



ST104148

October 15, 1998

40910 1

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

**Quarterly Report**  
**July 1, 1998 through September 30, 1998**  
**Groundwater Remediation and Monitoring**  
**Blue Print Service Facility**  
**1700 Jefferson Street**  
**Oakland, California**

Dear Mr. Christoff:

Harding Lawson Associates (HLA) presents this quarterly monitoring 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, 1998, through September 30, 1998. It was prepared to satisfy quarterly groundwater monitoring requirements of the Alameda County Health Care Services Agency (Alameda County). The report also satisfies the reporting requirements of the East Bay Municipal Utilities District (EBMUD) for treatment system discharge.

#### BACKGROUND

Three underground gasoline storage tanks were removed from the property in 1987. A preliminary investigation indicated that there had been 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 monitoring well MW-1. Initial groundwater level measurements indicated that groundwater flows in a north to northwest direction at the site.

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

October 15, 1998  
40910 1  
Mr. Jeff Christoff  
Blue Print Service Company  
Page 2

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In 1992 a groundwater extraction system was constructed at the site to remove free phase product from the groundwater surface. Groundwater is extracted from MW-1A and MW-4 and passes through an oil-water separator which removes the free phase gasoline. The water is then drawn into a 3,000-gallon bio-reactor tank for treatment by hydrocarbon reducing microbes. Air and nutrient are supplied to the groundwater within the bio-reactor to facilitate microbial growth. The treated water from the bio-reactor is pumped in batches of approximately 500 gallons through three granular activated carbon (GAC) vessels before being discharged to the sanitary sewer. Approximately 1,298,060 gallons of groundwater has been treated and discharged to the sanitary sewer by the groundwater extraction system since operation began in 1992. An estimated 5,062 pounds of gasoline have been recovered from the groundwater extracted. The groundwater from the system is discharged to the sanitary sewer under the EBMUD Wastewater Discharge Permit.

#### TREATMENT SYSTEM STATUS

During the third quarter of 1998, approximately 81,848 gallons of water were treated and discharged to the sanitary sewer. The average daily discharge flow rate for the treatment system was approximately 890 gallons per day (gpd). Average combined extraction rate for the two extraction wells was 0.62 gallons per minute (gpm). Operation and maintenance records show that 0.7 gallons or 3.6 pounds of free phase gasoline were recovered from the groundwater by the oil water separator. This amount of gasoline does not include dissolved concentrations treated by the bio-reactor. Flow totalizer readings and system maintenance activities are summarized in Table 1.

#### TREATMENT SYSTEM SAMPLING AND ANALYSIS

On August 28, 1998, HLA collected samples from the separator effluent, the bio-reactor effluent and the treatment system effluent. The separator effluent was sampled by collecting a grab sample with a Teflon bailer directly from the downstream end of the oil-water separator. The bio-reactor effluent sample was collected from a sampling port upstream of the GAC vessels. The system effluent sample was collected from a sample port downstream of the third and final GAC vessel. These water samples, consisting of 40-milliliter volatile analysis vials (VOAs), were placed in ice-chilled coolers and submitted to California Laboratory Services of Rancho Cordova, California, under chain-of-custody protocol for analysis. The samples were analyzed by EPA Test Method 8015 (modified) for total petroleum hydrocarbons as gasoline (TPHg) and EPA Test Method 8021 for benzene, toluene, ethylbenzene and xylene (BTEX).

Results of the chemical analyses of these samples indicate that treatment system effluent concentrations were below the EBMUD discharge limitations of 5 micrograms per liter ( $\mu\text{g/l}$ ) for each individual BTEX components.

HLA's treatment system sampling results are presented in Table 2. The laboratory reports are presented in the Appendix A.

October 15, 1998  
40910 1  
Mr. Jeff Christoff  
Blue Print Service Company  
Page 3

## GROUNDWATER SAMPLING AND ANALYSIS

On August 28, 1998, HLA measured the water levels in wells MW-1, MW-3, MW-5 and MW-6. Groundwater surface elevations are presented on Plate 1. The monitoring wells were sampled after purging at least three well volumes from each and allowing the water level to recover to at least 80 percent of the pre-purge level. HLA monitored the pH, conductivity, and temperature of the groundwater removed during purging. Sampling was not performed until these parameters had stabilized. Three 40-milliliter VOAs of water were collected from each well with a disposable Teflon bailer. Purge water was discharged to the treatment system bio-reactor.

HLA collected samples from the two extraction wells, MW-1A and MW-4, at individual sampling ports upstream of the oil-water separator.

All of the water samples were placed in ice-chilled coolers and submitted to California Laboratory Services of Rancho Cordova, California under chain-of-custody protocol. The samples were analyzed by EPA Test Method 8015 (modified) for TPHg and EPA Test Method 8021 for BTEX and MTBE. The historical analytical results are summarized in Table 3. Plate 2 presents the TPHg and BTEX results for this reporting period. The laboratory reports are presented in the Appendix A.

## DISCUSSION

The treatment system continues to be effective in removing and treating TPHg and BTEX in the groundwater as evidenced by product collected in the oil/water separator and the reduction of the petroleum hydrocarbons concentrations in the bio-reactor. The results of effluent sampling by HLA during this quarter indicate compliance with EBMUD permit discharge limitations.

The groundwater elevations on Plate 1 show a depression in the groundwater surface elevation at the site of the two extraction wells. Using the groundwater elevations measured from MW-3, MW-5, and MW-6, the groundwater gradient direction appears to be toward the east at approximately 0.007 ft/ft. However, the groundwater extraction at MW-1A and MW-4 may be artificially depressing the groundwater elevation at MW-3.

Comparison of this quarter's sample results with historical data indicates declining TPHg concentrations in monitoring wells MW-1 and MW-5. TPHg concentrations in MW-3 remained relatively stable. Benzene concentrations decreased in monitoring wells MW-3 and MW-5 while results indicated an increase in benzene concentrations in monitoring well MW-1. Toluene concentrations was found to have decreased in all monitoring wells. Ethylbenzene concentrations decreased in monitoring well MW-3 yet increased in MW-5 and MW-1. Xylene decreased in MW-1 and increased slightly in MW-3 and MW-5. The groundwater sample from MW-6, the offsite upgradient well did not contain any detectable concentrations of TPHg or BTEX. MTBE was not detected in any of the samples collected.

October 15, 1998  
40910 1  
Mr. Jeff Christoff  
Blue Print Service Company  
Page 4

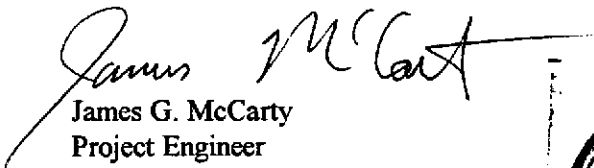
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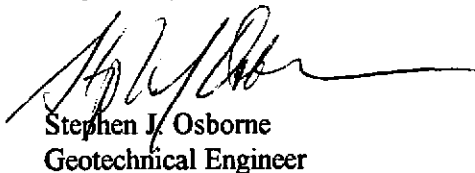
HLA recommends that Blue Print Services continue quarterly groundwater monitoring and reporting as required by Alameda County, and treatment system discharge monitoring reporting as required by EBMUD. The next groundwater sampling will be performed during the fourth quarter of 1998 and monitoring of the system effluent will continue to be performed as required by the EBMUD permit.

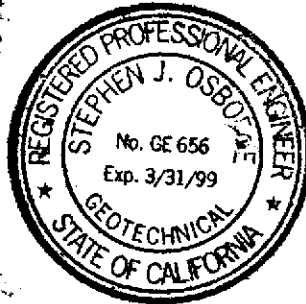
If you have any questions, please contact James McCarty at (510) 628-3220.

Yours very truly,

HARDING LAWSON ASSOCIATES

  
James G. McCarty  
Project Engineer

  
Stephen J. Osborne  
Geotechnical Engineer



JGM/SJO/mlw 40910037009L

Attachments: Table 1 - City Blue Groundwater Treatment System Maintenance Log  
Table 2 - Groundwater Treatment System Analytical Results  
Table 3 - Groundwater Monitoring Analytical Results  
Plate 1 - Groundwater Surface Elevations, August 28, 1998  
Plate 2 - Groundwater Surface Elevations, August 28, 1998  
Appendix A- Laboratory Reports

**Table 1. City Blue Groundwater Treatment System Maintenance Log  
Blue Print Services Facility  
1700 Jeferson Street  
Oakland, California**

DATE	FLOW TOTALIZER (gal)	DISCHARGE RATE (gpd)	DISCHARGE RATE (gpm)	COMMENTS
06/30/98	1,216,212			Check on system
07/08/98	1,217,480	159	0.11	Check on system, recycle line plugged, clear line
07/16/98	1,224,807	916	0.64	Check on system, system down high biotank, backwash sand filters
07/20/98	1,226,872	516	0.36	Check on system, recycle line plugged, clear line, backwash caron 1 & 2, and sand filters
07/21/98	1,228,570	1698	1.18	Check on system, recycle line plugged, clear line, belt to compressor making a lot of noise
07/25/98	1,230,878	577	0.40	Check on system, recycle line plugged, clear line
08/02/98	1,233,680	350	0.24	Check on system, recycle line plugged, clear line, backwash carbon 1 & 2, and sand filters
08/18/98	1,251,906	1139	0.79	Check on system
08/24/98	1,258,510	1101	0.76	Check on system, backwashed carbon and sand filters
08/28/98	1,263,020	1128	0.78	Quarterly sampling: wells and sep eff, bio eff, sys eff
09/05/98	1,269,660	830	0.58	Check on system, backwash carbon and sandfilters
09/09/98	1,275,400	1435	1.00	Nutrient plugged, backwash carbons and sand filters, remove 2.2 liters of gas
09/20/98	1,287,035	1058	0.73	Check on system, backwash carbon 1 & 2, and sand filters, remove 0.1 liter gas
09/23/98	1,290,260	1075	0.75	Check on system
09/26/98	1,293,800	1180	0.82	Check on system, backwash carbon 1 & 2, and sand filters, remove 0.5 liter gas
09/30/98	1,298,060	1065	0.74	Check on system

Total	Average	Average
(gallons)	(gpd)	(gpm)
<hr/> 81,848	<hr/> 890	<hr/> 0.62

**Table 2. Groundwater Treatment System Analytical Results  
Blue Print Service Facility  
1700 Jefferson Street  
Oakland, California**

Date/Analytes	Bioreactor Influent	Bioreactor Effluent	First Carbon Bed Effluent	Second Carbon Bed Effluent	Third* Carbon Bed Effluent
<b>16-Jun-92</b>					
TPHg	NA	3	ND <0.05	NA	—
Benzene	NA	220	ND <0.3	NA	—
Toluene	NA	460	ND <0.3	NA	—
Ethylbenzene	NA	35	ND <0.3	NA	—
Xylene	NA	290	ND <0.3	NA	—
<b>19-Jun-92</b>					
TPHg	180	2	ND <0.05	NA	—
Benzene	18,000	2	ND <0.3	NA	—
Toluene	31,000	5	ND <0.3	NA	—
Ethylbenzene	2,200	ND <0.3	ND <0.3	NA	—
Xylene	16,000	150	ND <0.3	NA	—
<b>2-Jul-92</b>					
TPHg	160	0	ND <0.05	NA	—
Benzene	14,000	1	ND <0.3	NA	—
Toluene	27,000	ND <0.3	ND <0.3	NA	—
Ethylbenzene	1,700	ND <0.3	ND <0.3	NA	—
Xylene	1,300	1	ND <0.3	NA	—
<b>20-Aug-92</b>					
TPHg	190	6	0.073	NA	—
Benzene	14,000	31	ND <0.3	NA	—
Toluene	24,000	14	ND <0.3	NA	—
Ethylbenzene	2,000	ND <6	ND <0.3	NA	—
Xylene	13,000	150	ND <0.3	NA	—
<b>15-Sep-92</b>					
TPHg	230	23	0.054	NA	—
Benzene	17,000	1,100	0.4	NA	—
Toluene	29,000	3,600	0.8	NA	—
Ethylbenzene	2,200	59	ND <0.3	NA	—
Xylene	15,000	1,100	0.6	NA	—
<b>3-Mar-94</b>					
TPHg	80	4	NA	ND <0.05	—
Benzene	1,500	270	NA	ND <0.5	—
Toluene	9,200	370	NA	ND <0.5	—
Ethylbenzene	1,000	32	NA	ND <0.5	—
Xylene	14,000	840	NA	ND <0.5	—
<b>7-Apr-94</b>					
TPHg	79	0	ND <0.05	NA	—
Benzene	8,300	16	3.7	NA	—
Toluene	19,000	4	ND <0.5	NA	—
Ethylbenzene	990	ND <0.5	ND <0.5	NA	—

**Table 2. Groundwater Treatment System Analytical Results**  
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 1700 Jefferson Street  
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Date/Analytes	Bioreactor Influent	Bioreactor Effluent	First Carbon Bed Effluent	Second Carbon Bed Effluent	Third* Carbon Bed Effluent
Xylene	9,300	2	ND <0.5	NA	---
<b>13-May-94</b>					
TPHg	220	1	ND <0.05	NA	---
Benzene	12,000	45	ND <0.5	NA	---
Toluene	23,000	7	ND <0.5	NA	---
Ethylbenzene	1,700	1	ND <0.5	NA	---
Xylene	17,000	11	ND <0.5	NA	---
<b>29-Sep-94</b>					
TPHg	96	1	NA	ND <0.05	---
Benzene	8,000	5	NA	ND <0.5	---
Toluene	16,000	8	NA	ND <0.5	---
Ethylbenzene	ND <250	ND <2.5	NA	ND <0.5	---
Xylene	9,000	9	NA	ND <0.5	---
<b>19-Dec-94</b>					
TPHg	NA	6	0.59	ND <0.05	---
Benzene	NA	140	60	1	---
Toluene	NA	100	14	0.5	---
Ethylbenzene	NA	ND <5	ND <0.5	ND <0.5	---
Xylene	NA	1,600	100	ND <0.5	---
<b>5-Jan-95</b>					
TPHg	NA	NA	0.2	ND <0.05	---
Benzene	NA	NA	17	0.7	---
Toluene	NA	NA	3	ND <0.5	---
Ethylbenzene	NA	NA	ND <0.5	ND <0.5	---
Xylene	NA	NA	3	ND <0.5	---
<b>14-Apr-95</b>					
TPHg	NA	2	0.9	NA	---
Benzene	NA	36	22	NA	---
Toluene	NA	6	3	NA	---
Ethylbenzene	NA	3	0.6	NA	---
Xylene	NA	58	13	NA	---
<b>18-May-95</b>					
TPHg	41	1	0.1	ND <0.05	---
Benzene	4,400	22	2	ND <0.5	---
Toluene	5,700	9	ND <0.5	ND <0.5	---
Ethylbenzene	430	ND <0.5	ND <0.5	ND <0.5	---
Xylene	8,200	16	ND <0.5	ND <2	---
<b>7-Sep-95</b>					
TPHg	NA	4	1.1	0.2	---
Benzene	NA	400	120	15	---
Toluene	NA	300	75	9	---

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Oakland, California**

Date/Analytes	Bioreactor Influent	Bioreactor Effluent	First Carbon Bed Effluent	Second Carbon Bed Effluent	Third* Carbon Bed Effluent
Ethylbenzene	NA	12	2	ND<0.5	—
Xylene	NA	320	82	9	—
<b>16-Nov-95</b>					
TPHg	NA	3	2.8	0.8	—
Benzene	NA	18	17	3	—
Toluene	NA	11	18	2	—
Ethylbenzene	NA	7	6	0.9	—
Xylene	NA	90	74	10	—
<b>22-Dec-95</b>					
TPHg	NA	10	0.54	NA	—
Benzene	NA	95	1	NA	—
Toluene	NA	38	0.6	NA	—
Ethylbenzene	NA	6	ND<0.5	NA	—
Xylene	NA	1,300	13	NA	—
<b>29-Dec-95</b>					
TPHg	NA	NA	0.7	0.1	—
Benzene	NA	NA	5	ND<0.5	—
Toluene	NA	NA	3	ND<0.5	—
Ethylbenzene	NA	NA	1	ND<0.5	—
Xylene	NA	NA	19	ND<0.5	—
<b>17-Jan-96</b>					
TPHg	NA	1	ND<0.05	NA	—
Benzene	NA	8	ND<0.5	NA	—
Toluene	NA	4	ND<0.5	NA	—
Ethylbenzene	NA	1	ND<0.5	NA	—
Xylene	NA	15	ND<2	NA	—
<b>16-Feb-96</b>					
TPHg	NA	1	0.2	ND<0.05	—
Benzene	NA	13	ND<0.5	ND<0.5	—
Toluene	NA	6	ND<0.5	ND<0.5	—
Ethylbenzene	NA	1	ND<0.5	ND<0.5	—
Xylene	NA	16	ND<2	ND<2	—
<b>19-Mar-96</b>					
TPHg	33	1	0.1	NA	—
Benzene	460	12	ND<0.5	NA	—
Toluene	360	7	ND<0.5	NA	—
Ethylbenzene	59	3	ND<0.5	NA	—
Xylene	3,300	32	ND<2	NA	—
<b>18-Apr-96</b>					
TPHg	NA	NA	1.3	0.17	0.09
Benzene	NA	NA	37	1.4	ND<0.5



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**Oakland, California**

<b>Date/Analytes</b>	<b>Bioreactor Influent</b>	<b>Bioreactor Effluent</b>	<b>First Carbon Bed Effluent</b>	<b>Second Carbon Bed Effluent</b>	<b>Third* Carbon Bed Effluent</b>
Toluene	NA	NA	16	0.5	ND<0.5
Ethylbenzene	NA	NA	3.8	ND<0.5	ND<0.5
Xylene	NA	NA	66	ND<2	ND<2
<b>5-Jun-96</b>					
TPHg	NA	NA	5.8	0.53	0.19
Benzene	NA	NA	93	2.1	ND<0.5
Toluene	NA	NA	93	1.2	ND<0.5
Ethylbenzene	NA	NA	11	1.7	0.5
Xylene	NA	NA	490	6	ND<2
<b>9-Aug-96</b>					
TPHg	NA	74	NA	0.77	0.19
Benzene	NA	5,600	NA	12	ND<0.5
Toluene	NA	11,000	NA	4.8	ND<0.5
Ethylbenzene	NA	990	NA	1.2	ND<0.5
Xylene	NA	18,000	NA	26	ND<2
<b>4-Oct-96</b>					
TPHg	NA	2,100	NA	670	44
Benzene	NA	2,900	NA	3,700	ND<30
Toluene	NA	13,000	NA	8,400	50
Ethylbenzene	NA	7,000	NA	1,600	110
Xylene	NA	170,000	NA	36,000	870
<b>11-Dec-96</b>					
TPHg	69	5	51	2.8	0.31
Benzene	11,000	72	4,300	2.3	ND<0.5
Toluene	17,000	120	8,500	8.0	ND<0.5
Ethylbenzene	1,500	32	750	7.8	0.6
Xylene	12,000	1,000	16,000	45	ND<2
<b>16-Dec-96</b>					
TPHg	NA	6	NA	NA	0.16
Benzene	NA	450	NA	NA	ND<0.5
Toluene	NA	790	NA	NA	ND<0.5
Ethylbenzene	NA	52	NA	NA	ND<0.5
Xylene	NA	540	NA	NA	ND<2
<b>23-Dec-96</b>					
TPHg	100	NA	NA	NA	NA
Benzene	15,000	NA	NA	NA	NA
Toluene	26,000	NA	NA	NA	NA
Ethylbenzene	1,800	NA	NA	NA	NA
Xylene	14,000	NA	NA	NA	NA
<b>18-Feb-97</b>					
TPHg	NA	2.0	NA	0.12	ND<0.05

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1700 Jefferson Street  
Oakland, California**

Date/Analytes	Bioreactor Influent	Bioreactor Effluent	First Carbon Bed Effluent	Second Carbon Bed Effluent	Third* Carbon Bed Effluent
Benzene	NA	14	NA	ND<0.5	ND<0.5
Toluene	NA	18	NA	ND<0.5	ND<0.5
Ethylbenzene	NA	2.1	NA	ND<0.5	ND<0.5
Xylene	NA	140	NA	ND<2	ND<2
<b>6-May-97</b>					
TPHg	NA	3.9	NA	0.05	ND<0.05
Benzene	NA	390	NA	ND<0.5	ND<0.5
Toluene	NA	770	NA	ND<0.5	ND<0.5
Ethylbenzene	NA	20	NA	ND<0.5	ND<0.5
Xylene	NA	700	NA	ND<2	ND<2
<b>21-Jun-97</b>					
TPHg	NA	0.22	NA	0.68	ND<0.05
Benzene	NA	0.9	NA	ND<0.5	ND<0.5
Toluene	NA	ND<0.5	NA	ND<0.5	ND<0.5
Ethylbenzene	NA	ND<0.5	NA	ND<0.5	ND<0.5
Xylene	NA	5	NA	ND<2	ND<2
<b>13-Aug-97</b>					
TPHg	NA	0.28	NA	0.05	ND<0.05
Benzene	NA	4.2	NA	ND<0.5	ND<0.5
Toluene	NA	0.9	NA	ND<0.5	ND<0.5
Ethylbenzene	NA	ND<0.5	NA	ND<0.5	ND<0.5
Xylene	NA	5	NA	ND<2	ND<2
<b>3-Oct-97</b>					
TPHg	NA	0.49	NA	0.17	ND<0.05
Benzene	NA	8.4	NA	2.2	ND<0.5
Toluene	NA	0.7	NA	ND<0.5	ND<0.5
Ethylbenzene	NA	ND<0.5	NA	ND<0.5	ND<0.5
Xylene	NA	3	NA	ND<2	ND<2
<b>23-Dec-97</b>					
TPHg	NA	NA	NA	0.26	ND<0.05
Benzene	NA	NA	NA	ND<0.5	ND<0.5
Toluene	NA	NA	NA	0.8	ND<0.5
Ethylbenzene	NA	NA	NA	0.6	ND<0.5
Xylene	NA	NA	NA	2	ND<2
<b>9-Feb-98</b>					
TPHg	NA	NA	NA	NA	ND<0.05
Benzene	NA	NA	NA	NA	ND<0.5
Toluene	NA	NA	NA	NA	ND<0.5
Ethylbenzene	NA	NA	NA	NA	ND<0.5
Xylene	NA	NA	NA	NA	ND<2
<b>24-Mar-98</b>					

**Table 2. Groundwater Treatment System Analytical Results**  
**Blue Print Service Facility**  
**1700 Jefferson Street**  
**Oakland, California**

Date/Analytes	Bioreactor Influent	Bioreactor Effluent	First Carbon Bed Effluent	Second Carbon Bed Effluent	Third* Carbon Bed Effluent
TPHg	NA	NA	NA	NA	ND<0.05
Benzene	NA	NA	NA	NA	ND<0.5
Toluene	NA	NA	NA	NA	ND<0.5
Ethylbenzene	NA	NA	NA	NA	ND<0.5
Xylene	NA	NA	NA	NA	ND<2
<b>31-Mar-98</b>					
TPHg	51	0.44	NA	NA	NA
Benzene	5,800	17	NA	NA	NA
Toluene	9,200	11	NA	NA	NA
Ethylbenzene	700	ND(0.5)	NA	NA	NA
Xylene	9,000	6	NA	NA	NA
<b>18-Jun-98</b>					
TPHg	26	ND(0.05)	NA	NA	ND(0.05)
Benzene	4,100	ND(0.30)	NA	NA	ND(0.30)
Toluene	1,900	ND(0.30)	NA	NA	ND(0.30)
Ethylbenzene	ND(15)	ND(0.30)	NA	NA	ND(0.30)
Xylene	4,700	ND(0.60)	NA	NA	ND(0.60)
<b>28-Aug-98</b>					
TPHg	31	ND(0.05)	NA	NA	ND(0.05)
Benzene	3,800	0.46	NA	NA	ND(0.30)
Toluene	3,900	0.37	NA	NA	ND(0.30)
Ethylbenzene	220	ND(0.30)	NA	NA	ND(0.30)
Xylene	5,700	1.8	NA	NA	ND(0.60)

TPHg = total petroleum hydrocarbons as gasoline

TPHg concentrations presented in milligrams per liter (mg/l)

Benzene, Toluene, Ethylbenzene, and Xylenes concentrations presented in micrograms per liter (µg/l)

ND = Not detected above the reporting limit in parenthesis

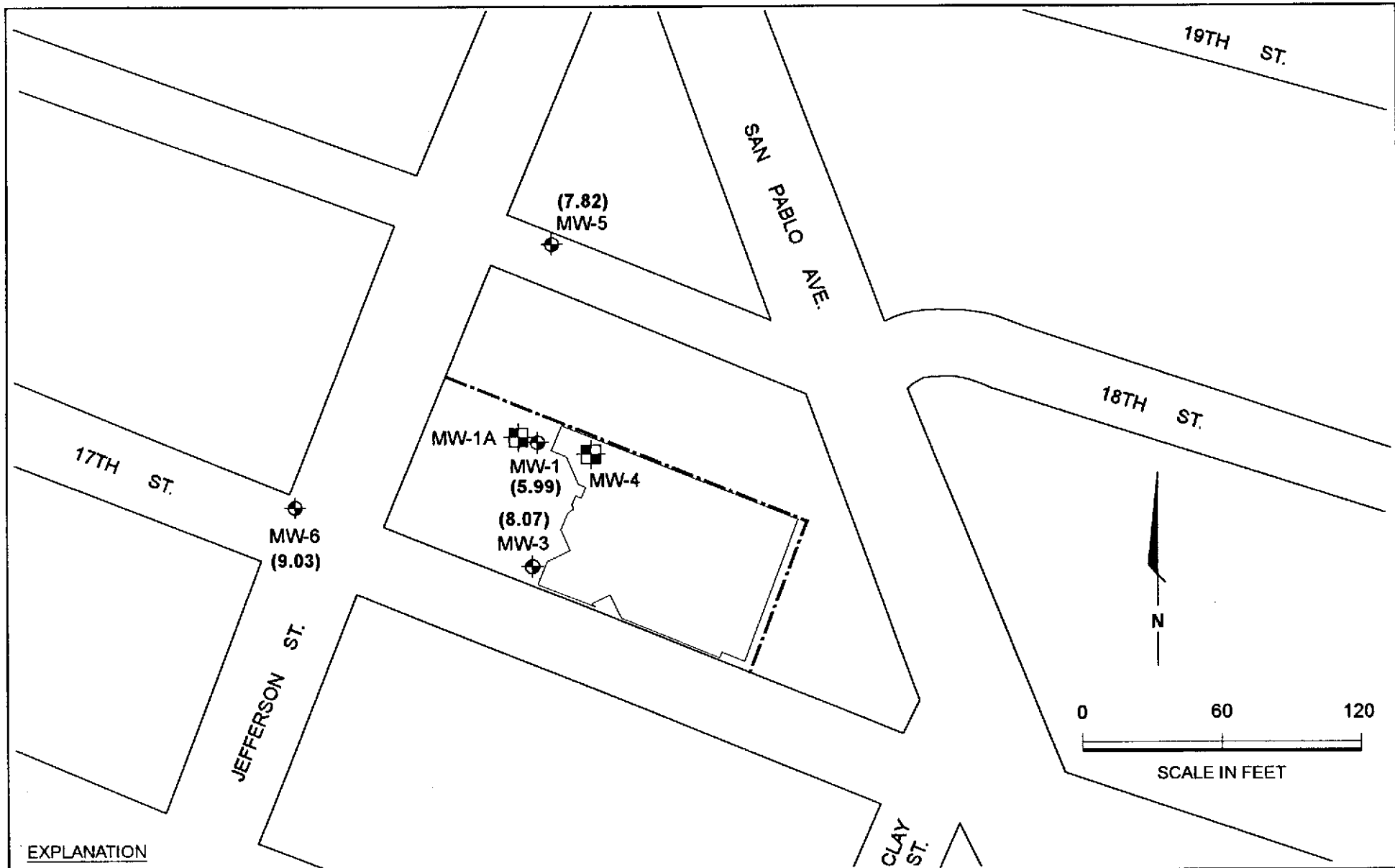
NA = Not analyzed

\* Third carbon added in-line December 29, 1996

Table 3. Groundwater Monitoring Analytical Results  
 Blue Print Service Facility  
 1700 Jefferson Street  
 Oakland, California

TPHg (mg/l)	Date Sampled																						
	8/1/91	9/30/92	3/30/93	1/13/94	4/13/94	6/29/94	12/8/94	4/3/95	6/27/95	9/19/95	12/13/95	3/6/96	6/11/96	9/19/96	12/23/96	3/27/97	6/4/97	9/26/97	12/23/97	3/31/98	6/18/98	8/28/98	
MW-1	FP	FP	FP	FP	FP	FP	FP	NA	NA	NA	NA	NA	FP	FP	FP	FP	68	59	41	44	32	26	
MW-1A	350	FP	FP	FP	170	95	190	67	53	52	62	200	140	100	FP	66	54	73	66	51	50	15	
MW-3	74	FP	FP	FP	FP	39	4,600	51	20	6.2	19	7	16	6	FP	FP	85	47	32	32	16	17	
MW-4	86	FP	FP	FP	58	16	92	35	13	14	11	110	260	95	FP	37	24	41	48	NA	25	46	
MW-5	120	51	74	80	63	64	59	51	41	50	45	51	48	48	45	44	35	36	39	48	17	16	
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)	
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	8,600	
MW-1A	17,000	FP	FP	FP	17,000	16,000	13,000	11,000	11,000	8,900	9,900	14,000	18,000	16,000	FP	12,000	11,000	10,000	10,000	9,100	11,000	1,100	
MW-3	1,600	FP	FP	FP	FP	3,200	1,500	1,100	270	70	220	120	170	45	FP	FP	8,500	610	640	690	180	84	
MW-4	1,500	FP	FP	FP	1,500	1,300	1,700	1,200	1,300	2,200	630	2,600	6,600	9,900	FP	2,600	2,600	2,900	6,000	NA	2,000	9,700	
MW-5	20,000	13,000	16,000	19,000	14,000	29,000	13,000	15,000	12,000	1,600	13,000	15,000	12,000	12,000	12,000	11,000	8,900	7,900	13,000	10,000	9,500	5,400	
MW-6	--	--	--	--	--	--	--	--	--	--	--	--	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.30)	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
MW-1A	31,000	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	16,000	16,000	11,000	15,000	830	
MW-3	4,600	FP	FP	FP	FP	2,900	4,200	2,300	550	140	480	170	270	30	FP	FP	13,000	6,000	5,300	3,800	1,500	1,100	
MW-4	6,200	FP	FP	FP	2,500	790	4,100	3,400	1,600	2,100	470	3,600	19,000	19,000	FP	6,900	3,200	5,000	11,000	NA	460	11,000	
MW-5	14,000	5,900	5,000	8,200	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	
MW-6	--	--	--	--	--	--	--	--	--	--	--	--	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.30)	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	
MW-1A	3,000	FP	FP	FP	2,100	1,500	1,400	910	500	710	790	2,700	2,800	2,100	FP	1,400	1,000	1,400	1,400	1,100	870	31	
MW-3	670	FP	FP	FP	FP	580	6,000	580	190	68	140	49	68	15	FP	FP	2,400	930	800	670	490	430	
MW-4	1,000	FP	FP	FP	520	51	310	280	77	110	14	780	3,700	2,000	FP	540	140	350	580	NA	ND(15)	890	
MW-5	1,900	1,400	1,800	1,400	1,500	2,800	1,800	2,800	1,400	2,000	16,000	2,000	2,000	2,300	2,700	1,900	1,500	1,500	1,900	2,000	420	1,100	
MW-6	--	--	--	--	--	--	--	--	--	--	--	--	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	0.5	ND(0.5)	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	4,300	3,000	2,100	
MW-1A	22,000	FP	FP	FP	14,000	12,000	11,000	9,800	6,300	6,800	5,300	22,000	19,000	14,000	FP	100	7,200	8,500	12,000	6,800	5,800	3,000	
MW-3	4,300	FP	FP	FP	FP	4,300	95,000	4,800	1,700	500	1,700	440	1,500	300	FP	FP	16,000	5,900	5,900	5,200	3,700	3,800	
MW-4	7,300	FP	FP	FP	3,200	3,400	5,400	5,800	1,800	2,100	1,800	10,000	28,000	13,000	FP	5,500	3,500	4,800	8,200	NA	6,400	5,000	
MW-5	4,900	2,600	2,700	2,700	2,100	4,500	2,900	4,500	1,600	2,100	1,900	2,400	2,700	4,000	6,500	2,800	1,700	1,300	1,700	2,200	850	900	
MW-6	--	--	--	--	--	--	--	--	--	--	--	--	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(0.60)	ND(0.60)	
MTBE (µg/l)																							
MW-1	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)	
MW-1A	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1,800	ND(500)	ND(500)	1,900	300	ND(50)	ND(50)	
MW-3	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)	
MW-4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1,400	ND(300)	ND(500)	270	NA	ND(50)	ND(50)	
MW-5	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)	
MW-6	--	--	--	--	--	--	--	--	--	--	--	--	NA	NA	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	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



**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

DRAWN: jgm  
PROJECT NUMBER: 40910.1

**Groundwater Surface Elevations**  
August 28, 1998  
City Blue Production Facility  
Oakland, California

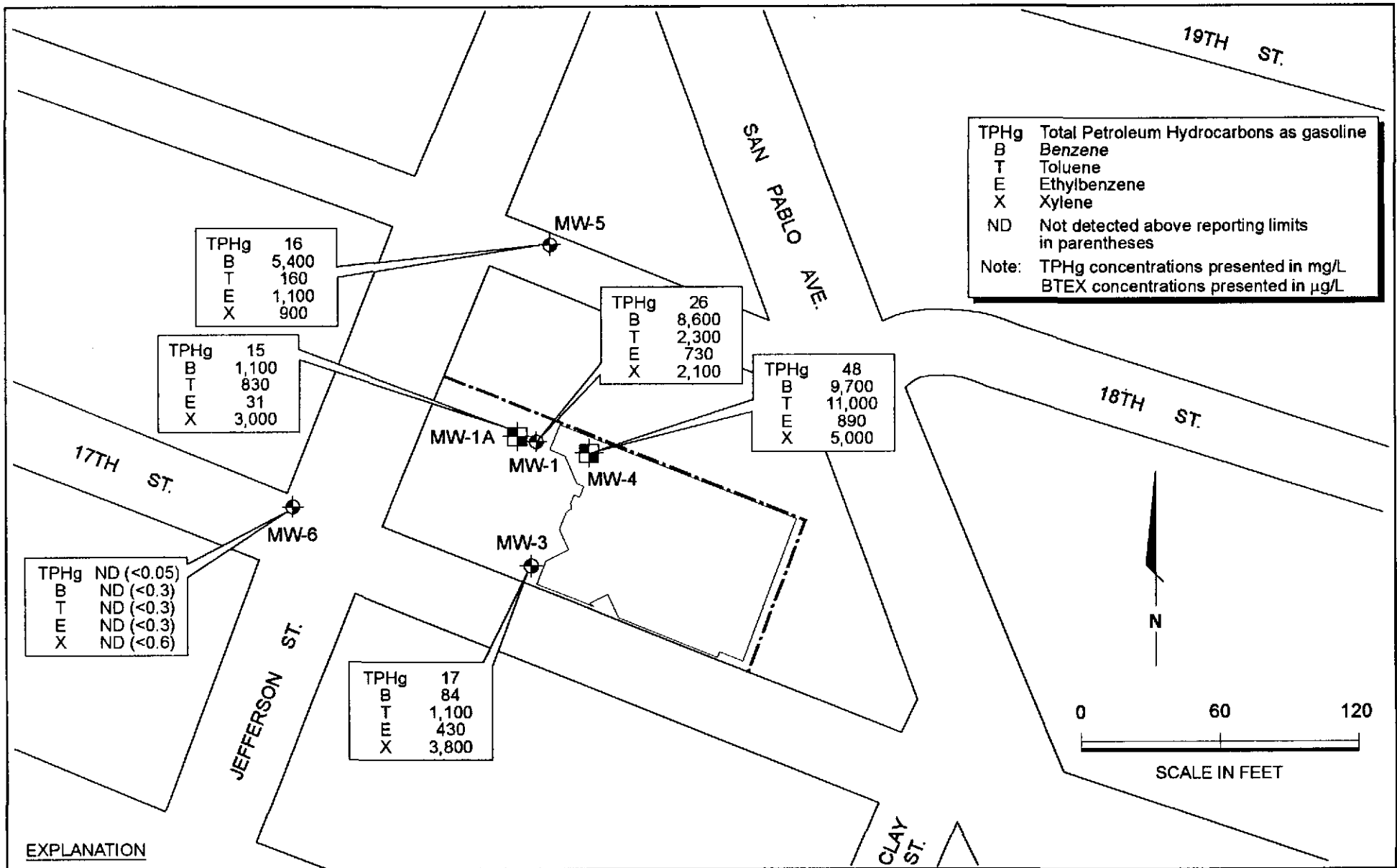
APPROVED: JGM

DATE: 10/02/98

REVISED DATE

PLATE

**1**



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

TPHg 16  
 B 5,400  
 T 160  
 E 1,100  
 X 900

TPHg 15  
 B 1,100  
 T 830  
 E 31  
 X 3,000

TPHg 26  
 B 8,600  
 T 2,300  
 E 730  
 X 2,100

TPHg 48  
 B 9,700  
 T 11,000  
 E 890  
 X 5,000

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

TPHg 17  
 B 84  
 T 1,100  
 E 430  
 X 3,800

**EXPLANATION**

- Site Boundary
- ⊕ Monitoring Well
- ⊞ Extraction Well



**Harding Lawson Associates**  
 Engineering and  
 Environmental Services

**TPHg and BTEX Concentrations  
 in Groundwater, August 28, 1998  
 City Blue Production Facility  
 Oakland, California**

PLATE  
**2**

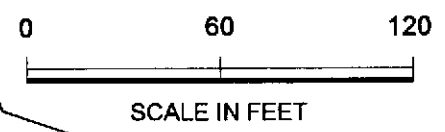
DRAWN  
 jgm

PROJECT NUMBER  
 40910.1

APPROVED  
 JGM

DATE  
 10/02/98

REVISED DATE



**APPENDIX A**  
**LABORATORY REPORTS**

# CLS Labs

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

09/10/98

Attention: Jim McCarty

Reference: Analytical Results

---

Project Name: City Blue Oakland  
Project No.: 40910-1  
Date Received: 08/31/98  
Chain Of Custody: 1964

CLS ID No.: P6528  
CLS Job No.: 816528

The following analyses were performed on the above referenced project:

<u>No. of Samples</u>	<u>Turnaround Time</u>	<u>Analysis Description</u>
6	10 Days	TPH as Gasoline, BTEX and MTBE
3	10 Days	TPH Gasoline and BTXE (water)

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,

  
George Hampton  
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.: 40910-1  
Contact: Jim McCarty  
Phone: (510)451-1001

Project: City Blue Oakland

Lab Contact: George Hampton  
Lab ID No.: P6528-1A  
Job No.: 816528  
COC Log No.: 1964  
Batch No.: 23283  
Instrument ID: GC007  
Analyst ID: NCOCDUNG  
Matrix: WATER

Date Sampled: 08/28/98  
Date Received: 08/31/98  
Date Extracted: 09/09/98  
Date Analyzed: 09/09/98  
Date Reported: 09/10/98  
Client ID No.: MW-1

## SURROGATE

Analyte	CAS No.	Surr Conc. (ug/L)	Surrogate Recovery (percent)
o-Chlorotoluene	95-49-8	1000	108

## Sample: MW-1

Analyte	CAS No.	Results (ug/L)	Rep. Limit (ug/L)	Dilution (factor)
Methyl t-butyl ether	1634-04-4	ND	50	50
Benzene	71-43-2	8600	150	500
Toluene	108-88-3	2300	150	500
Ethylbenzene	100-41-4	730	15	50
Xylenes, total	1330-20-7	2100	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.: 40910-1  
Contact: Jim McCarty  
Phone: (510)451-1001

Project: City Blue Oakland

Date Sampled: 08/28/98  
Date Received: 08/31/98  
Date Extracted: 09/09/98  
Date Analyzed: 09/09/98  
Date Reported: 09/10/98  
Client ID No.: MW-1A

Lab Contact: George Hampton  
Lab ID No.: P6528-2A  
Job No.: 816528  
COC Log No.: 1964  
Batch No.: 23283  
Instrument ID: GC007  
Analyst ID: NGOCDUNG  
Matrix: WATER

## SURROGATE

Analyte	CAS No.	Surr Conc. (ug/L)	Surrogate Recovery (percent)
o-Chlorotoluene	95-49-8	1000	98

## Sample: MW-1A

Analyte	CAS No.	Results (ug/L)	Rep. Limit (ug/L)	Dilution (factor)
Methyl t-butyl ether	1634-04-4	ND	50	50
Benzene	71-43-2	1100	15	50
Toluene	108-88-3	830	15	50
Ethylbenzene	100-41-4	31	15	50
Xylenes, total	1330-20-7	3000	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.: 40910-1  
Contact: Jim McCarty  
Phone: (510)451-1001

Project: City Blue Oakland

Date Sampled: 08/28/98  
Date Received: 08/31/98  
Date Extracted: 09/09/98  
Date Analyzed: 09/09/98  
Date Reported: 09/10/98  
Client ID No.: MW-3

Lab Contact: George Hampton  
Lab ID No.: P6528-3A  
Job No.: 816528  
COC Log No.: 1964  
Batch No.: 23283  
Instrument ID: GC007  
Analyst ID: NGOCDUNG  
Matrix: WATER

## SURROGATE

Analyte	CAS No.	Surr Conc. (ug/L)	Surrogate Recovery (percent)
o-Chlorotoluene	95-49-8	1000	106

## Sample: MW-3

Analyte	CAS No.	Results (ug/L)	Rep. Limit (ug/L)	Dilution (factor)
Methyl t-butyl ether	1634-04-4	ND	50	50
Benzene	71-43-2	84	15	50
Toluene	108-88-3	1100	15	50
Ethylbenzene	100-41-4	430	15	50
Xylenes, total	1330-20-7	3800	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.: 40910-1  
Contact: Jim McCarty  
Phone: (510)451-1001

Project: City Blue Oakland

Date Sampled: 08/28/98  
Date Received: 08/31/98  
Date Extracted: 09/09/98  
Date Analyzed: 09/09/98  
Date Reported: 09/10/98  
Client ID No.: MW-4

Lab Contact: George Hampton  
Lab ID No.: P6528-4A  
Job No.: 816528  
COC Log No.: 1964  
Batch No.: 23283  
Instrument ID: GC007  
Analyst ID: NGOCDUNG  
Matrix: WATER

## SURROGATE

Analyte	CAS No.	Surr Conc. (ug/L)	Surrogate Recovery (percent)
o-Chlorotoluene	95-49-8	1000	100

## Sample: MW-4

Analyte	CAS No.	Results (ug/L)	Rep. Limit (ug/L)	Dilution (factor)
Methyl t-butyl ether	1634-04-4	ND	50	50
Benzene	71-43-2	9700	300	1000
Toluene	108-88-3	11000	300	1000
Ethylbenzene	100-41-4	890	25	50
Xylenes, total	1330-20-7	5000	600	1000

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.: 40910-1  
Contact: Jim McCarty  
Phone: (510)451-1001

Project: City Blue Oakland

Lab Contact: George Hampton  
Lab ID No.: P6528-5A  
Job No.: 816528  
COC Log No.: 1964  
Batch No.: 23283  
Instrument ID: GC007  
Analyst ID: NCOCDUNG  
Matrix: WATER

Date Sampled: 08/28/98  
Date Received: 08/31/98  
Date Extracted: 09/09/98  
Date Analyzed: 09/09/98  
Date Reported: 09/10/98  
Client ID No.: MW-5

## SURROGATE

Analyte	CAS No.	Surr Conc. (ug/L)	Surrogate Recovery (percent)
o-Chlorotoluene	95-49-8	1000	108

## Sample: MW-5

Analyte	CAS No.	Results (ug/L)	Rep. Limit (ug/L)	Dilution (factor)
Methyl t-butyl ether	1634-04-4	ND	50	50
Benzene	71-43-2	5400	150	500
Toluene	108-88-3	160	15	50
Ethylbenzene	100-41-4	1100	15	50
Xylenes, total	1330-20-7	900	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.: 40910-1  
Contact: Jim McCarty  
Phone: (510)451-1001

Project: City Blue Oakland

Date Sampled: 08/28/98  
Date Received: 08/31/98  
Date Extracted: 09/09/98  
Date Analyzed: 09/09/98  
Date Reported: 09/10/98  
Client ID No.: MW-6

Lab Contact: George Hampton  
Lab ID No.: P6528-6A  
Job No.: 816528  
COC Log No.: 1964  
Batch No.: 23283  
Instrument ID: GC007  
Analyst ID: NGOCDUNG  
Matrix: WATER

## SURROGATE

Analyte	CAS No.	Surr Conc. (ug/L)	Surrogate Recovery (percent)
o-Chlorotoluene	95-49-8	20.0	107

## Sample: MW-6

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.: 40910-1  
Contact: Jim McCarty  
Phone: (510)451-1001

Project: City Blue Oakland

Lab Contact: George Hampton  
Lab ID No.: P6528-7A  
Job No.: 816528  
COC Log No.: 1964  
Batch No.: 23283  
Instrument ID: GC007  
Analyst ID: NCOCDUNG  
Matrix: WATER

Date Sampled: 08/28/98  
Date Received: 08/31/98  
Date Extracted: 09/09/98  
Date Analyzed: 09/09/98  
Date Reported: 09/10/98  
Client ID No.: BIO-EFF

## SURROGATE

Analyte	CAS No.	Surr Conc. (ug/L)	Surrogate Recovery (percent)
o-Chlorotoluene	95-49-8	20.0	106

## Sample: BIO-EFF

Analyte	CAS No.	Results (ug/L)	Rep. Limit (ug/L)	Dilution (factor)
Benzene	71-43-2	0.46	0.30	1.0
Toluene	108-88-3	0.37	0.30	1.0
Ethylbenzene	100-41-4	ND	0.30	1.0
Xylenes, total	1330-20-7	1.8	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.: 40910-1  
Contact: Jim McCarty  
Phone: (510)451-1001

Project: City Blue Oakland

Lab Contact: George Hampton  
Lab ID No.: P6528-8A  
Job No.: 816528  
COC Log No.: 1964  
Batch No.: 23283  
Instrument ID: GC007  
Analyst ID: NCOCDUNG  
Matrix: WATER

Date Sampled: 08/28/98  
Date Received: 08/31/98  
Date Extracted: 09/09/98  
Date Analyzed: 09/09/98  
Date Reported: 09/10/98  
Client ID No.: SYS-EFF

## SURROGATE

Analyte	CAS No.	Surr Conc. (ug/L)	Surrogate Recovery (percent)
o-Chlorotoluene	95-49-8	20.0	106

## Sample: SYS-EFF

Analyte	CAS No.	Results (ug/L)	Rep. Limit (ug/L)	Dilution (factor)
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.: 40910-1  
Contact: Jim McCarty  
Phone: (510)451-1001

Project: City Blue Oakland

Lab Contact: George Hampton  
Lab ID No.: P6528-9A  
Job No.: 816528  
COC Log No.: 1964  
Batch No.: 23283  
Instrument ID: GC007  
Analyst ID: NGOCDUNG  
Matrix: WATER

Date Sampled: 08/28/98  
Date Received: 08/31/98  
Date Extracted: 09/09/98  
Date Analyzed: 09/09/98  
Date Reported: 09/10/98  
Client ID No.: SEP-EFF

## SURROGATE

Analyte	CAS No.	Surr Conc. (ug/L)	Surrogate Recovery (percent)
o-Chlorotoluene	95-49-8	1000	98

## Sample: SEP-EFF

Analyte	CAS No.	Results (ug/L)	Rep. Limit (ug/L)	Dilution (factor)
Benzene	71-43-2	3800	300	1000
Toluene	108-88-3	3900	300	1000
Ethylbenzene	100-41-4	220	15	50
Xylenes, total	1330-20-7	5700	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.: 40910-1  
Contact: Jim McCarty  
Phone: (510)451-1001

Project: City Blue Oakland

Lab Contact: George Hampton  
Lab ID No.: P6528  
Job No.: 816528  
COC Log No.: 1964  
Batch No.: 23283  
Instrument ID: GC007  
Analyst ID: NCOCDUNG  
Matrix: WATER

Date Extracted: 09/09/98  
Date Analyzed: 09/09/98  
Date Reported: 09/10/98

## MB SURROGATE

Analyte	CAS No.	Surr Conc. (ug/L)	MB Surrogate Recovery (percent)
o-Chlorotoluene	95-49-8	20.0	108

## 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: 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.: 40910-1  
Contact: Jim McCarty  
Phone: (510)451-1001

Project: City Blue Oakland

Lab Contact: George Hampton  
Lab ID No.: P6528  
Job No.: 816528  
COC Log No.: 1964  
Batch No.: 23283  
Instrument ID: GC007  
Analyst ID: NCOCDUNG  
Matrix: WATER

Date Extracted: 09/09/98  
Date Analyzed: 09/09/98  
Date Reported: 09/10/98

### MS SURROGATE

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

### MATRIX SPIKE

Analyte	CAS No.	MS Conc. (ug/L)	MS Recovery (percent)
Benzene	71-43-2	20.0	98
Toluene	108-88-3	20.0	94
Ethylbenzene	100-41-4	20.0	97
Xylenes, total	1330-20-7	60.0	93

### MSD SURROGATE

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

### MATRIX SPIKE DUPLICATE

Analyte	CAS No.	MSD Conc. (ug/L)	MSD Recovery (percent)
Benzene	71-43-2	20.0	98
Toluene	108-88-3	20.0	94
Ethylbenzene	100-41-4	20.0	97
Xylenes, total	1330-20-7	60.0	94

### RELATIVE % DIFFERENCE

Analyte	CAS No.	Relative Percent Difference (percent)

# 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.: 40910-1  
Contact: Jim McCarty  
Phone: (510)451-1001

Project: City Blue Oakland

Lab Contact: George Hampton  
Lab ID No.: P6528  
Job No.: 816528  
COC Log No.: 1964  
Batch No.: 23283  
Instrument ID: GC007  
Analyst ID: NCOCDUNG  
Matrix: WATER

Date Extracted: 09/09/98  
Date Analyzed: 09/09/98  
Date Reported: 09/10/98

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## RELATIVE % DIFFERENCE (cont.)

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Analyte	CAS No.	Relative Percent Difference (percent)
Benzene	71-43-2	0
Toluene	108-88-3	0
Ethylbenzene	100-41-4	0
Xylenes, total	1330-20-7	1

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.: 40910-1  
Contact: Jim McCarty  
Phone: (510)451-1001

Project: City Blue Oakland

Lab Contact: George Hampton  
Lab ID No.: P6528  
Job No.: 816528  
COC Log No.: 1964  
Batch No.: 23283  
Instrument ID: GC007  
Analyst ID: NGOCDUNG  
Matrix: WATER

Date Extracted: 09/09/98  
Date Analyzed: 09/09/98  
Date Reported: 09/10/98

## LCS SURROGATE

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

## LAB CONTROL SAMPLE

Analyte	CAS No.	LCS Conc. (ug/L)	LCS Recovery (percent)
Benzene	71-43-2	20.0	96
Toluene	108-88-3	20.0	92
Ethylbenzene	100-41-4	20.0	105
Xylenes, total	1330-20-7	60.0	92

# 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.: 40910-1  
Contact: Jim McCarty  
Phone: (510)451-1001

Project: City Blue Oakland

Date Sampled: 08/28/98  
Date Received: 08/31/98  
Date Extracted: 09/09/98  
Date Analyzed: 09/09/98  
Date Reported: 09/10/98  
Client ID No.: MW-1

Lab Contact: George Hampton  
Lab ID No.: P6528-1A  
Job No.: 816528  
COC Log No.: 1964  
Batch No.: 23283  
Instrument ID: GC007  
Analyst ID: NGOCDUNG  
Matrix: WATER

## SURROGATE

Analyte	CAS No.	Surr Conc. (mg/L)	Surrogate Recovery (percent)
o-Chlorotoluene	95-49-8	1.00	114

## Sample: MW-1

Analyte	CAS No.	Results (mg/L)	Rep. Limit (mg/L)	Dilution (factor)
TPH as Gasoline	N/A	26	2.5	50

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.: 40910-1  
Contact: Jim McCarty  
Phone: (510)451-1001

Project: City Blue Oakland

Lab Contact: George Hampton  
Lab ID No.: P6528-2A  
Job No.: 816528  
COC Log No.: 1964  
Batch No.: 23283  
Instrument ID: GC007  
Analyst ID: NCOCDUNG  
Matrix: WATER

Date Sampled: 08/28/98  
Date Received: 08/31/98  
Date Extracted: 09/09/98  
Date Analyzed: 09/09/98  
Date Reported: 09/10/98  
Client ID No.: MW-1A

## SURROGATE

Analyte	CAS No.	Surr Conc. (mg/L)	Surrogate Recovery (percent)
o-Chlorotoluene	95-49-8	1.00	93

## Sample: MW-1A

Analyte	CAS No.	Results (mg/L)	Rep. Limit (mg/L)	Dilution (factor)
TPH as Gasoline	N/A	15	2.5	50

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.: 40910-1  
Contact: Jim McCarty  
Phone: (510)451-1001

Project: City Blue Oakland

Date Sampled: 08/28/98  
Date Received: 08/31/98  
Date Extracted: 09/09/98  
Date Analyzed: 09/09/98  
Date Reported: 09/10/98  
Client ID No.: MW-3

Lab Contact: George Hampton  
Lab ID No.: P6528-3A  
Job No.: 816528  
COC Log No.: 1964  
Batch No.: 23283  
Instrument ID: GC007  
Analyst ID: NGOCDUNG  
Matrix: WATER

## SURROGATE

Analyte	CAS No.	Surr Conc. (mg/L)	Surrogate Recovery (percent)
o-Chlorotoluene	95-49-8	1.00	116

## Sample: MW-3

Analyte	CAS No.	Results (mg/L)	Rep. Limit (mg/L)	Dilution (factor)
TPH as Gasoline	N/A	17	2.5	50

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.: 40910-1  
Contact: Jim McCarty  
Phone: (510)451-1001

Project: City Blue Oakland

Lab Contact: George Hampton  
Lab ID No.: P6528-4A  
Job No.: 816528  
COC Log No.: 1964  
Batch No.: 23283  
Instrument ID: GC007  
Analyst ID: NGOCDUNG  
Matrix: WATER

Date Sampled: 08/28/98  
Date Received: 08/31/98  
Date Extracted: 09/09/98  
Date Analyzed: 09/09/98  
Date Reported: 09/10/98  
Client ID No.: MW-4

## SURROGATE

Analyte	CAS No.	Surr Conc. (mg/L)	Surrogate Recovery (percent)
o-Chlorotoluene	95-49-8	1.00	110

## Sample: MW-4

Analyte	CAS No.	Results (mg/L)	Rep. Limit (mg/L)	Dilution (factor)
TPH as Gasoline	N/A	48	2.5	50

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.: 40910-1  
Contact: Jim McCarty  
Phone: (510)451-1001

Project: City Blue Oakland

Lab Contact: George Hampton  
Lab ID No.: P6528-5A  
Job No.: 816528  
COC Log No.: 1964  
Batch No.: 23283  
Instrument ID: GC007  
Analyst ID: NGOCDUNG  
Matrix: WATER

Date Sampled: 08/28/98  
Date Received: 08/31/98  
Date Extracted: 09/09/98  
Date Analyzed: 09/09/98  
Date Reported: 09/10/98  
Client ID No.: MW-5

## SURROGATE

Analyte	CAS No.	Surr Conc. (mg/L)	Surrogate Recovery (percent)
o-Chlorotoluene	95-49-8	1.00	116

## Sample: MW-5

Analyte	CAS No.	Results (mg/L)	Rep. Limit (mg/L)	Dilution (factor)
TPH as Gasoline	N/A	16	2.5	50

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.: 40910-1  
Contact: Jim McCarty  
Phone: (510)451-1001

Project: City Blue Oakland

Date Sampled: 08/28/98  
Date Received: 08/31/98  
Date Extracted: 09/09/98  
Date Analyzed: 09/09/98  
Date Reported: 09/10/98  
Client ID No.: MW-6

Lab Contact: George Hampton  
Lab ID No.: P6528-6A  
Job No.: 816528  
COC Log No.: 1964  
Batch No.: 23283  
Instrument ID: GC007  
Analyst ID: NCOCDUNG  
Matrix: WATER

## SURROGATE

Analyte	CAS No.	Surr Conc. (mg/L)	Surrogate Recovery (percent)
o-Chlorotoluene	95-49-8	0.0200	101100

## Sample: MW-6

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.: 40910-1  
Contact: Jim McCarty  
Phone: (510) 451-1001

Project: City Blue Oakland

Date Sampled: 08/28/98  
Date Received: 08/31/98  
Date Extracted: 09/09/98  
Date Analyzed: 09/09/98  
Date Reported: 09/10/98  
Client ID No.: BIO-EFF

Lab Contact: George Hampton  
Lab ID No.: P6528-7A  
Job No.: 816528  
COC Log No.: 1964  
Batch No.: 23283  
Instrument ID: GC007  
Analyst ID: NGOCDUNG  
Matrix: WATER

## SURROGATE

Analyte	CAS No.	Surr Conc. (mg/L)	Surrogate Recovery (percent)
o-Chlorotoluene	95-49-8	0.0200	99

## Sample: BIO-EFF

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.: 40910-1  
Contact: Jim McCarty  
Phone: (510) 451-1001

Project: City Blue Oakland

Lab Contact: George Hampton  
Lab ID No.: P6528-8A  
Job No.: 816528  
COC Log No.: 1964  
Batch No.: 23283  
Instrument ID: GC007  
Analyst ID: NGCDUNG  
Matrix: WATER

Date Sampled: 08/28/98  
Date Received: 08/31/98  
Date Extracted: 09/09/98  
Date Analyzed: 09/09/98  
Date Reported: 09/10/98  
Client ID No.: SYS-EFF

## SURROGATE

Analyte	CAS No.	Surr Conc. (mg/L)	Surrogate Recovery (percent)
o-Chlorotoluene	95-49-8	0.0200	100

## Sample: SYS-EFF

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.: 40910-1  
Contact: Jim McCarty  
Phone: (510)451-1001

Project: City Blue Oakland

Date Sampled: 08/28/98  
Date Received: 08/31/98  
Date Extracted: 09/09/98  
Date Analyzed: 09/09/98  
Date Reported: 09/10/98  
Client ID No.: SEP-EFF

Lab Contact: George Hampton  
Lab ID No.: P6528-9A  
Job No.: 816528  
COC Log No.: 1964  
Batch No.: 23283  
Instrument ID: GC007  
Analyst ID: NCOCDUNG  
Matrix: WATER

## SURROGATE

Analyte	CAS No.	Surr Conc. (mg/L)	Surrogate Recovery (percent)
o-Chlorotoluene	95-49-8	1.00	104

## Sample: SEP-EFF

Analyte	CAS No.	Results (mg/L)	Rep. Limit (mg/L)	Dilution (factor)
TPH as Gasoline	N/A	31	2.5	50

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.: 40910-1  
Contact: Jim McCarty  
Phone: (510)451-1001

Project: City Blue Oakland

Lab Contact: George Hampton  
Lab ID No.: P6528  
Job No.: 816528  
COC Log No.: 1964  
Batch No.: 23283  
Instrument ID: GC007  
Analyst ID: NGOCDUNG  
Matrix: WATER

Date Extracted: 09/09/98  
Date Analyzed: 09/09/98  
Date Reported: 09/10/98

## MB SURROGATE

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

## 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



Harding Lawson Associates  
1855 Gateway Boulevard, Suite 500  
Concord, California 94520  
(510) 687-9660

# CHAIN OF CUSTODY FORM

06578

Lab: CLS No 1964

Samplers: JGM

Job Number: 40910-1

Name/Location: City Blue Oakland

Project Manager: Jim McCarty

Recorder: James McCarty  
(Signature Required)

### ANALYSIS REQUESTED

EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	METALS	EPA 8015M/TPH9	EPA 8020/BTEX	EPA 8015M/TPHd.o	TPH, BTEX, MTBE	TPH, BTEX
								X	X
								X	X
								X	X
								X	X
								X	X
								X	X
								X	X
								X	X

SOURCE CODE	MATRIX					# CONTAINERS & PRESERV.				SAMPLE NUMBER OR LAB NUMBER			DATE				STATION DESCRIPTION/NOTES
	Water	Sediment	Soil	Oil	Unpres.	H <sub>2</sub> O <sub>2</sub>	HNO <sub>3</sub>	HCL	Ice	Yr	Wk	Seq	Yr	Mo	Day	Time	
	X							3					98	08	28	1125	
																7200	
																1145	
																1201	
																1055	
																1005	
																1158	
																1159	
																1220	

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

CHAIN OF CUSTODY RECORD		
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
<u>James McCarty</u>	<u>[Signature]</u>	8/31/98 1202
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
<u>[Signature]</u>	<u>[Signature]</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>[Signature]</u> 9/2/98 1900
METHOD OF SHIPMENT		
SAMPLE CONDITION WHEN RECEIVED BY THE LABORATORY		