



PORT OF OAKLAND

ENVIRONMENTAL
PROTECTION

MAY 31 PM 3:51

May 30, 2000

Mr. Larry Seto
Sr. Hazardous Materials Specialist
Alameda County Health Care Services Agency
Environmental Protection (LOP)
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

**SUBJECT: 2277 SEVENTH STREET, OAKLAND, CALIFORNIA
STID #3899**

Dear Mr. Seto:

My apologies for the late reply to your April 19th letter. Please find enclosed copies of the following quarterly monitoring events:

May 1, 1999, *Quarterly Groundwater Monitoring and Product Recovery report, 1st Quarter of 1999, 2277 Seventh Street, Oakland, California;*

August 9, 1999, *Quarterly Groundwater Monitoring and Product Recovery report, 2nd Quarter of 1999, 2277 Seventh Street, Oakland, California;*

December 1, 1999, *Quarterly Groundwater Monitoring and Product Recovery report, 3rd Quarter of 1999, 2277 Seventh Street, Oakland, California; and*

April 19, 2000, *Quarterly Groundwater Monitoring and Product Recovery report, 4th Quarter of 1999, 2277 Seventh Street, Oakland, California.*

The first quarter report for this year is presently under preparation by the project consultant, Harding Lawson Associates. The final report will be forwarded to you as soon as it has been completed.

If you have any questions, please contact me at 627-1373.

Sincerely,

John Prall, R.G.

Associate Environmental Scientist

Cc: Jeff Jones



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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



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Associate Environmental Scientist

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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 Thompkins, 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:

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- 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 ($\mu\text{g/l}$) in MW-4 and 130 $\mu\text{g/l}$ 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 $\mu\text{g/l}$ and in MW-6 at 120 $\mu\text{g/l}$ last quarter.
- Benzene was reported at a concentration of 280 $\mu\text{g/l}$ in MW-4, at 20 $\mu\text{g/l}$ 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 $\mu\text{g/l}$ and in MW-6 at 18 $\mu\text{g/l}$ last quarter
- Toluene was reported at a concentration of 1.5 $\mu\text{g/l}$ in MW-4, at 0.51 $\mu\text{g/l}$ in MW-6 and was not detected in MW-2, MW-5, or MW-7.
- Ethylbenzene was reported at a concentration of 2.2 $\mu\text{g/l}$ 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 $\mu\text{g/l}$ 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 $\mu\text{g/l}$ last quarter and at 5.3 $\mu\text{g/l}$ the quarter before.
- TPHd was reported at a concentration of 63 $\mu\text{g/l}$ in MW-4 and of 820 $\mu\text{g/l}$ 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 $\mu\text{g/l}$ 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,

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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

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 ²	active skimmer
		1/14/1999	-	-	-	400 ²	active skimmer
		2/3/1999	-	-	-	400 ²	active skimmer
		2/26/1999	-	-	-	570 ²	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 ²	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 (cont.)	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
	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



December 1, 1999

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

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and Product Recovery Report
3rd Quarter of 1999
2277 Seventh Street
Oakland, California**

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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

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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:

December 1, 1999

42633.1

Mr. John Prall

Associate Environmental Scientist

Port of Oakland

Page 3

- 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 ($\mu\text{g/l}$) in MW-4 and 130 $\mu\text{g/l}$ 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 $\mu\text{g/l}$ and in MW-6 at 120 $\mu\text{g/l}$ last quarter.
- Benzene was reported at a concentration of 280 $\mu\text{g/l}$ in MW-4, at 20 $\mu\text{g/l}$ 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 $\mu\text{g/l}$ and in MW-6 at 18 $\mu\text{g/l}$ last quarter
- Toluene was reported at a concentration of 1.5 $\mu\text{g/l}$ in MW-4, at 0.51 $\mu\text{g/l}$ in MW-6 and was not detected in MW-2, MW-5, or MW-7.
- Ethylbenzene was reported at a concentration of 2.2 $\mu\text{g/l}$ 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 $\mu\text{g/l}$ 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 $\mu\text{g/l}$ last quarter and at 5.3 $\mu\text{g/l}$ the quarter before.
- TPHd was reported at a concentration of 63 $\mu\text{g/l}$ in MW-4 and of 820 $\mu\text{g/l}$ 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 $\mu\text{g/l}$ 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,

December 1, 1999

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Mr. John Prall

Associate Environmental Scientist

Port of Oakland

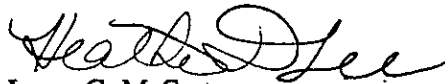
Page 4

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

JGM/SJO/mlw/42633/037486L

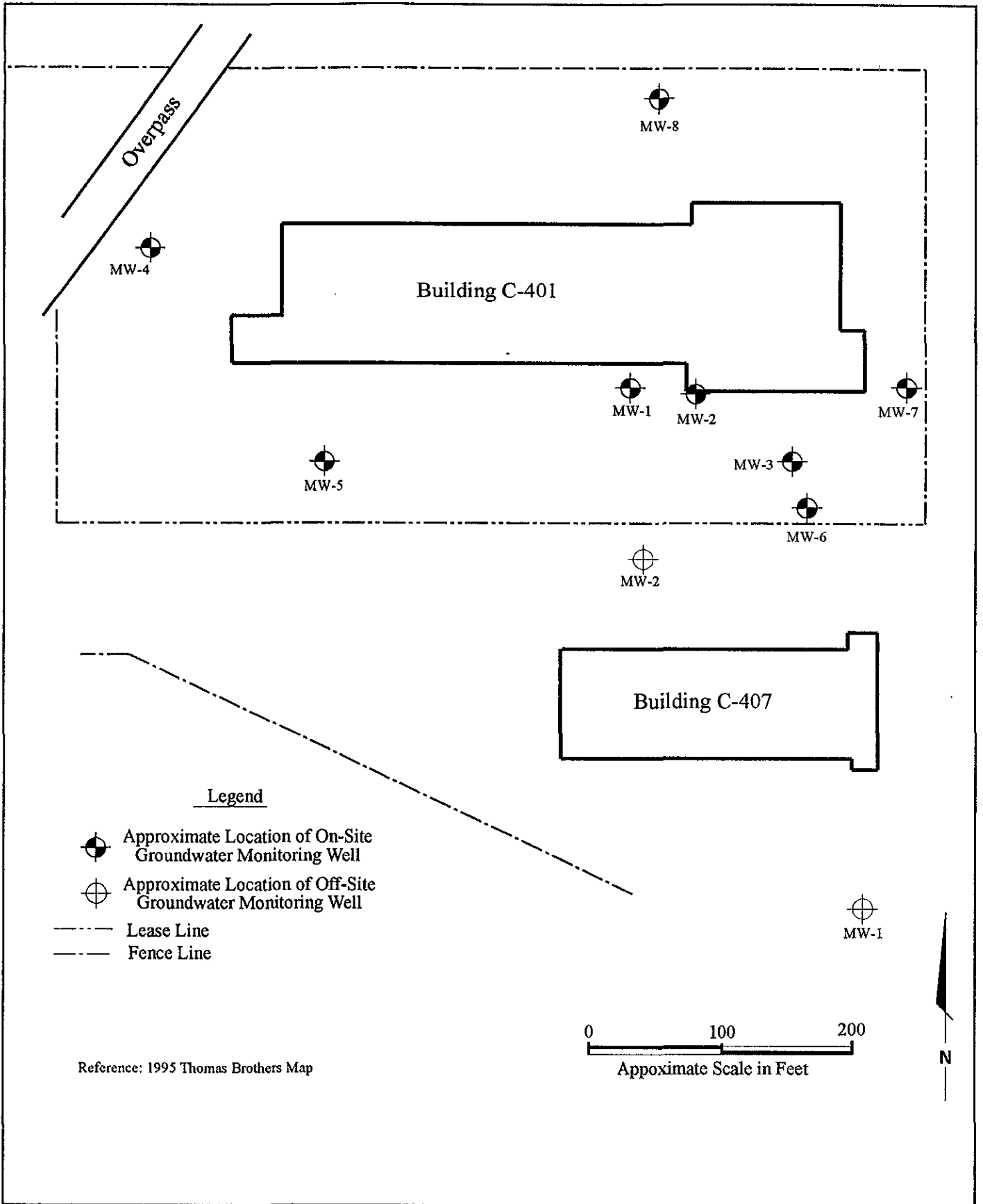
3 copies submitted



- 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

PLATES



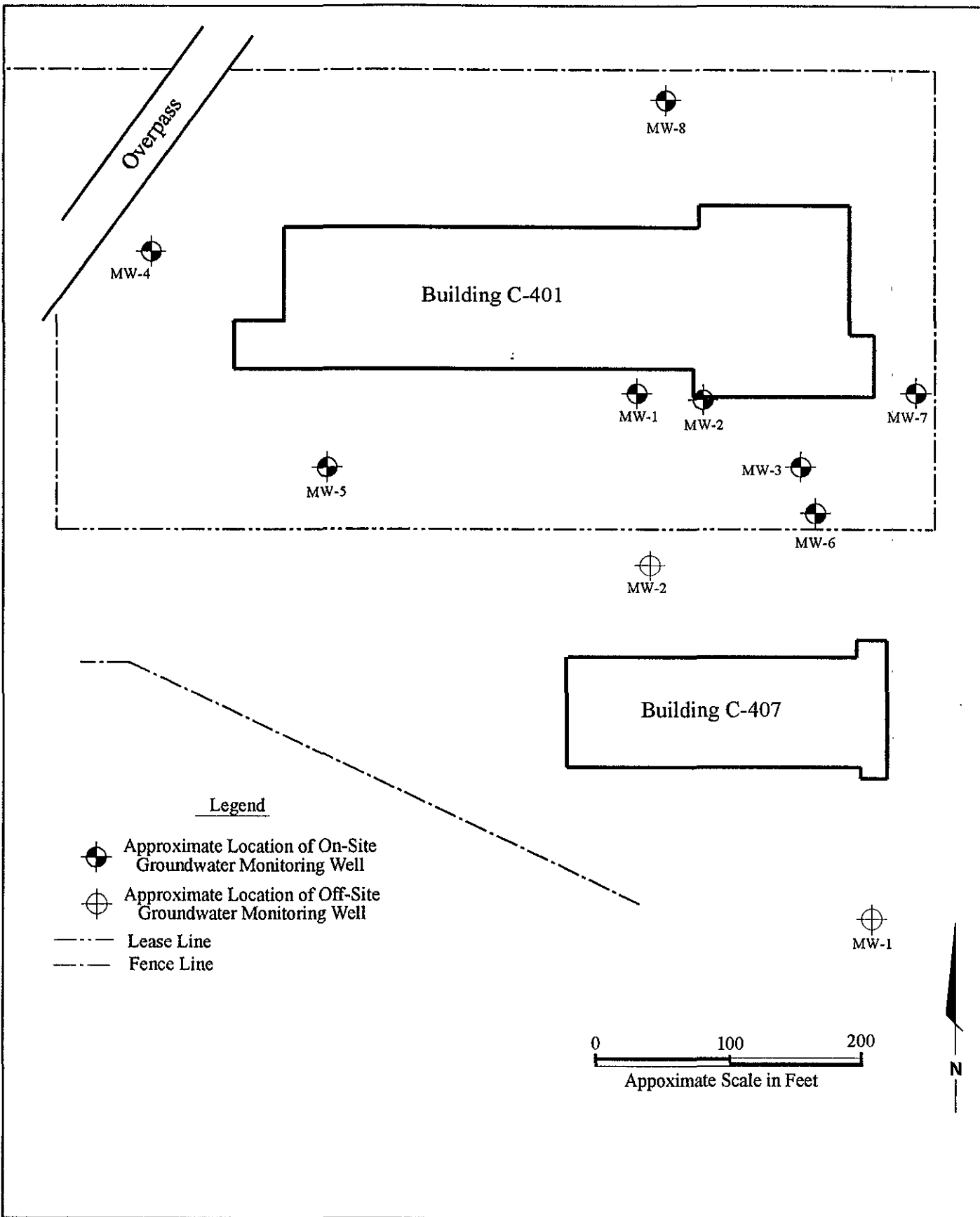


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 Engineering and
 Environmental Services

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

PLATE
1

DRAWN jgm	PROJECT NUMBER 42633.1	APPROVED	DATE 09/28/99	REVISED DATE
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 Engineering and
 Environmental Services

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

PLATE

2

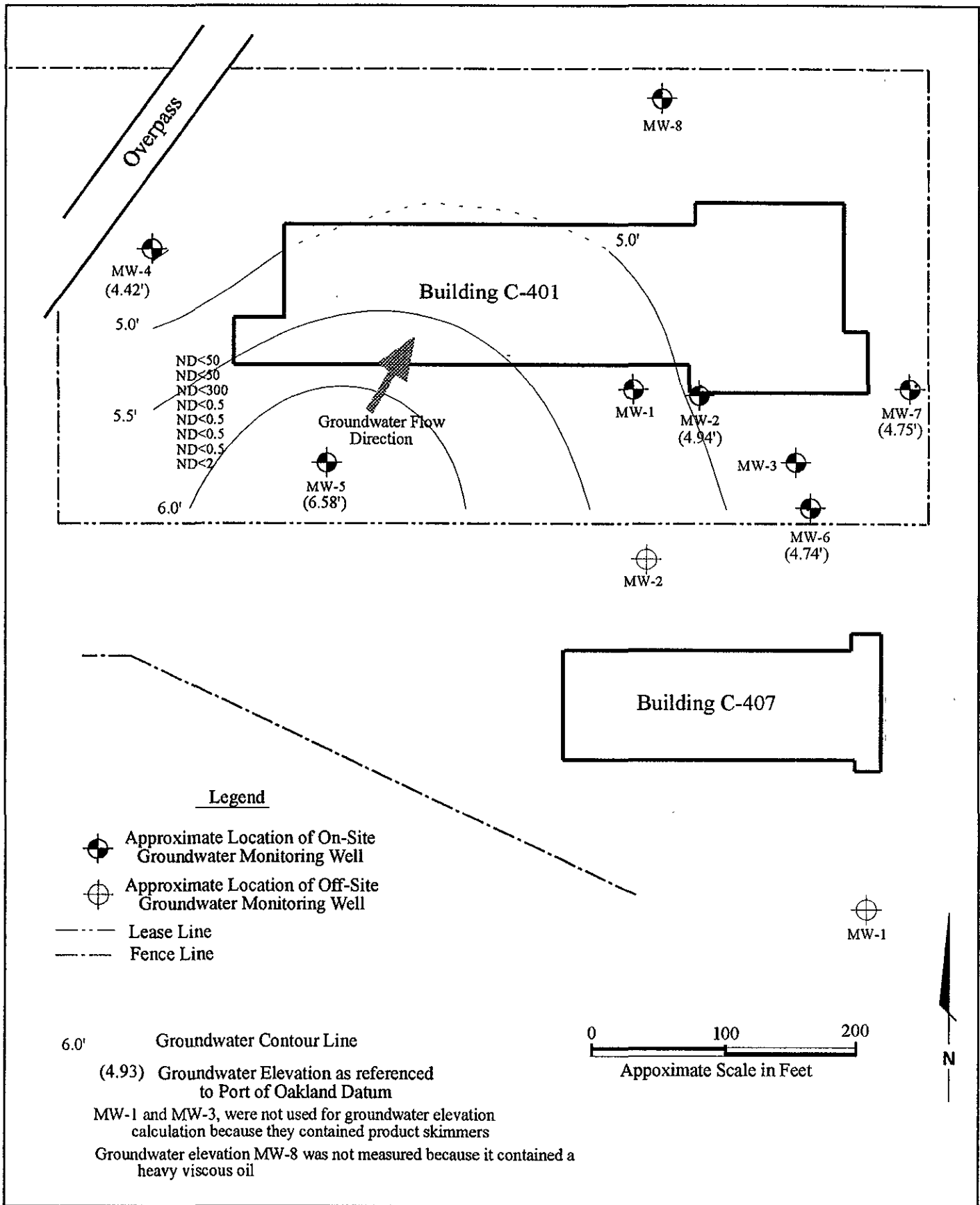
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 jgm

PROJECT NUMBER
 42633.1

APPROVED

DATE
 09/28/99

REVISED DATE



Harding Lawson Associates
 Engineering and
 Environmental Services

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

PLATE

3

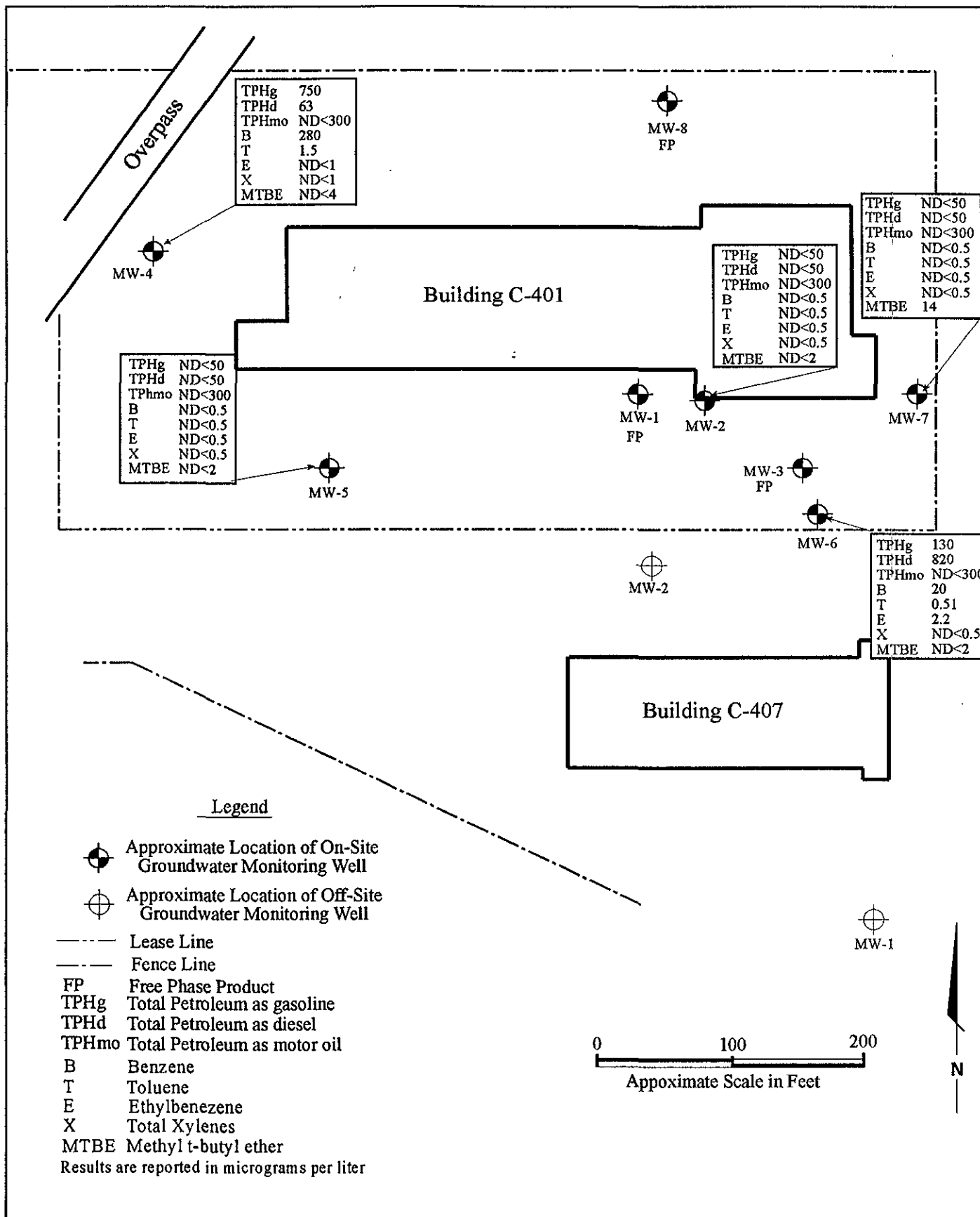
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 jgm

PROJECT NUMBER
 42633.1

APPROVED

DATE
 09/28/99

REVISED DATE



Harding Lawson Associates
Engineering and
Environmental Services

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

4

DRAWN
jgm

PROJECT NUMBER
42633.1

APPROVED

DATE
09/28/99

REVISED DATE

APPENDIX A
GROUNDWATER SAMPLE FORMS



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

Well No. MW-2
Well Type: Monitor Extraction Other _____
Well Material: PVC St. Steel Other _____
Date 9/28/99 Time 1104
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): 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

$$\left(\frac{15.27}{\text{TD (feet)}} - \frac{9.42}{\text{WL (feet)}} \right) \times \frac{2^2}{\text{D (inches)}} \times \frac{3}{\text{\# Vols}} \times 0.0408 = \frac{2.86}{\text{Calculated Purge Volume}} \text{ gallons}$$

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 $\frac{^{\circ}\text{C}}{^{\circ}\text{F}}$	Other _____
0	7.76	2360	74.7	
1	7.72	2350	72.0	
2	7.67	2310	72.0	
3	7.61	2330	71.6	

Minutes Since Pumping Began	pH	Cond. (µmhos/cm)	T $\frac{^{\circ}\text{C}}{^{\circ}\text{F}}$	Other _____
Meter Nos.	<u>9510</u>			

Observations During Purging (Well Condition, Turbidity, Color, Odor): no odor, initially clear because slightly brown

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

WELL SAMPLING

SAMPLING METHOD

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

SAMPLING DISTRIBUTION

Sample Series: _____

Sample No.	Volume/Cont.	Analysis Requested	Preservatives	Lab	Comments
MW-2	<u>3 Vols</u>	<u>TPHd, TPHmo</u> <u>TPHg, BTEX</u> <u>MTBE</u>	<u>HCL</u>	<u>Curtis Tompkins</u>	<u>w/ filtration & silica gel cleanup</u>

QUALITY CONTROL SAMPLES

Duplicate Samples

Original Sample No.	Duplicate Sample No.

Blank Samples

Type	Sample No.

Other Samples

Type	Sample No.
<u>Trip</u>	<u>Trip</u>



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

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

PURGE TIME

Start _____ Stop _____ Elapsed _____

PURGE RATE

Initial _____ gpm Final _____ gpm _____ gallons

ACTUAL PURGE VOLUME

FIELD PARAMETER MEASUREMENT

Minutes Since Pumping Began	pH	Cond. (µmhos/cm)	T <input type="checkbox"/> °C <input type="checkbox"/> °F	Other _____

Minutes Since Pumping Began	pH	Cond. (µmhos/cm)	T <input type="checkbox"/> °C <input type="checkbox"/> °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

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

SAMPLING DISTRIBUTION

Sample Series: _____

Sample No.	Volume/Cont.	Analysis Requested	Preservatives	Lab	Comments
	<u>2 Ambers</u>	<u>TPHd, TPHmo</u>	<u>-</u>	<u>Curtis & Tompkins</u>	<u>w/ filtration & silica gel cleanup</u>
	<u>3 Vols</u>	<u>TPHg, BTEX, MTBE</u>	<u>HCL</u>		

QUALITY CONTROL SAMPLES

Duplicate Samples

Original Sample No.	Duplicate Sample No.

Blank Samples

Type	Sample No.

Other Samples

Type	Sample No.
<u>Trip</u>	



Job Name 2277 7th St.
Job Number 42633-1
Recorded by Heath 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 ADL
(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

$$\left(\frac{18.84}{\text{TD (feet)}} - \frac{8.73}{\text{WL (feet)}} \right) \times \frac{2^2}{\text{D (inches)}} \times \frac{3}{\text{\# Vols}} \times 0.0408 = \frac{4.95}{\text{Calculated Purge Volume}} \text{ gallons}$$

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 $\begin{matrix} \square & \text{°C} \\ \square & \text{°F} \end{matrix}$	Other
2	8.07	1890	74.3	
1.5	7.95	1690	73.4	
3	7.62	1700	73.2	
5	7.01	1710	72.8	

Minutes Since Pumping Began	pH	Cond. (µmhos/cm)	T $\begin{matrix} \square & \text{°C} \\ \square & \text{°F} \end{matrix}$	Other
Meter Nos.	<u>9510</u>			

Observations During Purging (Well Condition, Turbidity, Color, Odor): no odor, clear to light brown

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

WELL SAMPLING

SAMPLING METHOD

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

SAMPLING DISTRIBUTION

Sample Series: _____

Sample No.	Volume/Cont.	Analysis Requested	Preservatives	Lab	Comments
MW-4	@ 1Abers	TPH d, TPHmo	-	Curtis + Tompkins	w/ filtration of silica gel cleanup
	3 Vols	TPHg, BTEX MTBE	HCL	"	

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.
Trp	ADL Trp



Job Name 2277 7th St.
Job Number 42633-1
Recorded by Heath 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 JGus 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

$$\left(\frac{17.68}{\text{TD (feet)}} - \frac{6.91}{\text{WL (feet)}} \right) \times \frac{2^2}{\text{D (Inches)}} \times \frac{3}{\text{\# Vols}} \times 0.0408 = \frac{5.27}{\text{Calculated Purge Volume}} \text{ gallons}$$

PURGE TIME

0942 Start 0951 Stop 9 Elapsed

PURGE RATE

Initial _____ gpm Final _____ gpm 6 gallons

ACTUAL PURGE VOLUME

FIELD PARAMETER MEASUREMENT

Minutes Since Pumping Began	pH	Cond. (µmhos/cm)	T °C / °F	Other
<u>2</u>	<u>7.28</u>	<u>2460</u>	<u>74.9</u>	
<u>2</u>	<u>7.25</u>	<u>2550</u>	<u>74.8</u>	
<u>4</u>	<u>7.24</u>	<u>2580</u>	<u>74.1</u>	
<u>6</u>	<u>7.26</u>	<u>2590</u>	<u>74.0</u>	

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

Observations During Purging (Well Condition, Turbidity, Color, Odor): clean, no odor becomes murky brown w/ Ben
Discharge Water Disposal: Sanitary Sewer Storm Sewer Other Drum on Site

WELL SAMPLING

SAMPLING METHOD

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

SAMPLE DISTRIBUTION

Sample Series: _____

Sample No.	Volume/Cont.	Analysis Requested	Preservatives	Lab	Comments
<u>MW-5</u>	<u>1 Ambers</u>	<u>TPH d, TPH mo</u>	<u>-</u>	<u>Curtis + Tompkins</u>	<u>w/ filtration + silica gel cleanup</u>
	<u>3 Vols</u>	<u>TPH g, BTEX</u>	<u>HCL</u>	<u>"</u>	
		<u>- MTBE</u>			

QUALITY CONTROL SAMPLES

Duplicate Samples

Original Sample No.	Duplicate Sample No.

Blank Samples

Type	Sample No.

Other Samples

Type	Sample No.
<u>Trip</u>	<u>TRSP 0999 (0925)</u>



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 SGM 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 TAKESETTING

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

PURGE VOLUME CALCULATION

$$\left(\frac{18.05 - 9.26}{\text{TD (feet)}} \right) \times \frac{2^2}{\text{D (inches)}} \times \frac{3}{\text{\# Vols}} \times 0.0408 = 4.3 \text{ gallons}$$

PURGE TIME

PURGE RATE

ACTUAL PURGE VOLUME

1204 Start 1226 Stop 22 Elapsed Initial _____ gpm Final _____ gpm 4.5 gallons

FIELD PARAMETER MEASUREMENT

Minutes Since Pumping Began	pH	Cond. (µmhos/cm)	T °C / °F	Other
6	7.54	4790	77.2	
15	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.	<u>9510</u>			

Observations During Purging (Well Condition, Turbidity, Color, Odor): fuel odor, clear w/ floaters to grey, sheer
Discharge Water Disposal: Sanitary Sewer Storm Sewer Other Drum on Site

WELL SAMPLING

SAMPLING METHOD

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

SAMPLING DISTRIBUTION

Sample Series: _____

Sample No.	Volume/Cont.	Analysis Requested	Preservatives	Lab	Comments
<u>MW-6</u>	<u>21 Ambers</u>	<u>TPHd, TPHmo</u>	<u>-</u>	<u>Curtis + Tompkins</u>	<u>w/ filtration & silica gel cleanup</u>
	<u>3 Vols</u>	<u>TPHg, BTEX, MTBE</u>	<u>HCL</u>	<u>''</u>	

QUALITY CONTROL SAMPLES

Duplicate Samples

Original Sample No.	Duplicate Sample No.

Blank Samples

Type	Sample No.

Other Samples

Type	Sample No.
<u>Trip</u>	



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 9/28/99 Time 1033
Sampled by [Signature]
(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

Bailor - 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

$$\left(\frac{18.16 - 9.60}{\text{TD (feet)}} \right) \times \frac{2^2 \times 3}{\text{D (inches)} \times \text{\# Vols}} \times 0.0408 = 4.2 \text{ gallons}$$

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
1	7.60	2300	72.4	
1.5	7.58	2230	72.1	
3	7.47	2210	71.4	
4.5	7.42	2210	72.0	

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

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

Bailor - Type: Reflow Disposable Same As Above
 Submersible Centrifugal Bladder; Pump No.: Grab - Type:
 Other - Type:

SAMPLE DISTRIBUTION

Sample Series: _____

Sample No.	Volume/Cont.	Analysis Requested	Preservatives	Lab	Comments
MW-7	21 Ambers	TPH d, TPH m	-	Curtis Tompkins	w/ filtration & silica gel cleanup
	3 Vols	TPH g, 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



CCT 1 3 1000

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:

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

141692

CHAIN OF CUSTODY FORM

Lab: Curtis & Tompkins

Job Number: 42033.1
 Name/Location: Port of Oakland - 2277 7th Street
 Project Manager: Jim McCarty

Samplers: Heather Lee
 Recorder: Heather Lee
(Signature Required)

SOURCE CODE	MATRIX					# CONTAINERS & PRESERV.					SAMPLE NUMBER OR LAB NUMBER			DATE			
	Water	Sediment	Soil	Oil	Ice	Unpres.	H ₂ O ₂	HNO ₃	HCL	Ice	Yr	Wk	Seq	Yr	Mo	Day	Time
	X												TRIP	09	09	28	09:25
	X					1							MW-5			99	09 28 09:55
	X					1							MW-7			99	09 28 10:33
	X					1							MW-2			99	09 28 11:04
	X					1							MW-4			99	09 28 11:38
	X					1							DUP	09	09	99	99 09 28 11:50
	X					1							MW-6			99	09 28 12:32

STATION DESCRIPTION/NOTES

ANALYSIS REQUESTED							
EPA 8010	EPA 8020	EPA 8260	EPA 8270	METALS	EPA 8015M/TPHG	EPA 8020/BTEX/MTBE	EPA 8015M/TPHd, oTPH mo
					X	X	X
					X	X	X
					X	X	X
					X	X	X
					X	X	X
					X	X	X

LAB NUMBER			DEPTH IN FEET	COL MTD CD	QA CODE	MISCELLANEOUS
Yr	Wk	Seq				
						Silica gel cleanup on TPHd + TPH mo
						Standard TAT
						Attn: Anna
						Sample TRIP0999
						BTEX, MTBE only

CHAIN OF CUSTODY RECORD		
RELINQUISHED BY: (Signature) <u>Heather Lee</u>	RECEIVED BY: (Signature) <u>Anna Bennett</u>	DATE/TIME 9/28/99 1320
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)
METHOD OF SHIPMENT		
SAMPLE CONDITION WHEN RECEIVED BY THE LABORATORY		

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

Chromatogram

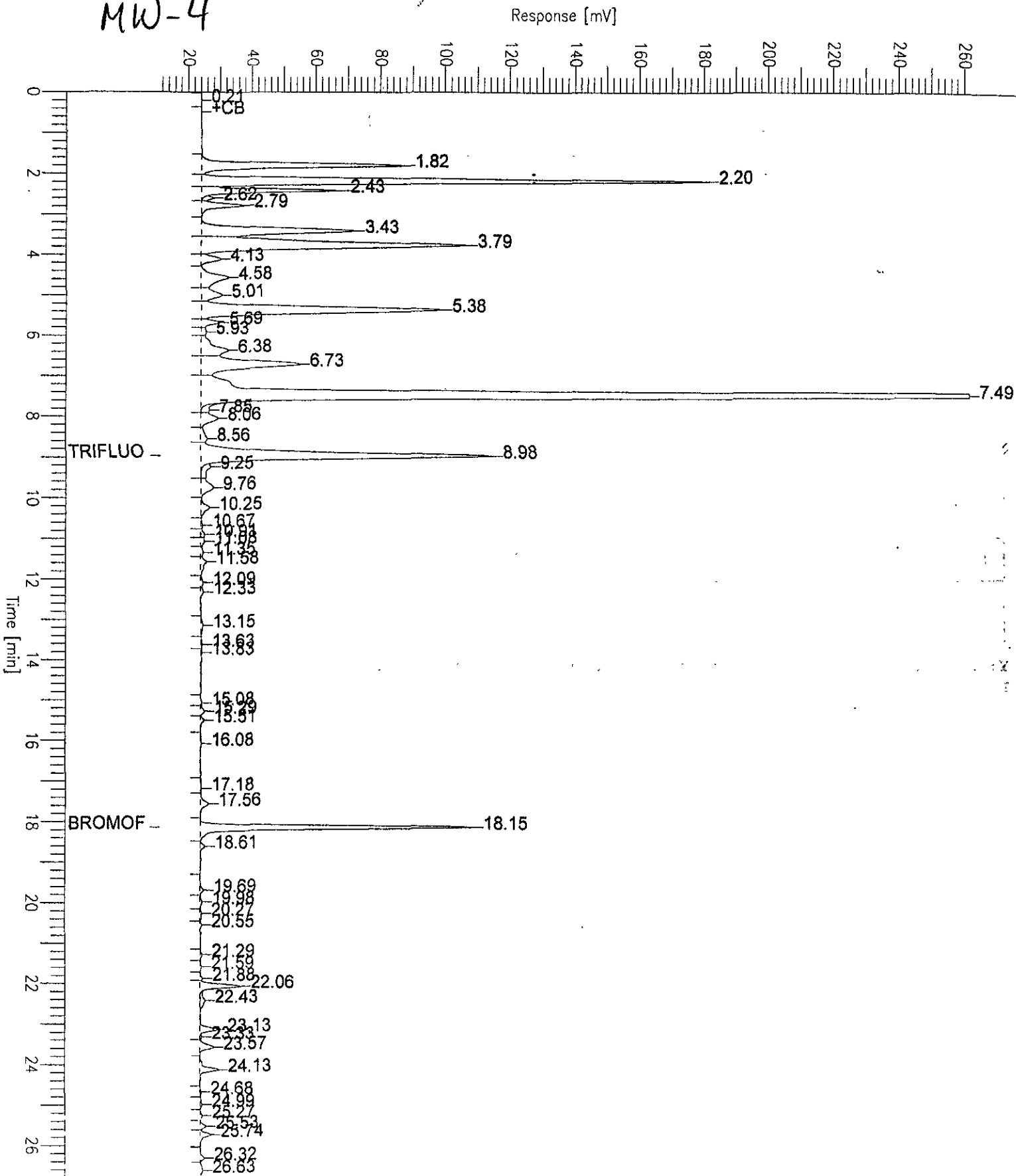
Sample Name : 141692-005,50999
FileName : G:\GC05\DATA\274G024.raw
Method : TVHBTXE
Start Time : 0.00 min
Scale Factor: -1.0

End Time : 26.80 min
Plot Offset: 11 mV

Sample #:
Date : 10/2/99 04:20 AM
Time of Injection: 10/2/99 03:53 AM
Low Point : 11.42 mV
Plot Scale: 250.0 mV
High Point : 261.42 mV

Page 1 of 1

MW-4



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

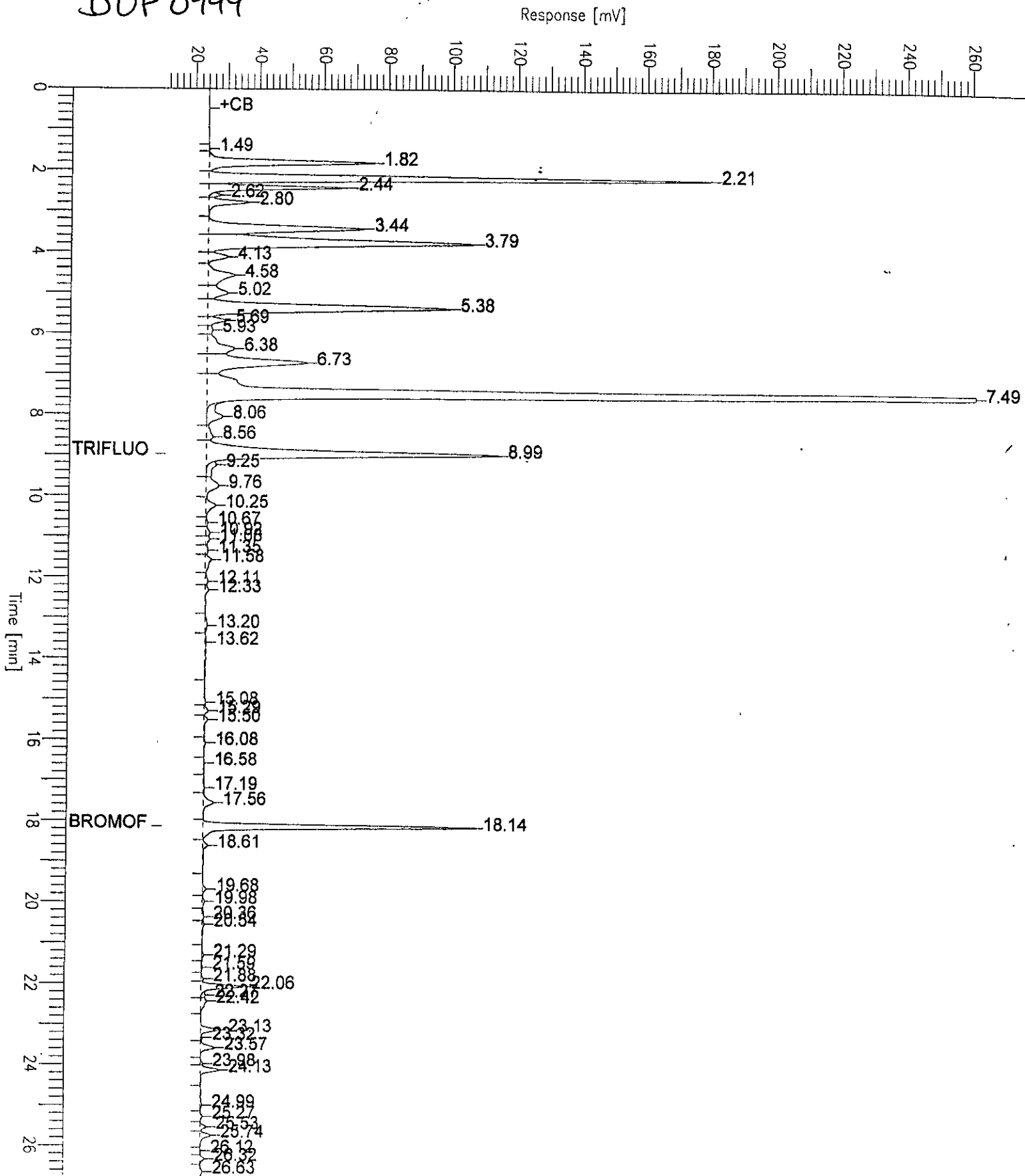
Chromatogram

Sample Name : 141692-006,50999
FileName : G:\GC05\DATA\274G025.raw
Method : TVHBTXE
Start Time : 0.00 min
Scale Factor: -1.0

End Time : 26.80 min
Plot Offset: 11 mV

Sample #: Page 1 of 1
Date : 10/2/99 05:01 AM
Time of Injection: 10/2/99 04:33 AM
Low Point : 11.35 mV High Point : 261.35 mV
Plot Scale: 250.0 mV

DUP 0999



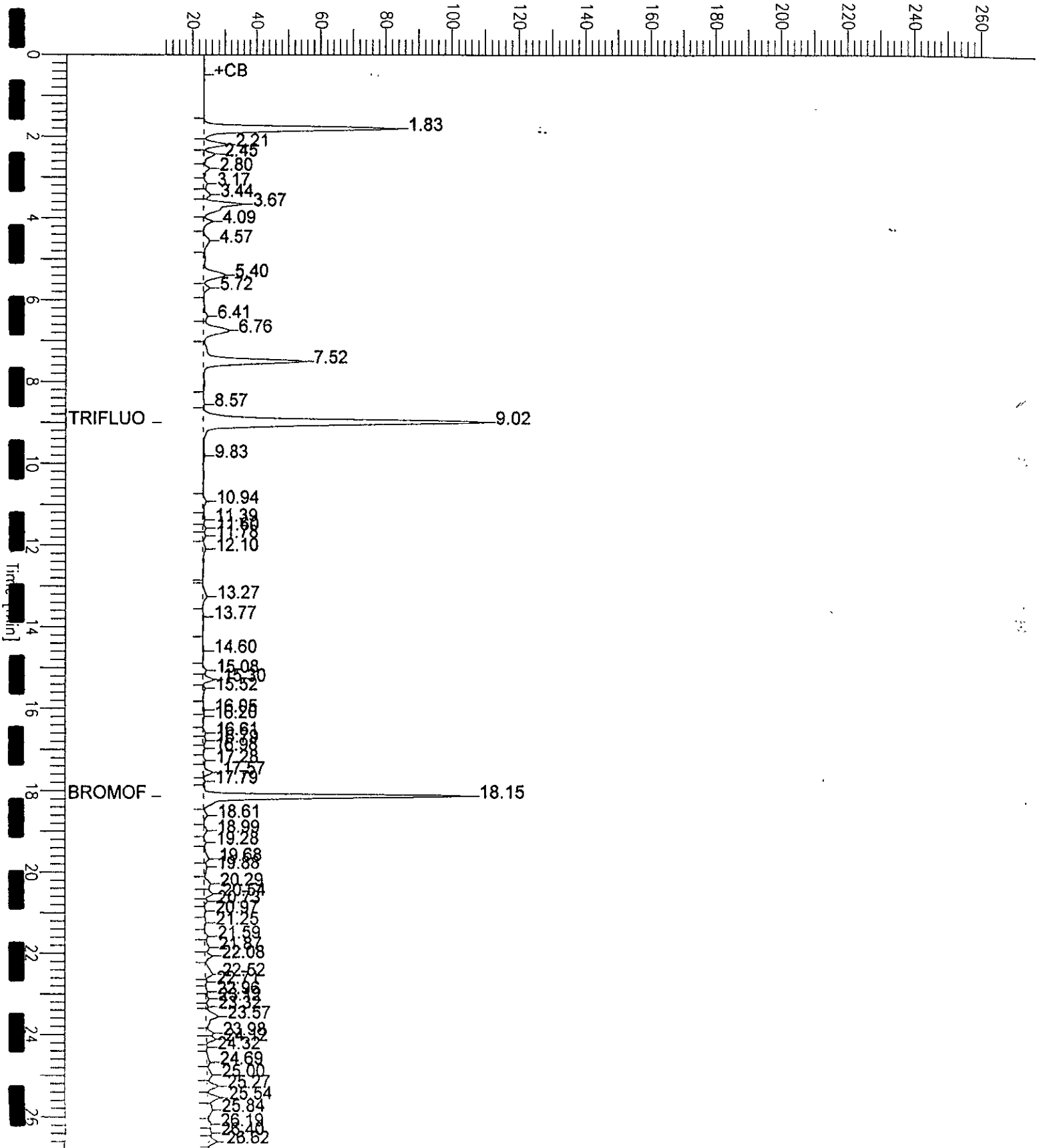
Chromatogram

Sample Name : 141692-007,50999
FileName : G:\GC05\DATA\274G008.raw
Method : TVHBTXE
Start Time : 0.00 min
Scale Factor: -1.0

Sample #:
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
End Time : 26.80 min
Plot Offset: 11 mV
Plot Scale: 250.0 mV

MW-6

Response [mV]



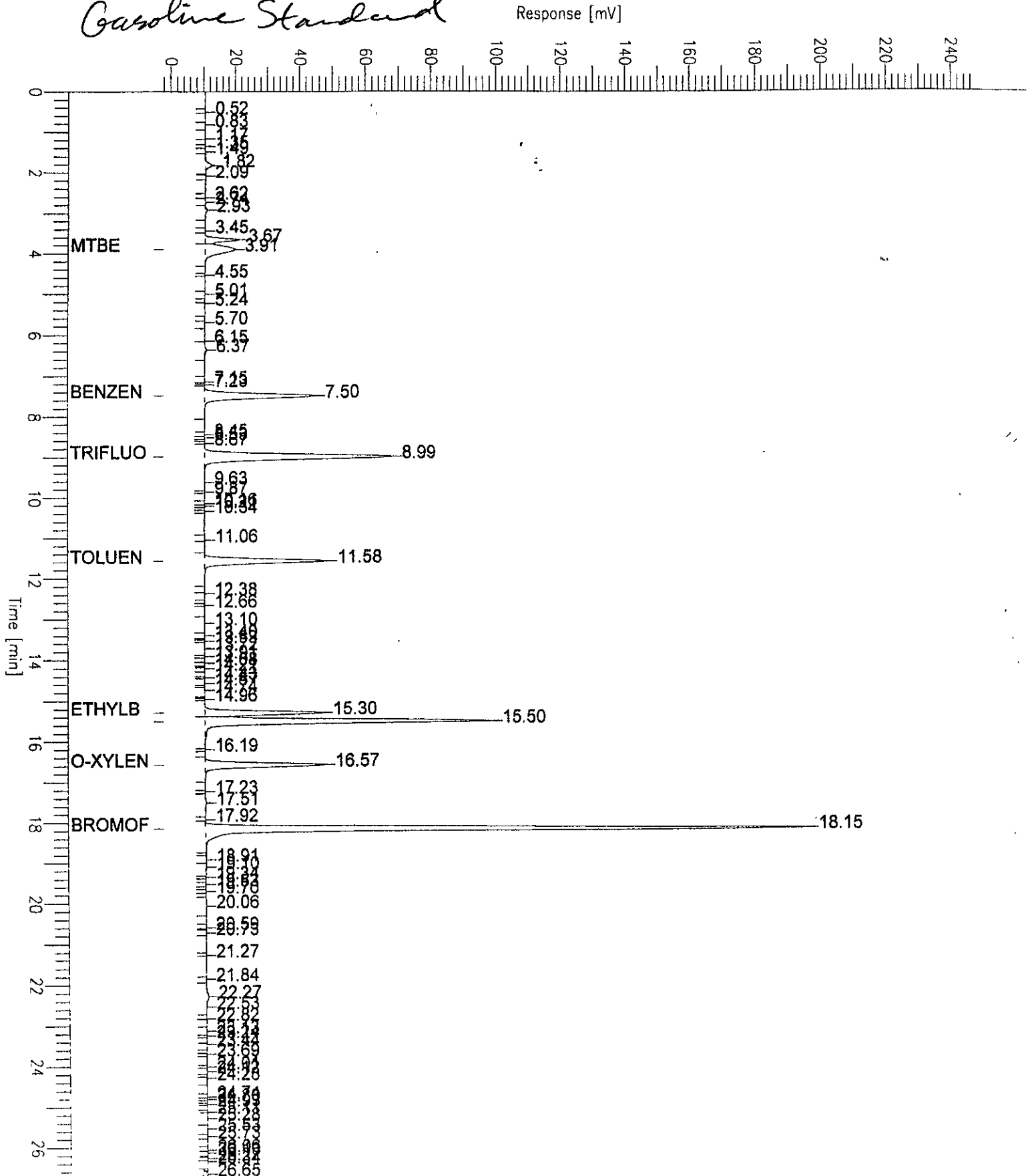
GC05 'H' File PID BTXE Quant

Sample Name : LCS, QC09174, 99WS8003, 50999
 FileName : G:\GC05\DATA\274H003.raw
 Method : TVHBTXE
 Start Time : 0.00 min
 Scale Factor : -1.0

End Time : 26.80 min
 Plot Offset : -2 mV

Sample #: MBTXE
 Date : 10/1/99 02:18 PM
 Time of Injection: 10/1/99 01:51 PM
 Low Point : -2.10 mV
 High Point : 247.90 mV
 Plot Scale: 250.0 mV

Gasoline Standard



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	Units	141692-001	141692-002	141692-003	141692-004
Diln Fac:		1	1	1	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

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
141692-005	MW-4	51038	09/28/99	10/04/99	10/04/99	
141692-006	DUP 0999	51038	09/28/99	10/04/99	10/04/99	
141692-007	MW-6	50999	09/28/99	10/01/99	10/01/99	

Matrix: Water

Analyte	Units	141692-005	141692-006	141692-007
Diln Fac:		2	2	1
MTBE	ug/L	<4	<4	<2
Benzene	ug/L	280	290	20
Toluene	ug/L	1.5	1.5	0.51
Ethylbenzene	ug/L	<1	<1	2.2
m,p-Xylenes	ug/L	<1	<1	<0.5
o-Xylene	ug/L	<1	<1	<0.5
Surrogate				
Trifluorotoluene	%REC	90	88	89
Bromofluorobenzene	%REC	85	84	87

Lab #: 141692

BATCH QC REPORT



Curtis & Tompkins Ltd.
Page 1 of 1

TVH-Total Volatile Hydrocarbons

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

Analysis Method: EPA 8015M
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
Gasoline C7-C12	<50

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

Lab #: 141692

BATCH QC REPORT



Curtis & Tompkins, Ltd.
Page 1 of 1

TVH-Total Volatile Hydrocarbons

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

Analysis Method: EPA 8015M
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: QC09173

Analyte	Result	Spike Added	%Rec #	Limits
Gasoline C7-C12	1981	2000	99	77-117
Surrogate	%Rec	Limits		
Trifluorotoluene	109	53-150		
Bromofluorobenzene	97	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

Lab #: 141692

BATCH QC REPORT



Curtis & Tompkins Ltd
Page 1 of 1

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

Lab #: 141692

BATCH QC REPORT



Curtis & Tompkins, Ltd.
Page 1 of 1

BTXR

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#: 51038
Units: ug/L
Diln Fac: 1

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

MB Lab ID: QC09340

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	79	51-143
Bromofluorobenzene	80	37-146

Lab #: 141692

BATCH QC REPORT

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



BTXE

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

Analysis Method: EPA 8021B
 Prep Method: EPA 5030

BLANK SPIKE/BLANK SPIKE DUPLICATE

Matrix: Water
 Batch#: 51038
 Units: ug/L
 Diln Fac: 1

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

BS Lab ID: QC09338

Analyte	Spike Added	BS	%Rec #	Limits
MTBE	20	16.47	82	66-126
Benzene	20	18.29	91	65-111
Toluene	20	18.16	91	76-117
Ethylbenzene	20	19.51	98	71-121
m,p-Xylenes	40	40.02	100	80-123
o-Xylene	20	20.11	101	75-127
Surrogate	%Rec	Limits		
Trifluorotoluene	82	51-143		
Bromofluorobenzene	85	37-146		

BSD Lab ID: QC09339

Analyte	Spike Added	BSD	%Rec #	Limits	RPD #	Limit
MTBE	20	16.82	84	66-126	2	12
Benzene	20	18.63	93	65-111	2	10
Toluene	20	18.66	93	76-117	3	10
Ethylbenzene	20	20.09	100	71-121	3	11
m,p-Xylenes	40	40.37	101	80-123	1	10
o-Xylene	20	20.49	102	75-127	2	11
Surrogate	%Rec	Limits				
Trifluorotoluene	83	51-143				
Bromofluorobenzene	86	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

Lab #: 141692

BATCH QC REPORT



BTXE

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

Analysis Method: EPA 8021B
Prep Method: EPA 5030

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

Field ID: MW-2
Lab ID: 141692-004
Matrix: Water
Batch#: 50999
Units: ug/L
Diln Fac: 1

Sample Date: 09/28/99
Received Date: 09/28/99
Prep Date: 10/01/99
Analysis Date: 10/01/99

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

TEH-Tot Ext Hydrocarbons

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

Analysis Method: EPA 8015M
Prep Method: EPA 3520

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
141692-002	MW-5	50991	09/28/99	09/30/99	10/04/99	
141692-003	MW-7	50991	09/28/99	09/30/99	10/04/99	
141692-004	MW-2	50991	09/28/99	09/30/99	10/04/99	
141692-005	MW-4	50991	09/28/99	09/30/99	10/04/99	

Matrix: Water

Analyte	Units	141692-002	141692-003	141692-004	141692-005
Diln Fac:		1	1	1	1
Diesel C10-C24	ug/L	<50	<50	<50	63 YL
Motor Oil C24-C36	ug/L	<300	<300	<300	<300
Surrogate					
Hexacosane	%REC	90	71	89	90

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

Chromatogram

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

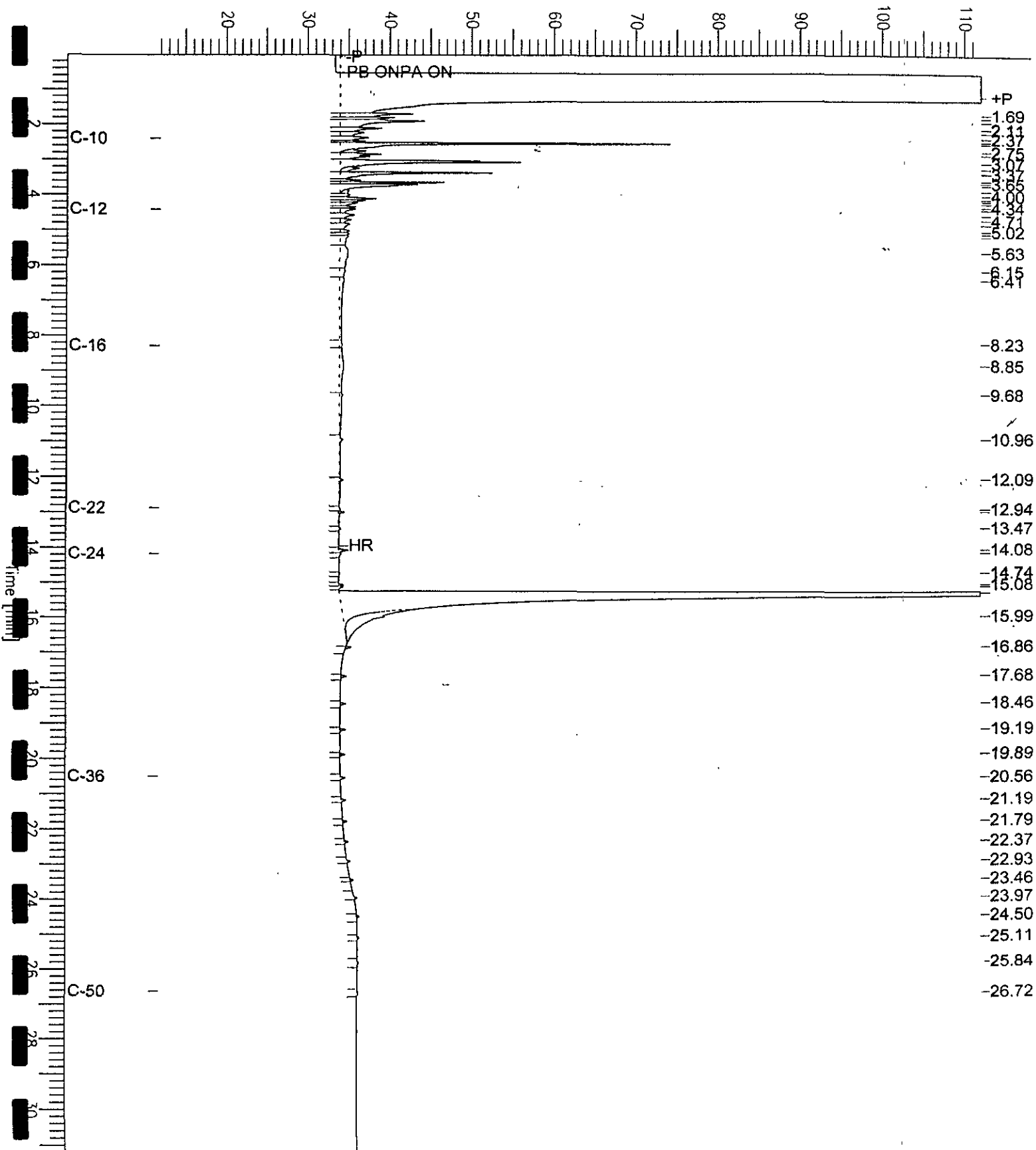
End Time : 31.19 min
Plot Offset: 12 mV

Sample #: 50991
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

Page 1 of 1

MW-4

Response [mV]



TEH-Tot Ext Hydrocarbons

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

 Analysis Method: EPA 8015M
 Prep Method: EPA 3520

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
141692-006	DUP 0999	50991	09/28/99	09/30/99	10/04/99	
141692-007	MW-6	50991	09/28/99	09/30/99	10/04/99	

Matrix: Water

Analyte	Units	141692-006	141692-007
Diln Fac:		1	1
Diesel C10-C24	ug/L	<50	820
Motor Oil C24-C36	ug/L	<300	<300
Surrogate			
Hexacosane	%REC	72	88

Chromatogram

Sample Name : 141692-007sg,50991

Sample #: 50991

Page 1 of 1

FileName : C:\GC15\CHB\277B009.RAW

Date : 10/04/1999 03:38 PM

Method : BTEH244.MTH

Time of Injection: 10/04/1999 02:17 PM

Start Time : 0.01 min

End Time : 31.91 min

Low Point : -19.36 mV

High Point : 83.81 mV

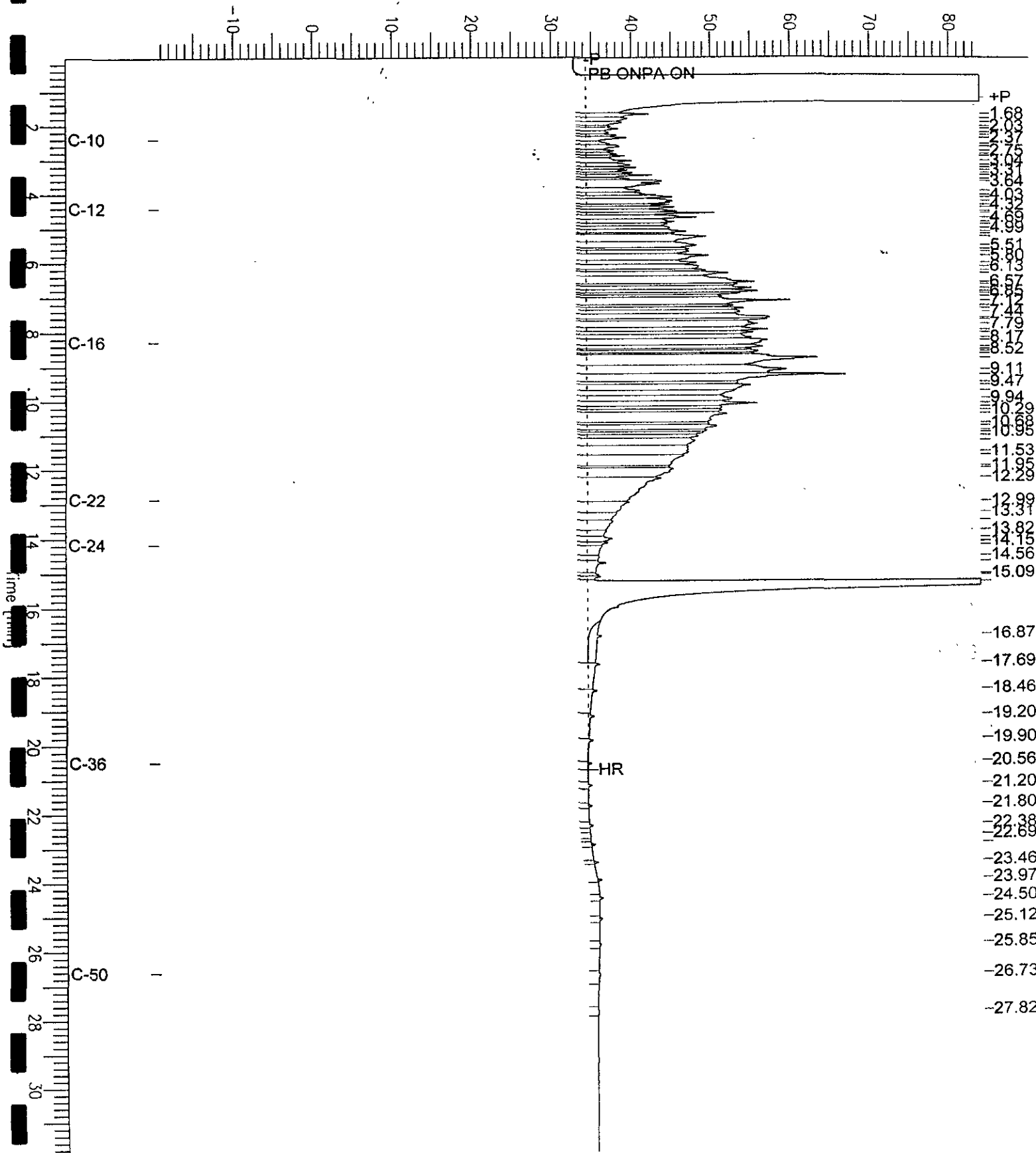
Scale Factor: 0.0

Plot Offset: -19 mV

Plot Scale: 103.2 mV

MW-6

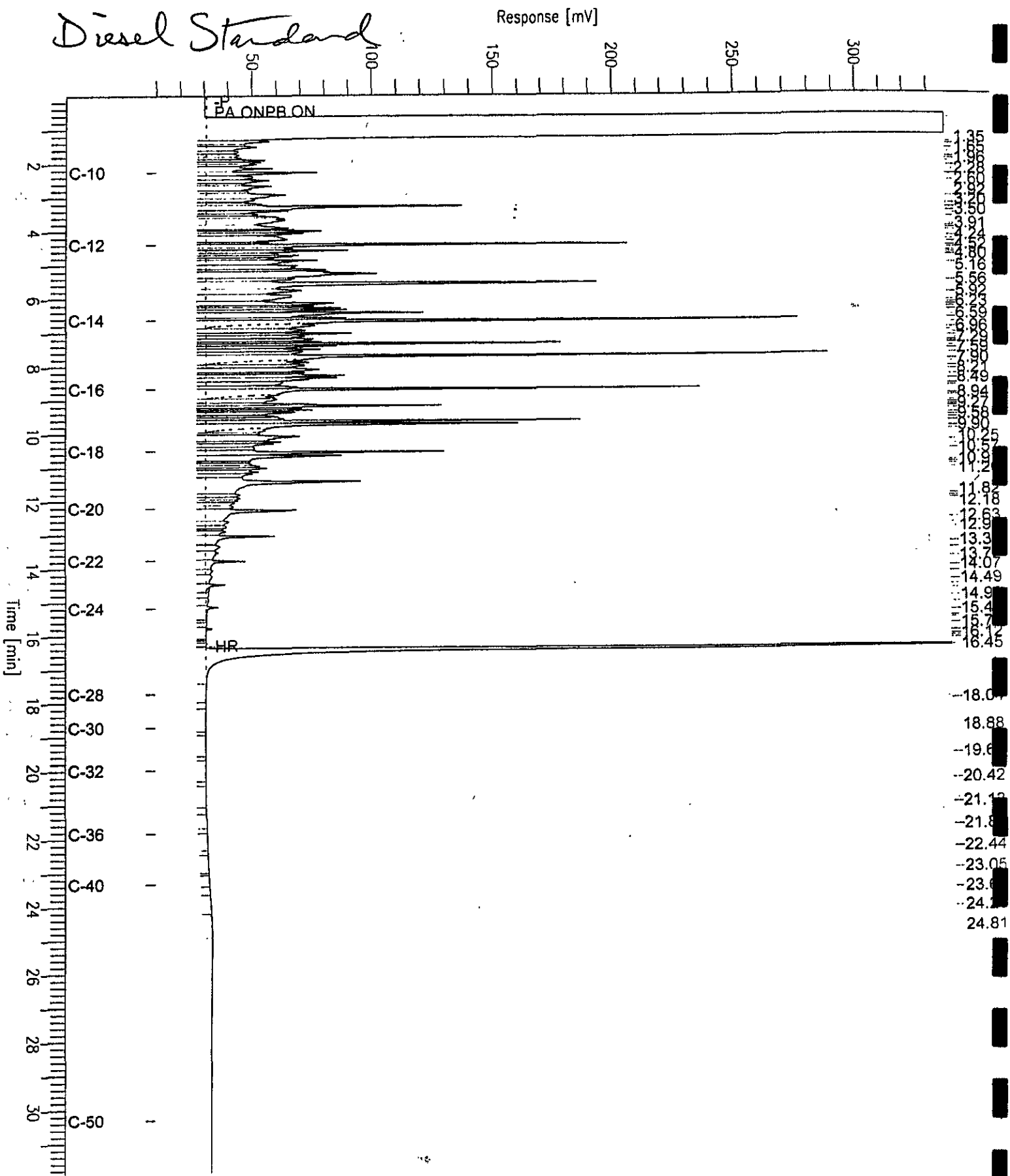
Response [mV]



Sample Name : ccv,99ws8168,ds1
FileName : G:\GC13\CHB\277B002.RAW
Method : BTEH274.MTH
Start Time : 0.01 min
Scale Factor : 0.0

Sample #: 500mg/l
Date : 10/04/1999 03:17 PM
Time of Injection: 10/04/1999 09:07 AM
Low Point : 9.98 mV
High Point : 337.32 mV
Plot Scale: 327.3 mV

Diesel 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

METHOD BLANK

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

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

MB Lab ID: QC09147

Analyte	Result	
Diesel C10-C24	<50	
Motor Oil C24-C36	<300	
Surrogate	%Rec	Recovery Limits
Hexacosane	94	58-128



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