Harding Lawson Associates

May 7, 1999

42633.1

Mr. John Prall
Associate Environmental Scientist
Port of Oakland
530 Water Street
Oakland, California 94607

Quarterly Groundwater Monitoring and Product Recovery Report
1st Quarter of 1999
2277 Seventh Street
Oakland, California

Dear Mr. Prall:

This Quarterly Groundwater Monitoring and Product Recovery Report has been prepared by Harding Lawson Associates (HLA) on behalf of the Port of Oakland for the groundwater monitoring and the operation and maintenance of the product recovery system at 2277 Seventh Street in Oakland, California (Plate 1).

This report summarizes monitoring and sampling of five groundwater monitoring wells, MW-2, MW-4, MW-5, MW-6, and MW-7 and operation and maintenance of the product recovery system on monitoring wells MW-1 and MW-3 during the first quarter of 1999 (Plate 2). Monitoring well MW-8 was not monitored because it contains a thick viscous tar–like substance. The monitoring wells were installed at the site by others to assess groundwater quality following the removal of underground storage tanks (USTs) from the site in September 1993. The former USTs consisted of two 10,000-gallon gasoline tanks (CF-17 and CF-18), one 500-gallon oil tank (CF-19), and one 300-gallon waste oil tank (CF-20).

MONITORING AND SAMPLING OF MONITORING WELLS

The groundwater monitoring and sampling was performed on April 19, 1999. The monitoring wells were initially gauged for depth to water and checked for the presence of separate-phase hydrocarbons. Separate-phase hydrocarbons were observed in monitoring wells MW-1, MW-3, and MW-8. Groundwater level measurements are summarized in Table 1 and groundwater elevations are presented on Plate 3. Groundwater level measurements from MW-1, MW-3, MW-6, and MW-8 were not use to calculate

groundwater elevations because MW-1, MW-3, and MW-6 contained product recovery equipment and because MW-8 contained thick viscous product prevented groundwater level measurements. Product thickness measurements on April 19, 1999 did not show a measurable amount of product in MW-1 though product in the passive skimmer suggests the presence of free product.

After the depth to water measurements were recorded, MW-2, MW-4, MW-5, MW-6, and MW-7 were purged using a PVC bailer. Conductivity, pH, and temperature were monitored periodically during purging. Sampling was not performed until at least three well casing volumes of water were removed and conductivity, pH, and temperature measurements had stabilized to within 10 percent. The depth to water and field parameter measurements were recorded on Groundwater Sampling Forms. The Groundwater Sampling Forms are included in Appendix A.

Groundwater samples were collected from the monitoring wells using a Teflon disposable bailer and then transferred into laboratory-provided containers. The sample containers were labeled with the sample number, date and time of collection, and sampler's initials, and were placed on ice in an insulated cooler. The samples were accompanied by a laboratory trip blank until delivery to the laboratory. A duplicate sample was collected from MW-6 and submitted to the laboratory for analysis. Purge water was placed in a labeled drum and stored inside the product recovery compound for disposal by the Port.

LABORATORY ANALYSIS GROUNDWATER SAMPLES

The samples were sent under chain-of-custody procedures to Curtis and Tompkins, Ltd. in Berkeley, California. The samples were analyzed using standard methodology for the following constituents:

- Total petroleum hydrocarbons (TPH) as gasoline (TPHg) by Modified EPA Method 8015.
- Benzene, toluene, ethylbenzene, and xylenes (BTEX) and methyl t-butyl ether (MTBE) by Method 8021B.
- TPH as diesel (TPHd) by Modified EPA Method 8015 following a silica-gel cleanup procedure.
- TPH as motor oil (TPHmo) by Modified EPA Method 8015 following a silica-gel cleanup procedure.

The trip blank was analyzed for BTEX and MTBE. The laboratory results for the groundwater samples are summarized in Table 2 and are shown on Plate 4. Copies of the laboratory results and chain-of-custody forms are provided in Appendix B.

FINDINGS

Results of the April 19, 1999, groundwater monitoring and sampling are summarized below:

- Separate-phase hydrocarbons were observed in monitoring wells MW-1, MW-3 and MW-8.
- TPHg was reported at a concentration of 81 micro grams per liter (µg/l) in MW-4 and 170 µg/l in MW-6. TPHg was not detected in MW-2, MW-5, or MW-7.
- Benzene was reported at a concentration of 250 µg/l in MW-4, at 21 µg/l in MW-6 and was not detected in MW-2, MW-5, or MW-7.
- Toluene was reported at a concentration of 0.86 µg/l in MW-6 and was not detected in MW-2, MW-4, MW-5, or MW-7.
- Ethylbenzene was reported at a concentration of 1.2 µg/l in MW-4 and 1.5 µg/l in MW-6 and was not detected in MW-2, MW-5, or MW-7.
- Total xylenes were reported at concentration of 2.9 µg/l in MW-6 and were not detected in MW-2, MW-4, MW-5, or MW-7.
- MTBE was reported at a concentration of 5.3 µg/l in MW-7 and was not detected in MW-2, MW-4, MW-5, or MW-6.
- TPHd was reported at a concentration of 3,800 µg/l in MW-6 and was not detected in MW-2, MW-4, MW-5, and MW-7.
- TPHmo was reported at a concentration of 580 µg/l in MW-6 and was not detected in MW-2, MW-4, MW-5, or MW-7.
- No BTEX or MTBE was detected in the trip blank.
- The results reported for the duplicate and its original sample were within acceptable limits.

PRODUCT RECOVERY SYSTEM

The product recovery system consists of an air-actuated (active) product skimmer that is located in MW-3 and two passive product skimmers located in MW-1 and MW-6. During the fourth quarter of 1998 and the first quarter of 1999, separate phase product was not observed in MW-6. The skimmer was removed to sample the well during this sample event and was not replaced in the well. Product was removed from the

this sample event and was not replaced in the well. Product was removed from the passive skimmer in MW- 1 during each site visit this reporting period. The total volume of product recovered from MW-1 during the 1st quarter of 1999 was 0.67 gallons. Performance Excavators, Inc., the Port's waste disposal Contractor, removed product from the product recovery tank on January 1st, January 14th, February 3rd, and February 26th. The total product removed by Performance Excavators, Inc. was an estimated to be 1,645 gallons, primarily consisting of product discharged by the active skimmer in MW-3. A total of 211 gallons of product was measured in the tank on March 19, 1999. Based on this data, it is estimated that the active skimmer in MW-3 recovered a total of 1,856 gallons of product. Table 3 presents product removal and product thickness data. A summary of the activities during the past quarter associated with the operation and maintenance of the product recovery system is presented in Table 4.

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

Yours very truly,

HARDING LAWSON ASSOCIATES

James G. McCarty
Project Engineer

James G. McClure
Civil Engineer

JGM/jgm/mlw 42633\037200L

Attachments:
Table 1 – Groundwater Elevations Data
Table 2 – Groundwater Sample Results
Table 3 – Summary of Product Removal and Product Thickness Data
Table 4 – Summary of Operation and Maintenance Activities
Plate 1 – Vicinity Map
Plate 2 – Site Plan
Plate 3 – Groundwater Elevations, April 19, 1999
Plate 4 – Groundwater Sample Results, April 19, 1999
Appendix A - Groundwater Sampling Forms
Appendix B - Laboratory Reports

TABLES

Table 1. Groundwater Elevations Data
Port of Oakland
2277 7th Street, Oakland California

Well ID	Elevation of Top of Casing[1] (feet)	Date Of Monitoring	Depth to Water (feet)	Groundwater Elevation (feet)
MW-2	14.36	12/31/97	8.73	5.63
		4/13/98	7.72	6.64
		11/6/98	9.43	4.93
		3/19/99	8.21	6.15
MW-4	13.15	12/31/97	7.09	6.06
		4/13/98	7.71	5.44
		11/6/98	8.69	4.46
		3/19/99	8.00	5.15
MW-5	13.49	12/31/97	6.38	7.11
		4/13/98	5.56	7.93
		11/6/98	9.56	3.93
		3/19/99	6.20	7.29
MW-7	14.35	12/31/97	8.88	5.47
		4/13/98	7.86	6.49
		11/6/98	9.55	4.80
		3/19/99	8.41	5.94

[1] Elevation data relative to Port of Oakland datum; well surveys performed on September 12, 1996, and February 4, 1998, by PLS Surveys.

- Data prior to November 6, 1998 taken from *Groundwater Monitoring, Sampling and Product Removal System O&M Report* dated July 21, 1998, by Innovative Technical Solutions, Inc.

Table 2. Groundwater Sample Result
Port of Oakland
2277 7th Street, Oakland California

Monitoring Well ID	Date	TPHg (µg/l)	TPHd (µg/l)	TPHmo (µg/l)	Benzene (µg/l)	Toluene (µg/l)	Ethylbenzene (µg/l)	Xylenes (µg/l)	MTBE (µg/l)
MW-2	05/27/94	87	470	NA	<0 5	<0.5	<0 5	<0 5	NA
	03/29/95	<50	110	1,400	<0 4	<0 3	<0 3	<0 4	NA
	09/06/95	<50	NA	NA	<0 4	<0 3	<0.3	<0 4	NA
	01/08/96	<50	<50	1200	<0.4	<0 3	<0 3	<0 4	NA
	04/04/96	<50	160	320	<0 5	<0 5	<0 5	<1 0	NA
	07/10/96	<50	120	1400	<0 4	<0 3	<0 3	<0 4	NA
	12/03/96	<50	230 [1,2]	<250	<0 5	<0.5	<0 5	<1 0	NA
	03/28/97	<50	714	<250	<0 5	<0 5	<0.5	<1 0	NA
	06/13/97	51	<50	<250	<0 5	<0 5	<0 5	<1 0	NA
	09/18/97	82	<50	<250	0 56	<0.5	<0.5	<1 0	NA
	12/31/97	<50	<47	<280	1.4	<0 5	<0 5	<1.0	NA
	04/13/98	<50	<50	<300	<0 5	<0 5	<0.5	<1 0	NA
	11/06/98	<50	<50	<300	<0 5	<0 5	<0 5	<0 5	<2
	03/19/99	<50	<50	<300	<0.5	<0.5	<0 5	<0 5	<2
MW-4	09/11/95	150	<200	500	23	<0 3	<0 3	<0 4	NA
	01/08/96	790	90	400	170	1 2	0 6	0 6	NA
	04/04/96	1,100	180	300	320	1 6	1 1	1 2	NA
	07/10/96	1,200	120	300	470	1 5	0 8	0 8	NA
	12/03/96	990	220 [1,2]	<250	350	3 3	1 3	1.3	NA
	03/28/97	440 [2]	<50	<250	190	1 2	0.64	<1 0	NA
	06/13/97	1,300	92 [5]	<250	500	5 5	3 4	2 8	NA
	09/18/97	1,300	150	<250	550	4 9	2 1	2.00	NA
	12/31/97	73 [1,2,3]	<47	<280	110 [1]	1 0 [1]	<0 5	<1 0	NA
	04/13/98	150 [2,3]	<50	<300	520	2 9	<2 5	<5 0	NA
	11/06/98	<50	<50	<300	250	1 7	<1	<1	<4
	03/19/99	81	<50	<300	250	<1	1 2	<1	<4
MW-5	09/11/95	90	<300	2,500	3 3	<0 3	<0 3	<0 4	NA
	04/04/96	<50	180	520	<0 5	<0 5	<0 5	<1 0	NA
	07/10/96	<50	120	1,500	<0 4	<0 3	<0 3	<0 4	NA
	12/03/96	<50	200 [1,2]	<250	<0 5	<0 5	<0 5	<1 0	NA
	03/28/97	<50	<50	<250	<0 5	<0 5	<0 5	<1 0	NA
	06/13/97	<50	<50	<250	<0 5	<0 5	<0 5	<1 0	NA
	09/18/97	<50	<50	<250	<0 5	<0 5	<0 5	<1 0	NA
	12/31/97	<50	<47	<280	<0 5	<0 5	<0 5	<1 0	NA
	04/13/98	<50	<47	<280	<0 5	<0 5	<0 5	<1 0	NA
	11/06/98	<50	<50	<300	<0 5	<0.5	<0 5	<0 5	<2
	03/19/99	<50	<50	<300	<0 5	<0.5	<0 5	<0.5	<2
MW-6	11/06/98	120	12,000	1,200	19	0 65	1 8	<0 5	<2
	03/19/99	170	3,800	580	21	0 86	1 5	2.9	<2
MW-7	09/06/95	<50	<300	800	<0 4	<0 3	<0 3	<0 4	NA
	01/08/96	<50	410	110	<0 4	<0 3	<0 3	<0 4	NA
	04/04/96	<50	530	340	<0 5	<0 5	<0 5	<1 0	NA
	07/10/96	80	840	1,700	<0 4	<0 3	<0 3	<0 4	NA
	12/03/96	<50	280 [1,2]	<250	<0 5	<0 5	<0 5	<1 0	NA
	03/28/97	65 [6]	94 [2]	<250	<0 5	<0 5	<0.5	<1 0	NA
	06/13/97	<50	100	<250	<0.5	<0 5	<0 5	<1.0	NA
	09/18/97	<50	240	<250	<0 5	<0 5	<0 5	<1 0	NA
	12/31/97	<50	53 [2,3]	<280	<0 5	<0 5	<0 5	<1 0	NA
	04/13/98	<50	<48	<290	<0 5	<0 5	<0 5	<1 0	NA
	11/06/98	<50	<50	<300	<0 5	<0 5	<0 5	<0 5	<2
	03/19/99	<50	<50	<300	<0 5	<0 5	<0 5	<0 5	5 3

[1] Analyte found in the associated blank as well as in the sample
[2] Hydrocarbons present do not match profile of laboratory standard
[3] Low-boiling-point/lighter hydrocarbons are present in the sample
[4] Chromatographic pattern matches known laboratory contaminant
[5] Hydrocarbons are present in the requested fuel quantification range, but do not resemble pattern of available fuel standard
[6] High boiling-point hydrocarbons are present in sample

NA Not Analyzed

- Data from December 1997 through April 1998 taken from *Groundwater Monitoring, Sampling and Product Removal System O&M Report* dated July 21, 1998, by Innovative Technical Solutions, Inc
-Data prior to December 1997 taken from *Groundwater Analytical Results, Quarterly Groundwater Monitoring Report Third Quarter 1997, Building C-401, 2277 7th Street, Oakland, CA* dated October 24, 1997, by Uribe and Associate

Table 3. Product Removal and Product Thickness Data
Port of Oakland
2277 7th Street, Oakland California

Well ID	Elevation of Top of Casing[1] (feet)	Date Of Monitoring	Depth to Free Product (feet)	Depth to Water (feet)	Product Thickness (feet)	Estimated Product Removed (gallons)	Product Removal Method [2]
MW-1	14.14	12/31/97	-	-	-	0.2	passive skimmer
		1/29/98	-	-	-	0.2	passive skimmer
		3/2/98	-	-	-	0.018	passive skimmer
		5/11/98	-	-	-	0.02	passive skimmer
		6/15/98	-	-	-	0.2	passive skimmer
		11/6/98	9.34	10.3	0.96	1.2	passive skimmer
		1/7/99	-	-	-	0.2	passive skimmer
		2/11/99	-	-	-	0.2	passive skimmer
		3/12/99	-	-	-	0.2	passive skimmer
		3/19/99	NM	8.45	>0.01	0.07	passive skimmer
MW-3	14.22	12/31/97	-	-	-	30	active skimmer
		1/29/98	-	-	-	10	active skimmer
		4/13/98	-	-	-	240	active skimmer
		5/11/98	-	-	-	1,545	active skimmer
		6/15/98	-	-	-	1,950	active skimmer
		11/6/98	8.84	9.94	1.1	500	active skimmer
		1/5/99	-	-	-	275[2]	active skimmer
		1/14/99	-	-	-	400[2]	active skimmer
		2/3/99	-	-	-	400[2]	active skimmer
		2/26/99	-	-	-	570[2]	active skimmer
		3/19/99	7.52	8.05	0.5	211	active skimmer
MW-6	14.00	13/31/97	-	-	-	0.0014	passive skimmer
		1/29/98	-	-	-	0.0014	passive skimmer
		3/2/98	-	-	-	0.0014	passive skimmer
		11/6/98	NM	9.62	>0.01	0.0	passive skimmer
		3/19/99	NM	7.37	>0.01	0.0	passive skimmer
MW-8 [1]	12.94	12/31/97	8.49	8.82	0.33	4.38	-
		11/6/98	9.25	10.3	1.1	3.48	-

- Data prior to November 6, 1998 taken from *Groundwater Monitoring, Sampling and Product Removal System O&M Report* dated July 21, 1998, by Innovative Technical Solutions, Inc.
- Data prior to November 6, 1998 taken from *Groundwater Monitoring, Sampling and Product*
- Product removal volumes from 11/6/98 on represent total product removed during that reporting period.

[1] Free product in well is too viscous to allow product thickness or groundwater level measurements.

[2] Product removal totals for MW-3 are estimated from documentation of product removal from the treatment system performed by Performance Excavators, Inc.

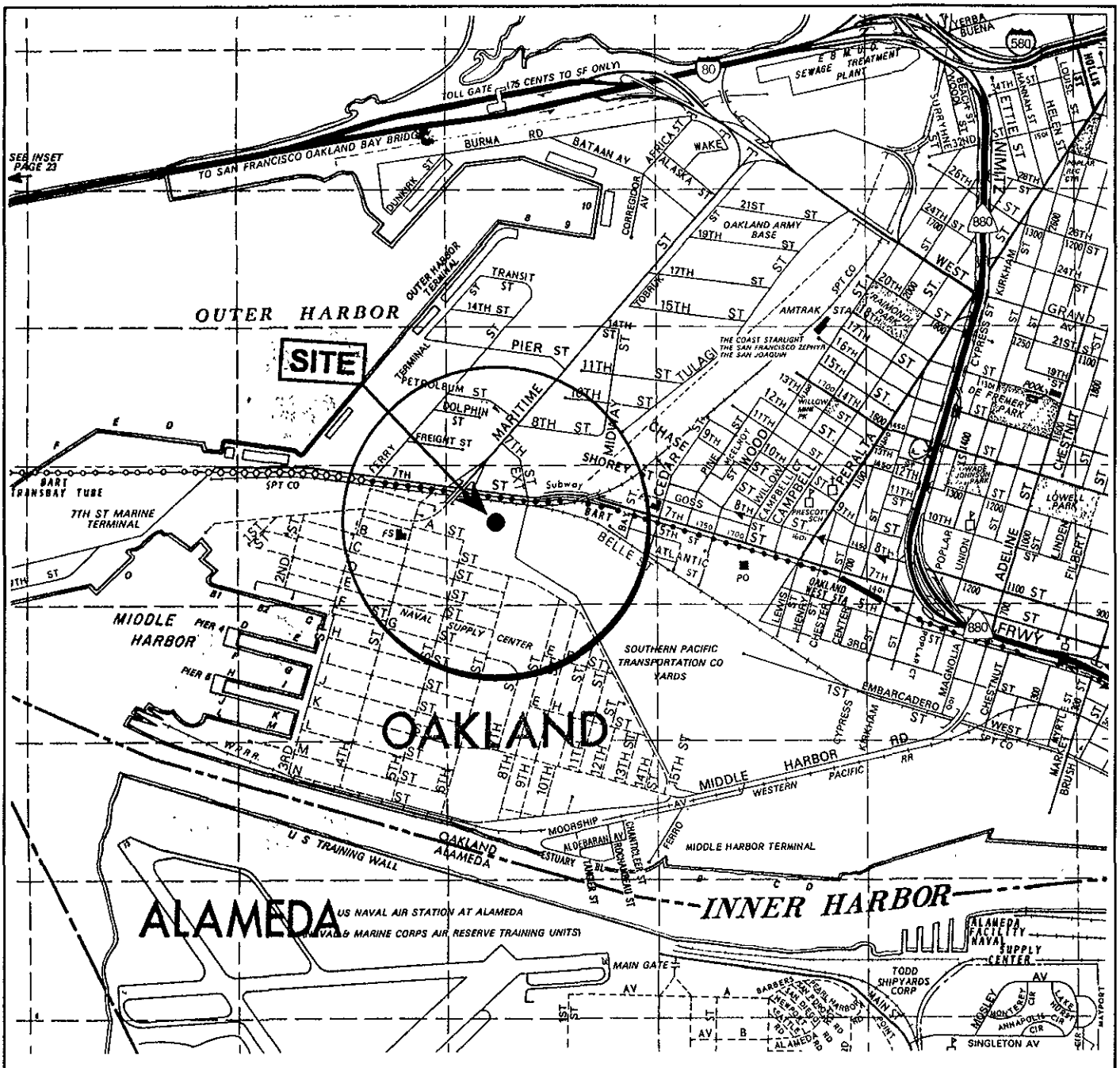
NM - Well checked for free product but was not able to detect a measurable amount in the well.

Greyed areas indicates data from this reporting period.

Table 4. Summary of Operation and Maintenance Activities
Port of Oakland
2277 7th Street, Oakland California

Date	System Status	Comments
01/07/99	System Running	Remove product from MW-1, cleaned the hydrophobic filters on skimmers in MW-1 and MW-3
02/11/99	System Running	Product recovery tank nearly full, had to raise skimmers because of increase in water elevation due to recent rainfall
03/12/99	System Not Running	Product recovery tank has been emptied, restart system, empty MW-1 skimmer
03/19/99	System Running	Onsite to perfom groundwater monitoring, remove product from MW-1, only a third full

PLATES



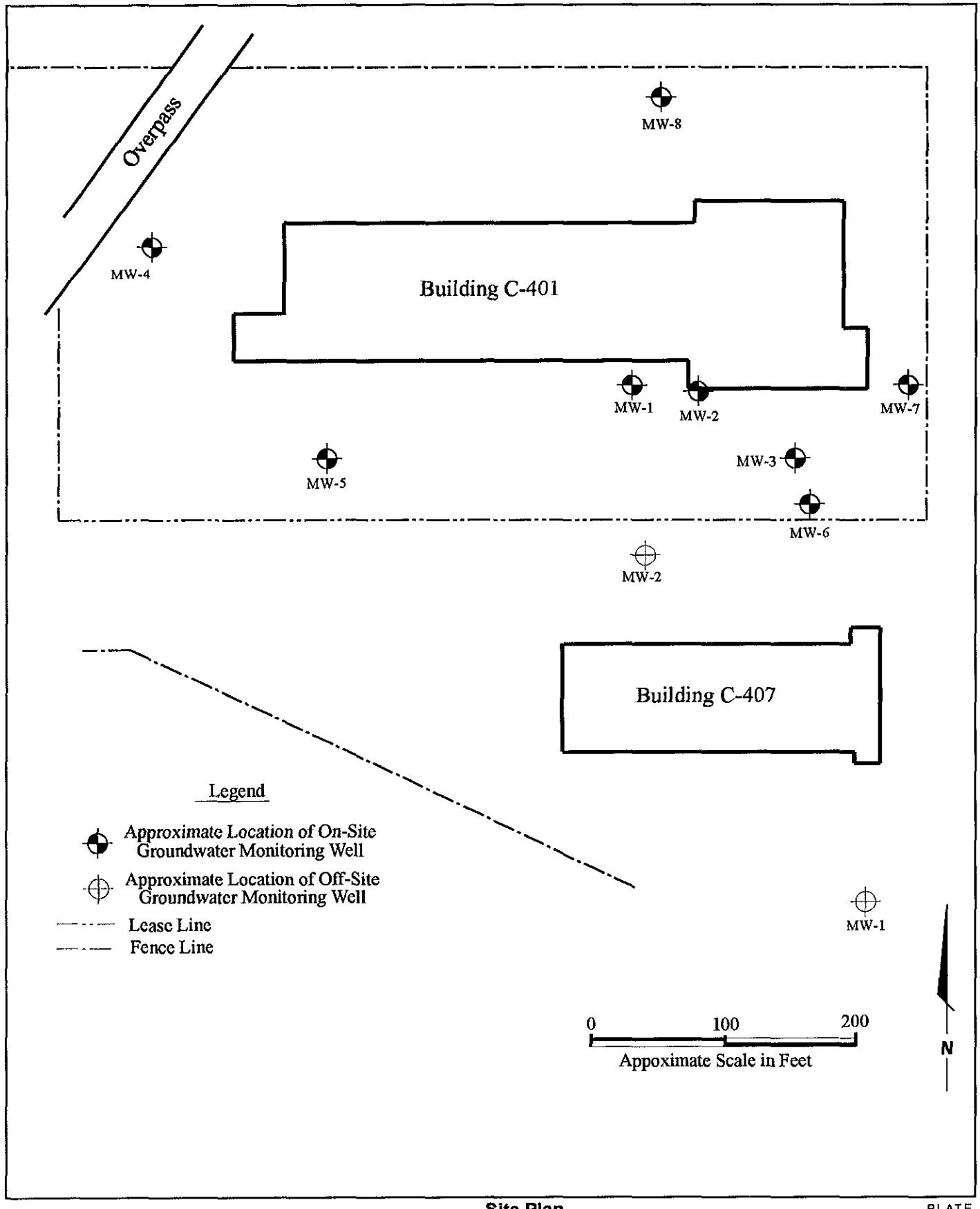
Reference: 1995 Thomas Brothers Map

Harding Lawson Associates
Engineering and
Environmental Services

Vicinity Map
Quarterly Groundwater Monitoring Report
2277 Seventh Street
Oakland, California 94607

PLATE **1**

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
jgm	42633.1		04/13/99	

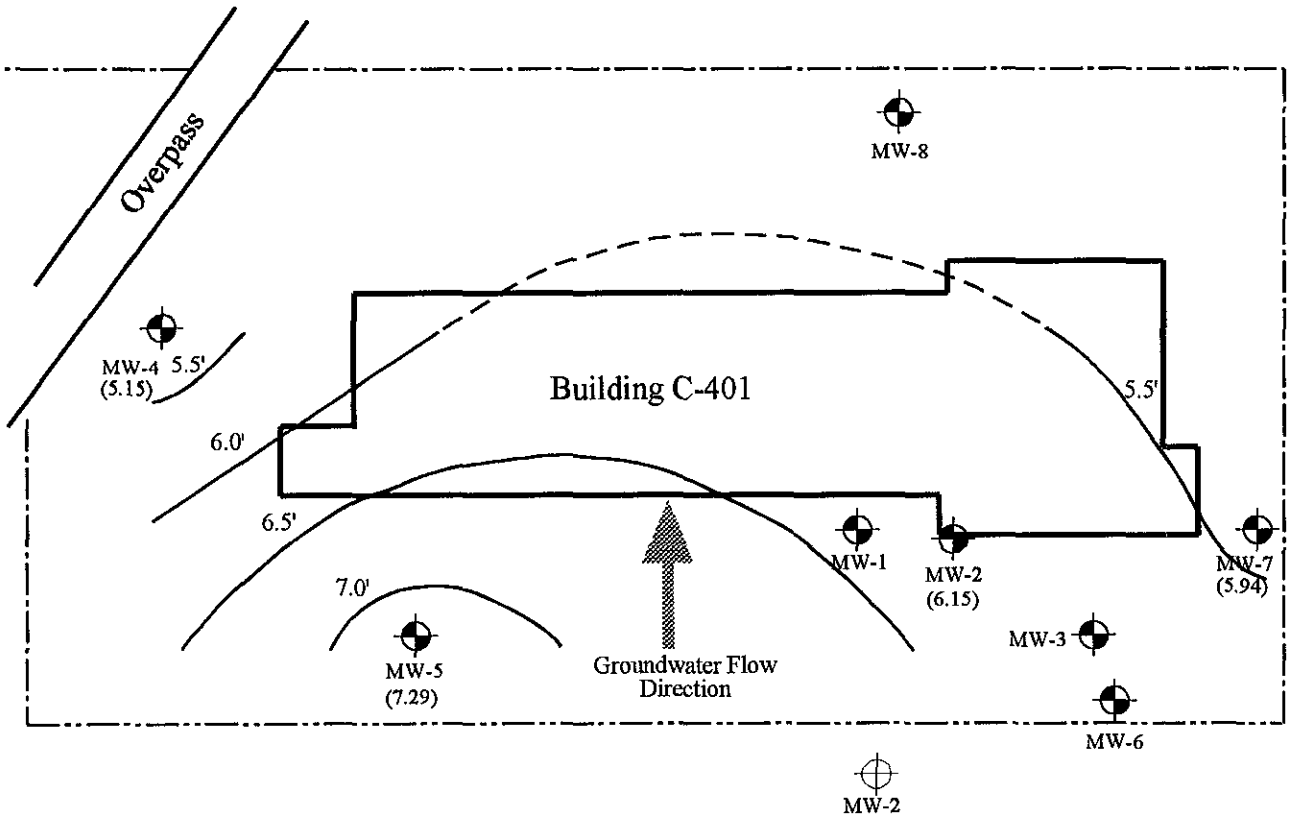


Harding Lawson Associates
Engineering and
Environmental Services

Site Plan
Quarterly Groundwater Monitoring Report
2277 Seventh Street
Oakland, California 94607

PLATE
2

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
jgm	42633.1		04/13/99	



Legend

- Approximate Location of On-Site Groundwater Monitoring Well
- Approximate Location of Off-Site Groundwater Monitoring Well
- Lease Line
- Fence Line

MW-1

6.0' Groundwater Contour Line

(4.93) Groundwater Elevation as referenced to Port of Oakland Datum

MW-1, MW-3, and MW-6 were not used for groundwater elevation calculation because they contained product skimmers

Groundwater elevation MW-8 was not measured because it contained a heavy viscous oil

0 100 200

Appoximate Scale in Feet

N

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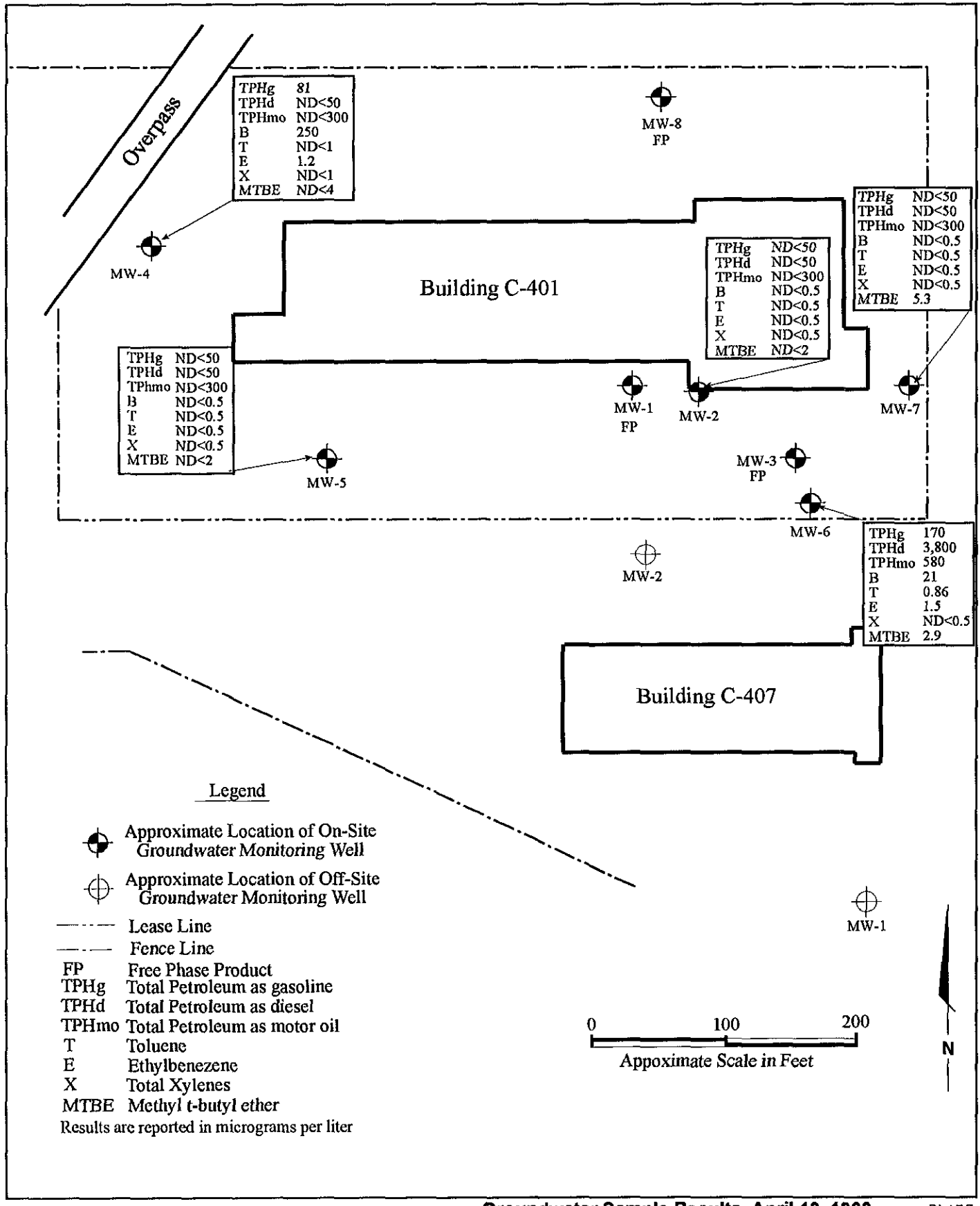
Environmental Services

Groundwater Elevation, April 19, 1999
Quarterly Groundwater Monitoring Report
2277 Seventh Street
Oakland, California 94607

PLATE **3**

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
jgm	42633.1		04/13/99	



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Engineering and Environmental Services

Groundwater Sample Results, April 19, 1999
Quarterly Groundwater Monitoring Report
2277 Seventh Street
Oakland, California 94607

PLATE **4**

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
jgm	42633.1		04/13/99	

APPENDIX A

GROUNDWATER SAMPLE FORMS

Harding Lawson Associates
Engineering and
Environmental Services

GROUND-WATER SAMPLING FORM

Job Name 2277 7th St.
Job Number 42633-1
Recorded by James McCourt (Signature)

Well No. MW-1
Well Type. ☒ Monitor ☐ Extraction ☐ Other _____
Well Material ☒ PVC ☐ St. Steel ☐ Other _____
Date 3/19/99 Time _____
Sampled by JGM (Initials)

WELL PURGING

PURGE VOLUME

Casing Diameter (D in inches).
☒ 2-inch ☐ 4-inch ☐ 6-inch ☐ Other _____
Total Depth of Casing (TD in feet BTOC): _____
Water Level Depth (WL in feet BTOC): _____
Number of Well Volumes to be purged (# Vols)
☒ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other _____

PURGE METHOD

☒ Bailer - Type: PVC
☐ Submersible ☐ Centrifugal ☐ Bladder; Pump No.: _____
☐ Other - Type: _____

PUMP INTAKE SETTING

☐ Near Bottom ☐ Near Top ☐ Other _____
Depth in feet (BTOC). _____ Screen Interval in Feet (BTOC) from _____ to _____

PURGE VOLUME CALCULATION

(_____ (TO feet) - _____ (WL feet)) X _____ (D (inches))^2 X _____ (# Vols) X 0.0408 = _____ gallons
Calculated Purge Volume

PURGE TIME

_____ Start _____ Stop _____ Elapsed

PURGE RATE

Initial _____ gpm Final _____ gpm

ACTUAL PURGE VOLUME

_____ gallons

FIELD PARAMETER MEASUREMENT

Minutes Since Pumping Began	pH	Cond. (µmnos/cm)	T ☐ °C ☐ °F	Other
Remove 0.07 diesel from				
passive skimmer @ 0955				

Minutes Since Pumping Began	pH	Cond. (µmnos/cm)	T ☐ °C ☐ °F	Other
measured WL/PL w/ interface				
probe, no measurable product				
WL @ 8.45' btc				
Meter Nos.				

Observations During Purging Well Condition, Turbidity, Color, Odor): _____
Discharge Water Disposal: ☐ Sanitary Sewer ☐ Storm Sewer ☒ Other Drum on Site

WELL SAMPLING

SAMPLING METHOD

☐ Same As Above
☒ Bailer - Type: Teflon Disposable
☐ Grab - Type: _____
☐ Submersible ☐ Centrifugal ☐ Bladder; Pump No.: _____
☐ Other - Type: _____

SAMPLING DISTRIBUTION

Sample Series: _____

Sample No.	Volume/Cont.	Analysis Requested	Preservatives	Lab	Comments
	2 Ambers	TPHd, TPHmo	—	Curtis & Tompkins	w/ filtration & silica gel cleanup
	3 VOAs	TPHg, BTEX MTBE	HCl		
		Not Sampled			

QUALITY CONTROL SAMPLES

Duplicate Samples		Blank Samples		Other Samples	
Original Sample No	Duplicate Sample No	Type	Sample No	Type	Sample No.
				Trip	

Harding Lawson Associates
Engineering and Environmental Services

GROUND-WATER SAMPLING FORM

Job Name 2277 7th St.
Job Number 42633-1
Recorded by James McCann (Signature)

Well No MW-2
Well Type. ☒ Monitor ☐ Extraction ☐ Other ____
Well Material: ☒ PVC ☐ St. Steel ☐ Other ____
Date 3/19/99 Time 1140
Sampled by JGM (Initials)

WELL PURGING

PURGE VOLUME

Casing Diameter (D in inches)
☒ 2-inch ☐ 4-inch ☐ 6-inch ☐ Other ____
Total Depth of Casing (TD in feet BTOC): 15.27
Water Level Depth (WL in feet BTOC): 8.21
Number of Well Volumes to be purged (# Vols)
☒ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other ____

PURGE METHOD

☒ Bailer - Type: PVC
☐ Submersible ☐ Centrifugal ☐ Bladder; Pump No.: ____
☐ Other - Type: ____

PUMP INTAKE SETTING

☐ Near Bottom ☐ Near Top ☐ Other ____
Depth in feet (BTOC). ____ Screen Interval in Feet (BTOC) from ____ to ____

PURGE VOLUME CALCULATION:

$\left(\frac{15.27}{\text{TD (feet)}} - \frac{\quad}{\text{WL (feet)}}\right) \times \frac{2}{\text{D (inches)}}^2 \times \frac{3}{\text{\# Vols}} \times 0.0408 = \frac{3.5}{\text{Calculated Purge Volume}}$ gallons

PURGE TIME

1100 Start 1130 Stop ____ Elapsed

PURGE RATE

Initial ____ gpm Final ____ gpm

ACTUAL PURGE VOLUME

4 gallons

FIELD PARAMETER MEASUREMENT

Minutes Since Pumping Began	pH	Cond. (µmnos/cm)	T ☐ °C ☒ °F	Other ____
+0	7.08	1700	61.8	
10	7.10	1800	60.3	
20	7.12	1800	60.3	
30	7.12	1800	60.3	

Minutes Since Pumping Began	pH	Cond. (µmnos/cm)	T ☐ °C ☐ °F	Other ____
Meter Nos.				

Observations During Purging Well Condition Turbidity, Color, Odor): ____

Discharge Water Disposal: ☐ Sanitary Sewer ☐ Storm Sewer ☒ Other Drum on Site

WELL SAMPLING

SAMPLING METHOD

☐ Same As Above
☒ Bailer - Type: Teflon Disposable
☐ Grab - Type: ____
☐ Submersible ☐ Centrifugal ☐ Bladder; Pump No.: ____
☐ Other - Type: ____

SAMPLING DISTRIBUTION

Sample Series: ____

Sample No.	Volume Cont.	Analysis Requested	Preservatives	Lab	Comments
MW-2	2 Ambers	TPHd, TPHmo	—	Curtis & Tompkins	w/ filtration & silica gel cleanup
	3 VOAs	TPHg, BTEX MTBE	HCL	"	

QUALITY CONTROL SAMPLES

Duplicate Samples		Blank Samples		Other Samples	
Original Sample No	Duplicate Sample No	Type	Sample No	Type	Sample No
				Trip	Trip-3/99

Harding Lawson Associates
Engineering and
Environmental Services

GROUND-WATER SAMPLING FORM

Job Name: 2277 7th St.
Job Number: 42633-1
Recorded by: James McCarty (Signature)

Well No: MW-3
Well Type: ☑ Monitor ☐ Extraction ☐ Other ______
Well Material: ☑ PVC ☐ St. Steel ☐ Other ______
Date: 3/19/99 Time: ______
Sampled by: JGM (Initials)

WELL PURGING

PURGE VOLUME

Casing Diameter (D in inches):
☑ 2-inch ☐ 4-inch ☐ 6-inch ☐ Other ______
Total Depth of Casing (TD in feet BTOC): ______
Water Level Depth (WL in feet BTOC): ______
Number of Well Volumes to be purged (# Vols)
☑ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other ______

PURGE METHOD

☑ Bailer - Type: PVC
☐ Submersible ☐ Centrifugal ☐ Bladder; Pump No.: ______
☐ Other - Type: ______

PUMP INTAKE SETTING

☐ Near Bottom ☐ Near Top ☐ Other ______
Depth in feet (BTOC): ______ Screen Interval in Feet (BTOC) from ______ to ______

PURGE VOLUME CALCULATION

$$\left(\_\_\_ - \_\_\_\right) \times \_\_\_^2 \times \_\_\_ \times 0.0408 = \_\_\_ \text{ gallons}$$

TD (feet) — WL (feet) — D (inches) — # Vols — Calculated Purge Volume

PURGE TIME

______ Start ______ Stop ______ Elapsed

PURGE RATE

Initial ______ gpm Final ______ gpm

ACTUAL PURGE VOLUME

______ gallons

FIELD PARAMETER MEASUREMENT

Minutes Since Pumping Began	pH	Cond. (μmnos/cm)	T ☐ °C ☐ °F	Other ______
Measured	WL/PL	w/ interface		
probe	@	9:41		
	WL =	8.05		
	PL =	7.52		

Minutes Since Pumping Began	pH	Cond (μmnos/cm)	T ☐ °C ☐ °F	Other ______
Meter Nos.				

Observations During Purging (Well Condition, Turbidity, Color, Odor): ______
Discharge Water Disposal: ☐ Sanitary Sewer ☐ Storm Sewer ☑ Other ~~Drum on Site~~

WELL SAMPLING

SAMPLING METHOD

☑ Bailer - Type: Teflon Disposable
☐ Submersible ☐ Centrifugal ☐ Bladder; Pump No. ______
☐ Same As Above
☐ Grab - Type: ______
☐ Other - Type: ______

SAMPLING DISTRIBUTION

Sample Series: ______

Sample No.	Volume/Cont.	Analysis Requested	Preservatives	Lab	Comments
	~~2 Ambers~~	~~TPHd, TPHmo~~	~~—~~	Curtis + Tompkins	~~w/ filtration~~ & silica gel cleanup
	~~3 VOAs~~	~~TPHg, BTEX MTBE~~	~~HCL~~		
			Not Sampled		

QUALITY CONTROL SAMPLES

Duplicate Samples

Original Sample No.	Duplicate Sample No.

Blank Samples

Type	Sample No.

Other Samples

Type	Sample No.
Trip	

Harding Lawson Associates
Engineering and Environmental Services

GROUND-WATER SAMPLING FORM

Job Name 2277 7th St.
Job Number 42633-1
Recorded by James McCann (Signature)

Well No. MW-4
Well Type: ☒ Monitor ☐ Extraction ☐ Other
Well Material: ☒ PVC ☐ St. Steel ☐ Other
Date 3/19/99 Time 13:40
Sampled by JCM (Initials)

WELL PURGING

PURGE VOLUME

Casing Diameter (D in inches):
☒ 2-inch ☐ 4-inch ☐ 6-inch ☐ Other
Total Depth of Casing (TD in feet BTOC): 18.84
Water Level Depth (WL in feet BTOC): 8.00
Number of Well Volumes to be purged (# Vols)
☒ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other

PURGE METHOD

☒ Bailer - Type: PVC
☐ Submersible ☐ Centrifugal ☐ Bladder; Pump No.:
☐ Other - Type:

PUMP INTAKE SETTING

☐ Near Bottom ☐ Near Top ☐ Other
Depth in feet (BTOC): Screen Interval in Feet (BTOC) from to

PURGE VOLUME CALCULATION

(18.84 (TD feet) - 8.00 (WL feet)) X 2 (D inches)^2 X 3 (# Vols) X 0.0408 = 5.3 gallons
Calculated Purge Volume

PURGE TIME

12:50 Start 13:30 Stop Elapsed

PURGE RATE

Initial gpm Final gpm

ACTUAL PURGE VOLUME

gallons

FIELD PARAMETER MEASUREMENT

Minutes Since Pumping Began	pH	Cond. (µmnos/cm)	T ☐ °C ☒ °F	Other
+0	7.20	1450	60.2	
12	7.14	1600	61.5	
21	7.14	1800	61.9	
37	7.13	1800	61.9	

Minutes Since Pumping Began	pH	Cond. (µmnos/cm)	T ☐ °C ☐ °F	Other
Meter Nos.				

Observations During Purging (Well Condition, Turbidity, Color, Odor): turbid grey → clear, no sheen, no odor
Discharge Water Disposal: ☐ Sanitary Sewer ☐ Storm Sewer ☒ Other Drum on Site

WELL SAMPLING

SAMPLING METHOD

☒ Bailer - Type: Teflon Disposable
☐ Submersible ☐ Centrifugal ☐ Bladder; Pump No.:
☐ Same As Above
☐ Grab - Type:
☐ Other - Type:

SAMPLING DISTRIBUTION

Sample Series:

Sample No.	Volume-Cont.	Analysis Requested	Preservatives	Lab	Comments
MW-4	2 Ambers	TPHd, TPHmo	—	Curtis & Tompkins	w/ filtration & silica gel cleanup
	3 VOAs	TPHg, BTEX MTBE	HCL		

QUALITY CONTROL SAMPLES

Duplicate Samples		Blank Samples		Other Samples	
Original Sample No	Duplicate Sample No	Type	Sample No	Type	Sample No
				Trip	Trip - 3/99

Harding Lawson Associates
Engineering and Environmental Services

GROUND-WATER SAMPLING FORM

Job Name 2272 7th St.
Job Number 42633-1
Recorded by James McCaw (Signature)

Well No. MW-5
Well Type: ☒ Monitor ☐ Extraction ☐ Other
Well Material: ☒ PVC ☐ St. Steel ☐ Other
Date 3/19/99 Time 1235
Sampled by JGM (Initials)

WELL PURGING

PURGE VOLUME

Casing Diameter (D in inches):
☒ 2-inch ☐ 4-inch ☐ 6-inch ☐ Other
Total Depth of Casing (TD in feet BTOC): 17.68
Water Level Depth (WL in feet BTOC): 6.20
Number of Well Volumes to be purged (# Vols)
☒ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other

PURGE METHOD

☒ Bailer - Type: PVC
☐ Submersible ☐ Centrifugal ☐ Bladder; Pump No.:
☐ Other - Type:

PUMP INTAKE SETTING

☐ Near Bottom ☐ Near Top ☐ Other
Depth in feet (BTOC): Screen Interval in Feet (BTOC) from to

PURGE VOLUME CALCULATION:

(17.68 (TD feet) - (WL feet)) X 2 (D inches) ^{2} X 3 (# Vols) X 0.0408 = 5.6 gallons (Calculated Purge Volume)

PURGE TIME

1200 Start 1231 Stop Elapsed

PURGE RATE

Initial gpm Final gpm

ACTUAL PURGE VOLUME

6 gallons

FIELD PARAMETER MEASUREMENT

Minutes Since Pumping Began	pH	Cond. (µmnos/cm)	T ☐ °C ☒ °F	Other
+0	7.00	1900	62.7	
10	7.02	1950	61.3	
20	6.93	2200	61.2	
30	6.93	2200	61.2	

Minutes Since Pumping Began	pH	Cond. (µmnos/cm)	T ☐ °C ☐ °F	Other
Meter Nos.				

Observations During Purging (Well Condition, Turbidity, Color, Odor): turbid → clear, no sheen, no odor
Discharge Water Disposal: ☐ Sanitary Sewer ☐ Storm Sewer ☒ Other Drum on Site

WELL SAMPLING

SAMPLING METHOD

☐ Same As Above
☒ Bailer - Type: Teflon Disposable
☐ Grab - Type:
☐ Submersible ☐ Centrifugal ☐ Bladder; Pump No.
☐ Other - Type:

SAMPLING DISTRIBUTION

Sample Series:

Sample No.	Volume/Cont.	Analysis Requested	Preservatives	Lab	Comments
MW-5	2 Ambers	TPHd, TPHmo	—	Curtis & Tompkins	w/ filtration & silica gel cleanup
	3 VOAs	TPHg, BTEX MTBE	HCL	"	

QUALITY CONTROL SAMPLES

Duplicate Samples		Blank Samples		Other Samples	
Original Sample No.	Duplicate Sample No.	Type	Sample No.	Type	Sample No.
				Trip	Trip-3/99

Harding Lawson Associates
Engineering and Environmental Services

GROUND-WATER SAMPLING FORM

Job Name 2277 7th St.
Job Number 42633-1
Recorded by James M°Court (Signature)

Well No. MW-6
Well Type: ☒ Monitor ☐ Extraction ☐ Other
Well Material: ☒ PVC ☐ St. Steel ☐ Other
Date 3/9/99 Time 14:45
Sampled by JGM (Initials)

WELL PURGING

PURGE VOLUME

Casing Diameter (D in inches):
☒ 2-inch ☐ 4-inch ☐ 6-inch ☐ Other
Total Depth of Casing (TD in feet BTOC): 18.05
Water Level Depth (WL in feet BTOC): 7.37
Number of Well Volumes to be purged (# Vols)
☒ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other

PURGE METHOD

☒ Bailer - Type: PVC
☐ Submersible ☐ Centrifugal ☐ Bladder; Pump No.:
☐ Other - Type:

PUMP INTAKE SETTING

☐ Near Bottom ☐ Near Top ☐ Other
Depth in feet (BTOC): Screen Interval in Feet (BTOC) from to

PURGE VOLUME CALCULATION

(18.05 TD (feet) - 7.37 WL (feet)) X 2 D (inches)^2 X 3 # Vols X 0.0408 = 5.2 gallons
Calculated Purge Volume

PURGE TIME

1355 Start 1440 Stop Elapsed

PURGE RATE

Initial gpm Final gpm

ACTUAL PURGE VOLUME

gallons

FIELD PARAMETER MEASUREMENT

Minutes Since Pumping Began	pH	Cond. (µmhos/cm)	T ☐ °C ☒ °F	Other
+0	6.89	3400	61.7	
1	7.01	4000	60.2	
3	7.05	4000	60.2	
5	7.05	4000	60.2	

Minutes Since Pumping Began	pH	Cond (µmhos/cm)	T ☐ °C ☐ °F	Other
Meter Nos.				

Observations During Purging (Well Condition, Turbidity, Color, Odor): turbid blk → clear, sheen & hydro odor
Discharge Water Disposal: ☐ Sanitary Sewer ☐ Storm Sewer ☒ Other Drum on Site

WELL SAMPLING

SAMPLING METHOD

☒ Bailer - Type: Teflon Disposable
☐ Submersible ☐ Centrifugal ☐ Bladder: Pump No.:
☐ Same As Above
☐ Grab - Type:
☐ Other - Type:

SAMPLING DISTRIBUTION

Sample Series:

Sample No.	Volume/Cont.	Analysis Requested	Preservatives	Lab	Comments
MW-6	2 Ambers	TPHd, TPHmo	—	Curtis & Tamplins	w/ filtration & silica gel cleanup
	3 VOAs	TPHg, BTEX MTBE	HCl	"	

QUALITY CONTROL SAMPLES

Duplicate Samples

Original Sample No	Duplicate Sample No
MW-6	Dup-3/99

Blank Samples

Type	Sample No

Other Samples

Type	Sample No
Trip	Trip-3/99

Harding Lawson Associates
Engineering and Environmental Services

GROUND-WATER SAMPLING FORM

Job Name 2277 7th St.
Job Number 42633-1
Recorded by [signature] (Signature)

Well No. MW-7
Well Type: ☒ Monitor ☐ Extraction ☐ Other ____
Well Material: ☒ PVC ☐ St. Steel ☐ Other ____
Date 3/19/99 Time 10:45
Sampled by JGM (Initials)

WELL PURGING

PURGE VOLUME

Casing Diameter (D in inches):
☒ 2-inch ☐ 4-inch ☐ 6-inch ☐ Other ____
Total Depth of Casing (TD in feet BTOC): 18.16
Water Level Depth (WL in feet BTOC): 8.41
Number of Well Volumes to be purged (# Vols)
☒ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other ____

PURGE METHOD

☒ Bailer - Type: PVC
☐ Submersible ☐ Centrifugal ☐ Bladder; Pump No.: ____
☐ Other - Type: ____

PUMP INTAKE SETTING

☐ Near Bottom ☐ Near Top ☐ Other ____
Depth in feet (BTOC): ____ Screen Interval in Feet (BTOC) from ____ to ____

PURGE VOLUME CALCULATION

$(18.16 - 8.41) \times 2^2 \times 3 \times 0.0408 = 4.8$ gallons

(TD (feet) − WL (feet)) × D (inches)² × # Vols × 0.0408 = Calculated Purge Volume

PURGE TIME

1026 Start 1040 Stop ____ Elapsed

PURGE RATE

Initial ____ gpm Final ____ gpm

ACTUAL PURGE VOLUME

5 gallons

FIELD PARAMETER MEASUREMENT

Minutes Since Pumping Began	pH	Cond. (µmhos/cm)	T ☐ °C ☐ °F	Other ____
+0	6.85	1700	62.7	
4	6.95	1850	61.2	
7	7.00	1900	61.3	
13	7.01	1900	61.2	

Minutes Since Pumping Began	pH	Cond. (µmhos/cm)	T ☐ °C ☐ °F	Other ____
Meter Nos.				

Observations During Purging (Well Condition, Turbidity, Color, Odor): turbid grey/brown → clear, no sheen, no odor
Discharge Water Disposal: ☐ Sanitary Sewer ☐ Storm Sewer ☒ Other Drum on Site

WELL SAMPLING

SAMPLING METHOD

☒ Bailer - Type: Teflon Disposable
☐ Submersible ☐ Centrifugal ☐ Bladder; Pump No. ____
☐ Same As Above
☐ Grab - Type: ____
☐ Other - Type: ____

SAMPLING DISTRIBUTION

Sample Series: ____

Sample No.	Volume/Cont.	Analysis Requested	Preservatives	Lab	Comments
MW-7	2 Ambers	TPHd, TPHmo	—	Curtis & Tompkins	w/ filtration & silica gel cleanup
	3 VOAs	TPHg, BTEX MTBE	HCL	"	

QUALITY CONTROL SAMPLES

Duplicate Samples		Blank Samples		Other Samples	
Original Sample No.	Duplicate Sample No.	Type	Sample No.	Type	Sample No.
				Trip	Trip-3/99

3746

APPENDIX B

LABORATORY REPORTS

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900, Fax (510) 486-0532

ANALYTICAL REPORT

Prepared for:

Harding Lawson Associates
383 Fourth Street, Third Floor
Oakland, CA 94607

Date: 15-APR-99
Lab Job Number: 138553
Project ID: 42633-1
Location: Port of Oakland

Reviewed by: _____

Reviewed by: _____

B0553

Curtis & Tompkins

Harding Lawson Associates
383 Fourth Street, Third Floor
Oakland California 94607
(510) 451-1001 FAX 510 451-3165

CHAIN OF CUSTODY FORM

Lab: Nº 2120

Samplers JCM

Job Number: 42633-1

Name/Location: POO 2277 7th St.

Project Manager: Jim McCarty

Recorder: James McCarty (Signature Required)

SOURCE CODE	MATRIX: Water	Sediment	Soil	Oil	# CONTAINERS & PRESERV.: Unpres.	H_2SO_4	HNO_3	HCL	Ice	SAMPLE NUMBER OR LAB NUMBER	DATE: Yr	Wk	Seq	Yr	Mo	Day	Time	STATION DESCRIPTION/ NOTES
	X								1	Trip - 3/99	99	03	19				1020	
	X				2			3	X	MW - 2							1140	
	X				2			3	X	MW - 4							1340	
	X				2			3	X	MW - 5							1235	
	X				2			3	X	MW - 6							1445	
	X				2			3	X	MW - 7							1045	
	X				2			3	X	Dup - 3/99							—	

ANALYSIS REQUESTED

EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	METALS	EPA 8015M/TPHg	EPA 8020/BTEX w/ MTBE	EPA 8015M/TPHd w/ silica gel cleanup
						X	
					X	X	X
					X	X	X
					X	X	X
					X	X	X
					X	X	X
					X	X	X

LAB NUMBER: Yr	Wk	Seq	DEPTH IN FEET	COL MTD CD	QA CODE	MISCELLANEOUS
						Silica gel cleanup on TPHd & TPHmo
						Std TAT

CHAIN OF CUSTODY RECORD

RELINQUISHED BY: (Signature) James McCarty	RECEIVED BY: (Signature)	DATE/TIME 3/24 1135
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

SAMPLE CONDITION WHEN RECEIVED BY THE LABORATORY

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

TVH-Total Volatile Hydrocarbons

Client: Harding Lawson Associates
Project#: 42633-1
Location: Port of Oakland

Analysis Method: EPA 8015M
Prep Method: EPA 5030

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
138553-002	MW-2	47023	03/19/99	03/26/99	03/26/99	
138553-003	MW-4	47023	03/19/99	03/26/99	03/26/99	
138553-004	MW-5	47023	03/19/99	03/26/99	03/26/99	
138553-005	MW-6	47023	03/19/99	03/26/99	03/26/99	

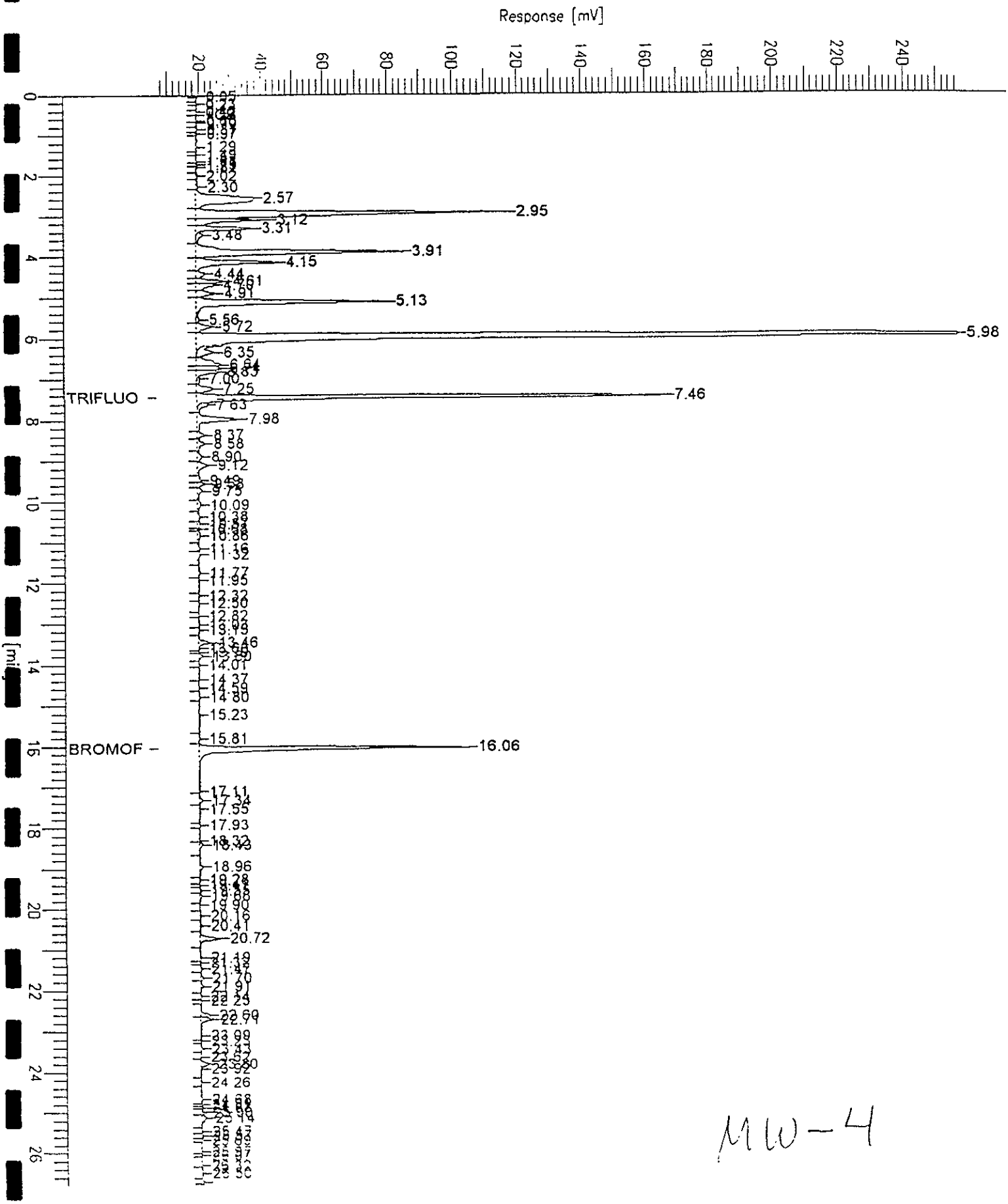
Matrix: Water

Analyte	Units	138553-002	138553-003	138553-004	138553-005
Diln Fac:		1	1	1	1
Gasoline C7-C12	ug/L	<50	81	<50	170
Surrogate					
Trifluorotoluene	%REC	98	93	99	102
Bromofluorobenzene	%REC	97	93	99	106

GC19 TVH 'X' Data File (FID)

Sample Name : 138553-003,47111
FileName : G:\GC19\DATA 99-011.raw
Method : TVHBTXE
Start Time : 0.00 min End Time : 26.80 min
Scale Factor: -1.0 Plot Offset: 6 mV

Sample #: Page 1 of 1
Date : 3/26/99 09:11 AM
Time of Injection: 3/26/99 03:30 AM
Low Point : 6.47 mV High Point : 256.47 mV
Plot Scale: 250.0 mV

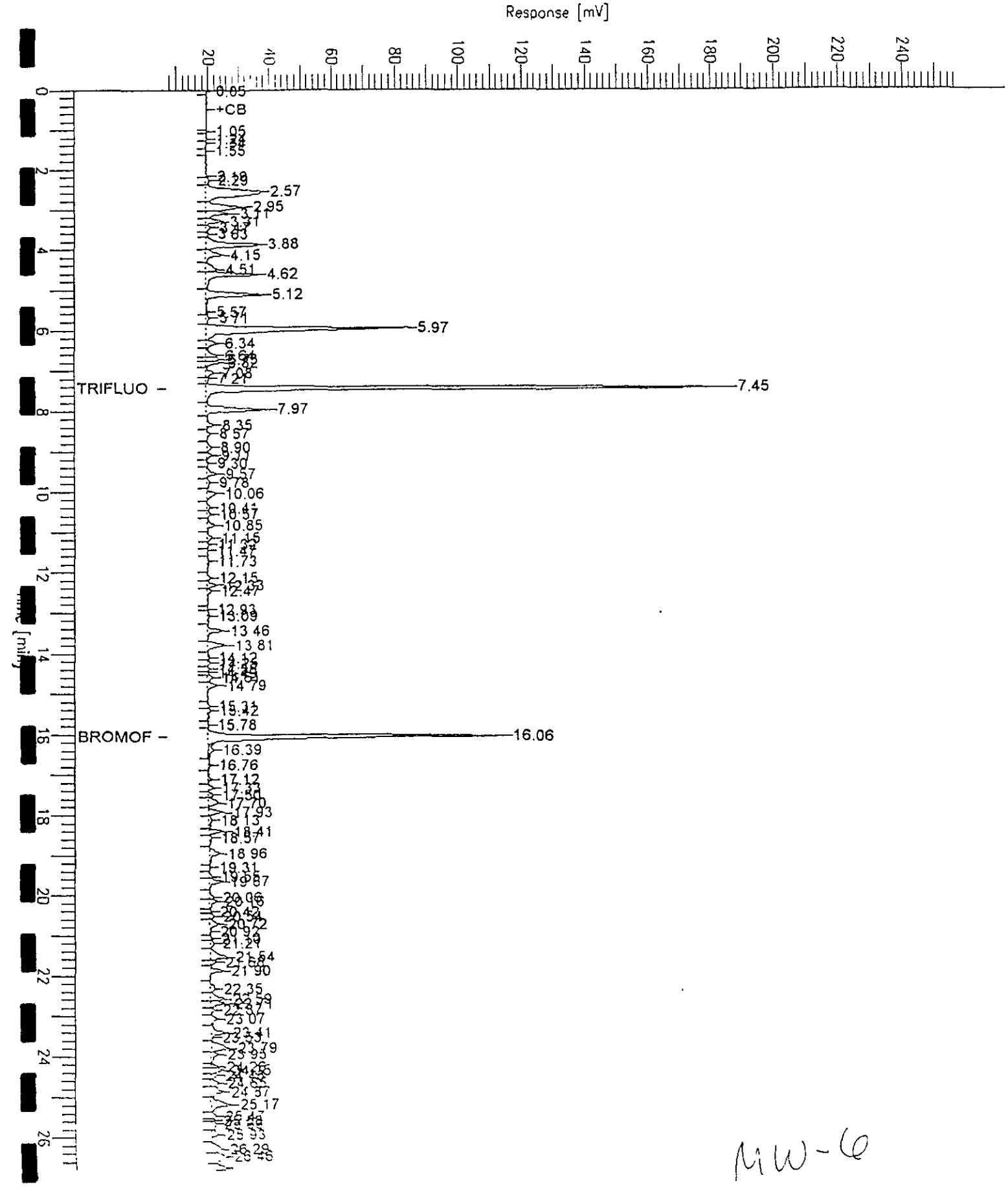


MW-4

GC19 TVH 'X' Data File (FID)

Sample Name : 138553-005,47011
FileName : G:\GC19\DATA\[illegible].raw
Method : TVHBTXE
Start Time : 0.00 min End Time : 26.80 min
Scale Factor: 1.0 Plot Offset: 7 mV

Sample #: Page 1 of 1
Date : 3/26/99 09:11 AM
Time of Injection: 3/26/99 04:30 AM
Low Point : 6.63 mV High Point 256.63 mV
Plot Scale: 250.0 mV



MW-6

TVH-Total Volatile Hydrocarbons

Client: Harding Lawson Associates
Project#: 42633-1
Location: Port of Oakland

Analysis Method: EPA 8015M
Prep Method: EPA 5030

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
138553-006	MW-7	47023	03/19/99	03/26/99	03/26/99	
138553-007	DUP-3/99	47023	03/19/99	03/26/99	03/26/99	

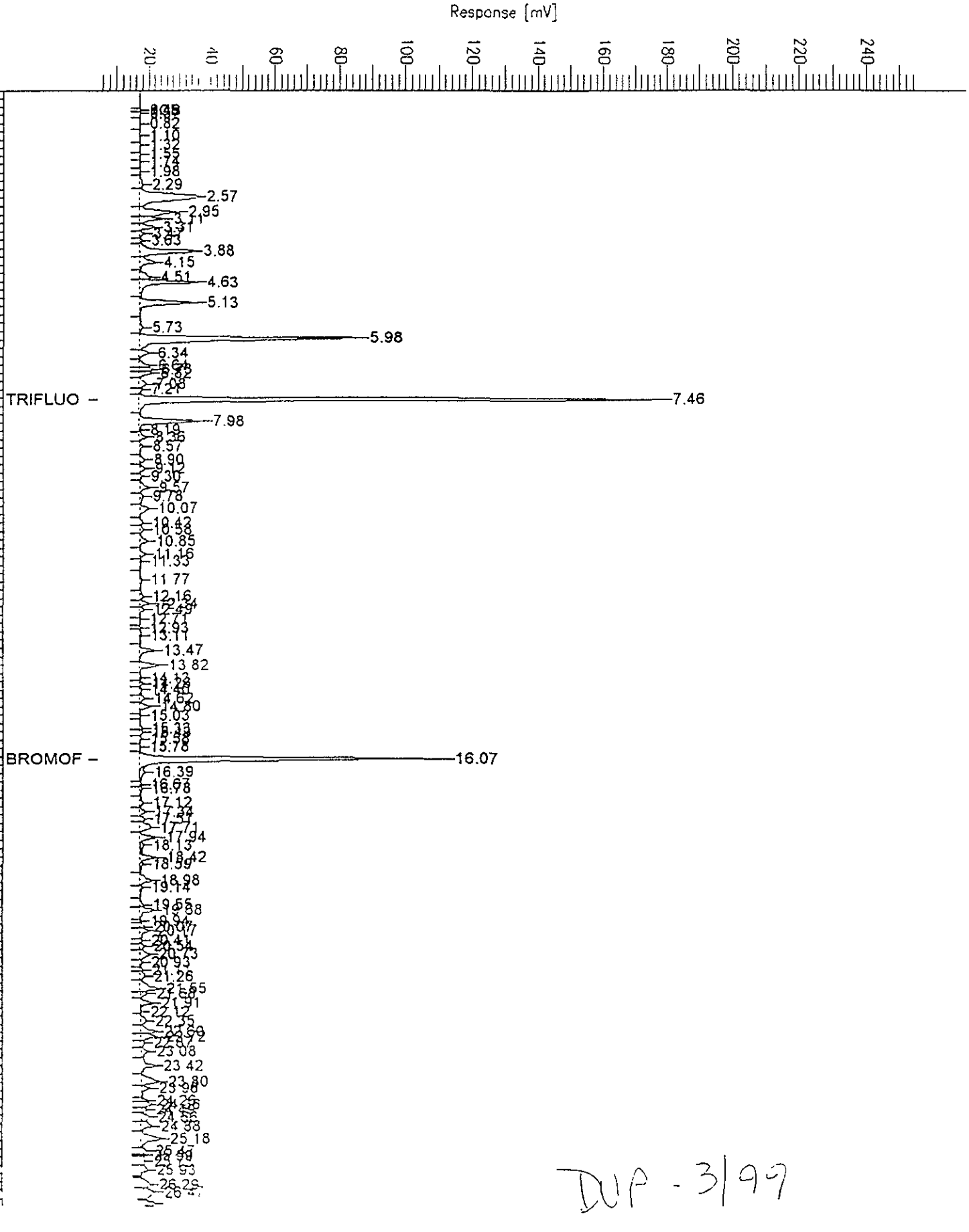
Matrix: Water

Analyte	Units	138553-006	138553-007
Diln Fac:		1	1
Gasoline C7-C12	ug/L	<50	180
Surrogate			
Trifluorotoluene	%REC	96	99
Bromofluorobenzene	%REC	94	105

GC19 TVH 'X' Data File (FID)

Sample Name : 138553-007,4X2x
FileName : G:\GC19\DATA\[illegible].raw
Method : TVHBTXE
Start Time : 0.00 min End Time : 26.80 min
Scale Factor: -1.0 Plot Offset: 5 mV

Sample #: Page 1 of 1
Date : 3/26/99 01:18 PM
Time of Injection: 3/26/99 12:51 PM
Low Point : 4.51 mV High Point : 254.51 mV
Plot Scale: 250.0 mV

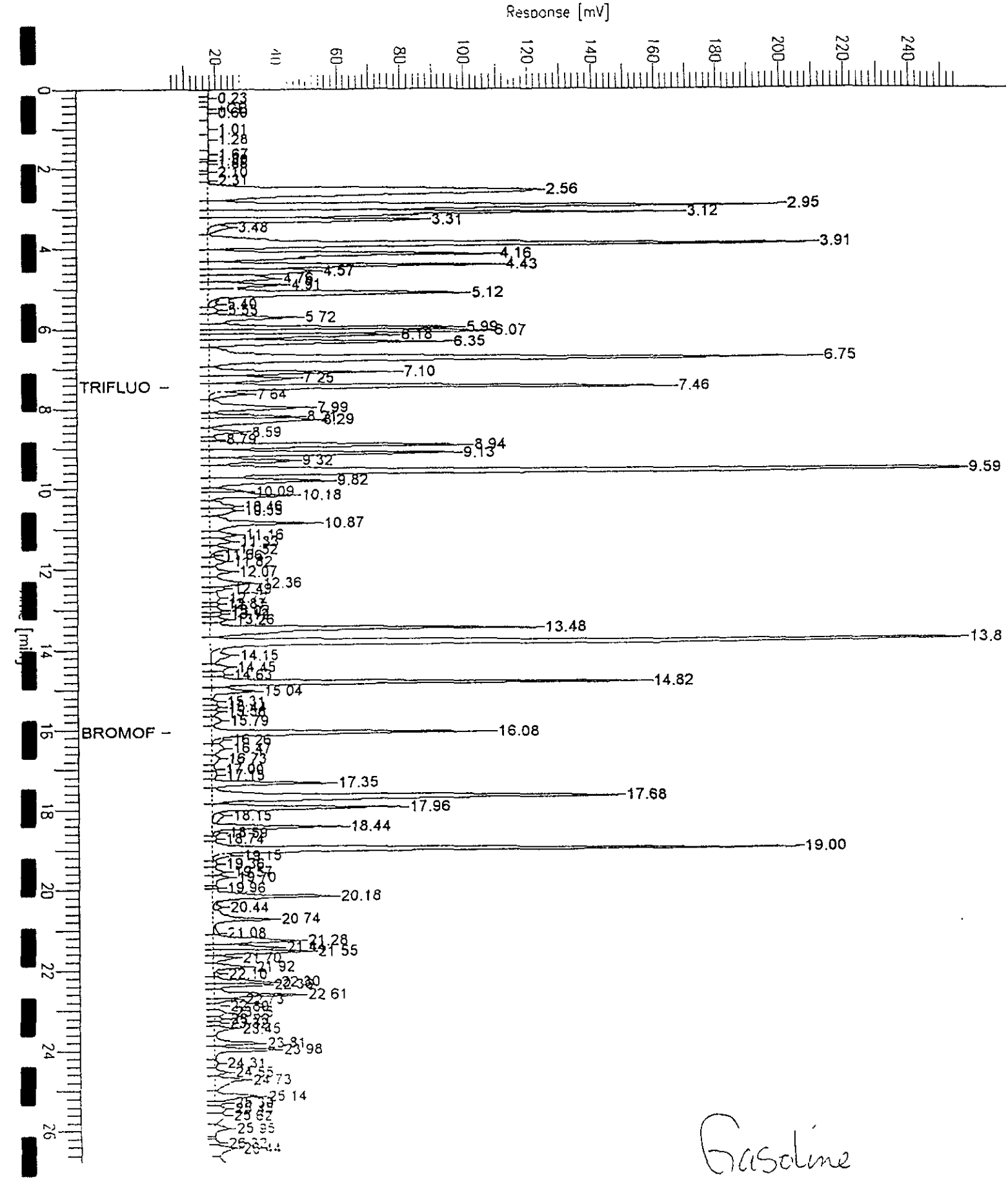


DUP - 3/99

GC19 TVH 'X' Data File (FID)

Sample Name : CCV/LCS,QC9[illegible]
FileName : G:\GC19\DATA\[illegible]
Method : TVHBTXE
Start Time : 0.00 min End Time : 26.80 min
Scale Factor: -1.0 Plot Offset: 8 mV

Sample #: GAS Page 1 of 1
Date : 3/26/99 09:10 AM
Time of Injection: 3/25/99 10:50 PM
Low Point : 5.07 mV High Point : 255.07 mV
Plot Scale: 250.0 mV



Gasoline

BTXE

Client: Harding Lawson Associates
Project#: 42633-1
Location: Port of Oakland

Analysis Method: EPA 8021B
Prep Method: EPA 5030

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
138553-001	TRIP-3/99	47023	03/19/99	03/26/99	03/26/99	
138553-002	MW-2	47023	03/19/99	03/26/99	03/26/99	
138553-003	MW-4	47073	03/19/99	03/29/99	03/29/99	
138553-004	MW-5	47023	03/19/99	03/26/99	03/26/99	

Matrix: Water

Analyte Diln Fac:	Units	138553-001 1	138553-002 1	138553-003 2	138553-004 1
MTBE	ug/L	<2	<2	<4	<2
Benzene	ug/L	<0.5	<0.5	250	<0.5
Toluene	ug/L	<0.5	<0.5	<1	<0.5
Ethylbenzene	ug/L	<0.5	<0.5	1.2	<0.5
m,p-Xylenes	ug/L	<0.5	<0.5	<1	<0.5
o-Xylene	ug/L	<0.5	<0.5	<1	<0.5
Surrogate					
Trifluorotoluene	%REC	83	91	106	89
Bromofluorobenzene	%REC	84	92	101	92

BTXE

Client: Harding Lawson Associates
Project#: 42633-1
Location: Port of Oakland

Analysis Method: EPA 8021B
Prep Method: EPA 5030

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
138553-005	MW-6	47023	03/19/99	03/26/99	03/26/99	
138553-006	MW-7	47023	03/19/99	03/26/99	03/26/99	
138553-007	DUP-3/99	47023	03/19/99	03/26/99	03/26/99	

Matrix: Water

Analyte	Units	138553-005	138553-006	138553-007
Diln Fac:		1	1	1
MTBE	ug/L	<2	5.3	<2
Benzene	ug/L	21	<0.5	22
Toluene	ug/L	0.86	<0.5	0.88
Ethylbenzene	ug/L	1.5	<0.5	1.6
m,p-Xylenes	ug/L	1.7	<0.5	1.8
o-Xylene	ug/L	1.2	<0.5	1.3
Surrogate				
Trifluorotoluene	%REC	94	88	92
Bromofluorobenzene	%REC	97	89	95

TVH-Total Volatile Hydrocarbons

Client:	Harding Lawson Associates	Analysis Method:	EPA 8015M
Project#:	42633-1	Prep Method:	EPA 5030
Location:	Port of Oakland		

METHOD BLANK

Matrix:	Water	Prep Date:	03/26/99
Batch#:	47023	Analysis Date:	03/26/99
Units:	ug/L		
Diln Fac:	1		

MB Lab ID: QC93711

Analyte	Result
Gasoline C7-C12	<50

Surrogate	%Rec	Recovery Limits
Trifluorotoluene	89	53-150
Bromofluorobenzene	87	53-149

BTXE

Client:	Harding Lawson Associates	Analysis Method:	EPA 8021B
Project#:	42633-1	Prep Method:	EPA 5030
Location:	Port of Oakland		

METHOD BLANK

Matrix:	Water	Prep Date:	03/26/99
Batch#:	47023	Analysis Date:	03/26/99
Units:	ug/L		
Diln Fac:	1		

MB Lab ID: QC93711

Analyte	Result
MTBE	<2.0
Benzene	<0.5
Toluene	<0.5
Ethylbenzene	<0.5
m,p-Xylenes	<0.5
o-Xylene	<0.5

Surrogate	%Rec	Recovery Limits
Trifluorotoluene	80	51-143
Bromofluorobenzene	82	37-146

TVH-Total Volatile Hydrocarbons

Client:	Harding Lawson Associates	Analysis Method:	EPA 8015M
Project#:	42633-1	Prep Method:	EPA 5030
Location:	Port of Oakland		

LABORATORY CONTROL SAMPLE

Matrix:	Water	Prep Date:	03/25/99
Batch#:	47023	Analysis Date:	03/25/99
Units:	ug/L		
Diln Fac:	1		

LCS Lab ID: QC93709

Analyte	Result	Spike Added	%Rec #	Limits
Gasoline C7-C12	1851	2000	93	77-117

Surrogate	%Rec	Limits
Trifluorotoluene	96	53-150
Bromofluorobenzene	106	53-149

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits
Spike Recovery: 0 out of 1 outside limits

BTXE

Client: Harding Lawson Associates
Project#: 42633-1
Location: Port of Oakland

Analysis Method: EPA 8021B
Prep Method: EPA 5030

LABORATORY CONTROL SAMPLE

Matrix: Water
Batch#: 47023
Units: ug/L
Diln Fac: 1

Prep Date: 03/26/99
Analysis Date: 03/26/99

LCS Lab ID: QC93710

Analyte	Result	Spike Added	%Rec #	Limits
MTBE	16.02	100	80	66-126
Benzene	17.3	20	87	65-111
Toluene	18.79	20	94	76-117
Ethylbenzene	19.09	20	95	71-121
m,p-Xylenes	39.66	40	99	80-123
o-Xylene	18.61	20	93	75-127

Surrogate	%Rec	Limits
Trifluorotoluene	81	51-143
Bromofluorobenzene	84	37-146

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits
Spike Recovery: 0 out of 6 outside limits

BTXE

Client: Harding Lawson Associates
Project#: 42633-1
Location: Port of Oakland

Analysis Method: EPA 8021B
Prep Method: EPA 5030

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

Field ID: MW-7
Lab ID: 138553-006
Matrix: Water
Batch#: 47023
Units: ug/L
Diln Fac: 1

Sample Date: 03/19/99
Received Date: 03/22/99
Prep Date: 03/26/99
Analysis Date: 03/26/99

MS Lab ID: QC93712

Analyte	Spike Added	Sample	MS	%Rec #	Limits
MTBE	20	5.27	21.62	82	49-136
Benzene	20	<0.5	18.31	92	55-122
Toluene	20	<0.5	19.9	100	63-139
Ethylbenzene	20	<0.5	19.97	100	61-137
m,p-Xylenes	40	<0.5	41.71	104	57-148
o-Xylene	20	<0.5	19.79	99	70-141

Surrogate	%Rec	Limits
Trifluorotoluene	90	51-143
Bromofluorobenzene	92	37-146

MSD Lab ID: QC93713

Analyte	Spike Added	MSD	%Rec #	Limits	RPD #	Limit
MTBE	20	21.71	82	49-136	0	11
Benzene	20	18.79	94	55-122	3	10
Toluene	20	20.16	101	63-139	1	10
Ethylbenzene	20	20.37	102	61-137	2	10
m,p-Xylenes	40	42.39	106	57-148	2	10
o-Xylene	20	20.23	101	70-141	2	10

Surrogate	%Rec	Limits
Trifluorotoluene	91	51-143
Bromofluorobenzene	94	37-146

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits
RPD: 0 out of 6 outside limits
Spike Recovery: 0 out of 12 outside limits

BTXE

Client:	Harding Lawson Associates	Analysis Method:	EPA 8021B
Project#:	42633-1	Prep Method:	EPA 5030
Location:	Port of Oakland		

METHOD BLANK

Matrix:	Water	Prep Date:	03/29/99
Batch#:	47073	Analysis Date:	03/29/99
Units:	ug/L		
Diln Fac:	1		

MB Lab ID: QC93903

Analyte	Result
MTBE	<2.0
Benzene	<0.5
Toluene	<0.5
Ethylbenzene	<0.5
m,p-Xylenes	<0.5
o-Xylene	<0.5

Surrogate	%Rec	Recovery Limits
Trifluorotoluene	106	51-143
Bromofluorobenzene	98	37-146

BATCH QC REPORT

Curtis & Tompkins, Ltd.

BTXE

Client: Harding Lawson Associates
Project#: 42633-1
Location: Port of Oakland

Analysis Method: EPA 8021B
Prep Method: EPA 5030

LABORATORY CONTROL SAMPLE

Matrix: Water
Batch#: 47073
Units: ug/L
Diln Fac: 1

Prep Date: 03/29/99
Analysis Date: 03/29/99

LCS Lab ID: QC93902

Analyte	Result	Spike Added	%Rec #	Limits
MTBE	15.66	20	78	66-126
Benzene	18.74	20	94	65-111
Toluene	19.77	20	99	76-117
Ethylbenzene	20.19	20	101	71-121
m,p-Xylenes	41.09	40	103	80-123
o-Xylene	20.53	20	103	75-127

Surrogate	%Rec	Limits
Trifluorotoluene	107	51-143
Bromofluorobenzene	98	37-146

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits
Spike Recovery: 0 out of 6 outside limits

BTXE

Client:	Harding Lawson Associates	Analysis Method:	EPA 8021B
Project#:	42633-1	Prep Method:	EPA 5030
Location:	Port of Oakland		

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

Field ID:	ZZZZZZ	Sample Date:	03/25/99
Lab ID:	138641-001	Received Date:	03/25/99
Matrix:	Water	Prep Date:	03/29/99
Batch#:	47073	Analysis Date:	03/29/99
Units:	ug/L		
Diln Fac:	1		

MS Lab ID: QC93904

Analyte	Spike Added	Sample	MS	%Rec #	Limits
MTBE	20	<2	17.64	88	49-136
Benzene	20	<0.5	18.97	95	55-122
Toluene	20	<0.5	20.11	101	63-139
Ethylbenzene	20	<0.5	21.36	107	61-137
m,p-Xylenes	40	<0.5	42.55	106	57-148
o-Xylene	20	1.22	23.17	110	70-141

Surrogate	%Rec	Limits
Trifluorotoluene	108	51-143
Bromofluorobenzene	103	37-146

MSD Lab ID: QC93905

Analyte	Spike Added	MSD	%Rec #	Limits	RPD #	Limit
MTBE	20	17.72	89	49-136	0	11
Benzene	20	19.03	95	55-122	0	10
Toluene	20	20.17	101	63-139	0	10
Ethylbenzene	20	21.4	107	61-137	0	10
m,p-Xylenes	40	42.88	107	57-148	1	10
o-Xylene	20	23.36	111	70-141	1	10

Surrogate	%Rec	Limits
Trifluorotoluene	108	51-143
Bromofluorobenzene	104	37-146

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits
RPD: 0 out of 6 outside limits
Spike Recovery: 0 out of 12 outside limits

TEH-Tot Ext Hydrocarbons

Client: Harding Lawson Associates
Project#: 42633-1
Location: Port of Oakland

Analysis Method: EPA 8015M
Prep Method: EPA 3520

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
138553-002	MW-2	46987	03/19/99	03/23/99	03/26/99	
138553-003	MW-4	46987	03/19/99	03/23/99	03/26/99	
138553-004	MW-5	46987	03/19/99	03/23/99	03/26/99	
138553-005	MW-6	46987	03/19/99	03/23/99	03/26/99	

Matrix: Water

Analyte Diln Fac:	Units	138553-002 1	138553-003 1	138553-004 1	138553-005 1
Diesel C10-C24	ug/L	<50	<50	<50	3800 H
Motor Oil C24-C36	ug/L	<300	<300	<300	580 YL
Surrogate					
Hexacosane	%REC	93	76	83	96

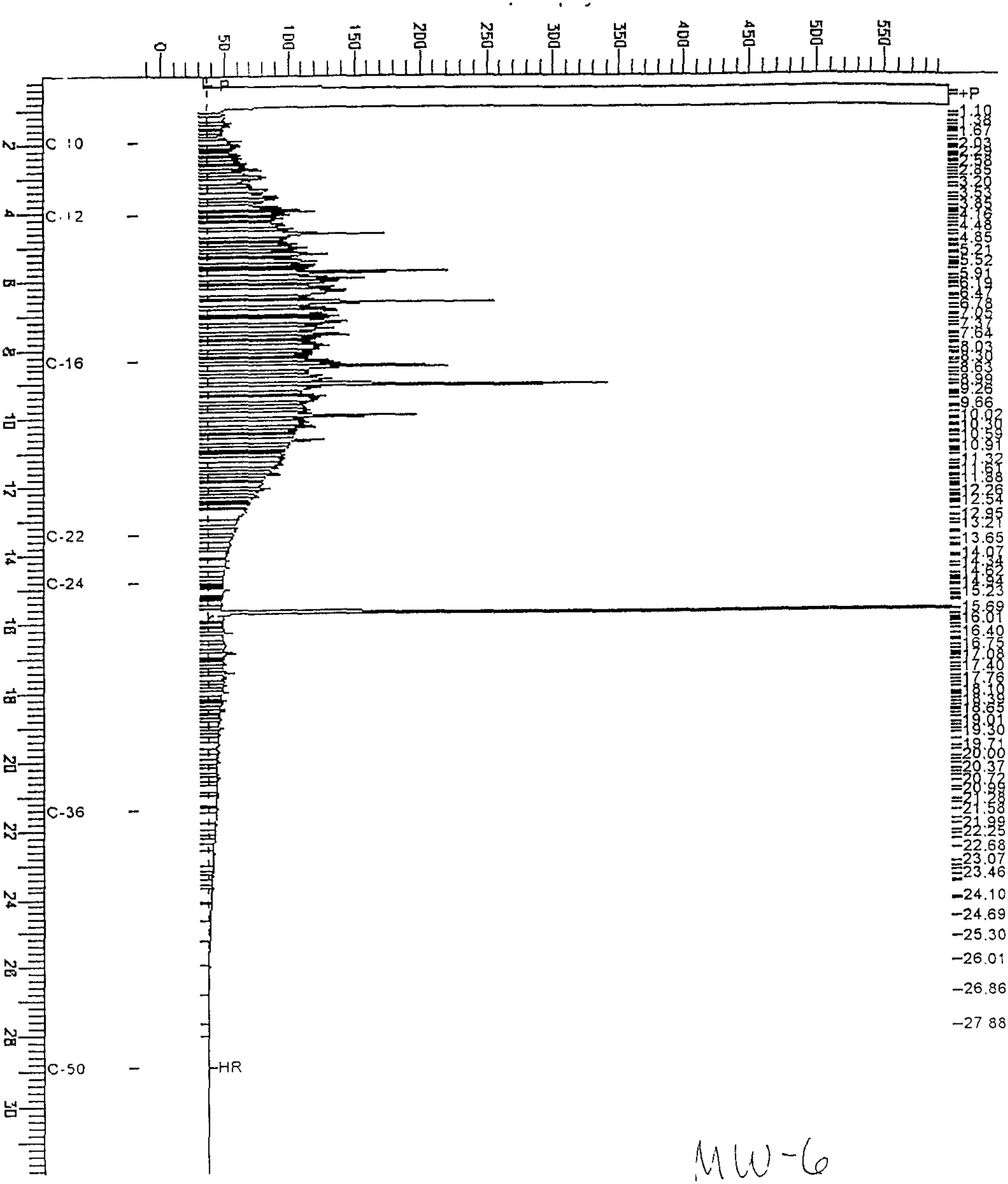
Y: Sample exhibits fuel pattern which does not resemble standard
H: Heavier hydrocarbons than indicated standard
L: Lighter hydrocarbons than indicated standard

Chromatogram

Sample Name : ..553-005sg,46987
FileName : ..\GC11\CHA\084A011..
Method : ..EHO55.MTH
Start Time : ..01 min
Scale Factor : 0.0
End Time : 31.91 min
Plot Offset: -18 mV

Sample #: 46987
Date : 3/26/99 02:39 PM
Time of Injection: 3/26/99 03:27 AM
Low Point : -17.97 mV
Plot Scale: 615.7 mV

High Point : 597.71 mV



MW-6

TEH-Tot Ext Hydrocarbons

Client: Harding Lawson Associates
Project#: 42633-1
Location: Port of Oakland

Analysis Method: EPA 8015M
Prep Method: EPA 3520

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
138553-006	MW-7	46987	03/19/99	03/23/99	03/26/99	
138553-007	DUP-3/99	46987	03/19/99	03/23/99	03/26/99	

Matrix: Water

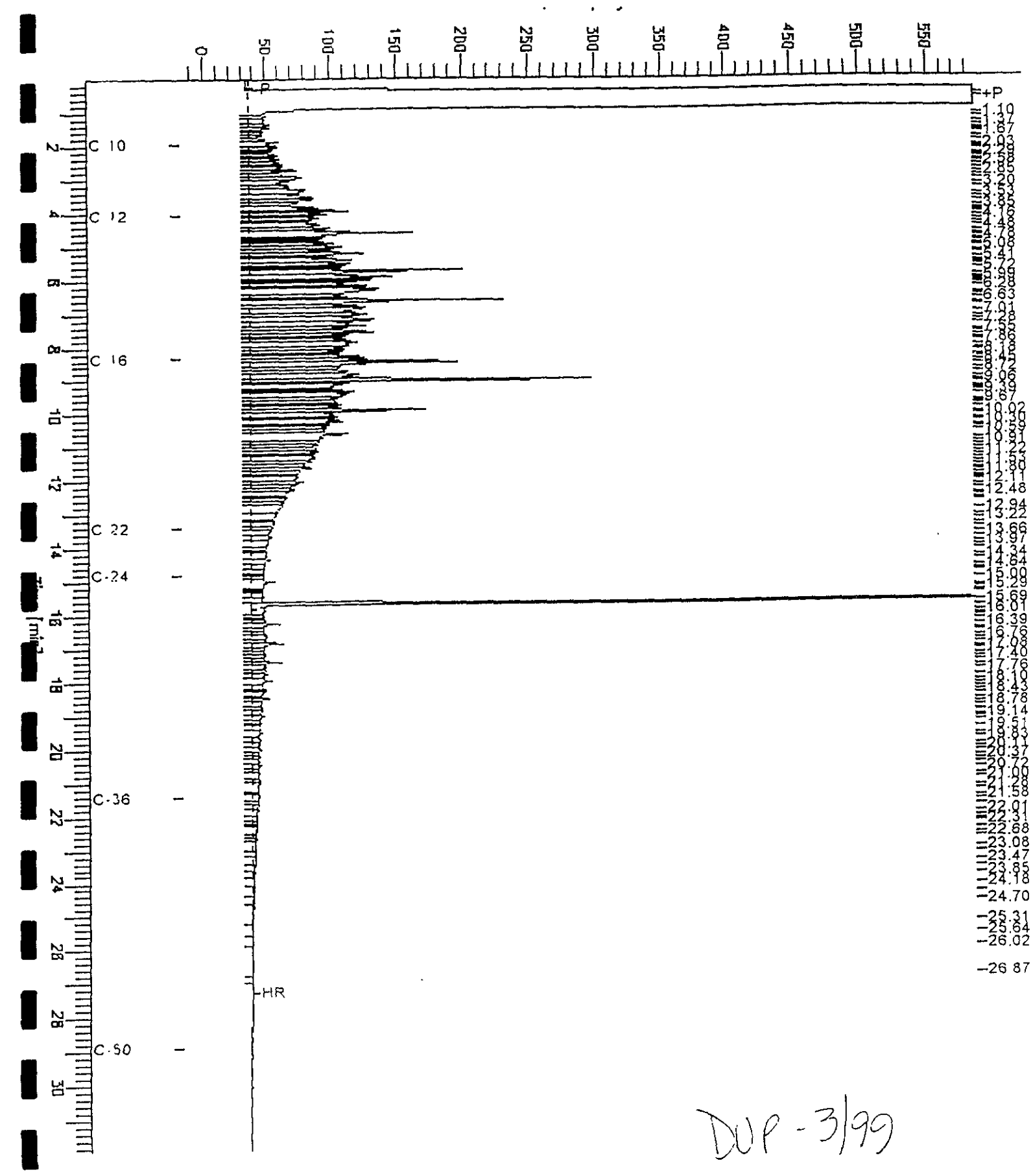
Analyte	Units	138553-006	138553-007
Diln Fac:		1	1
Diesel C10-C24	ug/L	<50	3400 H
Motor Oil C24-C36	ug/L	<300	540 YL
Surrogate			
Hexacosane	%REC	87	87

Y: Sample exhibits fuel pattern which does not resemble standard
H: Heavier hydrocarbons than indicated standard
L: Lighter hydrocarbons than indicated standard

Chromatogram

Sample Nam 130550-007sg,46987
FileName G:\GC11\CHA\084AC13.RAW
Method ATEH055.MTH
Start Time 1.11 min End Time : 31.91 min
Scale Fac 0.0 Plot Offset: -17 mV

Sample #: 46987 Page 1 of 1
Date : 3/26/99 02:41 PM
Time of Injection: 3/26/99 04:48 AM
Low Point : -17.43 mV High Point : 586.14 mV
Plot Scale: 603.6 mV

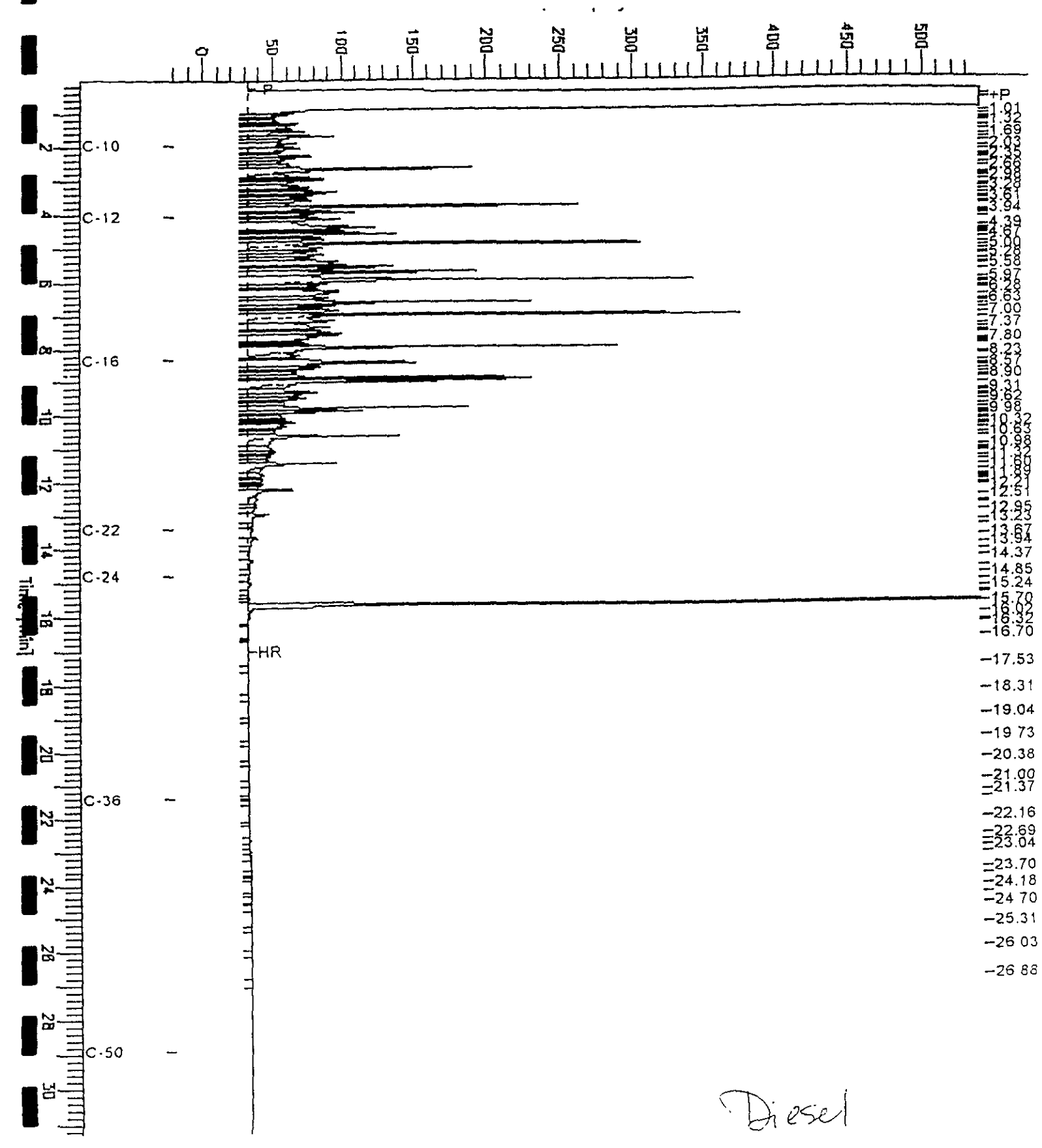


DUP - 3/99

Chromatogram

Sample Nar : [redacted],99ws7216,dsl
FileName : G:\GC11\CHA\084A001.RAW
Method : AIEH055.MTH
Start Time : 0.01 min End Time : 31.91 min
Scale Fac : 0.0 Plot Offset: -20 mV

Sample #: 500MG/L
Date : 3/26/99 01:36 PM
Time of Injection: 3/25/99 09:26 PM
Low Point : -20.14 mV High Point : 539.48 mV
Plot Scale: 559.6 mV

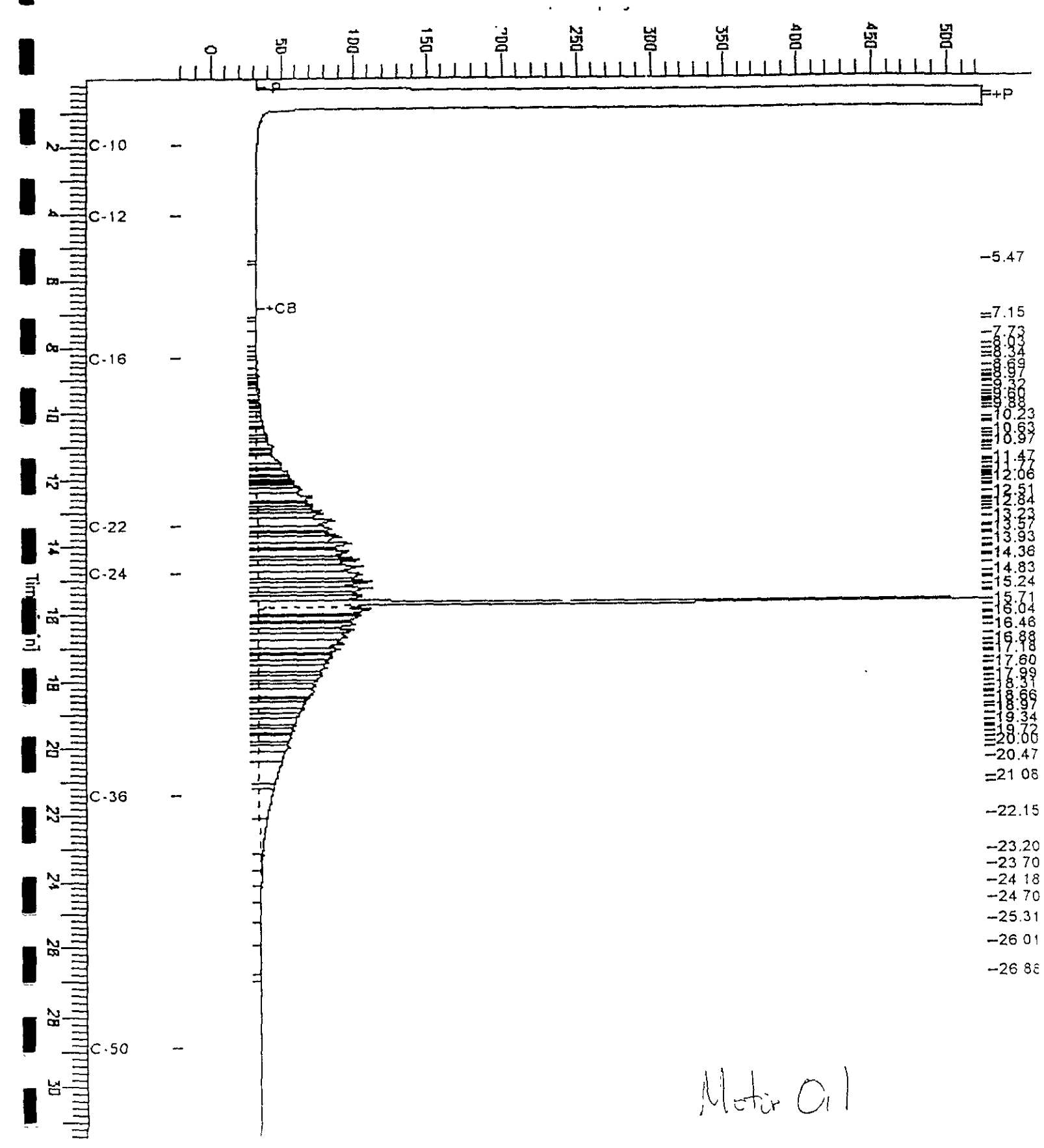


Diesel

Chromatogram

Sample Nat : ccv,99ws7122,mo
FileName : G:\GC11\CHA\084A003.RAW
Method : ATEH055.MTH
Start Time : 0.01 min End Time : 31.91 min
Scale Fac : 0.0 Plot Offset: -20 mV

Sample #: 500MG/L Page 1 of 1
Date : 3/26/99 01:37 PM
Time of Injection: 3/25/99 10:06 PM
Low Point : -20.14 mV High Point : 524.46 mV
Plot Scale: 544.6 mV



Motor Oil

Lab #: 138553

BATCH QC REPORT

Curtis & Tompkins, Ltd.

TEH-Tot Ext Hydrocarbons

Client: Harding Lawson Associates
Project#: 42633-1
Location: Port of Oakland

Analysis Method: EPA 8015M
Prep Method: EPA 3520

BLANK SPIKE/BLANK SPIKE DUPLICATE

Matrix: Water
Batch#: 46987
Units: ug/L
Diln Fac: 1

Prep Date: 03/23/99
Analysis Date: 03/27/99

BS Lab ID: QC93582

Analyte	Spike Added	BS	%Rec #	Limits
Diesel C10-C24	2475	2076	84	50-114

Surrogate	%Rec	Limits
Hexacosane	105	58-128

BSD Lab ID: QC93583

Analyte	Spike Added	BSD	%Rec #	Limits	RPD #	Limit
Diesel C10-C24	2475	2100	85	50-114	1	25

Surrogate	%Rec	Limits
Hexacosane	104	58-128

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits
RPD: 0 out of 1 outside limits
Spike Recovery: 0 out of 2 outside limits