--	--	--	---	--	
MW-1	04/03/90	90.20	12.46	77.74	820	--	64	1.9	23	34	--	--	--	--	---	---	ANA	
MW-1	07/30/90	90.20	12.92	77.28	190	ND<50	11	ND<5.0	ND<5.0	ND<5.0	--	ND<5000	--	ND	---	---	ANA	
MW-1	11/20/90	90.20	14.08	76.12	50	79	2.4	ND<0.3	ND<0.3	ND<0.3	--	ND<5000	--	4.0	---	---	SAL	
MW-1	03/01/91	90.20	13.61	76.59	ND<100	ND<1000	0.9	ND<0.3	ND<0.3	0.3	--	14000	--	ND	---	---	SAL	
MW-1	08/19/91	90.20	15.74	74.46	370	ND<50	35	0.73	6.4	5.6	--	ND<5000	--	1.4	---	---	SEQ	
MW-1	11/13/91	90.20	14.08	76.12	60	ND<50	0.68	ND<0.3	ND<0.3	ND<0.3	--	ND<5000	--	1.0	---	---	SEQ	
MW-1	02/24/92	90.20	12.52	77.68	140	100	3.9	0.66	1.2	3.8	--	ND<5000	--	1.7	---	---	SEQ	
MW-1	05/19/92	90.20	11.8	78.40	4200	910	440	21	250	37	--	ND<5000	--	ND	---	---	SEQ	
MW-1	06/17/92	90.20	12.01	78.19	4000	560	350	14	150	17	--	ND<5000	--	ND	---	---	SEQ	
MW-1	07/22/92	90.20	12.42	77.78	4000	--	ND<5.0	19	210	61	--	--	--	--	---	---	ANA	
MW-1	08/14/92	90.20	12.75	77.45	2400	1700	330	20	150	47	--	ND<5000	--	ND<2.5	---	---	SEQ	
MW-1	11/11/92	90.20	13.69	76.51	260	92	30	3.4	7.6	6.8	--	ND<5000	--	ND<2.5	---	---	ANA	
MW-1	06/07/93	90.20	10.93	79.27	3400	440	98	11	21	7.6	--	--	6.2	0.9	---	---	PACE	
QC-1 (c)	06/07/93	--	--	--	3700	--	120	12	26	9.5	--	--	--	--	---	---	PACE	
MW-1	12/02/93	90.20	12.72	77.48	1100	120	8.3	3.6	0.6	1.5	--	ND<5000	2.6	1.8	---	---	PACE	
MW-1	06/22/94	90.20	11.81	78.39	2100	ND<50	32	3.8	2.2	17	4000	(d) ND<5000	2.3	3.3	---	3.2	PACE	
QC-1 (c)	06/22/94	--	--	--	2100	--	30	3.2	2.0	15	2000	(d)	--	--	---	---	PACE	
MW-1	01/10/95	90.20	10.97	79.23	ND<500	420	120	ND<5	ND<5	ND<10	--	--	ND<1	1	---	3.9	ATI	
QC-1 (c)	01/10/95	--	--	--	ND<500	--	120	ND<5	5	ND<10	--	--	--	--	---	---	ATI	
MW-1	06/21/95	90.20	9.38	80.82	4700	1300	16	ND<5.0	ND<5.0	ND<10	--	2900	2.0	0.38	0.6	(e)	6.7	ATI
QC-1 (c)	06/21/95	--	--	--	3600	--	ND<13	ND<5.0	ND<5.0	ND<10	--	--	--	--	---	---	ATI	
MW-1	12/27/95	90.20	11.55	78.65	430	2100	ND<2.5	ND<2.5	ND<2.5	ND<5.0	1200	640	0.67	ND<0.20	---	6.3	ATI	
MW-1	06/13/96	90.20	9.28	80.92	3200	920	51	ND<12	ND<12	ND<12	4000	2000	--	--	---	6.3	SPL	
MW-1	12/04/96	90.20	11.91	78.29	1400	280	6.2	ND<5	ND<5	ND<5	2600	2000	ND<5.0	ND<5.0	6.0	(f)	6.7	SPL
MW-1	06/10/97	90.20	8.97	81.23	7900	1700	12	ND<10	ND<10	ND<10	15000	ND<5	ND<250	ND<250	ND	6.0	SPL	
QC-1 (c)	06/10/97	--	--	--	7700	--	14	ND<25	ND<25	ND<25	13000	--	--	--	---	---	SPL	
MW-1	12/12/97	90.20	11.37	78.83	440	760	8.8	ND<1.0	2.6	9.4	6700	1200	ND<1.0	ND<1.0	ND	5.5	SPL	
MW-1	06/18/98	90.20	8.02	82.18	7500	2900	ND<2.5	ND<5.0	ND<5.0	ND<5.0	5600	ND<5	ND<5.0	ND<5.0	ND	4.9	SPL	
MW-1	03/09/99	90.20	9.80	80.40	32000	--	100	16	72	110	49000	--	--	--	---	---	SPL	
MW-1	09/28/99	90.20	10.78	79.42	1000	--	ND<5.0	ND<5.0	ND<5.0	ND<5.0	730	--	ND<1.0	ND<1.0	ND<1.0	---	SPL	
MW-1	10/14/99	90.20	10.84	79.36	--	660	--	--	--	--	--	--	--	--	---	---	SPL	

TABLE 1 - SUMMARY OF RESULTS OF GROUNDWATER RESULTS

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-DCA (ug/l)	1,2-DCA (ug/l)	HVOC's (ug/l)	DO (ppm)	LAB
MW-2	11/04/89	87.91	15.84	72.07	ND<500	---	6.5	ND<0.3	ND<0.3	ND<0.3	---	---	---	---	---	---	SAL
MW-2	11/11/89	87.91	14.75	73.16	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-2	04/03/90	87.91	15.25	72.66	ND<500	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	---	---	---	---	ANA
MW-2	07/30/90	87.91	15.59	72.32	61	---	6.5	ND<0.5	ND<0.5	ND<0.5	---	---	---	---	---	---	ANA
MW-2	11/20/90	87.91	17.81	70.10	ND<50	---	0.3	ND<0.3	ND<0.3	ND<0.3	---	---	---	---	---	---	SAL
MW-2	03/01/91	87.91	17.11	70.80	ND<100	---	0.4	ND<0.3	ND<0.3	ND<0.3	---	---	---	4.0	---	---	SAL
MW-2	08/19/91	87.91	17.97	69.94	ND<30	---	ND<0.3	ND<0.3	ND<0.3	ND<0.3	---	---	---	---	---	---	SEQ
MW-2	11/13/91	87.91	16.76	71.15	38	---	0.32	ND<0.3	ND<0.3	ND<0.3	---	---	---	---	---	---	SEQ
MW-2	02/24/92	87.91	15.07	72.84	ND<50	---	ND<0.5	ND<0.5	ND<0.5	0.58	---	---	---	16	---	---	SEQ
MW-2	05/19/92	87.91	14.7	73.21	ND<50	---	0.55	ND<0.5	ND<0.5	ND<0.5	---	---	---	---	---	---	SEQ
MW-2	07/22/92	87.91	15.6	72.31	90	---	1.3	0.6	0.9	1.9	---	---	---	---	---	---	ANA
MW-2	08/14/92	87.91	15.88	72.03	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-2	11/11/92	87.91	16.19	71.72	52	---	2.8	ND<0.5	ND<0.5	0.9	---	---	---	---	---	---	ANA
QC-1 (c)	11/11/92	---	---	---	65	---	3.2	ND<0.5	ND<0.5	1.0	---	---	---	---	---	---	ANA
MW-2	06/07/93	87.91	14.42	73.49	1200	---	14	2.8	1.9	1.7	---	---	---	---	---	---	PACE
MW-2	12/02/93	87.91	14.94	72.97	790	---	3.4	0.5	10	ND<0.5	3700 (d)	---	---	---	---	---	PACE
QC-1 (c)	12/02/93	---	---	---	2100	---	32	3.8	2.2	17	3700 (d)	---	2.3	---	---	---	PACE
MW-2	06/22/94	87.91	14.25	73.66	110	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	120 (d)	---	---	---	---	3.9	PACE
MW-2	01/10/95	87.91	13.64	74.27	ND<50	---	ND<0.5	ND<0.5	0.6	1	---	---	---	---	---	4.3	ATI
MW-2	06/21/95	87.91	11.66	76.25	4700	---	ND<10	ND<10	ND<10	ND<20	---	---	---	---	---	7.8	ATI
MW-2	12/27/95	87.91	13.11	74.80	6100	---	ND<25	ND<25	ND<25	ND<50	20000	---	---	---	---	6.7	ATI
QC-1 (c)	12/27/95	---	---	---	6300	---	ND<25	ND<25	ND<25	ND<50	19000	---	---	---	---	---	ATI
MW-2	06/13/96	87.91	10.86	77.05	8300	---	ND<2.5	ND<2.5	ND<2.5	ND<2.5	13000	---	---	---	---	6.5	SPL
QC-1 (c)	06/13/96	---	---	---	8700	---	ND<5	ND<5	ND<5	ND<5	13000	---	---	---	---	---	SPL
MW-2	12/04/96	87.91	13.03	74.88	5900	---	ND<2.5	ND<5	ND<5	ND<5	11000	---	---	---	---	6.3	SPL
QC-1 (c)	12/04/96	---	---	---	5900	---	ND<2.5	ND<5	ND<5	ND<5	11000	---	---	---	---	---	SPL
MW-2	06/10/97	87.91	10.04	77.87	ND<50	---	ND<0.5	ND<1.0	ND<1.0	ND<1.0	ND<10	---	---	---	---	5.8	SPL
MW-2	12/12/97	87.91	12.44	75.47	ND<50	---	ND<0.5	ND<1.0	ND<1.0	ND<1.0	ND<10	---	---	---	---	5.7	SPL
MW-2	06/18/98	87.91	8.89	79.02	50	---	ND<0.5	ND<1.0	ND<1.0	ND<1.0	ND<10	---	---	---	---	5.3	SPL
QC-1 (c)	06/18/98	---	---	---	ND<50	---	ND<0.5	ND<1.0	ND<1.0	ND<1.0	ND<10	---	---	---	---	---	SPL
MW-2	03/09/99	87.91	10.20	77.71	15000	---	ND<5.0	ND<5.0	ND<5.0	ND<5.0	23000	---	---	---	---	---	SPL
MW-2	09/28/99	87.91	11.81	76.10	36000	---	ND<5.0	12	7.0	26	35000	---	ND<5.0	7.7	ND<5.0	---	SPL
MW-2	10/14/99	87.91	10.27	77.64	---	100	---	---	---	---	---	---	---	---	---	---	SPL

TABLE 1 - SUMMARY OF RESULTS OF GROUNDWATER RESULTS

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-DCA (ug/l)	1,2-DCA (ug/l)	HVOC's (ug/l)	DO (ppm)	LAB
MW-3	11/04/89	87.02	15.4	71.62	ND<500	---	ND<0.3	ND<0.3	ND<0.3	ND<0.3	---	---	---	---	---	---	SAL
MW-3	11/11/89	87.02	14.1	72.92	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-3	04/03/90	87.02	13.90	73.12	ND<100	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	---	---	---	---	ANA
MW-3	07/30/90	87.02	13.77	73.25	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	ND<5000	---	---	---	---	ANA
MW-3	11/20/90	87.02	14.67	72.35	ND<50	---	0.3	0.8	0.4	1.5	---	---	---	---	---	---	SAL
MW-3	03/01/91	87.02	15.22	71.80	ND<100	---	0.4	ND<0.3	ND<0.3	ND<0.3	---	---	---	ND	---	---	SAL
MW-3	08/19/91	87.02	13.15	73.87	ND<30	---	ND<0.3	ND<0.3	ND<0.3	ND<0.3	---	---	---	---	---	---	SEQ
MW-3	11/13/91	87.02	15.66	71.36	ND<30	---	ND<0.3	ND<0.3	ND<0.3	ND<0.3	---	---	---	---	---	---	SEQ
MW-3	02/24/92	87.02	15.01	72.01	ND<50	---	0.65	1.4	0.66	4.4	---	---	---	ND	---	---	SEQ
MW-3	05/19/92	87.02	15.52	71.50	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	---	---	---	---	SEQ
MW-3	07/22/92	87.02	15.63	71.39	ND<50	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	ND<5000	---	ND<0.50	---	---	ANA
MW-3	08/14/92	87.02	13.57	73.45	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-3	11/11/92	87.02	14.13	72.89	ND<50	---	ND<0.5	0.7	ND<0.5	1.3	---	---	---	---	---	---	ANA
MW-3	06/07/93	87.02	12.13	74.89	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	---	---	---	---	PACE
MW-3	12/02/93	87.02	13.29	73.73	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	---	---	---	---	PACE
MW-3	06/22/94	87.02	12.78	74.24	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	---	---	---	---	2.9 PACE
MW-3	01/10/95	87.02	12.01	75.01	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<1	---	---	---	1	---	---	3.8 ATI
MW-3	06/21/95	87.02	11.57	75.45	ND<50	---	ND<0.50	ND<0.50	ND<0.50	ND<1.0	---	---	---	---	---	---	7.4 ATI
MW-3	12/27/95	87.02	13.47	73.55	ND<50	---	ND<0.50	ND<0.50	ND<0.50	ND<1.0	5.7	---	---	---	---	---	7.3 ATI
MW-3	06/13/96	87.02	11.22	75.80	60	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<10	---	---	---	---	---	6.8 SPL
MW-3	12/04/96	87.02	13.28	73.74	ND<50	---	ND<0.5	ND<1	ND<1	ND<1	ND<10	---	---	---	---	---	6.7 SPL
MW-3	06/10/97	87.02	10.22	76.80	ND<50	---	ND<0.5	ND<1.0	ND<1.0	ND<1.0	ND<10	---	---	---	---	---	6.1 SPL
MW-3	12/12/97	87.02	12.61	74.41	ND<50	---	ND<0.5	ND<1.0	ND<1.0	ND<1.0	ND<10	---	---	---	---	---	5.6 SPL
QC-1 (c)	12/12/97	---	---	---	ND<50	---	ND<0.5	ND<1.0	ND<1.0	ND<1.0	ND<10	---	---	---	---	---	SPL
MW-3	06/18/98	87.02	9.07	77.95	50	---	ND<0.5	ND<1.0	ND<1.0	ND<1.0	ND<10	---	---	---	---	---	5.3 SPL
MW-3	06/18/98	87.02	12.80	74.22	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-3	09/28/99	87.02	13.76	73.26	---	---	---	---	---	---	---	---	---	---	---	---	---

TABLE 1 - SUMMARY OF RESULTS OF GROUNDWATER RESULTS

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-DCA (ug/l)	1,2-DCA (ug/l)	HVOC's (ug/l)	DO (ppm)	LAB
QC-2	(g) 11/11/92	---	---	---	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	---	---	---	---	ANA
QC-2	(g) 06/07/93	---	---	---	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	---	---	---	---	PACE
QC-2	(g) 12/02/93	---	---	---	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	---	---	---	---	PACE
QC-2	(g) 06/22/94	---	---	---	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	---	---	---	---	PACE
QC-2	(g) 01/10/95	---	---	---	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<1	---	---	---	---	---	---	ATI
QC-2	(g) 06/21/95	---	---	---	ND<50	---	ND<0.50	ND<0.50	ND<0.50	ND<1.0	---	---	---	---	---	---	ATI
QC-2	(g) 12/27/95	---	---	---	ND<50	---	ND<0.50	ND<0.50	ND<0.50	ND<1.0	ND<5.0	---	---	---	---	---	ATI
QC-2	(g) 06/13/96	---	---	---	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	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  
 TOG Total oil and grease  
 1,1-DCA 1,1-Dichloroethane  
 1,2-DCA 1,2-Dichloroethane  
 HVOC's Halogenated volatile organic compounds  
 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 analyzed/measured/applicable  
 SAL Superior Analytical Laboratory  
 ANA Anametrix, Inc.  
 SEQ Sequoia Analytical Laboratory  
 PACE Pace, Inc.  
 ATI Analytical Technologies, Inc.  
 SPL Southern Petroleum Laboratories

(a) Top of casing elevations surveyed to the nearest 0.01 foot 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 10-076-06-002.  
 (e) Tetrachloroethene.  
 (f) Trans-1,2-Dichloroethene  
 (g) Travel blank.

# **Analytical Appendix**



October 15, 1999

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

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

The following report contains analytical results for the sample(s) received at Southern Petroleum Laboratories (SPL) on October 2, 1999. The sample(s) was assigned to Certificate of Analysis No. (s) 9910078 and analyzed for all parameters as listed on the chain of custody.

Your samples "A" and "B" for Diesel Range Organics were not received. Morgan Hargrave with Blaine Tech Services Inc. was notified. Morgan will ship samples at a later date.

Your sample "B" (SPL ID: 9910078-02) was randomly selected for use in SPL's quality control sample for Halogenated Volatile Organics. The Matrix Spike and Matrix Spike Duplicate recoveries were outside advisable quality control limits (Batch ID: HP\_X991004105900) for Carbon Tetrachloride due to matrix interference. A Laboratory Control Sample (LCS) was analyzed as a quality control check for this batch and all recoveries were within acceptable limits.

Upon receipt of your samples it was found that the sample collection date/time was not listed on the chain of custody. Your samples were logged in per the sample bottle labels.

Any data flags or quality control exceptions associated with this report will be footnoted in the analytical result 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

A handwritten signature in cursive script that reads "Sonia West". The signature is written in black ink and is positioned above a horizontal line.

Sonia West  
Senior Project Manager



HOUSTON LABORATORY

8880 INTERCHANGE DRIVE

HOUSTON, TEXAS 77054

PHONE (713) 660-0901

Southern Petroleum Laboratories, Inc.

Certificate of Analysis Number: 99-10-078

Approved for Release by:

*Sonia West*

\_\_\_\_\_  
Sonia West, Senior Project Manager

*10-15-99*

\_\_\_\_\_  
Date

Joel Grice  
Laboratory Director

Ted Yen  
Quality Assurance Officer

The attached analytical data package may not be reproduced except in full without the express written approval of this laboratory.  
The results relate only to the samples tested.  
Results reported on a Wet Weight Basis unless otherwise noted.



**HOUSTON LABORATORY**  
 8880 INTERCHANGE DRIVE  
 HOUSTON, TEXAS 77054  
 PHONE (713) 680-0901

Certificate of Analysis No. H9-9910078-01

BP Oil Company  
 295 SW 41 Street Bldg.13, SteN  
 Renton, WA 98055  
 ATTN: Scott Hooton

P.O.#  
 N/A, COC#118682  
 DATE: 10/12/99

**PROJECT:** #11102, 100 MacArthur Blvd.  
**SITE:** Oakland  
**SAMPLED BY:** Blaine Tech Services  
**SAMPLE ID:** A

**PROJECT NO:** 990928-P1  
**MATRIX:** WATER  
**DATE SAMPLED:** 09/28/99 09:25:00  
**DATE RECEIVED:** 10/02/99

**ANALYTICAL DATA**

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
MTBE	35000	250 P	ug/L
BENZENE	ND	5.0 P	ug/L
TOLUENE	12	5.0 P	ug/L
ETHYLBENZENE	7.0	5.0 P	ug/L
TOTAL XYLENE	26	5.0 P	ug/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	45		ug/L

<b>Surrogate</b>	<b>% Recovery</b>
1,4-Difluorobenzene	93
4-Bromofluorobenzene	97

Method 8020A \*\*\*  
 Analyzed by: WLR  
 Date: 10/11/99

Gasoline Range Organics	36	0.25 P	mg/L
-------------------------	----	--------	------

<b>Surrogate</b>	<b>% Recovery</b>
1,4-Difluorobenzene	100
4-Bromofluorobenzene	107

California LUFT Manual for Gasoline  
 Analyzed by: WLR  
 Date: 10/08/99 02:24:00

(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) 880-0901

Certificate of Analysis No. H9-9910078-01

BP Oil Company  
 295 SW 41 Street Bldg.13, SteN  
 Renton, WA 98055  
 ATTN: Scott Hooton

P.O.#  
 N/A, COC#118682  
 10/12/99

PROJECT: #11102, 100 MacArthur Blvd.  
 SITE: Oakland  
 SAMPLED BY: Blaine Tech Services  
 SAMPLE ID: A

PROJECT NO: 990928-P1  
 MATRIX: WATER  
 DATE SAMPLED: 09/28/99 09:25:00  
 DATE RECEIVED: 10/02/99

ANALYTICAL DATA

PARAMETER	RESULTS	PQL*	UNITS
Dichlorodifluoromethane	ND	5.0	µg/L
Chloromethane	ND	5.0	µg/L
Vinyl chloride	ND	5.0	µg/L
Bromomethane	ND	5.0	µg/L
Chloroethane	ND	5.0	µg/L
Trichlorofluoromethane	ND	5.0	µg/L
1,1-Dichloroethene	ND	5.0	µg/L
Methylene chloride	ND	5.0	µg/L
Trans-1,2-Dichloroethene	ND	5.0	µg/L
1,1-Dichloroethane	ND	5.0	µg/L
Chloroform	ND	5.0	µg/L
1,1,1-Trichloroethane	ND	5.0	µg/L
Carbon tetrachloride	ND	5.0	µg/L
1,2-Dichloroethane	7.7	5.0	µg/L
Trichloroethene	ND	5.0	µg/L
1,2-Dichloropropane	ND	5.0	µg/L
Bromodichloromethane	ND	5.0	µg/L
cis-1,3-Dichloropropene	ND	5.0	µg/L
trans-1,3-Dichloropropene	ND	5.0	µg/L
1,1,2-Trichloroethane	ND	5.0	µg/L
Tetrachloroethene	ND	5.0	µg/L
Dibromochloromethane	ND	5.0	µg/L
Chlorobenzene	ND	5.0	µg/L
Bromoform	ND	5.0	µg/L
1,1,2,2-Tetrachloroethane	ND	5.0	µg/L
1,3-Dichlorobenzene	ND	5.0	µg/L
1,4-Dichlorobenzene	ND	5.0	µg/L
1,2-Dichlorobenzene	ND	5.0	µg/L

METHOD: 8010, Halogenated Volatile Organics  
 (continued on next page)



HOUSTON LABORATORY

8880 INTERCHANGE DRIVE

HOUSTON, TEXAS 77054

PHONE (713) 660-0901

Certificate of Analysis No. H9-9910078-01

BP Oil Company

SAMPLE ID: A

**SURROGATES**  
1-4 Dichlorobutane  
Fluorobenzene

**% RECOVERY**  
BCB=97  
930MI

ANALYZED BY: YN

DATE/TIME: 10/04/99 16:17:00

METHOD: 8010, Halogenated Volatile Organics

NOTES: \* - Practical Quantitation Limit

ND - Not Detected

NA - Not Analyzed

COMMENTS:

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



Certificate of Analysis No. H9-9910078-02

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

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

P.O.#
N/A, COC#118682
DATE: 10/12/99

PROJECT: #11102, 100 MacArthur Blvd.
SITE: Oakland
SAMPLED BY: Blaine Tech Services
SAMPLE ID: B

PROJECT NO: 990928-P1
MATRIX: WATER
DATE SAMPLED: 09/28/99 09:47:00
DATE RECEIVED: 10/02/99

ANALYTICAL DATA

Table with 5 columns: PARAMETER, RESULTS, DETECTION LIMIT, UNITS. Rows include MTBE, BENZENE, TOLUENE, ETHYLBENZENE, TOTAL XYLENE, and TOTAL VOLATILE AROMATIC HYDROCARBONS.

Table with 2 columns: Surrogate, % Recovery. Rows include 1,4-Difluorobenzene and 4-Bromofluorobenzene.

Method 8020A \*\*\*
Analyzed by: WLR
Date: 10/08/99

Gasoline Range Organics 1.0 0.25 P mg/L

Table with 2 columns: Surrogate, % Recovery. Rows include 1,4-Difluorobenzene and 4-Bromofluorobenzene.

California LUFT Manual for Gasoline
Analyzed by: WLR
Date: 10/08/99 02:48:00

(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



Certificate of Analysis No. H9-9910078-02

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

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

P.O.#  
N/A, COC#118682  
10/12/99

PROJECT: #11102, 100 MacArthur Blvd.  
SITE: Oakland  
SAMPLED BY: Blaine Tech Services  
SAMPLE ID: B

PROJECT NO: 990928-P1  
MATRIX: WATER  
DATE SAMPLED: 09/28/99 09:47:00  
DATE RECEIVED: 10/02/99

ANALYTICAL DATA

PARAMETER	RESULTS	PQL*	UNITS
Dichlorodifluoromethane	ND	1.0	µg/L
Chloromethane	ND	1.0	µg/L
Vinyl chloride	ND	1.0	µg/L
Bromomethane	ND	1.0	µg/L
Chloroethane	ND	1.0	µg/L
Trichlorofluoromethane	ND	1.0	µg/L
1,1-Dichloroethene	ND	1.0	µg/L
Methylene chloride	ND	1.0	µg/L
Trans-1,2-Dichloroethene	ND	1.0	µg/L
1,1-Dichloroethane	ND	1.0	µg/L
Chloroform	ND	1.0	µg/L
1,1,1-Trichloroethane	ND	1.0	µg/L
Carbon tetrachloride	ND	1.0	µg/L
1,2-Dichloroethane	ND	1.0	µg/L
Trichloroethene	ND	1.0	µg/L
1,2-Dichloropropane	ND	1.0	µg/L
Bromodichloromethane	ND	1.0	µg/L
cis-1,3-Dichloropropene	ND	1.0	µg/L
trans-1,3-Dichloropropene	ND	1.0	µg/L
1,1,2-Trichloroethane	ND	1.0	µg/L
Tetrachloroethene	ND	1.0	µg/L
Dibromochloromethane	ND	1.0	µg/L
Chlorobenzene	ND	1.0	µg/L
Bromoform	ND	1.0	µg/L
1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
1,3-Dichlorobenzene	ND	1.0	µg/L
1,4-Dichlorobenzene	ND	1.0	µg/L
1,2-Dichlorobenzene	ND	1.0	µg/L

METHOD: 8010, Halogenated Volatile Organics  
(continued on next page)



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

Certificate of Analysis No. H9-9910078-02

BP Oil Company

SAMPLE ID: B

SURROGATES  
1-4 Dichlorobutane  
Fluorobenzene

% RECOVERY  
BCB=93  
177MI

---

ANALYZED BY: YN

DATE/TIME: 10/04/99 15:40:00

METHOD: 8010, Halogenated Volatile Organics

NOTES: \* - Practical Quantitation Limit

ND - Not Detected

NA - Not Analyzed

COMMENTS:

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

*QUALITY CONTROL*

*DOCUMENTATION*



Matrix: Aqueous  
Units: ug/L

Batch Id: HP\_N991011113900

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	51	102	72 - 128
Benzene	ND	50	52	104	61 - 119
Toluene	ND	50	53	106	65 - 125
EthylBenzene	ND	50	52	104	70 - 118
O Xylene	ND	50	51	102	72 - 117
M & P Xylene	ND	100	110	110	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	42	20	65	115	65	115	0	20	39 - 150
BENZENE	ND	20	22	110	22	110	0	21	32 - 164
TOLUENE	ND	20	22	110	22	110	0	20	38 - 159
ETHYLBENZENE	ND	20	21	105	21	105	0	19	52 - 142
O XYLENE	ND	20	22	110	22	110	0	18	53 - 143
M & P XYLENE	ND	40	43	108	43	108	0	17	53 - 144

\* = Values outside QC Range due to Matrix Interference (except RPD)

< = 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)

Analyst: WLR

Sequence Date: 10/11/99

SPL ID of sample spiked: 99100065-04

Sample File ID: N\_J2014.TX0

Method Blank File ID:

Blank Spike File ID: N\_J2003.TX0

Matrix Spike File ID: N\_J2007.TX0

Matrix Spike Duplicate File ID: N\_J2008.TX0

SAMPLES IN BATCH (SPL ID): 9910076-01A 9910072-02A 9910073-01A



Matrix: Aqueous  
Units: ug/L

Batch Id: HP\_N991008111700

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	47	94.0	72 - 128
Benzene	ND	50	49	98.0	61 - 119
Toluene	ND	50	50	100	65 - 125
EthylBenzene	ND	50	50	100	70 - 118
O Xylene	ND	50	50	100	72 - 117
M & P Xylene	ND	100	100	100	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	21		105	23
BENZENE	ND	20	22	110	24	120	8.70	21	32 - 164
TOLUENE	ND	20	22	110	24	120	8.70	20	38 - 159
ETHYLBENZENE	ND	20	22	110	24	120	8.70	19	52 - 142
O XYLENE	ND	20	22	110	24	120	8.70	18	53 - 143
M & P XYLENE	ND	40	43	108	48	120	10.5	17	53 - 144

\* = Values outside QC Range due to Matrix Interference (except RPD)

\* = 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)

Analyst: WLR

Sequence Date: 10/08/99

SPL ID of sample spiked: 9909973-02A

Sample File ID: N\_J1167.TX0

Method Blank File ID:

Blank Spike File ID: N\_J1157.TX0

Matrix Spike File ID: N\_J1194.TX0

Matrix Spike Duplicate File ID: N\_J1195.TX0

SAMPLES IN BATCH(SPL ID):

9910219-03A 9909973-10A 9910078-02A 9910073-02A  
 9910066-01A 9910066-02A 9910066-04A 9910066-07A  
 9910070-01A 9909973-01A 9910219-03A 9909973-02A  
 9910219-04A 9910070-02A 9910073-03A 9910219-01A  
 9910219-02A





\* SPL BATCH QUALITY CONTROL REPORT \*\*  
California LUPT Manual for Gasoline

**HOUSTON LABORATORY**  
8880 INTERCHANGE DRIVE  
HOUSTON, TEXAS 77054  
PHONE (713) 680-0901

Matrix: Aqueous  
Units: mg/L

Batch Id: HP\_N991007141300

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	1.2	120	64 - 131

M A T R I X S P I K E S

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	0.48	0.90	1.5	113	1.5	113	0	36	36 - 160

Analyst: WLR

Sequence Date: 10/07/99

SPL ID of sample spiked: 9910066-03A

Sample File ID: NNJ1132.TX0

Method Blank File ID:

Blank Spike File ID: NNJ1124.TX0

Matrix Spike File ID: NNJ1128.TX0

Matrix Spike Duplicate File ID: NNJ1129.TX0

\* = Values outside QC Range due to Matrix Interference (except RPD)

« = 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 =  $|( <4> - <5> | / [( <4> + <5> ) \times 0.5] \times 100$

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

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

SAMPLES IN BATCH(SPL ID):

9910066-05A 9910066-06A 9910066-07A 9910070-01A  
9910070-03A 9910072-01A 9910072-02A 9910073-01A  
9910073-02A 9910073-03A 9910078-01A 9910078-02A  
9910066-03A 9910066-01A 9910066-02A 9910066-04A



\* SPL BATCH QUALITY CONTROL REPORT \*\*  
METHOD 8010\*\*\*

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

Matrix: Aqueous  
Units: µg/L

Batch Id: HP\_X991004105900

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 %	
Dichlorodifluoromethane	ND	20	20	100	9 - 168
Chloromethane	ND	20	19	95.0	11 - 139
Vinyl chloride	ND	20	18	90.0	51 - 126
Bromomethane	ND	20	19	95.0	34 - 141
Chloroethane	ND	20	18	90.0	27 - 174
Trichlorofluoromethane	ND	20	19	95.0	60 - 140
1,1-Dichloroethene	ND	20	19	95.0	51 - 132
Methylene chloride	ND	20	19	95.0	44 - 151
Trans-1,2-Dichloroethene	ND	20	19	95.0	50 - 155
1,1-Dichloroethane	ND	20	18	90.0	52 - 132
Chloroform	ND	20	18	90.0	75 - 124
1,1,1-Trichloroethane	ND	20	19	95.0	41 - 138
Carbon tetrachloride	ND	20	18	90.0	61 - 124
1,2-Dichloroethane	ND	20	19	95.0	79 - 121
Trichloroethene	ND	20	18	90.0	36 - 146
1,2-Dichloropropane	ND	20	19	95.0	44 - 151
Bromodichloromethane	ND	20	18	90.0	65 - 135
cis-1,3-Dichloropropene	ND	20	20	100	59 - 149
trans-1,3-Dichloropropene	ND	20	21	105	79 - 121
1,1,2-Trichloroethane	ND	20	21	105	66 - 129
Tetrachloroethene	ND	20	19	95.0	79 - 121
Dibromochloromethane	ND	20	21	105	52 - 148
Chlorobenzene	ND	20	18	90.0	84 - 126
Bromoform	ND	20	21	105	48 - 132
1,1,2,2-Tetrachloroethane	ND	20	21	105	51 - 151
1,3-Dichlorobenzene	ND	20	20	100	75 - 124
1,4-Dichlorobenzene	ND	20	21	105	72 - 125
1,2-Dichlorobenzene	ND	20	20	100	20 - 190

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
			DICHLORODIFLUOROMETHANE	ND	20	4.6			
CHLOROMETHANE	ND	20	11	55.0	10	50.0	9.52	29	39 - 175
VINYL CHLORIDE	ND	20	14	70.0	13	65.0	7.41	44	32 - 156
BROMOMETHANE	ND	20	18	90.0	18	90.0	0	52	26 - 180
CHLOROETHANE	ND	20	19	95.0	19	95.0	0	42	27 - 174
TRICHLOROFUOROMETHANE	ND	20	21	105	21	105	0	38	36 - 163



Matrix: Aqueous  
Units: µg/L

Batch ID: HP\_X991004105900

MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results <2>	Spike Added <3>	Matrix Spike		Matrix Spike Duplicate		MS/MSD Relative % Difference	QC Limits(***) (Advisory)	
			Result	Recovery	Result	Recovery		RPD Max.	Recovery Range
			<1>	<4>	<1>	<5>			
1,1-DICHLOROETHENE	ND	20	24	120	24	120	0	42	57 - 140
METHYLENE CHLORIDE	ND	20	21	105	23	115	9.09	32	67 - 137
TRANS-1,2-DICHLOROETHENE	ND	20	25	125	25	125	0	31	58 - 154
1,1-DICHLOROETHANE	ND	20	24	120	24	120	0	50	47 - 132
CHLOROFORM	ND	20	24	120	24	120	0	40	53 - 132
1,1,1-TRICHLOROETHANE	ND	20	24	120	24	120	0	27	34 - 135
CARBON TETRACHLORIDE	ND	20	24	120 *	24	120 *	0	32	54 - 111
1,2-DICHLOROETHANE	ND	20	23	115	23	115	0	50	49 - 155
TRICHLOROETHENE	ND	20	24	120	25	125	4.08	29	30 - 146
1,2-DICHLOROPROPANE	ND	20	23	115	24	120	4.26	41	44 - 123
BROMODICHLOROMETHANE	ND	20	22	110	22	110	0	38	49 - 179
CIS-1,3-DICHLOROPROPENE	ND	20	22	110	22	110	0	34	38 - 137
TRANS-1,3-DICHLOROPROPENE	ND	20	24	120	23	115	4.26	47	38 - 164
1,1,2-TRICHLOROETHANE	ND	20	24	120	24	120	0	43	45 - 128
TETRACHLOROETHENE	ND	20	24	120	23	115	4.26	38	17 - 138
DIBROMOCHLOROMETHANE	ND	20	24	120	25	125	4.08	41	38 - 162
CHLOROBENZENE	ND	20	23	115	23	115	0	50	58 - 122
BROMOFORM	ND	20	25	125	24	120	4.08	49	31 - 174
1,1,2,2-TETRACHLOROETHANE	ND	20	23	115	24	120	4.26	50	21 - 181
1,3-DICHLOROBENZENE	ND	20	23	115	23	115	0	36	24 - 151
1,4-DICHLOROBENZENE	ND	20	22	110	24	120	8.70	12	46 - 150
1,2-DICHLOROBENZENE	ND	20	22	110	23	115	4.44	12	44 - 153

\* = Values outside QC Range due to Matrix Interference (except RPD)

< = 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 Limits (1st Q '97)

(\*\*\*) = Source: SPL-Houston Historicals 1st Quarter '97

Analyst: YN

Sequence Date: 10/04/99

SPL ID of sample spiked: 9910078-02B

Sample File ID: XXJ1010.TX0

Method Blank File ID:

Blank Spike File ID: XXJ1004.TX0

Matrix Spike File ID: XXJ1005.TX0

Matrix Spike Duplicate File ID: XXJ1006.TX0

SAMPLES IN BATCH(SPL ID): 9910078-02B 9910078-01B

*CHAIN OF CUSTODY*  
*AND*  
*SAMPLE RECEIPT CHECKLIST*



9910078

300

### CHAIN OF CUSTODY

No. 118682

Page \_\_\_\_\_ of \_\_\_\_\_

CONSULTANT'S NAME <b>Blain Tech Services, Inc.</b>		CONSULTANT'S ADDRESS <b>1680 Rogers Ave., San Jose, CA 95112</b>	
BP SITE NUMBER <b>11102</b>	BP SITE / FACILITY ADDRESS <b>100 MacArthur Blvd., Oakland</b>		CONSULTANT PROJECT NUMBER <b>990928-P1</b>
CONSULTANT PROJECT MANGER <b>Doug Sanders</b>	PHONE NUMBER <b>(408)573-0555 X218</b>	FAX NUMBER <b>(408)573-7771</b>	CONSULTANT CONTRACT NUMBER
BP CONTACT <b>Scott Hooton</b>	BP ADDRESS <b>295 SW 41st St., Renton, WA</b>	PHONE NUMBER <b>(425)251-0689</b>	FAX NO. <b>(425)251-0736</b>
LAB CONTACT <b>SPL - Sonia West</b>	LABORATORY ADDRESS <b>P.O. Box 20807, Houston, TX</b>	PHONE NUMBER <b>(800)969-6775</b>	FAX NO. <b>(713)660-8975</b>
BP CONTACT REQUESTING RUSH TAT (Print BP Contact Name)	RUSH REQUESTED OF (Print Consultant Contact Name)	DATE/TIME	SHIPMENT DATE
TAT: <input type="checkbox"/> 24 Hours <input type="checkbox"/> 48 hours <input type="checkbox"/> 72 hours <input type="checkbox"/> Standard 7 or 14 Days		SHIPMENT METHOD	

SAMPLE DESCRIPTION	COLLECTION DATE	COLLECTION TIME	MATRIX SOIL/WATER	CONTAINERS		PRESERVATIVE		ANALYSIS REQUIRED										COMMENTS								
				NO.	TYPE (VOL.)	LAB SAMPLE #																				
<del>A</del> <del>B</del>	9:25 ↓	9:25 9:47						← X TPH-G	← X BTEX	← X MTBE	← X TPH-D	← X 810														

SAMPLED BY (Please Print Name) <b>Paul Sanna</b>			SAMPLED BY (Signature) <i>[Signature]</i>			ADDITIONAL COMMENTS <b>3C</b>		
RELINQUISHED BY / AFFILIATION (Print Name / Signature) <i>[Signature]</i> Paul Sanna	DATE <b>10/1/99</b>	TIME <b>4:30</b>	ACCEPTED BY / AFFILIATION (Print Name / Signature)	DATE	TIME			
			<i>[Signature]</i>	<b>10/2/99</b>	<b>1000</b>			

# SPL Houston Environmental Laboratory

## Sample Login Checklist

Date: 10/2/99	Time: 1000
---------------	------------

SPL Sample ID: <div style="text-align: center; font-size: 1.2em; margin-top: 10px;">9910078</div>
--

		<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:	3	C
10	Method of sample delivery to SPL:		
	SPL Delivery		
	Client Delivery		
	FedEx Delivery (airbill #)	814372885463	
	Other:		
11	Method of sample disposal:		
	SPL Disposal	✓	
	HOLD		
	Return to Client		

Name:	Date: 10/2/99
-------	---------------



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

October 27, 1999

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

The following report contains analytical results for the sample(s) received at Southern Petroleum Laboratories (SPL) on October 16, 1999. The sample(s) was assigned to Certificate of Analysis No. (s) 9910537 and analyzed for all parameters as listed on the chain of custody.

Any data flags or quality control exceptions associated with this report will be footnoted in the analytical result 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

  
\_\_\_\_\_  
Sonia West  
Senior Project Manager



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

Southern Petroleum Laboratories, Inc.

Certificate of Analysis Number: 99-10-537

Approved for Release by:

*Sonia West*

\_\_\_\_\_  
Sonia West, Senior Project Manager

*10-27-99*

\_\_\_\_\_  
Date

Joel Grice  
Laboratory Director

Ted Yen  
Quality Assurance Officer

The attached analytical data package may not be reproduced except in full without the express written approval of this laboratory.  
The results relate only to the samples tested.  
Results reported on a Wet Weight Basis unless otherwise noted.





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

Certificate of Analysis No. H9-9910537-02

BP Oil Company  
 295 SW 41 Street Bldg.13,SteN  
 Renton, WA 98055  
 ATTN: Scott Hooton

P.O.#  
 NA , COC#118682  
 DATE: 10/26/99

PROJECT: #11102, 100 MacArthur Blvd.  
 SITE: Oakland,CA  
 SAMPLED BY: Blaine Tech Services  
 SAMPLE ID: A

PROJECT NO: 991014 D2  
 MATRIX: WATER  
 DATE SAMPLED: 10/14/99 15:30:00  
 DATE RECEIVED: 10/16/99

**ANALYTICAL DATA**

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Diesel Range Organics	0.10	0.10 P	mg/L
Surrogate	% Recovery		
n-Pentacosane	74		
California LUFT Manual for Diesel			
Analyzed by: RR			
Date: 10/22/99 05:55:00			
California TPH-D Extraction	10/20/99		
Method 3510C ***			
Analyzed by: KL			
Date: 10/20/99 11:00:00			

(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. H9-9910537-01

BP Oil Company  
 295 SW 41 Street Bldg.13,SteN  
 Renton, WA 98055  
 ATTN: Scott Hooton

P.O.#  
 NA , COC#118682  
 DATE: 10/26/99

PROJECT: #11102, 100 MacArthur Blvd.  
 SITE: Oakland, CA  
 SAMPLED BY: Blaine Tech Services  
 SAMPLE ID: B

PROJECT NO: 991014 D2  
 MATRIX: WATER  
 DATE SAMPLED: 10/14/99 15:56:00  
 DATE RECEIVED: 10/16/99

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Diesel Range Organics	0.66	0.10 P	mg/L
Surrogate	% Recovery		
n-Pentacosane	97		
California LUFT Manual for Diesel Analyzed by: RR Date: 10/22/99 05:17:00			
California TPH-D Extraction Method 3510C *** Analyzed by: KL Date: 10/20/99 11:00:00			

(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

*QUALITY CONTROL*

*DOCUMENTATION*



\* SPL BATCH QUALITY CONTROL REPORT \*\*  
California LUFT Manual for Diesel

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

Matrix: Aqueous  
Units: mg/L

Batch Id: HP\_V991021081500

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 %	
Diesel	ND	2.50	2.41	96.4	53 - 148

M A T R I X S P I K E S

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
DIESEL	0.59	2.5	2.23	65.6	2.24	66.0	0.608	39	21 - 175

Analyst: RR

Sequence Date: 10/21/99

SPL ID of sample spiked: 9910225-04C

Sample File ID: VVJ5071.TX0

Method Blank File ID:

Blank Spike File ID: VVJ5070.TX0

Matrix Spike File ID: VVJ5072.TX0

Matrix Spike Duplicate File ID: VVJ5073.TX0

\* = Values outside QC Range due to Matrix Interference (except RPD)

« = 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 =  $|( <4> - <5> | / [ ( <4> + <5> ) \times 0.5 ] \times 100$

(\*\*) = Source: SPL Historical Limits (4th Qtr '97)

(\*\*\*) = Source: SPL Historical Limits (4th Qtr '97)

SAMPLES IN BATCH(SPL ID): 9910225-04C 9910537-01A 9910537-02A

*CHAIN OF CUSTODY*  
*AND*  
*SAMPLE RECEIPT CHECKLIST*



9910537

CHAIN OF CUSTODY

No. 118682

Page 1 of 1

CONSULTANT'S NAME <b>Blain Tech Services, Inc.</b>		CONSULTANT'S ADDRESS <b>1680 Rogers Ave., San Jose, CA 95112</b>	
BP SITE NUMBER <b>11102</b>	BP SITE / FACILITY ADDRESS <b>100 McArthur Blvd., Oakland</b>		CONSULTANT PROJECT NUMBER <b>991014-D2</b>
CONSULTANT PROJECT MANGER <b>Doug Sanders Morgan Hargrave</b>	PHONE NUMBER <b>(408)573-0555 X218</b>	FAX NUMBER <b>(408)573-7771</b>	CONSULTANT CONTRACT NUMBER
BP CONTACT <b>Scott Hooton</b>	BP ADDRESS <b>295 SW 41st St., Renton, WA</b>	PHONE NUMBER <b>(425)251-0689</b>	FAX NO. <b>(425)251-0736</b>
LAB CONTACT <b>SPL - Sonia West</b>	LABORATORY ADDRESS <b>P.O. Box 20807, Houston, TX</b>	PHONE NUMBER <b>(800)969-6775</b>	FAX NO. <b>(713)660-8975</b>
BP CONTACT REQUESTING RUSH TAT (Print BP Contact Name)	RUSH REQUESTED OF (Print Consultant Contact Name)	DATE/TIME	SHIPMENT DATE

TAT:  24 Hours  48 Hours  72 Hours  Standard 7 or 14 Days

ANALYSIS REQUIRED

AMBIENT NUMBER **814372888245**

SAMPLE DESCRIPTION	COLLECTION DATE	COLLECTION TIME	MATRIX SOIL/WATER	CONTAINERS		PRESERVATIVE		TAT-D										COMMENTS
				NO.	TYPE (VOL.)	LAB SAMPLE #												
<del>12/14/98</del> B	10/14/98	1556	W	2	Amber			X										
<del>12/14/98</del> A	10/14/98	1530	W	2	Amber			X										

SAMPLED BY (Please Print Name) <b>DONNIE MILLER</b>			SAMPLED BY (Signature) <i>Donnie Miller</i>			ADDITIONAL COMMENTS		
RELINQUISHED BY / AFFILIATION (Print Name / Signature)	DATE	TIME	ACCEPTED BY / AFFILIATION (Print Name / Signature)	DATE	TIME			
<b>Morgan Hargrave / BSTS / 10/15/99</b>	<b>10/15/99</b>	<b>8:00am</b>	<i>Morgan Hargrave</i>	<b>10/16/99</b>	<b>1000</b>			

# SPL Houston Environmental Laboratory

## Sample Login Checklist

Date: <i>10/16/99</i>	Time: <i>1000</i>
-----------------------	-------------------

SPL Sample ID:  <i>9910537</i>
--------------------------------------

		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:		<i>4c</i>
10	Method of sample delivery to SPL:		
	SPL Delivery		
	Client Delivery		
	FedEx Delivery (airbill #)	<i>814372888295</i>	
	Other:		
11	Method of sample disposal:		
	SPL Disposal	✓	
	HOLD		
	Return to Client		

Name: <i>Robert St...</i>	Date: <i>10/16/99</i>
---------------------------	-----------------------

# **Field Data Sheets**





## BP WELL MONITORING DATA SHEET

Project #: <u>991014-DD2</u>	Station # <u>11102</u>
Sampler: <u>Donner</u>	Date: <u>10/14/99</u>
Well I.D.: <u>mw-1</u>	Well Diameter: 2 3 <u>(4)</u> 6 8 <u>    </u>
Total Well Depth: <u>32.05</u>	Depth to Water: <u>10.84</u>
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: <u>PVOTC</u> Grade	D.O. Meter (if req'd): YSI HACH

Well Diameter	Multiplier	Well Diameter	Multiplier
2"	0.16	5"	1.02
3"	0.37	6"	1.47
4"	0.65	Other	radius <sup>2</sup> * 0.163

Purge Method: Bailer      Sampling Method: Bailer

Disposable Bailer       Disposable Bailer  
 Middleburg       Extraction Port  
 Electric Submersible      Other: \_\_\_\_\_  
 Extraction Pump

Other: \_\_\_\_\_

<u>13.7</u>	x	<u>3</u>	=	<u>41.3</u>	Gals.
I Case Volume (Gals.)		Specified Volumes		Calculated Volume	

Time	Temp (°F)	pH	Cond.	Gals. Removed	Observations
<u>1547</u>	<u>71.0</u>	<u>6.9</u>	<u>764.9</u>	<u>14</u>	
<u>1549</u>	<u>69.8</u>	<u>6.8</u>	<u>873.8</u>	<u>28</u>	<u>CLOUDY / OILY</u>
<u>1551</u>	<u>70.1</u>	<u>7.0</u>	<u>817.6</u>	<u>42</u>	<u>    "    "</u>

Did well dewater? Yes  NO      Gallons actually evacuated: 42

Sampling Time: 1556      Sampling Date: 10/14/99

Sample I.D. (Blind): B      Laboratory: SPL      Other: \_\_\_\_\_

Analyzed for: TPH-G BTEX MTBE TPH-D Other: \_\_\_\_\_

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

## BP WELL MONITORING DATA SHEET

Project #: <u>99/014</u>	Station # <u>1102</u>
Sampler: <u>Don't mix</u>	Date: <u>10/14/99</u>
Well I.D.: <u>mw-2</u>	Well Diameter: 2 3 <u>(4)</u> 6 8 <u>    </u>
Total Well Depth: <u>32.37</u>	Depth to Water: <u>10.27</u>
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: <u>PVC</u> Grade	D.O. Meter (if req'd): YSI HACH

Well Diameter	Multiplier	Well Diameter	Multiplier
2"	0.16	5"	1.02
3"	0.37	6"	1.47
4"	0.65	Other	radius <sup>2</sup> * 0.163

Purge Method:

- Bailer
- Disposable Bailer
- Middleburg
- Electric Submersible
- Extraction Pump

Other: \_\_\_\_\_

Sampling Method:

- Bailer
- Disposable Bailer
- Extraction Port

Other: \_\_\_\_\_

<u>14.3</u>	x	<u>3</u>	=	<u>43.0</u>	Gals.
1 Case Volume (Gals.)		Specified Volumes		Calculated Volume	

Time	Temp (°F)	pH	Cond.	Gals. Removed	Observations
<u>1522</u>	<u>72.4</u>	<u>7.1</u>	<u>856.5</u>	<u>15</u>	
<u>1524</u>	<u>70.9</u>	<u>6.8</u>	<u>3547</u>	<u>29</u>	
<u>1526</u>	<u>71.8</u>	<u>6.9</u>	<u>3046</u>	<u>43</u>	

Did well dewater? Yes  No  Gallons actually evacuated: 43

Sampling Time: 1530 Sampling Date: 10/14/99

Sample I.D. (Blind): A Laboratory: SPL Other: \_\_\_\_\_

Analyzed for: TPH-G BTEX MTBE TPH-D Other: \_\_\_\_\_

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
	O.R.P. (if req'd):	Pre-purge:	mV	Post-purge: