

October 13, 1992

18106,012.04

Blue Print Services Company 149 Second Street San Francisco, California 94105

Attention: Mr. Jeff Christoff

Gentlemen:

Quarterly Report June 30, 1992 through September 30, 1992 City Blue Groundwater Treatment System 1700 Jefferson Street Oakland, California

This letter presents the results of sampling and analysis from the groundwater treatment system at the City Blue Production facility at 1700 Jefferson Street in Oakland, California for the period from June 30, 1992 through September 30, 1992.

BACKGROUND

Three underground storage tanks were removed from the northwestern portion of the property in June 1987 (Plate 1). Monitoring wells were installed on the property to evaluate the distribution of petroleum hydrocarbons in the soil and groundwater and determine the direction of groundwater flow.

Petroleum hydrocarbons as gasoline were found floating on the groundwater in Monitoring Well MW-1. In January 1988, two additional monitoring wells (MW-1A and MW-4) were installed by HLA at the facility (Plate 1). One offsite monitoring well (MW-5) was installed by HLA in August 1988.

HLA performed additional investigations in 1989 and performed an aquifer testing and groundwater treatment feasibility study in 1990. The groundwater treatment feasibility study identified biodegradation as the most appropriate treatment for the City Blue site.

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PROCESS DESCRIPTION

Groundwater containing elevated concentrations of petroleum hydrocarbons and free-phase hydrocarbons (floating product) is being collected from two onsite extraction wells, MW-1A and MW-4. Maximum average system flow rates are 2 to 5 gallons per minute (gpm). Air pumps installed in the wells extract water and convey it through aboveground and underground piping to the treatment system. The treatment system is comprised of three modules: pretreatment (oil/water separation), treatment (biotreatment), and post-treatment (filtration and carbon bed polishing modules). The pretreatment module is a vapor-tight oil/water separator that separates the free-phase gasoline from the water. The gasoline flows to a recovered product tank and the water is pumped to the bioreactor for treatment. The bioreactor is a 3,000-gallon tank with associated nutrient, air, and caustic feed systems. The post-treatment module consists of a sand filter and two liquid phase carbon beds. Effluent from the second carbon bed is discharged to the sanitary sewer drain onsite. Vapor from the bioreactor is passed through a vapor phase carbon adsorption unit before being released to the atmosphere.

On average, the treatment system processes approximately 1,000 gallons per day. The system has experienced frequent automatic shutdowns due to microorganisms clogging the post-treatment module. Microorganisms must be backwashed from the sand filter and carbon beds at least twice weekly for the system to operate properly.

The treatment system has been permitted by the Bay Area Air Quality Management District (BAAQMD), the East Bay Municipal Utilities District (EBMUD), and the Oakland Fire Department.

TREATMENT SYSTEM SAMPLING

HLA has collected water and air samples from the treatment system and analyzed the samples by EPA Test Method 8015 for total petroleum hydrocarbons as gasoline (TPH-G) and by EPA Test Method 8020 for benzene, toluene, ethyl benzene, and xylenes (BTEX). Water samples are collected from the bioreactor effluent before the carbon beds and from the first carbon bed effluent before the second carbon bed and subsequent discharge to the sanitary sewer. In addition, samples of the bioreactor influent and effluent have been analyzed to determine the degradation efficiency of the bioreactor. Air samples were collected from the vapor phase carbon bed influent and effluent through the August 20, 1992 sampling. Subsequent air sampling will be from the effluent side only. Water samples were decanted from sampling ports into 40-milliliter volatile organic analysis (VOA) vials. Air samples were collected into 1-liter Tedlar bags with a vacuum box sampler. The air and water samples were stored in coolers on ice and submitted to Superior Analytical Laboratory in San Francisco under chain-of-custody protocols for analysis. The chain-of-custody records are included as an attachment.

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In addition to sampling air and groundwater, the system is maintained and inspected at least twice weekly. Copies of the inspection logs are included as an attachment.

SAMPLING SCHEDULE

Air and water samples were collected one hour after the system started on June 16, 1992; every 24 hours for the first three days after the system started; weekly for the first three weeks of operation; and monthly thereafter. For this period, samples were collected on July 10, August 20, and September 15, 1992. In addition, samples of bioreactor influent and effluent were collected on July 17 and 24, 1992, and Monitoring Well MW-5 was sampled on September 30, 1992. MW-5 is the only well that does not contain floating product.

ANALYTICAL RESULTS

The results of chemical analyses are presented in Table 1. The laboratory reports are attached. The results indicate that no detectable concentrations of TPH-G or BTEX are in the effluent water being discharged to the sanitary sewer. The bioreactor influent and effluent sample results indicate that the bioreactor treatment is degrading over 90 percent of the TPH-G and BTEX concentrations before post-treatment polishing by the carbon beds.

Based on current loading data we had estimated that the primary carbon bed would not allow a breakthrough of detectable TPH-G or BTEX until May 1993. However, the relatively high concentrations of TPH-G and BTEX in the bioreactor influent on September 15, 1992, were not degraded sufficiently to be completely adsorbed by the first carbon bed. The treatment system experienced a prolonged shutdown between September 10 and 14, 1992. The microorganism population decreases during shutdown periods due to a shortage of hydrocarbons. The sample results from September 15, 1992, indicate that the microorganism population had not yet increased sufficiently to achieve maximum degradation of the hydrocarbons.

The analytical results of the air samples (Table 1) indicate that no detectable concentrations of TPH-G or BTEX have been released from the vapor phase carbon adsorption unit into the atmosphere.

On September 30, 1992, the floating product thickness was measured in Monitoring Wells MW-1 and MW-3. MW-1, which is located between the two extraction wells, contained 2.47 feet of floating product. MW-3 is located approximately 60 feet south of the extraction wells and contained 0.34 feet of floating product.

HLA is continuing to monitor and sample the groundwater treatment system at City Blue. The sampling is being performed monthly and the results will be presented in the next quarterly report in January 1993.

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If you have any questions, please contact either of the undersigned.

Yours very truly,

HARDING LAWSON ASSOCIATES

David F. Scrivner Project Engineer

Mark G. Filippini // Engineering Geologist

DFS/MGF/dm/B14691-CT88

Attachments: Table 1 - Results of Chemical Analyses

Plate 1 - Site Plan

Laboratory Reports and Chain-of-Custody

CERTIFIED ENGINEERING GEOLOGIST

OF CAL

Facility Inspection Logs

cc: East Bay Municipal Utility District

P.O. Box 24055

Oakland, California 94623-1055

Attention: Ms. Molly Ong

Bay Area Air Quality Management District

939 Ellis Street

San Francisco, California 94109

Attention: Mr. Alexander V. Saschin

Ms. Loretta Robinson

Alameda County Health Care Services Department of Environmental Health Hazardous Materials Program 80 Swan Way, Room 200 Oakland, California 94621 Attention: Mr. Scott Seery

Table 1. Results of Air and Groundwater Chemical Analyses
Groundwater Treatment System
City Blue Production Facility

Sample Number	TPH-G	Benzene	Tal	Ethyl-	
min with a	Irn-G	Benzene	Toluene	Benzene	Xylene
92061601	3300	220	460	35	290
92061602	ND<50	ND<0.3	ND<0.3	ND<0.3	ND<0.3
92061603	110000	5200	6900	360	2200
92061604	ND<30000	ND<85	ND<250	ND<65	ND<250
7-70-50	112 130000	112305	110 1230	11000	11101230
92061701	43000	4900	7600	500	4100
92061702	ND<50	ND<0.3	ND<0.3	ND<0.3	ND<0.3
92061703	1300000	120000	140000	7100	40000
92061704	ND<30000	ND<85	ND<250	ND<65	ND<250
92061801	4300	20	48	3.6	970
92061802	ND<50	ND<0.3	ND<0.3	ND<0.3	ND<0.3
92061803	210000	1100	2200	240	10000
92061804	ND<30000	160	710	89	670
92061901	1600	1.6	5.0	NID .O.1	150
92061901	ND<50	ND<0.3	5.0 NID -0.3	ND<0.3	150
92061902	490000	4900	ND<0.3	ND<0.3	ND<0.3
92061903	ND<30000	4900 ND<85	5700 ND<250	550	7300 ND -250
92061904	180000	18000	31000	ND<65 2200	ND<250 16000
72001703	180000	18000	31000	2200	10000
92062401	980	11	13	1.8	140
92062402	ND<50	ND<0.3	ND<0.3	ND<0.3	ND<0.3
92062403	230000	3100	3600	380	6400
92062404	ND<30000	ND<85	ND<250	ND<65	ND<250
92070201	210	1.4	ND<0.3	ND<0.3	1.0
92070202	ND<50	ND<0.3	ND<0.3	ND<0.3	ND<0.3
92070203	43000	140	ND<250	79	360
92070204	ND<30000	ND<85	ND<250	ND<65	ND<250
92070205	160000	14000	27000	1700	1300
92071001	2800	41	36	2.2	360
92071002	ND<50	ND<0.3	ND<0.3	ND<0.3	ND<0.3
92071003	660000	15000	23000	1900	23000
92071004	ND<30000	ND<85	ND<250	ND<65	ND<250
92071005	150000	14000	26000	1700	12000
-		000		1700	12000
92071701	400	21	25	0.8	27
92071705	190000	22000	34000	2100	17000
02072401	1100	• •	~ .	115 A A	
92072401 92072405	1100 140000	15	2.4	ND<0.3	200
72012403	140000	13000	23000	1700	12000

Table 1. Results of Air and Groundwater Chemical Analyses
Groundwater Treatment System
City Blue Production Facility

Sample		1 2 12 12 12 12 12 12 12 12 12 12 12 12		Ethyl-	
Number	TPH-G	Benzene	Toluene	Benzene	Xylene
92082001	6400	31	14	ND<6	150
92082002	73	ND<0.3	ND<0.3	ND<0.3	ND<0.3
92082003	520000	6800	9100	630	4600
92082004	ND<30	ND<85	ND<250	ND<65	ND<250
92082005	190000	14000	24000	2000	13000
92091501	23000	1100	3600	59	1100
92091502	54	0.4	0.8	ND<0.3	0.6
92091504	ND<30	ND<85	ND<250	ND<65	ND<250
92091505	230000	17000	29000	2200	15000
92091506*	52	ND<0.3	0.4	ND<0.3	ND<0.3
MW-5	51000	13000	5900	1400	2600

Sample number begins with year, month, and day of sampling

Sample Sequence:

01 - Bioreactor Effluent (water)

02 - First Carbon Bed Effluent (water)

03 - Vapor Phase Carbon Influent (Air)

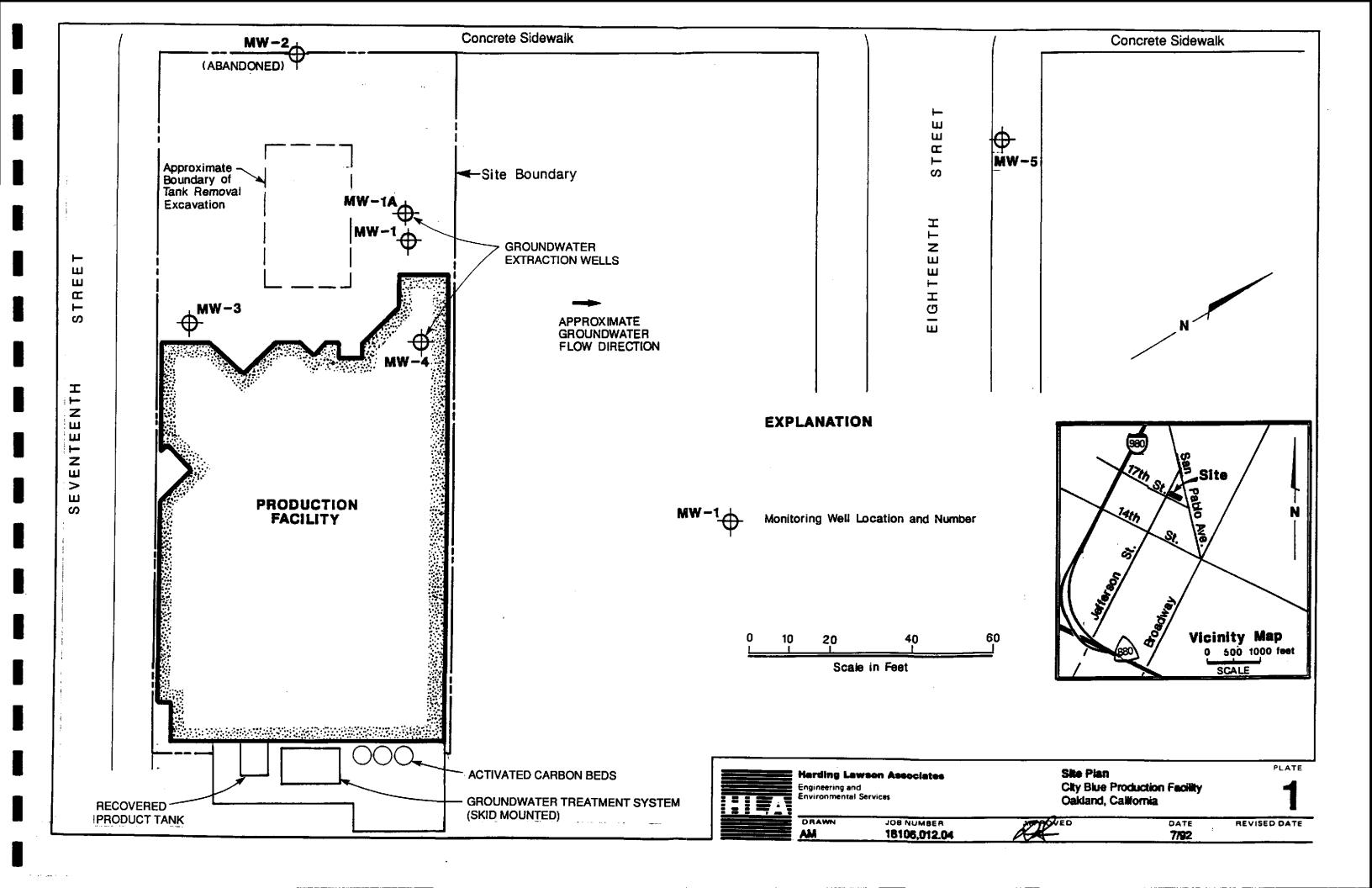
04 - Vapor Phase Carbon Effluent (Air)

05 - Bioreactor Influent (water)

All concentrations in parts per billion (ppb).

TPH-G in air has been converted to ppb from parts per million (ppm) reported by Superior Analytical.

*Sample 92091506 was collected as a duplicate of 92091502.



Harding Lawson Associates

LABORATORY REPORTS, CHAIN-OF-CUSTODY RECORDS, AND INSPECTION LOGS

1555 Burke. Unit 1 • San Francisco, California 94124 • (415) 647-2081 / fax (415) 821-7123

CERTIFICATE OF ANALYSIS

LABORATORY NO.: 55195

CLIENT: Harding Lawson Associates

CLIENT JOB NO.: 11295-017

DATE RECEIVED: 07/02/92

DATE REPORTED: 07/10/92

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS by Modified EPA SW-846 Method 5030 and 8015

LAB #	Sample Identification	Concentration (ug/L) Gasoline Range
1	92070201	210
2	92070202	ND<50

ug/L - parts per billion (ppb)

Method Detection Limit for Gasoline in Water: 50 ug/L

QAQC Summary:

Daily Standard run at 2mg/L: %Diff Gasoline = <15 MS/MSD Recovery =104%: Duplicate RPD = 8%

Richard Srna, Ph.D.



CERTIFICATE OF ANALYSIS

LABORATORY NO.: 55195

CLIENT: Harding Lawson Associates

CLIENT JOB NO.: 11295-017

DATE RECEIVED: 07/02/92

DATE REPORTED: 07/10/92

ANALYSIS FOR BENZENE, TOLUENE, ETHYL BENZENE & XYLENES by EPA SW-846 Methods 5030 and 8020

LAB			Concentr	ation(ug/ Ethyl	L)
#	Sample Identification	Benzene	Toluene	Benzene	Xylenes
1	92070201	1.4	ND<0.3	ND<0.3	1.0
2	9207020) 2	ND<0.3	ND<0.3	ND<0.3	ND<0.3
	Re Contraction of the Contractio				

ug/L - parts per billion (ppb)

Method Detection Limit in Water: 0.3 ug/L

QAQC Summary:

Daily Standard run at 20ug/L: %Diff 8020 = <15

MS/MSD Average Recovery = 96%: Duplicate RPD = 0.7%

Richard Srna, Ph.D.

Certified Laboratories



CERTIFICATE OF ANALYSIS

LABORATORY NO.: 55195

CLIENT: HARDING LAWSON ASSOCIATES

CLIENT JOB NO.: 11295-017

DATE RECEIVED: 07/02/92

DATE REPORTED: 07/06/92

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS by Modified EPA SW-846 Method 5030 and 8015

LAB # 	Sample Identification	Concentration (ppm) Gasoline Range
3	92070203	43
4	92070204	ND<30

ppm - parts per million in air Minimum Detection Limit for Gasoline in Air: 30 ppm Concentration of gasoline in air is calculated based on 20 C and 1 ATM and an assumed molecular weight of hexane. Reported as volume to volume.

QAQC Summary:

Daily Standard run at 2mg/L: %DIFF Gasoline = <15 MS/MSD Average Recovery = 91%: Duplicate RPD = 2%

Richard Srna, Ph.D.

Chy. of NWO To (for)
Laboratory Director

1555 Burke, Unit L • San Francisco, California 94124 • (415) 647-2081 / fax (415) 821-7123

CERTIFICATE OF ANALYSIS

LABORATORY NO.: 55195

DATE RECEIVED: 07/02/92

CLIENT: HARDING LAWSON ASSOCIATES

DATE REPORTED: 07/06/92

CLIENT JOB NO.: 11295-017

ANALYSIS FOR BENZENE, TOLUENE, ETHYL BENZENE & XYLENES by EPA SW-846 Methods 5030 and 8020

LAB #	Sample Identification	Benzene	Concentr Toluene	ation(ppb Ethyl Benzene) Xvlenes
					Ay Tenes
3	92070203	140	ND<250	79	360
4	92070204	ND<85	ND<250	ND<65	ND<250

ppb - parts per billion in air

Minimum Detection Limit for Benzene in air = 85 ppb Minimum Detection Limit for Toluene and Xylenes in air = 250 ppb Minimum Detection Limit for Ethyl Benzene in air = 65 ppb Concentration of BTXE in air is calculated based on 20 C and 1 ATM. Reported as volume to volume.

QAQC Summary:

Daily Standard run at 20ug/L: %DIFF 8020 = <15% MS/MSD Average Recovery = 92% : Duplicate RPD = 4%

Richard Srna, Ph.D.

Laboratory Director

Certified Laboratories



Superior Precision Analytical, Inc.

1555 Burke, Unit L. • San Francisco, California 94124 • (415) 647-2081 / fax (415) 821-7123

CERTIFICATE OF ANALYSIS

LABORATORY NO.: 55211

CLIENT: Harding Lawson Associates

CLIENT JOB NO.: 11295-017

DATE RECEIVED: 07/07/92

DATE REPORTED: 07/14/92

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS by Modified EPA SW-846 Method 5030 and 8015

LAB # 	Sample Identification	Concentration (ug/L) Gasoline Range
1	92070205	160000

ug/L - parts per billion (ppb)

Method Detection Limit for Gasoline in Water: 50 ug/L

QAQC Summary:

Daily Standard run at 2mg/L: %Diff Gasoline = <15 MS/MSD Recovery = 89%: Duplicate RPD = 3

Richard Srna, Ph.D.

Laboratory Manager



CERTIFICATE OF ANALYSIS

LABORATORY NO.: 55211

DATE RECEIVED: 07/07/92

CLIENT: Harding Lawson Associates

DATE REPORTED: 07/14/92

CLIENT JOB NO.: 11295-017

ANALYSIS FOR BENZENE, TOLUENE, ETHYL BENZENE & XYLENES

by EPA SW-846 Methods 5030 and 8020

LAB # 	Sample Identification	Benzene	Toluene	Ethyl Benzene	
1	92070205	14000	27000	1700	13000

ug/L - parts per billion (ppb)
Method Detection Limit in Water: 0.3 ug/L

QAQC Summary:

Daily Standard run at 20ug/L: %Diff 8020 = <15% MS/MSD Average Recovery =96%: Duplicate RPD = 3

Richard Syna, Ph.D.

Laboratory Manager



Harding Lawson Associates Marathon Plaza 303 Second Street, Suite 630 North San Francisco, CA 94107

CHAIN OF CUSTODY FORM

Lab: Superior

(415) 543-8422 • (415) 777-9706 Telecopy	Samplers: Jave Scrivner
Job Number: 1/295-017	
Name/Location: City Blue,	(i) 1
Project Manager: Cheryl Nelson	Recorder: Sunthern
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Harding Lawson Associates Marathon Plaza 303 Second Street, Suite 630 North San Francisco, CA 94107 (415) 543-8422 • (415) 777-9708 Telecopy Job Number:

Name/Location:

CHAIN OF CUSTODY FORM

ANALYSIS REQUESTED

Samplers:	Dave	Seri	vner	-
			^	

Recorder:

33775

Nelson Project Manager: (Signature Required) #CONTAINERS & PRESERV. SAMPLE NUMBER STATION DESCRIPTION/ MATRIX DATE OR **NOTES** Water Sediment Soil Oil SOURCE CODE LAB HNO. SO. NUMBER Time Dy Mo Wk Sea HOLD 928702

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CERTIFICATE OF ANALYSIS

LABORATORY NO.: 55213

CLIENT: Harding Lawson Associates

CLIENT JOB NO.: 11295-017

DATE RECEIVED: 07/10/92

DATE REPORTED: 07/13/92

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS by Modified EPA SW-846 Method 5030 and 8015

LAB # 	Sample Identification	Concentration (ug/L) Gasoline Range
1	92071001	2800
2	92071002	ND<50

ug/L - parts per billion (ppb)

Method Detection Limit for Gasoline in Water: 50 ug/L

QAQC Summary:

Daily Standard run at 2mg/L: %Diff Gasoline = <15 MS/MSD Recovery = 99%: Duplicate RPD = 5%

Richard Srna, Ph.D.

Laboratory Manager



Superior Precision Analytical, Inc.

1555 Burke, Unit F. San Francisco, California 94124 • [415] 647-2081 / fax (415) 821-7123

CERTIFICATE OF ANALYSIS

LABORATORY NO.: 55213

DATE RECEIVED: 07/10/92

CLIENT: Harding Lawson Associates

DATE REPORTED: 07/13/92

CLIENT JOB NO.: 11295-017

ANALYSIS FOR BENZENE, TOLUENE, ETHYL BENZENE & XYLENES by EPA SW-846 Methods 5030 and 8020

LAB #	Sample Identification	Benzene	Concentr Toluene	ation(ug/ Ethyl Benzene	L) Xylenes
1 2	92071001	41	36	2.2	360
	92071002	ND<0.3	ND<0.3	ND<0.3	ND<0.3

ug/L - parts per billion (ppb)

Method Detection Limit in Water: 0.3 ug/L

QAQC Summary:

Daily Standard run at 20ug/L: %Diff 8020 = <15% MS/MSD Average Recovery =95%: Duplicate RPD = 2%

Richard Srna, /Ph.D.

Laboratory Manager



Superior Precision Analytical, Inc.

1555 Burke, Unit F. San Francisco, California 94124 • (415) 647-2081 / fax (415) 821-7123

CERTIFICATE OF ANALYSIS

LABORATORY NO.:55213

CLIENT: Harding Lawson Associates

CLIENT JOB NO.:11295-017

DATE RECEIVED: 07/10/92

DATE REPORTED: 07/13/92

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS by Modified EPA SW-846 Method 5030 and 8015

LAB #	Sample Identification	Concentration (ppm) Gasoline Range
3	92071003	660
4	92071004	ND<30

ppm - parts per million in air Minimum Detection Limit for Gasoline in Air: 30 ppm Concentration of gasoline in air is calculated based on 20 C and 1 ATM and an assumed molecular weight of hexane. Reported as volume to volume.

QAQC Summary:

Daily Standard run at 2mg/L: %DIFF Gasoline = <15 MS/MSD Average Recovery =92%: Duplicate RPD = 2%

Richard Srna, Ph.D.

Laboratory Director

1555 Burke, Unit L • San Francisco, California 94124 • 74151 647-2081 / fax (415) 821-7123

CERTIFICATE OF ANALYSIS

LABORATORY NO.:55213

CLIENT: Harding Lawson Associates

CLIENT JOB NO.:11295-017

DATE RECEIVED: 07/10/92

DATE REPORTED: 07/13/92

ANALYSIS FOR BENZENE, TOLUENE, ETHYL BENZENE & XYLENES by EPA SW-846 Methods 5030 and 8020

	Ethyl	
Toluene	-	Xylenes
23000 ND<250	1900 ND<65	23000 ND<250
	23000 ND<250	

ppb - parts per billion in air

Minimum Detection Limit for Benzene in air = 85 ppb Minimum Detection Limit for Toluene and Xylenes in air = 250 ppb Minimum Detection Limit for Ethyl Benzene in air = 65 ppb Concentration of BTXE in air is calculated based on 20 C and 1 ATM. Reported as volume to volume.

QAQC Summary:

Daily Standard run at 20ug/L: %DIFF 8020 = <15 MS/MSD Average Recovery =94 % : Duplicate RPD = 0.5%

Richard, Srna, /Ph.D.

Laboratory Director



1955 Burker Unit Lillian Erandico, California 94124 illi 1415 (647-2081 / fax (415) 821-7123

CERTIFICATE OF ANALYSIS

LABORATORY NO.: 55223

CLIENT: Harding Lawson Associates

CLIENT JOB NO.: 11295-016

DATE RECEIVED: 07/10/92

DATE REPORTED: 07/15/92

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS by Modified EPA SW-846 Method 5030 and 8015

LAB # 	Sample Identification	Concentration (ug/L) Gasoline Range
1	92071005	150000

ug/L - parts per billion (ppb)

Method Detection Limit for Gasoline in Water: 50 ug/L

QAQC Summary:

Daily Standard run at 2mg/L: %Diff Gasoline = <15 MS/MSD Recovery = 110%: Duplicate RPD = 5.7

Richard Srna, Ph

Laboratory Manager



CERTIFICATE OF ANALYSIS

LABORATORY NO.: 55223

DATE RECEIVED: 07/10/92

CLIENT: Harding Lawson Associates

DATE REPORTED: 07/15/92

CLIENT JOB NO.: 11295-016

ANALYSIS FOR BENZENE, TOLUENE, ETHYL BENZENE & XYLENES by EPA SW-846 Methods 5030 and 8020

LAB			Concentr	ation(ug/ Ethyl	L)
#	Sample Identification	Benzene	Toluene	Benzene	Xylenes
1	92071005	14000	26000	1700	12000

ug/L - parts per billion (ppb)

Method Detection Limit in Water: 0.3 ug/L

QAQC Summary:

Daily Standard run at 20ug/L: %Diff 8020 = <15% MS/MSD Average Recovery =95%: Duplicate RPD = 3.4

Richard Srna, Ph.D.

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1555 Burke, Unit L. San Francisco, California 94124 (415) 647-2081 / fax (415) 821-7123

CERTIFICATE OF ANALYSIS

LABORATORY NO.: 55262

CLIENT: Harding Lawson Associates

CLIENT JOB NO.: 11295-016

DATE RECEIVED: 07/17/92

DATE REPORTED: 07/24/92

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS by Modified EPA SW-846 Method 5030 and 8015

LAB #	Sample Identification	Concentration (ug/L) Gasoline Range
1	92071701	400
2	92071705	400 190000

ug/L - parts per billion (ppb)

Method Detection Limit for Gasoline in Water: 50 ug/L

QAQC Summary:

Daily Standard run at 2mg/L: %Diff Gasoline = <15 MS/MSD Recovery = 99%: Duplicate RPD = 7%

Richard Srna, Ph.D.

Duy & Nhoga (for)
Laboratory Manager

CERTIFICATE OF ANALYSIS

LABORATORY NO.: 55262

DATE RECEIVED: 07/17/92 CLIENT: Harding Lawson Associates DATE REPORTED: 07/24/92

CLIENT JOB NO.: 11295-016

ANALYSIS FOR BENZENE, TOLUENE, ETHYL BENZENE & XYLENES by EPA SW-846 Methods 5030 and 8020

LAB #	Sample Identification	Benzene	Toluene	Ethyl Benzene	Xylenes
1	92071701	21	25	0.8	27
2	92071705	22000	34000	2100	17000

ug/L - parts per billion (ppb)

Method Detection Limit in Water: 0.3 ug/L

QAQC Summary:

Daily Standard run at 20ug/L: %Diff 8020 = <15% MS/MSD Average Recovery = 95%: Duplicate RPD = 3%

Richard Srna, Ph.D.

Cun & Nova (fr.)
Laboratory Manager



CHAIN OF CUSTODY FORM

CC262 Lab: Superior

RECEIVED FOR LAB BY:

DATE/TIME

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DISPATCHED BY: (Signature)

METHOD OF SHIPMENT

DATE/TIME

CERTIFICATE OF ANALYSIS

LABORATORY NO.: 55301

CLIENT: Harding Lawson Associates

CLIENT JOB NO.: 11295-016

DATE RECEIVED: 07/24/92 DATE REPORTED: 07/29/92

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS by Modified EPA SW-846 Method 5030 and 8015

LAB # 	Sample Identification	Concentration (ug/L) Gasoline Range
1	92072401	1100
2	92072405	140000

ug/L - parts per billion (ppb)

Method Detection Limit for Gasoline in Water: 50 ug/L

QAQC Summary:

Daily Standard run at 2mg/L: %Diff Gasoline = <15 MS/MSD Recovery = 95%: Duplicate RPD = 3.7%

Richard Srna, Ph.D.

Certified Laboratories

1555 Burke, Unit L • San Francisco, California 94124 • +415) 647-2081 / fax (415) 821-7123

CERTIFICATE OF ANALYSIS

LABORATORY NO.: 55301

DATE RECEIVED: 07/24/92

CLIENT: Harding Lawson Associates

DATE REPORTED: 07/29/92

CLIENT JOB NO.: 11295-016

ANALYSIS FOR BENZENE, TOLUENE, ETHYL BENZENE & XYLENES by EPA SW-846 Methods 5030 and 8020

LAB #	Sample Identification	Benzene	Toluene	ation(ug/ Ethyl Benzene	Xylenes
1	92072401	15	2.4	ND<0.3	200
2	92072405	13000	23000	1700	12000

ug/L - parts per billion (ppb)

Method Detection Limit in Water: 0.3 ug/L

QAQC Summary:

Daily Standard run at 20ug/L: %Diff 8020 = <15 MS/MSD Average Recovery =93%: Duplicate RPD = 2.7%

Richard Srna, Ph.D.

Laboratory Manager

Harding Lawson Associates 666 Howard Street, Third Floor San Francisco, California 94105 415/543-8422

CHAIN OF CUSTODY FORM 553 0/ Lab: Superior

Telecopy: 415/777-9706	Samplers: Dave	xrivner [ANALYSIS REQUESTED				
Job Number: 11295-016	·						
Name/Location: City Blue		<u> </u>					
Name/Location: City Blue Project Manager: David Scrivner	Recorder: (Signature Required	ann					
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Superior Precision Analytical, Inc.

1555 Burke, Unit 1 • San Francisco, California 94124 • (415) 647-2081 / fax (415) 821-7123

CERTIFICATE OF ANALYSIS

LABORATORY NO.: 55419

CLIENT: Harding Lawson Associates

CLIENT JOB NO.: 11295-017

DATE RECEIVED: 08/20/92

DATE REPORTED: 08/27/92

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS by Modified EPA SW-846 Method 5030 and 8015

LAB # 	Sample Identification	Concentration (ug/L) Gasoline Range
1	92082001	6400
2	92082002	73

ug/L - parts per billion (ppb)

Method Detection Limit for Gasoline in Water: 50 ug/L

QAQC Summary:

Daily Standard run at 2mg/L: %Diff Gasoline = <15 MS/MSD Recovery = 89%: Duplicate RPD = 1%

Richard Skna, Ph.D.

Laboratory Manager

Certified Laboratories

1555 Burge: Unit 1 • San Francisco, California 94124 • (415) 647-2081 / fax (415) 821-7123

CERTIFICATE OF ANALYSIS

LABORATORY NO.: 55419

DATE RECEIVED: 08/20/92

CLIENT: Harding Lawson Associates

DATE REPORTED: 08/27/92

CLIENT JOB NO.: 11295-017

ANALYSIS FOR BENZENE, TOLUENE, ETHYL BENZENE & XYLENES by EPA SW-846 Methods 5030 and 8020

LAB #	Sample Identification	Benzene	Concentr Toluene	ation(ug/ Ethyl Benzene	L) Xylenes
1	92082001	31	14	ND<6	150
2	92082002	ND<0.3	ND<0.3	ND<0.3	ND<0.3

ug/L - parts per billion (ppb)

Method Detection Limit in Water: 0.3 ug/L

QAQC Summary:

Daily Standard run at 20ug/L: %Diff 8020 = <15% MS/MSD Average Recovery = 97%: Duplicate RPD = 2%

Richard Srna, Ph.D.

Laboratory Manager

127192



1555 Burke, Unit L • San Francisco, California 94124 • (415) 647-2081 / fax (415) 821-7123

CERTIFICATE OF ANALYSIS

LABORATORY NO.: 55419

DATE RECEIVED: 08/20/92

CLIENT: Harding Lawson Associates

DATE REPORTED: 08/24/92

CLIENT JOB NO.: 11295-017

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS by Modified EPA SW-846 Method 5030 and 8015

LAB #	Sample Identification	Concentration (ppm) Gasoline Range
3	92082003	520
4	92082004	ND<30

ppm - parts per million in air Minimum Detection Limit for Gasoline in Air: 30 ppm Concentration of gasoline in air is calculated based on 20 C and 1 ATM and an assumed molecular weight of hexane. Reported as volume to volume.

QAQC Summary:

Daily Standard run at 2mg/L: %DIFF Gasoline = <15 MS/MSD Average Recovery =93%: Duplicate RPD = 2%

Richard Srna, Ph.D.

Chun A Nwe (m/n)
Laboratory Director



Superior Precision Analytical, Inc.

1555 Burke, Unit L. • San Francisco, California 94124. • (415) 647-2081 / fax (415) 821-7123

CERTIFICATE OF ANALYSIS

LABORATORY NO.: 55419

CLIENT: Harding Lawson Associates

CLIENT JOB NO.: 11295-017

DATE RECEIVED: 08/20/92

DATE REPORTED: 08/24/92

ANALYSIS FOR BENZENE, TOLUENE, ETHYL BENZENE & XYLENES by EPA SW-846 Methods 5030 and 8020

			Concentration(ppb)							
LAB #	Sample Identification	Benzene	Toluene	Ethyl Benzene	Xvlenes					
3	92082003	6800	9100	630	4600					
4	92082004	ND<85	ND<250	ND<65	ND<250					
7	72002004	בסקתו	MD/250	MD/62	MD/230					

ppb - parts per billion in air

Minimum Detection Limit for Benzene in air = 85 ppb Minimum Detection Limit for Toluene and Xylenes in air = 250 ppb Minimum Detection Limit for Ethyl Benzene in air = 65 ppb Concentration of BTXE in air is calculated based on 20 C and 1 ATM. Reported as volume to volume.

QAQC Summary:

Daily Standard run at 20ug/L: %DIFF 8020 = <15% MS/MSD Average Recovery = 98 %: Duplicate RPD = 8%

Richard Srna, Ph.D.

Oun A Nivory

1555 Burke, Unit . • San Francisco, California 94124 • i4151647-2081 / fax (415) 821-7123

CERTIFICATE OF ANALYSIS

LABORATORY NO.: 55420

DATE RECEIVED: 08/20/92

CLIENT: Harding Lawson Associates

DATE REPORTED: 08/27/92

CLIENT JOB NO.: 11295-016

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS by Modified EPA SW-846 Method 5030 and 8015

LAB # 	Sample Identification	Concentration (ug/L) Gasoline Range
1	92082005	190000

ug/L - parts per billion (ppb)

Method Detection Limit for Gasoline in Water: 50 ug/L

QAQC Summary:

Daily Standard run at 2mg/L: %Diff Gasoline = <15 MS/MSD Recovery = 91%: Duplicate RPD = 4%

Richard Srna/Ph.D.

Laboratory Manager

992742

CERTIFICATE OF ANALYSIS

LABORATORY NO.: 55420

CLIENT: Harding Lawson Associates

CLIENT JOB NO.: 11295-016

DATE RECEIVED: 08/20/92 DATE REPORTED: 08/27/92

ANALYSIS FOR BENZENE, TOLUENE, ETHYL BENZENE & XYLENES by EPA SW-846 Methods 5030 and 8020

LAB # ~	Sample Identification	Benzene	Toluene	Ethyl Benzene	Xylenes
1	92082005	14000	24000	2000	13000

ug/L - parts per billion (ppb)

Method Detection Limit in Water: 0.3 ug/L

QAQC Summary:

Daily Standard run at 20ug/L: %Diff 8020 = <15% MS/MSD Average Recovery = 100%: Duplicate RPD = 4%

Richard Srna Ph.D.

Laboratory Manager

415/543-8422

Harding Lawson Associates 666 Howard Street, Third Floor San Francisco, California 94105 Telecony: 415/777,9706

CHAIN OF CUSTODY FORM

+3392> 55-419 Lab: Superior

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1555 Burke. Unit I • San Francisco, California 94124 • (415) 647-2081 / fax (415) 821-7123

CERTIFICATE OF ANALYSIS

LABORATORY NO.: 55608

CLIENT: Harding Lawson Associates

CLIENT JOB NO.: 11295-017

DATE RECEIVED: 09/30/92

DATE REPORTED: 10/05/92

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS by Modified EPA SW-846 Method 5030 and 8015

# 	Sample Identification	Concentration (ug/L) Gasoline Range
1	MW-5	51000

ug/L - parts per billion (ppb)

Method Detection Limit for Gasoline in Water: 50 ug/L

QAQC Summary:

Daily Standard run at 2mg/L: %Diff Gasoline = <15 MS/MSD Recovery = 83%: Duplicate RPD = 0%

Richard Srna, Ph.D.

Laboratory Manager

1555 Burke, Unit F • San Francisco, California 94124 • [415] 647-2081 / fax (415) 821-7123

CERTIFICATE OF ANALYSIS

LABORATORY NO.: 55608

CLIENT: Harding Lawson Associates

CLIENT JOB NO.: 11295-017

DATE RECEIVED: 09/30/92

DATE REPORTED: 10/05/92

ANALYSIS FOR BENZENE, TOLUENE, ETHYL BENZENE & XYLENES by EPA SW-846 Methods 5030 and 8020

LAB # 	Sample Identification	Benzene		Ethyl Benzene	•
1	MW-5	13000	5900	1400	2600

ug/L - parts per billion (ppb)

Method Detection Limit in Water: 0.3 ug/L

QAQC Summary:

Daily Standard run at 20ug/L: %Diff 8020 = <15% MS/MSD Average Recovery =92%: Duplicate RPD = 4%

Richard Srna, Ph.D.

Harding Lawson Associates
Marathon Plaza
303 Second Street, Suite 630 North
San Francisco, CA 94107
(415) 543-8422 • (415) 777-9706 Telecopy

CHAIN OF CUSTODY FORM

Lab: Superior Analytical

San Francisco, CA 94107	0	0	
(415) 543-8422 • (415) 777-9706 Telecopy	Samplers:	· (eind)	ANALYSIS REQUESTED
Job Number: 11295-017 Name/Location: City Blve Project Manager: Dave Scrivnie	Recorder:		
SOURCE CODE SAMPLE NUMBER OR LATE OIL HAS Soil MATER Sediment OR LAB NUMBER OR LAB NUM	DATE Yr Mo Dy Time	STATION DESCRIPTION/ NOTES	EPA 601/8010 EPA 602/8020 EPA 625/8270 ICP METALS EPA 8015M/TPH TFH-6/8T
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SHEET	OF
	1295-012
DATE 6	18-92
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PROJECT City Blue, 1700 Jefferson Street SUBJECT General Inspection Log

General System Inspection Log To Be Completed By HLA Personnel Visiting the site.

- 1-Gasoline Product Inspection Log-Perform visual inspection as detailed on the log sheet and check that City Blue personnel are performing same check.
- 2- Natriont and Canstie Supply Tank Levels
- 3-Sand Filters Record pressure differential
- 4- Control Panel-Are any indicator lights on, record if any.
- 5- SCFM Gauge Check that gauge reads 1,0 SCFM
- 6-Pumps P-1, P-2, P-3, P-4 Check that pumps are in the "ON" or "AUTO" position, are pumps running.
- 7- Flow Totalizer Record total Flow of effluent to sanitary sewer.
- 8- BIO-Reactor Level Visually check the water level.

Date	Initials	1	2	3	4	5	6	7	8	_
7/23/92	/ 00	\	N-130g C-15°		BR-1 High System Reset	1.5	/	18120 gals.	Low	
7/24/92	OS	-			None /	1.5	>	19450gals		
7/27/92		/	N-109g C-15°		Nonev	1.5	V	22530 gals	Low	
8/3/92		\	N-100g C-15°		None /	1.5	レ	27080 gals		
8/6/92		/			NoneV	1.5	~	29770gals		
8/10/92	DR				BR-1 High Reset	1.5	V	32460		
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Notes/ Comments:	 	
	 	
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- 7- Flow Totalizer Record total Flow of effluent to sanitary sewer.
- 8-B10-Reactor Level Visually check the water level.

Date	Initials	1	2	3	4	5	6	7 1	8	1
8/20/92	. Ad	 -		6 psi	VNone	1.5	V	34660gals	High	System Sampled
8/24/92	DS-	V	OK	28 psi 10 psi	None	1.5	V	39537 gals	Low	
9/1/92	DS	V	N-2008 C-15*	28psi 10psi	Vpone	1.5	V	46220gals		Nutrient Tank Filled
9/9/92	DA	V			BR-1 High SF-1 High	1.5	~	49020gd		
9/15/92		V	OK		Mone	1,5	V	6119 Ogal		System
9/22/92	AS	V	N-1758 C-15"		BR-1 High SF-1 High	1,5	V	64340gal		
Notes	/Commen	43:								

Notes/Comments: