



PORT OF OAKLAND

May 2, 2001

MAY 04 2001

Mr. Barney Chan
Alameda County Health Care Services Agency
Environmental Protection (LOP)
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

SUBJECT: 2225 & 2277 Seventh Street UST Sites
Oakland, California

Dear Mr. Chan:

Please find enclosed the following reports prepared on the behalf of the Port of Oakland by Harding ESE (formerly Harding Lawson Associates):

4th Quarter of 2000 Quarterly Groundwater Monitoring and Product Recovery Report, 2277 7th Street, Oakland, California & 2nd Semi-Annual 2000 Groundwater Monitoring, 2225 7th Street, Oakland, California, dated January 30, 2001; and

First Quarter of 2001 Quarterly Groundwater Monitoring and Product Recovery Report, 2277 and 2225 Seventh Street, Oakland, California, dated April 30, 2001.

If you have any questions regarding these reports, please contact me at (510) 627-1373.

Sincerely,

John Prall, R.G.

Associate Environmental Scientist

Cc: Jeff Jones

April 30, 2001

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

PORT OF OAKLAND
ENVIRONMENTAL DIVISION

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**First Quarter of 2001 Quarterly Groundwater Monitoring
and Product Recovery Report
2277 and 2225 Seventh Street
Oakland, California**

Dear Mr. Prall:

Harding ESE, Inc. (Harding), formerly Harding Lawson Associates, has prepared this report on behalf of the Port of Oakland for the groundwater monitoring and sampling programs at 2277 Seventh Street and 2225 Seventh Street in Oakland, California (Plate 1). This report summarizes the quarterly monitoring of five groundwater monitoring wells (MW-2, MW-4, MW-5, MW-6, and MW-7) at 2277 7th Street and the quarterly water levels of three groundwater monitoring wells (MW-1, MW-2, and MW-3) at 2225 7th. The locations of these wells are shown on Plate 2.

This report also summarizes the operation of the product recovery system at the 2277 7th Street site during the first quarter of 2001. Monitoring well MW-3 at 2277 7th Street contains an active product skimmer that recovers separate phase petroleum hydrocarbons from the groundwater surface; Harding did not collect a groundwater sample from this well. Monitoring well MW-1 contains a passive product skimmer, and, therefore, Harding did not collect a sample from this well either.

BACKGROUND

2277 7th Street

Another consultant to the Port installed the monitoring wells 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 C-401, consisted of two 10,000-gallon gasoline tanks (GF-17 and GF-18), one 500-gallon oil tank (GF-19), and one 300-gallon waste oil tank (CF-20).

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2225 7th Street

Another consultant installed the monitoring wells at the adjacent site to assess groundwater quality following the removal of underground storage tanks (USTs) from the site in 1989 and 1992. The former USTs consisted of seven diesel USTs and one bulk oil UST located on the east side of Building C-407 and one waste oil UST located north of Building C-407.

GROUNDWATER MONITORING

2277 7th Street

Harding conducted this quarter's groundwater monitoring at 2277 7th Street on February 22, 2001. Prior to purging and sampling the monitoring wells, Harding measured the depth to groundwater below the top of the well casing with an electric water level indicator. Harding also measured the depth to product and depth to groundwater in wells MW-1 and MW-3 to calculate the product thickness. Harding collected groundwater level measurements on April 3, 2001 in order to construct the groundwater elevation contour and the gradient direction presented on Plate 3. Harding did not use the groundwater level measurements from MW-1 or MW-3 to develop the groundwater gradient because of the product recovery equipment in the wells. Groundwater level measurements are summarized in Table 1 and product thickness measurements are summarized on Table 2.

After measuring the depth to water, Harding purged wells MW-2, MW-4, MW-5, MW-6, and MW-7 using a PVC bailer. Conductivity, pH, and temperature were monitored periodically during purging. Harding collected the groundwater samples after removing a minimum of three well-casing volumes of water and when the 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. The Port's waste disposal contractor, Foss Environmental Services Company, Inc. periodically off-hauls and disposes of the purge water along with the product in the tank.

Harding collected groundwater samples from the five monitoring wells using Teflon disposable bailers and then transferred the groundwater into laboratory-provided containers. A duplicate sample was collected at MW-7. Sample containers were labeled with the sample number, date and time of collection, and sampler's initials, then placed in an insulated cooler with ice. The samples were accompanied by a laboratory provided trip blank and delivered under chain-of-custody protocol to Curtis and Tompkins, Ltd., a California certified analytical laboratory.

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2225 7th Street

Harding measured the depth to water at 2225 7th Street on April 3, 2001. The wells at 2225 7th Street are currently under semiannual monitoring, so no samples were taken during the first quarter of 2001. Historical sample results are presented in Table 5. Groundwater level measurements are summarized in Table 3. Groundwater elevations and the gradient direction are presented on Plate 3.

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 EPA Method 8021B (note: detections of MTBE at the 2277 7th Street site were checked by analysis of the samples in accordance with EPA Test Method 8260).
- 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.

Harding included a trip blank, which accompanied the samples from time of collection until delivery to the analytical laboratory and was analyzed for BTEX and MTBE. The laboratory results for 2277 7th Street are summarized in Table 4 and are shown on Plate 4. Copies of the laboratory results and chain-of-custody forms are provided in Appendix B.

FINDINGS

During this monitoring event, the groundwater measurements at both sites were conducted on April 3, 2001. The water levels at 2277 7th Street were also measured on February 22, 2001, however, to create a groundwater level contour incorporating the wells from both sites, all water levels were measured on the same day. The water levels are presented in Tables 1 and 3. Harding used the computer program Surfer to create the contours on Plate 3 using the Kriging method. According to these contours, the groundwater appears to be moving towards the north from Building C-407 toward Building C-401. The groundwater flow direction observed during the first quarter 2001 closely matched that observed during both the third and the fourth quarter 2000.

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2277 7th Street

Results of the February 22, 2001 groundwater sampling at 2277 7th Street are summarized below:

- Harding found measurable product in MW-1 and MW-3 and therefore did not collect a groundwater sample from either well.
- TPHg was reported at a concentration of 450 micrograms per liter ($\mu\text{g/L}$) in MW-4 and 120 $\mu\text{g/L}$ in MW-6. TPHg was not detected in MW-2, MW-5, or MW-7. Last quarter TPHg was detected in the sample from MW-2 at 200 $\mu\text{g/L}$, in MW-4 at 1,200 $\mu\text{g/L}$, MW-6 at 130 $\mu\text{g/L}$, and in MW-7 at 54 $\mu\text{g/L}$.
- Benzene was reported at a concentration of 120 in MW-4, and at 21 $\mu\text{g/L}$ in MW-6. Benzene was not detected in MW-2, MW-5 or MW-7. Last quarter benzene was detected in the sample from MW-2 at 39 $\mu\text{g/L}$, MW-4 at 440 $\mu\text{g/L}$, in MW-6 at 24 $\mu\text{g/L}$.
- Toluene was not detected above the reporting limit in MW-2, MW-4, MW-5, MW-6 or MW-7. Last quarter toluene was reported at a concentration of 1.8 $\mu\text{g/L}$ in MW-2.
- Ethylbenzene was reported at a concentration of 0.96 $\mu\text{g/L}$ in MW-6 and was not detected in MW-2, MW-4, MW-5, or MW-7. Ethylbenzene was detected at a concentration of 1.6 $\mu\text{g/L}$ in MW-6 during the previous quarter.
- Total xylenes were not detected above the reporting limit in MW-2, MW-4, MW-5, MW-6, or MW-7. Last quarter, xylenes were detected at a concentration of 2.6 $\mu\text{g/L}$ in MW-2.
- MTBE was reported at a concentration of 6.4 $\mu\text{g/L}$ in MW-4, and 93 and 98 $\mu\text{g/L}$ in MW-7 and was not detected in MW-2, MW-5 and MW-6. Confirmation samples of MTBE detections by EPA Test Method 8260 did not confirm the presence of MTBE in the sample from MW-4. It did confirm MTBE in the sample from MW-7 at concentrations of 66 and 60 $\mu\text{g/L}$.
- TPHd was reported at a concentration of 440 $\mu\text{g/l}$ in MW-6 and not detected in MW-2, MW-4, MW-5, and MW-7. During the previous quarter, TPHd was detected at 70 $\mu\text{g/l}$ in MW-4, 620 $\mu\text{g/L}$ in MW-6, and 51 $\mu\text{g/l}$ in MW-7.
- TPHmo was not detected above the reporting limit in any of the wells sampled this quarter or last.

QUALITY ASSURANCE AND QUALITY CONTROL

A duplicate sample was collected from monitoring well MW-7 on February 22 and submitted to the analytical laboratory to evaluate the precision of the analytical results. Precision is an indication of the

reproducibility of results and is assessed by calculating the relative percent difference (RPD) between the primary sample result (X1) and the duplicate sample result (X2), as follows:

$RPD = |X1 - X2| / \{(X1 + X2) / 2\} \times 100$. (For example: A low RPD indicates high precision; a RPD of 67 percent indicates the two results differ by a factor of two.)

As shown below, the RPD was calculated for chemical compounds detected above the reporting limit in either the duplicate or primary sample.

	ANALYTE	X1	X2	X1-X2	(X1+X2)/2	RPD
MW-7 2/22/01	MTBE	66	60	6	63	9.5%
	B	ND	ND	--	--	--
	T	ND	ND	--	--	--
	E	ND	ND	--	--	--
	X	ND	ND	--	--	--
	TPHd	ND	ND	--	--	--
	TPHmo	ND	ND	--	--	--
	TPHg	ND	ND	--	--	--

- The relative percent difference between the analytical results from MW-4 and the duplicate sample was considered within acceptable limits at 9.5 percent.
- BTEX was not detected in the trip blank.
- TPHd, TPHmo, and TPHg were not detected in the trip blank.

PRODUCT RECOVERY SYSTEM AT 2277 7TH STREET

The product recovery system at 2277 7th Street consists of an air-actuated (active) product skimmer in MW-3. Since MW-3 contained no measurable product, the passive product skimmer was removed on May 20, 2000. However in the following months, product was measured in the well and skimmer was replaced. Harding 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 Harding conducts monthly inspections of the treatment system. The Port's waste disposal contractor, Foss Environmental Services Company, Inc., removes product from the product recovery tank at various times throughout the quarter. The Port has reported to Harding that Foss Environmental disposed of 800 gallons of non-hazardous wastewater to Seaport Petroleum (Redwood City) on February 6, 2001. Table 2 presents a summary of the product

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thickness data. A summary of the activities during the past quarter associated with the operation and maintenance of the product recovery system is presented in Table 6.

If you have any questions, please contact Luis Fraticelli at (510) 451-1001.

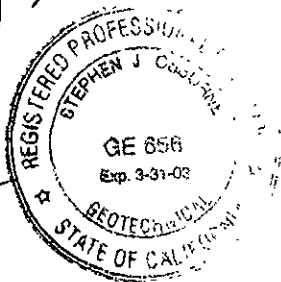
Yours very truly,

HARDING ESE, INC.

Trish Eliasson
510 / 310-1780 page

Trish A. Eliasson
Staff Engineer

Stephen J. Osborne
Stephen J. Osborne
Geotechnical Engineer



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- Attachments:
- Table 1 – Groundwater Elevations Data, 2277 7th Street
 - Table 2 – Summary of Product Removal and Product Thickness, 2277 7th Street
 - Table 3 – Groundwater Elevations Data, 2225 7th
 - Table 4 – Groundwater Sample Results, 2277 7th Street
 - Table 5 – Groundwater Sample Results, 2225 7th Street
 - Table 6 – Summary of Operation and Maintenance Activities

 - Plate 1 – Vicinity Map
 - Plate 2 – Site Plan
 - Plate 3 – Groundwater Elevations, 2277 and 2225 7th Street, April 3, 2001
 - Plate 4 – Groundwater Sample Results, 2277 7th Street, February 22, 2001

 - Appendix A - Groundwater Sampling Forms
 - Appendix B - Laboratory Reports

TABLES

**Table 1. Groundwater Elevations Data, 2277 7th Street
Port of Oakland
2277 and 2225 7th Street, Oakland California**

Well ID	Elevation Top of Casing (feet)	Date Of Monitoring	Depth to Water (feet)	Groundwater Elevation (feet)
MW-1	14.14	4/18/2000	8.21	5.93
		5/22/2000	8.17	5.97
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
		11/12/1999	9.63	4.73
		2/11/2000	8.54	5.82
		5/22/2000	8.10	6.26
		9/6/2000	8.79	5.57
		12/19/2000	9.19	5.17
		2/21/2001	7.99	6.37
		4/3/2001	8.23	6.13
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
		11/12/1999	8.83	4.32
		2/11/2000	7.71	5.44
		5/22/2000	8.09	5.06
		9/6/2000	8.32	4.83
		12/19/2000	8.47	4.68
		2/21/2001	7.51	5.64
		4/3/2001	8.13	5.02
MW-5	13.49	12/31/1997	6.38	7.11
		4/13/1998	5.56	7.93
		11/6/1998	6.59	6.90
		3/19/1999	6.20	7.29
		6/24/1999	6.73	6.76
		9/28/1999	6.91	6.58
		11/12/1999	7.06	6.43
		2/11/2000	7.00	6.49
		5/22/2000	6.21	7.28
		9/6/2000	6.56	6.93
		12/19/2000	6.68	6.81
		2/21/2001	6.08	7.41
		4/3/2001	6.38	7.11
MW-6	14.00	6/24/1999	8.61	5.39
		9/28/1999	9.26	4.74
		11/12/1999	8.01	5.99
		2/11/2000	7.20	6.80
		5/22/2000	7.13	6.87
		9/6/2000	7.12	6.88
		12/19/2000	7.57	6.43
MW-7	14.35	2/21/2001	7.50	6.50
		4/3/2001	6.88	7.12
		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		
11/12/1999	9.77	4.58		
2/11/2000	8.67	5.68		
5/22/2000	8.43	5.92		
9/6/2000	8.88	5.47		
12/19/2000	9.21	5.14		
2/21/2001	8.13	6.22		
4/3/2001	8.45	5.90		

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, 2277 7th Street
Port of Oakland
and 2225 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
		10/5/1999	--	--	--	0.2	passive skimmer
		11/12/1999	9.38	10.27	0.89	0.2	passive skimmer
		12/21/1999	--	--	--	0.2	passive skimmer
		1/26/2000	--	--	--	0.2	passive skimmer
		1/28/2000	9.22	9.24	0.02	--	passive skimmer
		2/11/2000	--	7.00	0.00	0.2	passive skimmer
		3/1/2000	--	7.45	0.00	0.0	passive skimmer
		3/21/2000	NM	7.34	0.00	0.0	passive skimmer
		4/18/2000	NM	8.21	0.00	0.0	passive skimmer
		5/22/2000 ³	NM	8.51	0.00	0.0	passive skimmer
		9/6/2000 ⁴	8.52	9.24	0.72	0.0	passive skimmer
		9/21/2000	8.71	9.26	0.55	0.0	passive skimmer
		10/11/2000	--	--	--	0.0	passive skimmer
		11/30/2000	--	--	--	0.0	passive skimmer
12/19/2000	9.5	9.89	0.39	0.0	passive skimmer		
2/22/2001	8.3	8.4	0.13	0.0	passive skimmer		
4/3/2001	8.3	8.55	0.25	0.0	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
		9/28/1999	--	--	0.2	--	active skimmer
		10/29/1999	--	--	--	125 ²	active skimmer
11/12/1999	9.14	9.23	0.09	--	active skimmer		
1/28/2000	--	--	--	135	active skimmer		

**Table 2. Product Removal and Product Thickness Data, 2277 7th Street
Port of Oakland
2277 and 2225 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-3		2/11/2000	7.97	8.37	0.40	40	active skimmer
		3/1/2000	6.59	7.24	0.65	0.0	active skimmer
		3/21/2000	6.50	6.56	0.06	35	active skimmer
		4/18/2000	--	--	--	--	active skimmer
		5/22/2000	7.51	8.05	0.54	40	active skimmer
		6/26/2000	7.82	8.2	0.38	90	active skimmer
		7/25/2000	7.90	8.92	1.02	20	active skimmer
		8/31/2000	8.15	9.5	1.35	30	active skimmer
		9/6/2000	8.21	9.42	1.21	--	active skimmer
		9/21/2000	8.30	8.88	0.58	115	active skimmer
		10/11/2000	--	--	--	170	active skimmer
		11/30/2000	--	--	--	105	active skimmer
		12/19/2000	8.60	9.65	1.05	10	active skimmer
		2/22/2001	6.36	8.15	1.79	--	active skimmer
	4/3/2001	7.48	8.88	1.40	--	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

³ The passive skimmer was removed from MW-1 on 5/22/00.

⁴ The passive skimmer replaced MW-1 on 9/6/00.

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

... Shaded areas indicate data from this reporting period

**Table 3. Groundwater Elevations Data, 2225 7th Street
Port of Oakland
2277 and ██████████ Street, Oakland California**

Well ID	Elevation Top of Casing (feet)	Date Of Monitoring	Depth to Water (feet)	Groundwater Elevation (feet)
██████████	13.72	1/15/1993	5.21	8.51
		9/12/1994	6.37	7.35
		11/30/1994	5.76	7.96
		3/29/1995	4.57	9.15
		5/25/1995	5.14	8.58
		6/21/1995	5.41	8.31
		6/23/1995	5.44	8.28
		11/20/1995	6.28	7.44
		12/27/1995	5.86	7.86
		3/25/1996	5.21	8.51
		6/26/1996	5.58	8.14
		10/14/1996	6.22	7.50
		3/19/1997	5.48	8.24
		6/26/2000	5.19	8.53
		9/6/2000	5.62	8.10
		12/19/2000	5.57	8.15
		4/3/2001	5.03	8.69
MW-2	13.8	1/15/1993	6.21	7.59
		9/12/1994	6.47	7.33
		11/30/1994	6.34	7.46
		3/29/1995	5.51	8.29
		5/25/1995	5.60	8.20
		6/21/1995	5.72	8.08
		6/23/1995	5.72	8.08
		9/28/1995	6.15	7.65
		11/20/1995	6.42	7.38
		12/27/1995	6.31	7.49
		3/25/1996	5.74	8.06
		6/26/1996	5.85	7.95
		10/14/1996	6.36	7.44
		3/19/1997	5.90	7.90
		6/26/2000	5.37	8.43
		9/6/2000	5.62	8.18
12/19/2000	5.81	7.99		
		4/3/2001	5.38	8.42
MW-3	15.06	1/15/1993	6.44	8.62
		9/12/1994	7.35	7.71
		11/30/1994	7.12	7.94
		3/29/1995	6.31	8.75
		5/25/1995	6.75	8.31
		6/21/1995	6.87	8.19
		6/23/1995	6.88	8.18
		9/28/1995	7.28	7.78
		11/20/1995	7.51	7.55
		12/27/1995	7.20	7.86
		3/25/1996	6.64	8.42
		6/26/1996	6.98	8.08
		10/14/1996	7.47	7.59
		3/19/1997	6.99	8.07
		6/26/2000	6.82	8.24
		9/6/2000	6.82	8.24
12/19/2000	7.10	7.96		
		4/3/2001	6.66	8.40

¹ Elevation data relative to Port of Oakland datum, well surveys performed on December 6, 1994
- Data prior to June 26, 2000 taken from *First Quarter 1997 Groundwater Monitoring and Sampling report* dated May 6, 1999, by Fluor Daniel GTI.

**Table 4. Groundwater Sample Result, 2277 7th Street
Port of Oakland
2277 and 2225 7th Street, Oakland California**

Monitoring Well ID	Date	TPH _g (µg/l)	TPH _d (µg/l)	TPH _{mo} (µg/l)	Benzene (µg/l)	Toluene (µg/l)	Ethylbenzene (µg/l)	Total Xylenes (µg/l)	MTBE (µg/l)
MW-1	05/22/00	3,600	41,000	<3,000	100	13 ⁸	2.9	2.05	3.2 ⁸
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}
	02/11/00	<50	<50	<300	5.4	<0.5	<0.5	<0.5	<2
	05/22/00	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2
	09/06/00	<50	<50	<300	0.76 ⁸	<0.5	<0.5	<0.5	<0.5 ¹⁰
	12/19/00	200 ^{3,11}	<50	<300	39	1.8	<0.5	2.6	<0.5 ^{10,12}
	02/21/01	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
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 ³	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
	02/11/00	200 ²	<50	<300	58	0.73	<0.5	<0.5	4.4 ³
	05/22/00	240	<50	<300	500	<2.5	<2.5	<2.5	17
	09/06/00	530 ^{2,3}	<50	<300	190	0.93	0.6	0.57	<0.5 ¹⁰
	12/19/00	960 ^{3,11}	70 ⁵	<300	420	<2.5	<2.5	<2.5	<0.5 ^{10,12}
Dup.	12/19/00	1,200 ^{3,11}	<50	<300	440	<2.5	<2.5	<2.5	<0.5 ^{10,12}
	02/21/01	450 ¹³	<50	<300	120	<0.5	<0.5	<0.5	<0.5 ¹⁰
MW-5	09/11/95	90	<300	2,500	3.3	<0.3	<0.3	<0.4	NA
	04/04/96	<50	180	520	<0.5	<0.5	<0.5	<1.0	NA
	07/10/96	<50	120	1,500	<0.4	<0.3	<0.3	<0.4	NA
	12/03/96	<50	200 ^{1,2}	<250	<0.5	<0.5	<0.5	<1.0	NA
	03/28/97	<50	<50	<250	<0.5	<0.5	<0.5	<1.0	NA
	06/13/97	<50	<50	<250	<0.5	<0.5	<0.5	<1.0	NA
	09/18/97	<50	<50	<250	<0.5	<0.5	<0.5	<1.0	NA
	12/31/97	<50	<47	<280	<0.5	<0.5	<0.5	<1.0	NA
	04/13/98	<50	<47	<280	<0.5	<0.5	<0.5	<1.0	NA
	11/06/98	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2

**Table 4. Groundwater Sample Result, 2277 7th Street
Port of Oakland
2277 and 2225 7th Street, Oakland California**

Monitoring Well ID	Date	TPH _g (µg/l)	TPH _d (µg/l)	TPH _{mo} (µg/l)	Benzene (µg/l)	Toluene (µg/l)	Ethylbenzene (µg/l)	Total Xylenes (µg/l)	MTBE (µg/l)
MW-5 (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
	02/11/00	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2
	05/22/00	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2
	09/06/00	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2
	12/19/00	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2
	02/21/01	<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	<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
	02/11/00	270 ²	2,300	<300	23	0.51	2.7	<0.5	5.8
	05/22/00	350	3,000	<300	18	0.51	<0.5	<0.5	7.7
	09/06/00	190	610	<300	26	<0.5	1.7	<0.5	<0.5 ¹⁰
	12/19/00	130 ^{3,11}	620	<300	24	<0.5	1.6	<0.5	<2
	02/21/01	120 ¹³	440	<300	21	<0.5	0.96	<0.5	<2
	MW-7	09/06/95	<50	<300	800	<0.4	<0.3	<0.3	<0.4
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
02/11/00		<50	<50	<300	<0.5	<0.5	<0.5	<0.5	51
05/22/00		110	53 ²	<300	<0.5	<0.5	<0.5	<0.5	75
09/06/00	50 ⁶	<50	<300	<0.5	<0.5	<0.5	<0.5	40 ¹⁰	
12/19/00	54 ¹¹	51 ⁵	<300	<0.5	<0.5	<0.5	<0.5	47 ^{10,12}	
02/21/01	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	66 ¹⁰	
Dup.	02/21/01	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	60 ¹⁰

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 of two
⁹ Trip blank contained MTBE at a concentration of 4.2 µg/l
¹⁰ MTBE detections confirmed by EPA Test Method 8260 8260 results displayed
¹¹ Sample exhibits unknown single peak or peaks
¹² EPA Method 8260 confirmation analyzed past holding time
¹³ Lighter hydrocarbons contributed to the quantitation
 - 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 Unbe and Associate
 NA Not Analyzed

**Table 5. Groundwater Sample Results, 2225 7th Street
Port of Oakland
2277 and 2225 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-1	1/15/1993	<50	<50	NA	<0.3	<0.3	<0.3	<0.3	NA
	9/12/1994	<10 ¹	10,000	NA	0.5	<0.3	<0.3	<0.3	NA
	11/30/1994	<10	2,800	NA	<0.3	<0.3	<0.3	<0.3	NA
	3/29/1995	<50	<50	NA	<0.3	<0.3	<0.3	<0.3	NA
	6/21/1995	<50	<50 ²	NA	<0.3	<0.3	<0.3	<0.3	NA
	9/28/1995	<50	<50	NA	<0.3	<0.3	<0.3	<0.3	NA
	12/27/1995	<50	<50	<100	<0.3	<0.3	<0.3	<0.3	NA
	3/25/1996	<50	<50	<100	<0.3	<0.3	<0.3	<0.3	NA
	6/26/1996	<50	<50	NA	<0.5	<0.5	<0.5	<0.5	<5.0
	10/14/1996	<50	<50	NA	<0.5	<0.5	<0.5	<0.5	<5.0
	3/19/1997	<50	<50	NA	<0.5	<0.5	<0.5	<0.5	<5.0
	6/26/2000	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5 ⁵
	12/19/2000	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2
Dup.	12/19/2000	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2
MW-2	1/15/1993	<50	<50	NA	<0.3	<0.3	<0.3	<0.3	NA
	9/12/1994	34 ¹	<50	NA	0.5	<0.3	<0.3	<0.3	NA
	11/30/1994	<10	81	NA	0.9	<0.3	<0.3	<0.3	NA
	3/29/1995	<50 ³	75	NA	0.3	<0.3	<0.3	<0.3	NA
	6/21/1995	<50 ³	<50	NA	<0.3	<0.3	<0.3	<0.3	NA
	9/28/1995	250 ¹	<50	NA	<0.3	<0.3	<0.3	<0.3	NA
	12/27/1995	220 ¹	<50	<100	<0.3	<0.3	<0.3	<0.3	NA
	3/25/1996	200 ¹	<50	<100	<0.3	<0.3	<0.3	<0.3	NA
	6/26/1996	77 ⁴	<50	NA	<0.5	<0.5	<0.5	<0.5	<5.0
	10/14/1996	<50	<50	NA	<0.5	<0.5	<0.5	<0.5	<5.0
	3/19/1997	150	<50	NA	<0.5	<0.5	<0.5	<0.5	<5.0
	6/26/2000	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5 ⁵
	12/19/2000	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2
MW-3	1/15/1993	<50	<50	NA	<0.3	<0.3	<0.3	<0.3	NA
	9/12/1994	<50	<50	NA	0.3	<0.3	<0.3	<0.3	NA
	11/30/1994	110	150	NA	<0.3	<0.3	<0.3	<0.3	NA
	3/29/1995	<50	<50	NA	<0.3	<0.3	<0.3	<0.3	NA
	6/21/1995	<50 ³	<50 ²	NA	<0.3	<0.3	<0.3	<0.3	NA
	9/28/1995	51 ¹	<50	NA	<0.3	<0.3	<0.3	<0.3	NA
	12/27/1995	55 ¹	<50	<100	<0.3	<0.3	<0.3	<0.3	NA
	3/25/1996	53	<50	<100	<0.3	<0.3	<0.3	<0.3	NA
	6/26/1996	<50	<50	NA	<0.5	<0.5	<0.5	<0.5	<5.0
	10/14/1996	<50	<50	NA	<0.5	<0.5	<0.5	<0.5	<5.0
	3/19/1997	<50	<50	NA	<0.5	<0.5	<0.5	<0.5	<5.0
	6/26/2000	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5 ⁵
	12/19/2000	<50	50 ²	<300	<0.5	<0.5	<0.5	<0.5	<2

NA Not Analyzed

¹ Hydrocarbon pattern is not characteristic of gasoline

² Hydrocarbon pattern present in sample is not characteristic of diesel

³ Uncategorized compound not included in the gasoline concentration

⁴ Product is not typical gasoline

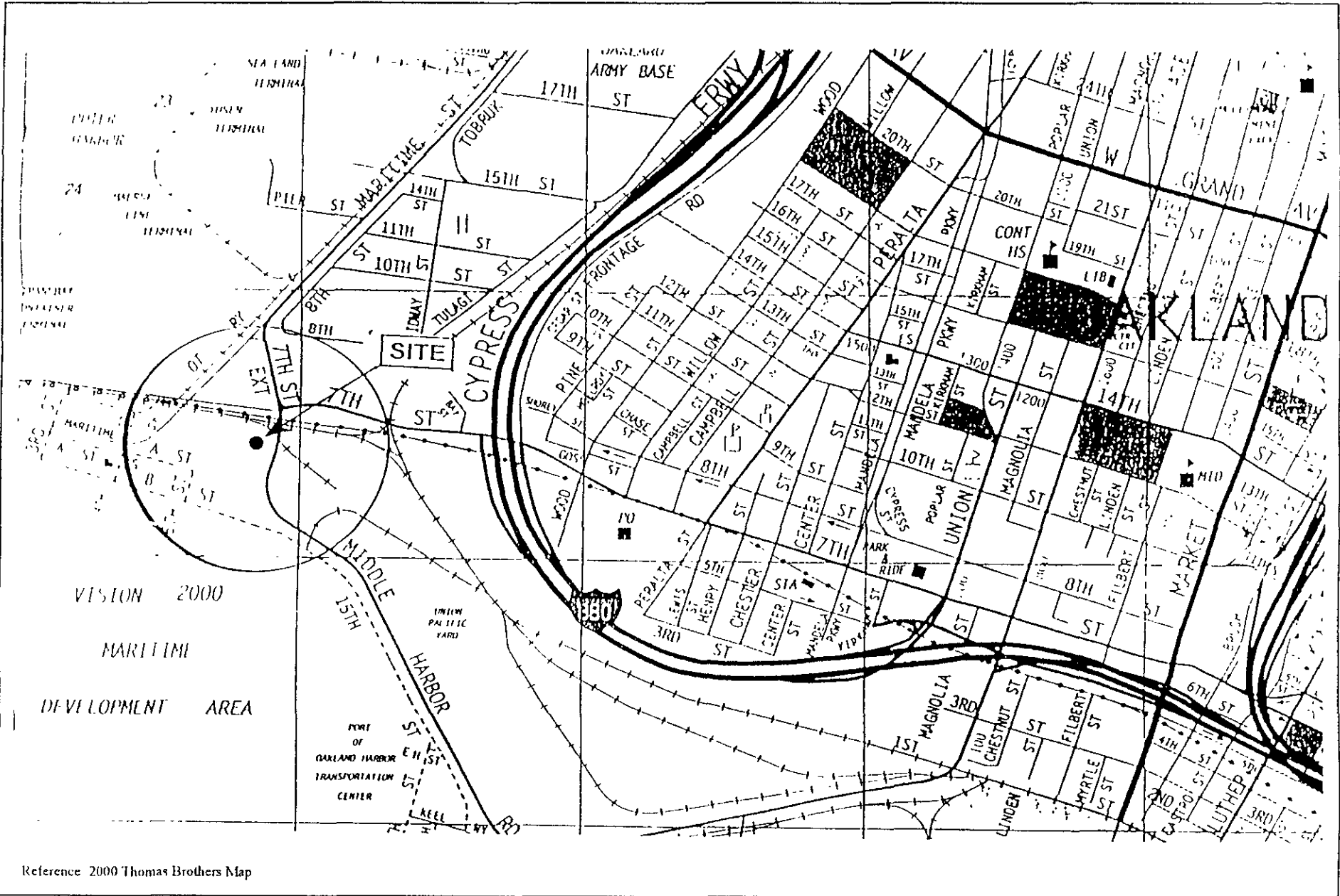
⁵ MTBE detected by EPA Test Method 8021B but reported as ND-0.5 by EPA Test Method 8260

- Data prior to June 26, 2000 taken from *First Quarter 1997 Groundwater Monitoring and Sampling report* dated May 6, 1999, by Fluor Daniel GTI

**Table 6. Summary of Operation and Maintenance Activities
Port of Oakland
2277 and 2225 7th Street, Oakland California**

Date	System Status	Comments
2/1/2001	System not running.	Check active skimmer in MW-3, check product in passive skimmer at MW-1. Some product on the outside of skimmer. Raise the skimmer. Check power to active skimmer. The circuit breakers were turned off in the building. Once they were turned back on, the system began running. Measure product and water levels in the tank.
2/22/2001	System Running.	Check passive skimmer at MW-1, no product in receptacle. MW-7 had a cracked well lid and no bolts. No product in tank at treatment system. Measured water levels and collected water samples at site 2277 wells.
4/3/2001	System not running.	Check active skimmer in MW-3 and passive skimmer at MW-1. Some product on outside of skimmer. Lower active skimmer and system began running. No product in tank at treatment system. Measured water levels at 2277 and 2225 wells.

PLATES



Reference 2000 Thomas Brothers Map



Harding ESE
A MACTEC COMPANY

DRAWN
tae

PROJECT NUMBER
42633.1

Vicinity Map
Quarterly Groundwater Monitoring Report
2277 and 2225 Seventh Street
Oakland, California 94607

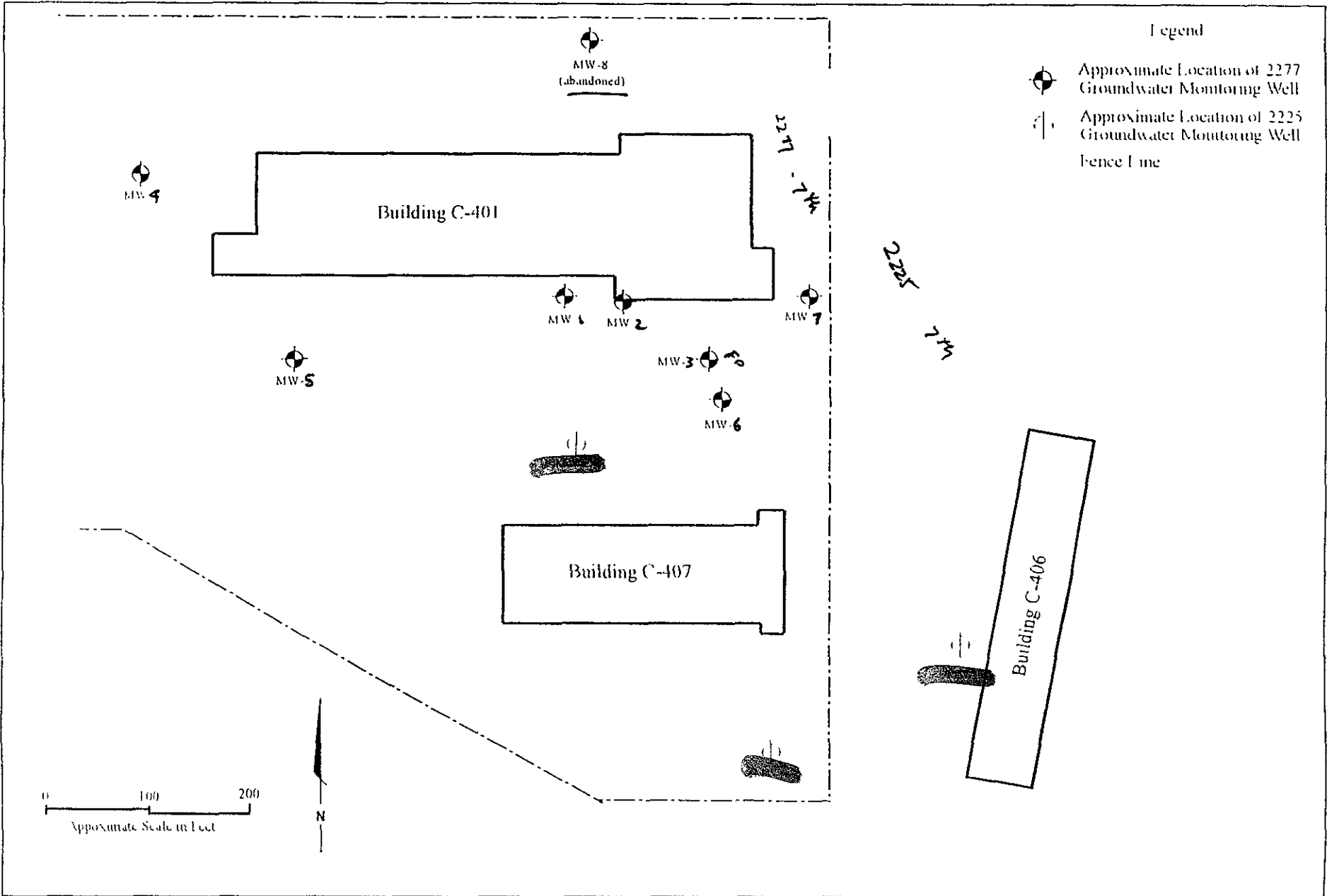
APPROVED

DATE
4/4/01

REVISED DATE

PLATE

1



Harding ESE
A MACTEC COMPANY

DRAWN
tae

PROJECT NUMBER
42633 1

Site Plan
Quarterly Groundwater Monitoring Report
2277 and 2225 Seventh Street
Oakland, California 94607

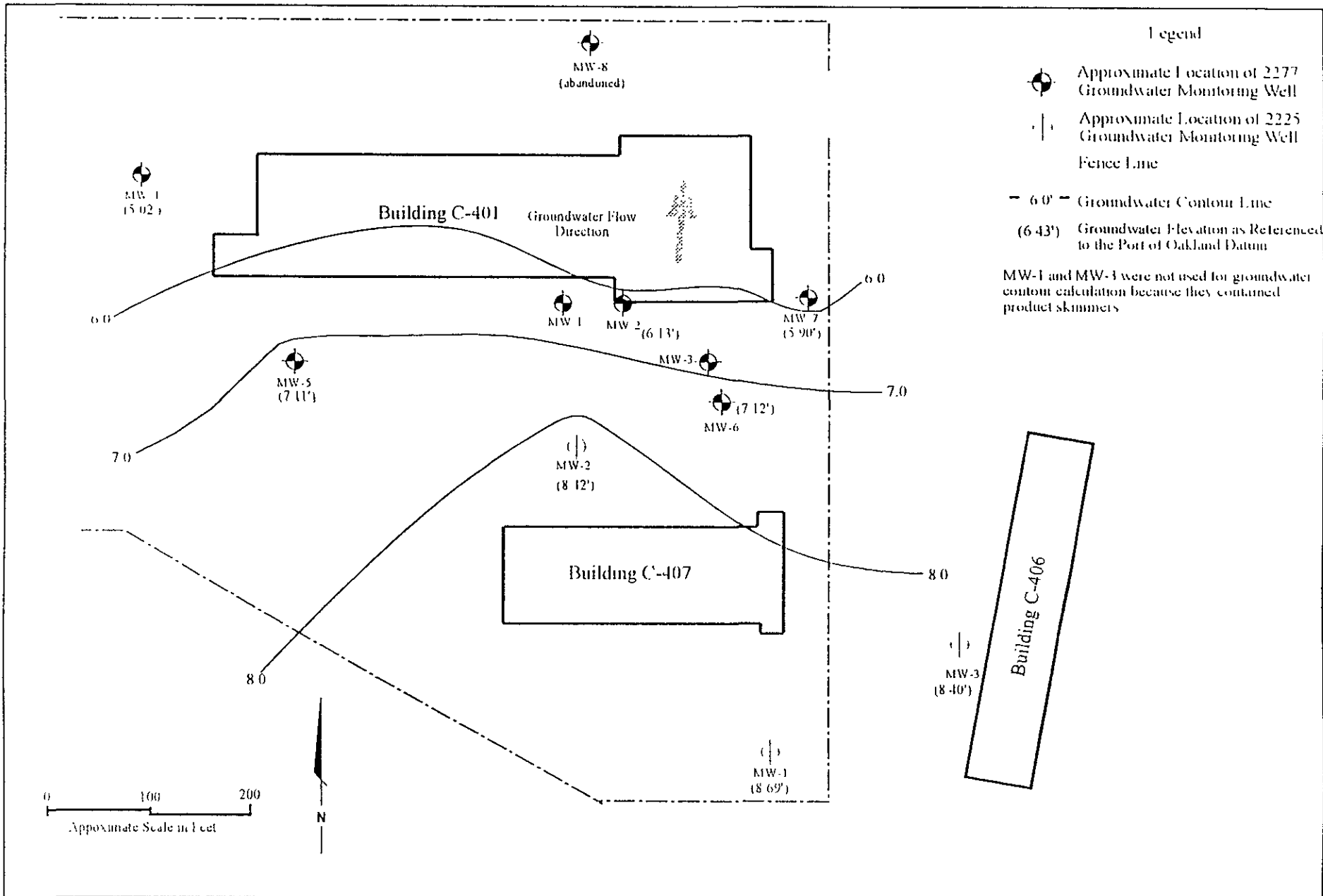
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DATE
4/4/01

REVISED DATE

PLATE

2



Harding ESE

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DRAWN
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PROJECT NUMBER
42633 1

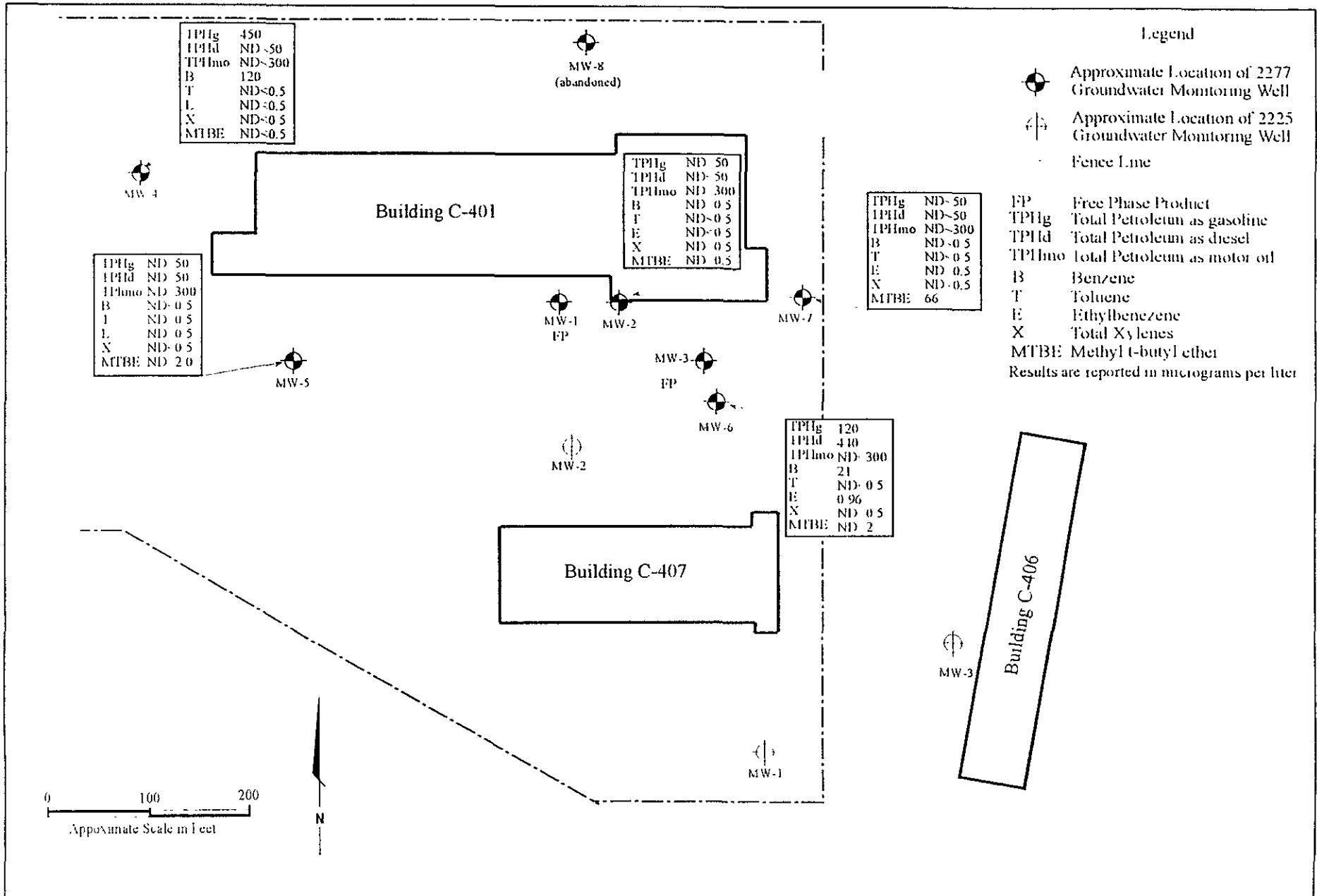
Groundwater Elevations, April 3, 2001 -
Quarterly Groundwater Monitoring Report
2277 and 2225 Seventh Street
Oakland, California 94607

APPROVED

DATE
4/4/01

REVISED DATE

PLATE
3



Harding ESE
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PROJECT NUMBER
42633.1

Groundwater Sample Results, February 22, 2001
Quarterly Groundwater Monitoring Report
2277 and 2225 Seventh Street
Oakland, California 94607

APPROVED

DATE
4/4/01

REVISED DATE

PLATE
4

APPENDIX A

GROUNDWATER SAMPLE FORMS



Job Name: Port of Oakland - 2277 7th Street
 Job Number: 42683
 Recorded By: [Signature]

Well Number: MW- 2
 Well Type: Monitor Extraction Other
 PVC St Steel Other
 Date: 2/21/01
 Sampled By: SJK

WELL PURGING

PURGE VOLUME
 Casing Diameter (D in inches): 2
 Total Depth of Casing (TD in ft BTOC): 15.37'
 Water Level Depth (WL in ft BTOC): 7.99'
 No. of Well Volumes to be purged (# V): 3

PURGE METHOD
 Bailer - Type pvc
 Submersible - Type _____
 Other - Type _____

PURGE VOLUME CALCULATION
 $15.37 - 7.99 \times 2^2 \times 3 \times 0.0408 = 3.75$ gals
 TD (feet) WL (feet) D (inches) #V Calculated Purge Volume

PUMP INTAKE SETTING
 Near Bottom Near Top
 Other _____
 Depth in feet (BTOC) _____
 Screen Interval in feet (BTOC) from _____ to _____

Field Parameter Measurement				
Vol # Minutes	pH	Conductivity (uS)	Temp °C °F	Turbidity (NTU)
Initial	5.2	1950	63.6	
1	5.84	1880	63.7	
2	5.84	1800	63.6	
3	5.82	1700	63.7	
3	5.84	1710	60.4	

Meter S/N _____

PURGE TIME PURGE RATE
 Purge Start _____ GPM _____
 Purge Stop _____ GPM _____
 Elapsed _____

PURGE VOLUME
 Volume 3.75 gallons
 Observations During Purging (Well Condition, Color, Odor)
low pH
 Discharge Water Disposal Sanitary Sewer
 Storm Sewer Other onsite TS

WELL SAMPLING

Bailer - Type: disposable Sample Time 2:20

Sample No	Volume/Cont	Analysis Requested	Preservatives	Lab	Comments
MW- <u>2</u>	2 LA	TPHd, TPHmo	none	C&T	silica gel cleanup
	3 VOAS	TPHg, BTEX, MTBE	HCl	C&T	

QUALITY CONTROL SAMPLES

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



Job Name: Port of Oakland - 2277 7th Street

Job Number: 42633 1

Recorded By: *[Signature]*
Signature

Well Number: MW- 4

Well Type: Monitor Extraction Other
 PVC St Steel Other

Date: 2/21/01

Sampled By: SJK *[Initials]*
Initials

WELL PURGING

PURGE VOLUME

Casing Diameter (D in inches): 2
Total Depth of Casing (TD in ft BTOC): 18.821
Water Level Depth (WL in ft BTOC): 7.56'
No. of Well Volumes to be purged (# V): 3

PURGE METHOD

Bailer - Type pvc
 Submersible - Type
 Other - Type

PUMP INTAKE SETTING

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

PURGE VOLUME CALCULATION

$18.821 \times 3 \times 0.0408 = 2.31$ gals
TD (feet) WL (feet) D (inches) #V Calculated Purge Volume

Field Parameter Measurement

Volume Minutes	pH	Conductivity (µS)	Temp		Turbidity (NTU)
			°C	°F	
Initial	5.70	1850	5.7		
1	5.72	1910	61.0		
2	6.26	1860	61.1		
3	5.84	1710	60.4		
Meter S/N					

PURGE TIME

Purge Start _____ GPM _____
Purge Stop _____ GPM _____
Elapsed _____

PURGE RATE

PURGE VOLUME

Volume 5.75 gallons

Observations During Purging (Well Condition, Color, Odor)

Discharge Water Disposal Sanitary Sewer
 Storm Sewer Other onsite TS

WELL SAMPLING

Bailer - Type. disposable

Sample Time 5:20

Sample No.	Volume/Cont.	Analysis Requested	Preservatives	Lab	Comments
MW- 4	2 LA	TPHd, TPHmo	none	C&T	silica gel cleanup
	3 VOAS	TPHg, BTEX, MTBE	HCl	C&T	

QUALITY CONTROL SAMPLES

Duplicate Samples	
Original Sample No	Dupl. Sample No

Blank Samples	
Type	Sample No

Other Samples	
Type	Sample No



Job Name: Port of Oakland - 2277 7th Street

Job Number: 42683.1

Recorded By: [Signature]

Well Number: MW- 5

Well Type: Monitor Extraction Other

PVC St. Steel Other

Date: 2/21/01

Sampled By: SJK
(Initials)

WELL PURGING

PURGE VOLUME

Casing Diameter (D in inches): 2
Total Depth of Casing (TD in ft BTOC): 17.68'
Water Level Depth (WL in ft BTOC): 6.18'
No. of Well Volumes to be purged (# V): 3

PURGE METHOD

Bailer - Type pvc
 Submersible - Type _____
 Other - Type _____

PURGE VOLUME CALCULATION

$6.18' - 0.25' \times 2 \times 3 \times 0.0408 = 5.67$ gals

TD (feet) WL (feet) D (inches) #V Calculated Purge Volume

PUMP INTAKE SETTING

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

Field Parameter Measurement

Minutes	pH	Conductivity (uS)	Temp °C °F	Turbidity (NTU)
Initial	5.64	1430	60.6	
1	5.73	1520	60.4	
2	5.71	1540	60.5	
3	5.68	1540	60.2	

PURGE TIME: Purge Start _____ Purge Stop _____ Elapsed _____
PURGE RATE: _____ GPM _____ GPM

PURGE VOLUME: Volume: 5.80 gallons

Observations During Purging (Well Condition, Color, Odor)

Discharge Water Disposal: Sanitary Sewer Storm Sewer Other onsite TS

WELL SAMPLING

Bailer - Type disposable Sample Time: 2:50

Sample No	Volume/Cont	Analysis Requested	Preservatives	Lab	Comments
MW- 5	2 LA	TPHd, TPHmo	none	C&T	silica gel cleanup
	3 VOAS	TPHg, BTEX, MTBE	HCl	C&T	

QUALITY CONTROL SAMPLES

Duplicate Samples	
Original Sample No	Dupl. Sample No

Blank Samples	
Type	Sample No

Other Samples	
Type	Sample No



Job Name: Port of Oakland - 2277 7th Street
 Job Number: 42833 1
 Recorded By: [Signature]

Well Number: MW- 6
 Well Type: Monitor Extraction Other
 PVC St Steel Other
 Date: 2/21/01
 Sampled By: SJK (initials)

WELL PURGING

PURGE VOLUME

Casing Diameter (D in inches): 2
 Total Depth of Casing (TD in ft BTOC): 18.95'
 Water Level Depth (WL in ft BTOC): 7.50'
 No. of Well Volumes to be purged (# V): 3

PURGE METHOD

Bailer - Type: pvc
 Submersible - Type
 Other - Type

PURGE VOLUME CALCULATION

$(18.95 - 7.50) \times 2^2 \times 3 \times 0.0408 = 5.6$ gals
 TD (feet) WL (feet) D (inches) # V Calculated Purge Volume

PUMP INTAKE SETTING

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

Field Parameter Measurement

Time Minutes	pH	Conductivity (uS)	Temp. °C °F	Turbidity (NTU)
Initial	6.53	3200	61.1	
1	6.47	3200	63.6	
2	6.30	3270	66.7	
3	6.13	3350	68.3	
3	5.94	3330	68.0	

PURGE TIME

Purge Start _____ GPM _____
 Purge Stop _____ GPM _____
 Elapsed: _____

PURGE RATE

PURGE VOLUME

Volume 5.25 gallons

Observations During Purging (Well Condition, Color, Odor)

DRY ROUS NEAR MW-3
HIGH CONDUCTIVITY

Discharge Water Disposal: Storm Sewer Sanitary Sewer Other onsite TS

WELL DRYERS QUICKLY

WELL SAMPLING

Bailer - Type: disposable Sample Time 1:50

Sample No.	Volume/Cont.	Analysis Requested	Preservatives	Lab	Comments
MW- 6	2 LA	TPHd, TPHmo	none	C&T	silica gel cleanup
	3 VOAS	TPHg, BTEX, MTBE	HCl	C&T	

QUALITY CONTROL SAMPLES

Duplicate Samples	
Original Sample No	Dupl Sample No

Blank Samples	
Type	Sample No

Other Samples	
Type	Sample No



Job Name: Port of Oakland - 2277 7th Street
 Job Number: 426331
 Recorded By: [Signature]

Well Number: MW- 7
 Well Type: Monitor Extraction Other
 PVC St Steel Other
 Date: 2/21/01
 Sampled By: SJK (initials)

WELL PURGING

PURGE VOLUME

Casing Diameter (D in inches): 2
 Total Depth of Casing (TD in ft BTOC): 18.16'
 Water Level Depth (WL in ft BTOC): 8.13'
 No. of Well Volumes to be purged (# V): 3

PURGE METHOD

Bailer - Type PVC
 Submersible - Type _____
 Other - Type _____

PURGE VOLUME CALCULATION

(18.16 - 8.13) x 2^2 x 3 x 0.0408 = 4.91 gals
 TD (feet) WL (feet) D (inches) #V Calculated Purge Volume

PUMP INTAKE SETTING

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

Field Parameter Measurement

Minutes	pH	Conductivity (µS)	Temp °C / °F	Turbidity (NTU)
Initial	6.09	1850	64.1	
1 min	6.24	1440	63.4	
2 "	6.31	1460	62.5	
3 "	6.55	1550	63.2	

PURGE TIME: Purge Start _____, Purge Stop _____, Elapsed _____
 PURGE RATE: _____ GPM

PURGE VOLUME

Volume 5.0 gallons

Observations During Purging (Well Condition, Color, Odor)

DIRTY GREY PURGE WATER

Discharge Water Disposal: Sanitary Sewer, Storm Sewer, Other onsite TS

WELL SAMPLING

Bailer - Type disposable Sample Time 1:00

Sample No	Volume/Cont.	Analysis Requested	Preservatives	Lab	Comments
MW- 7	2 LA	TPHd, TPHmo + SILICA GEL	none	C&T	silica gel cleanup
	3 VOAS	TPHg, BTEX, MTBE	HCl	C&T	
MW- 7 DUP	2 LA	TPHd + SILICA GEL			
	3 VOAS	TPHg, BTEX, MTBE			

QUALITY CONTROL SAMPLES

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

APPENDIX B
LABORATORY REPORTS



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

RECEIVED
 MAR 19 2001
 HARDING LAWSON

A N A L Y T I C A L R E P O R T

Prepared for:

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

Date: 15-MAR-01
 Lab Job Number: 150510
 Project ID: 42633.1
 Location: Port of Oakland-2277

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signatures. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis.

Reviewed by:
 Project Manager

Reviewed by:
 Operations Manager

This package may be reproduced only in its entirety.

Laboratory Number: 150510
Client: Harding Lawson Associates
Location: Port of Oakland-2277
Project#: 42633.1

Receipt Date: 2/26/01

CASE NARRATIVE

This hardcopy data package contains sample and QC results for seven water samples that were received on February 26, 2001. The samples were received cold and intact.

TVH/BTXE: No analytical problems were encountered.

Total Extractable Hydrocarbons: No analytical problems were encountered.

MTBE confirmation by EPA Method 8260B: MTBE confirmation was performed on samples **MW-7**, **MW-7DUP**, and **MW-4** as requested on the chain of custody. No analytical problems were encountered.

Curtis & Tompkins Laboratories Analytical Report

Lab #:	150510	Location:	Port of Oakland-2277
Client:	Harding Lawson Associates	Prep:	EPA 5030
Project#:	42633.1		
Matrix:	Water	Sampled:	02/22/01
Units:	ug/L	Received:	02/26/01
Diln Fac:	1.000	Analyzed:	03/05/01
Batch#:	61940		

Field ID: MW-6 Lab ID: 150510-003
 Type: SAMPLE

Analyte	Result	RL	Analysis
Gasoline C7-C12	120 L	50	EPA 8015M
MTBE	ND	2.0	EPA 8021B
Benzene	21	0.50	EPA 8021B
Toluene	ND	0.50	EPA 8021B
Ethylbenzene	0.96	0.50	EPA 8021B
m,p-Xylenes	ND	0.50	EPA 8021B
o-Xylene	ND	0.50	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	115	59-135	EPA 8015M
Bromofluorobenzene (FID)	109	60-140	EPA 8015M
Trifluorotoluene (PID)	92	56-142	EPA 8021B
Bromofluorobenzene (PID)	90	55-149	EPA 8021B

Field ID: MW-2 Lab ID: 150510-004
 Type: SAMPLE

Analyte	Result	RL	Analysis
Gasoline C7-C12	ND	50	EPA 8015M
MTBE	ND	2.0	EPA 8021B
Benzene	ND	0.50	EPA 8021B
Toluene	ND	0.50	EPA 8021B
Ethylbenzene	ND	0.50	EPA 8021B
m,p-Xylenes	ND	0.50	EPA 8021B
o-Xylene	ND	0.50	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	108	59-135	EPA 8015M
Bromofluorobenzene (FID)	109	60-140	EPA 8015M
Trifluorotoluene (PID)	88	56-142	EPA 8021B
Bromofluorobenzene (PID)	93	55-149	EPA 8021B

GC04 TVH 'J' Data File FID

Sample Name 150510-003,61940,+MTBE
 FileName G:\GC04\DATA\064J019.raw
 Method : TVHBTXE
 Start Time : 0.00 min
 Scale Factor: 1.0

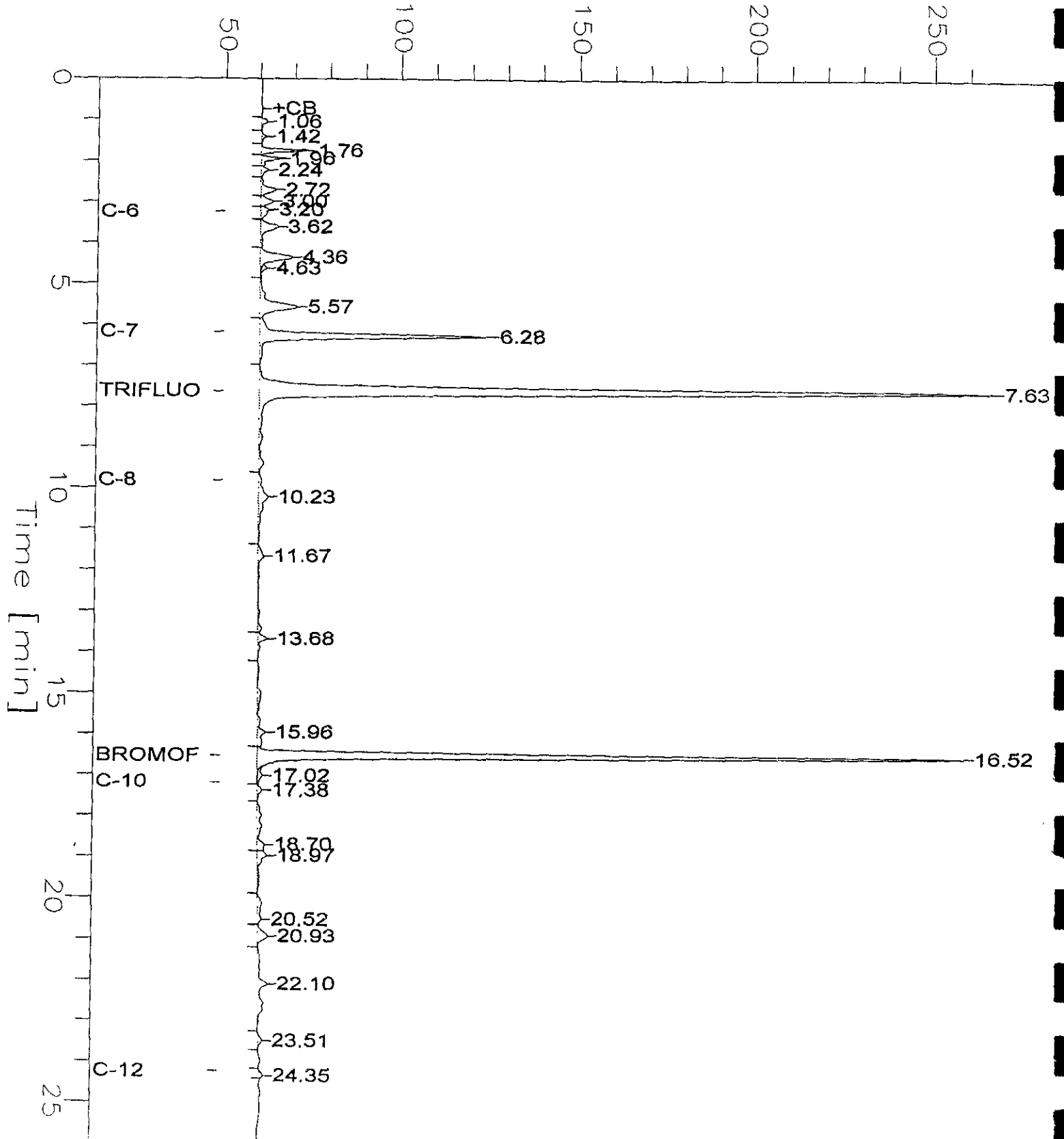
End Time : 26.00 min
 Plot Offset: 50 mV

Sample #: A1
 Date : 3/5/01 10:05 PM
 Time of Injection: 3/5/01 09:39 PM
 Low Point : 49.72 mV
 High Point : 266.76 mV
 Plot Scale: 217.0 mV

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MW-6

Response [mV]



GC04 TVH 'J' Data File FID

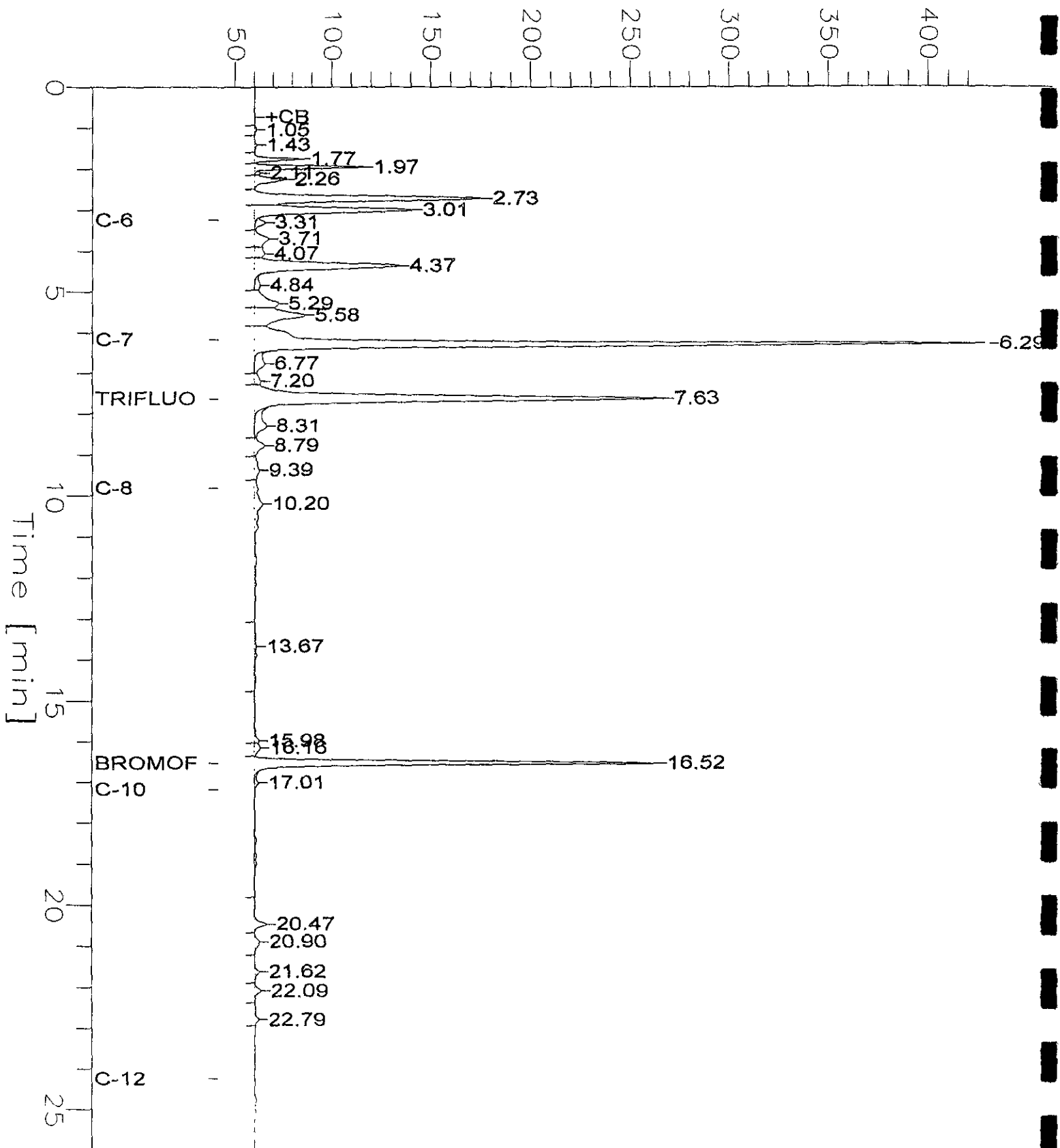
Sample Name : 150510-006,61940,+MTBE
 FileName : G:\GC04\DATA\064J016.raw
 Method : TVHBTXE
 Start Time : 0.00 min
 Scale Factor: 1.0

End Time : 26.00 min
 Plot Offset: 42 mV

Sample #: C1
 Date : 3/5/01 08:18 PM
 Time of Injection: 3/5/01 07:52 PM
 Low Point : 41.55 mV
 High Point : 429.83 mV
 Plot Scale: 388.3 mV

MW-4

Response [mV]



Sample Name : CCV/LCS, QC139083, 61940, 01WS0395, 5/5000

Sample #:

Page 1 of 1

FileName : G:\GC04\DATA\064J002.raw

Date : 3/5/01 10:28 AM

Method : TVHBTXE

Time of Injection: 3/5/01 10:02 AM

Start Time : 0.00 min

End Time : 26.00 min

Low Point : 44.36 mV

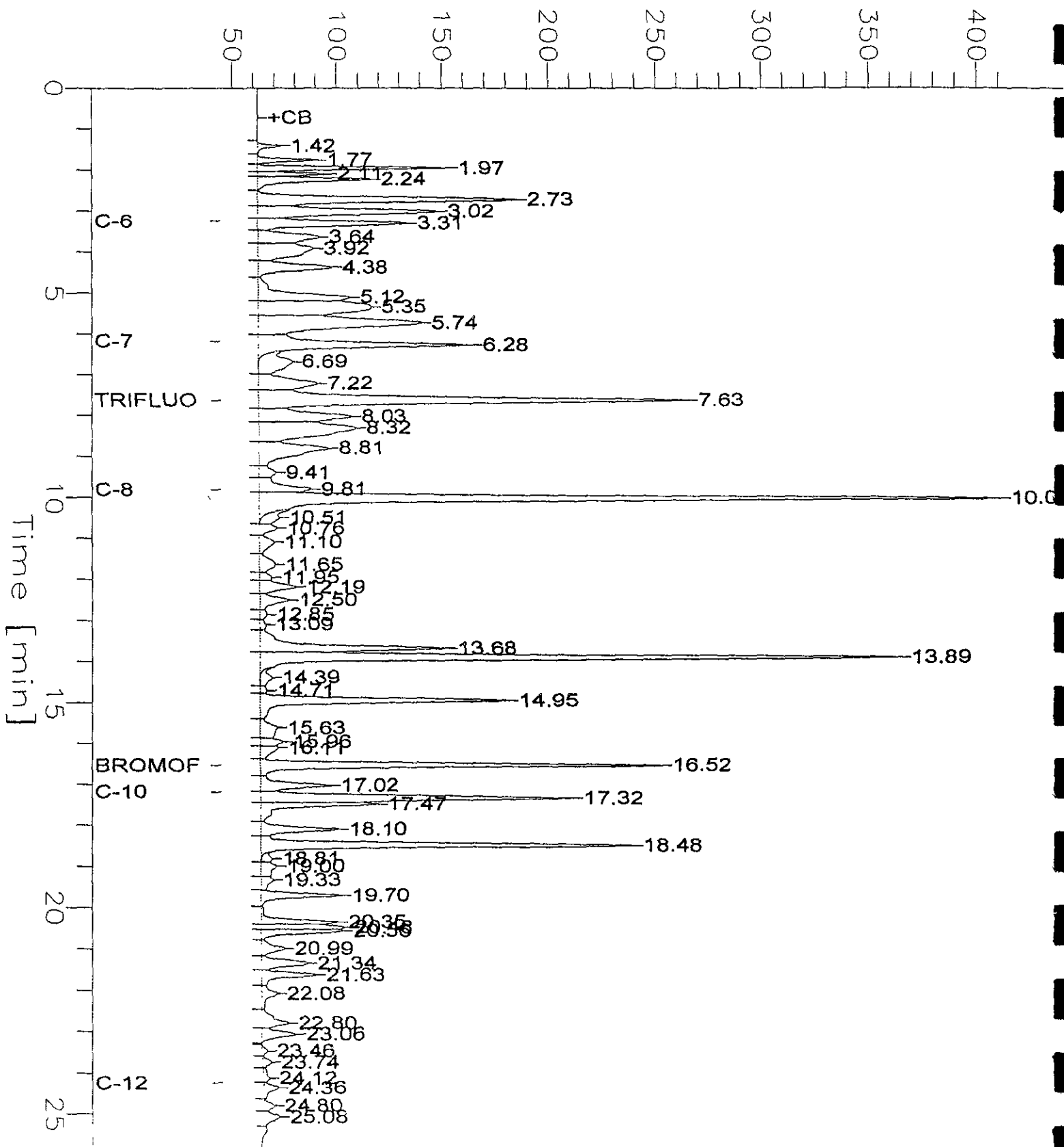
High Point : 410.41 mV

Scale Factor: 1.0

Plot Offset: 44 mV

Plot Scale: 366.1 mV

Gasoline Standard Response [mV]



Gasoline by GC/FID CA LUFT

Lab #:	1S0510	Location:	Port of Oakland-2277
Client:	Harding Lawson Associates	Prep:	EPA 5030
Project#:	42633.1	Analysis:	EPA 8015M
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC139083	Batch#:	61940
Matrix:	Water	Analyzed:	03/05/01
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	2,000	2,127	106	73-121

Surrogate	%REC	Limits
Trifluorotoluene (FID)	115	59-135
Bromofluorobenzene (FID)	104	60-140

Benzene, Toluene, Ethylbenzene, Xylenes

Lab #:	150510	Location:	Port of Oakland-2277
Client:	Harding Lawson Associates	Prep:	EPA 5030
Project#:	42633.1	Analysis:	EPA 8021B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC139086	Batch#:	61940
Matrix:	Water	Analyzed:	03/05/01
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
MTBE	20.00	21.77	109	51-125
Benzene	20.00	18.58	93	67-117
Toluene	20.00	20.86	104	69-117
Ethylbenzene	20.00	17.26	86	68-124
m,p-Xylenes	40.00	35.40	89	70-125
o-Xylene	20.00	17.25	86	65-129

Surrogate	%REC	Limits
Trifluorotoluene (PID)	83	56-142
Bromofluorobenzene (PID)	85	55-149

Gasoline by GC/FID CA LUFT

Lab #:	150510	Location:	Port of Oakland-2277
Client:	Harding Lawson Associates	Prep:	EPA 5030
Project#:	42633.1	Analysis:	EPA 8015M
Field ID:	ZZZZZZZZZZ	Batch#:	61940
SS Lab ID:	150612-001	Sampled:	03/01/01
Matrix:	Water	Received:	03/01/01
Units:	ug/L	Analyzed:	03/06/01
Diln Fac:	1.000		

Type: MS Lab ID: QC139084

Analyte	MSS Result	Spiked	Result	%REC	Limits
Gasoline C7-C12	<21.00	2,000	2,069	103	65-131
Surrogate	%REC	Limits			
Trifluorotoluene (FID)	119	59-135			
Bromofluorobenzene (FID)	110	60-140			

Type: MSD Lab ID: QC139085

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	2,000	2,124	106	65-131	3	20
Surrogate	%REC	Limits				
Trifluorotoluene (FID)	120	59-135				
Bromofluorobenzene (FID)	112	60-140				

Total Extractable Hydrocarbons

Lab #:	150510	Location:	Port of Oakland-2277
Client:	Harding Lawson Associates	Prep:	EPA 3520
Project#:	42633.1	Analysis:	EPA 8015M
Matrix:	Water	Sampled:	02/22/01
Units:	ug/L	Received:	02/26/01
Diln Fac:	1.000	Prepared:	02/27/01
Batch#:	61841	Analyzed:	02/28/01

Field ID:	MW-7	Lab ID:	150510-001
Type:	SAMPLE	Cleanup Method:	EPA 3630C

Analyte	Result	RL
Diesel C10-C24 (SGCU)	ND	50
Motor Oil C24-C36 (SGCU)	ND	300

Surrogate	%REC	Limits
Hexacosane (SGCU)	58	44-121

Field ID:	MW-7 DUP	Lab ID:	150510-002
Type:	SAMPLE	Cleanup Method:	EPA 3630C

Analyte	Result	RL
Diesel C10-C24 (SGCU)	ND	50
Motor Oil C24-C36 (SGCU)	ND	300

Surrogate	%REC	Limits
Hexacosane (SGCU)	68	44-121

Field ID:	MW-6	Lab ID:	150510-003
Type:	SAMPLE	Cleanup Method:	EPA 3630C

Analyte	Result	RL
Diesel C10-C24 (SGCU)	440	50
Motor Oil C24-C36 (SGCU)	ND	300

Surrogate	%REC	Limits
Hexacosane (SGCU)	81	44-121

Field ID:	MW-2	Lab ID:	150510-004
Type:	SAMPLE	Cleanup Method:	EPA 3630C

Analyte	Result	RL
Diesel C10-C24 (SGCU)	ND	50
Motor Oil C24-C36 (SGCU)	ND	300

Surrogate	%REC	Limits
Hexacosane (SGCU)	75	44-121

ND= Not Detected

RL= Reporting Limit

SGCU= Silica gel cleanup

Chromatogram

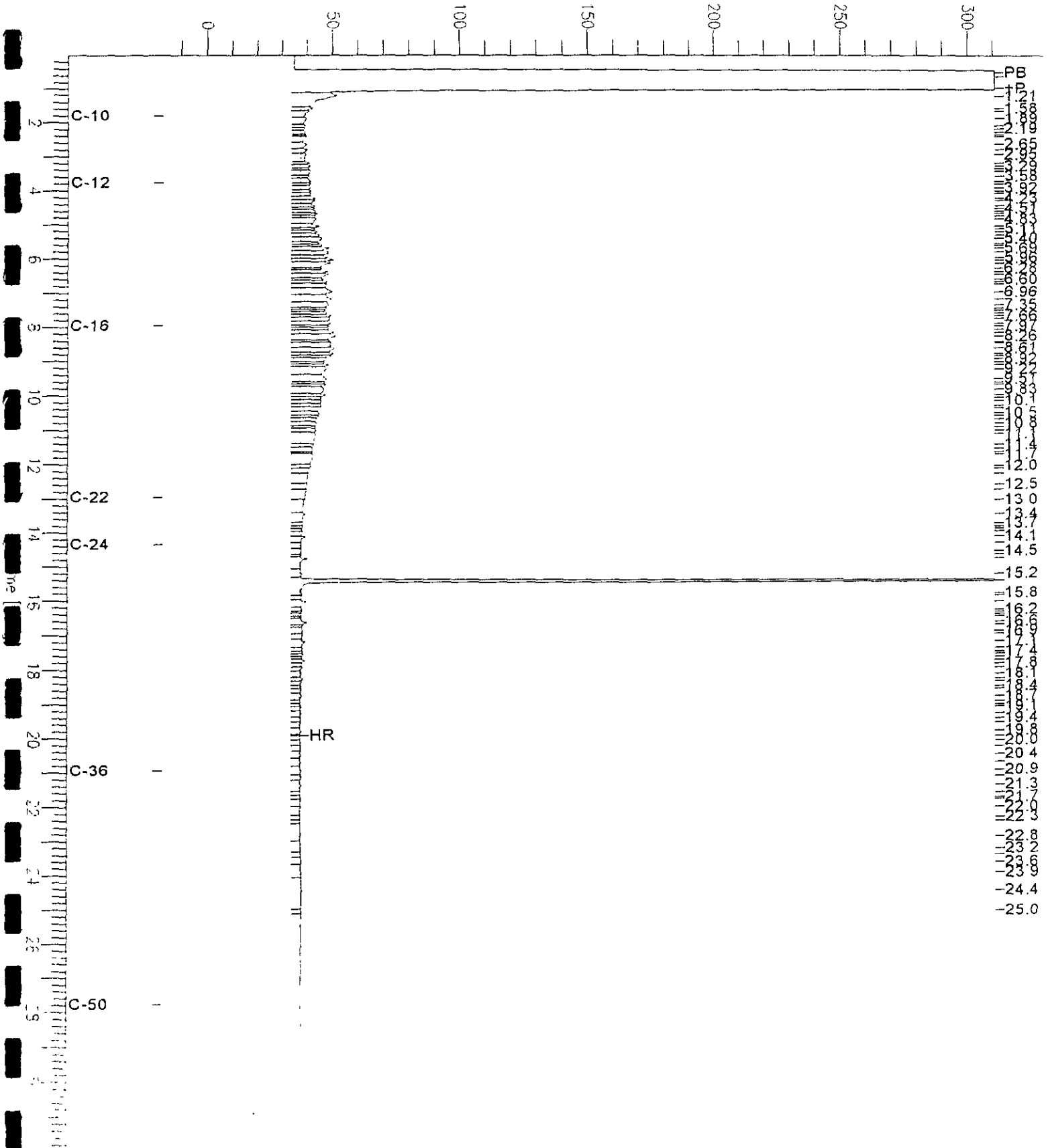
Sample Name : 150510-003sg,61841
FileName : G:\GC15\CHB\059B011.RAW
Method : BTEH044.MTH
Start Time : 0.01 min
Scale Factor: 0.0

Sample #: 61841
Date : 03/01/2001 08:13 AM
Time of Injection: 02/28/2001 09:06 PM
Low Point : -17.23 mV
High Point : 310.75 mV
Plot Scale: 328.0 mV

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MW-6

Response [mV]



Chromatogram

Sample Name : ccv_01ws0489.dsl
FileName : G:\GC15\CHB\059B002.RAW
Method : BTEH044.MTH
Start Time : 0.01 min
Scale Factor : 0.0

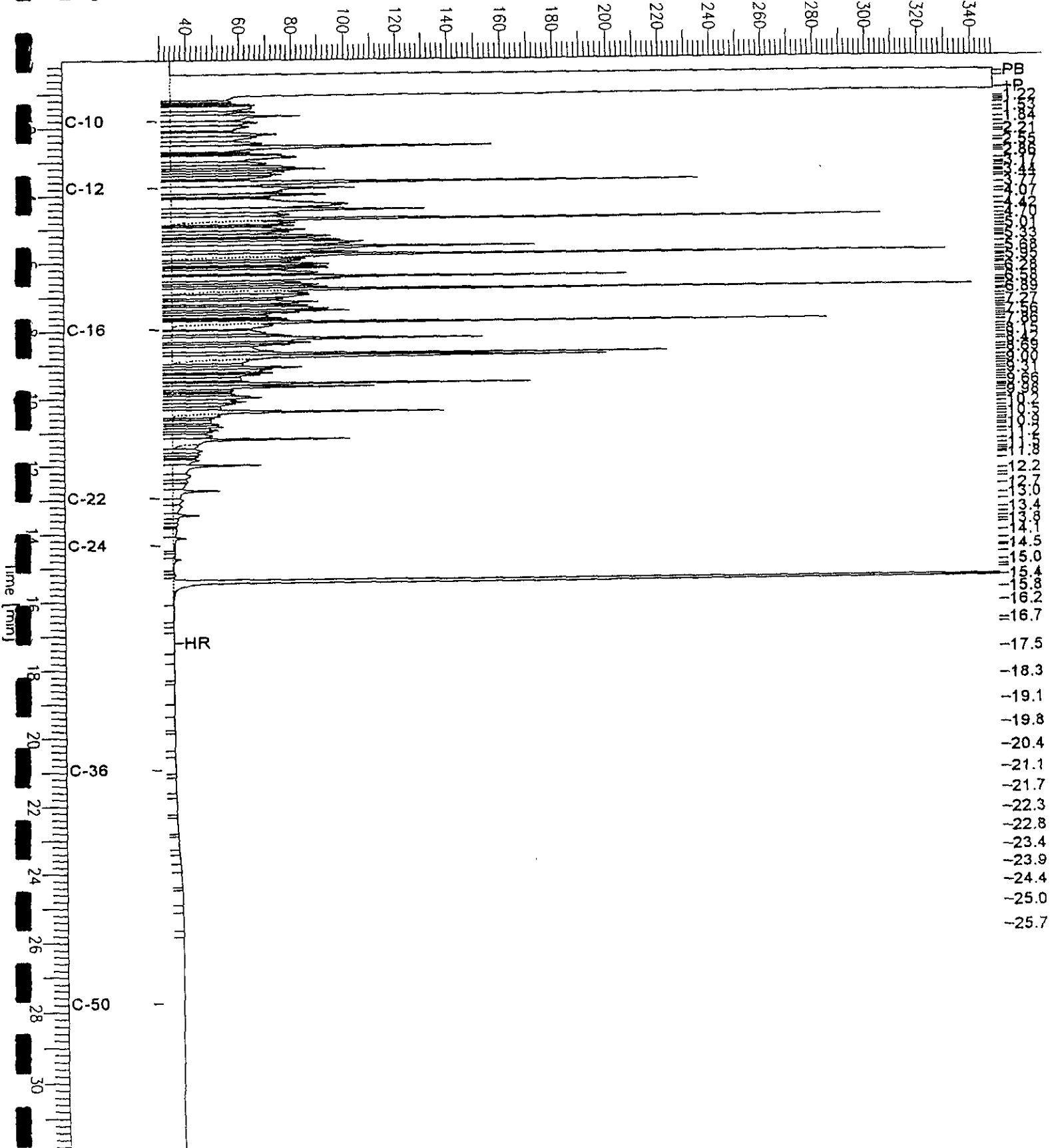
End Time : 31.91 min
Plot Offset : 29 mV

Sample #: 500mg/L
Date : 02/28/2001 01:39 PM
Time of Injection: 02/28/2001 01:11 PM
Low Point : 29.03 mV
Plot Scale: 319.4 mV
High Point : 348.44 mV

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Diesel Std

Response [mV]



Chromatogram

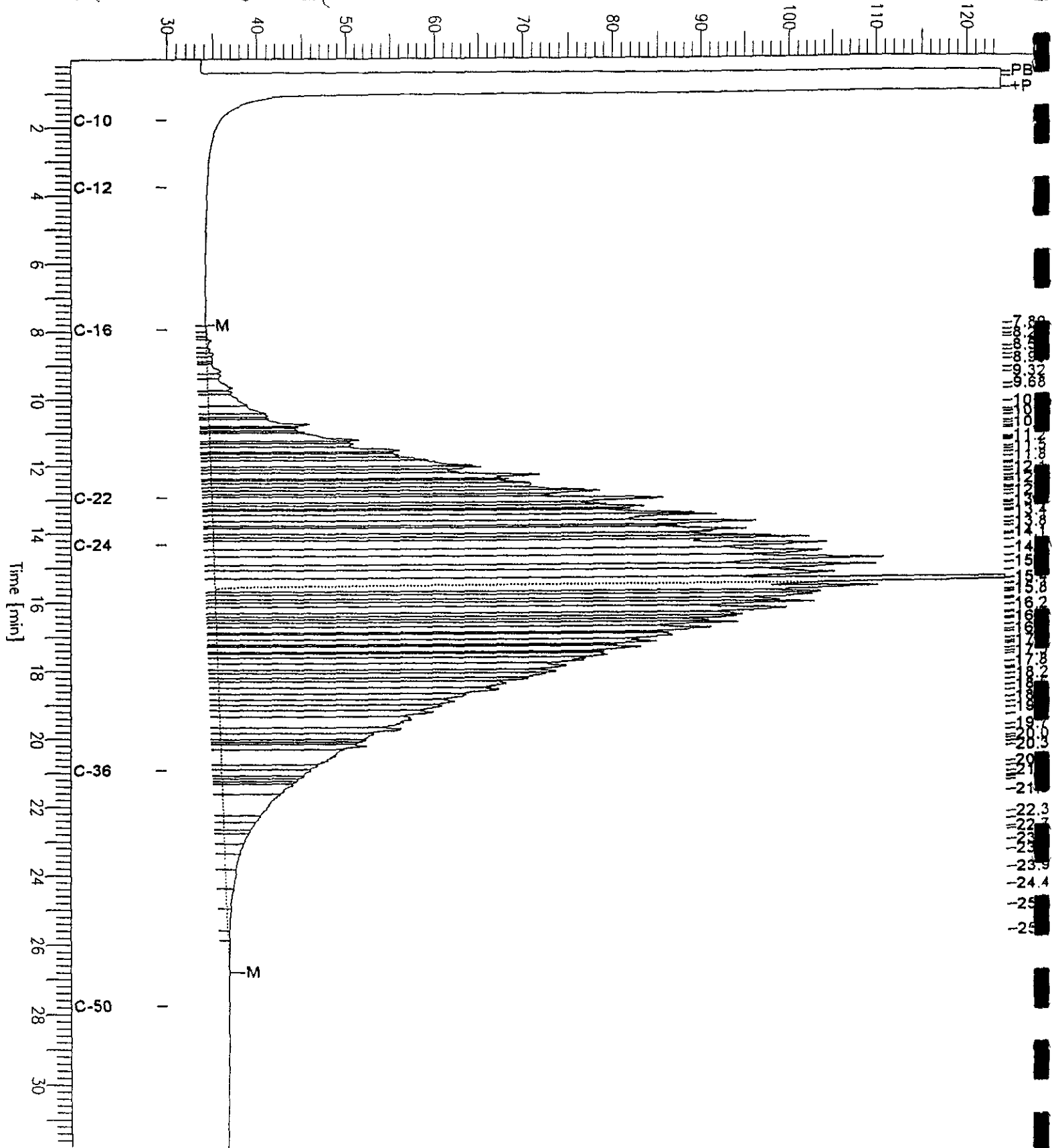
Sample Name : ccv_01ws0460.mo
FileName : G:\GC15\CHB\059B003.RAW
Method : BTEH044.MTH
Start Time : 0.01 min
Scale Factor: 0.0

End Time : 31.91 min
Plot Offset: 30 mV

Sample #: 500mg/L
Date : 02/28/2001 02:20 PM
Time of Injection: 02/28/2001 01:47 PM
Low Point : 29.90 mV
Plot Scale: 93.8 mV
High Point : 123.72 mV

Motor Oil Std

Response [mV]



Purgeable Aromatics by GC/MS

Lab #:	150510	Location:	Port of Oakland-2277
Client:	Harding Lawson Associates	Prep:	EPA 5030
Project#:	42633.1	Analysis:	EPA 8260B
Field ID:	MW-7 DUP	Batch#:	61995
Lab ID:	150510-002	Sampled:	02/22/01
Matrix:	Water	Received:	02/26/01
Units:	ug/L	Analyzed:	03/06/01
Diln Fac:	3.333		

Analyte	Result	RL
MTBE	60	1.7

Surrogate	%REC	Limits
1,2-Dichloroethane-d4	91	78-123
Toluene-d8	100	80-110
Bromofluorobenzene	101	80-115



Purgeable Aromatics by GC/MS

Lab #:	150510	Location:	Port of Oakland-2277
Client:	Harding Lawson Associates	Prep:	EPA 5030
Project#:	42633.1	Analysis:	EPA 8260B
Field ID:	MW-4	Batch#:	61995
Lab ID:	150510-006	Sampled:	02/22/01
Matrix:	Water	Received:	02/26/01
Units:	ug/L	Analyzed:	03/06/01
Diln Fac:	1.000		

Analyte	Result	RL
MTBE	ND	0.5

Surrogate	%REC	Limits
1,2-Dichloroethane-d4	94	78-123
Toluene-d8	99	80-110
Bromofluorobenzene	99	80-115



Total Extractable Hydrocarbons

Lab #:	150510	Location:	Port of Oakland-2277
Client:	Harding Lawson Associates	Prep:	EPA 3520
Project#:	42633.1	Analysis:	EPA 8015M
Matrix:	Water	Batch#:	61841
Units:	ug/L	Prepared:	02/27/01
In Fac:	1.000	Analyzed:	02/28/01

Type: BS Cleanup Method: EPA 3630C
 Lab ID: QC138701

Analyte	Spiked	Result	%REC	Limits
Diesel C10-C24 (SGCU)	2,339	1,216	52	45-110

Surrogate	%REC	Limits
Hexacosane (SGCU)	72	44-121

Type: BSD Cleanup Method: EPA 3630C
 Lab ID: QC138702

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Diesel C10-C24 (SGCU)	2,339	1,260	54	45-110	4	22

Surrogate	%REC	Limits
Hexacosane (SGCU)	72	44-121



Purgeable Aromatics by GC/MS

Lab #:	150510	Location:	Port of Oakland-2277
Client:	Harding Lawson Associates	Prep:	EPA 5030
Project#:	42633.1	Analysis:	EPA 8260B
Field ID:	MW-7	Batch#:	61995
Lab ID:	150510-001	Sampled:	02/22/01
Matrix:	Water	Received:	02/26/01
Units:	ug/L	Analyzed:	03/06/01
Diln Fac:	1.000		

Analyte	Result	RL
MTBE	66	0.5

Surrogate	%REC	Limits
1,2-Dichloroethane-d4	93	78-123
Toluene-d8	99	80-110
Bromofluorobenzene	103	80-115

Purgeable Aromatics by GC/MS

Lab #:	150510	Location:	Port of Oakland-2277
Client:	Harding Lawson Associates	Prep:	EPA 5030
Project#:	42633.1	Analysis:	EPA 8260B
Matrix:	Water	Batch#:	61995
Units:	ug/L	Analyzed:	03/06/01
Diln Fac:	1.000		

Type: BS Lab ID: QC139285

Analyte	Spiked	Result	%REC	Limits
MTBE	50.00	31.43	63	50-150

Surrogate	%REC	Limits
1,2-Dichloroethane-d4	87	78-123
Toluene-d8	97	80-110
Bromofluorobenzene	101	80-115

Type: BSD Lab ID: QC139286

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
MTBE	50.00	32.47	65	50-150	3	20

Surrogate	%REC	Limits
1,2-Dichloroethane-d4	87	78-123
Toluene-d8	98	80-110
Bromofluorobenzene	99	80-115

Purgeable Aromatics by GC/MS

Lab #:	150510	Location:	Port of Oakland-2277
Client:	Harding Lawson Associates	Prep:	EPA 5030
Project#:	42633.1	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC139287	Batch#:	61995
Matrix:	Water	Analyzed:	03/06/01
Units:	ug/L		

Analyte	Result	RL
MTBE	ND	0.5

Surrogate	%REC	Limits
1,2-Dichloroethane-d4	89	78-123
Toluene-d8	97	80-110
Bromofluorobenzene	99	80-115