Harding Lawson Associates

April 29, 1994

11295 012

Mr. Jeff Christoff
Blue Print Service Company
149 Second Street
San Francisco, California 94105

Quarterly Report
January 1, 1994 through March 31, 1994
City Blue Groundwater Treatment System
1700 Jefferson Street
Oakland, California

Dear Mr. Christoff:

This letter presents the current status and discusses the results of groundwater sampling and analysis at the City Blue Production facility, 1700 Jefferson Street, Oakland, California for the period of January 1, 1994 through March 31, 1994.

BACKGROUND

Three underground storage tanks (USTs) 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.

Separate-phase petroleum hydrocarbons (gasoline) were found floating on the surface of 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 downgradient 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 a feasible and cost-effective groundwater treatment method for the City Blue site.

From October 1987 to March 1991, BPS personnel purged gasoline from Monitoring Well MW-1 and kept a record of the well purging on a product skimming log. Gasoline was bailed from the well with a bailer between 15 and 20 times a month. **Between October 1987 and March 1991, a total of approximately 2,300 gallons of gasoline was bailed from MW-1.**

PROCESS DESCRIPTION

Groundwater containing elevated concentrations of petroleum hydrocarbons as gasoline and separate-phase gasoline is being collected from two onsite extraction wells, MW-1A and MW-4. The long-term average extraction flow rate is 0.7 to 0.8 gallons per minute (gpm). Air displacement pumps in the wells convey total fluids through aboveground and underground piping to the treatment system. The treatment system is comprised of the following three modules:

Pretreatment: The groundwater and separate phase gasoline are pumped from the extraction wells to an aboveground oil/water separator. The gasoline is separated from the water and flows to an aboveground recovered product tank. The gasoline is periodically pumped from the tank by BPS, mixed with fresh gasoline, and used in the BPS company vehicles.

Treatment: The water separated from the gasoline is pumped to a 3,000-gallon biotreatment tank where the water is mixed with nutrient and oxygen to stimulate the growth of microorganisms that degrade the hydrocarbons.

Post-treatment: When the contents of the biotreatment tank reach a designated high level, a batch discharge of approximately 500 gallons is pumped through sand filters to remove particulates (biomass). The filtered water flows through activated carbon drums to adsorb the remaining hydrocarbons. After passing through two activated carbon drums the treated water flows through a flow totalizer and is discharged to the sanitary sewer. Flow totalizer readings are recorded weekly and are presented in Table 3. At the current pumping rate of 0.7 to 0.8 gpm, an average of approximately 1,000 gallons of treated water is discharged to the sanitary sewer per day. Vapor from the bioreactor is passed through a vapor phase carbon adsorption unit before being released to the atmosphere.

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.

GROUNDWATER CAPTURE ZONE

HLA presented the results of aquifer testing and capture zone simulations in a report dated February 2, 1990. A hydraulic conductivity estimate of 1.48 feet/day was derived from a slug test performed in MW-3. Using the observed pumping rate of approximately 0.75 gpm, a natural groundwater gradient of 0.02 feet/foot between MW-3 and MW-1, an aquifer thickness of 5 feet, and a hydraulic conductivity of 1.5 feet/day, we have estimated the capture zone to extend as far as 150 feet downgradient of the extraction wells. This estimated capture zone would include MW-5, but may not be realistic due to subsurface heterogeneity and channeling of subsurface flow.

Using more conservative values, a pumping rate of 0.5 gpm and a hydraulic conductivity of 2.0 feet/day, we have estimated a capture zone that extends approximately 75 feet downgradient of the extraction wells. This capture zone estimate does not include MW-5, but does effectively capture groundwater and separate-phase gasoline in the vicinity of the former USTs.

TREATMENT SYSTEM STATUS

On October 24, 1992, a level control switch in the oil/water separator failed, resulting in overfilling of the recovered product tank with gasoline and water. The recovered product tank overflowed into the BPS parking lot and into the street. This incident was reported in the quarterly report dated January 20, 1993.

From June 1992 through October 1992, approximately 350 gallons of gasoline was recovered by the treatment system. This recovered gasoline was recycled by BPS as fuel for their delivery vehicles.

The treatment system was not fully operational from October 24, 1992 through February 1994. In the interim, HLA recommended modifications to improve the safety and maintenance features. The recommended modifications were submitted to BPS and the contractor expected to perform the modifications in April 1993. The contractor completed the recommended modifications to the treatment system in September 1993. From late December 1993 through February 1994, HLA made several mechanical and electrical repairs and adjustments to the treatment unit.

The groundwater treatment system resumed continuous operation on March 3, 1994. From March 3, 1994 through March 31, 1994, approximately 27,000 gallons of water were treated and discharged to the sanitary sewer. During the same period, approximately 170 gallons of gasoline were recovered.

In addition to monitoring separate-phase gasoline levels in the onsite wells, we have periodically purged MW-3 and MW-1 of water and gasoline. The wells are purged and monitored to assess if the gasoline in the well casings is stagnant or representative of the separate-phase level in the aquifer. This was done once in this quarter on March 30, 1994. Each well was purged until the well casings were emptied (purged dry). Approximately one gallon of gasoline and five gallons of water were purged from MW-1 and a trace of gasoline and five gallons of water were purged from MW-3.

SAMPLING AND ANALYSIS

In accordance with the sampling schedule submitted with the monitoring proposal and regulatory agency permit applications, HLA has sampled the treatment system effluent on a monthly basis and the offsite Monitoring Well MW-5 semiannually. The treatment system water samples were collected from the bioreactor effluent before carbon adsorption, and from the effluent side of the first carbon vessel, CB-1. In addition, samples of the bioreactor influent have been analyzed to determine the degradation efficiency of the bioreactor. The sampling locations are shown on Plate 2, Process Flow and Sampling Locations. Water samples were decanted from brass sampling ports into 40-milliliter

volatile organic analysis (VOA) vials. The water samples were stored in coolers on ice and submitted to Superior Precision Analytical Laboratory in San Francisco under chain-of-custody protocol for analysis. The samples were analyzed by EPA Test Method 8015 for total petroleum hydrocarbons as gasoline (TPHg) and EPA Test Method 8020 for benzene, toluene, ethyl benzene, and total xylenes (BTEX).

MW-5 was sampled on January 13, 1994. Before sampling, the water level was measured and approximately ten well casing volumes (12 gallons) were purged from the well. The groundwater in the well was sampled with a teflon bailer 20 minutes after purging. The two extraction wells MW-1A and MW-4, and monitoring wells MW-1 and MW-3 have separate-phase gasoline and have therefore not been sampled semiannually. The bioreactor influent water is a combination of water from MW-1A and MW-4 after passing through the oil/water separator. The results of the MW-5 monitoring are presented in Table 1 along with the treatment system analytical results. The separate-phase gasoline thicknesses as measured in the onsite wells is presented in Table 2.

Air samples were collected from the vapor phase carbon bed influent and effluent through the August 20, 1992 sampling. On March 30, 1994 the air emissions from the vapor phase carbon unit were measured for approximately five minutes with a photoionization detector at the roof of the facility where the air is vented to the atmosphere. We measured an average hydrocarbon concentration of 10 parts per million (ppm) at the discharge point. The air flow rate into the bioreactor to supply oxygen to the bacteria is 1 cubic foot per minute (cfm). This is the assumed flow rate through the vapor phase carbon unit to the atmosphere. At a flow rate of 1 cfm and a vapor concentration of 10 ppm, approximately 0.004 pounds per day of hydrocarbons are being released to the atmosphere.

In addition to sampling air and groundwater, the system is maintained and inspected at least twice weekly during normal operation.

ANALYTICAL RESULTS

A summary of the analytical results are presented in Table 1. The results indicate that no detectable concentrations of TPHg or BTEX have been discharged to the sanitary sewer. The bioreactor influent and effluent sample results indicate that, on average, the bioreactor treatment degrades approximately 90 percent of the TPHg and BTEX concentrations before post-treatment polishing by the carbon beds.

PROPOSED ACTIVITIES IN THE SECOND QUARTER OF 1994

During the next quarter we plan to; sample the offsite monitoring well MW-5 in mid-April; continue to monitor separate-phase gasoline levels in MW-1 and MW-3; continue to purge MW-1 and MW-3 as long as they contain separate-phase gasoline; and begin sampling any onsite wells when they no longer

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Blue Print Service Company
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contain separate-phase gasoline. We expect to continue operation of the treatment system on a continuous basis through the next quarter with weekly maintenance and monthly sampling.

If you have any questions, please contact David Scrivner at (510) 687-9660.

Yours very truly,

HARDING LAWSON ASSOCIATES

Cheryl Lee Nelson for

David F. Scrivner
Project Engineer

David R. Kleesattel, R.G.
Associate Geologist

REGISTERED GEOLOGIST
DAVID R. KLEESATTEL
NO. 5136
STATE OF CALIFORNIA

DFS/DRK/pkp 034534P/L44

Attachments: Table 1 - Results of Chemical Analyses
Table 2 - Monitoring Well Product Thickness Measurements
Table 3 - Flow Totalizer Readings
Plate 1 - Site Plan
Plate 2 - Process Flow and Sampling Locations
Laboratory Reports and Chain-of-Custody Documents

cc: Mr. Thomas Peacock
Alameda County Health Care Services
Department of Environmental Health
Hazardous Materials Program
80 Swan Way, Room 200
Oakland, California 94621

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

Mr. Alexander V. Saschin
Bay Area Air Quality Management District
939 Ellis Street
San Francisco, California 94109

LABORATORY REPORTS AND CHAIN-OF-CUSTODY RECORDS

Table 1. Results of Air and Groundwater Chemical Analysis
Groundwater Treatment System
1700 Jefferson Street
Oakland, California

Date/ Analytes	Bioreactor Influent (1)	Bioreactor Effluent (2)	First Carbon Bed Effluent (3)	Sanitary Sewer Influent (4)	Vapor Phase Carbon Effluent (Air) (5)	MW-5
August 1, 1991						
TPHg	NA	NA	NA	NA	NA	120,000
Benzene	NA	NA	NA	NA	NA	20,000
Toluene	NA	NA	NA	NA	NA	14,000
Ethylbenzene	NA	NA	NA	NA	NA	1,900
Xylene	NA	NA	NA	NA	NA	4,900
June 16, 1992						
TPHg	NA	3,300	ND <50	NA	ND <30,000	NA
Benzene	NA	220	ND <0.3	NA	ND <85	NA
Toluene	NA	460	ND <0.3	NA	ND <250	NA
Ethylbenzene	NA	35	ND <0.3	NA	ND <65	NA
Xylene	NA	290	ND <0.3	NA	ND <250	NA
June 17, 1992						
TPHg	NA	43,000	ND <50	NA	ND <30,000	NA
Benzene	NA	4,900	ND <0.3	NA	ND <85	NA
Toluene	NA	7,600	ND <0.3	NA	ND <250	NA
Ethylbenzene	NA	500	ND <0.3	NA	ND <65	NA
Xylene	NA	4,100	ND <0.3	NA	ND <250	NA
June 18, 1992						
TPHg	NA	4,300	ND <50	NA	ND <30,000	NA
Benzene	NA	20	ND <0.3	NA	160	NA
Toluene	NA	48	ND <0.3	NA	710	NA
Ethylbenzene	NA	3.6	ND <0.3	NA	89	NA
Xylene	NA	970	ND <0.3	NA	670	NA
June 19, 1992						
TPHg	180,000	1,600	ND <50	NA	ND	NA
Benzene	18,000	1.6	ND <0.3	NA	ND	NA
Toluene	31,000	5.0	ND <0.3	NA	ND	NA
Ethylbenzene	2,200	ND <0.3	ND <0.3	NA	ND	NA
Xylene	16,000	150	ND <0.3	NA	ND	NA

Table 1. (Continued)

Date/ Analytes	Bioreactor Influent (1)	Bioreactor Effluent (2)	First Carbon Bed Effluent (3)	Sanitary Sewer Influent (4)	Vapor Phase Carbon Effluent (Air) (5)	MW-5
June 24, 1992						
TPHg	NA	980	ND <50	NA	ND <30,000	NA
Benzene	NA	11	ND <0.3	NA	ND <85	NA
Toluene	NA	13	ND <0.3	NA	ND <250	NA
Ethylbenzene	NA	1.8	ND <0.3	NA	ND <65	NA
Xylene	NA	140	ND <0.3	NA	ND <250	NA
July 2, 1992						
TPHg	160,000	210	ND <50	NA	ND <30,000	NA
Benzene	14,000	1.4	ND <0.3	NA	ND <85	NA
Toluene	27,000	ND <0.3	ND <0.3	NA	ND <250	NA
Ethylbenzene	1,700	ND <0.3	ND <0.3	NA	ND <65	NA
Xylene	1,300	1.0	ND <0.3	NA	ND <250	NA
July 10, 1992						
TPHg	150,000	2,800	ND <50	NA	ND <30,000	NA
Benzene	14,000	41	ND <0.3	NA	ND <85	NA
Toluene	26,000	36	ND <0.3	NA	ND <250	NA
Ethylbenzene	1,700	2.2	ND <0.3	NA	ND <65	NA
Xylene	12,000	360	ND <0.3	NA	ND <250	NA
July 17, 1992						
TPHg	190,000	400	NA	NA	NA	NA
Benzene	22,000	21	NA	NA	NA	NA
Toluene	34,000	25	NA	NA	NA	NA
Ethylbenzene	2,100	0.8	NA	NA	NA	NA
Xylene	17,000	27	NA	NA	NA	NA
July 24, 1992						
TPHg	140,000	1,100	NA	NA	NA	NA
Benzene	13,000	15	NA	NA	NA	NA
Toluene	23,000	2.4	NA	NA	NA	NA
Ethylbenzene	1,700	ND <0.3	NA	NA	NA	NA
Xylene	12,000	200	NA	NA	NA	NA

Table 1. (Continued)

Date/ Analytes	Bioreactor Influent (1)	Bioreactor Effluent (2)	First Carbon Bed Effluent (3)	Sanitary Sewer Influent (4)	Vapor Phase Carbon Effluent (Air) (5)	MW-5
August 20, 1992						
TPHg	190,000	6,400	73	NA	ND <30,000	NA
Benzene	14,000	31	ND <0.3	NA	ND <85	NA
Toluene	24,000	14	ND <0.3	NA	ND <250	NA
Ethylbenzene	2,000	ND <6	ND <0.3	NA	ND <65	NA
Xylene	13,000	150	ND <0.3	NA	ND <250	NA
September 15, 1992						
TPHg	230,000	23,000	54	NA	ND <30,000	NA
Benzene	17,000	1,100	0.4	NA	ND <85	NA
Toluene	29,000	3,600	0.8	NA	ND <250	NA
Ethylbenzene	2,200	59	ND <0.3	NA	ND <65	NA
Xylene	15,000	1,100	0.6	NA	ND <250	NA
September 30, 1992						
TPHg	NA	NA	NA	NA	NA	51,000
Benzene	NA	NA	NA	NA	NA	13,000
Toluene	NA	NA	NA	NA	NA	5,900
Ethylbenzene	NA	NA	NA	NA	NA	1,400
Xylene	NA	NA	NA	NA	NA	2,600
March 30, 1993						
TPHg	NA	NA	NA	NA	NA	74,000
Benzene	NA	NA	NA	NA	NA	16,000
Toluene	NA	NA	NA	NA	NA	5,000
Ethylbenzene	NA	NA	NA	NA	NA	1,800
Xylene	NA	NA	NA	NA	NA	2,700
January 13, 1994						
TPHg	NA	NA	NA	NA	NA	80,000
Benzene	NA	NA	NA	NA	NA	19,000
Toluene	NA	NA	NA	NA	NA	8,200
Ethylbenzene	NA	NA	NA	NA	NA	1,400
Xylene	NA	NA	NA	NA	NA	2,700

Table 1. (Continued)

Date/ Analytes	Bioreactor Influent (1)	Bioreactor Effluent (2)	First Carbon Bed Effluent (3)	Sanitary Sewer Influent (4)	Vapor Phase Carbon Effluent (Air) (5)	MW-5
March 3, 1994						
TPHg	**80,000**	3900	NA	ND <50	NA	NA
Benzene	**1,500**	270	NA	ND <0.5	NA	NA
Toluene	**9,200**	370	NA	ND <0.5	NA	NA
Ethylbenzene	**1,000**	32	NA	ND <0.5	NA	NA
Xylene	**14,000**	840	NA	ND <0.5	NA	NA
March 4, 1994						
TPHg	**58,000**	5,600	NA	ND <50	NA	NA
Benzene	**1,900**	350	NA	ND <0.5	NA	NA
Toluene	**8,700**	210	NA	ND <0.5	NA	NA
Ethylbenzene	**870**	60	NA	ND <0.5	NA	NA
Xylene	**11,000**	970	NA	ND <0.5	NA	NA

(1) = Sample Location Identification Number (see Plate 2)
All concentrations in parts per billion (ppb)
ND = Not detected above the reporting limit
NA = Not analyzed

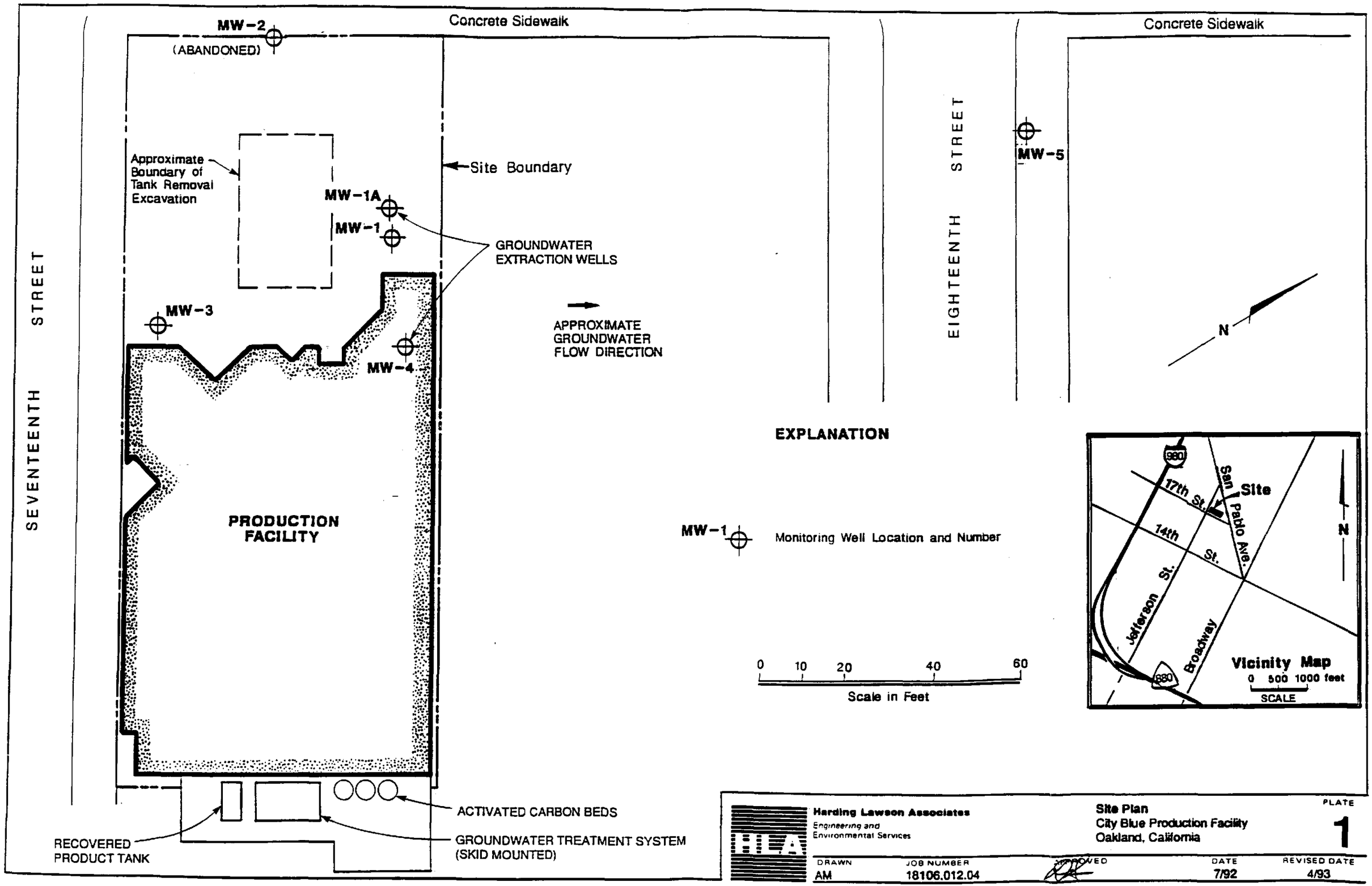
Table 2. Monitoring Well Product Thickness Measurements

Date	MW-1	MW-1A	MW-3	MW-4	MW-5
07/08/87	30	NA	0	NA	NA
07/12/89	21.6	18.6	0	25.2	0.4
06/18/92	34	NM	NM	NM	NM
07/02/92	18	NM	NM	NM	NM
07/23/92	10	NM	NM	NM	NM
08/18/92	10	NM	NM	NM	NM
09/30/92	NM	NM	4.1	NM	0
11/11/92	13	NM	2	NM	NM
01/29/93	25.2	NM	1.7	NM	NM
02/12/93	10.2	13	1.3	8.8	0
03/30/93	NM	NM	NM	NM	0.06
01/06/94	14.8	16.2	2.2	6.2	0
03/17/94	23.4	NM	2.4	NM	NM

All measurements in inches
NA = Not applicable, these wells not yet installed
NM = Not measured

Table 3. Flow Totalizer Readings.
Discharge to Sanitary Sewer

Date	Flow Total to Sanitary Sewer (gallons)
06/16/92	1,000
06/17/92	2,957
06/18/92	4,011
06/19/92	5,650
06/24/92	6,830
07/02/92	13,040
07/10/92	14,470
07/24/92	19,450
09/15/92	51,190
10/15/92	70,370
10/23/92	75,470
03/04/94	77,866
03/15/94	89,800
03/30/94	104,690

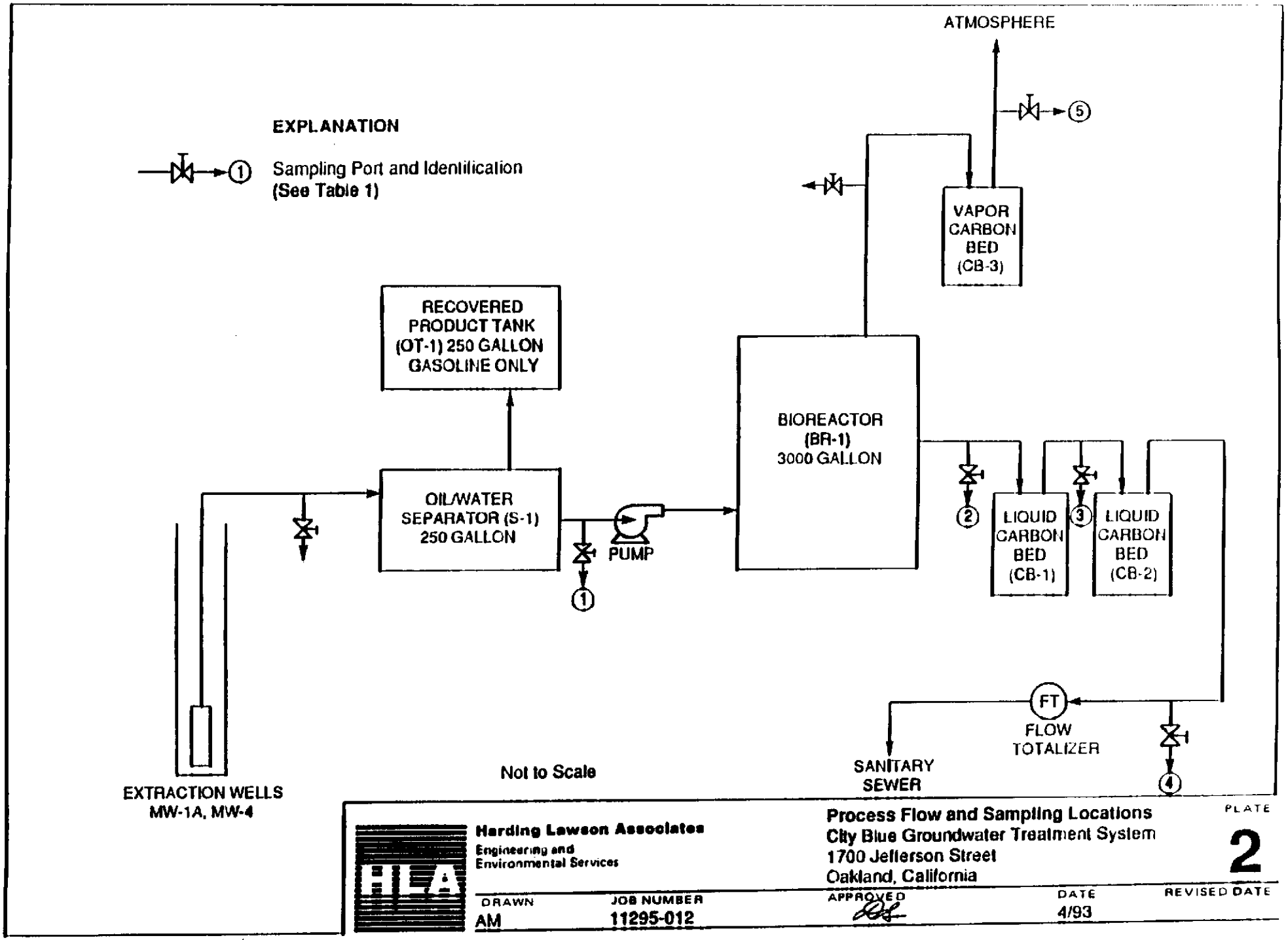


Harding Lawson Associates
Engineering and Environmental Services

Site Plan
City Blue Production Facility
Oakland, California

PLATE **1**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
AM	18106.012.04		7/92	4/93


ATMOSPHERE
EXPLANATION
Sampling Port and Identification
(See Table 1)
VAPOR CARBON BED (CB-3)
RECOVERED PRODUCT TANK (OT-1) 250 GALLON GASOLINE ONLY
BIOREACTOR (BR-1) 3000 GALLON
OIL/WATER SEPARATOR (S-1) 250 GALLON
PUMP
LIQUID CARBON BED (CB-1)
LIQUID CARBON BED (CB-2)
FT
FLOW TOTALIZER
SANITARY SEWER
EXTRACTION WELLS MW-1A, MW-4
Not to Scale
Harding Lawson Associates
Engineering and Environmental Services
Process Flow and Sampling Locations
City Blue Groundwater Treatment System
1700 Jefferson Street
Oakland, California
PLATE
2
DRAWN
AM
JOB NUMBER
11295-012
APPROVED
DATE
4/93
REVISED DATE

Superior Precision Analytical, Inc.
825 Arnold Drive, Suite 114 • Martinez, California 94553 • (510) 229-1512 / fax (510) 229-1526

HARDING LAWSON ASSOCIATES
Attn: DAVID SCRIVNER

Project 11295-012
Reported 01/19/94

TOTAL PETROLEUM HYDROCARBONS

Lab #	Sample Identification	Sampled	Analyzed	Matrix
90942- 1	MW-5	01/13/94	01/18/94	Water

RESULTS OF ANALYSIS

Laboratory Number: 90942- 1

Gasoline:	80000
Benzene:	19000
Toluene:	8200
Ethyl Benzene:	1400
Total Xylenes:	2700
Concentration:	ug/L

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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

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS

QA/QC INFORMATION
SET: 90942

NA = ANALYSIS NOT REQUESTED
ND = ANALYSIS NOT DETECTED ABOVE QUANTITATION LIMIT
ug/L = parts per billion (ppb)

OIL AND GREASE ANALYSIS By Standard Methods Method 5520F:
Minimum Detection Limit in Water: 5000ug/L

Modified EPA SW-846 Method 8015 for Extractable Hydrocarbons:
Minimum Quantitation Limit for Diesel in Water: 50ug/L

EPA SW-846 Method 8015/5030 Total Purgable Petroleum Hydrocarbons:
Minimum Quantitation Limit for Gasoline in Water: 50ug/L

EPA SW-846 Method 8020/BTXE
Minimum Quantitation Limit in Water: 0.5ug/L

ANALYTE	MS/MSD RECOVERY	RPD	CONTROL LIMIT
Gasoline:	105/99	6%	70-130
Benzene:	114/108	5%	70-130
Toluene:	109/105	4%	70-130
Ethyl Benzene:	104/99	5%	70-130
Total Xylenes:	117/111	5%	70-130

Senior Chemist

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

90942

Lab: Superior

Samplers: Jim McCarty

Job Number: 11295-012

Name/Location: City Blue

Project Manager: Dave Scrivner

Recorder: *(Signature Required)*

Unpreserved

SOURCE CODE	MATRIX: Water	Sediment	Soil	Oil	#CONTAINERS & PRESERV.: Unpres.	H_2SO_4	HNO_3	VOA	SAMPLE NUMBER OR LAB NUMBER: ~~Yr~~ ~~Wk~~ ~~Seq~~	DATE: Yr	Mo	Dy	Time	STATION DESCRIPTION/ NOTES
	X							3	MW-5	94	01	13		Note: Unpreserved VOAs, therefore reduced holding time.

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

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 1/13 5:05
METHOD OF SHIPMENT		

Laboratory Copy Project Office Copy Field or Office Copy

6533

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

Harding Lawson Associates (SF)
Attn: Dave Scrivner

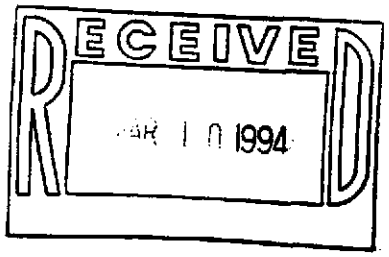
Project 11295-017
Reported 03/08/94

TOTAL PETROLEUM HYDROCARBONS

Lab #	Sample Identification	Sampled	Analyzed	Matrix
57739- 1	94030301	03/03/94	03/08/94	Water
57739- 2	94030305	03/03/94	03/07/94	Water
57739- 3	94030306	03/03/94	03/03/94	Water

RESULTS OF ANALYSIS

Laboratory Number:	57739- 1	57739- 2	57739- 3
Gasoline:	3900	80000	ND<50
Benzene:	270	1500	ND<0.5
Toluene:	370	9200	ND<0.5
Ethyl Benzene:	32	1000	ND<0.5
Total Xylenes:	840	14000	ND<0.5
Concentration:	ug/L	ug/L	ug/L



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

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS

QA/QC INFORMATION
SET: 57739

NA = ANALYSIS NOT REQUESTED
ND = ANALYSIS NOT DETECTED ABOVE QUANTITATION LIMIT
ug/L = parts per billion (ppb)

OIL AND GREASE ANALYSIS By Standard Methods Method 5520F:
Minimum Detection Limit in Water: 5000ug/L

Modified EPA SW-846 Method 8015 for Extractable Hydrocarbons:
Minimum Quantitation Limit for Diesel in Water: 50ug/L

EPA SW-846 Method 8015/5030 Total Purgable Petroleum Hydrocarbons:
Minimum Quantitation Limit for Gasoline in Water: 50ug/L

EPA SW-846 Method 8020/BTXE
Minimum Quantitation Limit in Water: 0.5ug/L

ANALYTE	MS/MSD RECOVERY	RPD	CONTROL LIMIT
Gasoline:	106/108	2%	60-134
Benzene:	91/96	5%	60-140
Toluene:	94/98	4%	75-125
Ethyl Benzene:	92/97	5%	75-125
Total Xylenes:	99/104	5%	75-125

3/8/94

Senior Chemist
Account Manager

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:

Job Number: 11295-017

Name/Location: City Blue

Project Manager: David Scrivner

Recorder: (Signature Required)

SOURCE CODE	MATRIX: Water	Sediment	Soil	Oil	#CONTAINERS & PRESERV.: Unpres.	H_2SO_4	HNO_3			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							3		94	03	01	94	03	03	1500	Normal TAT							X
	X							3		94	03	05	"			"	Normal TAT							X
	X							3		94	03	06	"			"	24-Hr TAT							X

RUSH

LAB NUMBER: Yr	Wk	Seq	DEPTH IN FEET	COL MTD CD	QA CODE	MISCELLANEOUS
						Please initial: KB
						Samples Stored in Ice. ✓
						Appropriate containers. ✓
						Samples preserved. ✓
						VOA's without headspace. ✓
						Comments:

CHAIN OF CUSTODY RECORD

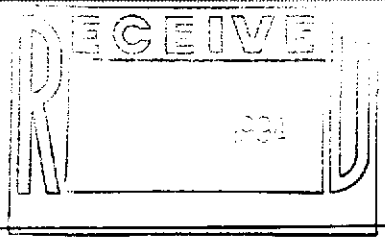
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
DISPATCHED BY: (Signature) DATE/TIME	RECEIVED FOR LAB BY: (Signature)	DATE/TIME 3/3/94 1640

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



Harding Lawson Associates (SF)
Attn: Dave Scrivner

Project 11295-017
Reported 03/08/94

TOTAL PETROLEUM HYDROCARBONS

Lab #	Sample Identification	Sampled	Analyzed	Matrix
57742- 1	94030401	03/04/94	03/07/94	Water
57742- 2	94030405	03/04/94	03/07/94	Water
57742- 3	94030406	03/04/94	03/07/94	Water

RESULTS OF ANALYSIS

Laboratory Number:	57742- 1	57742- 2	57742- 3
Gasoline:	5600	58000	ND<50
Benzene:	350	1900	ND<0.5
Toluene:	210	8700	ND<0.5
Ethyl Benzene:	60	870	ND<0.5
Total Xylenes:	970	11000	ND<0.5
Concentration:	ug/L	ug/L	ug/L

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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

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS

QA/QC INFORMATION
SET: 57742

NA = ANALYSIS NOT REQUESTED
ND = ANALYSIS NOT DETECTED ABOVE QUANTITATION LIMIT
ug/L = parts per billion (ppb)

OIL AND GREASE ANALYSIS By Standard Methods Method 5520F:
Minimum Detection Limit in Water: 5000ug/L

Modified EPA SW-846 Method 8015 for Extractable Hydrocarbons:
Minimum Quantitation Limit for Diesel in Water: 50ug/L

EPA SW-846 Method 8015/5030 Total Purgable Petroleum Hydrocarbons:
Minimum Quantitation Limit for Gasoline in Water: 50ug/L

EPA SW-846 Method 8020/BTXE
Minimum Quantitation Limit in Water: 0.5ug/L

ANALYTE	MS/MSD RECOVERY	RPD	CONTROL LIMIT
Gasoline:	107/109	2%	60-134
Benzene:	99/105	6%	60-140
Toluene:	103/101	2%	75-125
Ethyl Benzene:	99/99	0%	75-125
Total Xylenes:	108/107	1%	75-125

3/8/94

Senior Chemist
Account Manager

5742

Harding Lawson Associates
160 Spear Street, Suite 1560
San Francisco, CA 94105
415 / 543-8422
415 / 777-9706 FAX

CHAIN OF CUSTODY FORM

Lab: Superior Analytical

Project Number: 11295-017
Name/Location: City Blue
Project Manager: Dave Scrivner

Samplers: Ron Reindl

Recorder: [signature] (Signature Required)

Source Code	Matrix: Water	Sediment	Soil	Oil	Unpres.	H_2SO_4	HNO_3	HCl-VOAs	Sample 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	Gas/BTEX
	X							X	94	03	0401	94	03	04	1500	3 VOAs							X
	X							X	94	03	0405	94	03	04	1500	"							X
	X							X	94	03	0406	94	03	04	1500	"							X

5 DAY TAT

Please initial: PP
Samples Stored in ice: Hand delivered
Appropriate containers: ✓
Samples preserved: ✓
VOA's without headspace: ✓
Comments:

Was threated blue ice after sampling
Ron Reindl

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]		

Dispatched by: (Signature)	Date/Time	Received for lab by: (Signature)	Date/Time
		[signature]	3/4/94 350PM

METHOD OF SHIPMENT