Harding Lawson Associates

July 17, 1992

18106,012.04

STID 4148

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

Attention: Mr. Paul Koze

Gentlemen:

Quarterly Report
April 1 through June 30, 1992
City Blue Groundwater Treatment System
1700 Jefferson Street
Oakland, California 94612

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 April 1 through June 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.

PROCESS DESCRIPTION

Groundwater containing elevated concentrations of petroleum hydrocarbons is being collected from two onsite extraction wells. 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 above-ground 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; the treatment module consists of a bioreactor, a vapor phase carbon adsorption unit, and the associated nutrient and caustic feed systems. The post-treatment module consists of a sand filter and two liquid phase carbon beds. Effluent from the carbon bed is discharged to the sanitary sewer drain onsite. Vapor from the bioreactor is passed through the vapor phase carbon adsorption unit before being released to the atmosphere.

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

TREATMENT SYSTEM SAMPLING

Water and air samples have been collected from the treatment system and analyzed 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 were collected from the bioreactor effluent before the carbon beds and from the carbon bed effluent before discharge to the sanitary sewer. Air samples were collected from the influent to and the effluent from the vapor phase carbon bed. 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 in the appendix.

In addition to sampling air and groundwater, the system is inspected for leaks and other problems. Copies of the inspection logs are included in the appendix.

SAMPLING SCHEDULE

The 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 will be collected monthly thereafter.

ANALYTICAL RESULTS

The results of chemical analyses are presented in Table 1. The laboratory reports are in the appendix. The results indicate that no detectable concentrations of TPH-G or BTEX are in effluent water being discharged to the sanitary sewer. Sample Number 92061905, 92070205, and 92071005 were analyzed to determine the concentrations of TPH-G and BTEX going into the bioreactor. The sample results indicate that the bioreactor treatment is degrading approximately 99 percent of the TPH-G and BTEX concentrations before post-treatment polishing by the carbon beds.

Based on current loading data we estimate that the primary carbon bed will not allow a breakthrough of detectable TPH-G or BTEX until May 1993.

The analytical results of the air samples (Table 1) also indicate that no detectable concentrations of TPH-G or BTEX are in the air being released from the vapor phase carbon adsorption unit. However, detectable concentrations of BTEX were found in the vapor phase carbon effluent sample from June 18, 1992. Analytical results from air samples taken the following day and following weeks showed no detectable concentrations of TPH-G or BTEX in the vapor phase carbon effluent samples. We believe that the BTEX concentrations detected in the effluent sample from June 18, 1992 were due to cross contamination during sampling. Cross contamination may have occurred by sampling the influent to the vapor phase carbon unit before sampling the effluent, and using the same tubing to draw both samples.

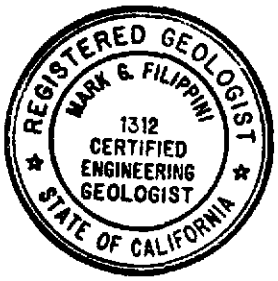
HLA is continuing to monitor and sample the groundwater treatment system at City Blue. The third week of sampling was performed on July 10, 1992. The sampling will now be performed monthly and the results presented in the next quarterly report in October 1992.

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
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

Alameda County Health Care Services
Department of Environmental Health
Hazardous Materials Program
80 Swan Way, Room 200
Oakland, California 94621
Attention: Ms. Jennifer Eberly

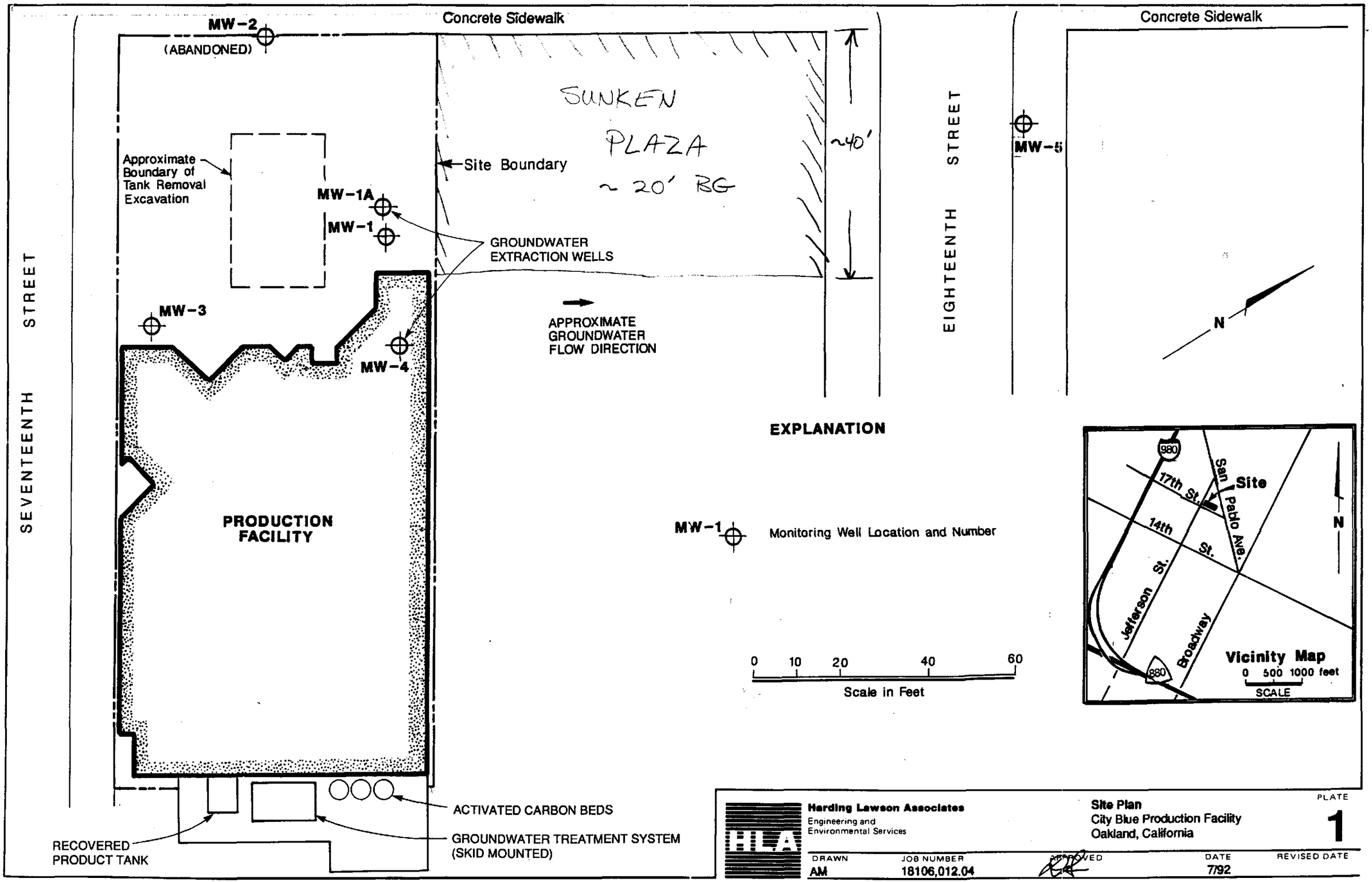
Table 1. Results of Air and Groundwater Chemical Analyses Harding Lawson Associates
Groundwater Treatment System
City Blue Production Facility

Sample Number	TPH-G	Benzene	Toluene	Ethyl-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
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	ND<0.3	150
92061902	ND<50	ND<0.3	ND<0.3	ND<0.3	ND<0.3
92061903	490000	4900	5700	550	7300
92061904	ND<30000	ND<85	ND<250	ND<65	ND<250
92061905	180000	18000	31000	2200	16000
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	13000
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

Sample number begins with year, month, and day of sampling
Sample Sequence:
01 - Bioreactor Effluent (water)
02 - 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.

B14691-CT88



Harding Lawson Associates
Engineering and Environmental Services

Site Plan
City Blue Production Facility
Oakland, California

PLATE **1**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
AM	18106,012.04		7/92	

Appendix

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

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

C E R T I F I C A T E O F A N A L Y S I S

LABORATORY NO.: 54974
CLIENT: Harding Lawson Associates
CLIENT JOB NO.: 11295-017

DATE RECEIVED: 06/16/92
DATE REPORTED: 06/16/92

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

LAB #	Sample Identification	Concentration (ug/L) Gasoline Range
1	92061601	3300
2	92061602	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 = 93%: Duplicate RPD = 5%

Richard Srna, Ph.D.

Laboratory Manager

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

CERTIFICATE OF ANALYSIS

LABORATORY NO.: 54974
CLIENT: Harding Lawson Associates
CLIENT JOB NO.: 11295-017

DATE RECEIVED: 06/16/92
DATE REPORTED: 06/16/92

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

LAB #	Sample Identification	Concentration(ug/L) Benzene	Toluene	Ethyl Benzene	Xylenes
1	92061601	220	460	35	290
2	92061602	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 = 94%: Duplicate RPD = 1%

Richard Srna, Ph.D.

Laboratory Manager

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

CERTIFICATE OF ANALYSIS

LABORATORY NO.: 54974
CLIENT: HARDING LAWSON ASSOC.
CLIENT JOB NO.: 11295-017

DATE RECEIVED: 06/16/92
DATE REPORTED: 06/16/92

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

LAB #	Sample Identification	Concentration (ppm) Gasoline Range
3	92061603	110
4	92061604	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 = 96%: Duplicate RPD = 4%

Richard Srna, Ph.D.

Laboratory Director

RECEIVED
JUN 18 1992
Harding Lawson Associates

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

C E R T I F I C A T E O F A N A L Y S I S

LABORATORY NO.: 54974
CLIENT: HARDING LAWSON ASSOC.
CLIENT JOB NO.: 11295-017

DATE RECEIVED: 06/16/92
DATE REPORTED: 06/16/92

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

LAB #	Sample Identification	Concentration(ppb) Benzene	Toluene	Ethyl Benzene	Xylenes
3	92061603	5200	6900	360	2200
4	92061604	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 = 98% : Duplicate RPD = 3%

Richard Srna, Ph.D.

Laboratory Director

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

Call/Cheryl Nelson or Dave Scrivner ASAP

CHAIN OF CUSTODY FORM

54974

Lab: Superior

Samplers: Dave Scrivner

Job Number: 11295-017

Name/Location: City Blue / Oakland

Project Manager: Cheryl Nelson

Recorder: Dave Scrivner (Signature Required)

SOURCE CODE	MATRIX: Water	Sediment	Soil	Oil	AIR	#CONTAINERS & PRESERV.: Unpres.	H_2SO_4	HNO_3	VOA's	Tedlar	SAMPLE NUMBER OR LAB NUMBER: Yr	Wk	Seq	DATE: Yr	Mo	Dy	Time	STATION DESCRIPTION/ NOTES	ANALYSIS REQUESTED: EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	ICP METALS	EPA 8015M/TPH	TPH Gas + BTEX
	X								2		92	06	1601	92	06	16		Same Day Turnaround on water samples, 24 Hour Turnaround on Air samples							X
	X								2		92	06	1602	92	06	16									X
					X					1	92	06	1603	92	06	16									X
					X					1	92	06	1604	92	06	16									X

RUSH

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

CHAIN OF CUSTODY RECORD

RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
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)	DATE/TIME 6/16/92 1040
METHOD OF SHIPMENT		

Laboratory Copy White — Project Office Copy Yellow — Field or Office Copy Pink

6533

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

C E R T I F I C A T E O F A N A L Y S I S

LABORATORY NO.: 54979
CLIENT: Harding Lawson Associates
CLIENT JOB NO.: 11295-017

DATE RECEIVED: 06/17/92
DATE REPORTED: 06/18/92

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

LAB #	Sample Identification	Concentration (ug/L) Gasoline Range
1	92061701	**43000**
2	92061702	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 = 102%: Duplicate RPD = 7%

Richard Srna, Ph.D.
Laboratory Manager

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

CERTIFICATE OF ANALYSIS

LABORATORY NO.: 54979
CLIENT: Harding Lawson Associates
CLIENT JOB NO.: 11295-017

DATE RECEIVED: 06/17/92
DATE REPORTED: 06/18/92

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

LAB #	Sample Identification	Concentration(ug/L) Benzene	Toluene	Ethyl Benzene	Xylenes
1	92061701	**4900**	7600	500	4100
2	92061702	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 = 99%: Duplicate RPD = 3%

Richard Srna, Ph.D.
Laboratory Manager

Superior Precision Analytical, Inc.
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CERTIFICATE OF ANALYSIS

LABORATORY NO.: 54979
CLIENT: Harding Lawson Associates
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DATE RECEIVED: 06/17/92
DATE REPORTED: 06/18/92

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

LAB #	Sample Identification	Concentration (ppm) Gasoline Range
3	92061703	1300
4	92061704	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 = 97%: Duplicate RPD = 7%

Richard Srna, Ph.D.
Laboratory Director

Superior Precision Analytical, Inc.
1555 Burke, Unit I ▪ San Francisco, California 94124 ▪ (415) 647-2081 / fax (415) 821-7123

C E R T I F I C A T E O F A N A L Y S I S

LABORATORY NO.: 54979
CLIENT: Harding Lawson Associates
CLIENT JOB NO.: 11295-017

DATE RECEIVED: 06/17/92
DATE REPORTED: 06/18/92

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

LAB #	Sample Identification	Concentration(ppb) Benzene	Toluene	Ethyl Benzene	Xylenes
3	92061703	120000	140000	7100	40000
4	92061704	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 = 93% : Duplicate RPD = 4%

Richard Srna, Ph.D.

Laboratory Director

Harding Lawson Associates
666 Howard Street, Third Floor
San Francisco, California 94105
415/543-8422
Telecopy: 415/777-9706

CHAIN OF CUSTODY FORM

54979

Lab: Superior

Samplers: David Scrivner

Job Number: 11295-017

Name/Location: City Blue

Project Manager: Cheryl Nelson

Recorder: (Signature Required)

SOURCE CODE	MATRIX: Water	Sediment	Soil	Oil	Air	#CONTAINERS & PRESERV.: Unpres.	H_2SO_4	HNO_3	HCl	SAMPLE NUMBER OR LAB NUMBER: Yr	Wk	Seq	DATE: Yr	Mo	Dy	Time	STATION DESCRIPTION/ NOTES	ANALYSIS REQUESTED: EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	ICP METALS	EPA 8015M/TPH	TPH Gas & BTEX
	X								2	9	20	61	70	1	9	20	6	17	24 Hour Turnaround							X
	X								2	9	20	61	70	2	9	20	6	17								X
					X				1	9	20	61	70	3	9	20	6	17								X
					X				1	9	20	61	70	4	9	20	6	17								X
																			RUSH							

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

CHAIN OF CUSTODY RECORD

RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
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)	DATE/TIME 6/17/92 1620
METHOD OF SHIPMENT		

Laboratory Copy White — Project Office Copy Yellow — Field or Office Copy Pink

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

C E R T I F I C A T E O F A N A L Y S I S

LABORATORY NO.: 54990
CLIENT: Harding Lawson Associates
CLIENT JOB NO.: 11295-017

DATE RECEIVED: 06/18/92
DATE REPORTED: 06/19/92

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

LAB #	Sample Identification	Concentration (ug/L) Gasoline Range
1	92061801	4300
2	92061802	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 = 102%: Duplicate RPD = 4%

Richard Srna, Ph.D.
Laboratory Manager

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

C E R T I F I C A T E O F A N A L Y S I S

LABORATORY NO.: 54990
CLIENT: Harding Lawson Associates
CLIENT JOB NO.: 11295-017

DATE RECEIVED: 06/18/92
DATE REPORTED: 06/19/92

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

LAB #	Sample Identification	Concentration(ug/L) Benzene	Toluene	Ethyl Benzene	Xylenes
1	92061801	20	48	3.6	970
2	92061802	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 =100%: Duplicate RPD = 5.5%

Richard Srna, Ph.D.
Laboratory Manager

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

C E R T I F I C A T E O F A N A L Y S I S

LABORATORY NO.: 54990
CLIENT: Harding Lawson Associates
CLIENT JOB NO.: 11295-017

DATE RECEIVED: 06/18/92
DATE REPORTED: 06/19/92

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

LAB #	Sample Identification	Concentration (ppm) Gasoline Range
3	92061803	210
4	92061804	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 = 107 %: Duplicate RPD = 3.3 %

Richard Srna, Ph.D.
Laboratory Director

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

C E R T I F I C A T E O F A N A L Y S I S

LABORATORY NO.: 54990
CLIENT: Harding Lawson Associates
CLIENT JOB NO.: 11295-017

DATE RECEIVED: 06/18/92
DATE REPORTED: 06/19/92

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

LAB #	Sample Identification	Concentration(ppb) Benzene	Toluene	Ethyl Benzene	Xylenes
3	92061803	1100	2200	240	10000
4	92061804	160	710	89	670

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 = 2.2 %

Richard Srna, Ph.D.

Laboratory Director

Harding Lawson Associates
666 Howard Street, Third Floor
San Francisco, California 94105
415/543-8422
Telecopy: 415/777-9706

CHAIN OF CUSTODY FORM

54990

Lab: Superior

Samplers: Dave Scavner

Job Number: 11295-017

Name/Location: City Blue

Project Manager: Cheryl Nelson

Recorder: (Signature Required)

SOURCE CODE	MATRIX: Water	Sediment	Soil	Oil	Air	#CONTAINERS & PRESERV.: Unpres.	H_2SO_4	HNO_3	VOAs	Air	SAMPLE NUMBER OR LAB NUMBER: Yr	Wk	Seq	DATE: Yr	Mo	Dy	Time	STATION DESCRIPTION/ NOTES	ANALYSIS REQUESTED: EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	ICP METALS	EPA 8015M/TPH	TPH Gas + BTEX
	X								2		9206	180	1	9206	18			24-Hour Turnaround							X
	X								2		9206	180	2	9206	18										X
					X					1	9206	180	3	9206	18										X
					X					1	9206	180	4	9206	18										X

RUSH

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

CHAIN OF CUSTODY RECORD

RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
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)	DATE/TIME 6-18-92 1320
METHOD OF SHIPMENT		

Laboratory Copy White — Project Office Copy Yellow — Field or Office Copy Pink

6533

Superior Precision Analytical, Inc.
1555 Burke, Unit I ▪ San Francisco, California 94124 ▪ (415) 647-2081 / fax (415) 821-7123

C E R T I F I C A T E O F A N A L Y S I S

LABORATORY NO.: 54996
CLIENT: Harding Lawson Associates
CLIENT JOB NO.: 11295-017

DATE RECEIVED: 06/19/92
DATE REPORTED: 06/22/92

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

LAB #	Sample Identification	Concentration (ug/L) Gasoline Range
1	92061901	1600
2	92061902	ND<50
5	92061905	180000

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 = 94%: Duplicate RPD =0.7%

Richard Srna, Ph.D.
Laboratory Manager

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

CERTIFICATE OF ANALYSIS

LABORATORY NO.: 54996
CLIENT: Harding Lawson Associates
CLIENT JOB NO.: 11295-017

DATE RECEIVED: 06/19/92
DATE REPORTED: 06/22/92

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

LAB #	Sample Identification	Concentration(ug/L) Benzene	Toluene	Ethyl Benzene	Xylenes
1	92061901	1.6	5.0	ND<0.3	150
2	92061902	ND<0.3	ND<0.3	ND<0.3	ND<0.3
5	92061905	18000	31000	2200	16000

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 = 1.6%

Richard Srna, Ph.D.
Laboratory Manager

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

C E R T I F I C A T E O F A N A L Y S I S

LABORATORY NO.: 54996
CLIENT: Harding Lawson Associates
CLIENT JOB NO.: 11295-017

DATE RECEIVED: 06/19/92
DATE REPORTED: 06/22/92

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

LAB #	Sample Identification	Concentration (ppm) Gasoline Range
3	92061903	490
4	92061904	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 = 107%: Duplicate RPD = 3.3%

Richard Srna, Ph.D.
Laboratory Director

Superior Precision Analytical, Inc.
1555 Burke, Unit I ▪ San Francisco, California 94124 ▪ (415) 647-2081 / fax (415) 821-7123

C E R T I F I C A T E O F A N A L Y S I S

LABORATORY NO.: 54996
CLIENT: Harding Lawson Associates
CLIENT JOB NO.: 11295-017

DATE RECEIVED: 06/19/92
DATE REPORTED: 06/22/92

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

LAB #	Sample Identification	Concentration(ppb) Benzene	Toluene	Ethyl Benzene	Xylenes
3	92061903	4900	5700	550	7300
4	92061904	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 = 94% : Duplicate RPD = 2.2%

Richard Srna, Ph.D.
Laboratory Director

Harding Lawson Associates
666 Howard Street, Third Floor
San Francisco, California 94105
415/543-8422
Telecopy: 415/777-9706

CHAIN OF CUSTODY FORM

524996 Lab: Superior

Job Number: 11295-017
Name/Location: City Blue
Project Manager: Cheryl Nelson

Samplers: Dave Scrivner
Recorder: [signature] (Signature Required)

SOURCE CODE	Water	Sediment	Soil	Oil	AIR	Unpres.	H_2SO_4	HNO_3	VOA/HCl	BAG	Yr	Wk	Seq	Yr	Mo	Dy	Time	STATION DESCRIPTION/ NOTES	EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	ICP METALS	EPA 8015M/TPH	TPH Gas + BTEX
	X								2		92	06	1901	92	06	19	1350	24 Hour							X
	X								2		92	06	1902	92	06	19	1345	Turnaround							X
					X					1	92	06	1903	92	06	19	1410	6/22/92 Results							X
					X					1	92	06	1904	92	06	19	1405								X
	X								2		92	06	1905	92	06	19	1325								X

Pl... initial: OM
...s Stored in ice. yes
A...priate containers yes
Samples preserved yes
VOA's without headsp... yes
Comments: OK

CHAIN OF CUSTODY RECORD

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

RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
[signature]		

DISPATCHED BY: (Signature)	DATE/TIME	RECEIVED FOR LAB BY: (Signature)	DATE/TIME
		Duyen A Nguyen	6/19/92

METHOD OF SHIPMENT

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C E R T I F I C A T E O F A N A L Y S I S

LABORATORY NO.: 55145
CLIENT: Harding Lawson Associates
CLIENT JOB NO.: 11295-017

DATE RECEIVED: 06/25/92
DATE REPORTED: 07/01/92

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

LAB #	Sample Identification	Concentration (ug/L) Gasoline Range
1	92062401	980
2	92062402	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 = 100%: Duplicate RPD = 6%

Richard Srna, Ph.D.

Laboratory Manager

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

C E R T I F I C A T E O F A N A L Y S I S

LABORATORY NO.: 55145
CLIENT: Harding Lawson Associates
CLIENT JOB NO.: 11295-017

DATE RECEIVED: 06/25/92
DATE REPORTED: 07/01/92

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

LAB #	Sample Identification	Concentration(ug/L) Benzene	Toluene	Ethyl Benzene	Xylenes
1	92062401	11	13	1.8	140
2	92062402	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 =94%: Duplicate RPD = 7%

Richard Srna, Ph.D.

Laboratory Manager

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

C E R T I F I C A T E O F A N A L Y S I S

LABORATORY NO.: 55145
CLIENT: Harding Lawson Associates
CLIENT JOB NO.: 11295-017

DATE RECEIVED: 06/25/92
DATE REPORTED: 07/01/92

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

LAB #	Sample Identification	Concentration (ppm) Gasoline Range
3	92062403	230
4	92062404	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 = 95 %: Duplicate RPD = 3.8%

Richard Srna, Ph.D.

Laboratory Director

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

C E R T I F I C A T E O F A N A L Y S I S

LABORATORY NO.: 55145
CLIENT: Harding Lawson Associates
CLIENT JOB NO.: 11295-017

DATE RECEIVED: 06/25/92
DATE REPORTED: 07/01/92

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

LAB #	Sample Identification	Concentration(ppb) Benzene	Toluene	Ethyl Benzene	Xylenes
3	92062403	3100	3600	380	6400
4	92062404	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 = 90 % : Duplicate RPD = 4.3 %

Richard Srna, Ph.D.

Laboratory Director

55145

Harding Lawson Associates
666 Howard Street, Third Floor
San Francisco, California 94105
415/543-8422
Telecopy: 415/777-9706

CHAIN OF CUSTODY FORM

Lab: Superior

Samplers: Dave Scrivner

Job Number: 11295-017

Name/Location: City Blue

Project Manager: Cheryl Nelson

Recorder: (Signature Required)

SOURCE CODE	MATRIX: Water	Sediment	Soil	Oil	Air	#CONTAINERS & PRESERV.: Unpres.	H_2SO_4	HNO_3	VOA/HCl	Tedlar	SAMPLE NUMBER OR LAB NUMBER: Yr	Wk	Seq	DATE: Yr	Mo	Dy	Time	STATION DESCRIPTION/ NOTES
	X								2		9	20	624	01	92	06	24	1700	5-Day Turnaround
	X								2		9	20	624	02	92	06	24	1700	
					X					1	9	20	624	03	92	06	24	1700	
					X					1	9	20	624	04	92	06	24	1700	
	X								2		9	20	624	05	92	06	24	1700	2ND Carbon Effluent, HOLD

ANALYSIS REQUESTED

EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	ICP METALS	EPA 8015M/TPH	TPH-GAS/BTEX
						X
						X
						X
						X

LAB NUMBER: Yr	Wk	Seq	DEPTH IN FEET	COL MTD CD	QA CODE	MISCELLANEOUS
						Please initial: dbl
						Samples Stored in ice: chilled
						Appropriate containers: Yes
						Samples preserved: Yes
						VOA's without headspace: Yes
						Comments:

CHAIN OF CUSTODY RECORD

RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
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)	DATE/TIME 6-25-92 0907
METHOD OF SHIPMENT		

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C E R T I F I C A T E O F A N A L Y S I S

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.

Cecilia G. Jorquera (for)
Laboratory Manager

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

C E R T I F I C A T E O F A N A L Y S I S

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 #	Sample Identification	Concentration(ug/L) Benzene	Toluene	Ethyl Benzene	Xylenes
1	92070201	1.4	ND<0.3	ND<0.3	1.0
2	92070202	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 = 96%: Duplicate RPD = 0.7%

Richard Srna, Ph.D.

Laboratory Manager

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

C E R T I F I C A T E O F A N A L Y S I S

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.

Laboratory Director

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

C E R T I F I C A T E O F A N A L Y S I S

LABORATORY NO.: 55195
CLIENT: HARDING LAWSON ASSOCIATES
CLIENT JOB NO.: 11295-017

DATE RECEIVED: 07/02/92
DATE REPORTED: 07/06/92

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

LAB #	Sample Identification	Concentration(ppb) Benzene	Toluene	Ethyl Benzene	Xylenes
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

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

C E R T I F I C A T E O F A N A L Y S I S

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

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

C E R T I F I C A T E O F A N A L Y S I S

LABORATORY NO.: 55211
CLIENT: Harding Lawson Associates
CLIENT JOB NO.: 11295-017

DATE RECEIVED: 07/07/92
DATE REPORTED: 07/14/92

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

LAB #	Sample Identification	Concentration(ug/L) Benzene	Toluene	Ethyl Benzene	Xylenes
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 Srna, Ph.D.
Laboratory Manager

55195

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

Samplers: Dave Scrivner

Job Number: 11295-017

Name/Location: City Blue

Project Manager: Cheryl Nelson

Recorder: _____ (Signature Required)

SOURCE CODE	MATRIX: Water	Sediment	Soil	Oil	Air	#CONTAINERS & PRESERV.: Unpres.	H_2SO_4	HNO_3	HCl/Tedlar	SAMPLE NUMBER OR LAB NUMBER: Yr	Wk	Seq	DATE: Yr	Mo	Dy	Time	STATION DESCRIPTION/ NOTES	ANALYSIS REQUESTED: EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	ICP METALS	EPA 8015M/TPH	TPH-GAS + BTEX
	X								Z	9	20	7020	1	92	07	02	1000							X
	X								Z	9	20	7020	2	92	07	02	1000							X
					X				1	9	20	7020	3	92	07	02	1000							X
					X				1	9	20	7020	4	92	07	02	1000							X
	X								Z	9	20	7020	5	92	07	02	1000	HOLD 92070205						

RUSH

RUSH

LAB NUMBER: Yr	Wk	Seq	DEPTH IN FEET	COL MTD CD	QA CODE	MISCELLANEOUS
					998	4pm
						4pm
						4pm

CHAIN OF CUSTODY RECORD

RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
[signature]	[signature] EXPRESS IT	7-2-92 1510
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
[signature] EXPRESS IT 1257	Peter B. Olson	7-2-92 1536
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)	DATE/TIME
METHOD OF SHIPMENT		

Laboratory Copy White Project Office Copy Yellow Field or Office Copy Pink

6533

55145

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

Samplers: Dave Scrivner

Job Number: 11295-017

Name/Location: City Blue

Project Manager: Cheryl Nelson

Recorder: (Signature Required)

SOURCE CODE	MATRIX: Water	Sediment	Soil	Oil	Air	#CONTAINERS & PRESERV.: Unpres.	H_2SO_4	HNO_3	HCl/Tube Tedlar	SAMPLE NUMBER OR LAB NUMBER: Yr	Wk	Seq	DATE: Yr	Mo	Dy	Time	STATION DESCRIPTION/ NOTES	ANALYSIS REQUESTED: EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	ICP METALS	EPA 8015M/TPH	TPH-GAS + BTEX
	X								2	9	20	702019	92	07	02	1000	please analyze as per client 7/1/92 -MW							X
	X								2	9	20	702029	92	07	02	1000								X
					X				1	9	20	702039	92	07	02	1000								X
					X				1	9	20	702049	92	07	02	1000								X
	X								2	9	20	702059	92	07	02	1000	HOLD 92070205							X
																	RUSH							

ADDITIONAL REQUEST

RUSH

LAB NUMBER: Yr	Wk	Seq	DEPTH IN FEET	COL MTD CD	QA CODE	MISCELLANEOUS
			Please initial:			
			Samples stored at			You
			Appropriate containers			You
			Sample labels			You
			VOA			
			Comments			

CHAIN OF CUSTODY RECORD

RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
	A. M. Express IT	7-2-92/1510
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
A. M. Express IT 1257	Peter B. Dann	7-2-92/1536
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) DATE/TIME	
METHOD OF SHIPMENT		

Laboratory Copy
White

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

C E R T I F I C A T E O F A N A L Y S I S

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

C E R T I F I C A T E O F A N A L Y S I S

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

LAB #	Sample Identification	Concentration(ug/L) Benzene	Toluene	Ethyl Benzene	Xylenes
1	92071001	41	36	2.2	360
2	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 I ▪ San Francisco, California 94124 ▪ (415) 647-2081 / fax (415) 821-7123

C E R T I F I C A T E O F A N A L Y S I S

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.
for
Laboratory Director

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

C E R T I F I C A T E O F A N A L Y S I S

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

LAB #	Sample Identification	Concentration(ppb) Benzene	Toluene	Ethyl Benzene	Xylenes
3	92071003	15000	23000	1900	23000
4	92071004	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 =94 % : Duplicate RPD = 0.5%

Richard Srna, Ph.D.
(for)
Laboratory Director

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

C E R T I F I C A T E O F A N A L Y S I S

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.D.
Laboratory Manager

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

C E R T I F I C A T E O F A N A L Y S I S

LABORATORY NO.: 55223
CLIENT: Harding Lawson Associates
CLIENT JOB NO.: 11295-016

DATE RECEIVED: 07/10/92
DATE REPORTED: 07/15/92

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

LAB #	Sample Identification	Concentration(ug/L) Benzene	Toluene	Ethyl 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.
Laboratory Manager

Harding Lawson Associates
666 Howard Street, Third Floor
San Francisco, California 94105
415/543-8422
Telecopy: 415/777-9706

CHAIN OF CUSTODY FORM 55213

Lab: Superior

Job Number: 11295-017

Name/Location: City Blue

Project Manager: Cheryl Nelson

Samplers: David Scrivner

Recorder: (Signature Required)

SOURCE CODE	MATRIX: Water	Sediment	Soil	Oil	AIR	#CONTAINERS & PRESERV.: Unpres.	H_2SO_4	HNO_3	VOA/HCL	Tedlar	SAMPLE NUMBER OR LAB NUMBER: Yr	Wk	Seq	DATE: Yr	Mo	Dy	Time	STATION DESCRIPTION/ NOTES	EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	ICP METALS	EPA 8015M/TPH	TPH-GAS/BTEX
	X								2		92	07	1001	92	07	10	0900								X
	X								2		92	07	1002	92	07	10	0900								X
					X					1	92	07	1003	92	07	10	0900								X
					X					1	92	07	1004	92	07	10	0900								X
	X								2		92	07	1006	92	07	10	0915	2ND CB Effl., HOLD							

Plea...
Sam...
App...
Samp...
VOA...
Comm...
H_2O / Air

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

CHAIN OF CUSTODY RECORD

RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
[signature]	Satin B. Aaron	7-10-92 1005
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
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)	DATE/TIME

METHOD OF SHIPMENT

Laboratory Copy White | Project Office Copy Yellow | Field or Office Copy Pink

6533

Harding Lawson Associates
666 Howard Street, Third Floor
San Francisco, California 94105
415/543-8422
Telecopy: 415/777-9706

CHAIN OF CUSTODY FORM

55223

Lab: Superior

Samplers: David Scrivner

Job Number: 11295-016

Name/Location: City Blue

Project Manager: Cheryl Nelson

Recorder: (Signature Required)

SOURCE CODE	MATRIX: Water	Sediment	Soil	Oil	#CONTAINERS & PRESERV.: Unpres.	H_2SO_4	HNO_3	VOA/HCl	SAMPLE NUMBER OR LAB NUMBER: Yr	Wk	Seq	DATE: Yr	Mo	Dy	Time	STATION DESCRIPTION/ NOTES
	X							2	9	20	71005	9	20	7	0900	

ANALYSIS REQUESTED

EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	ICP METALS	EPA 8015M/TPH	TPH-Gas/BTEX

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

CHAIN OF CUSTODY RECORD

RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature) Peter B. Olson	DATE/TIME 7-10-92 1005
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
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)	DATE/TIME
METHOD OF SHIPMENT		

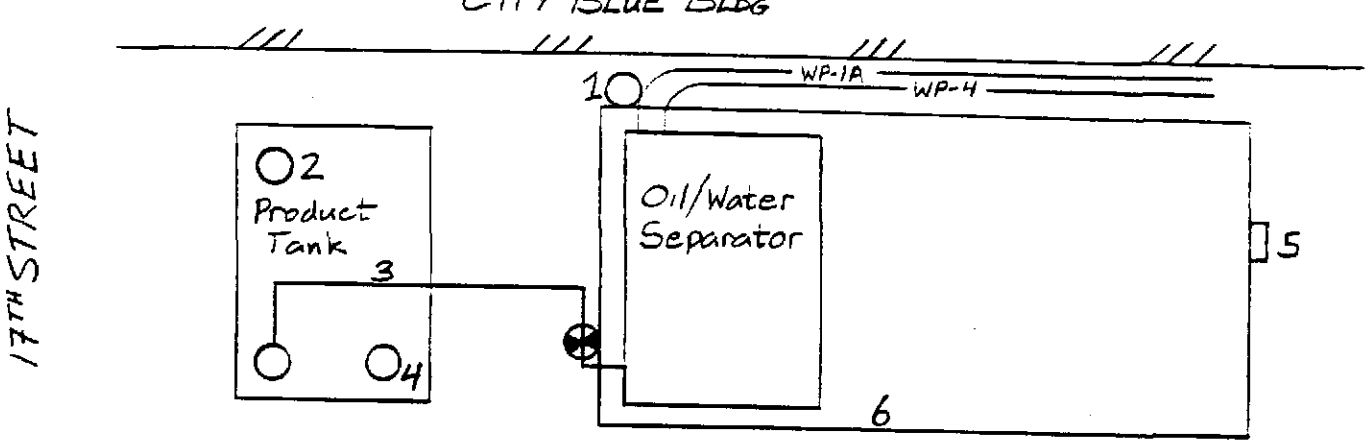
Laboratory Copy White — Project Office Copy Yellow — Field or Office Copy Pink

6533

Harding Lawson Associates
Engineering
and
Environmental Services

SHEET _____ OF _____
JOB NO. _____
DATE _____
COMPUTED BY _____
CHECKED BY _____

PROJECT City Blue, 1700 Jefferson St.
SUBJECT Gasoline Product Inspection Log



1 - Influent From wells WP-1A and WP-4 to Oil / Water Separator

2 - Convault Product Tank Dispenser

3 - Recovered Product Line from Oil/Water Separator to Convault Product Tank

4 - Fuel Level Gauge

5 - Control Panel

6 - Secondary Containment

If Any Questions Contact:
Cheryl Nelson (415) 543-8422
OR David Scrivner (415) 543-842
OR Dan Johnson (415) 892-08.

CHECKPOINTS

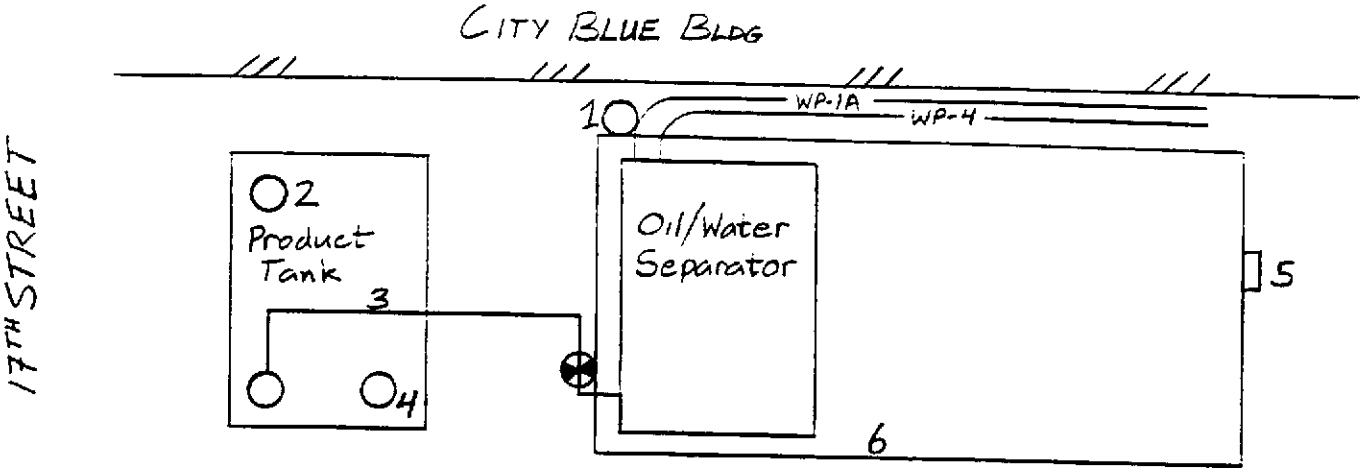
DATE	INITIALS	#1	#2	#3	#4	#5	#6
6/16/92	[illegible]	✓	✓	✓	1/8	✓	Dry
6/17/92	[illegible]	✓	✓	✓	1/8	✓	Dry
6/18/92	[illegible]	✓	✓	✓	1/8 - 1/4	✓	Small Leak
6/19/92	[illegible]	✓	✓	✓	1/4	✓	Small Leak
6/24/92	[illegible]	✓	✓	✓	~5/16	✓	Small Leak

Comments:

Harding Lawson Associates
Engineering
and
Environmental Services

SHEET _____ OF _____
JOB NO. _____
DATE _____
COMPUTED BY _____
CHECKED BY _____

PROJECT City Blue, 1700 Jefferson St.
SUBJECT Gasoline Product Inspection Log



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OR David Scrivner (415) 543-842

OR Dan Johnson (415) 892-08

CHECKPOINTS

DATE	INITIALS	#1	#2	#3	#4	#5	#6
6/30/92	[illegible]	✓	✓	✓	3/8	✓	1/4" of Rain H2O
7/2/92	[illegible]	✓	✓	✓	3/8	BR-1 High	Small Puddle
7/7/92	[illegible]	✓	✓	✓	3/8	BR-1 High	Small Puddle
7/10/92	[illegible]	✓	✓	✓	3/8	BR-1 High	Small Puddle

Comments:

Harding Lawson Associates
Engineering
and
Environmental Services

SHEET 1 OF 1
JOB NO. 11295-012
DATE 6-18-92
COMPUTED BY DES
CHECKED BY

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 - Nutrient and Caustic 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	
6/16/92	DS	✓	Full	10 psi	No	✓	✓	1000 gals	Full	System Start-Up
6/17/92	DS	✓	Full	10 psi	No	✓	✓	2920 gals	Full	Onsite All day
6/18/92	DS	✓	Full -2-	10 psi	No	✓	✓	4280 gals	-4"	
6/19/92	DS	✓	Full -3-	10 psi	No	✓	✓	5650 gals	-17"	
6/24/92	DS	✓	~~Full~~ -4"	10 psi	BR-1 High	✓ up to 2.0	✓	6830 gals 7208 gals	-19" Full	
7/2/92	DS	✓	-5-	15 psi	BR-1 High	✓ 2.0	✓	13040 gals	Full	

Notes/Comments:

6/30/92 record on separate sheet

Harding Lawson Associates
Engineering and Environmental Services

SHEET 1 OF 1
JOB NO. 11295-012
DATE 6-18-92
COMPUTED BY DFS
CHECKED BY

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.

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8 - Bio-Reactor Level - Visually check the water level.

Date	Initials	1	2	3	4	5	6	7	8	
6/30/92	[illegible]	✓ Of	C-15¼" N-43"	✓10 B.W.	BR-1 High, SF-1 High	✓	✓	11,180 gals	-9½"	
7/2/92	[illegible]	✓ [illegible]	—	—	BR-1 High, SF-1 High	✓	✓	13,040 gals	High	
7/7/92	[illegible]	✓ [illegible]	C-15" N-39"	—	BR-1 High	✓	✓	13,670 gals	—	
7/10/92	[illegible]	✓ [illegible]	C-15" N-160 gal	8 psi, 10 psi	BR-1 High	✓	✓	14,470 gals	—	

Notes/Comments: