BP OIL

BP Oil Company
Environmental Remediation Management
295 SW 41st Street
Renton, Washington 98055-3931
(425) 251-0667
Fax No. (425) 251-0736

97 NOV -7 PM 3:53

November 4, 1997

Alameda County Health Care Services Agency
Attention Ms. Susan Hugo
1131 Harbor Bay Parkway, Ste. 250
Alameda, CA 94502-6577

RE: BP Oil Site No. 11126
1700 Powell St. (at Christie)
Emeryville, CA

Dear Ms. Hugo:

Enclosed please find a report titled Groundwater Monitoring and Sampling Report, dated 6 October 1997.

The report shows that aromatic petroleum constituents were detected in groundwater samples collected from four of the five wells sampled this quarter. The highest benzene concentration (26,000 ug/l) was reported in a sample obtained from well MW-9, located between the underground storage tanks and the product dispensers.

You will also note that MTBE was detected in several of the wells, and that concentrations appear to have increased over time. It is noted that the underground storage tank system will require upgrading to comply with 1998 federal requirements for leak detection and prevention. I understand that this will include the installation of turbine riser sumps, dispenser pans and spill buckets around the fill tubes for the underground storage tanks. The lack of these prophylactic appurtenances most likely explains the variable MTBE concentrations detected in groundwater samples collected from the monitoring wells installed at this site.

Please give me a call if you have any questions, comments or concerns regarding this matter. I can be reached at (206) 251-0689.

Sincerely,

Scott Hooton
Environmental Remediation Management

attachment

cc: B. Nagle - Alisto
K. Graves - CRWQCB-SFBR

GROUNDWATER MONITORING AND SAMPLING REPORT

BP Oil Company Service Station No. 11126
1700 Powell Street
Emeryville, California

Project No. 10-061-08-001

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 6, 1997

William Howell
Project Manager

Al Sevilla, P.E.
Principal

GROUNDWATER MONITORING AND SAMPLING REPORT

BP Oil Company Service Station No. 11126
1700 Powell Street
Emeryville, California

Project No. 10-061-08-001

October 6, 1997

INTRODUCTION

This report presents the results and findings of the August 11, 1997 groundwater monitoring and sampling conducted by Alisto Engineering Group at BP Oil Company Service Station No. 11126, 1700 Powell Street, Emeryville, California. A site vicinity map is shown on Figure 1.

FIELD PROCEDURES

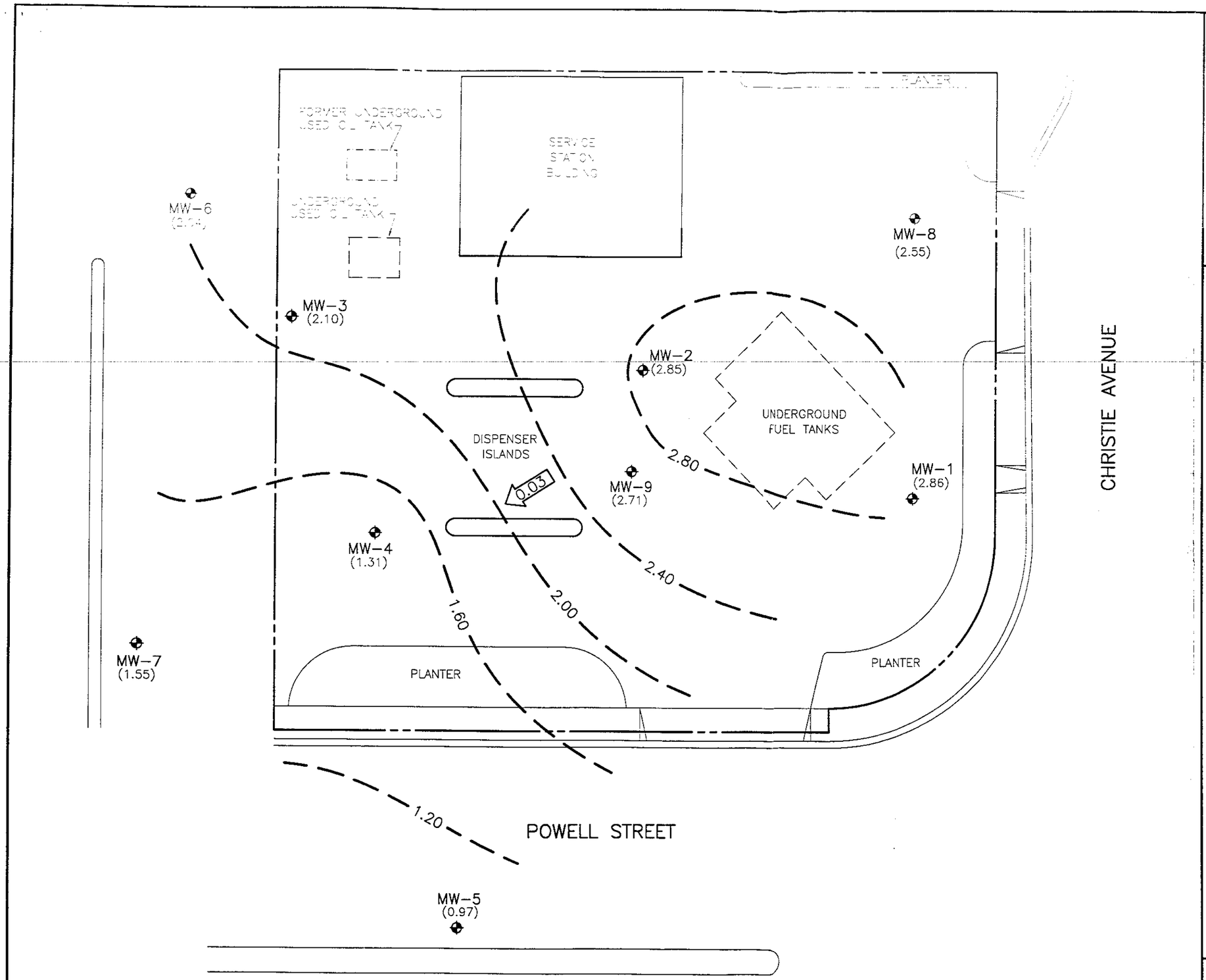
Field activities were performed in accordance with the procedures and guidelines of the Alameda County Health Care Services Agency and the California Regional Water Quality Control Board, San Francisco Bay Region.

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.

FREE PRODUCT MONITORING AND RECOVERY

A passive product recovery canister has been installed in Monitoring Well MW-9 to recover liquid-phase product. Product thicknesses for this and previous monitoring events are presented in Table 1. The volume of free product recovered from the well is presented in Table 2.



N

0 20 40

SCALE IN FEET

LEGEND

- ◆ GROUNDWATER MONITORING WELL
- (2.71) GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL
- 2.80 GROUNDWATER ELEVATION CONTOUR IN FEET ABOVE MEAN SEA LEVEL (CONTOUR INTERVAL=0.40 FOOT)
- 0.03 CALCULATED GROUNDWATER GRADIENT DIRECTION AND MAGNITUDE IN FOOT PER FOOT

FIGURE 2

POTENTIOMETRIC GROUNDWATER ELEVATION CONTOUR MAP

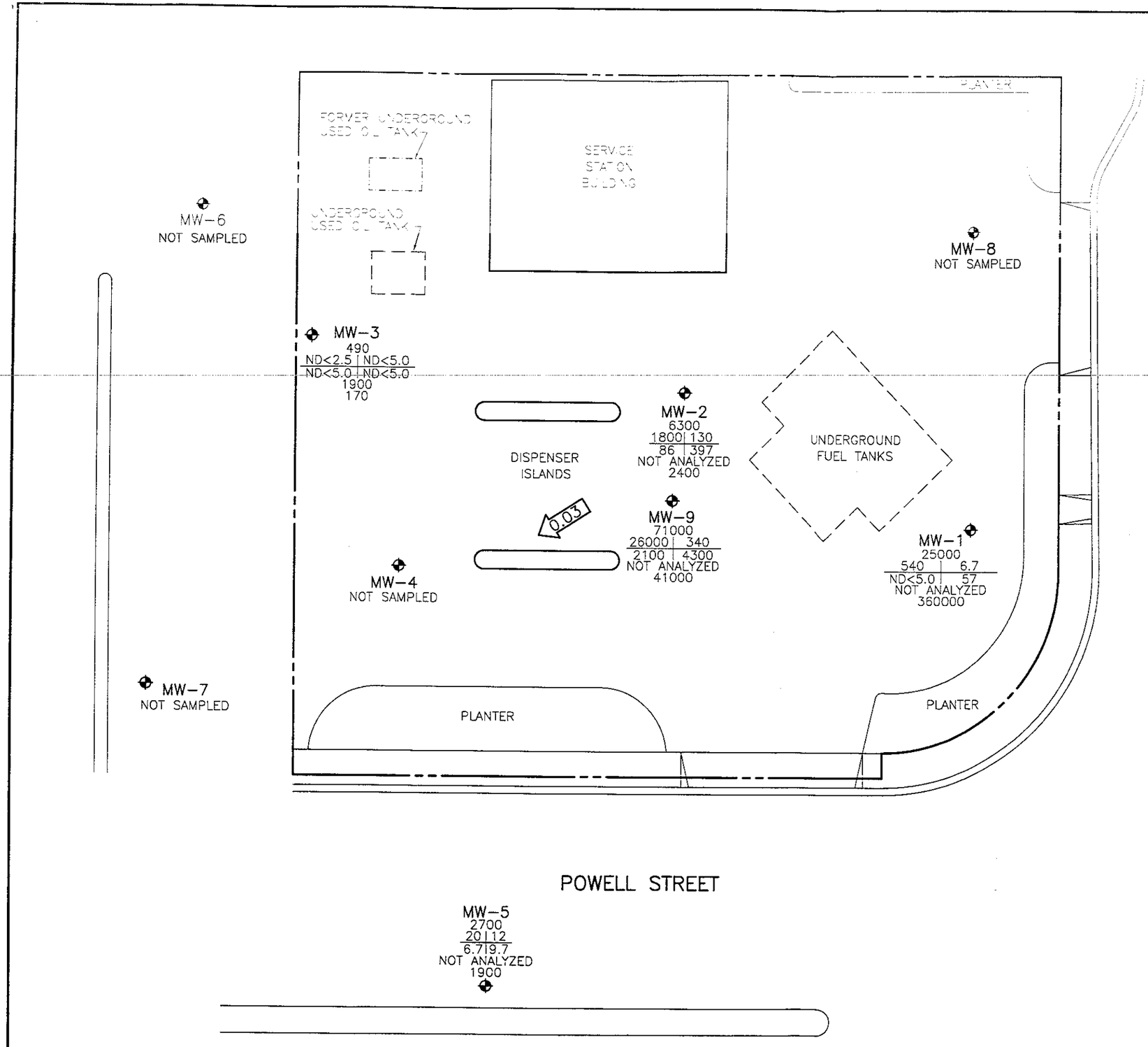
AUGUST 11, 1997

BP OIL SERVICE STATION NO. 11126
1700 POWELL STREET
EMERYVILLE, CALIFORNIA

PROJECT NO. 10-061

ALISTO ENGINEERING GROUP
WALNUT CREEK, CALIFORNIA

10061D-W.DWG 9-17-97 DRM 1"=20



N

0 20 40

SCALE IN FEET

LEGEND

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

FIGURE 3

CONCENTRATIONS OF PETROLEUM HYDROCARBONS IN GROUNDWATER

AUGUST 11, 1997

BP OIL SERVICE STATION NO. 11126
1700 POWELL STREET
EMERYVILLE, CALIFORNIA

PROJECT NO. 10-061

ALISTO ENGINEERING GROUP
WALNUT CREEK, CALIFORNIA

10061E-W.DWG 10-2-97 DGM 1=20

APPENDIX A

WATER SAMPLING FIELD SURVEY FORMS

ALISTO

Field Report / Sampling Data Sheet

ENGINEERING
GROUP
1575 TREAT BOULEVARD, SUITE 201

Project No. 10-061-08-001 Date: 8/11/97
Address 1700 Powell St. Day: M T W TH F
Contract No. H177106 City: Emeryville
Station No. BP 11126 Sampler: LB

DEPTH TO GROUNDWATER SUMMARY

WELL ID	SAMPLE ID	WELL DIAM	TOTAL DEPTH	DEPTH TO WATER	PRODUCT THICKNESS	TIME MONITORED	COMMENTS:
MW-1	S-4	2"	11.62'	4.90	ϕ	1150	
MW-2	S-3	2"	11.91'	5.71		1145	
MW-3	S-1	2"	12.08'	6.15		1132	needs 9/16 bolts (3)
MW-4	S	2"	11.06'	6.81		1110	ANNUAL
MW-5	S-2	2"	13.70'	6.72		1140	
MW-6	S-4 NB	2"	13.25'	6.48		1113	ANNUAL
MW-7	S-2	2"	13.72'	6.06		1117	ANNUAL
MW-8	S-3	2"	13.65'	6.05		1122	ANNUAL
MW-9	S-5	4"	13.85'	5.37		1125	QC-1 S-6 from this Well

FIELD INSTRUMENT CALIBRATION DATA

pH METER Icm 4.00 4 7.00 7 10.00 10 TEMPERATURE COMPENSATED (Y) N TIME 1215

D.O. METER Icm ZERO d.O. SOLUTION _____ BAROMETRIC PRESSURE 760 TEMP 62 WEATHER Clear

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

LEAK DETECTOR : _____ ALARM MODE _____ NON ALARM MODE

Well ID	Depth to Water	Diam	Cap/Lock	Product Depth	Iridescence	Gal.	Time	Temp °F	pH	E.C.	D.O.
MW-3	6.15	2"	DK	ϕ	Y (N)	1	1320	78.8	7.11	5.31ms	6.2
						2		77.1	7.09	5.36ms	
						3	1328	78.1	7.39	5.33ms	7.4

Total Depth - Water Level= x Well Vol. Factor= x#vol. to Purge PurgeVol.
12.08-6.15 = 5.93 x .16 = .95x3 = 2.85

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

Comments:

O EPA 601____
X TPH-G/BTEX___
O TPH Diesel____
O TOG 5520 ___
TIME/SAMPLE ID
1:30 / S-1

Well ID	Depth to Water	Diam	Cap/Lock	Product Depth	Iridescence	Gal.	Time	Temp °F	pH	E.C.	D.O.
MW-5	6.72	2"	OK	ϕ	Y (N)	1	1345	76.1	7.39	2.08ms	7.9
						2.5		76.8	7.21	1.06ms	
						3.5	1357		7.18		8.5

Total Depth - Water Level= x Well Vol. Factor= x#vol. to Purge PurgeVol.
13.70-6.72 =

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

Comments:

O EPA 601____
X TPH-G/BTEX___
O TPH Diesel____
O TOG 5520 ___
TIME/SAMPLE ID
1359

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. 10-061-08-001 Date: 8/11/97
Address 1700 Powell St. Day: (M) T W TH F
Contract No. H177106 City: Emeryville
Station No. BP 11126 Sampler: LB

MW-2

Well ID	Depth to Water	Diam	Cap/Lock	Product Depth	Iridescence
MW-2	5.71	2"	OK	∅	Y (N)

Total Depth - Water Level= x Well Vol. Factor= x#vol. to Purge PurgeVol.
11.91 - 5.71 = 6.2 x .16 = .99 x 3 = 2.97

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

Comments:

Gal.	Time	Temp °F	pH	E.C.	D.O.
1	1400	75.2	7.63	1.22mS	6.6
2		76.4	7.51	1.16mS	8.2
3	1407	77.6	7.69	1.11mS	8.3

- O EPA 601_____
- O TPH-G/BTEX___
- O TPH Diesel____
- O TOG 5520 ___

TIME/SAMPLE ID: 14:08 | 5-3

MW-1

Well ID	Depth to Water	Diam	Cap/Lock	Product Depth	Iridescence
MW-1	4.90	2"	OK	∅	Y (N)

Total Depth - Water Level= x Well Vol. Factor= x#vol. to Purge PurgeVol.
11.62 - 4.90 = 6.72 x .16 = 1.08 x 3 = 3.24

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

Comments:

Gal.	Time	Temp °F	pH	E.C.	D.O.
1	1418	74.5	7.34	1.68mS	8.1
2		76.1	7.25	1.63mS	
3.5	1423	76.7	7.21	1.60mS	7.9

- O EPA 601_____
- X TPH-G/BTEX___
- O TPH Diesel____
- O TOG 5520 ___

TIME/SAMPLE ID: 14:25 | 5-4

MW-9

Well ID	Depth to Water	Diam	Cap/Lock	Product Depth	Iridescence
MW-9	5.37	4"	OK	∅	(Y) N

Total Depth - Water Level= x Well Vol. Factor= x#vol. to Purge PurgeVol.
13.85 - 5.37 = 8.48 x .65 = 5.51 x 3 = 16.53

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

Comments:

Gal.	Time	Temp °F	pH	E.C.	D.O.
4	1440	75.0	7.47	2.01mS	7.9
10		76.8	7.53	2.00mS	
17	1452	79.3	7.71	2.06mS	9.1

- O EPA 601_____
- X TPH-G/BTEX___
- O TPH Diesel____
- O TOG 5520 ___

TIME/SAMPLE ID: 14:35 | 5-5

Well ID | Depth to Water | Diam | Cap/Lock | Product Depth | Iridescence Y N

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

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

Comments:

Gal.	Time	Temp °F	pH	E.C.	D.O.

- O EPA 601_____
- O TPH-G/BTEX___
- O TPH Diesel____
- O TOG 5520 ___

TIME/SAMPLE ID:

Well ID | Depth to Water | Diam | Cap/Lock | Product Depth | Iridescence Y N

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

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

Comments:

Gal.	Time	Temp °F	pH	E.C.	D.O.

- O EPA 601_____
- O TPH-G/BTEX___
- O TPH Diesel____
- O TOG 5520 ___

TIME/SAMPLE ID:

APPENDIX B

LABORATORY REPORT AND CHAIN OF CUSTODY RECORD

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

September 25, 1997

Mr. Bill Howell/Mr. Brady Nagle
Alisto Engineering
1575 Treat Boulevard
Walnut Creek, CA 94598

The following report contains a corrected analytical result for the MTBE compound for a sample received at Southern Petroleum Laboratories (SPL) on August 14, 1997 . The sample was assigned to Certificate of Analysis No.9708590-05 and analyzed for all parameters as listed on the chain of custody.

The original result for MTBE was taken from a rerun since the sample run prior to the original run was high in MTBE and the analyst was concerned about MTBE carryover. Since MTBE is not a compound that historically carries over, we are able to report the MTBE value from the first run. The original result was 41000ug/L with a detection limit of 1000ug/L, and the corrected result is 26000ug/L with a detection limit of 1000ug/L.

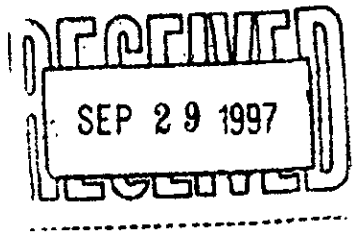
There were no analytical problems encountered with this sample and all quality control data was within acceptance limits.

Please discard the original results page for 9708590-05 and replace it with this "corrected copy" page.

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
Shannon Tyrell
Client Services Representative



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

Southern Petroleum Laboratories, Inc.

Certificate of Analysis Number 97-08-590

Approved for Release by:

Brett VanDelinder, Project Manager

8-25-97
Date:

Greg Grandits
Laboratory Director

Idelis Williams
Quality Assurance Officer

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

Certificate of Analysis No. H9-9708590-01

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

P.O.# H177106, COC#079345
DATE: 08/25/97

PROJECT: BP Oil #11126
SITE: Emeryville, CA
SAMPLED BY: Alisto Engineering
SAMPLE ID: S-1

PROJECT NO: 10-061-8-1
MATRIX: WATER
DATE SAMPLED: 08/11/97
DATE RECEIVED: 08/14/97

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
MTBE	170	50 P	µg/L
Benzene	ND	2.5 P	µg/L
Toluene	ND	5.0 P	µg/L
Ethylbenzene	ND	5.0 P	µg/L
Total Xylene	ND	5.0 P	µg/L
Surrogate	**% Recovery**		
1,4-Difluorobenzene	93		
4-Bromofluorobenzene	120		
Method 8020A***			
Analyzed by: JN			
Date: 08/20/97			
Total Petroleum Hydrocarbons-Gasoline	0.49	0.25 P	mg/L
Surrogate	**% Recovery**		
1,4-Difluorobenzene	80		
4-Bromofluorobenzene	87		
California LUFT Manual			
Analyzed by: JN			
Date: 08/20/97 06:42:00			
Total Petroleum Hydrocarbons-Diesel	1.9	0.1 P	mg/L
Surrogate	**% Recovery**		

(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.

COMMENTS: Sample contains petroleum hydrocarbons from c10-c24 that do not resemble a diesel pattern. (c10-c24) RR

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. H9-9708590-01

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

P.O.# H177106, COC#079345
DATE: 08/25/97

PROJECT: BP Oil #11126
SITE: Emeryville, CA
SAMPLED BY: Alisto Engineering
SAMPLE ID: S-1

PROJECT NO: 10-061-8-1
MATRIX: WATER
DATE SAMPLED: 08/11/97
DATE RECEIVED: 08/14/97

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
n-Pentacosane	MI 161		
Modified 8015A - Diesel ***			
Analyzed by: RR/			
Date: 08/21/97 10:23:00			
Liquid-liquid extraction	08/18/97		
Method 3510B ***			
Analyzed by: DL			
Date: 08/18/97 08:00:00			
Hydrocarbons by Gravimetry	ND	5	mg/L
Method 5520 B & F **			
Analyzed by: DB			
Date: 08/15/97 10:00:00			

MI - Matrix interference. 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.

COMMENTS: Sample contains petroleum hydrocarbons from c10-c24 that do not resemble a diesel pattern. (c10-c24) RR

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. H9-9708590-01

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

P.O.# H177106, COC#079345
08/25/97

PROJECT: BP Oil #11126
SITE: Emeryville, CA
SAMPLED BY: Alisto Engineering
SAMPLE ID: S-1

PROJECT NO: 10-061-8-1
MATRIX: WATER
DATE SAMPLED: 08/11/97
DATE RECEIVED: 08/14/97

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
2-Chloroethylvinyl ether	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: 601, Halogenated Volatile Organics

(continued on next page)

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

Certificate of Analysis No. H9-9708590-01

BP Oil Company

SAMPLE ID: S-1

SURROGATES	**% RECOVERY**
1-Chloro-2-Fluorobenzene	94

ANALYZED BY: RL DATE/TIME: 08/18/97 08:28:00
METHOD: 601, 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

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

Certificate of Analysis No. H9-9708590-02

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

P.O.# H177106, COC#079345
DATE: 08/25/97

PROJECT: BP Oil #11126
SITE: Emeryville, CA
SAMPLED BY: Alisto Engineering
SAMPLE ID: S-2

PROJECT NO: 10-061-8-1
MATRIX: WATER
DATE SAMPLED: 08/11/97
DATE RECEIVED: 08/14/97

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
MTBE	1900	50 P	µg/L
Benzene	20	2.5 P	µg/L
Toluene	12	5.0 P	µg/L
Ethylbenzene	6.7	5.0 P	µg/L
Total Xylene	9.7	5.0 P	µg/L
Surrogate	**% Recovery**		
1,4-Difluorobenzene	107		
4-Bromofluorobenzene	140MI		
Method 8020A***			
Analyzed by: JN			
Date: 08/20/97			
Total Petroleum Hydrocarbons-Gasoline	2.7	0.25 P	mg/L
Surrogate	**% Recovery**		
1,4-Difluorobenzene	120		
4-Bromofluorobenzene	133		
California LUFT Manual			
Analyzed by: JN			
Date: 08/20/97 07:10:00			

(P) - Practical Quantitation Limit MI - Matrix interference.

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. H9-9708590-03

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

P.O.# H177106, COC#079345
DATE: 08/25/97

PROJECT: BP Oil #11126
SITE: Emeryville, CA
SAMPLED BY: Alisto Engineering
SAMPLE ID: S-3

PROJECT NO: 10-061-8-1
MATRIX: WATER
DATE SAMPLED: 08/11/97
DATE RECEIVED: 08/14/97

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
MTBE	2400	100 P	µg/L
Benzene	1800	5 P	µg/L
Toluene	130	10 P	µg/L
Ethylbenzene	86	10 P	µg/L
Total Xylene	397	10 P	µg/L
Surrogate	**% Recovery**		
1,4-Difluorobenzene	103		
4-Bromofluorobenzene	120		
Method 8020A***			
Analyzed by: JN			
Date: 08/20/97			
Total Petroleum Hydrocarbons-Gasoline	6.3	0.5 P	mg/L
Surrogate	**% Recovery**		
1,4-Difluorobenzene	93		
4-Bromofluorobenzene	87		
California LUFT Manual			
Analyzed by: JN			
Date: 08/20/97 07:38:00			

(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. H9-9708590-04

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

P.O.# H177106, COC#079345
DATE: 08/25/97

PROJECT: BP Oil #11126
SITE: Emeryville, CA
SAMPLED BY: Alisto Engineering
SAMPLE ID: S-4

PROJECT NO: 10-061-8-1
MATRIX: WATER
DATE SAMPLED: 08/11/97
DATE RECEIVED: 08/14/97

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
MTBE	360000	25000 P	µg/L
Benzene	540	2.5 P	µg/L
Toluene	6.7	5.0 P	µg/L
Ethylbenzene	ND	5.0 P	µg/L
Total Xylene	57	5.0 P	µg/L
Surrogate	**% Recovery**		
1,4-Difluorobenzene	97		
4-Bromofluorobenzene	77		
Method 8020A***			
Analyzed by: VHZ			
Date: 08/22/97			
Total Petroleum Hydrocarbons-Gasoline	25	0.25 P	mg/L
Surrogate	**% Recovery**		
1,4-Difluorobenzene	1130MI		
4-Bromofluorobenzene	100		
California LUFT Manual			
Analyzed by: JN			
Date: 08/20/97 08:06:00			

(P) - Practical Quantitation Limit ND - Not detected.
MI - Matrix interference.

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

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PHONE (713)660-0901

Certificate of Analysis No. H9-9708590-05

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

P.O.# H177106, COC#079345
DATE: 09/24/97

PROJECT: BP Oil #11126
SITE: Emeryville, CA
SAMPLED BY: Alisto Engineering
SAMPLE ID: S-5

PROJECT NO: 10-061-8-1
MATRIX: WATER
DATE SAMPLED: 08/11/97
DATE RECEIVED: 08/14/97

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
MTBE	26000	1000 P	µg/L
Benzene	12000	50 P	µg/L
Toluene	340	100 P	µg/L
Ethylbenzene	2100	100 P	µg/L
Total Xylene	4300	100 P	µg/L
Surrogate	**% Recovery**		
1,4-Difluorobenzene	93		
4-Bromofluorobenzene	123		
Method 8020A***			
Analyzed by: VHZ			
Date: 08/20/97			
Total Petroleum Hydrocarbons-Gasoline	71	5 P	mg/L
Surrogate	**% Recovery**		
1,4-Difluorobenzene	103		
4-Bromofluorobenzene	90		
California LUFT Manual			
Analyzed by: JN			
Date: 08/20/97 08:34:00			

(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.

CORRECTED COPY

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Certificate of Analysis No. H9-9708590-06

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

P.O.# H177106, COC#079345
DATE: 08/25/97

PROJECT: BP Oil #11126
SITE: Emeryville, CA
SAMPLED BY: Alisto Engineering
SAMPLE ID: S-6

PROJECT NO: 10-061-8-1
MATRIX: WATER
DATE SAMPLED: 08/11/97
DATE RECEIVED: 08/14/97

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
MTBE	27000	1000 P	µg/L
Benzene	14000	50 P	µg/L
Toluene	360	100 P	µg/L
Ethylbenzene	3200	100 P	µg/L
Total Xylene	5790	100 P	µg/L
Surrogate	**% Recovery**		
1,4-Difluorobenzene	113		
4-Bromofluorobenzene	127		
Method 8020A***			
Analyzed by: JN			
Date: 08/20/97			
Total Petroleum Hydrocarbons-Gasoline	100	5 P	mg/L
Surrogate	**% Recovery**		
1,4-Difluorobenzene	130		
4-Bromofluorobenzene	100		
California LUFT Manual			
Analyzed by: JN			
Date: 08/20/97 09:02:00			

(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.
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QUALITY CONTROL

DOCUMENTATION

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Modified 8015A - Diesel * BATCH#:HPTT970819094100**
WORK ORDER: 9708590-01C **CLIENT SAMPLE ID:** S-1

	AMOUNT ADDED	CONC. MEASURED	RECOVERY	LIMITS
n-Pentacosane	50	80.39	161 «	50- 150

Modified 8015A - Diesel * BATCH#:HPTT970819094100**
WORK ORDER: Method Blank **CLIENT SAMPLE ID:**

n-Pentacosane	50	41.69		50- 150

Modified 8015A - Diesel * BATCH#:HPTT970819094100**
WORK ORDER: LCS **CLIENT SAMPLE ID:**

n-Pentacosane	50	41.15	82.3	50- 150

Modified 8015A - Diesel * BATCH#:HPTT970819094100**
WORK ORDER: Matrix Spike **CLIENT SAMPLE ID:** 9708591-02B

n-Pentacosane	50	47.80	96	50- 150

Modified 8015A - Diesel * BATCH#:HPTT970819094100**
WORK ORDER: Matrix Spike Dup. **CLIENT SAMPLE ID:** 9708591-02B

n-Pentacosane	50	43.42	87	50- 150

Method 601 40 CFR PART 136 BATCH#:HP_F970818123000
WORK ORDER: 9708590-01B **CLIENT SAMPLE ID:** S-1

1-Chloro-2-Fluorobenzene		94	94	56- 130

Method 8010B * BATCH#:HP_F970818123000**
WORK ORDER: Method Blank **CLIENT SAMPLE ID:**

1-Chloro-2-Fluorobenzene		92		56- 130

Method 8020A* BATCH#:HP_R970820044800**
WORK ORDER: 9708590-01A **CLIENT SAMPLE ID:** S-1

1,4-Difluorobenzene	30	28.0000	93	70- 131
4-Bromofluorobenzene	30	36.0000	120	43- 135

Method 8020A* BATCH#:HP_R970820044800**
WORK ORDER: 9708590-02A **CLIENT SAMPLE ID:** S-2

1,4-Difluorobenzene	30	32.0000	107	70- 131
4-Bromofluorobenzene	30	42.0000	140 «	43- 135

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	AMOUNT ADDED	CONC. MEASURED	RECOVERY	LIMITS

Method 8020A* BATCH#:HP_R970820044800**
WORK ORDER: 9708590-03A **CLIENT SAMPLE ID:** S-3

1,4-Difluorobenzene	30	31.0000	103	70- 131
4-Bromofluorobenzene	30	36.0000	120	43- 135

Method 8020A* BATCH#:HP_R970820044800**
WORK ORDER: 9708590-04A **CLIENT SAMPLE ID:** S-4

1,4-Difluorobenzene	30	460.0000	1530 «	70- 131
4-Bromofluorobenzene	30	38.0000	127	43- 135

Method 8020A* BATCH#:HP_R970820044800**
WORK ORDER: 9708590-05A **CLIENT SAMPLE ID:** S-5

1,4-Difluorobenzene	30	28.0000	93	70- 131
4-Bromofluorobenzene	30	37.0000	123	43- 135

Method 8020A* BATCH#:HP_R970820044800**
WORK ORDER: 9708590-06A **CLIENT SAMPLE ID:** S-6

1,4-Difluorobenzene	30	34.0000	113	70- 131
4-Bromofluorobenzene	30	0.1700	1 «	43- 135

Method 8020A* BATCH#:HP_R970820044800**
WORK ORDER: Method Blank **CLIENT SAMPLE ID:**

1,4-Difluorobenzene	30	28	28.2	70- 131
4-Bromofluorobenzene	30	34	34.1	43- 135

Method 8020A* BATCH#:HP_R970820044800**
WORK ORDER: LCS **CLIENT SAMPLE ID:**

1,4-Difluorobenzene	30	28	93.3	70- 131
4-Bromofluorobenzene	30	35	117	43- 135

Method 8020A* BATCH#:HP_R970820044800**
WORK ORDER: Matrix Spike **CLIENT SAMPLE ID:** 9708642-08A

1,4-DIFLUOROBENZENE	30	69	230 «	70- 131
4-BROMOFLUOROBENZENE	30	51	170 «	43- 135

Method 8020A* BATCH#:HP_R970820044800**
WORK ORDER: Matrix Spike Dup. **CLIENT SAMPLE ID:** 9708642-08A

1,4-Difluorobenzene	30	67	223 «	70- 131

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	AMOUNT ADDED	CONC. MEASURED	RECOVERY	LIMITS
4-Bromofluorobenzene	30	52	173 «	43- 135

California LUFT Manual **BATCH#:**HP_R970820051700
WORK ORDER: 9708590-01A **CLIENT SAMPLE ID:**S-1

1,4-Difluorobenzene	30	24.0000	80	50- 150
4-Bromofluorobenzene	30	26.0000	87	50- 150

California LUFT Manual **BATCH#:**HP_R970820051700
WORK ORDER: 9708590-02A **CLIENT SAMPLE ID:**S-2

1,4-Difluorobenzene	30	36.0000	120	50- 150
4-Bromofluorobenzene	30	40.0000	133	50- 150

California LUFT Manual **BATCH#:**HP_R970820051700
WORK ORDER: 9708590-03A **CLIENT SAMPLE ID:**S-3

1,4-Difluorobenzene	30	28.0000	93	50- 150
4-Bromofluorobenzene	30	26.0000	87	50- 150

California LUFT Manual **BATCH#:**HP_R970820051700
WORK ORDER: 9708590-04A **CLIENT SAMPLE ID:**S-4

1,4-Difluorobenzene	30	340.0000	1130 «	50- 150
4-Bromofluorobenzene	30	30.0000	100	50- 150

California LUFT Manual **BATCH#:**HP_R970820051700
WORK ORDER: 9708590-05A **CLIENT SAMPLE ID:**S-5

1,4-Difluorobenzene	30	31.0000	103	50- 150
4-Bromofluorobenzene	30	27.0000	90	50- 150

California LUFT Manual **BATCH#:**HP_R970820051700
WORK ORDER: 9708590-06A **CLIENT SAMPLE ID:**S-6

1,4-Difluorobenzene	30	39.0000	130	50- 150
4-Bromofluorobenzene	30	30.0000	100	50- 150

California LUFT Manual **BATCH#:**HP_R970820051700
WORK ORDER: Method Blank **CLIENT SAMPLE ID:**

1,4-Difluorobenzene	30	27	27.1	50- 150
4-Bromofluorobenzene	30	24	24.1	50- 150

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	AMOUNT ADDED	CONC. MEASURED	RECOVERY	LIMITS

California LUFT Manual **BATCH#:**HP_R970820051700
WORK ORDER: LCS **CLIENT SAMPLE ID:**

1,4-Difluorobenzene	30	31	103	50- 150
4-Bromofluorobenzene	30	28	93.3	50- 150

California LUFT Manual **BATCH#:**HP_R970820051700
WORK ORDER: Matrix Spike **CLIENT SAMPLE ID:**9708642-09A

1,4-Difluorobenzene	30	93	310 «	50- 150
4-Bromofluorobenzene	30	36	120	50- 150

California LUFT Manual **BATCH#:**HP_R970820051700
WORK ORDER: Matrix Spike Dup. **CLIENT SAMPLE ID:**9708642-09A

1,4-Difluorobenzene	30	97	323 «	50- 150
4-Bromofluorobenzene	30	36	120	50- 150

California LUFT Manual **BATCH#:**HP_W970820012500
WORK ORDER: Method Blank **CLIENT SAMPLE ID:**

1,4-Difluorobenzene	30	29	29.4	50- 150
4-Bromofluorobenzene	30	21	20.9	50- 150

California LUFT Manual **BATCH#:**HP_W970820012500
WORK ORDER: Matrix Spike **CLIENT SAMPLE ID:**9708774-03A

1,4-Difluorobenzene	30	30	100	50- 150
4-Bromofluorobenzene	30	31	103	50- 150

California LUFT Manual **BATCH#:**HP_W970820012500
WORK ORDER: Matrix Spike Dup. **CLIENT SAMPLE ID:**9708774-03A

1,4-Difluorobenzene	30	30	100	50- 150
4-Bromofluorobenzene	30	31	103	50- 150

Method 8020A*** **BATCH#:**HP_W970820121900
WORK ORDER: Method Blank **CLIENT SAMPLE ID:**

1,4-Difluorobenzene	30	28	27.8	70- 131
4-Bromofluorobenzene	30	25	25.2	43- 135

Method 8020A*** **BATCH#:**HP_W970820121900
WORK ORDER: LCS **CLIENT SAMPLE ID:**

1,4-Difluorobenzene	30	33	110	70- 131

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	AMOUNT ADDED	CONC. MEASURED	RECOVERY	LIMITS
4-Bromofluorobenzene	30	28	93.3	43- 135

Method 8020A* BATCH#:HP_W970820121900
WORK ORDER: Matrix Spike **CLIENT SAMPLE ID:**9708774-02A

1,4-DIFLUOROBENZENE	30	32	107	70- 131
4-BROMOFLUOROBENZENE	30	28	93	43- 135

Method 8020A* BATCH#:HP_W970820121900
WORK ORDER: Matrix Spike Dup. **CLIENT SAMPLE ID:**9708774-02A

1,4-Difluorobenzene	30	29	97	70- 131
4-Bromofluorobenzene	30	28	93	43- 135

Method 8020A* BATCH#:HP_W970821092300
WORK ORDER: Method Blank **CLIENT SAMPLE ID:**

1,4-Difluorobenzene	30	28	27.7	70- 131
4-Bromofluorobenzene	30	26	26.0	43- 135

Method 8020A* BATCH#:HP_W970821092300
WORK ORDER: LCS **CLIENT SAMPLE ID:**

1,4-Difluorobenzene	30	30	100	70- 131
4-Bromofluorobenzene	30	29	96.7	43- 135

Method 8020A* BATCH#:HP_W970821092300
WORK ORDER: Matrix Spike **CLIENT SAMPLE ID:**9708589-01A

1,4-DIFLUOROBENZENE	30	29	97	70- 131
4-BROMOFLUOROBENZENE	30	28	93	43- 135

Method 8020A* BATCH#:HP_W970821092300
WORK ORDER: Matrix Spike Dup. **CLIENT SAMPLE ID:**9708589-01A

1,4-Difluorobenzene	30	31	103	70- 131
4-Bromofluorobenzene	30	28	93	43- 135

California LUFT Manual BATCH#:HP_W970821101700
WORK ORDER: Method Blank **CLIENT SAMPLE ID:**

1,4-Difluorobenzene	30	30	29.9	50- 150
4-Bromofluorobenzene	30	21	20.6	50- 150

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	AMOUNT ADDED	CONC. MEASURED	RECOVERY	LIMITS
California LUFT Manual			**BATCH#:** HP_W970821101700	
WORK ORDER: Matrix Spike			**CLIENT SAMPLE ID:** 9708589-02A	
1,4-Difluorobenzene	30	30	100	50- 150
4-Bromofluorobenzene	30	31	103	50- 150
California LUFT Manual			**BATCH#:** HP_W970821101700	
WORK ORDER: Matrix Spike Dup.			**CLIENT SAMPLE ID:** 9708589-02A	
1,4-Difluorobenzene	30	31	103	50- 150
4-Bromofluorobenzene	30	32	107	50- 150
Method 8020A* **			**BATCH#:** HP_W970822034900	
WORK ORDER: Method Blank			**CLIENT SAMPLE ID:**	
1,4-Difluorobenzene	30	27	27.3	70- 131
4-Bromofluorobenzene	30	24	24.2	43- 135
Method 8020A* **			**BATCH#:** HP_W970822034900	
WORK ORDER: LCS			**CLIENT SAMPLE ID:**	
1,4-Difluorobenzene	30	32	107	70- 131
4-Bromofluorobenzene	30	28	93.3	43- 135
Method 8020A* **			**BATCH#:** HP_W970822034900	
WORK ORDER: Matrix Spike			**CLIENT SAMPLE ID:** 9708774-07A	
1,4-DIFLUOROBENZENE	30	30	100	70- 131
4-BROMOFLUOROBENZENE	30	26	87	43- 135
Method 8020A* **			**BATCH#:** HP_W970822034900	
WORK ORDER: Matrix Spike Dup.			**CLIENT SAMPLE ID:** 9708774-07A	
1,4-Difluorobenzene	30	28	93	70- 131
4-Bromofluorobenzene	30	26	87	43- 135

« = Recovery outside of control limits
*** = Methods for Chemical Analysis of Water & Wastes,1983,EPA**
**** = Standard Methods for Examination of Water & Wastewater,17th**
***** = Test Methods for Evaluating Solid Waste,EPA SW846,3rd**

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

Matrix: Aqueous
Units: µg/L

Batch Id: HP_R970820044800

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	48	96.0	20 - 110
Benzene	ND	50	52	104	62 - 121
Toluene	ND	50	52	104	66 - 136
Ethyl_Benzene	ND	50	52	104	70 - 136
O-Xylene	ND	50	53	106	74 - 134
M and P Xylene	ND	100	100	100	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	59	20	89	150	90	155 *	3.28	20	39 - 150
BENZENE	55	20	72	85.0	70	75.0	12.5	25	39 - 150
TOLUENE	2.7	20	24	106	24	106	0	26	56 - 134
ETHYL_BENZENE	130	20	120	NC	120	NC	NC	38	61 - 128
O-XYLENE	ND	20	23	115	22	110	4.44	29	40 - 130
M AND P XYLENE	20	40	60	100	58	95.0	5.13	20	43 - 152

Analyst: JN
Sequence Date: 08/20/97
SPL ID of sample spiked: 9708642-08A
Sample File ID: R_H7586.TX0
Method Blank File ID:
Blank Spike File ID: R_H7578.TX0
Matrix Spike File ID: R_H7588.TX0
Matrix Spike Duplicate File ID: R_H7589.TX0

* = Values Outside QC Range. « = Data outside Method Specification limits.
NC = Not Calculated (Sample exceeds spike by factor of 4 or more)
ND = Not Detected/Below Detection Limit
% Recovery = [(<1> - <2>) / <3>] x 100
LCS % Recovery = (<1> / <3>) x 100
Relative Percent Difference = |(<4> - <5> | / [(<4> + <5>) x 0.5] x 100
(**) = Source: SPL-Houston Historical Data (4th Q '95)
(***) = Source: SPL-Houston Historical Data (3rd Q '96)

SAMPLES IN BATCH(SPL ID): 9708642-09A 9708590-01A 9708590-02A 9708590-03A 9708590-04A 9708590-05A 9708590-06A 9708642-08A

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** SPL BATCH QUALITY CONTROL REPORT **
CA LUFT

Matrix: Aqueous
Units: mg/L

Batch Id: HP_R970820051700

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	0.97	97.0	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	2.2	0.9	3.1	100	3.1	100	0	50	50 - 150

Analyst: JN
Sequence Date: 08/20/97
SPL ID of sample spiked: 9708642-09A
Sample File ID: RRH7587.TX0
Method Blank File ID:
Blank Spike File ID: RRH7579.TX0
Matrix Spike File ID: RRH7590.TX0
Matrix Spike Duplicate File ID: RRH7591.TX0

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

SAMPLES IN BATCH(SPL ID): 9708642-09A 9708590-01A 9708590-02A 9708590-03A 9708590-04A 9708590-05A 9708590-06A

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** SPL BATCH QUALITY CONTROL REPORT **
Mod. 8015 - Diesel

Matrix: Aqueous
Units: mg/L

Batch Id: HPTT970819094100

LABORATORY CONTROL SAMPLE

SPIKE COMPOUNDS	Method Blank Result <2>	Spike Added <3>	Blank Spike Result <1>	Blank Spike Recovery %	QC Limits(**) (Mandatory) % Recovery Range
Diesel Petr. Hydrocarbons	ND	5.0	4.36	87.2	60 - 139

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
DIESEL PETR. HYDROCARBONS	ND	5.0	4.53	90.0	4.52	89.8	0.222	43	20 - 177

Analyst: RR/
Sequence Date: 08/19/97
SPL ID of sample spiked: 9708591-02B
Sample File ID: TTH7419.TX0
Method Blank File ID:
Blank Spike File ID: TTH7414.TX0
Matrix Spike File ID: TTH7447.TX0
Matrix Spike Duplicate File ID: TTH7448.TX0

* = Values Outside QC Range. « = Data outside Method Specification limits.
NC = Not Calculated (Sample exceeds spike by factor of 4 or more)
ND = Not Detected/Below Detection Limit
% Recovery = [(<1> - <2>) / <3>] x 100
LCS % Recovery = (<1> / <3>) x 100
Relative Percent Difference = |(<4> - <5> | / [(<4> + <5>) x 0.5] x 100
(**) = Source: SPL-Houston Historical Data (1st Q '96)
(***) = Source: SPL-Houston Historical Data (2nd Q '94)

SAMPLES IN BATCH(SPL ID): 9708594-03B 9708595-01B 9708594-01B 9708595-02B 9708590-01C 9708591-02B 9708591-01B 9708594-02B

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

Matrix: Aqueous
Units: µg/L

Batch Id: HP_F970818123000

LABORATORY CONTROL SAMPLE

SPIKE COMPOUNDS	Method Blank Result <2>	Spike Added <3>	Blank Spike Result <1>	Blank Spike Recovery %	QC Limits(**) (Mandatory) % Recovery Range
Dichlorodifluoromethane	ND	20	17	85.0	1 - 170
Chloromethane	ND	20	16	80.0	47 - 138
Vinyl chloride	ND	20	21	105	39 - 121
Bromomethane	ND	20	19	95.0	43 - 155
Chloroethane	ND	20	19	95.0	49 - 137
Trichlorofluoromethane	ND	20	21	105	40 - 149
1,1-Dichloroethene	ND	20	16	80.0	28 - 167
Methylene chloride	ND	20	19	95.0	50 - 162
Trans-1,2-Dichloroethene	ND	20	19	95.0	38 - 155
1,1-Dichloroethane	ND	20	20	100	52 - 132
Chloroform	ND	20	20	100	67 - 133
1,1,1-Trichloroethane	ND	20	20	100	54 - 138
Carbon tetrachloride	ND	20	20	100	56 - 143
1,2-Dichloroethane	ND	20	20	100	51 - 147
2-Chloroethylvinyl ether	ND	20	19	95.0	68 - 125
Trichloroethene	ND	20	20	100	46 - 146
1,2-Dichloropropane	ND	20	21	105	61 - 156
Bromodichloromethane	ND	20	21	105	52 - 155
cis-1,3-Dichloropropene	ND	20	21	105	60 - 160
trans-1,3-Dichloropropene	ND	20	21	105	44 - 161
1,1,2-Trichloroethane	ND	20	21	105	48 - 136
Tetrachloroethene	ND	20	20	100	32 - 162
Dibromochloromethane	ND	20	21	105	52 - 148
Chlorobenzene	ND	20	22	110	38 - 150
Bromoform	ND	20	20	100	49 - 149
1,1,2,2-Tetrachloroethane	ND	20	21	105	21 - 167
1,3-Dichlorobenzene	ND	20	21	105	46 - 162
1,4-Dichlorobenzene	ND	20	21	105	45 - 143
1,2-Dichlorobenzene	ND	20	21	105	45 - 158

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
DICHLORODIFLUOROMETHANE	ND	20	17	85.0	17	85.0	0	20	1 - 200
CHLOROMETHANE	ND	20	15	75.0	15	75.0	0	20	1 - 193
VINYL CHLORIDE	ND	20	18	90.0	18	90.0	0	20	28 - 163
BROMOMETHANE	ND	20	17	85.0	17	85.0	0	20	1 - 144
CHLOROETHANE	ND	20	16	80.0	15	75.0	6.45	20	46 - 137

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

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

Matrix: Aqueous
Units: µg/L

Batch Id: HP_F970818123000

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
TRICHLOROFLUOROMETHANE	ND	20	17	85.0	17	85.0	0	20	21 - 156
1,1-DICHLOROETHENE	ND	20	18	90.0	17	85.0	5.71	20	28 - 167
METHYLENE CHLORIDE	ND	20	19	95.0	19	95.0	0	20	25 - 162
TRANS-1,2-DICHLOROETHENE	ND	20	18	90.0	18	90.0	0	20	38 - 155
1,1-DICHLOROETHANE	ND	20	18	90.0	18	90.0	0	20	47 - 132
CHLOROFORM	ND	20	18	90.0	18	90.0	0	20	49 - 133
1,1,1-TRICHLOROETHANE	ND	20	18	90.0	17	85.0	5.71	20	41 - 138
CARBON TETRACHLORIDE	ND	20	18	90.0	18	90.0	0	20	43 - 143
1,2-DICHLOROETHANE	ND	20	17	85.0	17	85.0	0	20	51 - 147
2-CHLOROETHYLVINYL ETHER	ND	20	16	80.0	16	80.0	0	20	14 - 186
TRICHLOROETHENE	ND	20	16	80.0	16	80.0	0	20	35 - 146
1,2-DICHLOROPROPANE	ND	20	17	85.0	17	85.0	0	20	44 - 156
BROMODICHLOROMETHANE	ND	20	18	90.0	18	90.0	0	20	42 - 172
CIS-1,3-DICHLOROPROPENE	ND	20	17	85.0	17	85.0	0	20	22 - 178
TRANS-1,3-DICHLOROPROPENE	ND	20	17	85.0	17	85.0	0	20	33 - 178
1,1,2-TRICHLOROETHANE	ND	20	17	85.0	17	85.0	0	20	39 - 136
TETRACHLOROETHENE	ND	20	16	80.0	16	80.0	0	20	26 - 162
DIBROMOCHLOROMETHANE	ND	20	18	90.0	18	90.0	0	20	24 - 191
CHLOROBENZENE	ND	20	17	85.0	17	85.0	0	20	38 - 150
BROMOFORM	ND	20	17	85.0	17	85.0	0	20	13 - 159
1,1,2,2-TETRACHLOROETHANE	ND	20	18	90.0	18	90.0	0	20	8 - 184
1,3-DICHLOROBENZENE	ND	20	17	85.0	17	85.0	0	20	7 - 187
1,4-DICHLOROBENZENE	ND	20	17	85.0	17	85.0	0	20	42 - 143
1,2-DICHLOROBENZENE	ND	20	17	85.0	17	85.0	0	20	1 - 208

Analyst: RL
Sequence Date: 08/18/97
SPL ID of sample spiked: 9708684-04C
Sample File ID: FPH7257.TX0
Method Blank File ID:
Blank Spike File ID: FPH7248.TX0
Matrix Spike File ID: FPH7262.TX0
Matrix Spike Duplicate File ID: FPH7263.TX0

* = Values Outside QC Range. « = Data outside Method Specification limits.
NC = Not Calculated (Sample exceeds spike by factor of 4 or more)
ND = Not Detected/Below Detection Limit
% Recovery = [(<1> - <2>) / <3>] x 100
LCS % Recovery = (<1> / <3>) x 100
Relative Percent Difference = |(<4> - <5> | / [(<4> + <5>) x 0.5) x 100
(**) = Source: SPL-Houston Historical Limits (3rd Q '95)
(***) = Source: SPL-Houston Historical Data

SAMPLES IN BATCH(SPL ID):

9708590-01B 9708677-02A 9708677-01A 9708383-02A
9708383-09A 9708383-11A 9708383-05A 9708383-07A
9708383-06A 9708383-12A 9708383-10A 9708383-08A
9708383-03A 9708108-01A 9708108-06A 9708107-01A
9708108-02A 9708108-05A 9708684-04C

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** SPL QUALITY CONTROL REPORT **

Matrix: Aqueous

Reported on: 08/14/97
Analyzed on: 08/14/97
Analyst: DB

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Hydrocarbons by Gravimetry
Method 5520 B & F **

SPL Sample ID Number	Method Blank mg/L	Sample Result mg/L	Spike Added mg/L	Matrix Spike Result mg/L	Matrix Spike Recovery %	Matrix Spike Duplicate Result mg/L	Matrix Spike Duplicate Recovery %	RPD (%)	QC LIMITS (Advisory) RPD Max	QC LIMITS (Advisory) % REC
BLANK	ND	ND	45	42	93.3	40	88.9	4.8	7.9	84 -108

970815DR -9708612

Samples in batch:

9708205-01C 9708208-01C 9708473-02D 9708572-15C
9708590-01D

COMMENTS:

CHAIN OF CUSTODY

AND

SAMPLE RECEIPT CHECKLIST

9708590

CHAIN OF CUSTODY

No. 079345 Page 1 of 1

CONSULTANT'S NAME: Alisto Engineering	ADDRESS: 1575 Treat Blvd #201		CITY: W.C.	STATE: Ca	ZIP CODE: 94598
BP SITE NUMBER: 11126	BP CORNER ADDRESS/CITY: Emeryville, Ca			CONSULTANT PROJECT NUMBER: 10-061-8-1	
CONSULTANT PROJECT MANAGER: Brady Nagle	PHONE NUMBER: (510) 295-1650	FAX NUMBER: 295-1823		CONSULTANT CONTRACT NUMBER: H177106	
BP CONTACT: Scott Hooton	BP ADDRESS: Renton, WA	PHONE NUMBER:		FAX NO.:	
LAB CONTACT: SPL	LABORATORY ADDRESS: Texas	PHONE NUMBER:		FAX NO:	
SAMPLED BY (Please Print Name): Larry Buenaventura	SAMPLED BY (Signature): [signature]	SHIPMENT DATE: 8/12/97		SHIPMENT METHOD: Fed Ex	

AIRBILL NUMBER: 384847126[illegible]

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

ANALYSIS REQUIRED

SAMPLE DESCRIPTION	COLLECTION DATE / COLLECTION TIME	MATRIX SOIL/WATER	CONTAINERS NO.	CONTAINERS TYPE (VOL.)	PRESERVATIVE LAB SAMPLE #	TPH-G/BTEX	[illegible]	TPH-D	TOG 5520	HVOCs					COMMENTS
S-1	8/11/97	W	8	Hcl		X	X	X	X	X		CH			
S-2	↓	↓	3	↓		↓	↓					[initials]			
S-3												8-14-97			
S-4															
S-5															
S-6	↓	↓	↓	↓		↓	↓								

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
[signature]	8/12/97				
[signature]	8/12/97		[signature] / SPL	8/14/97	1015

ADDITIONAL COMMENTS: 5°C [illegible]

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:
8/14/97	1015

SPL Sample ID:
9708590

			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:		5° C	
10	Method of sample delivery to SPL:	SPL Delivery		
		Client Delivery		
		FedEx Delivery (airbill #)	384847126	
		Other:		
11	Method of sample disposal:	SPL Disposal	✓	
		HOLD		
		Return to Client		

Name:	Date:
[signature]	8/14/97

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

BP Site Number:	11126
ERM Contact:	G79746 7
Sampling Date:	08/11/97
Matrix Description:	Water
Date Final Report Received:	08/28/97
Laboratory & Location:	SPL, Houston, Texas

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

Notes: (1) Exceeds 30% for TPH gas, Ethylbenzene, + MTBE. See table attached
~~To confirm~~ 9/23 Called SPL to confirm results for S-5 + S-6. Shana will check + call me back tomorrow &
(2) Matrix interference noted for S-2, S-4,
(3) Not Calculated for ethylbenzene
& APCL re checked calcs for S-5 + S-6 for TPH gas, Ethylbenzene, + MTBE. Only MTBE value changed.

Data Validation Completed by: William Howell

(signature): ~~9/23~~ Bill Howell

Date: ~~8~~ 9/23/97

Calculation of RPD
for BP Oil QA/QC Program
BP Oil Station 11226 08/11/1997 Event

Analytical Data	TPHg	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE
Primary Sample	71,000	12,000	340	2,100	4,300	26,000
QC-1 Duplicate	100,000	14,000	360	3,200	5,790	27,000
Sample Mean	85,500	13,000	350	2,650	5,045	26,500
RPD (a)	-33.92%	-15.38%	-5.71%	-41.51%	-29.53%	-3.77%
Significant Result?	YES	NO	NO	YES	NO	NO

Notes:

(a) RPD = (primary-duplicate)/sample mean (converted to percent)

(1) Significance is defined as an RPD greater than 30% (or less than -30)

(2) "A negative" RPD will result if the value of the Primary Sample Result is smaller than QC-1
The determination of Significant Result is not affected by sign of RPD