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October 25, 1999

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Mr. Jeff Christoff
Blue Print Service Company
1057 Shary Circle
Concord, California 94518

Quarterly Report
July 1, 1999 through September 30, 1999
Groundwater Remediation and Monitoring
Blue Print Service Facility
1700 Jefferson Street
Oakland, California

Dear Mr. Christoff:

Harding Lawson Associates (HLA) presents this quarterly status report of the groundwater monitoring wells and treatment system at the Blue Print Service facility at 1700 Jefferson Street, Oakland, California. This report covers the period of July 1, 1999 through September 30, 1999 and was prepared to satisfy quarterly groundwater monitoring requirements of the Alameda County Environmental Health Services (Alameda County). The report also satisfies the reporting requirements of the East Bay Municipal Utilities District (EBMUD) for treatment system discharge to the sanitary sewer. This monitoring report includes the use of purge and non-purge techniques during well monitoring.

BACKGROUND

Three underground gasoline storage tanks were removed from the property in 1987. A preliminary investigation indicated a release of fuel into the soil and groundwater. Three groundwater monitoring wells (MW-1, MW-2, and MW-3) were installed on the property to evaluate the distribution of petroleum hydrocarbons in the soil and groundwater and to determine the direction of groundwater flow. Monitoring of these wells revealed free phase gasoline floating on the surface of the groundwater in MW-1. Initial groundwater level measurements indicated that local groundwater flows is in a north to northwest direction.



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In November 1987, monitoring well MW-2 was abandoned to facilitate the construction of the present structures and in January 1988, two additional wells (MW-1A and MW-4) were installed at the facility as groundwater extraction wells. HLA also installed one downgradient monitoring well (MW-5) in August 1988 and an upgradient well, MW-6, in April 1996 to improve our understanding of groundwater flow at the site. The locations of the monitoring wells are shown on Plate 1.

In 1992 a groundwater extraction system was constructed at the site to remove free phase product from the groundwater surface. Groundwater was extracted from MW-1A and MW-4 and passed through an oil-water separator that removed the free phase gasoline. The water was then drawn into a 3,000-gallon bioreactor tank for treatment by hydrocarbon reducing microbes. Air and nutrients were supplied to the groundwater within the bioreactor to facilitate microbial growth. The treated water from the bioreactor was pumped in batches of approximately 500 gallons through three granular activated carbon (GAC) vessels before being discharged to the sanitary sewer. The three-phase treatment system has processed approximately 1,384,290 gallons of groundwater and discharged the treated effluent to the sanitary sewer. An estimated 5,062 pounds of free-phase gasoline have been recovered. The discharge of the treated groundwater to the sanitary sewer is authorized under the EBMUD Wastewater Discharge Permit (Account No. 500-68191).

TREATMENT SYSTEM STATUS

During the third quarter of 1999, the treatment system was not operational and groundwater was not extracted or discharged. HLA is modifying the remediation technique from a pump and treat groundwater treatment system to an insitu treatment technique by placement of Oxygen Releasing Compounds (ORC) in the wells. ORC is manufactured and distributed by Regenisis, Inc.; its purpose is to raise the concentration of dissolved oxygen in the groundwater and thereby stimulate the naturally occurring biodegradation of the petroleum hydrocarbons in the groundwater.

Approximately 2,000 gallons of treated groundwater remain in the treatment system. HLA expects to discharge of this water during the next quarterly reporting period.

TREATMENT SYSTEM SAMPLING AND ANALYSIS

Because the system was not operational, HLA did not collect samples from the two extraction wells, the separator effluent, the bioreactor effluent or the treatment system effluent during this quarter. Two system effluent samples will be collected during the next quarter, one prior to beginning discharge of the remaining water and one during the discharge of the final 500 gallons.

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GROUNDWATER SAMPLING AND ANALYSIS

On September 23, 1999, HLA issued a Groundwater Monitoring Plan to the Alameda County Environmental Health Services (County), in order to initiate insitu-bioremediation (Appendix A). This plan outlined sampling of the wells using the guidelines presented in *Non-Purge Approach for Sampling Monitoring Wells Impacted by Petroleum Hydrocarbons, BTEX, and MTBE* as published by the Regional Water Quality Control Board (RWQCB) in January 31, 1997. The plan included using both the purge and non-purge methods in this quarter's sample event. Future sampling will be conducted by the non-purge technique. HLA implemented the Groundwater Monitoring Plan on September 29, 1999 after receiving approval from the Alameda County on September 28, 1999 (Appendix B).

On September 29, 1999, HLA measured the water levels in wells MW-1, MW-3, MW-5 and MW-6. HLA collected purge samples and non-purge samples at each of these four monitoring wells for baseline comparative analysis. HLA used the following two sampling procedures during our fieldwork.

Non-Purge Method

After measuring the depth to groundwater in each well, HLA inserted into the well a length of Teflon tubing equal to the total depth of the well to be left in the well for future sampling. To collect the sample groundwater samples, HLA raised the tubing until the end was 2 to 4 feet below the groundwater surface and then connected the tubing to a peristaltic pump. After removing the approximate volume of groundwater equal to the volume of the Teflon tubing, HLA collected a sample for conductivity, pH, dissolved oxygen (DO), and temperature measurements. After these groundwater parameters were measured, HLA pumped the groundwater directly into containers provided by the laboratory, which were then stored in a cooler with ice. The initial DO measurements are included in Table 1.

Purge Method

HLA performed the Purge Method after completing the non-purge sampling. We removed a minimum of three well casing volumes of groundwater with a PVC bailer. HLA cleaned the bailer in a non-phosphate cleaning solution and rinsed the bailer first in tap water, then in distilled water before use in each well. Conductivity, pH, temperature and DO of the extracted groundwater were monitored during purging. Sampling was not performed until the aforementioned groundwater parameter measurements had stabilized. Water samples were collected using a disposable Teflon bailer and preserved in laboratory-provided sterile containers and then placed in a cooler with ice. We transferred the purged groundwater from the monitoring wells to the bioreactor for treatment prior to discharge to the sanitary sewer under EBMUD Permit Number 500-68191. The purged water was not discharged during this reporting period.

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The groundwater samples from both the Non-Purge Method and the Purge Method were submitted to California Laboratory Services of Rancho Cordova, California under chain-of-custody protocol. Samples collected by the non-purge method were designated with an "A" prefix (MW-1A) and the purge samples were designated with a "B" prefix (MW-1B). The groundwater samples were analyzed using the following methods:

- Total petroleum hydrocarbons as gasoline (TPHg) in accordance with EPA Method 8015 modified
- Benzene, toluene, ethylbenzene, total xylenes (BTEX), and methyl t-butyl ether (MTBE) in accordance with EPA Method 8020

The laboratory reports are presented in Appendix C.

OXYGEN RELEASING COMPOUND

Upon completion of the groundwater sampling, HLA placed ORC in selected wells to enhance insitu-bioremediation. Increased concentrations of DO should stimulate the native microbial organisms to oxidize the petroleum hydrocarbons in the groundwater. The ORC is contained in socks that are hung in the groundwater across the well's screened interval. HLA removed the extraction pumps from wells MW-1A and MW-4 and hung the ORC socks in wells MW1A, MW-3, MW-4 and MW-5. Five socks were placed in each well.

DISCUSSION

HLA's groundwater measurements indicated lower groundwater levels in comparison to last quarter's measurements; the decrease ranged from 0.38 at MW-5 to 0.46 at MW-6. Groundwater level measurements indicated a depression in the water table at MW-1, however, this may be due to the removal to the two groundwater extraction pumps from the adjacent wells, MW-1A and MW-4, during groundwater level measurements. Using the groundwater elevations from MW-3, MW-5, and MW-6, HLA calculated that the groundwater gradient at approximately 0.0036 toward the northwest. Plate 1 shows the groundwater elevations at the wells.

Table 2 contains the compilation of historical groundwater sample results by the purge method. Table 3 provides a comparison of the non-purge and purge sample results from this sample event. Plate 2 presents the sample results from the non-purge method. A comparison of the results from the purge and non-purge methods for this quarter indicates that slightly higher concentrations are associated with the purge method. Comparison of this quarter's results with past results indicate an increase in TPHg and BTEX

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concentrations within the groundwater, probably due to the fact that the treatment system was not operating this quarter. HLA expects that the addition of the ORC socks will create an environment favorable to increased microbiological activity, causing the petroleum hydrocarbon concentrations to decrease next quarter. The groundwater sample from the offsite well MW-6 did not contain any detectable concentrations of TPHg or BTEX

MTBE was detected in MW-3 at concentrations of 10 and 14 $\mu\text{g/l}$ and not detected in any of the other wells. The detection limit for the MTBE analysis was elevated in the samples from MW-1 (250 $\mu\text{g/l}$) and MW-5 (100 $\mu\text{g/l}$) due to petroleum hydrocarbon interference. Analysis of a free-phase product sample collected from the oil-water separator in 1997 did not detect any MTBE; however, analysis of petroleum contaminated groundwater in by EPA Test Method 8020 may result in false positive detections of MTBE. HLA did not confirm the MTBE detections by EPA Test method 8260.

The DO concentration of the groundwater in the wells measured prior to purging ranged from 0.4 mg/l in MW-5 to 2.9 mg/l in MW-3.

CONCLUSIONS AND RECOMMENDATIONS

Concentrations of petroleum hydrocarbons in the groundwater did not change significantly from previous sample events. Our comparison between the Non-Purge Method and the Purge Method for this first quarter indicates that the Non-Purge method tends to yield slightly lower detected concentrations. HLA intends to use this data as a baseline comparative analysis for future sampling. We will use the Non-Purge Method for future groundwater monitoring of this site, but we will use both the Non-Purge and the Purge Methods for the final confirmation sampling event in support of our request for closure.

HLA will monitor DO and dissolved TPHg and BTEX concentrations in the wells to evaluate the need for ORC sock replacement.

HLA recommends that Blue Print Services send a copy of this report to the following addresses:

Mr. Don Hwang
Alameda County
Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, California, 94502-6577

Ms. Trish Maguire
East Bay Municipal Utility District
P.O. Box 24055
Oakland, California, 94623-1055

While under contract to BPS, HLA will continue to provide quarterly groundwater monitoring and reporting as required by Alameda County. Any treatment system discharge will be reported to EBMUD as required. The next groundwater sampling will be performed during the fourth quarter of 1999 and monitoring of the system effluent will continue to be performed as required by the EBMUD permit.

If you have any questions, please contact James McCarty at (510) 628-3220.

Yours very truly,

HARDING LAWSON ASSOCIATES

James McCarty

James G. McCarty
Project Engineer

Stephen J. Osborne

Stephen J. Osborne
Geotechnical Engineer



SJO/JGM/HDL/mlw/037426L

5 copies submitted

- Attachments:
- Table 1 - Dissolved Oxygen Results
 - Table 2 - Groundwater Monitoring Analytical Results (Historical)
 - Table 3 - Groundwater Monitoring Analytical Results
 - Plate 1 - Groundwater Surface Elevations, September 29, 1999
 - Plate 2 - TPHg and BTEX Concentrations, September 29, 1999
 - Appendix A - Groundwater Monitoring Plan
 - Appendix B - Alameda County Health Care Services Approval of Groundwater Monitoring Plan
 - Appendix C - Groundwater Monitoring Analytical Results

**Table 1. Dissolved Oxygen Results
Blue Print Service Facility
1700 Jefferson Street
Oakland, California**

<u>Date</u>	<u>MW-1</u>	<u>MW-3</u>	<u>MW-5</u>	<u>MW-6</u>
9/29/1999	2.9	1.7	0.4	1.8

All concentrations presented in milligrams per liter (mg/L)

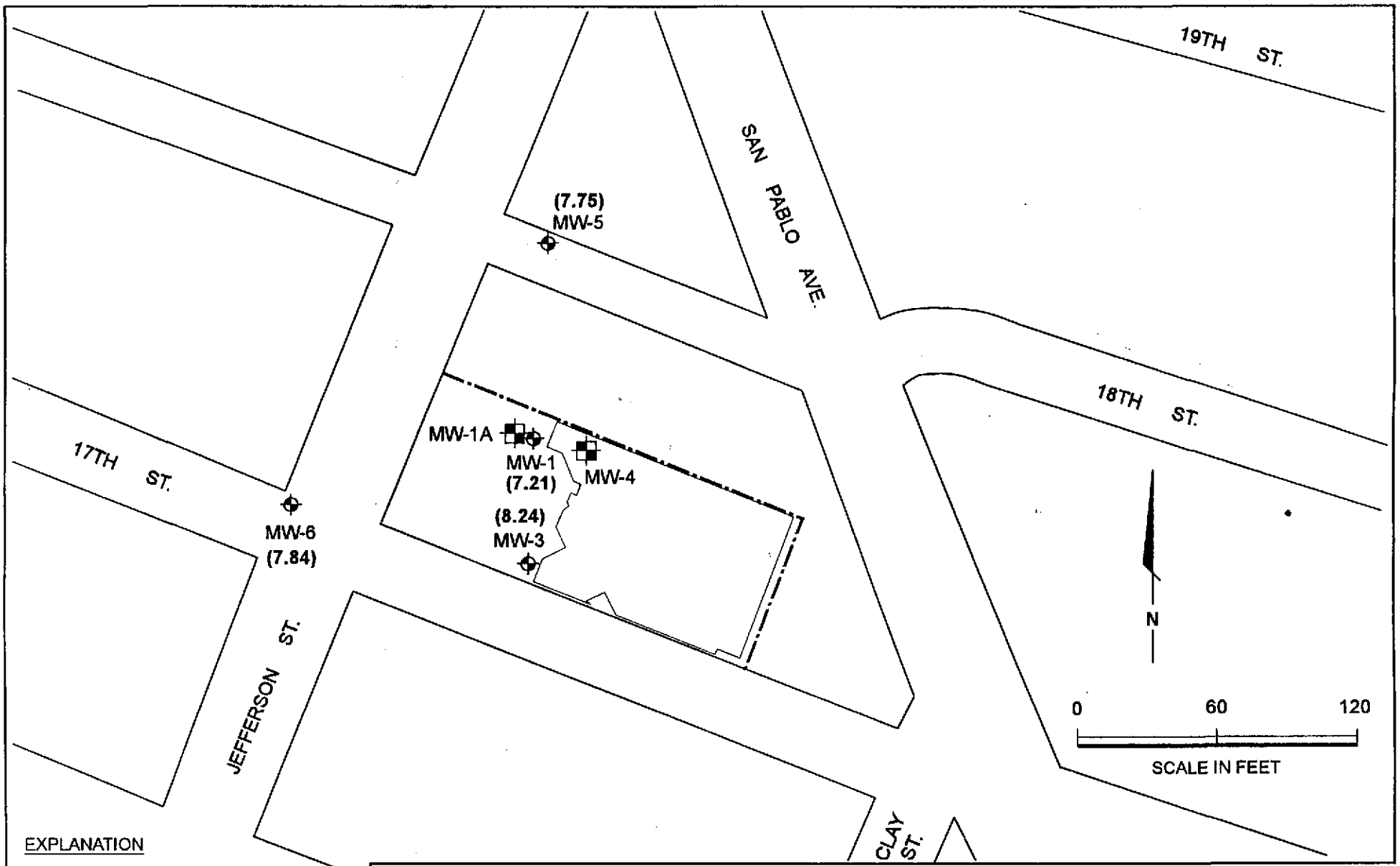
Table 1. Groundwater Monitoring Analytical Results
 Blue Print Service Facility
 1700 Jafferson Street
 Oakland, California

TPHg (mg/l)	Date Sampled																										
	8/1/1991	8/30/1992	3/30/1993	1/13/1994	4/13/1994	8/29/1994	12/8/1994	4/3/1995	8/27/1995	9/19/1995	12/13/1995	3/5/1996	9/11/1996	9/19/1996	12/23/1996	3/27/1997	8/4/1997	9/26/1997	12/23/1997	3/31/1998	8/18/1998	8/28/1998	12/2/1998	3/10/1999	6/30/1999	9/29/1999	
MW-1	FP	FP	FP	FP	FP	FP	FP	NA	NA	NA	NA	NA	FP	FP	FP	FP	68	59	41	44	32	26	26	26	18	21	
MW-1A	350	FP	FP	FP	FP	170	95	190	67	53	52	82	200	140	100	FP	86	54	73	86	51	56	15	41	16	NA	
MW-3	74	FP	FP	FP	FP	39	4,800	51	20	6.2	19	7	16	6	FP	FP	65	47	32	32	16	17	3.2	9.6	7.9	5.0	
MW-4	64	FP	FP	FP	FP	54	16	92	34	13	14	11	110	260	95	FP	37	24	41	46	NA	26	46	10	11	8.8	NA
MW-5	120	51	74	60	63	64	59	51	41	50	45	51	46	45	45	44	35	36	39	46	17	16	15	23	7.7	11	
MW-6	-	-	-	-	-	-	-	-	-	-	-	-	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)
Benzene (µg/l)																											
MW-1	FP	FP	FP	FP	FP	FP	FP	NA	NA	NA	NA	NA	FP	FP	FP	FP	2,200	6,000	6,800	8,300	1,100	6,800	9,200	8,200	7,000	9,200	
MW-1A	17,000	FP	FP	FP	FP	17,000	18,000	13,000	11,000	11,000	8,900	8,900	14,000	18,000	18,000	FP	12,800	11,000	10,600	10,000	9,100	11,000	1,300	8,500	2,300	8,400	NA
MW-3	1,600	FP	FP	FP	FP	FP	3,200	1,500	1,100	270	70	220	120	170	45	FP	FP	8,500	610	640	690	180	64	39	66	31	120
MW-4	1,500	FP	FP	FP	FP	1,500	1,300	1,700	1,200	1,300	2,200	630	2,600	6,800	9,800	FP	2,600	2,600	2,600	8,000	NA	2,000	8,700	1,700	2,300	1,800	NA
MW-5	20,000	13,000	16,000	19,000	14,000	20,000	13,000	15,000	12,000	1,600	13,000	15,000	12,000	12,000	11,000	8,900	7,900	13,000	10,000	9,500	5,400	8,400	14,000	5,200	9,600		
MW-6	-	-	-	-	-	-	-	-	-	-	-	-	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)
Toluene (µg/l)																											
MW-1	FP	FP	FP	FP	FP	FP	FP	NA	NA	NA	NA	NA	FP	FP	FP	FP	14,000	4,500	3,000	3,000	3,700	3,800	2,300	4,300	5,800	6,800	10,000
MW-1A	31,000	FP	FP	FP	FP	31,000	21,000	21,000	13,000	9,900	9,200	11,000	22,000	28,000	22,000	FP	15,000	12,000	18,000	18,000	11,000	15,000	830	11,000	1,900	7,800	NA
MW-3	4,600	FP	FP	FP	FP	FP	2,900	4,200	2,300	550	140	460	170	270	30	FP	FP	13,000	6,000	5,300	3,600	1,500	1,100	85	540	330	340
MW-4	5,200	FP	FP	FP	FP	2,500	790	4,100	3,400	1,600	2,100	470	3,600	19,000	19,000	FP	6,800	3,200	5,000	11,000	NA	460	11,000	810	2,100	3,000	NA
MW-5	14,000	5,900	5,000	6,200	3,500	5,400	3,800	2,200	2,100	2,700	2,100	2,800	2,900	4,500	2,200	1,100	560	270	500	400	310	160	120	300	270	710	
MW-6	-	-	-	-	-	-	-	-	-	-	-	-	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)
Ethylbenzene (µg/l)																											
MW-1	FP	FP	FP	FP	FP	FP	FP	NA	NA	NA	NA	NA	FP	FP	FP	FP	1,500	1,600	1,400	1,100	550	730	820	870	950	1,200	
MW-1A	3,000	FP	FP	FP	FP	2,100	1,500	1,400	910	800	710	790	2,700	2,800	2,100	FP	1,400	1,900	1,400	1,400	1,100	870	31	720	1,600	660	NA
MW-3	670	FP	FP	FP	FP	FP	580	6,000	580	190	66	140	49	66	15	FP	FP	2,400	830	800	870	490	430	25	200	230	
MW-4	1,000	FP	FP	FP	FP	520	51	316	280	77	110	14	760	3,700	2,000	FP	840	140	350	680	NA	ND(15)	880	ND(15)	68	150	NA
MW-5	1,900	1,400	1,800	1,400	1,500	2,600	1,800	2,800	1,400	2,000	1,600	2,000	2,000	2,300	2,700	1,900	1,500	1,500	1,900	2,000	420	1,100	1,500	1,800	1,100	1,100	
MW-6	-	-	-	-	-	-	-	-	-	-	-	-	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)
Xylene (µg/l)																											
MW-1	FP	FP	FP	FP	FP	FP	FP	NA	NA	NA	NA	NA	FP	FP	FP	FP	11,000	8,600	6,600	6,600	4,300	3,000	2,100	2,800	3,500	2,500	5,500
MW-1A	22,000	FP	FP	FP	FP	14,000	12,000	11,000	9,800	6,300	6,800	9,300	22,000	19,000	14,000	FP	100	7,200	8,500	12,000	8,800	3,800	3,800	8,700	2,300	4,100	NA
MW-3	4,300	FP	FP	FP	FP	FP	4,300	95,000	4,600	1,700	500	1,700	440	1,500	300	FP	FP	16,000	5,900	5,900	5,200	3,700	3,600	360	2,300	1,800	1,300
MW-4	7,300	FP	FP	FP	FP	3,200	3,400	5,400	5,800	1,800	2,100	1,800	10,000	26,000	13,000	FP	5,500	3,500	4,800	8,200	NA	8,400	5,900	2,300	1,600	2,700	NA
MW-5	4,900	2,600	2,700	2,700	2,100	4,500	2,900	4,500	1,800	2,100	1,900	2,400	2,700	4,000	6,500	2,600	1,700	1,300	1,700	2,200	650	900	840	1,100	690	1,100	
MW-6	-	-	-	-	-	-	-	-	-	-	-	-	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(0.80)	ND(0.80)	ND(0.80)	ND(0.80)	ND(0.80)	ND(0.80)	ND(0.80)
MTBE (µg/l)																											
MW-1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	FP	FP	ND(500)	ND(500)	300	420	ND(50)	ND(50)	ND(50)	ND(50)	ND(25)	ND(250)
MW-1A	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1,800	ND(300)	ND(500)	1,900	300	ND(50)	ND(50)	ND(50)	ND(50)	ND(25)	NA
MW-3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	FP	FP	ND(500)	ND(100)	ND(300)	350	ND(25)	ND(50)	ND(50)	ND(25)	ND(25)	10
MW-4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1,400	ND(300)	ND(300)	270	NA	ND(50)	ND(50)	ND(50)	ND(25)	ND(25)	NA
MW-5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	600	300	ND(100)	ND(500)	ND(1000)	350	ND(10)	ND(50)	ND(50)	ND(50)	ND(25)	ND(100)
MW-6	-	-	-	-	-	-	-	-	-	-	-	-	NA	NA	NA	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)




TPHg = total petroleum hydrocarbons as gasoline
 MTBE = methyl t-butyl ether
 (mg/l) milligrams per liter
 (µg/l) micrograms per liter
 ND = Not detected above the reporting limit in parenthesis
 NA = Not analyzed
 FP = Free Product
 -- = Well did not exist at date indicated

Table 3. City Blue Groundwater Monitoring Analytical Results
 Collected September 29, 1999
 Blue Print Service Facility
 1700 Jefferson Street
 Oakland, California

Sample ID	units	Non-Purge Method				Purge Method			
		MW-1 A	MW-3 A	MW-5 A	MW-6 A	MW-1 B	MW-3 B	MW-5 B	MW-6 B
TPHg	mg/l	14	4.1	10	ND<0.5	21	5.0	11	ND<0.5
Benzene	µg/l	6,200	180	14,000	ND<0.3	9,200	120	9,600	ND<0.3
Toluene	µg/l	5,900	340	470	ND<0.3	10,000	340	710	ND<0.3
Ethylbenzene	µg/l	620	130	1,100	ND<0.3	1,200	230	1,100	ND<0.3
Total Xylenes	µg/l	3,500	580	600	ND<0.6	5,500	1,300	1,100	ND<0.6
MTBE	µg/l	ND<250	14	ND<100	ND<1.0	ND<250	10	ND<100	ND<1.0



EXPLANATION

-  Site Boundary
-  Monitoring Well
-  Extraction Well
- (5.03)** Groundwater Elevation (in feet based on City of Oakland datum)



Harding Lawson Associates
 Engineering and
 Environmental Services

Groundwater Surface Elevations
September 29, 1999
 City Blue Production Facility
 Oakland, California

PLATE
1

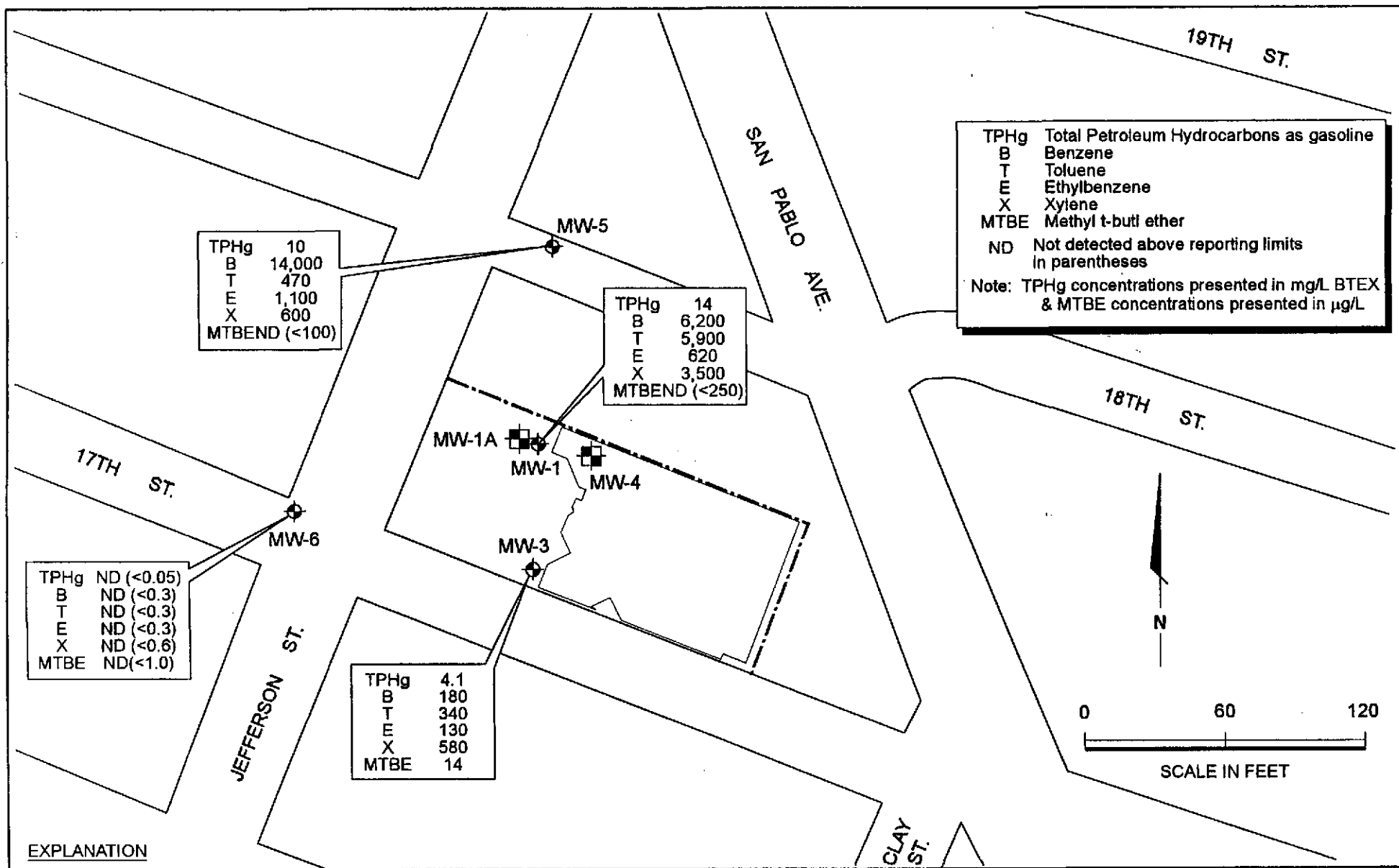
DRAWN
 jgm

PROJECT NUMBER
 48559.1

APPROVED
 JGM

DATE
 10/19/99

REVISED DATE



TPHg Total Petroleum Hydrocarbons as gasoline
 B Benzene
 T Toluene
 E Ethylbenzene
 X Xylene
 MTBE Methyl t-butyl ether
 ND Not detected above reporting limits in parentheses
 Note: TPHg concentrations presented in mg/L BTEX & MTBE concentrations presented in µg/L

TPHg 10
 B 14,000
 T 470
 E 1,100
 X 600
 MTBEND (<100)

TPHg 14
 B 6,200
 T 5,900
 E 620
 X 3,500
 MTBEND (<250)

TPHg ND (<0.05)
 B ND (<0.3)
 T ND (<0.3)
 E ND (<0.3)
 X ND (<0.6)
 MTBE ND (<1.0)

TPHg 4.1
 B 180
 T 340
 E 130
 X 580
 MTBE 14

EXPLANATION

- Site Boundary
- ◊ Monitoring Well
- ◻ Extraction Well



Harding Lawson Associates
 Engineering and Environmental Services

TPHg, BTEX, and MTBE Concentrations in Groundwater
Non-Purge Method of Sampling
September 29, 1999
 City Blue Production Facility
 Oakland, California

PLATE
2

DRAWN jgm	PROJECT NUMBER	APPROVED JGM	DATE 10/19/99	REVISED DATE
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APPENDIX A
Groundwater Monitoring Plan




FILE COPY

September 23, 1999

46559.1

Hwang 
Mr. Don ~~Wayne~~
Alameda County Environmental Health Services
1131 Harbor by Parkway, Suite 250
Alameda, California 94502

Groundwater Monitoring Plan
Blue Print Services Facility
17th Street and Jefferson Street
Oakland California

Hwang 
Dear Mr. ~~Wayne~~:

As stated in our letter dated August 17, 1999, HLA plans to begin insitu-bioremediation at the Blue Print Services site in Oakland, California. HLA will place an oxygen-releasing compound (ORC), manufactured and sold by Regensis, Inc. in selected wells to enhance insitu-bioremediation. The ORC will be contained in socks that will be hung in the groundwater across the wells' screened intervals. The ORC socks will be placed in wells MW-1A, MW-3, MW-4, and MW-5 (Plate 1). In order to monitor groundwater conditions without the direct influence of ORC, the socks will be removed from wells MW-3 and MW-5 two weeks prior to sampling. Groundwater samples from MW-1A and MW-4 are not needed because groundwater sampled at MW-1 can monitor groundwater quality in this area. The following is a description of the groundwater sampling procedures to be followed.

HLA plans to use the non-purge approach for future sampling at this site as published by the San Francisco Bay Regional Water Quality Control Board on January 31, 1999, (see attachment). On the first quarter of implementation of this plan, HLA will collect purge samples and non-purge samples for a baseline comparative analysis.

Prior to the purging or sampling of monitoring wells MW-1, MW-3, MW-5, and MW-6, the distance from the top of the well casing to groundwater in the well will be measured with an electric water level indicator. Depth to groundwater will be measured to the nearest one-hundredth of a foot.



September 23, 1999

46559.1

Don Wayne

Alameda County Environmental Health Services

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Harding Lawson Associates

Non-Purge Method

Groundwater samples will be collected through dedicated Teflon tubing using a peristaltic pump. This tubing will be inserted into the well immediately prior to sampling during the first sampling event. In order to collect a sample, the tubing will be pulled up till the end is at a depth of 2 to 4 feet below the groundwater surface. The tubing will be connected to the peristaltic pump and after removal of approximately a volume of groundwater equal to the length of the Teflon tubing, a sample will be collected for a conductivity, pH, dissolved oxygen (DO), and temperature measurements and a groundwater sample for chemical analysis. This sample will be taken prior to using the purge method in the first sample event.

Purge Method

During the first sample event, the monitoring wells will be purged by removing a minimum of three well casing volumes of groundwater with a submersible pump or PVC bailer. Before each use, the pump or bailer will be decontaminated in a non-phosphate cleaning solution and rinsed first in tap water, then in distilled water. Conductivity, pH, and temperature of the extracted groundwater will be monitored during purging. Sampling will not take place until the aforementioned groundwater parameter measurements have stabilized. Purged groundwater from the monitoring wells will be treated by the onsite groundwater treatment system before discharge to the sanitary sewer under East Bay Municipal Water District Permit Number 500-68191. Water samples from MW-1, MW-3, MW-5, and MW-6 will be collected using a disposable Teflon bailer. After the first quarter implementation of this plan, the purge method of sampling will no longer be used.

The groundwater samples preserved in laboratory-provided sterile containers and placed in a cooler with ice packs and for submittal to a California certified analytical laboratory under chain of custody protocol. The groundwater samples will be analyzed using the following methods:

- Total petroleum hydrocarbons (TPH) in accordance with EPA Method 8015 modified
- Benzene, toluene, ethylbenzene, total xylenes, and methyl t-butyl ether in accordance with EPA Method 8020

In monitoring events after the initial sampling, where the ORC socks are removed from the well two weeks prior to sampling, the ORC socks will be replaced in the wells following collection of the groundwater samples. DO measurements as well as chemical results will be used to determine the replacement rate of the ORC socks.

September 23, 1999

46559.1

Don Wayne

Alameda County Environmental Health Services

Page 3

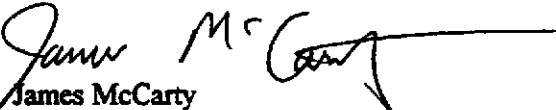
Harding Lawson Associates

HLA anticipates performing the next groundwater monitoring on or about September 28, 1999 and then placing the ORC socks in the wells following the collection of the groundwater samples. HLA will continue to issue quarterly monitoring reports within one month of the end of the quarterly period. DO measurements will be reported along with the results of chemical analyses.

We trust this letter provides information required at this time. Please call if you have questions or additional information is required. We would appreciate a letter of approval documenting your acceptance of this plan.

Yours very truly,

HARDING LAWSON ASSOCIATES



James McCarty
Project Engineer

jgm/ 46559/gwplan

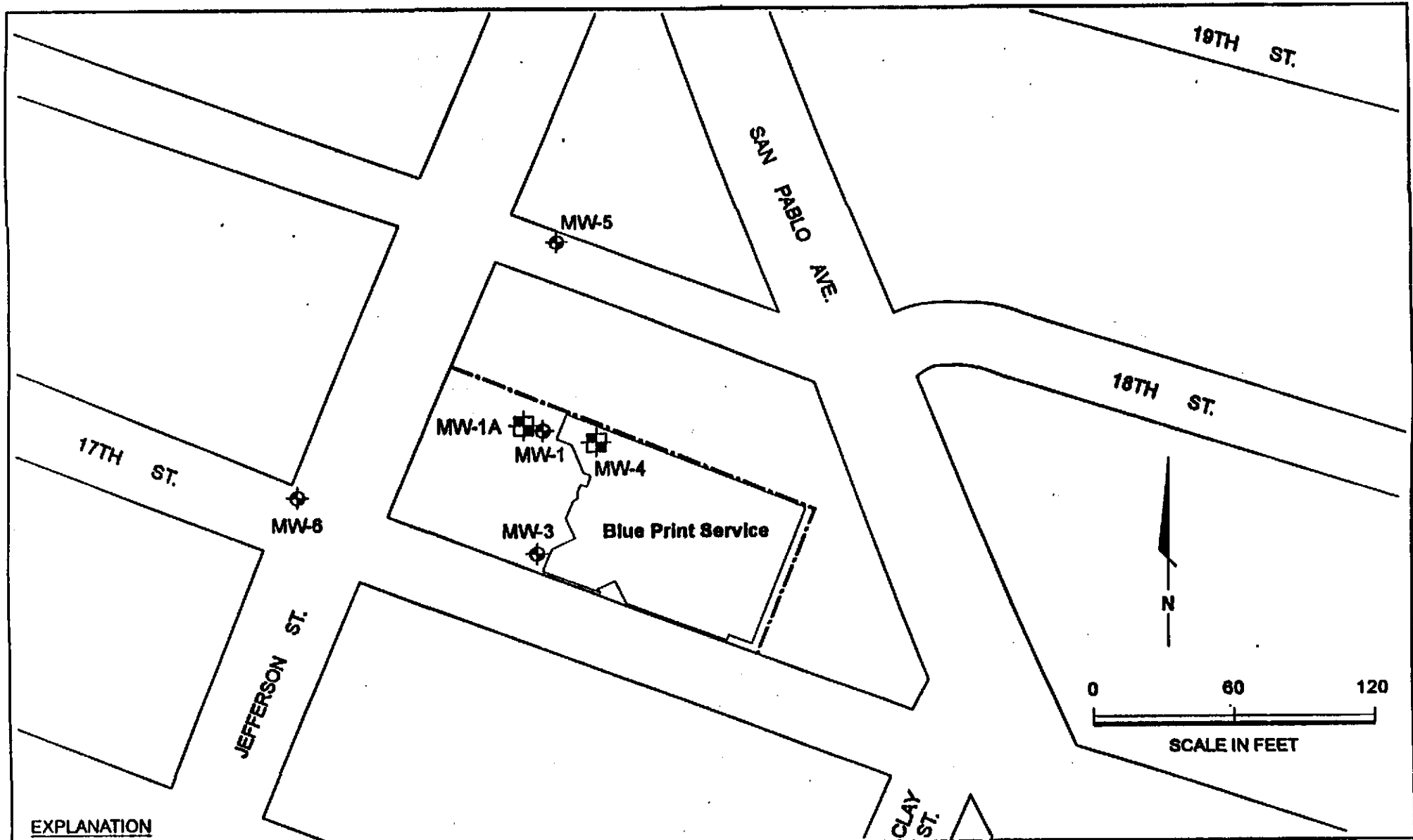
1 copies submitted

Attachments:

Plate 1 - Site Map

Utilization of Non-Purge Approach for Sampling of Monitoring Wells Impacted by Petroleum Hydrocarbons, BTEX, and MTBE

Mr. Jeff Christoff
Blue Print Service Company
1057 Shary Circle
Concord, California 94518



EXPLANATION

- Site Boundary
- ⊕ Monitoring Well
- ⊞ Extraction Well
- (5.03) Groundwater Elevation (In feet based on City of Oakland datum)



Harding Lawson Associates
 Engineering and Environmental Services

SITE MAP
 City Blue Production Facility
 Oakland, California

PLATE

1

DRAWN
 Jgm

PROJECT NUMBER
 46559.1

APPROVED
 JGM

DATE
 8/17/99

REVISED DATE

San Francisco Bay
Regional Water
Quality Control
Board

2101 Webster Street
Suite 500
Oakland, CA 94612
(510) 236-1255
FAX (510) 236-1380



Pete Wilson
Governor

To: Interested Parties

January 31, 1997

File: 1123.64

**SUBJECT: Utilization of Non-Purge Approach for Sampling of
Monitoring Wells Impacted by Petroleum Hydrocarbons,
BTEX, and MTBE**

**REFERENCE: "The California Groundwater Purging Study for
Petroleum Hydrocarbons", Report for Western States
Petroleum Association by SECOR International
Incorporated, Dated October 28, 1996**

Finding and Recommendation

The WSPA study concludes that selection of a non-purge sampling methodology will not affect the overall variability of analytic data, and will provide a comparable, and in many cases, conservative estimate of petroleum hydrocarbons in groundwater. Based upon our review of the study, we conclude that for monitoring wells at fuel UST sites purging is not required providing the conditions we have outlined below are met. Our rationale is provided below.

Rationale

Since the release of the Western States Petroleum Association (WSPA) study on the effects of purging or not purging gasoline impacted monitoring wells prior to sampling there have been questions posed as to the validity and applicability of the study. Board staff acknowledge the concerns of some towards the possible bias in the study because of variations in data quality due to differing purging and sampling techniques utilized in the study, the lack of specific well design information or water quality parameter information, and the questions of statistical bias introduced into the study by the inclusion of non-detect data. However, we believe that these concerns are mitigated by the overall environmental and economic benefits discussed below.

Section 13267 (b) of the Water Code states that for technical or monitoring program reports the board may specify that ... "The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports". From an environmental perspective, there is an advantage in reducing the environmental burden by virtue of reducing the volumes of purge water



for treatment and disposal, which in turn reduces secondary impacts to air and water quality from waste handling, transport, and treatment of the purge water. In

addition, there is a positive cost savings and, consequently, a potential savings to the State's limited Clean Up Fund resources. We therefore believe that this approach is consistent with Section 13267.

We recognize at least one disadvantage from not purging is that, if true, higher analytic readings from non-purged samples may result in unnecessarily prolonging remediation and monitoring. In the worst case, some minor changes in water quality may be missed on a timely basis, such as those due to changes resulting from utilizing effective remediation techniques or, conversely, missing the detection of a new release from on or off site. Also, if further refinement of the WSPA study provides new information in conflict to the present study, we are prepared to modify our requirements accordingly.

Conditions on Using the Non-Purging Approach

In consideration of the above, we will now require the following for any Responsible Party or consultant proposing to utilize the non-purging approach:

1. The non-purging approach shall be used only for monitoring wells where groundwater has been impacted by Petroleum Hydrocarbons, BTEX, and MTBE.
2. Non-purge sampling shall be utilized for unconfined aquifers only.
3. The monitoring well shall be properly permitted, constructed (in this case, screened across the water table), and developed.
4. The well is not presently in use for groundwater or soil vapor extraction.
5. The well does not have free product.
6. For new wells or wells brought into monitoring for the first time, the first round of groundwater sampling performed at a site shall be with both non-purged and purged samples. The purging and sampling method used shall be documented. This shall include the rate of purge and sampling details. For these wells we require measurements of dissolved oxygen, specific conductance, pH, and temperature whether purged or not purged. Also, if biodegradation is being tracked at the well, our requirements do not preclude the measurement of other parameters.



7. Existing wells which have already been routinely purged in previous sampling events immediate to being switched to a non-purging mode do not require an initial duplicate non-purged and purged sample.
8. Monitoring data frequency shall be as required by the appropriate regulatory oversight agency.
9. Should a Responsible Party request site closure where the non-purged approach has been used, the final confirmation sampling event shall include both non-purged and purged samples from each well or as agreed upon with the appropriate regulatory oversight agency.

Prior to implementing the non-purge approach, the appropriate regulatory oversight agency shall be contacted, with an information copy to this office. Please call John Kaiser (510 - 286 - 0803) or me (510 - 286 - 0304) if you have any questions regarding this letter.

Loretta K. Barsamian
Executive Officer

Stephen I. Morse, P.E.
Chief,
Toxics Cleanup Division

cc: SWRCB - CWP (Alan Patton and Dave Deaner)
Regional Boards 1,3-9 UST Program Managers
RWQCB Region 2 UST Staff
USEPA, Region 9 (Matt Small)
Region 2 Local Agency UST Managers

Note: A synopsis of the WSPA Report including information on how to obtain the complete report may be found on the Internet at
<http://www.secor.com/purge.html>



APPENDIX B

**ALAMEDA COUNTY HEALTH CARE SERVICES APPROVAL OF
GROUNDWATER MONITORING PLAN**

ALAMEDA COUNTY
HEALTH CARE SERVICES

AGENCY
DAVID J. KEARS, Agency Director



007011999

ENVIRONMENTAL HEALTH SERVICES
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
(510) 567-6700
(510) 337-9335 (FAX)

September 28, 1999

Jeff Christoff
Blue Print Service Co.
1057 Shary Circle
Concord, CA 94518

Re: Blue Print Service Co., 1700 Jefferson St., Oakland, CA 94612;
StId 4148

Dear Mr. Christoff:

This office has received the ORC calculation sheet and the "Groundwater Monitoring Plan" addendums to "Enhanced Insitu-Bioremediation and Groundwater Monitoring Procedures, ...46559.1, Harding Lawson Associates, August 17, 1999". The procedures with the addendums is accepted.

If you have any questions, you may call me at 510/567-6746.

Sincerely,

Don Hwang
Hazardous Materials Specialist

LS

C: Jim McCarty, Harding Lawson Associates, Engineering and
Environmental Services, 383 4th St., 3rd Floor, Oakland, CA 94607

file

APPENDIX C
GROUNDWATER MONITORING ANALYTICAL RESULTS



383 Fourth Street, Third Floor
Oakland, California 94607
(510) 451-1001 - Phone
(510) 451-3165 - Fax

Samplers: Heather Lee

Lab: CLS

Job Number: 46559-1

Name/Location: City Blue GW Monitoring

Project Manager: Jim McCarty

Recorder: Heather Lee
(Signature Required)

SOURCE CODE	MATRIX					CONTAINERS & PRESERV.					SAMPLE NUMBER OR LAB NUMBER			DATE				STATION DESCRIPTION/NOTES
	Water	Sediment	Soil	Oil		Unpres.	H ₂ S	HNO ₃	HCL	Ice	Yr	Wk	Seq	Yr	Mo	Day	Time	
	X							3X					99	09	29	08	15	
	X							3X					99	09	29	08	40	
	X							3X					99	09	29	09	10	
	X							3X					99	09	29	09	30	
	X							3X					99	09	29	09	57	
	X							3X					99	09	29	10	35	
	X							3X					99	09	29	11	05	
	X							3X					99	09	29	11	35	

ANALYSIS REQUESTED						
EPA 8010	EPA 8020	EPA 8260	EPA 8270	METALS	EPA 8015M/TPGH	EPA 8020/BTEX + MTBE
					X	X
					X	X
					X	X
					X	X
					X	X
					X	X
					X	X
					X	X

LAB NUMBER			DEPTH IN FEET	COL MTD CD	QA CODE	MISCELLANEOUS
Yr	Wk	Seq				
						Standard TAT

CHAIN OF CUSTODY RECORD		
RELINQUISHED BY: (Signature) <u>Heather Lee</u>	RECEIVED BY: (Signature) <u>Jim McCarty</u>	DATE/TIME <u>9/30/99</u>
RELINQUISHED BY: (Signature) <u>Heather Lee</u>	RECEIVED BY: (Signature)	DATE/TIME <u>9/30/99</u>
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
DISPATCHED BY: (Signature)	DATE/TIME	RECEIVED FOR LAB BY: (Signature) <u>Jim McCarty</u>
METHOD OF SHIPMENT		
SAMPLE CONDITION WHEN RECEIVED BY THE LABORATORY		

Laboratory Copy
White

Project (Office) Copy
Yellow

Field or Office Copy
Pink

CLS Labs

Harding Lawson Associates
Engineering and Environmental
383 4th Street, Third Floor
Oakland, CA 94607

10/12/99

Attention: Jim McCarty

Reference: Analytical Results

Project Name: City Blue GW Monitoring
Project No.: 46559-1
Date Received: 09/30/99
Chain Of Custody: 2371

CLS ID No.: R4902
CLS Job No.: 824902

The following analyses were performed on the above referenced project:

<u>No. of Samples</u>	<u>Turnaround Time</u>	<u>Analysis Description</u>
8	10 Days	TPH as Gasoline, BTEX and MIBB

These samples were received by CLS Labs in a chilled, intact state and accompanied by a valid chain of custody document.

Calibrations for analytical testing have been performed in accordance to and pass the EPA's criteria for acceptability.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,


James Liang, Ph.D.
Laboratory Director

CLS Labs

Analysis Report: EPA 8020, BTEX and MTBE
Purge and Trap, EPA Method 5030

Client: Harding Lawson Associates
Engineering and Environmental
383 4th Street, Third Floor
Oakland, CA 94607

Project No.: 46559-1
Contact: Jim McCarty
Phone: (510)451-1001

Project: City Blue GW Monitoring

Lab Contact: James Liang
Lab ID No.: R4902-1A
Job No.: 824902
COC Log No.: 2371
Batch No.: 26735
Instrument ID: GC018
Analyst ID:
Matrix: WATER

Date Sampled: 09/29/99
Date Received: 09/30/99
Date Extracted: N/A
Date Analyzed: 10/01/99
Date Reported: 10/11/99
Client ID No.: MW-6A

SURROGATE

Analyte	CAS No.	Surr Conc. (ug/L)	Surrogate Recovery (percent)
o-Chlorotoluene	95-49-8	20.0	104

MW-6A

Analyte	CAS No.	Results (ug/L)	Rep. Limit (ug/L)	Dilution (factor)
Methyl t-butyl ether	1634-04-4	ND	1.0	1.0
Benzene	71-43-2	ND	0.30	1.0
Toluene	108-88-3	ND	0.30	1.0
Ethylbenzene	100-41-4	ND	0.30	1.0
Xylenes, total	1330-20-7	ND	0.60	1.0

ND = Not detected at or above indicated Reporting Limit

CLS Labs

Analysis Report: EPA 8020, BTEX and MTBE
Purge and Trap, EPA Method 5030

Client: Harding Lawson Associates
Engineering and Environmental
383 4th Street, Third Floor
Oakland, CA 94607

Project No.: 46559-1
Contact: Jim McCarty
Phone: (510)451-1001

Project: City Blue GW Monitoring

Lab Contact: James Liang
Lab ID No.: R4902-2A
Job No.: 824902
COC Log No.: 2371
Batch No.: 26735
Instrument ID: GC018
Analyst ID:
Matrix: WATER

Date Sampled: 09/29/99
Date Received: 09/30/99
Date Extracted: N/A
Date Analyzed: 10/01/99
Date Reported: 10/11/99
Client ID No.: MW-6B

SURROGATE

Analyte	CAS No.	Surr Conc. (ug/L)	Surrogate Recovery (percent)
o-Chlorotoluene	95-49-8	20.0	102

MW-6B

Analyte	CAS No.	Results (ug/L)	Rep. Limit (ug/L)	Dilution (factor)
Methyl t-butyl ether	1634-04-4	ND	1.0	1.0
Benzene	71-43-2	ND	0.30	1.0
Toluene	108-88-3	ND	0.30	1.0
Ethylbenzene	100-41-4	ND	0.30	1.0
Xylenes, total	1330-20-7	ND	0.60	1.0

ND = Not detected at or above indicated Reporting Limit

CLS Labs

Analysis Report: EPA 8020, BTEX and MTBE
Purge and Trap, EPA Method 5030

Client: Harding Lawson Associates
Engineering and Environmental
383 4th Street, Third Floor
Oakland, CA 94607

Project No.: 46559-1
Contact: Jim McCarty
Phone: (510)451-1001

Project: City Blue GW Monitoring

Lab Contact: James Liang
Lab ID No.: R4902-3A
Job No.: 824902
COC Log No.: 2371
Batch No.: 26735
Instrument ID: GC018
Analyst ID:
Matrix: WATER

Date Sampled: 09/29/99
Date Received: 09/30/99
Date Extracted: N/A
Date Analyzed: 10/01/99
Date Reported: 10/11/99
Client ID No.: MW-5A

SURROGATE

Analyte	CAS No.	Surr Conc. (ug/L)	Surrogate Recovery (percent)
o-Chlorotoluene	95-49-8	2000	100

MW-5A

Analyte	CAS No.	Results (ug/L)	Rep. Limit (ug/L)	Dilution (factor)
Methyl t-butyl ether	1634-04-4	ND	100	100
Benzene	71-43-2	14000	300	1000
Toluene	108-88-3	470	30	100
Ethylbenzene	100-41-4	1100	30	100
Xylenes, total	1330-20-7	600	60	100

ND = Not detected at or above indicated Reporting Limit

CLS Labs

Analysis Report: EPA 8020, BTEX and MTBE
Purge and Trap, EPA Method 5030

Client: Harding Lawson Associates
Engineering and Environmental
383 4th Street, Third Floor
Oakland, CA 94607

Project No.: 46559-1
Contact: Jim McCarty
Phone: (510)451-1001

Project: City Blue GW Monitoring

Lab Contact: James Liang
Lab ID No.: R4902-4A
Job No.: 824902

Date Sampled: 09/29/99
Date Received: 09/30/99
Date Extracted: N/A
Date Analyzed: 10/01/99
Date Reported: 10/11/99
Client ID No.: MW-5B

COC Log No.: 2371
Batch No.: 26735
Instrument ID: GC018
Analyst ID:
Matrix: WATER

SURROGATE

Analyte	CAS No.	Surr Conc. (ug/L)	Surrogate Recovery (percent)
o-Chlorotoluene	95-49-8	2000	100

MW-5B

Analyte	CAS No.	Results (ug/L)	Rep. Limit (ug/L)	Dilution (factor)
Methyl t-butyl ether	1634-04-4	ND	100	100
Benzene	71-43-2	9600	300	1000
Toluene	108-88-3	710	30	100
Ethylbenzene	100-41-4	1100	30	100
Xylenes, total	1330-20-7	1100	60	100

ND = Not detected at or above indicated Reporting Limit

CLS Labs

Analysis Report: EPA 8020, BTEX and MTBE
Purge and Trap, EPA Method 5030

Client: Harding Lawson Associates
Engineering and Environmental
383 4th Street, Third Floor
Oakland, CA 94607

Project No.: 46559-1
Contact: Jim McCarty
Phone: (510)451-1001

Project: City Blue GW Monitoring

Lab Contact: James Liang
Lab ID No.: R4902-5A
Job No.: 824902
COC Log No.: 2371
Batch No.: 26735
Instrument ID: GC018
Analyst ID:
Matrix: WATER

Date Sampled: 09/29/99
Date Received: 09/30/99
Date Extracted: N/A
Date Analyzed: 10/01/99
Date Reported: 10/11/99
Client ID No.: MW-1A

SURROGATE

Analyte	CAS No.	Surr Conc. (ug/L)	Surrogate Recovery (percent)
o-Chlorotoluene	95-49-8	5000	95

MW-1A

Analyte	CAS No.	Results (ug/L)	Rep. Limit (ug/L)	Dilution (factor)
Methyl t-butyl ether	1634-04-4	ND	250	250
Benzene	71-43-2	6200	75	250
Toluene	108-88-3	5900	75	250
Ethylbenzene	100-41-4	620	75	250
Xylenes, total	1330-20-7	3500	150	250

ND = Not detected at or above indicated Reporting Limit

CLS Labs

Analysis Report: EPA 8020, BTEX and MTBE
Purge and Trap, EPA Method 5030

Client: Harding Lawson Associates
Engineering and Environmental
383 4th Street, Third Floor
Oakland, CA 94607

Project No.: 46559-1
Contact: Jim McCarty
Phone: (510)451-1001

Project: City Blue GW Monitoring

Lab Contact: James Liang
Lab ID No.: R4902-6A
Job No.: 824902
COC Log No.: 2371
Batch No.: 26735
Instrument ID: GC018
Analyst ID:
Matrix: WATER

Date Sampled: 09/29/99
Date Received: 09/30/99
Date Extracted: N/A
Date Analyzed: 10/01/99
Date Reported: 10/11/99
Client ID No.: MW-1B

SURROGATE

Analyte	CAS No.	Surr Conc. (ug/L)	Surrogate Recovery (percent)
o-Chlorotoluene	95-49-8	5000	96

MW-1B

Analyte	CAS No.	Results (ug/L)	Rep. Limit (ug/L)	Dilution (factor)
Methyl t-butyl ether	1634-04-4	ND	250	250
Benzene	71-43-2	9200	75	250
Toluene	108-88-3	10000	75	250
Ethylbenzene	100-41-4	1200	75	250
Xylenes, total	1330-20-7	5500	150	250

ND = Not detected at or above indicated Reporting Limit

CA DOHS ELAP Accreditation/Registration Number 1233

CLS Labs

Analysis Report: EPA 8020, BTEX and MTBE
Purge and Trap, EPA Method 5030

Client: Harding Lawson Associates
Engineering and Environmental
383 4th Street, Third Floor
Oakland, CA 94607

Project No.: 46559-1
Contact: Jim McCarty
Phone: (510) 451-1001

Project: City Blue GW Monitoring

Lab Contact: James Liang
Lab ID No.: R4902-7A
Job No.: 824902
COC Log No.: 2371
Batch No.: 26735
Instrument ID: GC018
Analyst ID:
Matrix: WATER

Date Sampled: 09/29/99
Date Received: 09/30/99
Date Extracted: N/A
Date Analyzed: 10/01/99
Date Reported: 10/11/99
Client ID No.: MW-3A

SURROGATE

Analyte	CAS No.	Surr Conc. (ug/L)	Surrogate Recovery (percent)
o-Chlorotoluene	95-49-8	100	90

MW-3A

Analyte	CAS No.	Results (ug/L)	Rep. Limit (ug/L)	Dilution (factor)
Methyl t-butyl ether	1634-04-4	14	5.0	5.0
Benzene	71-43-2	180	1.5	5.0
Toluene	108-88-3	340	15	50
Ethylbenzene	100-41-4	130	1.5	5.0
Xylenes, total	1330-20-7	580	30	50

ND = Not detected at or above indicated Reporting Limit

CLS Labs

Analysis Report: EPA 8020, BTEX and MTBE
Purge and Trap, EPA Method 5030

Client: Harding Lawson Associates
Engineering and Environmental
383 4th Street, Third Floor
Oakland, CA 94607

Project No.: 46559-1
Contact: Jim McCarty
Phone: (510)451-1001

Project: City Blue GW Monitoring

Lab Contact: James Liang
Lab ID No.: R4902-8A
Job No.: 824902

Date Sampled: 09/29/99
Date Received: 09/30/99
Date Extracted: N/A
Date Analyzed: 10/01/99
Date Reported: 10/11/99
Client ID No.: MW-3B

COC Log No.: 2371
Batch No.: 26735
Instrument ID: GC018
Analyst ID:
Matrix: WATER

SURROGATE

Analyte	CAS No.	Surr Conc. (ug/L)	Surrogate Recovery (percent)
o-Chlorotoluene	95-49-8	200	90

MW-3B

Analyte	CAS No.	Results (ug/L)	Rep. Limit (ug/L)	Dilution (factor)
Methyl t-butyl ether	1634-04-4	10	10	10
Benzene	71-43-2	120	3.0	10
Toluene	108-88-3	340	15	50
Ethylbenzene	100-41-4	230	3.0	10
Xylenes, total	1330-20-7	1300	30	50

ND = Not detected at or above indicated Reporting Limit

CLS Labs

Analysis Report: EPA 8020, BTEX and MTBE
Purge and Trap, EPA Method 5030

Client: Harding Lawson Associates
Engineering and Environmental
383 4th Street, Third Floor
Oakland, CA 94607

Project No.: 46559-1
Contact: Jim McCarty
Phone: (510)451-1001

Project: City Blue GW Monitoring

Lab Contact: James Liang
Lab ID No.: R4902
Job No.: 824902
COC Log No.: 2371
Batch No.: 26735
Instrument ID: GC018
Analyst ID:
Matrix: WATER

Date Extracted: N/A
Date Analyzed: 10/01/99
Date Reported: 10/11/99

MB SURROGATE

Analyte	CAS No.	Surr Conc. (ug/L)	MB Surrogate Recovery (percent)
o-Chlorotoluene	95-49-8	20.0	100

METHOD BLANK

Analyte	CAS No.	Results (ug/L)	Reporting Limit (ug/L)
Methyl t-butyl ether	1634-04-4	ND	1.0
Benzene	71-43-2	ND	0.30
Toluene	108-88-3	ND	0.30
Ethylbenzene	100-41-4	ND	0.30
Xylenes, total	1330-20-7	ND	0.60

ND = Not detected at or above indicated Reporting Limit

CLS Labs

Analysis Report: Total Petroleum Hydrocarbons, EPA Method 8015
Purge and Trap, EPA Method 5030

Client: Harding Lawson Associates
Engineering and Environmental
383 4th Street, Third Floor
Oakland, CA 94607

Project No.: 46559-1
Contact: Jim McCarty
Phone: (510)451-1001

Project: City Blue GW Monitoring

Lab Contact: James Liang
Lab ID No.: R4902-1A
Job No.: 824902

Date Sampled: 09/29/99
Date Received: 09/30/99
Date Extracted: N/A
Date Analyzed: 10/01/99
Date Reported: 10/11/99
Client ID No.: MW-6A

COC Log No.: 2371
Batch No.: 26735
Instrument ID: GC018
Analyst ID:
Matrix: WATER

SURROGATE

Analyte	CAS No.	Surr Conc. (mg/L)	Surrogate Recovery (percent)
o-Chlorotoluene	95-49-8	0.0200	103

MW-6A

Analyte	CAS No.	Results (mg/L)	Rep. Limit (mg/L)	Dilution (factor)
TPH as Gasoline	N/A	ND	0.050	1.0

ND = Not detected at or above indicated Reporting Limit

CLS Labs

Analysis Report: Total Petroleum Hydrocarbons, EPA Method 8015
Purge and Trap, EPA Method 5030

Client: Harding Lawson Associates
Engineering and Environmental
383 4th Street, Third Floor
Oakland, CA 94607

Project No.: 46559-1
Contact: Jim McCarty
Phone: (510)451-1001

Project: City Blue GW Monitoring

Lab Contact: James Liang
Lab ID No.: R4902-2A
Job No.: 824902
COC Log No.: 2371
Batch No.: 26735
Instrument ID: GC018
Analyst ID:
Matrix: WATER

Date Sampled: 09/29/99
Date Received: 09/30/99
Date Extracted: N/A
Date Analyzed: 10/01/99
Date Reported: 10/11/99
Client ID No.: MW-6B

SURROGATE

Analyte	CAS No.	Surr Conc. (mg/L)	Surrogate Recovery (percent)
o-Chlorotoluene	95-49-8	0.0200	102

MW-6B

Analyte	CAS No.	Results (mg/L)	Rep. Limit (mg/L)	Dilution (factor)
TPH as Gasoline	N/A	ND	0.050	1.0

ND = Not detected at or above indicated Reporting Limit

CLS Labs

Analysis Report: Total Petroleum Hydrocarbons, EPA Method 8015
Purge and Trap, EPA Method 5030

Client: Harding Lawson Associates
Engineering and Environmental
383 4th Street, Third Floor
Oakland, CA 94607

Project No.: 46559-1
Contact: Jim McCarty
Phone: (510) 451-1001

Project: City Blue GW Monitoring

Lab Contact: James Liang
Lab ID No.: R4902-3A
Job No.: 824902

Date Sampled: 09/29/99
Date Received: 09/30/99
Date Extracted: N/A
Date Analyzed: 10/01/99
Date Reported: 10/11/99
Client ID No.: MW-5A

COC Log No.: 2371
Batch No.: 26735
Instrument ID: GC018
Analyst ID:
Matrix: WATER

SURROGATE

Analyte	CAS No.	Surr Conc. (mg/L)	Surrogate Recovery (percent)
o-Chlorotoluene	95-49-8	0.200	96

MW-5A

Analyte	CAS No.	Results (mg/L)	Rep. Limit (mg/L)	Dilution (factor)
TPH as Gasoline	N/A	10	0.50	10

ND = Not detected at or above indicated Reporting Limit

CLS Labs

Analysis Report: Total Petroleum Hydrocarbons, EPA Method 8015
Purge and Trap, EPA Method 5030

Client: Harding Lawson Associates
Engineering and Environmental
383 4th Street, Third Floor
Oakland, CA 94607

Project No.: 46559-1
Contact: Jim McCarty
Phone: (510)451-1001

Project: City Blue GW Monitoring

Lab Contact: James Liang
Lab ID No.: R4902-4A
Job No.: 824902
COC Log No.: 2371
Batch No.: 26735
Instrument ID: GC018
Analyst ID:
Matrix: WATER

Date Sampled: 09/29/99
Date Received: 09/30/99
Date Extracted: N/A
Date Analyzed: 10/01/99
Date Reported: 10/11/99
Client ID No.: MW-5B

SURROGATE

Analyte	CAS No.	Surr Conc. (mg/L)	Surrogate Recovery (percent)
o-Chlorotoluene	95-49-8	0.200	88

MW-5B

Analyte	CAS No.	Results (mg/L)	Rep. Limit (mg/L)	Dilution (factor)
TPH as Gasoline	N/A	11	0.50	10

ND = Not detected at or above indicated Reporting Limit

CLS Labs

Analysis Report: Total Petroleum Hydrocarbons, EPA Method 8015
Purge and Trap, EPA Method 5030

Client: Harding Lawson Associates
Engineering and Environmental
383 4th Street, Third Floor
Oakland, CA 94607

Project No.: 46559-1
Contact: Jim McCarty
Phone: (510)451-1001

Project: City Blue GW Monitoring

Lab Contact: James Liang
Lab ID No.: R4902-5A
Job No.: 824902
COC Log No.: 2371
Batch No.: 26735
Instrument ID: GC018
Analyst ID:
Matrix: WATER

Date Sampled: 09/29/99
Date Received: 09/30/99
Date Extracted: N/A
Date Analyzed: 10/01/99
Date Reported: 10/11/99
Client ID No.: MW-1A

SURROGATE

Analyte	CAS No.	Surr Conc. (mg/L)	Surrogate Recovery (percent)
o-Chlorotoluene	95-49-8	0.500	90

MW-1A

Analyte	CAS No.	Results (mg/L)	Rep. Limit (mg/L)	Dilution (factor)
TPH as Gasoline	N/A	14	1.3	25

ND = Not detected at or above indicated Reporting Limit

CA DOHS ELAP Accreditation/Registration Number 1233

CLS Labs

Analysis Report: Total Petroleum Hydrocarbons, EPA Method 8015
Purge and Trap, EPA Method 5030

Client: Harding Lawson Associates
Engineering and Environmental
383 4th Street, Third Floor
Oakland, CA 94607

Project No.: 46559-1
Contact: Jim McCarty
Phone: (510)451-1001

Project: City Blue GW Monitoring

Lab Contact: James Liang
Lab ID No.: R4902-6A
Job No.: 824902
COC Log No.: 2371
Batch No.: 26735
Instrument ID: GC018
Analyst ID:
Matrix: WATER

Date Sampled: 09/29/99
Date Received: 09/30/99
Date Extracted: N/A
Date Analyzed: 10/01/99
Date Reported: 10/11/99
Client ID No.: MW-1B

SURROGATE

Analyte	CAS No.	Surr Conc. (mg/L)	Surrogate Recovery (percent)
o-Chlorotoluene	95-49-8	0.500	95

MW-1B

Analyte	CAS No.	Results (mg/L)	Rep. Limit (mg/L)	Dilution (factor)
TPH as Gasoline	N/A	21	1.3	25

ND = Not detected at or above indicated Reporting Limit

CA DOHS ELAP Accreditation/Registration Number 1233

CLS Labs

Analysis Report: Total Petroleum Hydrocarbons, EPA Method 8015
Purge and Trap, EPA Method 5030

Client: Harding Lawson Associates
Engineering and Environmental
383 4th Street, Third Floor
Oakland, CA 94607

Project No.: 46559-1
Contact: Jim McCarty
Phone: (510) 451-1001

Project: City Blue GW Monitoring

Lab Contact: James Liang
Lab ID No.: R4902-7A
Job No.: 824902
COC Log No.: 2371
Batch No.: 26735
Instrument ID: GC018
Analyst ID:
Matrix: WATER

Date Sampled: 09/29/99
Date Received: 09/30/99
Date Extracted: N/A
Date Analyzed: 10/01/99
Date Reported: 10/11/99
Client ID No.: MW-3A

SURROGATE

Analyte	CAS No.	Surr Conc. (mg/L)	Surrogate Recovery (percent)
o-Chlorotoluene	95-49-8	0.100	88

MW-3A

Analyte	CAS No.	Results (mg/L)	Rep. Limit (mg/L)	Dilution (factor)
TPH as Gasoline	N/A	4.1	0.25	5.0

ND = Not detected at or above indicated Reporting Limit

CA DORS ELAP Accreditation/Registration Number 1233

CLS Labs

Analysis Report: Total Petroleum Hydrocarbons, EPA Method 8015
Purge and Trap, EPA Method 5030

Client: Harding Lawson Associates
Engineering and Environmental
383 4th Street, Third Floor
Oakland, CA 94607

Project No.: 46559-1
Contact: Jim McCarty
Phone: (510)451-1001

Project: City Blue GW Monitoring

Lab Contact: James Liang
Lab ID No.: R4902-8A
Job No.: 824902
COC Log No.: 2371
Batch No.: 26735
Instrument ID: GC018
Analyst ID:
Matrix: WATER

Date Sampled: 09/29/99
Date Received: 09/30/99
Date Extracted: N/A
Date Analyzed: 10/01/99
Date Reported: 10/11/99
Client ID No.: MW-3B

SURROGATE

Analyte	CAS No.	Surr Conc. (mg/L)	Surrogate Recovery (percent)
o-Chlorotoluene	95-49-8	0.200	74

MW-3B

Analyte	CAS No.	Results (mg/L)	Rep. Limit (mg/L)	Dilution (factor)
TPH as Gasoline	N/A	5.0	0.50	10

ND = Not detected at or above indicated Reporting Limit

CLS Labs

Analysis Report: Total Petroleum Hydrocarbons, EPA Method 8015
Purge and Trap, EPA Method 5030

Client: Harding Lawson Associates
Engineering and Environmental
383 4th Street, Third Floor
Oakland, CA 94607

Project No.: 46559-1
Contact: Jim McCarty
Phone: (510)451-1001

Project: City Blue GW Monitoring

Lab Contact: James Liang

Lab ID No.: R4902

Job No.: 824902

COC Log No.: 2371

Batch No.: 26735

Instrument ID: GC018

Analyst ID:

Matrix: WATER

Date Extracted: N/A
Date Analyzed: 10/01/99
Date Reported: 10/11/99

MB SURROGATE

Analyte	CAS No.	Surr Conc. (mg/L)	MB Surrogate Recovery (percent)
o-Chlorotoluene	95-49-8	0.0200	105

METHOD BLANK

Analyte	CAS No.	Results (mg/L)	Reporting Limit (mg/L)
TPH as Gasoline	N/A	ND	0.050

ND = Not detected at or above indicated Reporting Limit

CLS Labs

Analysis Report: EPA 8020, BTEX and MTBE
Purge and Trap, EPA Method 5030

Client: Harding Lawson Associates
Engineering and Environmental
383 4th Street, Third Floor
Oakland, CA 94607

Project No.: 46559-1
Contact: Jim McCarty
Phone: (510)451-1001

Project: City Blue GW Monitoring

Lab Contact: James Liang
Lab ID No.: R4902
Job No.: 824902
COC Log No.: 2371
Batch No.: 26735
Instrument ID: GC018
Analyst ID:
Matrix: WATER

Date Extracted: N/A
Date Analyzed: 10/01/99
Date Reported: 10/11/99

MS SURROGATE

Analyte	CAS No.	MS Surr. Conc. (ug/L)	MS Surrogate Recovery (percent)
o-Chlorotoluene	95-49-8	20.0	98

MATRIX SPIKE

Analyte	CAS No.	MS Conc. (ug/L)	MS Recovery (percent)
Benzene	71-43-2	20.0	90
Toluene	108-88-3	20.0	106
Ethylbenzene	100-41-4	20.0	113
Xylenes, total	1330-20-7	60.0	114

MSD SURROGATE

Analyte	CAS No.	Surr. Conc. (ug/L)	MSD Surrogate Recovery (percent)
o-Chlorotoluene	95-49-8	20.0	99

MATRIX SPIKE DUPLICATE

Analyte	CAS No.	MSD Conc. (ug/L)	MSD Recovery (percent)
Benzene	71-43-2	20.0	93
Toluene	108-88-3	20.0	111
Ethylbenzene	100-41-4	20.0	117
Xylenes, total	1330-20-7	60.0	116

RELATIVE % DIFFERENCE

Analyte	CAS No.	Relative Percent Difference (percent)
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CA DOHS ELAP Accreditation/Registration Number 1233

CLS Labs

Analysis Report: EPA 8020, BTEX and MTBE
Purge and Trap, EPA Method 5030

Client: Harding Lawson Associates
Engineering and Environmental
383 4th Street, Third Floor
Oakland, CA 94607

Project No.: 46559-1
Contact: Jim McCarty
Phone: (510) 451-1001

Project: City Blue GW Monitoring

Lab Contact: James Liang
Lab ID No.: R4902
Job No.: 824902
COC Log No.: 2371
Batch No.: 26735
Instrument ID: GC018
Analyst ID:
Matrix: WATER

Date Extracted: N/A
Date Analyzed: 10/01/99
Date Reported: 10/11/99

RELATIVE % DIFFERENCE (cont.)

Analyte	CAS No.	Relative Percent Difference (percent)
Benzene	71-43-2	3
Toluene	108-88-3	5
Ethylbenzene	100-41-4	3
Xylenes, total	1330-20-7	2

CA DOHS ELAP Accreditation/Registration Number 1233

CLS Labs

Analysis Report: EPA 8020, BTEX and MTBE
Purge and Trap, EPA Method 5030

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Lab Contact: James Liang
Lab ID No.: R4902
Job No.: 824902
COC Log No.: 2371
Batch No.: 26735
Instrument ID: GC018
Analyst ID:
Matrix: WATER

Date Extracted: N/A
Date Analyzed: 10/01/99
Date Reported: 10/11/99

LCS SURROGATE

Analyte	CAS No.	LCS Conc. (ug/L)	LCS Surrogate Recovery (percent)
o-Chlorotoluene	95-49-8	20.0	99

LAB CONTROL SAMPLE

Analyte	CAS No.	LCS Conc. (ug/L)	LCS Recovery (percent)
Benzene	71-43-2	20.0	112
Toluene	108-88-3	20.0	99
Ethylbenzene	100-41-4	20.0	98
Xylenes, total	1330-20-7	60.0	97

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