PORT OF OAKLAND

May 13, 1999

Mr. Larry Seto
Alameda County
Department of Environmental Health
1131 Harbor Bay Parkway, Second Floor
Alameda, California 94502-6577

SUBJECT: QUARTERLY MONITORING REPORTS
2277 SEVENTH STREET SITE
OAKLAND, CALIFORNIA

Dear Mr. Seto:

Please find enclosed the following quarterly monitoring reports:

Quarterly Groundwater Monitoring and Product Recovery Report, 4th Quarter of 1998, 2277 Seventh Street, Oakland, California, dated February 18, 1999; *and*

Quarterly Groundwater Monitoring and Product Recovery Report, 1st Quarter of 1999, 2277 Seventh Street, Oakland, California, dated May 7, 1999.

If you have any questions regarding these two reports, please contact me at 272-1373.

Sincerely,

John Prall, R.G.
Associate Environmental Scientist

Enclosures

cc: Neil Werner

530 Water Street ■ Jack London Square ■ P.O. Box 2064 ■ Oakland, California 94604-2064
Telephone (510) 272-1100 ■ Fax (510) 272-1172 ■ TDD (510) 763-5703 ■ Cable address, PORTOFOAK, Oakland

December 1, 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
3rd Quarter of 1999
2277 Seventh Street
Oakland, California

Dear Mr. Prall:

Harding Lawson Associates (HLA) has prepared this Quarterly Groundwater Monitoring and Product Recovery Report on behalf of the Port of Oakland for the groundwater monitoring and sampling program and the operation of the product recovery system at 2277 Seventh Street in Oakland, California (Plate 1) between July 1, 1999 and September 30, 1999.

This report summarizes the monitoring of five groundwater monitoring wells, MW-2, MW-4, MW-5, MW-6, and MW-7 and the maintenance activities of the product recovery system during the third quarter of 1999. MW-3 and MW-1 contain in-well product skimmers that recover separate-phase petroleum hydrocarbons. MW-8 is not because it contains a thick viscous petroleum hydrocarbon. Well locations are presented on Plate 2.

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, located on the south side of Building 401, 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

HLA conducted the groundwater sampling at 2277 7th Street on September 28, 1999. Prior to purging and sampling the monitoring wells, HLA measured the depth to water with an electric water level indicator. HLA also measured the product level thickness in wells MW-1 and MW-3. Groundwater level measurements are summarized in Table 1, groundwater elevations and the gradient direction are presented on Plate 3, and product thickness measurements are summarized on Table 2. HLA did not use the

groundwater level measurements from MW-1, MW-3, and MW-8 to calculate groundwater elevations presented on Plate 3 because MW-1, and MW-3, contained product recovery equipment and because the thick viscous product in MW-8 prevented accurate groundwater level measurements.

After measuring the depth to water, HLA purged MW-2, MW-4, MW-5, MW-6, and MW-7 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. The depths to groundwater and field parameter measurements were recorded on Groundwater Sampling Forms included in Appendix A. The Port waste disposal contractor, Performance Excavators, Inc, disposed of the purge water.

HLA collected groundwater samples from the five monitoring wells using a Teflon disposable bailer and then transferred the groundwater into laboratory-provided containers. A duplicate sample was collected from MW-4. Sample containers were labeled with the sample number, date and time of collection, and sampler's initials, then placed in an insulated cooler with blue ice. The samples were accompanied by a laboratory provided trip blank and delivered under chain-of-custody protocol to Curtis and Thompkins, Ltd., a California-state certified laboratory.

LABORATORY ANALYSIS GROUNDWATER SAMPLES

Curtis and Tompkins, Ltd. performed the chemical analyses of the groundwater samples using the following analytical methods:

- Total petroleum hydrocarbons as gasoline (TPHg) in accordance with EPA Method 8015 modified.
- Benzene, toluene, ethylbenzene, and xylenes (BTEX) and methyl t-butyl ether (MTBE) in accordance with Method 8021B.
- TPH as diesel (TPHd) in accordance with EPA Method 8015 modified following a silica-gel cleanup procedure.
- TPH as motor oil (TPHmo) in accordance with EPA Method 8015 modified 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 3 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 September 28, 1999 groundwater 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 750 micro grams per liter (µg/l) in MW-4 and 130 µg/l in MW-6. TPHg was not detected in MW-2, MW-5 or MW-7. TPHg was detected in the sample from MW-4 at 190 µg/l and in MW-6 at 120 µg/l last quarter.
- Benzene was reported at a concentration of 280 µg/l in MW-4, at 20 µg/l in MW-6 and was not detected in MW-2, MW-5, or MW-7. Benzene was detected in the sample from MW-4 at 360 µg/l and in MW-6 at 18 µg/l last quarter
- Toluene was reported at a concentration of 1.5 µg/l in MW-4, at 0.51 µg/l in MW-6 and was not detected in MW-2, MW-5, or MW-7.
- Ethylbenzene was reported at a concentration of 2.2 µg/l in MW-6 and was not detected in MW-2, MW-4, MW-5, or MW-7.
- Total xylenes were not detected above the reporting limit in any of the wells sampled.
- MTBE was reported at a concentration of 14 µg/l in MW-7 and was not detected in MW-2, MW-4, MW-5 or MW-6. MTBE was detected in the sample from MW-7 at 12 µg/l last quarter and at 5.3 µg/l the quarter before.
- TPHd was reported at a concentration of 63µg/l in MW-4 and of 820 µg/l in MW-6 and was not detected in MW-2, MW-5, and MW-7. TPHd was not detected in the sample from MW-4 and was detected in MW-6 at 1,700 µg/l last quarter.
- TPHmo was not detected above the reporting limit in any of the wells sampled.

QUALITY ASSURANCE AND QUALITY CONTROL

- BTEX and MTBE were not detected in the trip blank.
- The relative percent difference between the analytical results from MW-4 and the duplicate sample was considered within acceptable limits, ranging from zero to 23 percent

PRODUCT RECOVERY SYSTEM

The product recovery system consists of an air-actuated (active) product skimmer in MW-3 and a passive product skimmer in MW-1. HLA completed product recovery at MW-6 and removed the passive skimmer on April 19, 1999. The product in MW-3 discharges to a product recovery tank and HLA periodically removes the product collected in skimmer in MW-1. HLA removed product from the passive skimmer at MW-1 four times during this reporting period. The total volume of product recovered from MW-1 during the third quarter of 1999 was 0.8 gallons. The Port's waste disposal contractor, Performance Excavators,

Inc., removed product from the product recovery tank on July 16, 1999. The total product removed was an estimated to be 830 gallons, consisting of product and water discharged by the active skimmer in MW-3. Table 2 presents product removal 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

for James G. McCarty
Project Engineer

Stephen J. Osborne
Geotechnical Engineer

REGISTERED PROFESSIONAL ENGINEER
STEPHEN J. OSBORNE
GE 656
Exp. 3-31-03
GEOTECHNICAL
STATE

JGM/SJO/mlw/42633/037486L

3 copies submitted

Attachments: Table 1 – Groundwater Elevations Data
Table 2 – Summary of Product Removal and Product Thickness Data
Table 3 – Groundwater Sample Results
Table 4 – Summary of Operation and Maintenance Activities
Plate 1 – Vicinity Map
Plate 2 – Site Plan
Plate 3 – Groundwater Elevations, September 28, 1999
Plate 4 – Groundwater Sample Results, September 28, 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 Top of Casing (feet)	Date Of Monitoring	Depth to Water (feet)	Groundwater Elevation (feet)
MW-2	14.36	12/31/1997	8.73	5.63
		4/13/1998	7.72	6.64
		11/6/1998	9.43	4.93
		3/19/1999	8.21	6.15
		6/24/1999	8.91	5.45
		9/28/1999	9.42	4.94
MW-4	13.15	12/31/1997	7.09	6.06
		4/13/1998	7.71	5.44
		11/6/1998	8.69	4.46
		3/19/1999	8.00	5.15
		6/24/1999	8.45	4.70
		9/28/1999	8.73	4.42
MW-5	13.49	12/31/1997	6.38	7.11
		4/13/1998	5.56	7.93
		11/6/1998	9.56	3.93
		3/19/1999	6.20	7.29
		6/24/1999	6.73	6.76
		9/28/1999	6.91	6.58
MW-6	14.00	6/24/1999	8.61	5.39
		9/28/1999	9.26	4.74
MW-7	14.35	12/31/1997	8.88	5.47
		4/13/1998	7.86	6.49
		11/6/1998	9.55	4.80
		3/19/1999	8.41	5.94
		6/24/1999	9.08	5.27
		9/28/1999	9.60	4.75

[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. 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	12/31/1997	-	-	-	0.2	passive skimmer
		1/29/1998	-	-	-	0.2	passive skimmer
		3/2/1998	-	-	-	0.018	passive skimmer
		5/11/1998	-	-	-	0.02	passive skimmer
		6/15/1998	-	-	-	0.2	passive skimmer
		11/6/1998	9.34	10.3	0.96	1.2	passive skimmer
		1/7/1999	-	-	-	0.2	passive skimmer
		2/11/1999	-	-	-	0.2	passive skimmer
		3/12/1999	-	-	-	0.2	passive skimmer
		3/19/1999	NM	8.45	>0.01	0.07	passive skimmer
		4/14/1999	-	-	-	0.2	passive skimmer
		5/11/1999	-	-	-	0.2	passive skimmer
		6/24/1999	8.88	9.63	0.8	0.2	passive skimmer
		7/15/1999	--	--	--	0.2	passive skimmer
		7/16/1999	--	--	--	0.2	passive skimmer
		8/27/1999	--	--	--	0.2	passive skimmer
		9/28/1999	--	--	0.65	0.2	passive skimmer
MW-3	14.22	12/31/1997	-	-	-	30	active skimmer
		1/29/1998	-	-	-	10	active skimmer
		4/13/1998	-	-	-	240	active skimmer
		5/11/1998	-	-	-	1,545	active skimmer
		6/15/1998	-	-	-	1,950	active skimmer
		11/6/1998	8.84	9.94	1.1	500	active skimmer
		1/5/1999	-	-	-	275[3]	active skimmer
		1/14/1999	-	-	-	400[3]	active skimmer
		2/3/1999	-	-	-	400[3]	active skimmer
		2/26/1999	-	-	-	570[3]	active skimmer
		3/19/1999	7.52	8.05	0.5	211	active skimmer
		6/16/1999	-	-	-	310	active skimmer
		6/24/1999	8.38	8.56	0.2	--	active skimmer
		7/14/1999	--	--	--	50[3]	active skimmer
		8/27/1999	--	--	--	200	active skimmer
		9/28/1999	--	--	0.2	100	active skimmer
MW-6	14.00	13/31/97	-	-	-	0.0014	passive skimmer
		1/29/1998	-	-	-	0.0014	passive skimmer
		3/2/1998	-	-	-	0.0014	passive skimmer
		11/6/1998	NM	9.62	>0.01	0.0	passive skimmer
		3/19/1999	NM	7.37	>0.01	0.0	passive skimmer
MW-8 [1]	12.94	12/31/1997	8.49	8.82	0.33	4.38	-
		11/6/1998	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 3. 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)	Total 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
	06/24/99	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2
	09/28/99	<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
	06/24/99	190	<50	<300	360	1.4	2.2	1	24
	09/28/99	750 [3,5]	63 [3,5]	<300	280	1.5	<1	<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

Table 3. 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)	Total Xylenes (µg/l)	MTBE (µg/l)
MW-5	12/31/97	<50	<47	<280	<0.5	<0.5	<0.5	<1.0	NA
(cont.)	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
	06/24/99	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	3.1
	09/28/99	<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
	06/24/99	120	1,700[7]	<300[7]	18	<0.5	1	<0.5	54
	09/28/99	130[3,5]	820	<300	20	0.51	2.2	<0.5	<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
	06/24/99	73	<50	<300	<0.5	<0.5	<0.5	<0.5	12
	09/28/99	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	14

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.

7 Sample did not pass laboratory QA/QC and may be biased low

- 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.

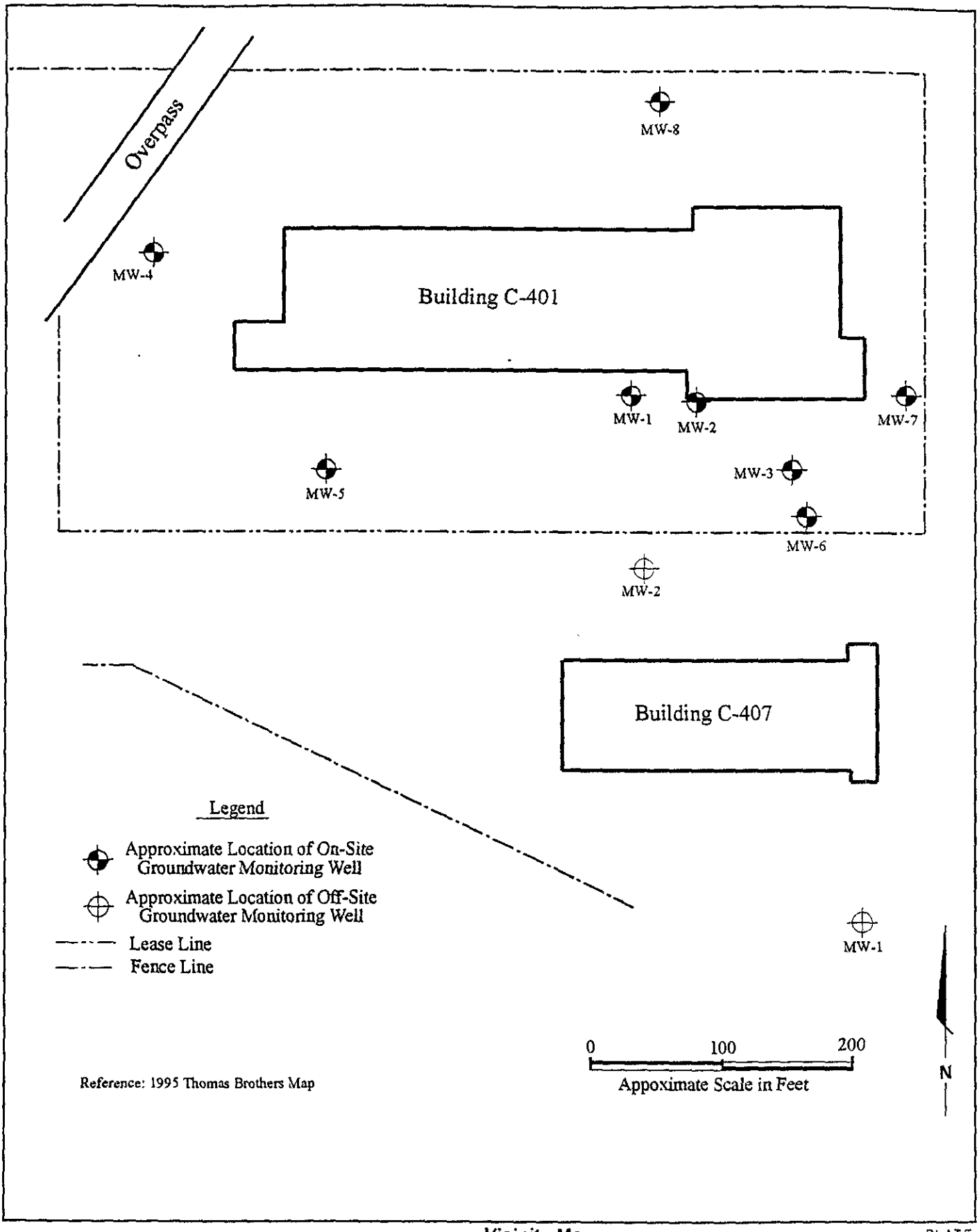
-Data prior to December 1997 taken from *Groundwater Analytical Results, Quarterly Groundwater Monitoring Report: Third Quarter 1997, Building C-401, 2277 7th Street, Oakland, CA.* dated October 24, 1997, by Uribe and Associate

NA Not Analyzed.

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

Date	System Status	Comments
07/15/99	System Not Running	Restart system, remove product from MW-1, active skimmer appears to be removing water and product at a high rate, raise skimmers 6 inches
07/16/99	System Running	Remove product from MW-1, active skimmer appears to be removing product at a slow rate, lower skimmer 2 inches, seems to improve
08/27/99	System Running	Remove product from MW-1, lower passive skimmer 6 inches, check active skimmer, performing well
09/28/99	System Running	Remove product from MW-1 measure product level in both MW-1 and MW-3, active skimmer appears to be removing product at a slow rate, lower skimmers 3 inches

PLATES

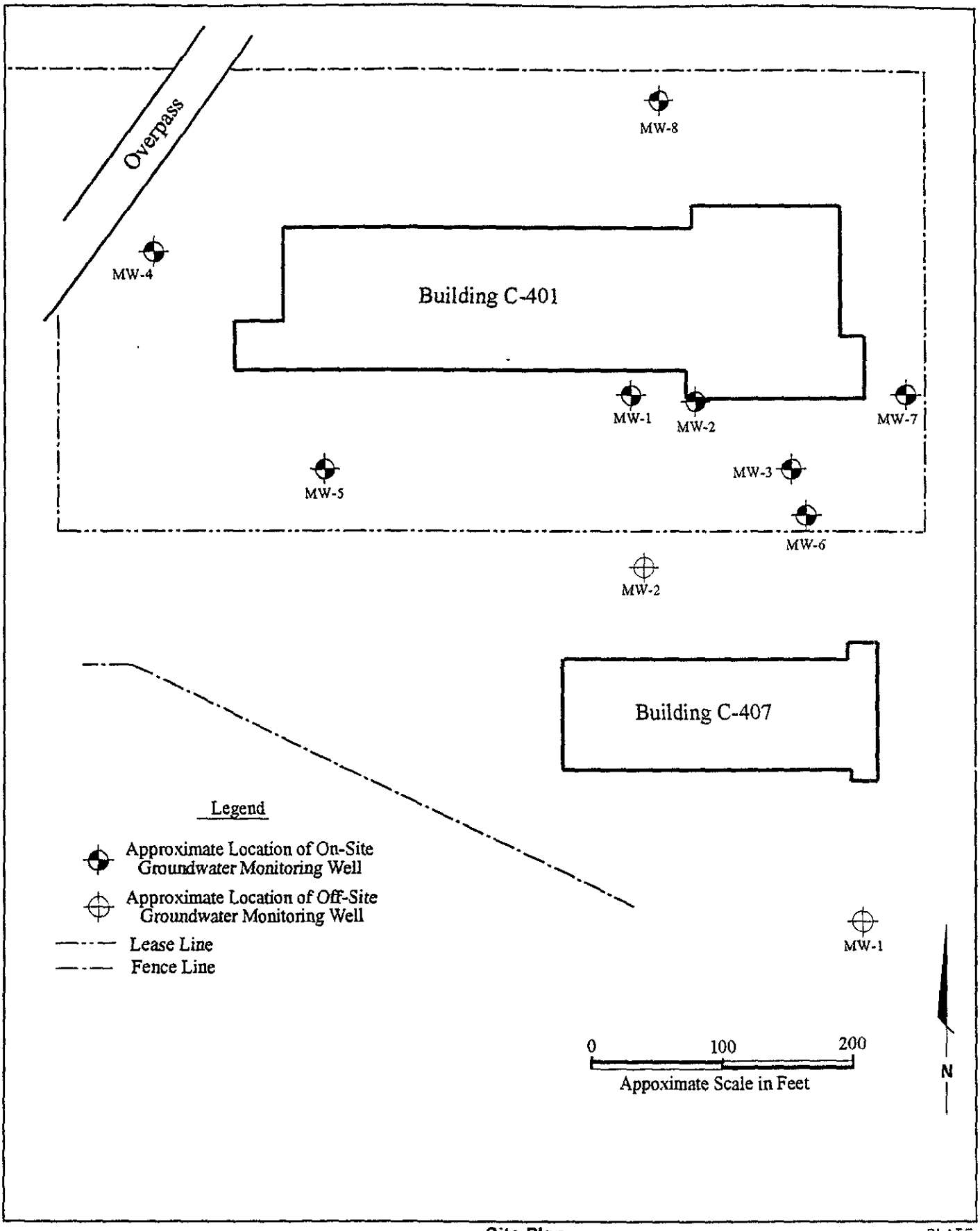


Harding Lawson Associates
Engineering and Environmental Services

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

PLATE **1**

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
jgm	42633.1		09/28/99	

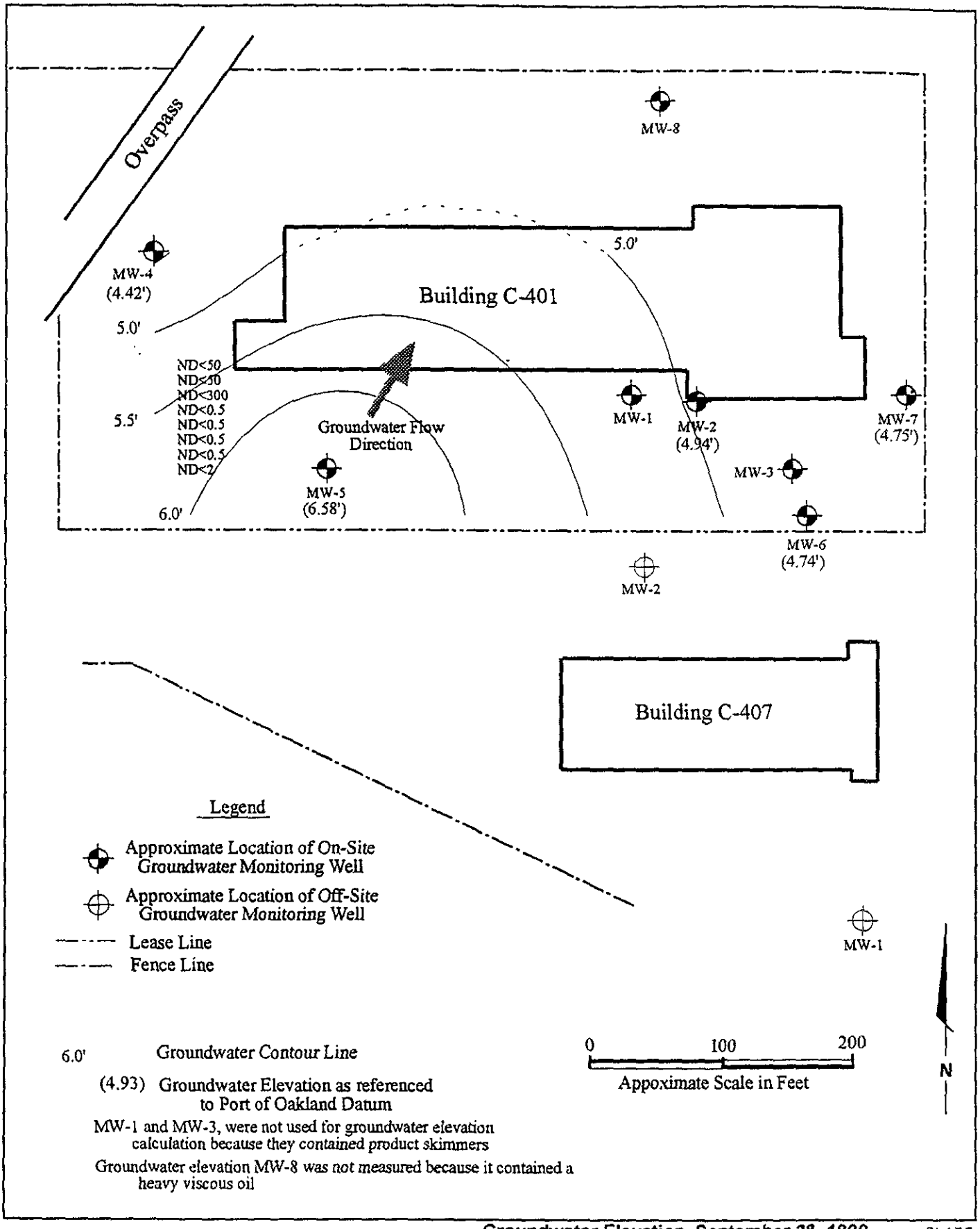


Harding Lawson Associates
Engineering and Environmental Services

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

PLATE **2**

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
jgm	42633.1		09/28/99	



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

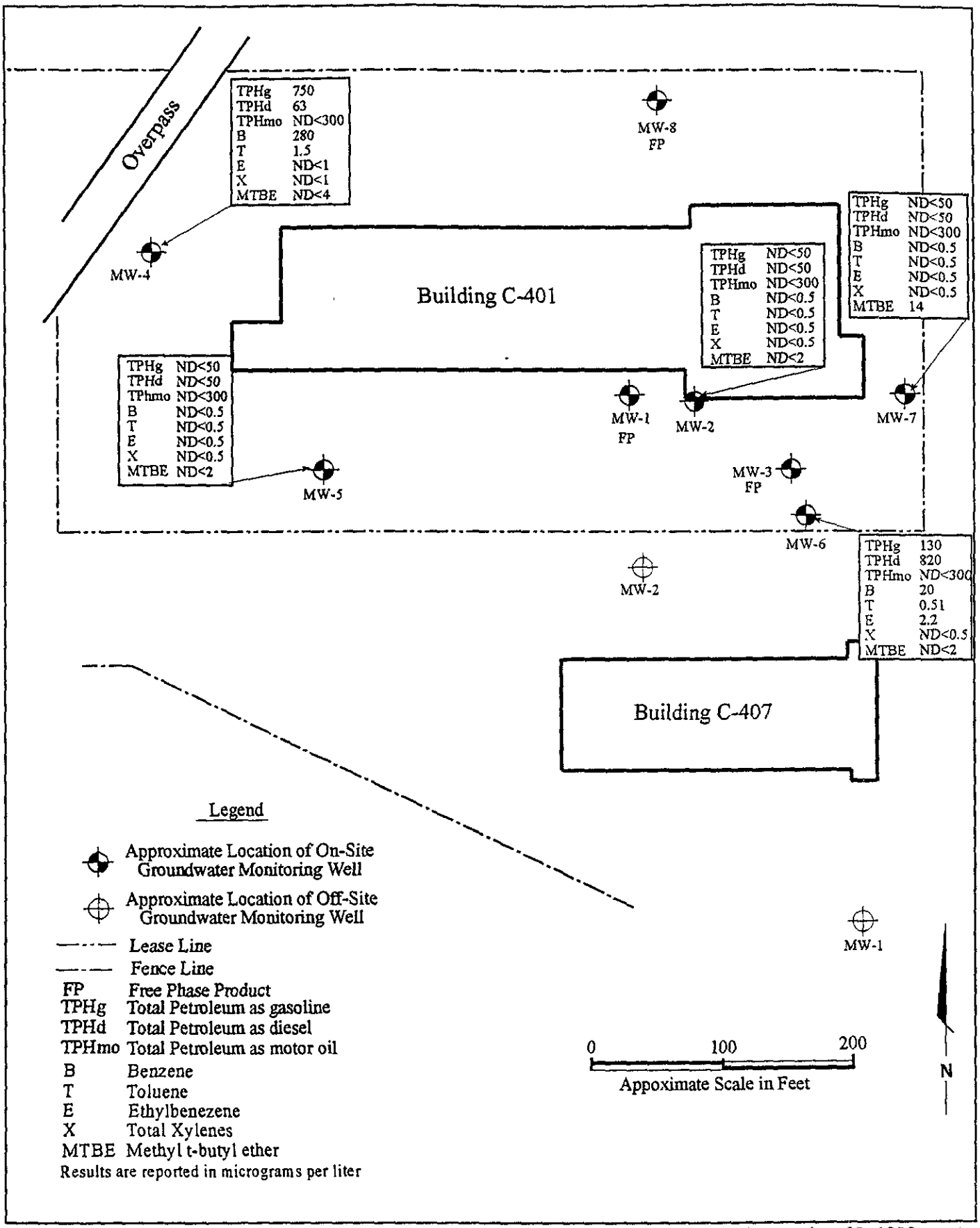
Groundwater elevation MW-8 was not measured because it contained a heavy viscous oil

Harding Lawson Associates
Engineering and Environmental Services

Groundwater Elevation, September 28, 1999
Quarterly Groundwater Monitoring Report
2277 Seventh Street
Oakland, California 94607

PLATE **3**

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
jgm	42633.1		09/28/99	



Harding Lawson Associates
Engineering and Environmental Services

Groundwater Sample Results, September 28, 1999
Quarterly Groundwater Monitoring Report
2277 Seventh Street
Oakland, California 94607

PLATE **4**

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
jgm	42633.1		09/28/99	

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 Heather D Lee (Signature)

Well No. MW-1
Well Type: ☑ Monitor ☐ Extraction ☐ Other ____
Well Material: ☑ PVC ☐ St. Steel ☐ Other ____
Date 9/28/99 Time ____
Sampled by HDL (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

(____ (TD 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. (µmhos/cm)	T ☐ °C ☐ °F	Other ____

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

Observations During Purging (Well Condition, Turbidity, Color, Odor): 0.2 gal product removed from passive skimmer
Discharge Water Disposal: ☐ Sanitary Sewer ☐ Storm Sewer ☑ Other Drum on Site

0.65 feet Depth to product in well

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		

QUALITY CONTROL SAMPLES

Duplicate Samples

Orginal 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 Heather Lee (Signature)

Well No. MW-2
Well Type: ☑ Monitor ☐ Extraction ☐ Other ____
Well Material: ☑ PVC ☐ St. Steel ☐ Other ____
Date 9/28/99 Time 1104
Sampled by JSM HDL (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): 9.42
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

$(15.27 - 9.42) \times 2^2 \times 3 \times 0.0408 = 2.86$ gallons

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

PURGE TIME

1058 Start 1059 Stop 9 Elapsed

PURGE RATE

Initial ____ gpm Final ____ gpm

ACTUAL PURGE VOLUME

3 gallons

FIELD PARAMETER MEASUREMENT

Minutes Since Pumping Began	pH	Cond. (µmhos/cm)	T ☐ °C ☐ °F	Other ____
i	7.76	2360	74.7	
1	7.72	2350	72.6	
2	7.67	8310	72.0	
3	7.61	2330	71.6	

Minutes Since Pumping Began	pH	Cond. (µmhos/cm)	T ☐ °C ☐ °F	Other ____
Meter Nos.	9510			

Observations During Purging (Well Condition, Turbidity, Color, Odor): no odor, initially clear because silty brown
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	1L Ambers	TPHd, TPHmo	—	Curtis & Tompkins	w/ filtration & silica gel cleanup
	3 VOAs	TPHg, BTEX MTBE	HCL	"	

QUALITY CONTROL SAMPLES

Duplicate Samples

Original Sample No.	Duplicate Sample No.

Blank Samples

Type	Sample No.

Other Samples

Type	Sample No.
Trip	Trip

Harding Lawson Associates
Engineering and
Environmental Services

GROUND-WATER SAMPLING FORM

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

Well No. MW-3
Well Type: ☑ Monitor ☐ Extraction ☐ Other _____
Well Material: ☑ PVC ☐ St. Steel ☐ Other _____
Date 9/28/99 Time _____
Sampled by _____ (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

(_____ TD (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. (µmhos/cm)	T ☐ °C ☐ °F	Other _____

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

Observations During Purging (Well Condition, Turbidity, Color, Odor): 0.2 feet product in well
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: _____

SAMPLE 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		

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 Heather D Lee (Signature)

Well No. MW-4
Well Type: ☑ Monitor ☐ Extraction ☐ Other
Well Material: ☑ PVC ☐ St. Steel ☐ Other
Date 9/28/99 Time 1138
Sampled by ~~JGM~~ HDL (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): 8.73
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

$(18.84 - 8.73) \times 2^2 \times 3 \times 0.0408 = 4.95$ gallons

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

PURGE TIME

1124 Start 1133 Stop 9 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
1	8.01	1890	74.3	
1.5	7.95	1690	73.4	
3	7.62	1700	73.2	
5	7.61	1710	72.8	

Minutes Since Pumping Began	pH	Cond. (µmhos/cm)	T ☐ °C ☐ °F	Other
Meter Nos.	9510			

Observations During Purging (Well Condition, Turbidity, Color, Odor): no odor, clear to cloudy brown
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-4	2 1Ambers	TPHd, TPHmo	—	Curtis & Tompkins	w/ filtration & silica gel cleanup
	3 Voas	TPHg, BTEX	HCL	"	
		MTBE			

QUALITY CONTROL SAMPLES

Duplicate Samples

Original Sample No.	Duplicate Sample No.
MW-4	DUP0999
	1150

Blank Samples

Type	Sample No.

Other Samples

Type	Sample No.
Trip Blk	Trip

Harding Lawson Associates
Engineering and
Environmental Services

GROUND-WATER SAMPLING FORM

Job Name 2277 7th St.
Job Number 42633-1
Recorded by Heather D Lee (Signature)

Well No. MW-5
Well Type: ☑ Monitor ☐ Extraction ☐ Other
Well Material: ☑ PVC ☐ St. Steel ☐ Other
Date 9/20/99 Time 0955
Sampled by JGM HDL (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): 6.91
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

$(17.68 - 6.91) \times 2^2 \times 3 \times 0.0408 = 5.27$ gallons

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

PURGE TIME

CR47 Start 0951 Stop 9 Elapsed

PURGE RATE

Initial gpm Final gpm

ACTUAL PURGE VOLUME

6 gallons

FIELD PARAMETER MEASUREMENT

Minutes Since Pumping Began	pH	Cond. (µmhos/cm)	T ☐ °C ☒ °F	Other
2	7.28	2460	74.9	
2	7.25	2550	74.5	
4	7.24	2500	74.1	
6	7.26	2590	74.1	

Minutes Since Pumping Began	pH	Cond. (µmhos/cm)	T ☐ °C ☐ °F	Other
Meter Nos.	9510			

Observations During Purging (Well Condition, Turbidity, Color, Odor): clear, no odor becomes murky brown w/ bail
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	(1) Ambers	TPHd, TPHmo	—	Curtis & Tompkins	w/ filtration & silica gel cleanup
	3 VOAs	TPHg, BTEX - MTBE	HCL	"	

QUALITY CONTROL SAMPLES

Duplicate Samples

Original Sample No.	Duplicate Sample No.

Blank Samples

Type	Sample No.

Other Samples

Type	Sample No.
Trip	TRIP 0999 (0925)

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-6
Well Type: ☑ Monitor ☐ Extraction ☐ Other
Well Material: ☑ PVC ☐ St. Steel ☐ Other
Date 9/28/99 Time 1232
Sampled by SG [illegible] HDL (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): 9.26
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) - 9.26 WL (feet)) X 2 D (inches)^2 X 3 # Vols X 0.0408 = 4.3 gallons
Calculated Purge Volume

PURGE TIME

1204 Start 1226 Stop 22 Elapsed

PURGE RATE

Initial gpm Final gpm

ACTUAL PURGE VOLUME

4.5 gallons

FIELD PARAMETER MEASUREMENT

Minutes Since Pumping Began	pH	Cond. (µmhos/cm)	T ☐ °C ☐ °F	Other
0	7.54	4790	77.2	
1.5	7.52	4750	75.2	
3	7.54	4860	74.3	
4.5	7.50	4860	76.2	

Minutes Since Pumping Began	pH	Cond. (µmhos/cm)	T ☐ °C ☐ °F	Other
Meter Nos.	9510			

Observations During Purging (Well Condition, Turbidity, Color, Odor): fuel odor, clear w/ floaties to grey, sheen
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-6	1 Ambers	TPHd, TPHmo	—	Curtis & Tompkins	w/ filtration & silica gel cleanup
	3 VOAs	TPHg, BTEX MTBE	HCL	"	

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 42633-001
Recorded by _____ (Signature)

Well No. MW-7
Well Type: ☑ Monitor ☐ Extraction ☐ Other _____
Well Material: ☑ PVC ☐ St. Steel ☐ Other _____
Date 9/28/99 Time 1033
Sampled by JSW (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): 9.60
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 (TD) - 9.60 (WL)) x 2 (D) ^{2} x 3 (# Vols) x 0.0408 = 4.2 gallons (Calculated Purge Volume)

PURGE TIME

1015 Start 1029 Stop 12 Elapsed

PURGE RATE

Initial _____ gpm Final _____ gpm

ACTUAL PURGE VOLUME

4.5 gallons

FIELD PARAMETER MEASUREMENT

Minutes Since Pumping Began	pH	Cond. (µmhos/cm)	T ☐ °C ☒ °F	Other _____
i	7.60	2300	72.4	
1.5	7.58	2230	72.1	
3	7.47	2210	71.4	
4.5	7.43	2210	72.0	

Minutes Since Pumping Began	pH	Cond. (µmhos/cm)	T ☐ °C ☐ °F	Other _____
Meter Nos.	9510			

Observations During Purging (Well Condition, Turbidity, Color, Odor): slight sulfur odor, silty brown
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	1L Ambers	TPHd, TPHmo	—	Curtis & Tompkins	w/ filtration & silica gel cleanup
	3 VOAs	TPHg, BTEX MTBE	HCl	"	

QUALITY CONTROL SAMPLES

Duplicate Samples

Original Sample No.	Duplicate Sample No.

Blank Samples

Type	Sample No.

Other Samples

Type	Sample No.
Trip	

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: 13-OCT-99
Lab Job Number: 141692
Project ID: 42633.1
Location: Port of Oakland-2277

Reviewed by: _____

Reviewed by: _____

TVH-Total Volatile Hydrocarbons

Client: Harding Lawson Associates
Project#: 42633.1
Location: Port of Oakland-2277

Analysis Method: EPA 8015M
Prep Method: EPA 5030

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
141692-002	MW-5	50999	09/28/99	10/01/99	10/01/99	
141692-003	MW-7	50999	09/28/99	10/01/99	10/01/99	
141692-004	MW-2	50999	09/28/99	10/01/99	10/01/99	
141692-005	MW-4	50999	09/28/99	10/02/99	10/02/99	

Matrix: Water

Analyte	Units	141692-002	141692-003	141692-004	141692-005
Diln Fac:		1	1	1	1
Gasoline C7-C12	ug/L	<50	<50	<50	750 YL
Surrogate					
Trifluorotoluene	%REC	92	95	98	115
Bromofluorobenzene	%REC	99	98	98	98

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

TVH-Total Volatile Hydrocarbons

Client: Harding Lawson Associates
Project#: 42633.1
Location: Port of Oakland-2277

Analysis Method: EPA 8015M
Prep Method: EPA 5030

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
141692-006	DUP 0999	50999	09/28/99	10/02/99	10/02/99	
141692-007	MW-6	50999	09/28/99	10/01/99	10/01/99	

Matrix: Water

Analyte	Units	141692-006	141692-007
Diln Fac:		1	1
Gasoline C7-C12	ug/L	740 YL	130 YL
Surrogate			
Trifluorotoluene	%REC	115	101
Bromofluorobenzene	%REC	97	97

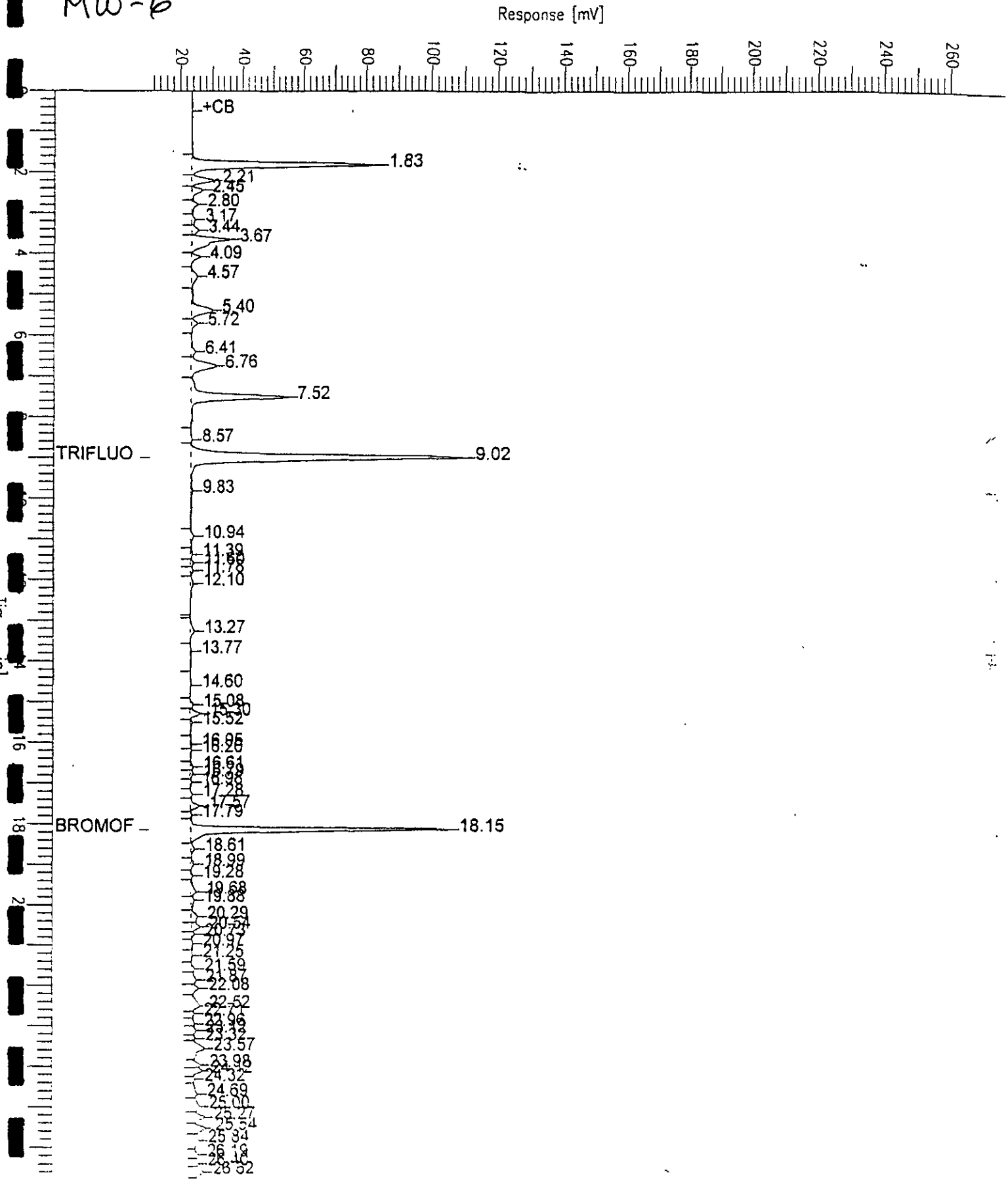
Y: Sample exhibits fuel pattern which does not resemble standard
L: Lighter hydrocarbons than indicated standard

Chromatogram

Sample Name : 141692-007,50999
[redacted]leName : G:\GC05\DATA\274G008.raw
[redacted]od : TVHBTXE
[redacted]t Time : 0.00 min End Time : 26.80 min
Scale Factor: -1.0 Plot Offset: 11 mV

Sample #: Page 1 of 1
Date : 10/1/99 05:40 PM
Time of Injection: 10/1/99 05:13 PM
Low Point : 10.91 mV High Point : 260.91 mV
Plot Scale: 250.0 mV

MW-6



BTXE

Client: Harding Lawson Associates
Project#: 42633.1
Location: Port of Oakland-2277

Analysis Method: EPA 8021B
Prep Method: EPA 5030

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
141692-001	TRIP 0999	50999	09/28/99	10/02/99	10/02/99	
141692-002	MW-5	50999	09/28/99	10/01/99	10/01/99	
141692-003	MW-7	50999	09/28/99	10/01/99	10/01/99	
141692-004	MW-2	50999	09/28/99	10/01/99	10/01/99	

Matrix: Water

Analyte Diln Fac:	Units	141692-001 1	141692-002 1	141692-003 1	141692-004 1
MTBE	ug/L	<2	<2	14	<2
Benzene	ug/L	<0.5	<0.5	<0.5	<0.5
Toluene	ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	ug/L	<0.5	<0.5	<0.5	<0.5
Surrogate					
Trifluorotoluene	%REC	84	83	85	85
Bromofluorobenzene	%REC	90	86	90	88

TVH-Total Volatile Hydrocarbons

Client:	Harding Lawson Associates	Analysis Method:	EPA 8015M
Project#:	42633.1	Prep Method:	EPA 5030
Location:	Port of Oakland-2277		

METHOD BLANK

Matrix:	Water	Prep Date:	10/01/99
Batch#:	50999	Analysis Date:	10/01/99
Units:	ug/L		
Diln Fac:	1		

MB Lab ID: QC09175

Analyte	Result
Gasoline C7-C12	<50

Surrogate	%Rec	Recovery Limits
Trifluorotoluene	93	53-150
Bromofluorobenzene	94	53-149

BTXE

Client: Harding Lawson Associates
Project#: 42633.1
Location: Port of Oakland-2277

Analysis Method: EPA 8021B
Prep Method: EPA 5030

METHOD BLANK

Matrix: Water
Batch#: 50999
Units: ug/L
Diln Fac: 1

Prep Date: 10/01/99
Analysis Date: 10/01/99

MB Lab ID: QC09175

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	84	51-143
Bromofluorobenzene	87	37-146

BTXE

Client: Harding Lawson Associates
Project#: 42633.1
Location: Port of Oakland-2277

Analysis Method: EPA 8021B
Prep Method: EPA 5030

LABORATORY CONTROL SAMPLE

Matrix: Water
Batch#: 50999
Units: ug/L
Diln Fac: 1

Prep Date: 10/01/99
Analysis Date: 10/01/99

LCS Lab ID: QC09174

Analyte	Result	Spike Added	%Rec #	Limits
MTBE	17.13	20	86	66-126
Benzene	19.17	20	96	65-111
Toluene	19.24	20	96	76-117
Ethylbenzene	20.78	20	104	71-121
m,p-Xylenes	42.16	40	105	80-123
o-Xylene	21.37	20	107	75-127

Surrogate	%Rec	Limits
Trifluorotoluene	85	51-143
Bromofluorobenzene	90	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

Lab #: 141692

BATCH QC REPORT

Curtis & Tompkins, Ltd.

BTXE

Client:	Harding Lawson Associates	Analysis Method:	EPA 8021B
Project#:	42633.1	Prep Method:	EPA 5030
Location:	Port of Oakland-2277		

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

Field ID:	MW-2	Sample Date:	09/28/99
Lab ID:	141692-004	Received Date:	09/28/99
Matrix:	Water	Prep Date:	10/01/99
Batch#:	50999	Analysis Date:	10/01/99
Units:	ug/L		
Diln Fac:	1		

MS Lab ID: QC09176

Analyte	Spike Added	Sample	MS	%Rec #	Limits
MTBE	20	<2	23.36	117	49-136
Benzene	20	<0.5	18.67	93	55-122
Toluene	20	<0.5	18.64	93	63-139
Ethylbenzene	20	<0.5	20.15	101	61-137
m,p-Xylenes	40	<0.5	39.35	98	57-148
o-Xylene	20	<0.5	20.32	102	70-141

Surrogate	%Rec	Limits
Trifluorotoluene	86	51-143
Bromofluorobenzene	89	37-146

MSD Lab ID: QC09177

Analyte	Spike Added	MSD	%Rec #	Limits	RPD #	Limit
MTBE	20	23.48	117	49-136	1	11
Benzene	20	19.31	97	55-122	3	10
Toluene	20	19.12	96	63-139	3	10
Ethylbenzene	20	20.59	103	61-137	2	10
m,p-Xylenes	40	40.29	101	57-148	2	10
o-Xylene	20	20.76	104	70-141	2	10

Surrogate	%Rec	Limits
Trifluorotoluene	87	51-143
Bromofluorobenzene	91	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

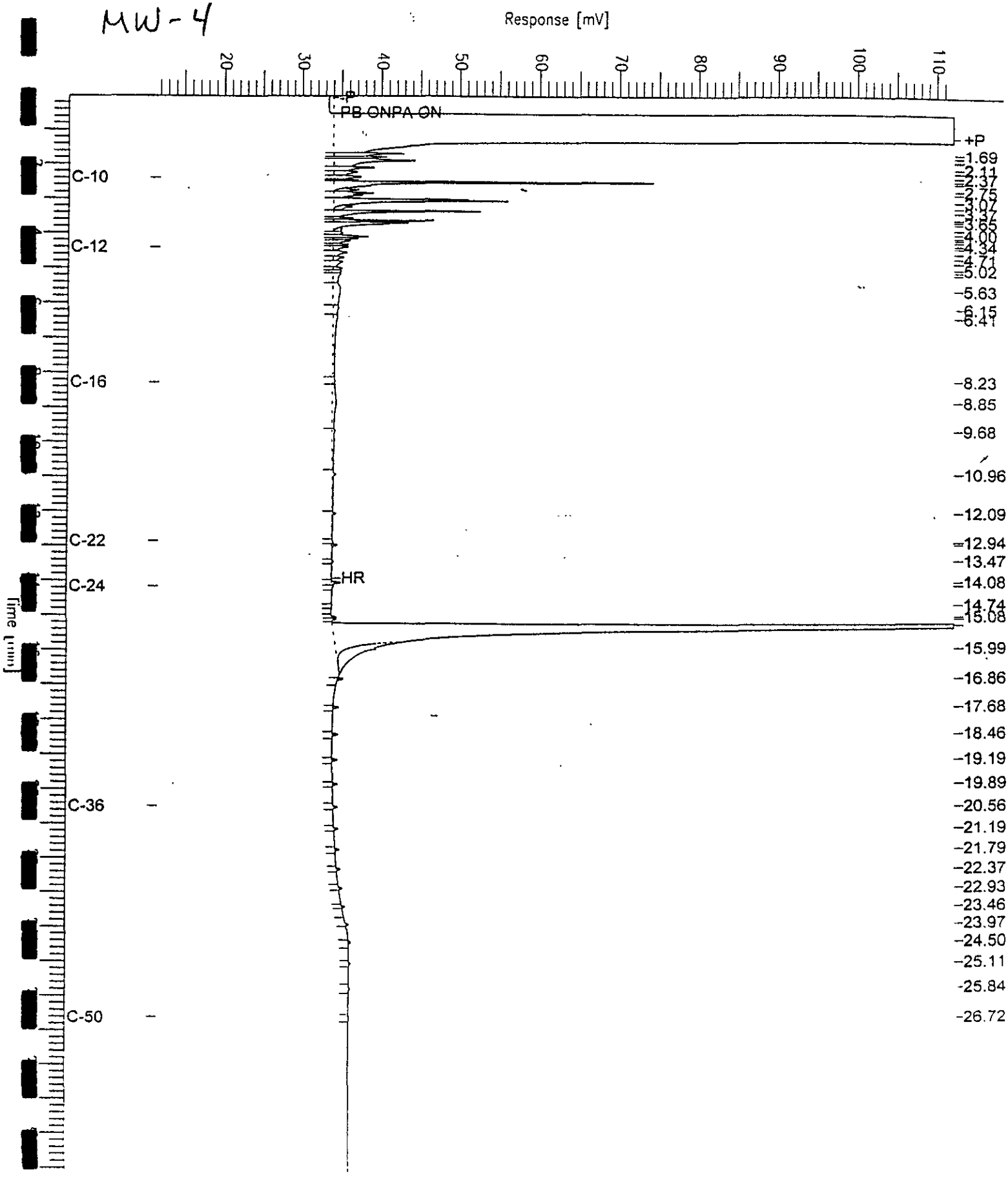
Spike Recovery: 0 out of 12 outside limits

Chromatogram

Sample Name : 141692-005sg,50991
FileName : C:\GC15\CHB\277B007.RAW
Method : BTEH244.MTH
Start Time : 0.01 min End Time : 31.19 min
Scale Factor: 0.0 Plot Offset: 12 mV

Sample #: 50991 Page 1 of 1
Date : 10/04/1999 03:37 PM
Time of Injection: 10/04/1999 12:51 PM
Low Point : 11.92 mV High Point : 111.99 mV
Plot Scale: 100.1 mV

MW-4

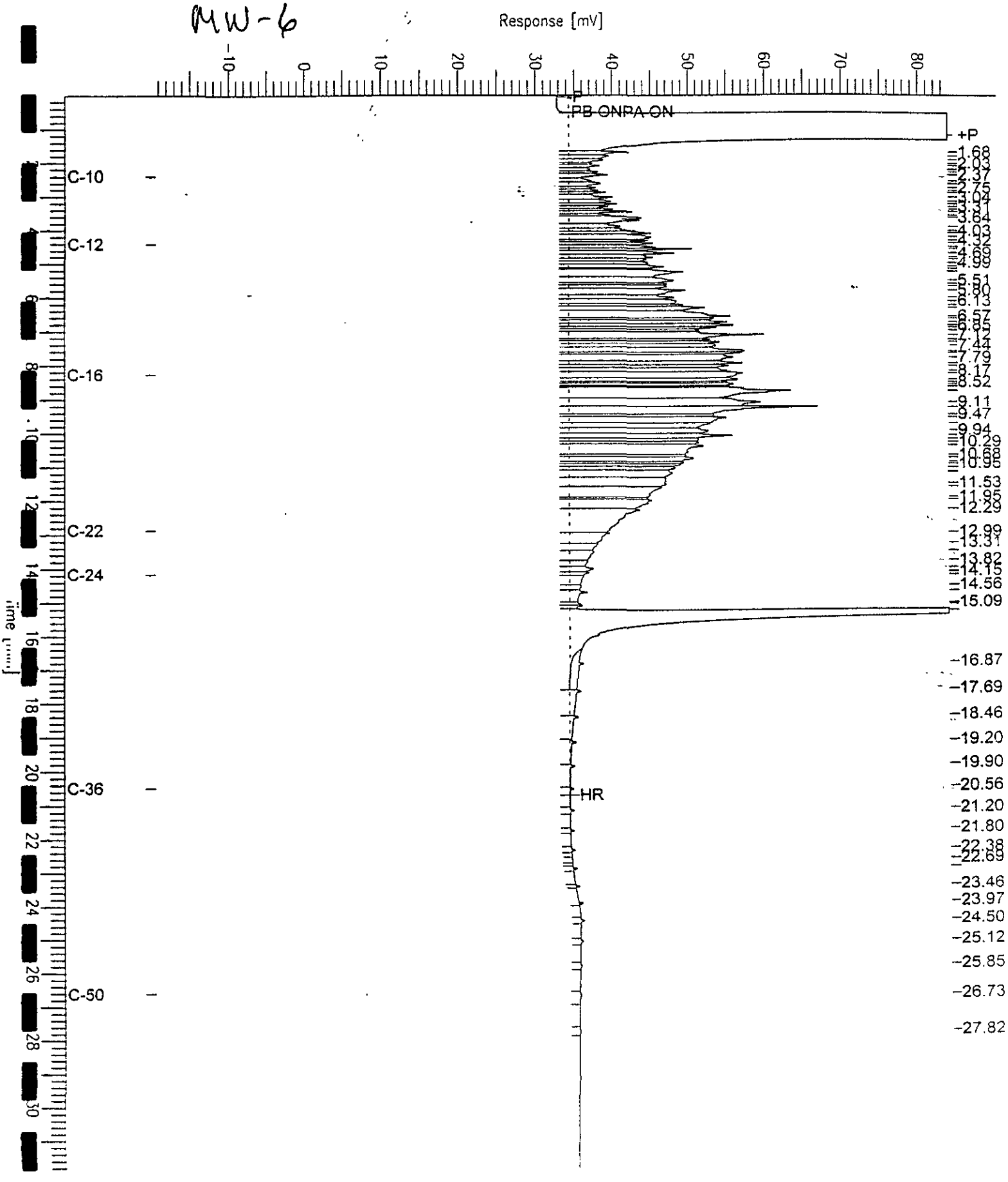


Chromatogram

Sample Name : 141692-007sg,50991
FileName : C:\GC15\CHB\277B009.RAW
Method : BTEH244.MTH
Start Time : 0.01 min End Time : 31.91 min
Scale Factor: 0.0 Plot Offset: -19 mV

Sample #: 50991 Page 1 of 1
Date : 10/04/1999 03:38 PM
Time of Injection: 10/04/1999 02:17 PM
Low Point : -19.36 mV High Point : 83.81 mV
Plot Scale: 103.2 mV

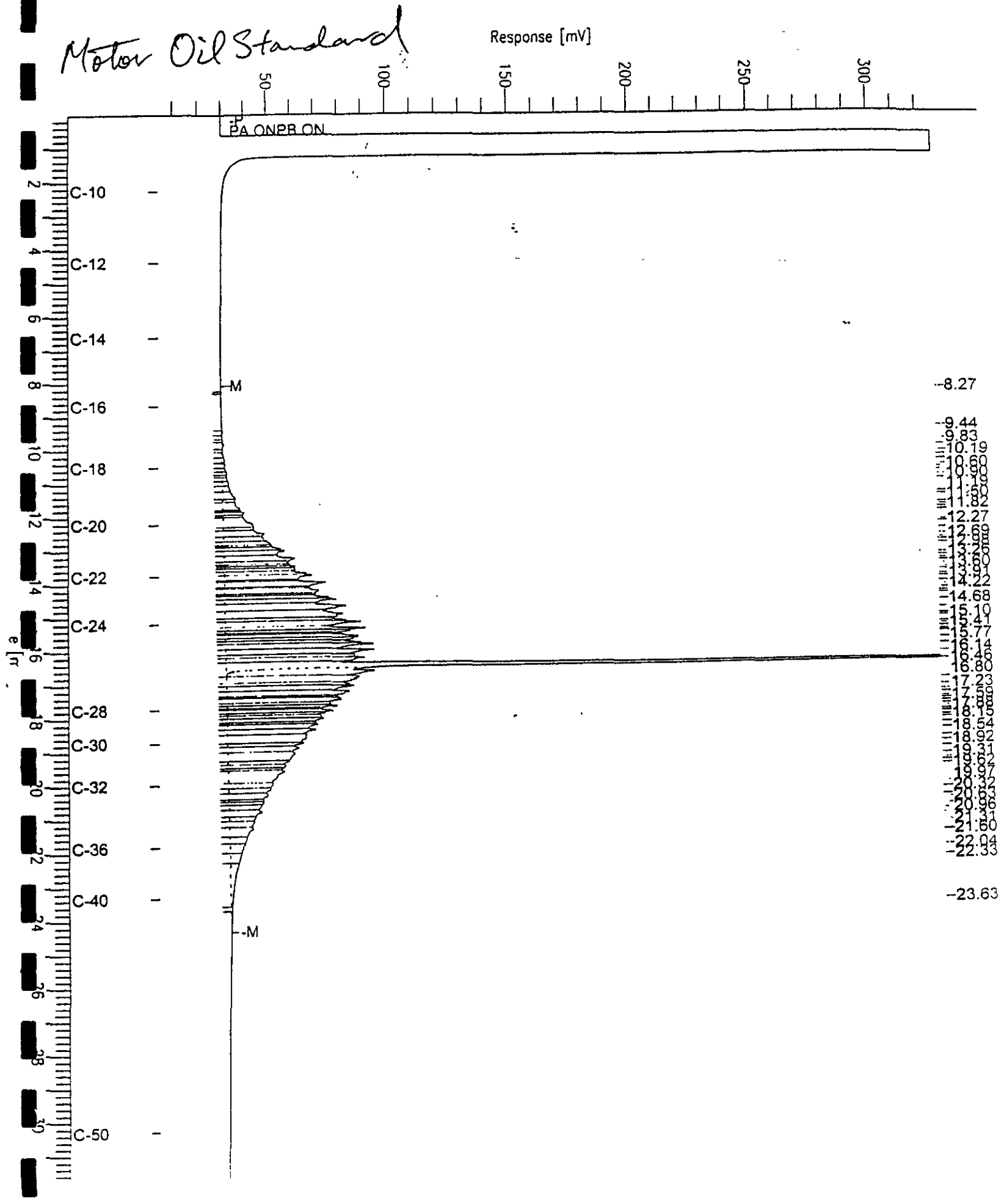
MW-6



: [redacted]le Name : ccv,99ws8084,mo
Fi[redacted] Name : G:\GC13\CH8\277B003.RAW
Method : BTEH274.MTH
: [redacted]art Time : 0.01 min End Time : 31.73 min
: [redacted]le Factor: 0.0 Plot Offset: 4 mV

Sample #: 500mg/l
Date : 10/04/1999 03:18 PM
Time of Injection: 10/04/1999 09:49 AM
Low Point : 4.50 mV High Point : 326.43 mV
Plot Scale: 321.9 mV

Motor Oil Standard



TEH-Tot Ext Hydrocarbons

Client: Harding Lawson Associates
Project#: 42633.1
Location: Port of Oakland-2277

Analysis Method: EPA 8015M
Prep Method: EPA 3520

BLANK SPIKE/BLANK SPIKE DUPLICATE

Matrix: Water
Batch#: 50991
Units: ug/L
Diln Fac: 1

Prep Date: 09/30/99
Analysis Date: 10/04/99

BS Lab ID: QC09148

Analyte	Spike Added	BS	%Rec #	Limits
Diesel C10-C24	2475	1616	65	50-114
Surrogate	**%Rec**	**Limits**		
Hexacosane	87	58-128		

BSD Lab ID: QC09149

Analyte	Spike Added	BSD	%Rec #	Limits	RPD #	Limit
Diesel C10-C24	2475	1735	70	50-114	7	25
Surrogate	**%Rec**	**Limits**				
Hexacosane	91	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