BP OIL

BP Oil Company
Aetna Bldg., Suite 360
2868 Prospect Park Drive
Rancho Cordova, California 95670-6020
(916) 631-0733

September 30, 1991

Ms. Katherine Chesick
Alameda County Division of Hazardous Materials
80 Swan Way, Suite 200
Oakland, CA 94621

RE: BP OIL FACILITY #11266
1541 PARK STREET
ALAMEDA, CALIFORNIA

Dear Ms. Chesick,

Attached please find results of the quarterly sampling and analysis performed at the above referenced facility.

Please call me at 916/631-6919 with any questions regarding this submission.

Respectfully,

Peter J. DeSantis
Environmental Resource Management

PJD:lk

cc: Rich Hiett - RWQCB, San Francisco Bay Reigon
Craig Mayfield - Alameda County Flood Control District
Lt. McKinley - City of Alameda Fire Department
J.R. Rocco - BP Oil, Cleveland
Site file

EMCON
ASSOCIATES
Consultants in Wastes
Management and
Environmental Control

September 25,1991
Project C90-04.07

Mr. Peter DeSantis
BP Oil Company
2868 Prospect Park Drive, Suite 360
Rancho Cordova, California 95670-6020

Re: Third quarter 1991 ground-water monitoring program results,
BP Oil Company service station 11266, Alameda, California

Dear Mr. DeSantis:

This letter presents the results of the third quarter 1991 ground-water monitoring program at BP Oil Company (BP) service station 11266, 1541 Park Street, Alameda, California (figure 1). The quarterly monitoring complies with Regional Water Quality Control Board (RWQCB) requirements regarding underground tank investigations.

BACKGROUND

In September 1987, Kaprealian Engineering Incorporated (KEI) performed an initial site assessment and tank removal at the project location. KEI reported on the removal of three gasoline tanks (5,000-, 6,000-, and 8,000-gallon capacities) and one waste-oil tank (250-gallon capacity). The excavations were analyzed for total petroleum hydrocarbons as gasoline (TPHG), TPH as diesel (TPHD), and benzene, toluene, xylenes, and ethylbenzene (BTXE). Soil from the waste-oil tank excavation was analyzed for gravimetric waste oil as petroleum oil (GWO) and TPHD. Certified analytical results indicated that soil and ground water were impacted by TPHG (3,200 parts per million [ppm] and 530 ppm). Soil from the waste-oil tank excavation contained 150 ppm GWO and no detectable TPHD (<10 ppm).

These analytical results prompted the installation of three on-site ground-water monitoring wells (MW-1, MW-2, and MW-3) by KEI in March 1988

1921 Ringwood Avenue, San Jose, California 95131, (408) 453-7300

(figure 2). The analysis indicated that the lateral extent of impacted ground water was limited. Well MW-1 contained 95 ppm TPHG, with no detectable petroleum hydrocarbons in wells MW-2 and MW-3. KEI implemented a quarterly ground-water monitoring program at the site. Levels of TPHG and BTXE decreased over 1 year in MW-1, and no petroleum hydrocarbons were detected in the other wells.

In March 1989, KEI was contracted to install three more monitoring wells (MW-4, MW-5, and MW-6) to define the limits of impacted ground water. These additional wells were constructed identical to the previous wells. Soil and ground-water samples from these locations did not contain detectable levels of petroleum hydrocarbons.

In November 1989, EMCON Associates (EMCON) performed additional site characterization consisting of collecting and analyzing ground-water samples. Direct-push ground-water sampling was used to confirm the lateral extent of the plume, and pumping tests were run to determine aquifer characteristics for evaluating potential remediation options.

Based on the results of this additional site assessment and a review of previous work, the lateral extent of impacted ground water was concluded to be limited to the area near well MW-1. The results of the hydraulic testing indicated that the optimal extraction flow rate is 0.5 gallons per minute (gpm).

The site is being monitored quarterly in compliance with the RWQCB requirements regarding underground tank investigations.

SAMPLE COLLECTION PROCEDURES

The third quarter 1991 ground-water monitoring event was conducted on August 1, 1991. A water-level survey preceded the purging and sampling of the monitoring wells. The wells included in the survey are identified in figure 2. During the survey, wells MW-1 through MW-6 were measured for depth-to-water, floating product thickness, and total depth. No floating product was observed in the six wells. Depth-to-water measurements were recorded to the nearest 0.01 foot, and well-depth measurements were recorded to the nearest 0.5 foot to facilitate purge volume calculations. Depth-to-water and ground-water elevation data are presented in table 1.

Sample collection was consistent with the procedures presented in appendix A of EMCON's Proposal P91A059, submitted to BP on

January 28, 1991. Monitoring wells MW-1 through MW-6 were purged with a polyvinyl chloride (PVC) bailer and sampled with a Teflon® bailer on August 1, 1991. During the purging operation, the ground water was monitored for pH, specific conductance, and temperature as a function of volume of water removed. Monitoring continued until these parameters were stable. Purge water from the monitoring wells was temporarily stored in 55-gallon drums.

Ground water from the monitoring wells was collected with a Teflon bailer and transferred to 40-milliliter sample containers. Samples were collected in duplicate, labeled, placed on ice, and transported to a state-certified laboratory for chemical analysis. Chain-of-custody documentation accompanied all ground-water samples. A copy of this documentation is attached.

ANALYTICAL PROCEDURES

The samples were analyzed for TPHG and BTXE. The samples were prepared for analysis by U.S. Environmental Protection Agency (EPA) method 5030 (purge and trap). The samples were analyzed for TPHG using the methods accepted by the Department of Health Services (DHS) and referenced in the *Leaking Underground Fuel Tank (LUFT) Field Manual* (State Water Resources Control Board, May 1988). The samples were analyzed for BTXE by EPA method 8020 as described in *Test Methods for Evaluating Solid Waste: Physical/Chemcial Methods*, USEPA, SW-846, November 1986, 3rd Edition. These methods are recommended for use at petroleum hydrocarbon-impacted sites in the *Tri-Regional Board Staff Recommendations for Preliminary Evaluation and Investigation of Underground Tank Sites* (August 10, 1990).

The samples were also analyzed for volatile organic compounds (VOCs) by EPA method 8240. In this method, VOCs are introduced into a gas chromatograph by the purge-and-trap method or by direct injection. The components are separated via the gas chromatograph and detected using a mass spectrometer.

MONITORING PROGRAM RESULTS

Analytical results for the third quarter 1991 monitoring event are summarized in table 2 (TPHG, BTXE), and table 3 (VOCs). Selected analytical data are also shown on figure 2. Wells MW-1 and MW-2 contained 11,000

and 110 parts per billion (ppb) TPHG, and 240 and <0.5 ppb benzene, respectively. Wells MW-3 through MW-6 did not contain detectable concentrations of TPHG or BTXE. No floating product was observed in the monitoring wells.

Well MW-1 contained 2 ppb chlorobenzene. Well MW-6 contained 2 ppb chlorobenzene and 2 ppb tetrachloroethene (PCE). Wells MW-2 through MW-5 did not contain detectable concentrations of VOCs. Note that all results are expressed in micrograms per liter (µg/l) or ppb. The certified analytical reports are attached.

Ground-water elevation data show local ground-water flows east with a calculated hydraulic gradient of approximately 0.008. Table 1 shows ground-water flow direction and gradient data; figure 2 illustrates the ground-water contours for the third quarter 1991 monitoring event.

If you have questions, please call.

Very truly yours,

EMCON Associates

David C. Larsen
Sampling Coordinator

Russell J. Scharlin
Manager, Petroleum Group

REGISTERED PROFESSIONAL ENGINEER
RUSSELL J. SCHARLIN
No GE 751
Exp. 12/31/93
GEOTECHNICAL
STATE OF CALIFORNIA

Attachments: Table 1 - Monitoring well data
Table 2 - Ground-water analyses (TPHG, BTXE)
Table 3 - Ground-water analyses (VOCs)
Figure 1 - Site location
Figure 2 - Ground-water contours (August 1, 1991)
Certified analytical reports
Chain-of-custody documentation

PJC C900407A.DOC

Table 1
Monitoring Well Data
BP Service Station 11266, Alameda, California

Well	Date	TOC[1] Elevation (ft-MSL)[2]	Depth to Ground Water (feet)	Ground-Water Elevation (ft-MSL)	Approximate Ground-Water Flow Direction[3]	Gradient[3]
MW-1	11/28/89	22.63	9.77	12.86	NA[4]	NA[4]
	02/13/91	22.63	9.46	13.17	East	0.009
	05/10/91	22.63	9.07	13.56	East	0.01
	08/01/91	22.63	9.76	12.87	East	0.008
MW-2	11/28/89	22.75	10.25	12.50		
	02/13/91	22.75	10.01	12.74		
	05/10/91	22.75	9.74	13.01		
	08/01/91	22.75	10.27	12.48		
MW-3	11/28/89	23.45	10.72	12.73		
	02/13/91	23.45	10.61	12.84		
	05/10/91	23.45	10.32	13.13		
	08/01/91	23.45	10.76	12.69		
MW-4	11/28/89	23.63	10.41	13.22		
	02/13/91	23.63	10.02	13.61		
	05/10/91	23.63	9.67	13.96		
	08/01/91	23.63	10.42	13.21		
MW-5	11/28/91	22.87	9.83	13.04		
	02/13/91	22.87	9.51	13.36		
	05/10/91	22.87	9.03	13.84		
	08/01/91	22.87	9.70	13.17		
MW-6	11/28/91	22.85	10.30	12.55		
	02/13/91	22.85	10.29	12.56		
	05/10/91	22.85	9.80	13.05		
	08/01/91	22.85	10.29	12.56		

1. TOC = top of casing
2. Elevation in feet, relative to mean sea level
3. Ground-water flow direction and gradient apply to the entire monitoring well network, not just well MW-1.
4. NA = Not available

Table 2
Ground-Water Analyses
Microgram Per Liter (parts per billion)
BP Service Station 11266, Alameda, California

Well	Date Sampled	TPHG[1]	Benzene	Toluene	Ethylbenzene	Total Xylenes
MW-1	11/28/89[2]	15,000	280	880	340	1,200
	02/13/91[2]	25,000	680	2,700	1,100	3,200
	02/13/91[3]	NA [4]	640	3,270	980	3,620
	05/10/91[2]	20,000	400	1,300	540	1,600
	05/10/91[3]	NA	530	2,200	760	2,100
	08/01/91[2]	11,000	240	1,100	500	1,300
	08/01/91[3]	NA	300	1,000	520	980
MW-2	11/28/89[2]	170 [5]	<5.7[6]	<1	<1	<3
	02/13/91[2]	150	1.4	<0.5	<0.5	0.9
	02/13/91[3]	NA	1.5	<1	<1	<1
	05/10/91[2]	160	5.4	<0.5	0.5	0.8
	05/10/91[3]	NA	5.8	<1	<1	<1
	08/01/91[2]	110	<0.5	<0.5	<0.5	0.5
	08/01/91[3]	NA	<1	<1	<1	<1
MW-3	11/28/89[2]	<50	<0.5	<1	<1	<3
	02/13/91[2]	<50	<0.5	<0.5	<0.5	<0.5
	02/13/91[3]	NA	<1	<1	<1	<1
	05/10/91[2]	<50	<0.5	<0.5	<0.5	<0.5
	05/10/91[3]	NA	<1	<1	<1	<1
	08/01/91[2]	<50	<0.5	<0.5	<0.5	<0.5
	08/01/91[3]	NA	<1	<1	<1	<1

Table 2
Ground-Water Analyses
Microgram Per Liter (parts per billion)
BP Service Station 11266, Alameda, California
(Continued)

Well	Date Sampled	TPHG[1]	Benzene	Toluene	Ethylbenzene	Total Xylenes
MW-4	11/28/89[2]	<50 [5]	<0.5	<1	<1	<3
	02/13/91[2]	430	6.2	0.6	12	3.3
	02/13/91[3]	NA	6.0	<1	16	4.5
	05/10/91[2]	<50	<0.5	<0.5	<0.5	<0.5
	05/10/91[3]	NA	<1	<1	<1	<1
	08/01/91[2]	<50	<0.5	<0.5	<0.5	<0.5
	08/01/91[3]	NA	<1	<1	<1	<1
MW-5	11/28/89[2]	<50	<0.5	<1	<1	<3
	02/13/91[2]	<50	<0.5	<0.5	<0.5	<0.5
	02/13/91[3]	NA	<1	<1	<1	<1
	05/10/91[2]	<50	<0.5	<0.5	<0.5	<0.5
	05/10/91[3]	NA	<1	<1	<1	<1
	08/01/91[2]	<50	<0.5	<0.5	<0.5	<0.5
	08/01/91[3]	NA	<1	<1	<1	<1
MW-6	11/28/89[2]	<50	<0.5	<1	<1	<3
	02/13/91[2]	<50	<0.5	<0.5	<0.5	<0.5
	02/13/91[3]	NA	<1	<1	<1	<1
	05/10/91[2]	<50	<0.5	<0.5	<0.5	<0.5
	05/10/91[3]	NA	<1	<1	<1	<1
	08/01/91[2]	<50	<0.5	<0.5	<0.5	<0.5
	08/01/91[3]	NA	<1	<1	<1	<1

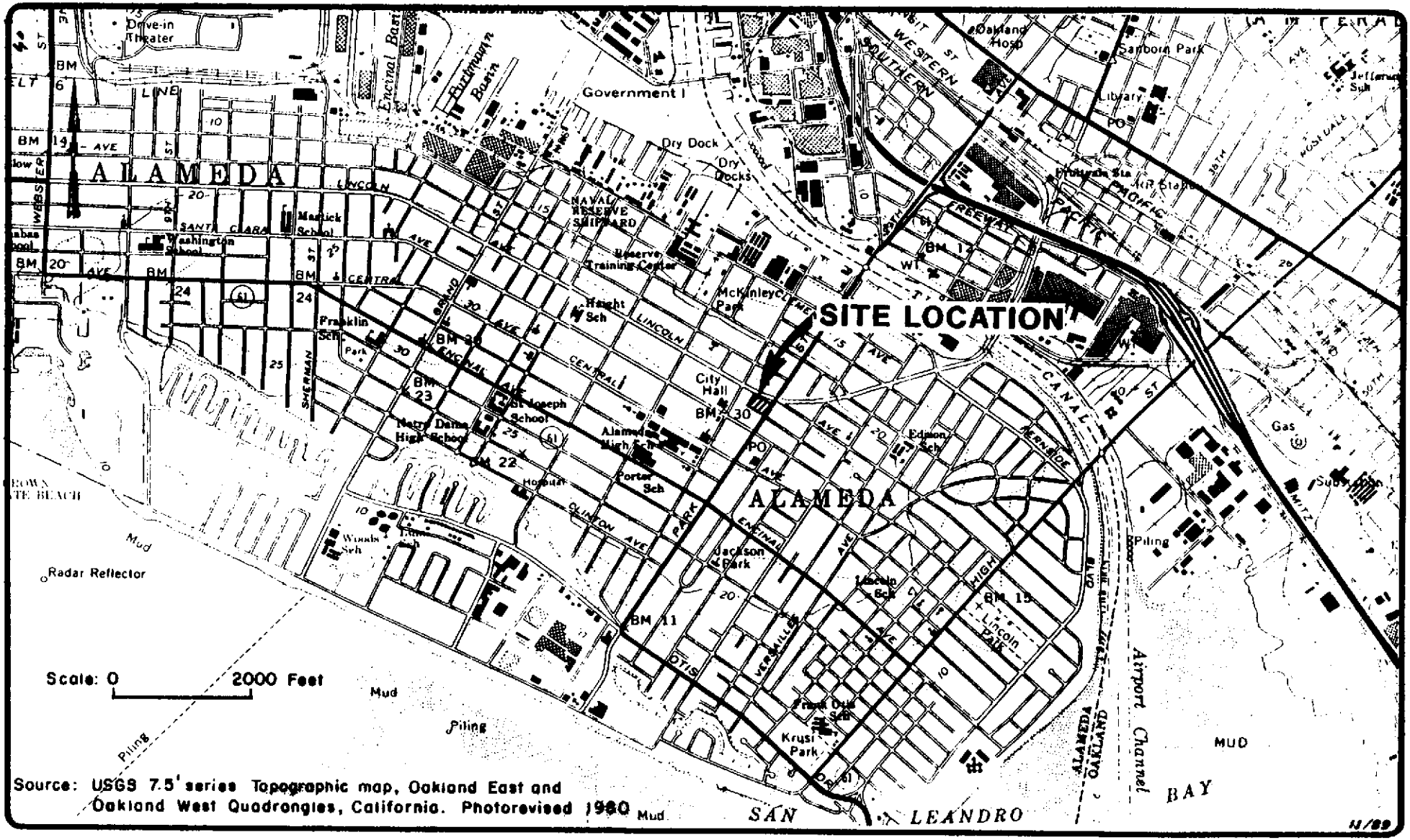
1. TPHG = total petroleum hydrocarbons as gasoline
2. BTXE was analyzed by EPA method 8020
3. BTXE was analyzed by EPA method 8240
4. NA = Not analyzed
5. An unknown, discrete, volatile, non-fuel hydrocarbon was observed.
6. Raised detection limit due to unknown volatile components.

Table 3
Ground-Water Analyses
Microgram Per Liter (parts per billion)
BP Service Station 11266, Alameda, California

Well	Date Sampled	2-Butanone (MEK)	Chlorobenzene (CB)	Tetrachloroethene (PCE)	Styrene
MW-1	11/29/89	-- [1]	--	--	--
	02/13/91	14	2.8	<1	<1
	05/10/91	<10	3.0	<1	1.7
	08/01/91	<10	2	<1	<1
MW-2	11/29/89	-- [1]	--	--	--
	02/13/91	<10	<1	<1	<1
	05/10/91	<10	<1	<1	<1
	08/10/91	<10	<1	<1	<1
MW-3	11/29/89	-- [1]	--	--	--
	02/13/91	<10	<1	<1	<1
	05/10/91	<10	<1	<1	<1
	08/01/91	<10	<1	<1	<1
MW-4	11/29/89	-- [1]	--	--	--
	02/13/91	<10	1.9	2.5	<1
	05/10/91	<10	1.4	2.8	<1
	08/01/91	<10	<1	<1	<1
MW-5	11/29/89	-- [1]	--	--	--
	02/13/91	<10	<1	<1	<1
	05/10/91	<10	<1	<1	<1
	08/01/91	<10	<1	<1	<1
MW-6	11/29/89	-- [1]	--	--	--
	02/13/91	<10	<1	<1	<1
	05/10/91	<10	<1	<1	<1
	08/01/91	<10	2	2	<1

1. Ground-water samples were not analyzed for EPA method 8240 during the November 1989 monitoring event.

124965



EMCON Associates

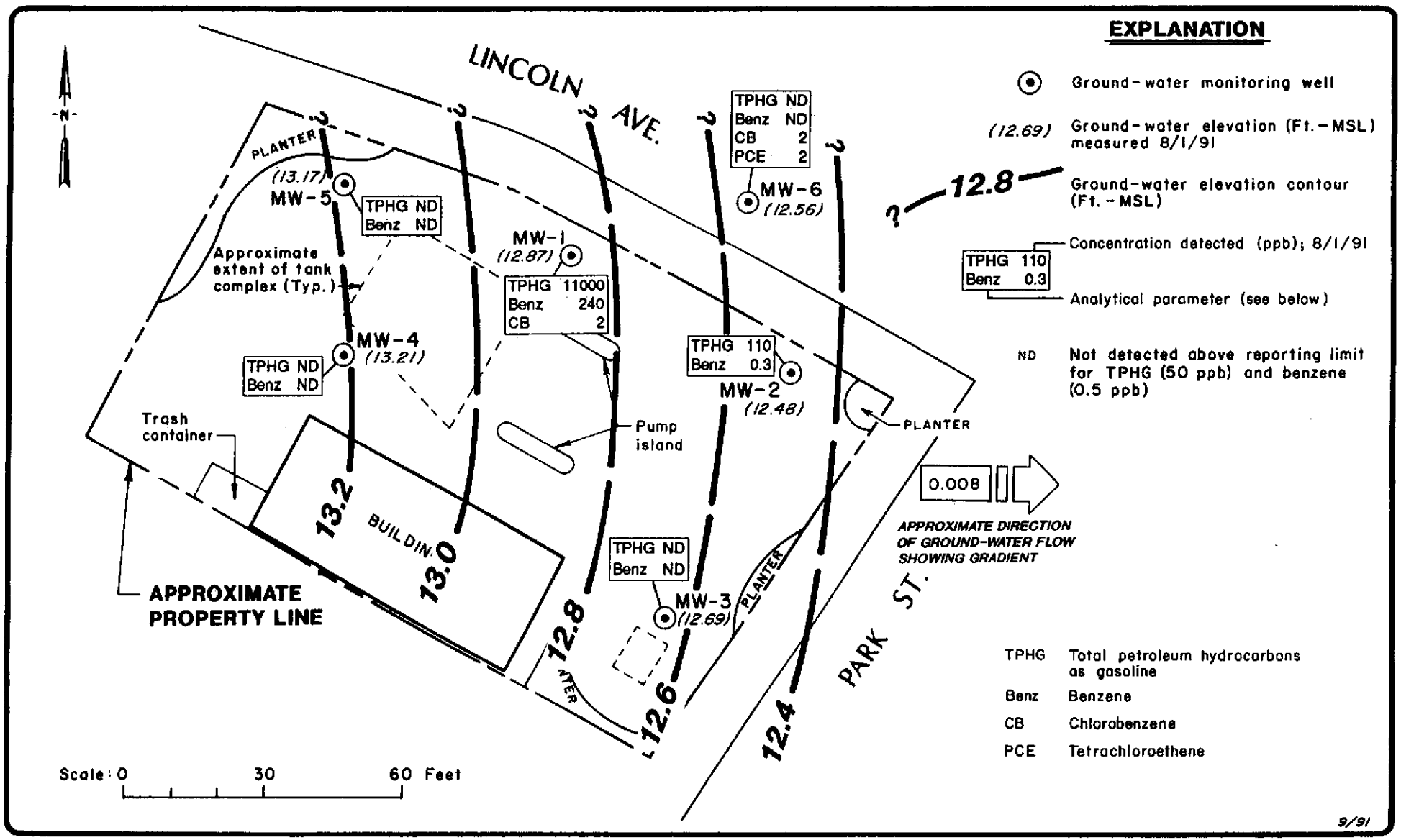
BP OIL CORPORATION
SERVICE STATION No. 11266
SITE ASSESSMENT
ALAMEDA, CALIFORNIA

SITE LOCATION

FIGURE 1

PROJECT NO. C90-04.06

124965



EMCON Associates

BP OIL CORPORATION
SERVICE STATION No. 11266
QUARTERLY GROUND-WATER MONITORING
ALAMEDA, CALIFORNIA

GROUND-WATER CONTOURS
THIRD QUARTER 1991

FIGURE 2

PROJECT NO. C90-04.07

Columbia Analytical Services, Inc.

August 13, 1991

Bill Woods
EMCON Associates
1921 Ringwood Avenue
San Jose, CA 95131

Re: **BP/C90-04.07**

Dear Mr. Woods:

Enclosed are the results of the water samples submitted to our lab on August 1, 1991. For your reference, our service request number for this work is SJ91-1073.

All analyses were performed in accordance with the laboratory's quality assurance program.

Please call if you have any questions.

Respectfully submitted:

Keoni A. Murphy
COLUMBIA ANALYTICAL SERVICES, INC.

le/KAM

1921 Ringwood Avenue • San Jose, California 95131 • Telephone 408/437-2400 • Fax 408/437-9356

Analytical Report

Client:	EMCON Associates	**Date Received:**	08/01/91
Project:	BP/C90-04.07	**Work Order #:**	SJ91-1073
Sample Matrix:	Water		

BTEX and TPH as Gasoline
EPA Methods 5030/8020/DHS LUFT Method
µg/L (ppb)

Sample Name:		MW-2	MW-6	MW-3
Date Analyzed:		08/07/91	08/07/91	08/07/91
Analyte	**MRL**			
Benzene	0.5	ND	ND	ND
Toluene	0.5	ND	ND	ND
Ethylbenzene	0.5	ND	ND	ND
Total Xylenes	0.5	0.5	ND	ND
TPH as Gasoline	50	110.	ND	ND

TPH Total Petroleum Hydrocarbons
MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by Kevin V. Murphy Date August 13, 1991

1921 Ringwood Avenue • San Jose, California 95131 • Telephone 408/437-2400 • Fax 408/437-9356

Analytical Report

Client: EMCON Associates
Project: BP/C90-04.07
Sample Matrix: Water

Date Received: 08/01/91
Work Order #: SJ91-1073

BTEX and TPH as Gasoline
EPA Methods 5030/8020/DHS LUFT Method
µg/L (ppb)

Sample Name:		MW-5	MW-4	MW-1
Date Analyzed:		08/07/91	08/12/91	08/07/91
Analyte	MRL			
Benzene	0.5	ND	ND	240.
Toluene	0.5	ND	ND	1,100.
Ethylbenzene	0.5	ND	ND	500.
Total Xylenes	0.5	ND	ND	1,300.
TPH as Gasoline	50	ND	ND	11,000.

TPH Total Petroleum Hydrocarbons
MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by Karen A Murphy Date August 13, 1991

1921 Ringwood Avenue • San Jose, California 95131 • Telephone 408/437-2400 • Fax 408/437-9356

Analytical Report

Client:	EMCON Associates	**Date Received:**	08/01/91
Project:	BP/C90-04.07	**Work Order #:**	SJ91-1073
Sample Matrix:	Water		

BTEX and TPH as Gasoline
EPA Methods 5030/8020/DHS LUFT Method
µg/L (ppb)

Sample Name:		Method Blank	Method Blank
Date Analyzed:		08/07/91	08/12/91
Analyte	**MRL**		
Benzene	0.5	ND	ND
Toluene	0.5	ND	ND
Ethylbenzene	0.5	ND	ND
Total Xylenes	0.5	ND	ND
TPH as Gasoline	50	ND	ND

TPH Total Petroleum Hydrocarbons
MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by Keonit Murphy Date August 13, 1991

1921 Ringwood Avenue • San Jose, California 95131 • Telephone 408/437-2400 • Fax 408/437-9356

Client: EMCON Associates
Project: BP/C90-04.07
Sample Matrix: Water

Date Received: 08/01/91
Work Order #: SJ91-1073

QA/QC Report
Surrogate Recovery Summary
BTEX and TPH as Gasoline
EPA Methods 5030/8020/DHS LUFT Method

Sample Name	Date Analyzed	Percent Recovery α,α,α-Trifluorotoluene
MW-2	08/07/91	96.
MW-6	08/07/91	97.
MW-3	08/07/91	94.
MW-5	08/07/91	90.
MW-4	08/12/91	98.
MW-1	08/07/91	95.
Method Blank	08/07/91	100.
Method Blank	08/12/91	99.
	CAS Acceptance Criteria	70-130

TPH Total Petroleum Hydrocarbons

Approved by Kevin Murphy Date August 13, 1991

1921 Ringwood Avenue • San Jose, California 95131 • Telephone 408/437-2400 • Fax 408/437-9356

Columbia Analytical Services, inc.

1921 Ringwood Ave. • San Jose, CA 95131 • (408) 437-2400, FAX (408)437-9356

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

DATE _____ PAGE _____ OF _____

PROJECT NAME BP # 11266 # 490-64.07

PROJECT MNGR.

COMPANY/ADDRESS Emcon Assoc

PHONE 453-2266

SAMPLERS SIGNATURE Rich Muzzy

SAMPLE I.D.	DATE	TIME	LAB I.D.	SAMPLE MATRIX	NUMBER OF CONTAINERS	Base/Neu/Acid Organics GC/MS 625/8270	Volatile Organics GC/MS 624/8240	Halogenated or Aromatic Volatiles 601/8010 ☐ 602/8020 ☐	TPH as Gas/BTEX DHS LUFT 8020	TPH as Diesel/HBHC DHS LUFT	TRPH - 418.1	Oil and Grease Method	Metals (total or dissolved) List Below	pH, Cond, Cl, SO4, PO4, F, NO2, Alk, TDS, TSS (circle)	NH3-N, COD, Total-P, TKN, NO3 (circle)	Total Organic Carbon TOC 415/9060	Total Phenols	REMARKS
MW-2	8/6/91	1400	1-2	H2O	4		2		2									
MW-6		1040	3-4		4		2		2									
MW-3		1120	5-6		4		2		2									
MW-5		1200	7-8		4		2		2									
MW-4		1235	9-10		4		2		2									
MW-1		1425	11-12		4		2		2									

RELINQUISHED BY:
Signature: Rich Muzzy
Printed Name: Rich Muzzy
Firm: Emcon Assoc.
Date/Time: 8-1-91 1530

RECEIVED BY:
Signature:
Printed Name: Howard Friedman
Firm: CAS-SJ
Date/Time: 8-1-91 1530

RELINQUISHED BY:
Signature
Printed Name
Firm
Date/Time

RECEIVED BY:
Signature
Printed Name
Firm
Date/Time

TURNAROUND REQUIREMENTS:
___ 24 hr ___ 48 hr ___ 5 day
___ Standard (~ 10-15 working days)
___ Provide Verbal Preliminary Results
___ Provide FAX Preliminary Results
Requested Report Date _____

REPORT REQUIREMENTS
___ I. Routine Report
___ II. Report (includes DUP,MS, MSD, as required, may be charged as samples)
___ III. Data Validation Report (includes All Raw Data)
___ IV. CLP Deliverable Report

INVOICE INFORMATION:
P.O. #
Bill to:

SAMPLE RECEIPT:
Shipping VIA: Sample
Shipping #:
Condition: OK
Lab No.: SF11-1073

SPECIAL INSTRUCTIONS/COMMENTS:
82 Volatiles

SAR#1754

DISTRIBUTION: WHITE - return to originator; YELLOW - lab; PINK - retained by originator

400 05

Columbia Analytical Services inc.

RECEIVED
AUG 30 1991

August 27, 1991

Bill Woods
EMCON Associates
1921 Ringwood Avenue
San Jose, CA 95131

Re: **BP #11266 Alameda/Project #C90-04.07/SJ91-1073**

Dear Bill:

Enclosed are the results of the samples submitted to our lab on August 2, 1991. For your reference, our service request number for this work is K914325C.

All analyses were performed in accordance with our laboratory's quality assurance program.

Please call if you have any questions.

Respectfully submitted,

Columbia Analytical Services, Inc.

Abbie Spielman
Project Chemist

AS/das

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates	**Date Received:**	08/02/91
Project:	BP #11266 Alameda	**Work Order #:**	K914325C
Sample Matrix:	Water		

Volatile Organic Compounds
EPA Method 8240
µg/L (ppb)

Sample Name:		MW-1	MW-2	MW-3
Lab Code:		K4325-1	K4325-2	K4325-3
Date Analyzed:		08/10/91	08/10/91	08/12/91
Analyte	**MRL**			
Chloromethane	1	ND	ND	ND
Vinyl Chloride	1	ND	ND	ND
Bromomethane	1	ND	ND	ND
Chloroethane	1	ND	ND	ND
Trichlorofluoromethane (Freon 11)	1	ND	ND	ND
Trichlorotrifluoroethane (Freon 113)	10	ND	ND	ND
1,1-Dichloroethene	1	ND	ND	ND
Acetone	20	ND	ND	ND
Carbon Disulfide	1	ND	ND	ND
Methylene Chloride	10	ND	ND	ND
trans-1,2-Dichloroethene	1	ND	ND	ND
cis-1,2-Dichloroethene	1	ND	ND	ND
2-Butanone (MEK)	10	ND	ND	ND
1,1-Dichloroethane	1	ND	ND	ND
Chloroform	1	ND	ND	ND
1,1,1-Trichloroethane (TCA)	1	ND	ND	ND
Carbon Tetrachloride	1	ND	ND	ND
Benzene	1	*300	ND	ND
1,2-Dichloroethane	1	ND	ND	ND
Vinyl Acetate	10	ND	ND	ND
Trichloroethene (TCE)	1	ND	ND	ND
1,2-Dichloropropane	1	ND	ND	ND
Bromodichloromethane	1	ND	ND	ND
2-Chloroethyl Vinyl Ether	10	ND	ND	ND
trans-1,3-Dichloropropene	1	ND	ND	ND
2-Hexanone	10	ND	ND	ND
4-Methyl-2-pentanone (MIBK)	10	ND	ND	ND
Toluene	1	*1000	ND	ND
cis-1,3-Dichloropropene	1	ND	ND	ND
1,1,2-Trichloroethane	1	ND	ND	ND
Tetrachloroethene (PCE)	1	ND	ND	ND
Dibromochloromethane	1	ND	ND	ND
Chlorobenzene	1	2	ND	ND
Ethylbenzene	1	*520	ND	ND
Styrene	1	ND	ND	ND
Total Xylenes	1	*980	ND	ND
Bromoform	1	ND	ND	ND
1,1,2,2-Tetrachloroethane	1	ND	ND	ND
1,3-Dichlorobenzene	1	ND	ND	ND
1,4-Dichlorobenzene	1	ND	ND	ND
1,2-Dichlorobenzene	1	ND	ND	ND

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit
* Result is from the analysis of a diluted sample performed on August 10, 1991.

Approved by Arthur Spielman Date 8/27/91

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON Associates
Project: BP #11266 Alameda
Sample Matrix: Water

Date Received: 08/02/91
Work Order #: K914325C

Volatile Organic Compounds
EPA Method 8240
µg/L (ppb)

Sample Name:		MW-4	MW-5	MW-6
Lab Code:		K4325-4	K4325-5	K4325-6
Date Analyzed:		08/12/91	08/12/91	08/12/91
Analyte	**MRL**			
Chloromethane	1	ND	ND	ND
Vinyl Chloride	1	ND	ND	ND
Bromomethane	1	ND	ND	ND
Chloroethane	1	ND	ND	ND
Trichlorofluoromethane (Freon 11)	1	ND	ND	ND
Trichlorotrifluoroethane (Freon 113)	10	ND	ND	ND
1,1-Dichloroethene	1	ND	ND	ND
Acetone	20	ND	ND	ND
Carbon Disulfide	1	ND	ND	ND
Methylene Chloride	10	ND	ND	ND
trans-1,2-Dichloroethene	1	ND	ND	ND
cis-1,2-Dichloroethene	1	ND	ND	ND
2-Butanone (MEK)	10	ND	ND	ND
1,1-Dichloroethane	1	ND	ND	ND
Chloroform	1	ND	ND	ND
1,1,1-Trichloroethane (TCA)	1	ND	ND	ND
Carbon Tetrachloride	1	ND	ND	ND
Benzene	1	ND	ND	ND
1,2-Dichloroethane	1	ND	ND	ND
Vinyl Acetate	10	ND	ND	ND
Trichloroethene (TCE)	1	ND	ND	ND
1,2-Dichloropropane	1	ND	ND	ND
Bromodichloromethane	1	ND	ND	ND
2-Chloroethyl Vinyl Ether	10	ND	ND	ND
trans-1,3-Dichloropropene	1	ND	ND	ND
2-Hexanone	10	ND	ND	ND
4-Methyl-2-pentanone (MIBK)	10	ND	ND	ND
Toluene	1	ND	ND	ND
cis-1,3-Dichloropropene	1	ND	ND	ND
1,1,2-Trichloroethane	1	ND	ND	ND
Tetrachloroethene (PCE)	1	ND	ND	2
Dibromochloromethane	1	ND	ND	ND
Chlorobenzene	1	ND	ND	2
Ethylbenzene	1	ND	ND	ND
Styrene	1	ND	ND	ND
Total Xylenes	1	ND	ND	ND
Bromoform	1	ND	ND	ND
1,1,2,2-Tetrachloroethane	1	ND	ND	ND
1,3-Dichlorobenzene	1	ND	ND	ND
1,4-Dichlorobenzene	1	ND	ND	ND
1,2-Dichlorobenzene	1	ND	ND	ND

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by Ann Spielman Date 8/27/91

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON Associates
Project: BP #11266 Alameda
Sample Matrix: Water

Date Received: 08/02/91
Work Order #: K914325C

Volatile Organic Compounds
EPA Method 8240
µg/L (ppb)

Sample Name:		Method Blank	Method Blank
Lab Code:		K4325-MB	K4325-MB
Date Analyzed:		08/10/91	08/12/91
Analyte	**MRL**		
Chloromethane	1	ND	ND
Vinyl Chloride	1	ND	ND
Bromomethane	1	ND	ND
Chloroethane	1	ND	ND
Trichlorofluoromethane (Freon 11)	1	ND	ND
Trichlorotrifluoroethane (Freon 113)	10	ND	ND
1,1-Dichloroethene	1	ND	ND
Acetone	20	ND	ND
Carbon Disulfide	1	ND	ND
Methylene Chloride	10	ND	ND
trans-1,2-Dichloroethene	1	ND	ND
cis-1,2-Dichloroethene	1	ND	ND
2-Butanone (MEK)	10	ND	ND
1,1-Dichloroethane	1	ND	ND
Chloroform	1	ND	ND
1,1,1-Trichloroethane (TCA)	1	ND	ND
Carbon Tetrachloride	1	ND	ND
Benzene	1	ND	ND
1,2-Dichloroethane	1	ND	ND
Vinyl Acetate	10	ND	ND
Trichloroethene (TCE)	1	ND	ND
1,2-Dichloropropane	1	ND	ND
Bromodichloromethane	1	ND	ND
2-Chloroethyl Vinyl Ether	10	ND	ND
trans-1,3-Dichloropropene	1	ND	ND
2-Hexanone	10	ND	ND
4-Methyl-2-pentanone (MIBK)	10	ND	ND
Toluene	1	ND	ND
cis-1,3-Dichloropropene	1	ND	ND
1,1,2-Trichloroethane	1	ND	ND
Tetrachloroethene (PCE)	1	ND	ND
Dibromochloromethane	1	ND	ND
Chlorobenzene	1	ND	ND
Ethylbenzene	1	ND	ND
Styrene	1	ND	ND
Total Xylenes	1	ND	ND
Bromoform	1	ND	ND
1,1,2,2-Tetrachloroethane	1	ND	ND
1,3-Dichlorobenzene	1	ND	ND
1,4-Dichlorobenzene	1	ND	ND
1,2-Dichlorobenzene	1	ND	ND

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by Ann Spielman Date 8/27/91

00003

1317 South 13th Avenue • P.O. Box 479 • Kelso, Washington 98626 • Telephone 206/577-7222 • Fax 206/636-10

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	EMCON Associates	**Date Received:**	08/02/91
Project:	BP #11266 Alameda	**Date Analyzed:**	08/12/91
Sample Matrix:	Water	**Work Order #:**	K914325C

QA/QC Report
Surrogate Recovery Summary
Volatile Organic Compounds
EPA Method 8240

Sample Name	Lab Code	Percent Recovery		
		1,2-Dichloroethane - D_4	Toluene - D_8	4-Bromofluorobenzene
MW-3	K4325-3	95.0	90.2	92.2
MW-4	K4325-4	93.5	88.7	91.6
MW-5	K4325-5	98.9	91.5	95.3
MW-6	K4325-6	101	94.0	100
Method Blank	K4325-MB	96.4	93.8	89.3
EPA Acceptance Criteria		76-114	88-110	86-115

Approved by Arne Spielman Date 8/27/91

00005

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	EMCON Associates	**Date Received:**	08/02/91
Project:	BP #11266 Alameda	**Date Analyzed:**	08/10/91
Sample Matrix:	Water	**Work Order #:**	K914325C

QA/QC Report
Surrogate Recovery Summary
Volatile Organic Compounds
EPA Method 8240

Sample Name	Lab Code	Percent Recovery		
		1,2-Dichloroethane - D_4	Toluene - D_8	4-Bromofluorobenzene
MW-1	K4325-1	97.4	99.8	96.3
MW-2	K4325-2	95.1	101	98.3
MW-3	K4325-3MS	89.0	93.0	92.5
MW-3	K4325-3DMS	93.4	93.6	94.9
Method Blank	K4325-MB	102	95.0	94.7
EPA Acceptance Criteria		76-114	88-110	86-115

Approved by Ann Hjelmar Date 8/27/91

00006

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	EMCON Associates	**Date Received:**	08/02/91
Project:	BP #11266 Alameda	**Date Analyzed:**	08/10/91
Sample Matrix:	Water	**Work Order #:**	K914325C

QA/QC Report
Matrix Spike/Duplicate Matrix Spike Summary
Volatile Organic Compounds
EPA Method 8240
µg/L (ppb)

Sample Name: MW-3
Lab Code: K4325-3

Analyte	Spike Level	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	EPA Acceptance Criteria	Relative Percent Difference
1,1-Dichloroethene	50	ND	46.0	46.8	92.0	93.6	61-145	2
Trichloroethene	50	ND	53.1	55.1	106	110	71-120	4
Chlorobenzene	50	ND	48.7	50.5	97.4	101	75-130	4
Toluene	50	ND	49.4	51.8	98.8	104	76-125	5
Benzene	50	ND	51.3	55.2	103	110	76-127	7

ND None Detected at or above the method reporting limit

Approved by Anne Hjelmen Date 8/27/91

00007

APPENDIX B

CHAIN OF CUSTODY INFORMATION

Columbia Analytical Services™

1921 Ringwood Ave. • San Jose, CA 95131 • (408) 437 2400, FAX (408)437 9356

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

DATE _____ PAGE _____ OF _____

PROJECT NAME AP # 11266 # 090-64.07

PROJECT MNGR _____

COMPANY/ADDRESS Emcon Assoc

PHONE 453-2266

SAMPLERS SIGNATURE Rich Murray

SAMPLE I.D.	DATE	TIME	LAB I.D.	SAMPLE MATRIX	NUMBER OF CONTAINERS	ANALYSIS REQUESTED	REMARKS
MW-2	8/6/91	1400	1-2	H2O	4	2 2	
MW-6		1040	3-4		4	2 2	
MW-3		1120	5-6		4	2 2	
MW-5		1200	7-8		4	2 2	
MW-4		1235	9-10		4	2 2	
MW-1		1425	11-12		4	2 2	

ANALYSIS REQUESTED: Base/Neutral/Acid Organics GC/MS 8240/8270; Volatile Organics GC/MS 8240/8240; Halogenated or Aromatic Volatiles 601/8010 ☐ 602/8020 ☐; TPH as Gas/BTEX DHS LUFT/8020; TPH as Diesel/HEHC DHS LUFT; TPH - 418.1; Oil and Grease Method; Metals (total or dissolved) List Below; pH, Cond, Cl, SO4, PO4, F, NO2, Alk, TDS, TSS (circle); NH3-N, COD, Total-P, TKN, NO3 (circle); Total Organic Carbon TOC 415.9060; Total Phenols

RELINQUISHED BY:
Signature: Rich Murray
Printed Name: Rich Murray
Firm: Emcon Assoc
Date/Time: 08-01-91/1530

RECEIVED BY:
Signature: [illegible]
Printed Name: Howard Friedman
Firm: CAS-SJ
Date/Time: 8-1-91 1530

RELINQUISHED BY:
Signature:
Printed Name:
Firm:
Date/Time:

RECEIVED BY:
Signature: [illegible]
Printed Name: Marline Horner
Firm: CAS
Date/Time: 8/2/91 12:00

TURNAROUND REQUIREMENTS:
___ 24 hr ___ 48 hr ___ 5 day
___ Standard (~ 10-15 working days)
___ Provide Verbal Preliminary Results
___ Provide FAX Preliminary Results
Requested Report Date _____

REPORT REQUIREMENTS
___ I. Routine Report
___ II. Report (includes DUP,MS, MSD, as required, may be charged as samples)
___ III. Data Validation Report (includes All Raw Data)
___ IV. CLP Deliverable Report

INVOICE INFORMATION:
P.O. # _____
Bill to: _____

SAMPLE RECEIPT:
Shipping VIA: Sample
Shipping #: _____
Condition: OK
Lab No.: SF11-1073

SPECIAL INSTRUCTIONS/COMMENTS:
B2 to Tucker

SAR#1754

DISTRIBUTION: WHITE - return to originator, YELLOW - lab, PINK - retained by originator

400 05