Harding Lawson Associates

April 19, 2000

02884 101BAYA

Mr. Lawrence Seto
Senior Hazardous Materials Specialist
Alameda County Department of Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

Request for Approval to
Abandon Monitoring Well MW-8
Port of Oakland
2277 Seventh Street
Oakland, California

Dear Mr. Seto:

On behalf of the Port of Oakland (Port), Harding Lawson Associates (HLA) requests approval to abandon groundwater monitoring well MW-8, located at 2277 Seventh Street in Oakland, California (Site), see Plate 1. Construction of a railroad track associated with the Port of Oakland Vision 2000 improvements requires the removal of MW-8. The well is located in the alignment of the new track, and in order for construction to proceed, all surface structures need to be removed. After the well has been properly abandoned and the construction activities are complete, HLA will construct a replacement well in the location shown on Plate 1.

HLA has received a permit (#W00-1690) from the Alameda County Public Works Agency (ACPW) for the abandonment of the well. The well will be destroyed in accordance with ACPW well permit policy by overdrilling to remove the sand pack and well casing and then backfilling with a cement grout and bentonite mix.

HLA will construct the replacement well approximately 30 days after the abandonment of MW-8 using standard construction procedures for groundwater monitoring wells. Within three weeks of the construction of the replacement well, HLA will issue a brief letter report will be issued to the Alameda County Department of Environmental Health documenting the replacement well's location and construction details.

The Port has scheduled surface preparation for the construction for the new railroad spur to begin on Friday, April 21, 2000. Therefore HLA requests your authorization on Wednesday, April 19, 2000, to the proceed with well abandonment so that the well can be remove on Thursday, April 20, 2000 before construction begins. HLA appreciates your attention to this matter on such short notice and if you have any questions please contact James McCarty at (510) 628-3220.

Yours very truly,

HARDING LAWSON ASSOCIATES

James McCarty
Project Engineer

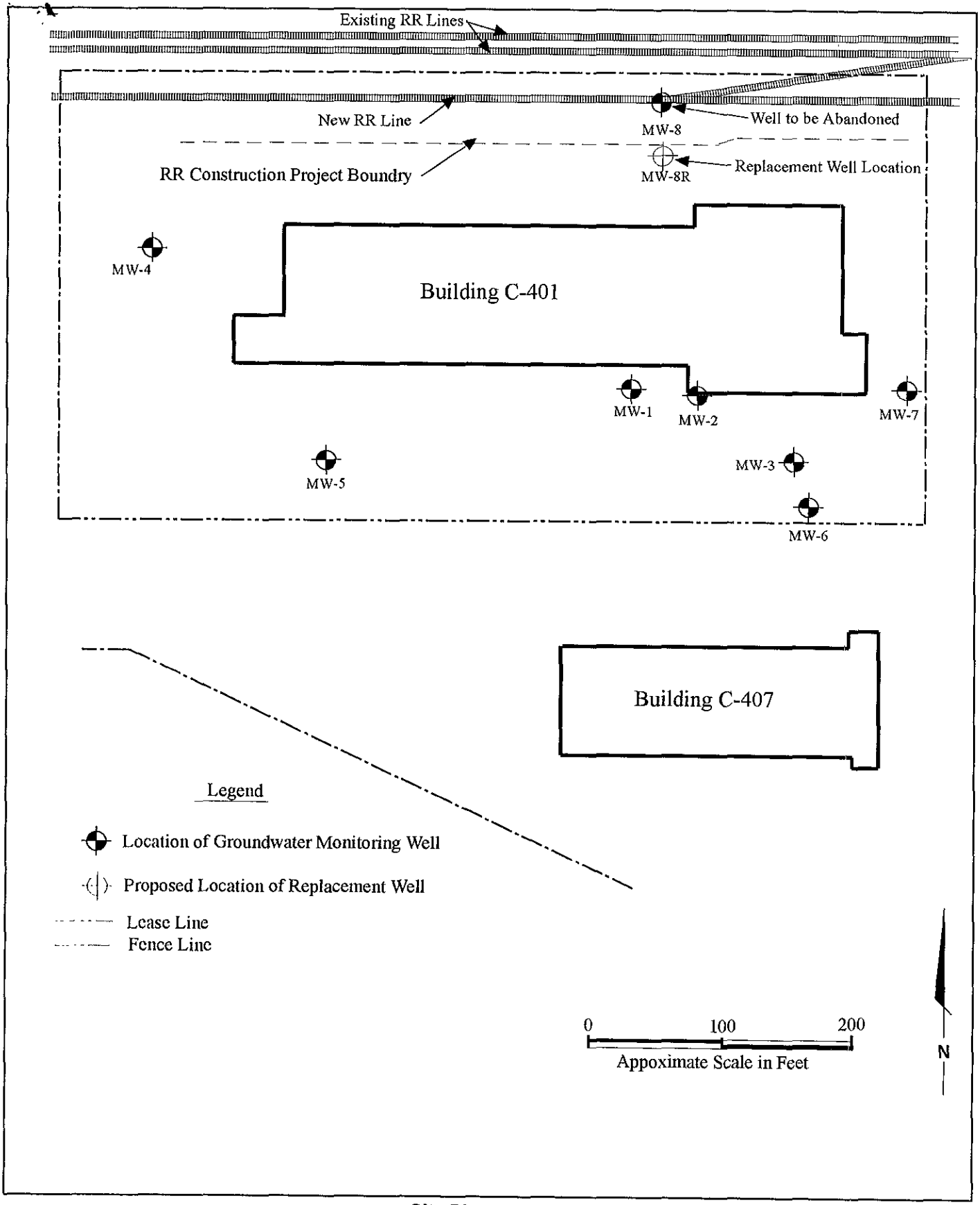
Stephen Osborne.
Geotechnical Engineer

JGM/SJO/mlw/P/037665P

1 copies submitted

Attachments Plate 1 – Site Map

cc: John Prall
Port of Oakland



Harding Lawson Associates
Engineering and Environmental Services

Site Plan
Monitoring Well MW-8 Removal and Replacement
2277 Seventh Street
Oakland, California 94607

PLATE **1**

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
jgm	02884 BAYA101		04/18/00	

April 19, 2000

42633.1

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

Quarterly Groundwater Monitoring and Product Recovery Report
4th 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 October 1, 1999 and December 31, 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 fourth quarter of 1999. MW-3 and MW-1 contain in-well product skimmers that recover separate-phase petroleum hydrocarbons. MW-8 is not monitored because it contains a thick viscous tar-like petroleum product. Well locations are presented on Plate 2.

The monitoring wells were installed at the site 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 November 12, 1999. Prior to purging and sampling the monitoring wells, HLA measured the depth to groundwater below the to of the well's casing with an electric water level indicator. HLA also measured the depth to product and depth to groundwater 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 petroleum product in MW-8 prevents 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 purge water was stored onsite in the treatment system's product recovery tank to be disposed of by the Port waste disposal contractor, Performance Excavators, Inc.

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-6. 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 8020B.
- 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 November 12, 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 330 micrograms per liter (µg/l) in MW-4 and 150 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 750 µg/l and in MW-6 at 130 µg/l last quarter.
- Benzene was reported at a concentration of 740 µg/l in MW-4, at 27 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 280 µg/l and in MW-6 at 20 µg/l last quarter
- Toluene was not detected above the reporting limit in any of the wells sampled.
- Ethylbenzene was reported at a concentration of 2.2 µg/l in MW-6, the same result as last quarter, 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 6.3 µg/l in MW-2, 42 µg/l in MW-4, 5.5 µg/l in MW-5, 13 µg/l in MW-6, and 15 µg/l in MW-7. Last quarter MTBE was detected a concentration of 14 µg/l at MW-7 and was not detected in MW-2, MW-4, or MW-5.
- TPHd was reported at a concentration of 120 µg/l in MW-2, 840µg/l in MW-4, 110 µg/l in MW-5, 11,000 µg/l in MW-6, and 600 µg/l in MW-7. TPHd was detected a concentration of 63 µg/l at MW-4 and 820 µg/l at MW-6 and was not detected in MW-2, MW-5, or MW-7 last quarter.
- TPHmo was reported at a concentration of 3,000 µg/l in MW-6 and 420 µg/l in MW-7 and was not detected in MW-2, MW-4, or MW-5. TPHmo was not detected above the reporting limit in any of the wells sampled last quarter.

QUALITY ASSURANCE AND QUALITY CONTROL

- MTBE was detected at a concentration of 4.2 µg/l in the trip blank, which could indicate a compromise in the MTBE results. MTBE was analyzed by EPA Test Method 8020, which may result in false results. HLA will suggest to the Port that future MTBE analyses include confirmation by EPA Test Method 8260.
- BTEX was not detected in the trip blank.
- The relative percent difference between the analytical results from MW-6 and the duplicate sample was considered within acceptable limits, ranging from zero to 9 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 removes the product collected in skimmer in MW-1 on a monthly basis. The total volume of product recovered from MW-1 during the fourth quarter of 1999 was 0.6 gallons. The Port's waste disposal contractor, Performance Excavators, Inc., removed product from the product recovery tank on October 29, 1999. According to records provided to the Port, Performance Excavators, Inc removed 470 gallons of product and water. Performance Excavators, Inc estimated that of this 470 gallons removed, 125 gallons was free phase product. Table 2 presents a summary of the 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

James G. McCarty
Project Engineer

Stephen J. Osborne
Geotechnical Engineer

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

JGM/SJO/mlw/42633/037666L

4 copies submitted

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	12/31/97	8.73	5.63
		04/13/98	7.72	6.64
		11/06/98	9.43	4.93
		03/19/99	8.21	6.15
		06/24/99	8.91	5.45
		09/28/99	9.42	4.94
		11/12/199	9.63	4.73
MW-4	13.15	12/31/97	7.09	6.06
		04/13/98	7.71	5.44
		11/06/98	8.69	4.46
		03/19/99	8.00	5.15
		06/24/99	8.45	4.70
		09/28/99	8.73	4.42
		11/12/99	8.83	4.32
MW-5	13.49	12/31/97	6.38	7.11
		04/13/98	5.56	7.93
		11/06/98	9.56	3.93
		03/19/99	6.20	7.29
		06/24/99	6.73	6.76
		09/28/99	6.91	6.58
		11/12/99	7.06	6.43
MW-6	14.00	06/24/99	8.61	5.39
		09/28/99	9.26	4.74
		11/12/99	8.01	5.99
MW-7	14.35	12/31/97	8.88	5.47
		04/13/98	7.86	6.49
		11/06/98	9.55	4.80
		03/19/99	8.41	5.94
		06/24/99	9.08	5.27
		09/28/99	9.60	4.75
		11/12/99	9.77	4.58

[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	12/31/97	-	-	-	0.2	passive skimmer
		01/29/98	-	-	-	0.2	passive skimmer
		03/02/98	-	-	-	0.018	passive skimmer
		05/11/98	-	-	-	0.02	passive skimmer
		06/15/98	-	-	-	0.2	passive skimmer
		11/06/98	9.34	10.3	0.96	1.2	passive skimmer
		01/07/99	-	-	-	0.2	passive skimmer
		02/11/99	-	-	-	0.2	passive skimmer
		03/12/99	-	-	-	0.2	passive skimmer
		03/19/99	NM	8.45	>0.01	0.07	passive skimmer
		04/14/99	-	-	-	0.2	passive skimmer
		05/11/99	-	-	-	0.2	passive skimmer
		06/24/99	8.88	9.63	0.8	0.2	passive skimmer
		07/15/99	--	--	--	0.2	passive skimmer
		07/16/99	--	--	--	0.2	passive skimmer
		08/27/99	--	--	--	0.2	passive skimmer
		09/28/99	--	--	0.65	0.2	passive skimmer
		10/05/99	--	--	--	0.2	passive skimmer
		11/12/99	9.38	10.27	0.89	0.2	passive skimmer
		12/21/99	--	--	--	0.2	passive skimmer
MW-3	14.22	12/31/97	-	-	-	30	active skimmer
		01/29/98	-	-	-	10	active skimmer
		04/13/98	-	-	-	240	active skimmer
		05/11/98	-	-	-	1,545	active skimmer
		06/15/98	-	-	-	1,950	active skimmer
		11/06/98	8.84	9.94	1.1	500	active skimmer
		01/05/99	-	-	-	275[2]	active skimmer
		01/14/99	-	-	-	400[2]	active skimmer
		02/03/99	-	-	-	400[2]	active skimmer
		02/26/99	-	-	-	570[2]	active skimmer
		03/19/99	7.52	8.05	0.5	211	active skimmer
		06/16/99	-	-	-	310	active skimmer
		06/24/99	8.38	8.56	0.2	--	active skimmer
		07/14/99	--	--	--	50[2]	active skimmer
		09/28/99	--	--	0.2	--	active skimmer
		10/29/99	--	--	--	125[2]	active skimmer
		11/12/99	9.14	9.23	0.09	--	active skimmer
MW-6	14.00	13/31/97	-	-	-	0.0014	passive skimmer
		01/29/98	-	-	-	0.0014	passive skimmer
		03/02/98	-	-	-	0.0014	passive skimmer
		11/06/98	NM	9.62	>0.01	0.0	passive skimmer
		03/19/99	NM	7.37	>0.01	0.0	passive skimmer
MW-8 [1]	12.94	12/31/97	8.49	8.82	0.33	4.38	-
		11/06/98	9.25	10.3	1.1	3.48	-

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

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

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

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

Greyed areas indicates data from this reporting period.

Table 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
	11/12/99	<50	120 [2,6]	<300	<0.5	<0.5	<0.5	<0.5	6.3 [8,9]
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
	11/12/99	330 [3]	840 [2]	<300	740	<2.5	<2.5	<2.5	42 [9]
MW-5	09/11/95	90	<300	2,500	3.3	<0.3	<0.3	<0.4	NA
	04/04/96	<50	180	520	<0.5	<0.5	<0.5	<1.0	NA
	07/10/96	<50	120	1,500	<0.4	<0.3	<0.3	<0.4	NA
	12/03/96	<50	200 [1,2]	<250	<0.5	<0.5	<0.5	<1.0	NA
	03/28/97	<50	<50	<250	<0.5	<0.5	<0.5	<1.0	NA
	06/13/97	<50	<50	<250	<0.5	<0.5	<0.5	<1.0	NA
	09/18/97	<50	<50	<250	<0.5	<0.5	<0.5	<1.0	NA
	12/31/97	<50	<47	<280	<0.5	<0.5	<0.5	<1.0	NA

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)
	04/13/98	<50	<47	<280	<0.5	<0.5	<0.5	<1.0	NA
MW-5	11/06/98	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2
(cont.)	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
	11/12/99	<50	110 [2,6]	<300	<0.5	<0.5	<0.5	<0.5	5.5 [9]
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	<0.5	54
	09/28/99	130 [3,5]	820	<300	20	0.51	2.2	<0.5	<2
	11/12/99	150	11,000 [2,6]	3,000 [3,6]	27	<0.5	2.2	<0.5	13 [9]
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
	11/12/99	<50	600 [2,6]	420 [3]	<0.5	<0.5	<0.5	<0.5	15 [9]

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/heavier hydrocarbons are present in sample.

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

8 Presence of this compound confirmed by second column, however, the confirmation concentration differed from the reported result by more than a factor or two.

9 Trip blank contained MTBE at a concentration of 4.2 µg/l

- 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.

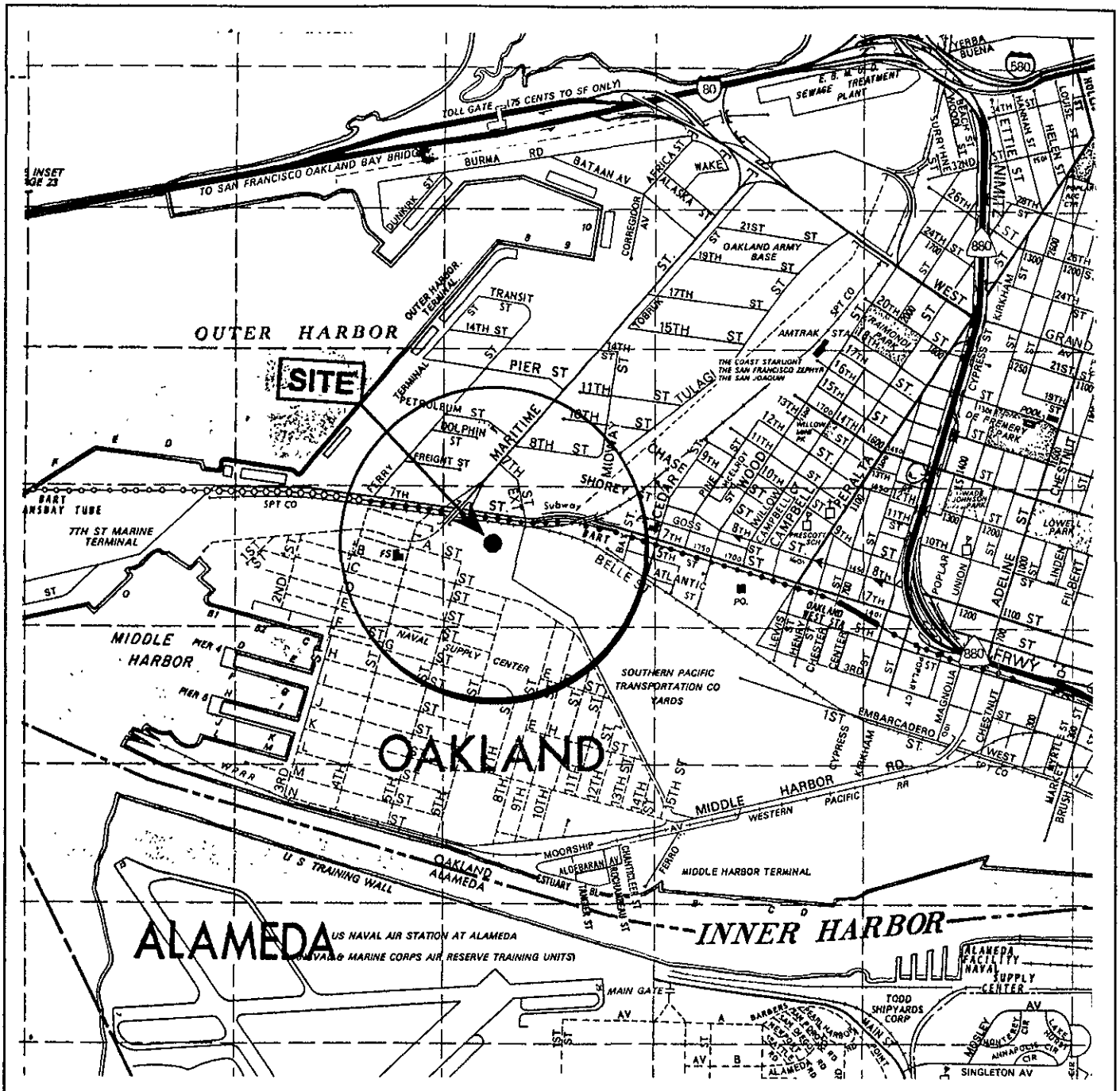
-Data prior to December 1997 taken from *Groundwater Analytical Results, Quarterly Groundwater Monitoring Report: Third Quarter 1997, Building C-401, 2277 7th Street, Oakland, CA,* dated October 24, 1997, by Uribe and Associate

NA Not Analyzed.

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

Date	System Status	Comments
10/05/99	System Running	Remove product from MW-1, lower passive skimmer 6 inches, active skimmer appears to be removing product at a slow rate, lower skimmer 2 inches, seems to improve
11/12/99	System Running	Remove product from MW-1, check active skimmer, performing well
12/21/99	System Running	Remove product from MW-1, active skimmer pumping some water, raise skimmer 3 inches, seems to improve

PLATES

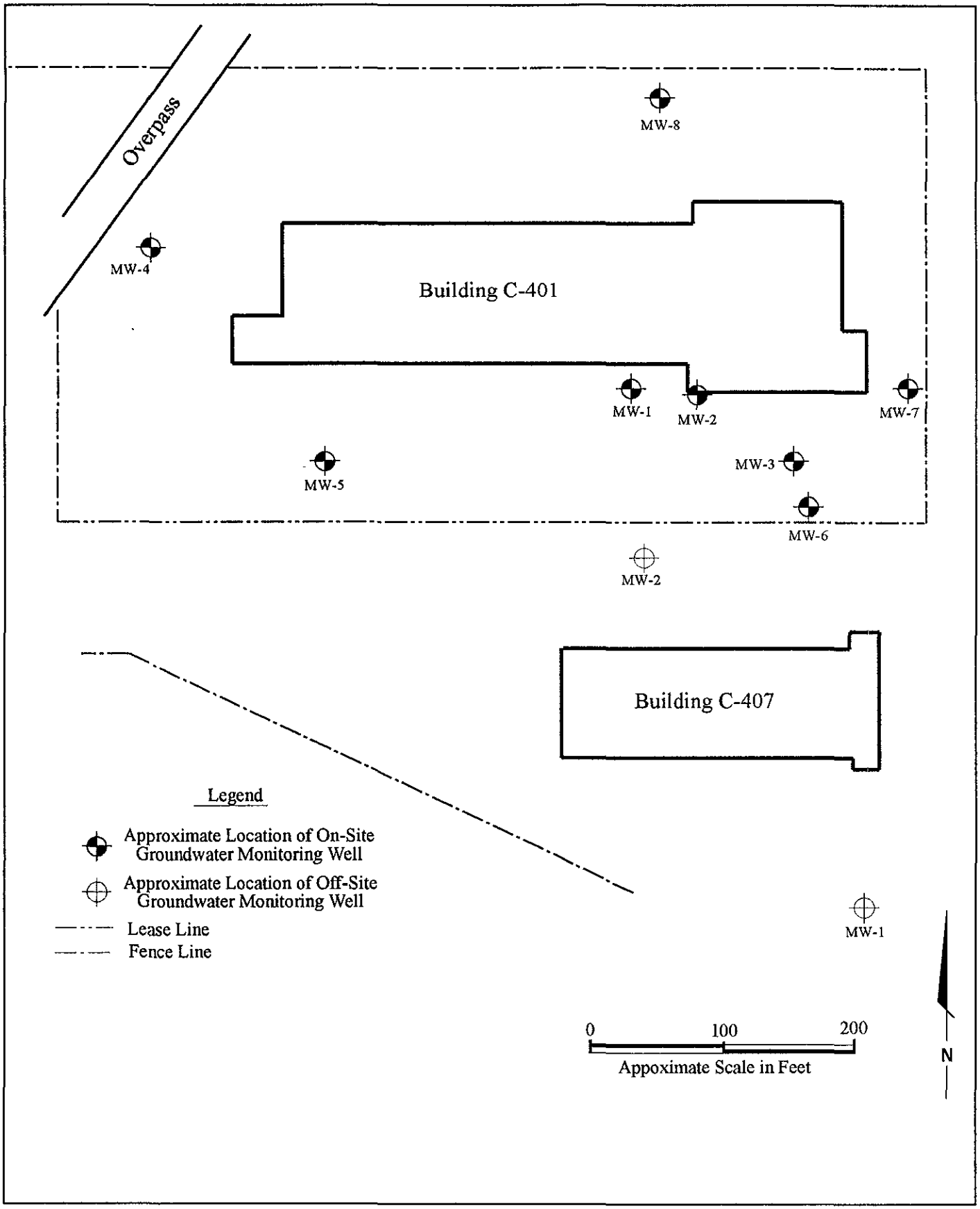


Harding Lawson Associates
Engineering and
Environmental Services

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

PLATE **1**

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
jgm	42633.1		12/17/99	

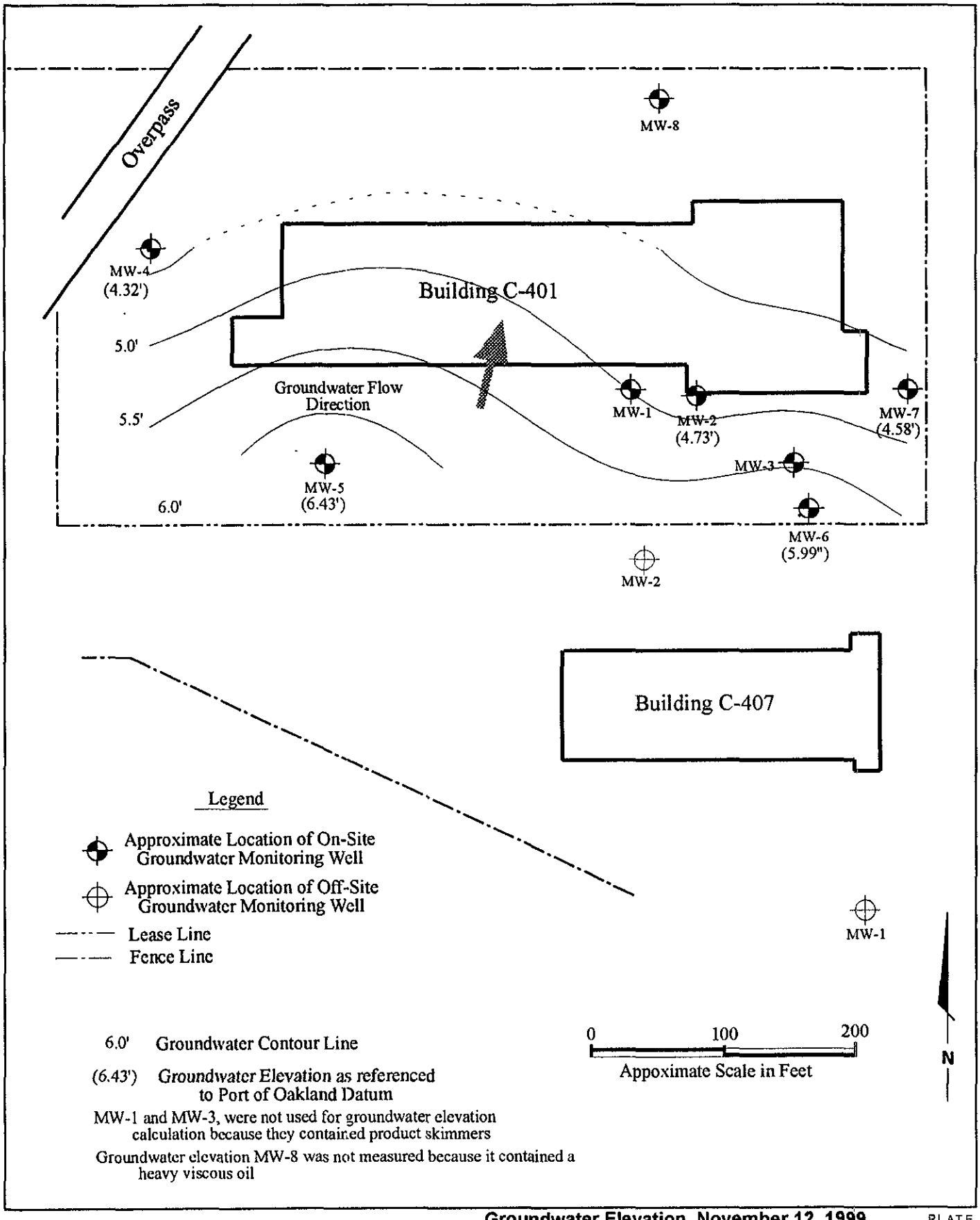


Harding Lawson Associates
Engineering and Environmental Services

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

PLATE **2**

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
jgm	42633.1		12/17/99	

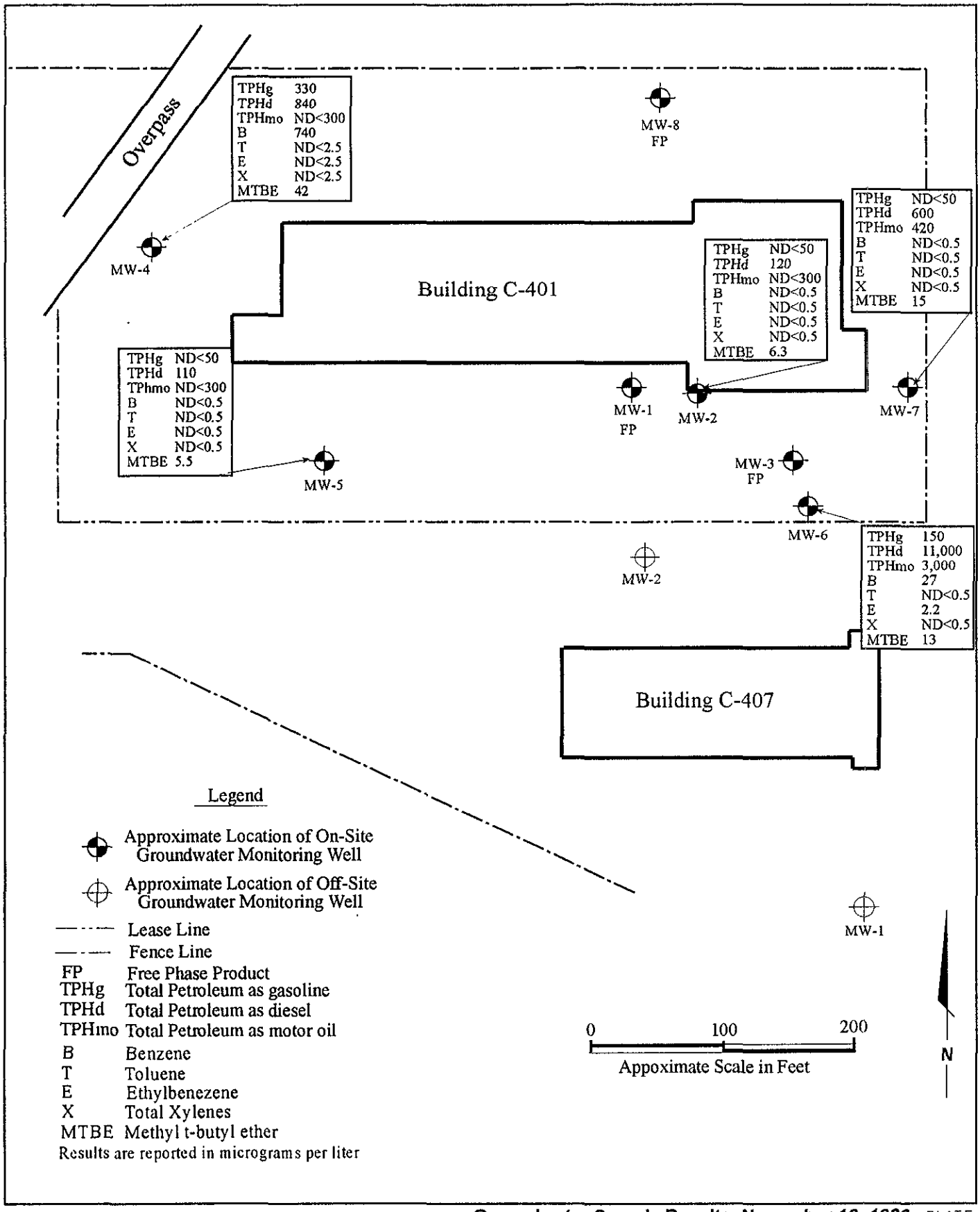


Harding Lawson Associates
Engineering and Environmental Services

Groundwater Elevation, November 12, 1999
Quarterly Groundwater Monitoring Report
2277 Seventh Street
Oakland, California 94607

PLATE **3**

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
jgm	42633.1		12/17/99	



Harding Lawson Associates
Engineering and Environmental Services

Groundwater Sample Results, November 12, 1999
Quarterly Groundwater Monitoring Report
2277 Seventh Street
Oakland, California 94607

PLATE **4**

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
jgm	42633.1		12/17/99	

APPENDIX A

GROUNDWATER SAMPLE FORMS

Harding Lawson Associates
Engineering and
Environmental Services

GROUND-WATER SAMPLING FORM

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

Well No MW-1
Well Type: ☒ Monitor ☐ Extraction ☐ Other ____
Well Material: ☒ PVC ☐ St Steel ☐ Other ____
Date 11/12/99 Time 1130
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): 10.27' product @ 9.38'
Number of Well Volumes to be purged (# Vols)
☐ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other ____

PURGE METHOD

☐ Bailer - Type: ____
☐ 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:

product thickness is 0.89'

(____ 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): Empty 0.2 gals of product from passive skimer
Discharge Water Disposal: ☐ Sanitary Sewer ☐ Storm Sewer ☐ Other ____

WELL SAMPLING

SAMPLING METHOD

☐ Bailer - Type: ____
☐ 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

QUALITY CONTROL SAMPLES

Duplicate Samples

Original Sample No.	Duplicate Sample No.

Blank Samples

Type	Sample No.

Other Samples

Type	Sample No.

Harding Lawson Associates
Engineering and
Environmental Services

GROUND-WATER SAMPLING FORM

Job Name 2277 7th St.
Job Number 42633-001
Recorded by Heather Ofee (Signature)

Well No. MW-2
Well Type: ☑ Monitor ☐ Extraction ☐ Other
Well Material: ☑ PVC ☐ St. Steel ☐ Other
Date 11/12/99 Time 1003
Sampled by Sean 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): 9.63
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

$(15.27 - 9.63) \times 2^2 \times 3 \times 0.0408 = 2.76$ gallons

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

PURGE TIME

0948 Start 0957 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
initial	7.06	2490	67.4	
1	7.14	2300	67.8	
2	7.16	2320	68.0	
3	7.20	2290	67.6	

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

Observations During Purging (Well Condition, Turbidity, Color, Odor): Light brown, no odor
Discharge Water Disposal: ☐ Sanitary Sewer ☐ Storm Sewer ☑ Other Drum on Site

WELL SAMPLING

SAMPLING METHOD

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

SAMPLING DISTRIBUTION

Sample Series:

Sample No.	Volume/Cont.	Analysis Requested	Preservatives	Lab	Comments
MW-2	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.
Temp	Temp

Harding Lawson Associates
Engineering and
Environmental Services

GROUND-WATER SAMPLING FORM

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

Well No MW-3
Well Type: ☒ Monitor ☐ Extraction ☐ Other _____
Well Material ☒ PVC ☐ St. Steel ☐ Other _____
Date 11/12/99 Time 1055
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): 9.23'
Number of Well Volumes to be purged (# Vols) product @ 9.14'
☐ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other _____ product thickness is 0.91'

PURGE METHOD

☐ Bailer - Type: _____
☐ 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): active skimmer running fine
Discharge Water Disposal: ☐ Sanitary Sewer ☐ Storm Sewer ☐ Other _____

WELL SAMPLING

SAMPLING METHOD

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

SAMPLING DISTRIBUTION

Sample Series: _____

Sample No.	Volume/Cont.	Analysis Requested	Preservatives	Lab	Comments

QUALITY CONTROL SAMPLES

Duplicate Samples

Original Sample No.	Duplicate Sample No.

Blank Samples

Type	Sample No.

Other Samples

Type	Sample No.

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 11/12/99 Time 1031
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): 18.84
Water Level Depth (WL in feet BTOC): 8.83
Number of Well Volumes to be purged (# Vols)
☑ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other

PURGE METHOD

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

PUMP INTAKE SETTING

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

PURGE VOLUME CALCULATION

(18.84 TD (feet) - 8.83 WL (feet)) X 2 D (inches)^2 X 3 # Vols X 0.0408 = 4.9 gallons
Calculated Purge Volume

PURGE TIME

1018 Start 1026 Stop 8 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
initial	6.99	1200	67.6	
1.5	7.17	1650	69.8	
3	7.21	1660	71.1	
5	7.22	1760	71.4	

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

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

WELL SAMPLING

SAMPLING METHOD

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

SAMPLING DISTRIBUTION

Sample Series:

Sample No.	Volume/Cont.	Analysis Requested	Preservatives	Lab	Comments
MW-4	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.
Rinsate	Rinsate

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-5
Well Type: ☑ Monitor ☐ Extraction ☐ Other _____
Well Material: ☑ PVC ☐ St. Steel ☐ Other _____
Date 11/12/99 Time 0902
Sampled by [redacted] 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): 7.06
Number of Well Volumes to be purged (# Vols)
☑ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other _____

PURGE METHOD

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

PUMP INTAKE SETTING

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

PURGE VOLUME CALCULATION

(17.68 (TD feet) - 7.06 (WL feet)) X 2 (D inches)^2 X 3 (# Vols) X 0.0408 = 5.20 gallons (Calculated Purge Volume)

PURGE TIME

0847 Start 0855 Stop 9 Elapsed

PURGE RATE

Initial _____ gpm Final _____ gpm

ACTUAL PURGE VOLUME

5.5 gallons

FIELD PARAMETER MEASUREMENT

Minutes Since Pumping Began	pH	Cond. (µmhos/cm)	T ☐ °C ☒ °F	Other ____
Initial	6.66	1850	70.2	
1.5	6.98	2420	69.6	
3.5	7.04	2490	69.7	
5.5	7.06	2500	69.4	

Minutes Since Pumping Began	pH	Cond. (µmhos/cm)	T ☐ °C ☐ °F	Other ____
Meter Nos.	9570			

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

QUALITY CONTROL SAMPLES

Duplicate Samples

Original Sample No.	Duplicate Sample No.

Blank Samples

Type	Sample No

Other Samples

Type	Sample No.
Trip	TRIP1199

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-6
Well Type: ☑ Monitor ☐ Extraction ☐ Other _____
Well Material: ☑ PVC ☐ St. Steel ☐ Other _____
Date 11/12/99 Time ~~1053~~ 1110
Sampled by ~~Sam~~ 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): 8.01
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) - 8.01 (WL feet)) X 2 (D inches) ^{2} X 3 (# Vols) X 0.0408 = 4.92 gallons (Calculated Purge Volume)

PURGE TIME

1044 Start 1104 Stop 20 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
initial	6.89	4320	73.0	
1.5	7.16	4380	72.7	
3	7.15	4570	73.4	
5	7.28	4540	72.2	

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

Observations During Purging (Well Condition, Turbidity, Color, Odor): Light grey, sheen, slight odor
Discharge Water Disposal: ☐ Sanitary Sewer ☐ Storm Sewer ☑ Other Drum on Site

WELL SAMPLING

SAMPLING METHOD

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

SAMPLING DISTRIBUTION

Sample Series: _____

Sample No.	Volume/Cont.	Analysis Requested	Preservatives	Lab	Comments
MW-6	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.
MW-6	DUP1199
(1101)	(1120)

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 Diee (Signature)

Well No. MW-7
Well Type: ☑ Monitor ☐ Extraction ☐ Other ____
Well Material: ☑ PVC ☐ St. Steel ☐ Other ____
Date 11/12/99 Time 0935
Sampled by [redacted] 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): 18.16
Water Level Depth (WL in feet BTOC): 9.77
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 (feet) - 9.77 WL (feet)) X 2 D (inches)^2 X 3 # Vols X 0.0408 = 4.1 gallons Calculated Purge Volume

PURGE TIME

0918 Start 0928 Stop 10 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 ____
initial	7.03	2100	66.0	
1.5	7.13	1960	66.8	
3	7.13	2100	67.3	
4.5	7.14	2150	67.7	

Minutes Since Pumping Began	pH	Cond. (µmhos/cm)	T ☐ °C ☐ °F	Other ____
Meter Nos.	9870			

Observations During Purging (Well Condition, Turbidity, Color, Odor): Silty brown, no odor
Discharge Water Disposal: ☐ Sanitary Sewer ☐ Storm Sewer ☑ Other Drum on Site

WELL SAMPLING

SAMPLING METHOD

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

SAMPLING DISTRIBUTION

Sample Series: ____

Sample No.	Volume/Cont.	Analysis Requested	Preservatives	Lab	Comments
MW-7	2 Ambers	TPHd, TPHmo	—	Curtis & Tompkins	w/ filtration & silica gel cleanup
	3 Vials	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: 24-NOV-99
Lab Job Number: 142545
Project ID: 42633.1
Location: Port of Oakland-2277

Reviewed by: Anna Fogarty

Reviewed by:

Anna

142545

No. 2422

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

CHAIN OF CUSTODY FORM

Lab: Curtis & Tompkins

Samplers: Heather Lee

Job Number: 42033.1

Name/Location: Port of Oakland - 2277 7th Street

Project Manager: Jim McCarty

Recorder: Heather Lee (Signature Required)

Source Code	Matrix: Water	Matrix: Sediment	Matrix: Soil	Matrix: Oil	# Containers & Preserv.: Unpres.	H_2SO_4	HNO_3	HCL	Ice	Sample Number or Lab Number (Yr / Wk / Seq)	Date: Yr	Mo	Day	Time	Station Description/Notes	EPA 8010	EPA 8020	EPA 8260	EPA 8270	Metals	EPA 8015M/TPHG	EPA 8020/BTEX w/ MTBE	EPA 8015M/TPHd, TPHmo
	X							3	X	TRIP1199	99	11	12	0830	1							X	
	X				1			3	X	MW-5	99	11	12	0902	2						X	X	X
	X				1			3	X	MW-7	99	11	12	0935	3						X	X	X
	X				1			3	X	MW-2	99	11	12	1003	4						X	X	X
	X				1			3	X	MW-4	99	11	12	1031	5						X	X	X
	X				1			3	X	MW-6	99	11	12	1110	6						X	X	X
	X				1			3	X	DUP1199	99	11	12	1120	7						X	X	X

Lab Number (Yr / Wk / Seq)	Depth in Feet	Col Mtd CD	QA Code	Miscellaneous
				Silica gel cleanup on TPHd + TPHmo
				Standard TAT

CHAIN OF CUSTODY RECORD

Relinquished by (Signature)	Received by (Signature)	Date/Time
Heather Lee	Anna Pajault	11/12/99 1200

Dispatched by: (Signature) — Date/Time — Received for lab by: (Signature) — Date/Time

Method of Shipment:

Sample Condition When Received by the Laboratory:

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

TVH-Total Volatile Hydrocarbons

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

Analysis Method: EPA 8015M
Prep Method: EPA 5030

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
142545-002	MW-5	52014	11/12/99	11/15/99	11/15/99	
142545-003	MW-7	52014	11/12/99	11/15/99	11/15/99	
142545-004	MW-2	52014	11/12/99	11/15/99	11/15/99	
142545-005	MW-4	52014	11/12/99	11/15/99	11/15/99	

Matrix: Water

Analyte Diln Fac:	Units	142545-002 1	142545-003 1	142545-004 1	142545-005 1
Gasoline C7-C12	ug/L	<50	<50	<50	330 L
Surrogate					
Trifluorotoluene	%REC	101	102	103	108
Bromofluorobenzene	%REC	108	110	108	107

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
142545-006	MW-6	52014	11/12/99	11/15/99	11/15/99	
142545-007	DUP1199	52014	11/12/99	11/15/99	11/15/99	

Matrix: Water

Analyte	Units	142545-006	142545-007
Diln Fac:		1	1
Gasoline C7-C12	ug/L	150	150
Surrogate			
Trifluorotoluene	%REC	103	103
Bromofluorobenzene	%REC	108	107

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
142545-001	TRIP 1199	52053	11/12/99	11/18/99	11/18/99	
142545-002	MW-5	52053	11/12/99	11/17/99	11/17/99	
142545-003	MW-7	52053	11/12/99	11/18/99	11/18/99	
142545-004	MW-2	52053	11/12/99	11/18/99	11/18/99	

Matrix: Water

Analyte Diln Fac:	Units	142545-001 1	142545-002 1	142545-003 1	142545-004 1
MTBE	ug/L	4.2	5.5	15	6.3C
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	121	120	127	121
Bromofluorobenzene	%REC	127	131	134	128

C: Presence of this compound confirmed by second column, however, the confirmation concentration differed from the reported result by more than a factor of two

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
142545-005	MW-4	52053	11/12/99	11/18/99	11/18/99	
142545-006	MW-6	52053	11/12/99	11/18/99	11/18/99	
142545-007	DUP1199	52053	11/12/99	11/18/99	11/18/99	

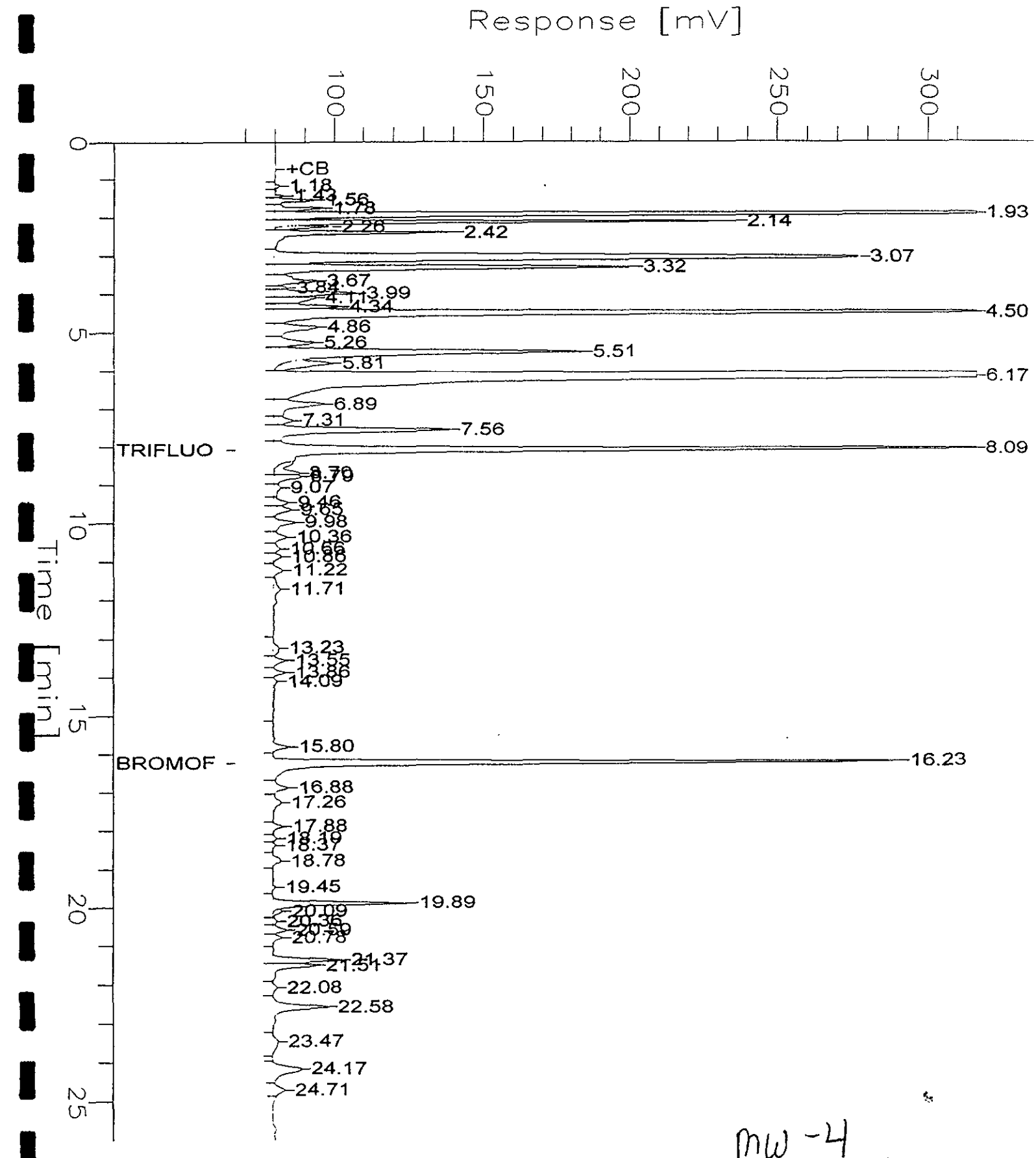
Matrix: Water

Analyte	Units	142545-005	142545-006	142545-007
Diln Fac:		5	1	1
MTBE	ug/L	42	13	14
Benzene	ug/L	740	27	28
Toluene	ug/L	<2.5	<0.5	0.52
Ethylbenzene	ug/L	<2.5	2.2	2.3
m,p-Xylenes	ug/L	<2.5	<0.5	<0.5
o-Xylene	ug/L	<2.5	<0.5	<0.5
Surrogate				
Trifluorotoluene	%REC	126	123	119
Bromofluorobenzene	%REC	132	134	130

GC04 TVH 'J' Data File Rtx1FID

Sample Name : 142545-005b,52014
FileName : G:\GC04\DATA\319J012.raw
Method : TVHBTXE
Start Time : 0.00 min End Time : 26.00 min
Scale Factor: -1.0 Plot Offset: 67 mV

Sample #: ph<2 Page 1 of 1
Date : 11/16/99 11:07 AM
Time of Injection: 11/15/99 09:36 PM
Low Point : 66.61 mV High Point : 316.61 mV
Plot Scale: 250.0 mV

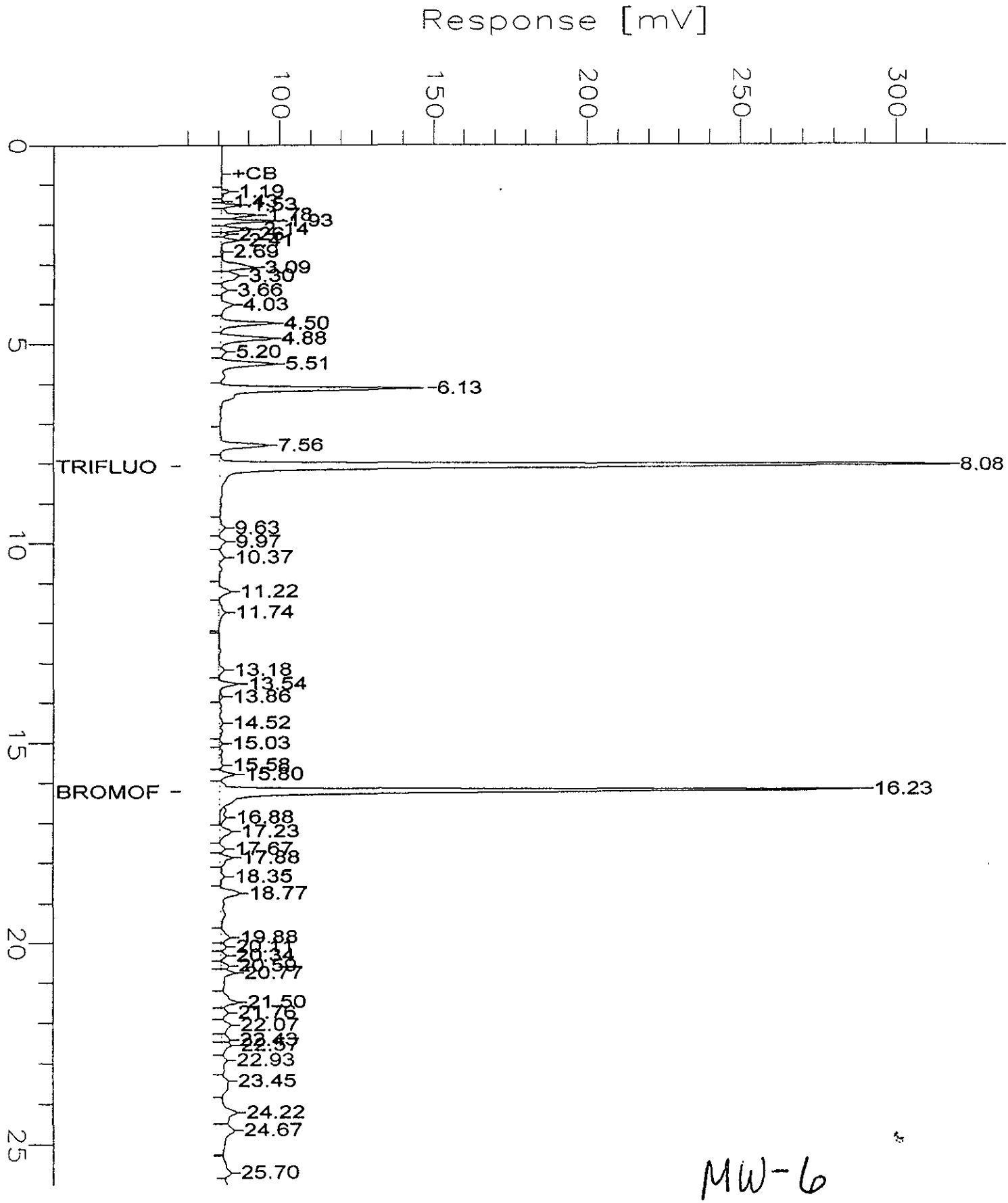


MW-4

GC04 TVH 'J' Data File Rtx1FID

Sample Name : 142545-006b,52014
FileName : G:\GC04\DATA\319J014.raw
Method : TVHBTXE
Start Time : 0.00 min End Time : 26.00 min
Scale Factor: -1.0 Plot Offset: 68 mV

Sample #: ph<2 Page 1 of 1
Date : 11/16/99 11:07 AM
Time of Injection: 11/15/99 10:45 PM
Low Point : 67.70 mV High Point : 317.70 mV
Plot Scale: 250.0 mV

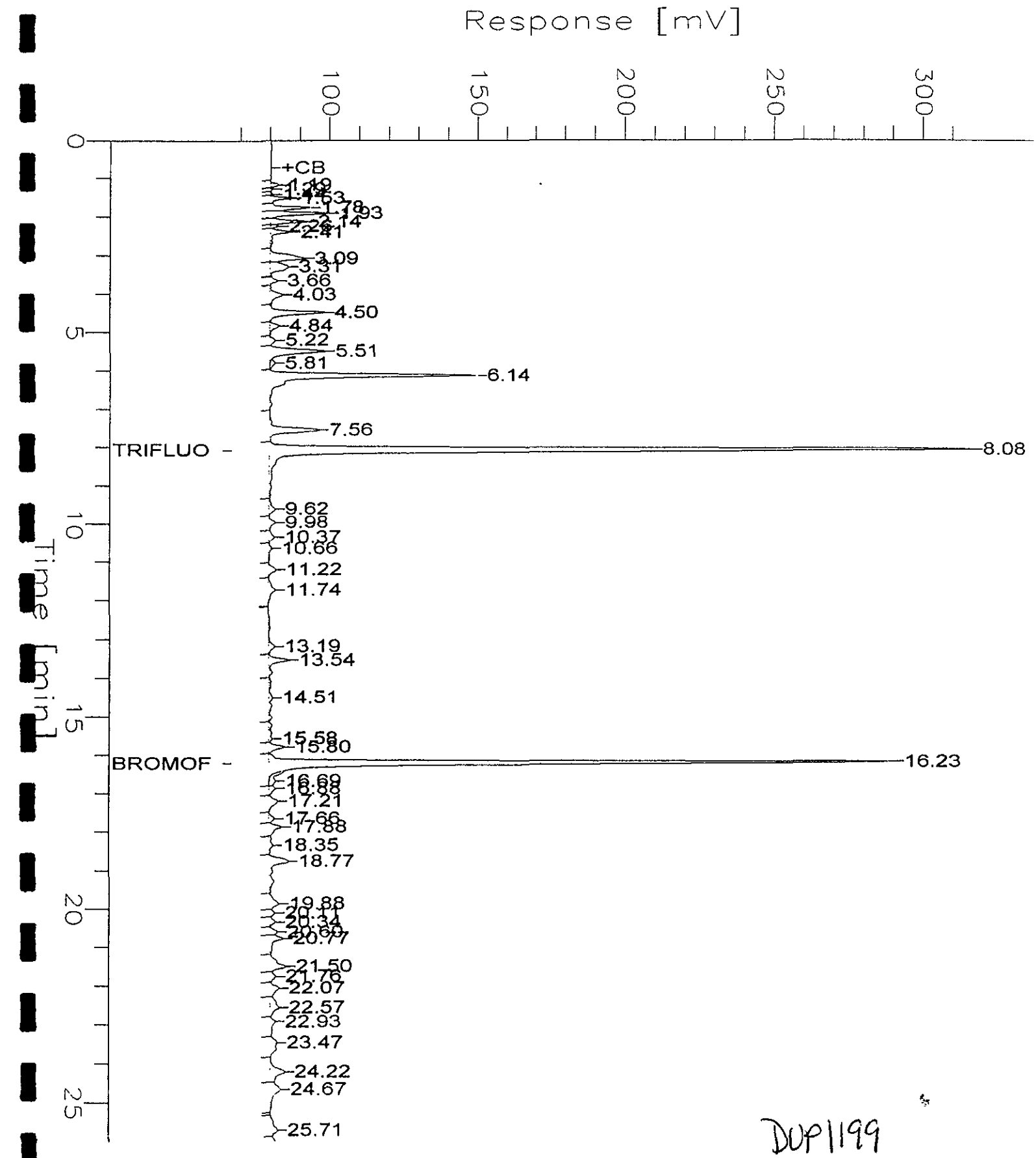


MW-6

GC04 TVH 'J' Data File Rtx1FID

Sample Name : 142545-007b,52014
FileName : G:\GC04\DATA\319J013.raw
Method : TVHBTXE
Start Time : 0.00 min End Time : 26.00 min
Scale Factor: -1.0 Plot Offset: 67 mV

Sample #: ph=7 Page 1 of 1
Date : 11/16/99 11:07 AM
Time of Injection: 11/15/99 10:10 PM
Low Point : 67.11 mV High Point : 317.11 mV
Plot Scale: 250.0 mV

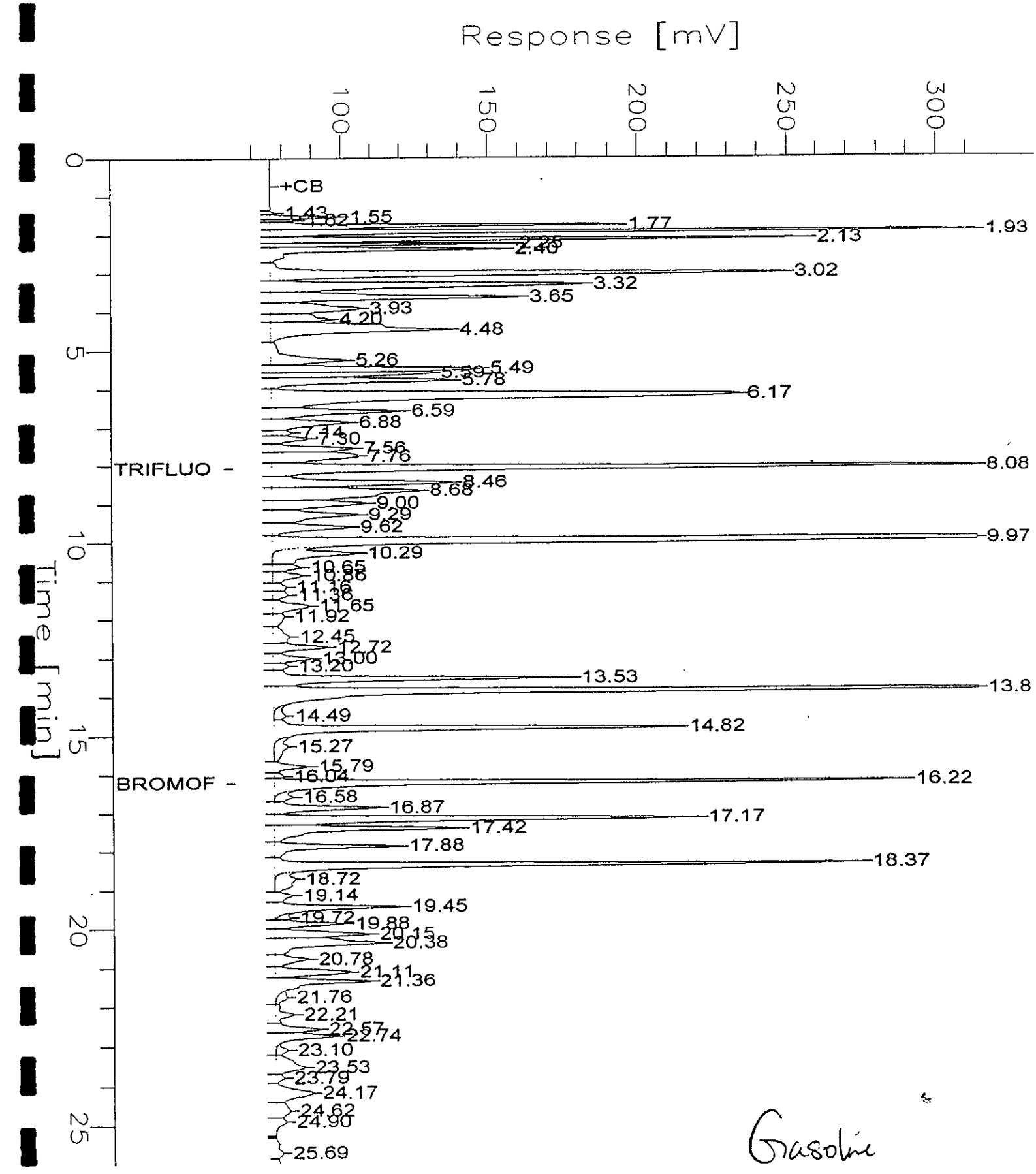


DUP1199

GC04 TVH 'J' Data File Rtx1FID

Sample Name : ccv/lcs,qc101245,99ws8141,52014
FileName : G:\GC04\DATA\319J004.raw
Method : TVHBTXE
Start Time : 0.00 min End Time : 26.00 min
Scale Factor: -1.0 Plot Offset: 63 mV

Sample #: gas Page 1 of 1
Date : 11/15/99 04:11 PM
Time of Injection: 11/15/99 03:41 PM
Low Point : 63.45 mV High Point : 313.45 mV
Plot Scale: 250.0 mV



Gasoline

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:	11/15/99
Batch#:	52014	Analysis Date:	11/15/99
Units:	ug/L		
Diln Fac:	1		

MB Lab ID: QC101244

Analyte	Result
Gasoline C7-C12	<50

Surrogate	%Rec	Recovery Limits
Trifluorotoluene	99	53-150
Bromofluorobenzene	100	53-149

BTXE

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

METHOD BLANK

Matrix:	Water	Prep Date:	11/17/99
Batch#:	52053	Analysis Date:	11/17/99
Units:	ug/L		
Diln Fac:	1		

MB Lab ID: QC101386

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	114	51-143
Bromofluorobenzene	120	37-146

TVH-Total Volatile Hydrocarbons

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

LABORATORY CONTROL SAMPLE

Matrix:	Water	Prep Date:	11/15/99
Batch#:	52014	Analysis Date:	11/15/99
Units:	ug/L		
Diln Fac:	1		

LCS Lab ID: QC101245

Analyte	Result	Spike Added	%Rec #	Limits
Gasoline C7-C12	2216	2000	111	77-117

Surrogate	%Rec	Limits
Trifluorotoluene	104	53-150
Bromofluorobenzene	113	53-149

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

BTXE

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

Analysis Method: EPA 8021B
Prep Method: EPA 5030

LABORATORY CONTROL SAMPLE

Matrix: Water
Batch#: 52053
Units: ug/L
Diln Fac: 1

Prep Date: 11/17/99
Analysis Date: 11/17/99

LCS Lab ID: QC101447

Analyte	Result	Spike Added	%Rec #	Limits
MTBE	21.01	20	105	66-126
Benzene	22.04	20	110	65-111
Toluene	22.64	20	113	76-117
Ethylbenzene	23.66	20	118	71-121
m,p-Xylenes	47.39	40	118	80-123
o-Xylene	23.29	20	116	75-127

Surrogate	%Rec	Limits
Trifluorotoluene	116	51-143
Bromofluorobenzene	123	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

TVH-Total Volatile Hydrocarbons

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

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

Field ID:	MW-5	Sample Date:	11/12/99
Lab ID:	142545-002	Received Date:	11/12/99
Matrix:	Water	Prep Date:	11/15/99
Batch#:	52014	Analysis Date:	11/15/99
Units:	ug/L		
Diln Fac:	1		

MS Lab ID: QC101283

Analyte	Spike Added	Sample	MS	%Rec #	Limits
Gasoline C7-C12	2000	<50	2403	120	69-131

Surrogate	%Rec	Limits
Trifluorotoluene	105	53-150
Bromofluorobenzene	117	53-149

MSD Lab ID: QC101284

Analyte	Spike Added	MSD	%Rec #	Limits	RPD #	Limit
Gasoline C7-C12	2000	2337	117	69-131	3	13

Surrogate	%Rec	Limits
Trifluorotoluene	105	53-150
Bromofluorobenzene	116	53-149

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

Lab #: 142545 BATCH QC REPORT Page

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-5
Lab ID: 142545-002
Matrix: Water
Batch#: 52053
Units: ug/L
Diln Fac: 1

Sample Date: 11/12/99
Received Date: 11/12/99
Prep Date: 11/18/99
Analysis Date: 11/18/99

MS Lab ID: QC101448

Analyte	Spike Added	Sample	MS	%Rec #	Limits
MTBE	20	5.46	27.74	111	49-136
Benzene	20	<0.5	22.88	114	55-122
Toluene	20	<0.5	23.97	120	63-139
Ethylbenzene	20	<0.5	24.92	125	61-137
m,p-Xylenes	40	<0.5	49.8	125	57-148
o-Xylene	20	<0.5	25.17	126	70-141

Surrogate	%Rec	Limits
Trifluorotoluene	126	51-143
Bromofluorobenzene	138	37-146

MSD Lab ID: QC101449

Analyte	Spike Added	MSD	%Rec #	Limits	RPD #	Limit
MTBE	20	25.18	99	49-136	10	11
Benzene	20	22.79	114	55-122	0	10
Toluene	20	23.8	119	63-139	1	10
Ethylbenzene	20	24.51	123	61-137	2	10
m,p-Xylenes	40	48.99	122	57-148	2	10
o-Xylene	20	24.73	124	70-141	2	10

Surrogate	%Rec	Limits
Trifluorotoluene	125	51-143
Bromofluorobenzene	135	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
142545-002	MW-5	52096	11/12/99	11/17/99	11/19/99	
142545-003	MW-7	52096	11/12/99	11/17/99	11/19/99	
142545-004	MW-2	52096	11/12/99	11/17/99	11/19/99	
142545-005	MW-4	52096	11/12/99	11/17/99	11/19/99	

Matrix: Water

Analyte	Units	142545-002	142545-003	142545-004	142545-005
Diln Fac:		1	1	1	1
Diesel C10-C24	ug/L	110 YH	600 YH	120 YH	840 Y
Motor Oil C24-C36	ug/L	<300	420 L	<300	<300
Surrogate					
Hexacosane	%REC	94	94	93	93

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

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
142545-006	MW-6	52096	11/12/99	11/17/99	11/20/99	
142545-007	DUP1199	52096	11/12/99	11/17/99	11/19/99	

Matrix: Water

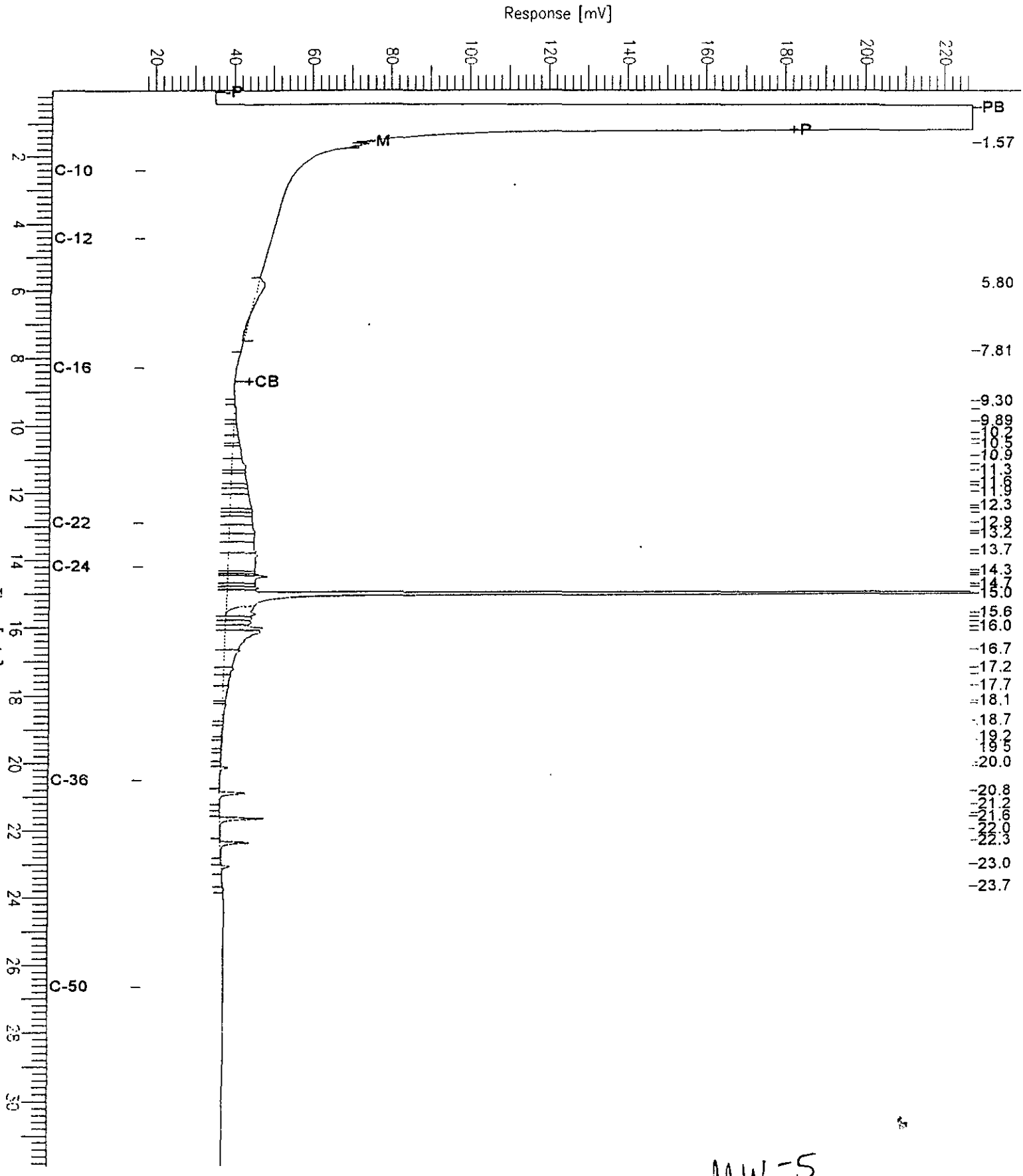
Analyte	Units	142545-006		142545-007	
Diln Fac:		1		1	
Diesel C10-C24	ug/L	11000	YH	12000	YH
Motor Oil C24-C36	ug/L	3000	LH	2300	LH
Surrogate					
Hexacosane	%REC	98		85	

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

Chromatogram

Sample Name : 142545-002,52096
FileName : C:\GC15\CHB\321B061.RAW
Method : BTEH292.MTH
Start Time : 0.01 min End Time : 31.91 min
Scale Factor: 0.0 Plot Offset: 17 mV

Sample #: 52096 Page 1 of 1
Date : 11/24/1999 10:02 AM
Time of Injection: 11/19/1999 05:33 AM
Low Point : 17.27 mV High Point : 227.04 mV
Plot Scale: 209.8 mV

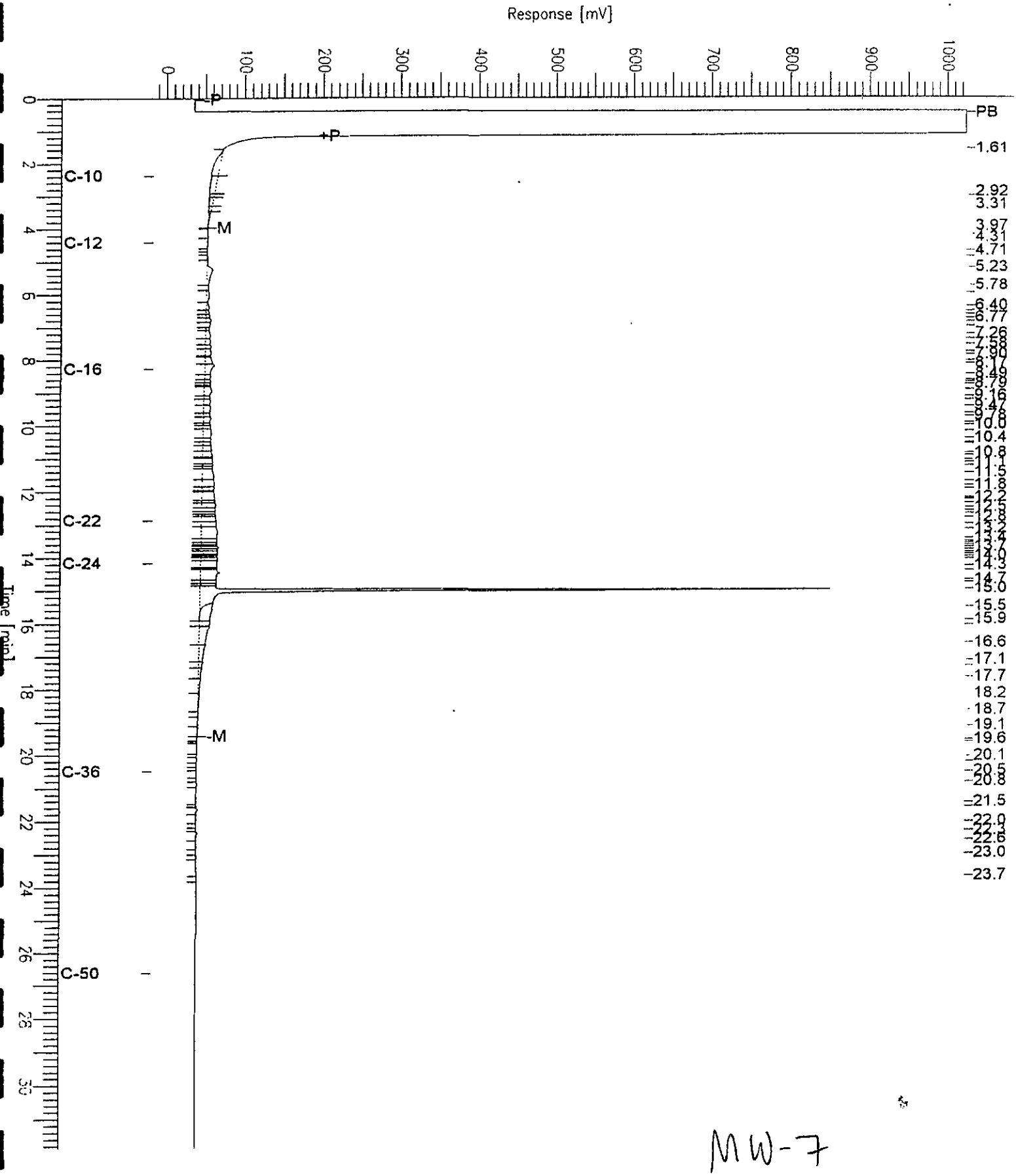


MW-5

Chromatogram

Sample Name : 142545-003,52096
FileName : C:\GC15\CHB\321B062.RAW
Method : BTEH292.MTH
Start Time : 0.00 min End Time : 31.90 min
Scale Factor: 0.0 Plot Offset: -17 mV

Sample #: 52096 Page 1 of 1
Date : 11/19/1999 10:59 AM
Time of Injection: 11/19/1999 06:16 AM
Low Point : -17.34 mV High Point : 1024.00 mV
Plot Scale: 1041.3 mV

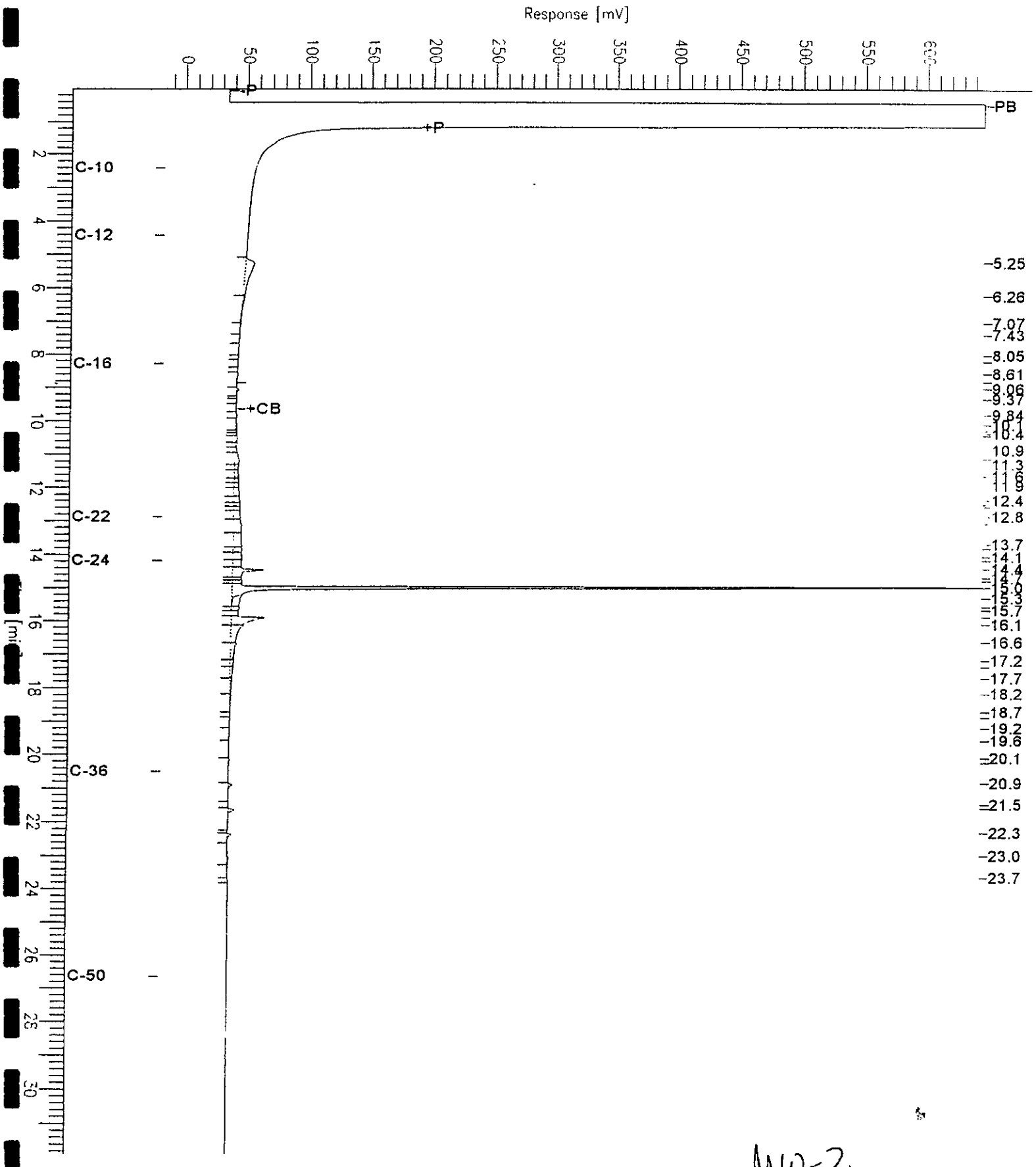


MW-7

Chromatogram

Sample Name : 142545-004,52096
FileName : C:\GC15\CHB\321B063.RAW
Method : BTEH292.MTH
Start Time : 0.01 min End Time : 31.91 min
Scale Factor: 0.0 Plot Offset: -17 mV

Sample #: 52096 Page 1 of 1
Date : 11/19/1999 11:00 AM
Time of Injection: 11/19/1999 06:59 AM
Low Point : -17.47 mV High Point : 646.37 mV
Plot Scale: 663.8 mV

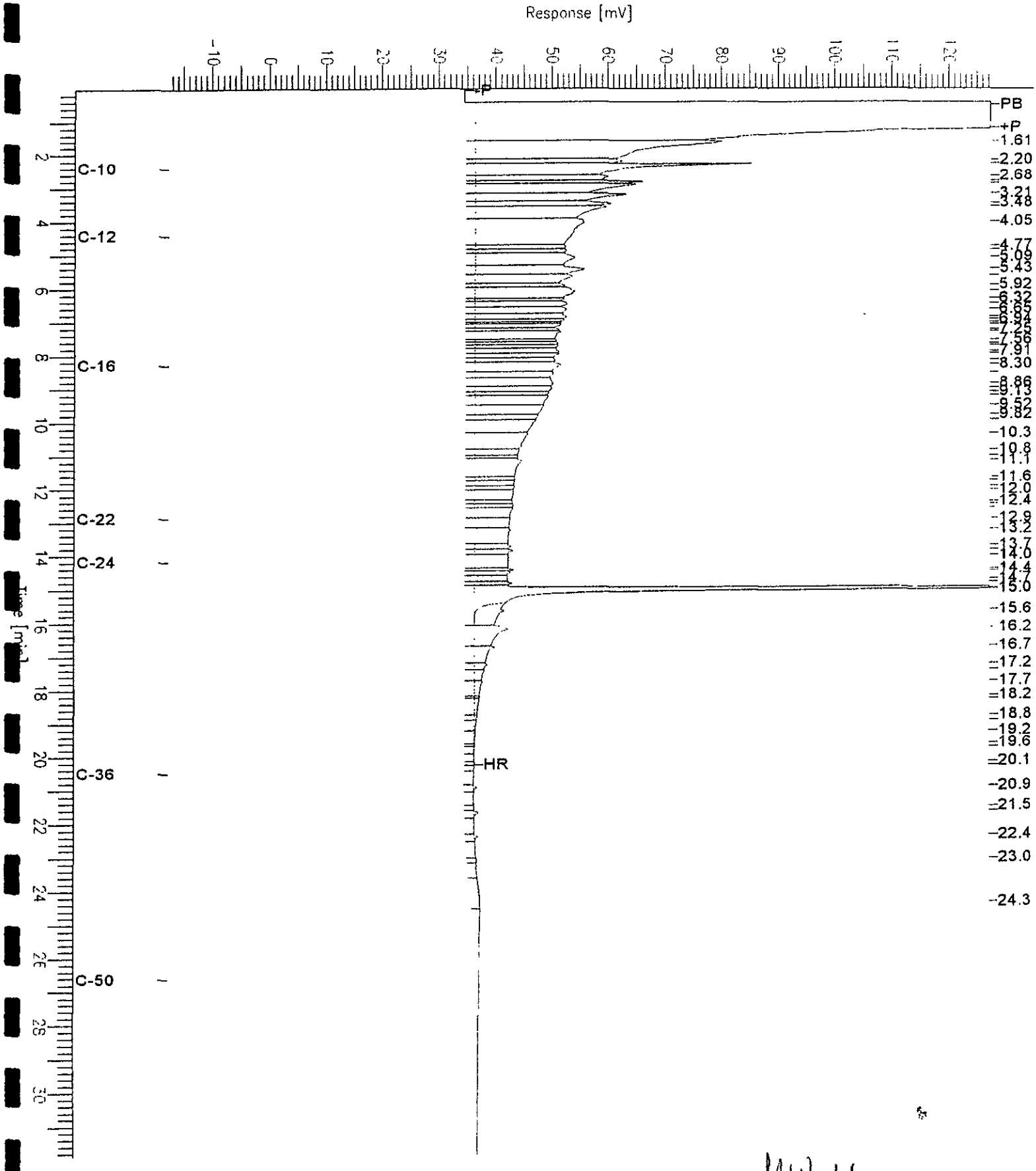


MW-2

Chromatogram

Sample Name : 142545-005,52096
FileName : C:\GC15\CHB\321B064.RAW
ethod : BTEH292.MTH
tart Time : 0.01 min End Time : 31.91 min
cale Factor: 0.0 Plot Offset: -18 mV

Sample #: 52096 Page 1 of 1
Date : 11/24/1999 10:17 AM
Time of Injection: 11/19/1999 07:42 AM
Low Point : -17.66 mV High Point : 127.30 mV
Plot Scale: 145.0 mV

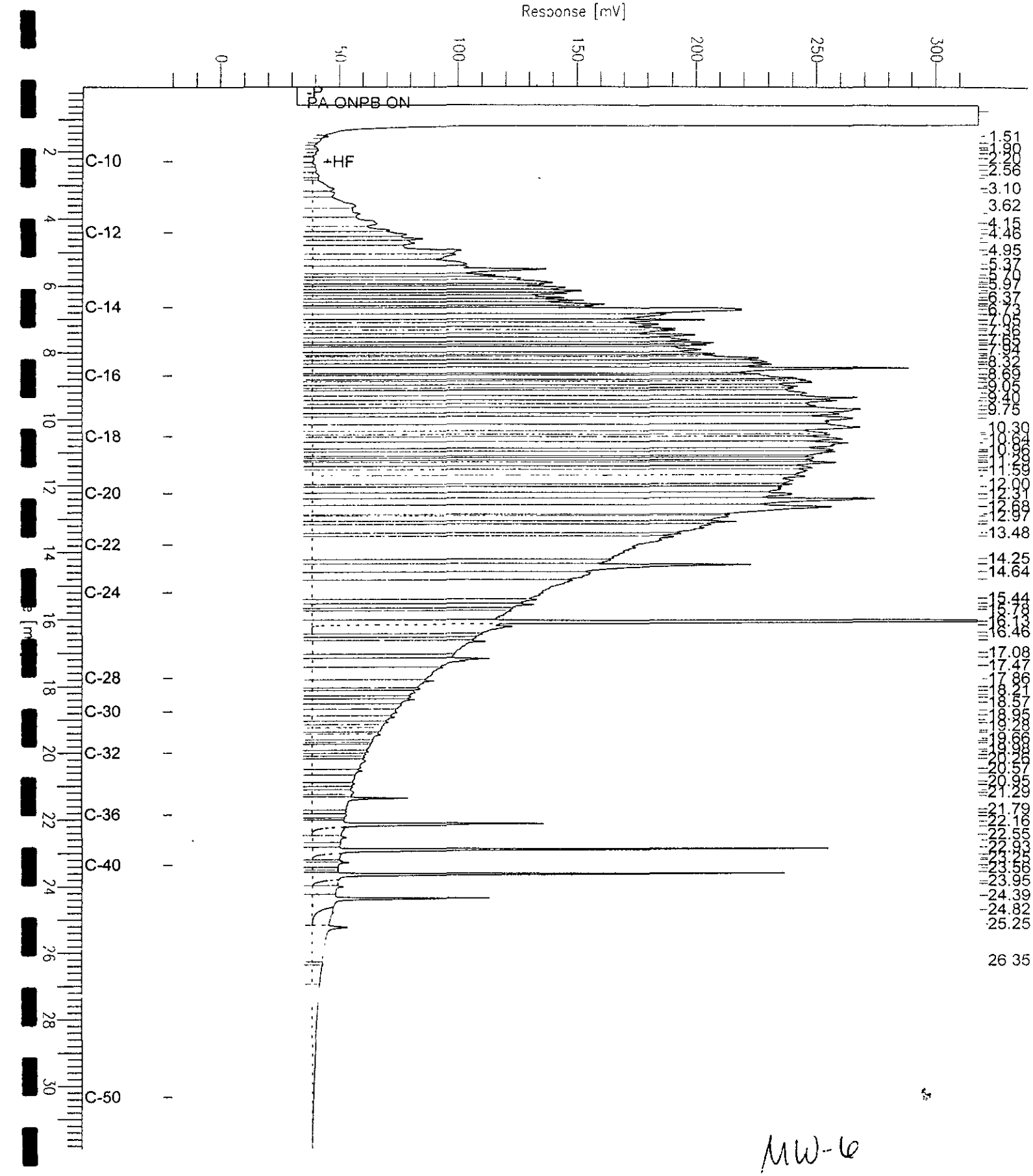


MW-4

Chromatogram

[redacted]mple Name : 142545-006,52096
FileName : G:\GC13\CHB\322B057.RAW
Method : BTEH305.MTH
[redacted]art Time : 0.01 min End Time : 31.91 min
[redacted]ale Factor: 0.0 Plot Offset: -20 mV

Sample #: 52096 Page 1 of 1
Date : 11/21/1999 10:00 PM
Time of Injection: 11/20/1999 05:33 AM
Low Point : -20.12 mV High Point : 317.96 mV
Plot Scale: 338.1 mV

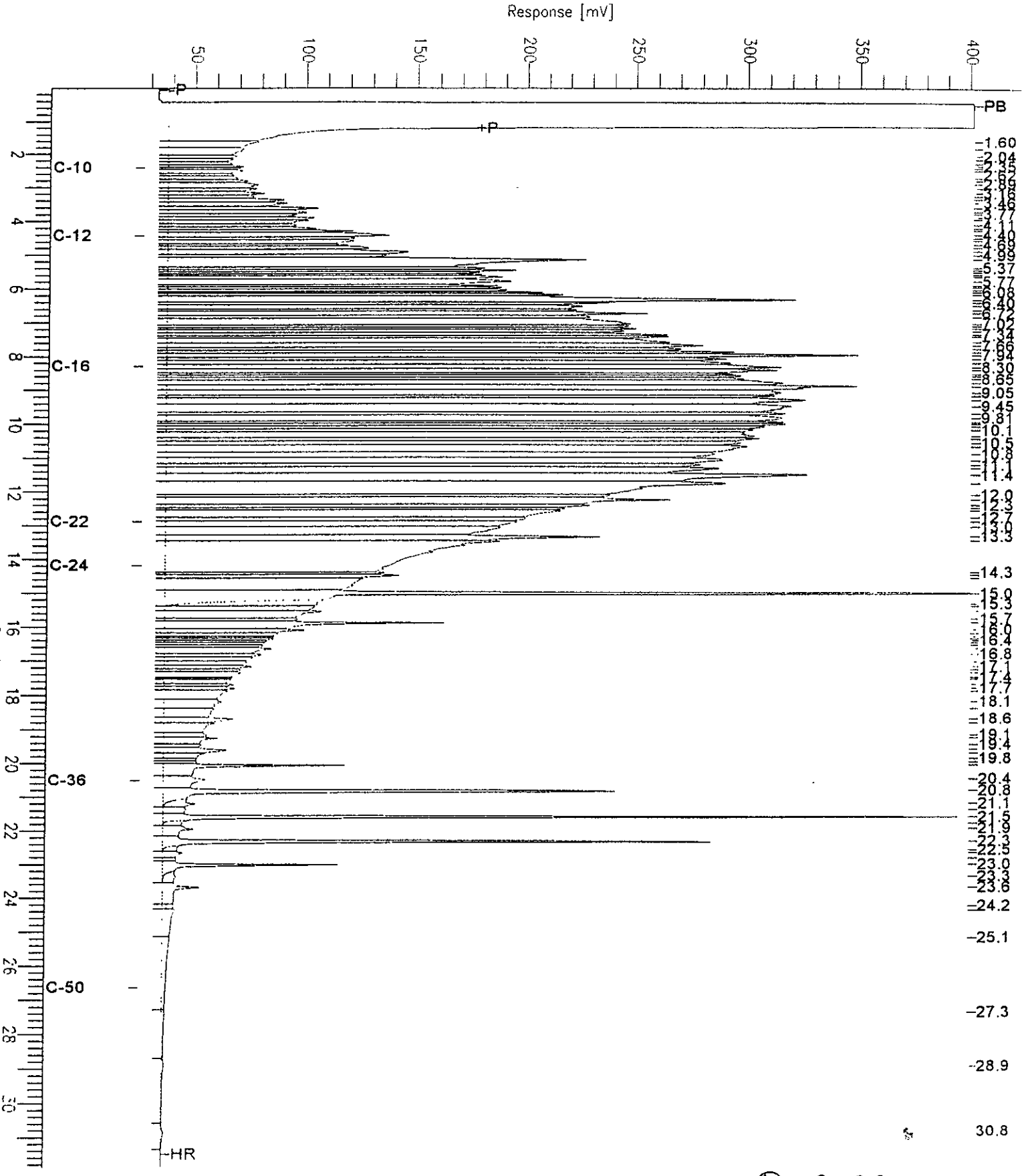


MW-6

Chromatogram

Sample Name : 142545-007,52096
FileName : C:\GC15\CHB\321B066.RAW
Method : BTEH292.MTH
Start Time : 0.01 min End Time : 31.91 min
Scale Factor: 0.0 Plot Offset: 27 mV

Sample #: 52096 Page 1 of 1
Date : 11/19/1999 11:04 AM
Time of Injection: 11/19/1999 09:24 AM
Low Point : 26.88 mV High Point : 401.21 mV
Plot Scale: 374.3 mV

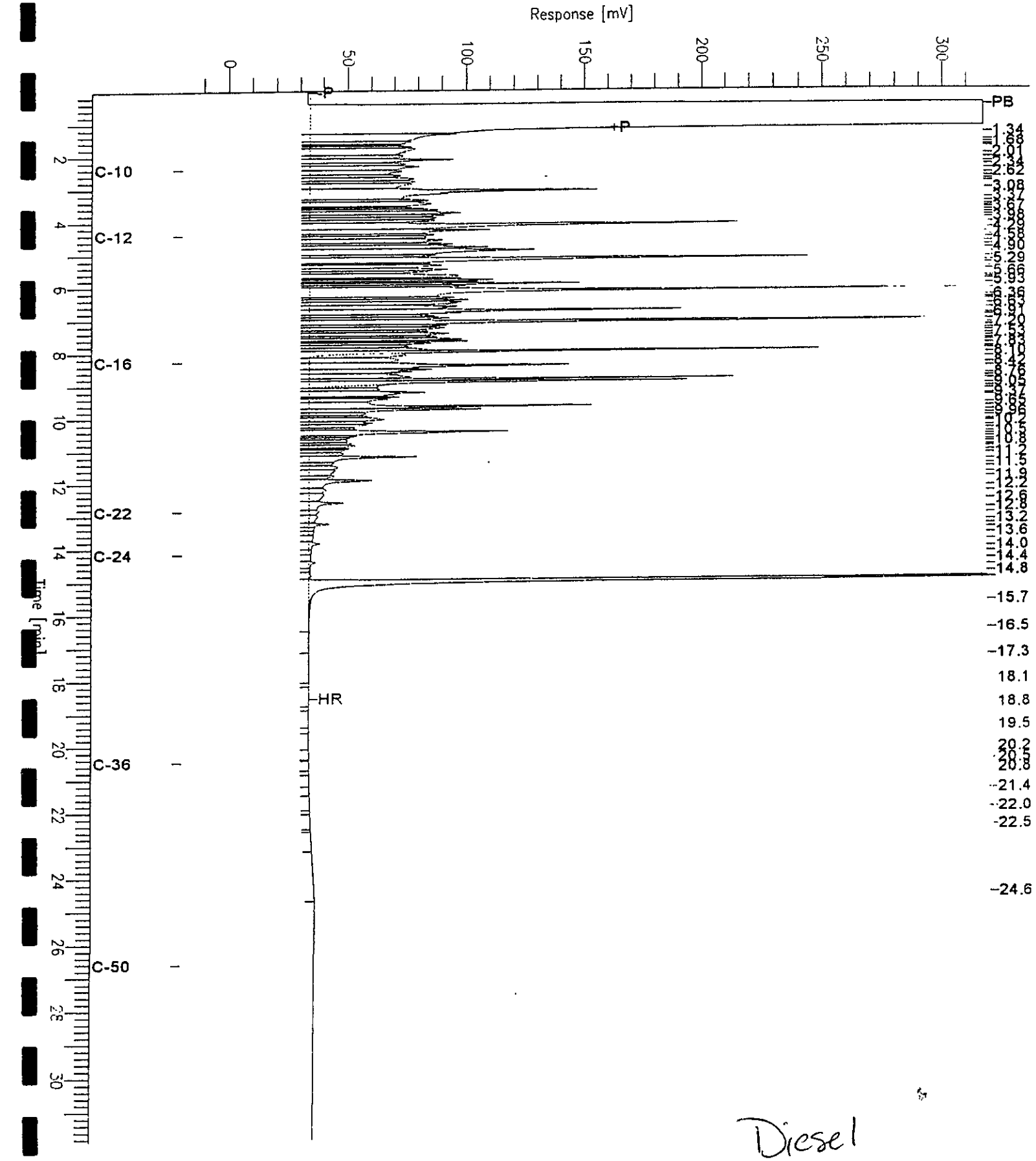


DUP1199

Chromatogram

Sample Name : x,ccv,99ws8230,dsl
FileName : C:\GC15\CHB\321B042.RAW
Method : BTEH292.MTH
Start Time : 0.01 min End Time : 31.91 min
Scale Factor: 0.0 Plot Offset: -19 mV

Sample #: 500mg/l
Date : 11/18/1999 04:23 PM
Time of Injection: 11/18/1999 03:46 PM
Low Point : -19.14 mV High Point : 317.15 mV
Plot Scale: 336.3 mV



Diesel

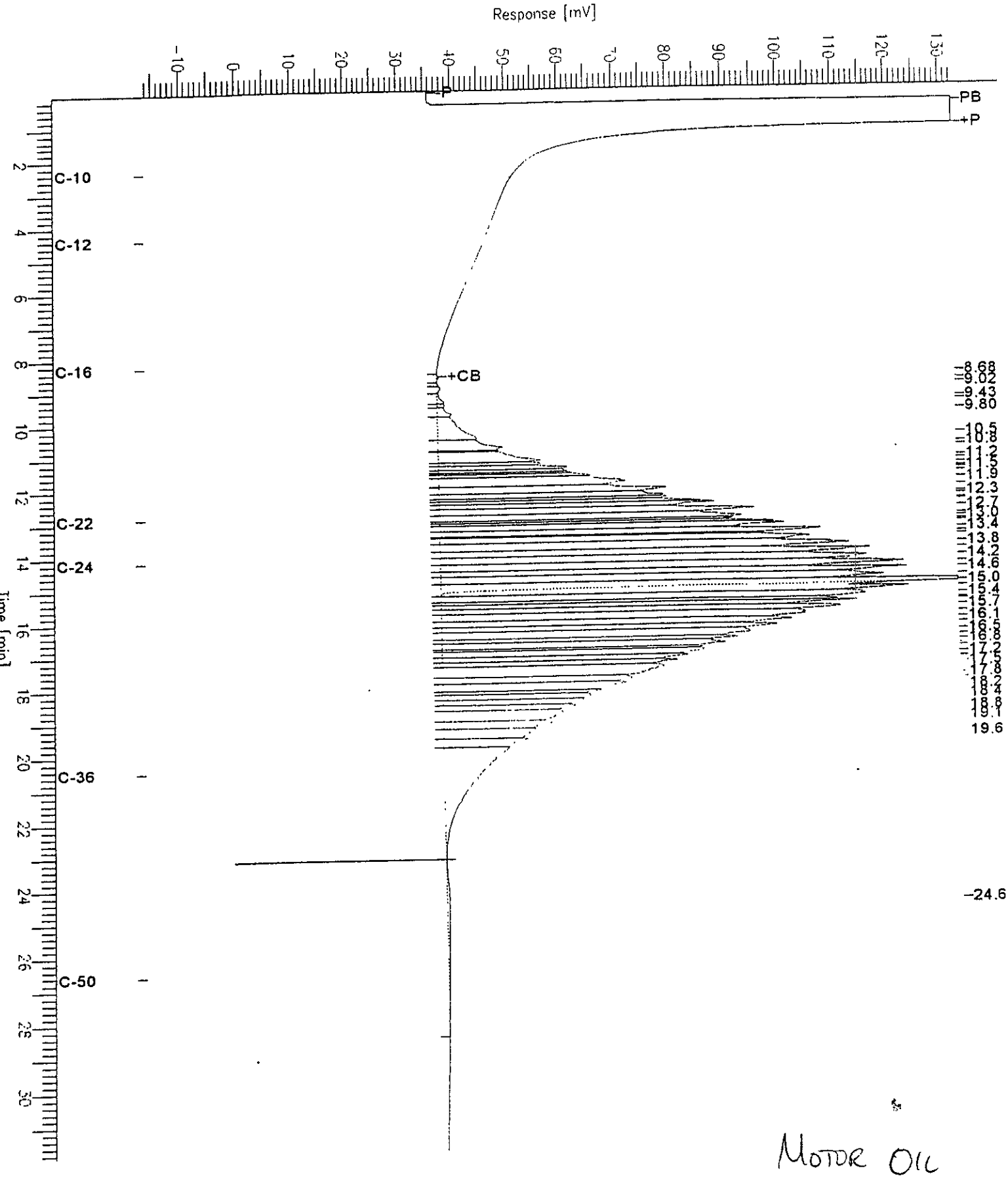
Chromatogram

Sample Name : ccv,99ws8284,mo
FileName : C:\GC15\CHB\321B017.RAW
Method : BTEH292.MTH
Start Time : 0.01 min
Scale Factor: 0.0

End Time : 31.91 min
Plot Offset: -16 mV

Sample #: 500mg/l
Date : 11/18/1999 01:21 PM
Time of Injection: 11/17/1999 09:54 PM
Low Point : -16.18 mV
Plot Scale: 148.6 mV

High Point : 132.37 mV



Motor Oil

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#: 52096
Units: ug/L
Diln Fac: 1

Prep Date: 11/17/99
Analysis Date: 11/19/99

BS Lab ID: QC101580

Analyte	Spike Added	BS	%Rec #	Limits
Diesel C10-C24	2475	2123	86	50-114

Surrogate	%Rec	Limits
Hexacosane	97	58-128

BSD Lab ID: QC101581

Analyte	Spike Added	BSD	%Rec #	Limits	RPD #	Limit
Diesel C10-C24	2475	2248	91	50-114	6	25

Surrogate	%Rec	Limits
Hexacosane	102	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

TEH-Tot Ext Hydrocarbons

Client:	Harding Lawson Associates	Analysis Method:	EPA 8015M
Project#:	42633.1	Prep Method:	EPA 3520
Location:	Port of Oakland-2277		

METHOD BLANK

Matrix:	Water	Prep Date:	11/17/99
Batch#:	52096	Analysis Date:	11/18/99
Units:	ug/L		
Diln Fac:	1		

MB Lab ID: QC101579

Analyte	Result
Diesel C10-C24	<50
Motor Oil C24-C36	<300

Surrogate	%Rec	Recovery Limits
Hexacosane	75	58-128