

BASELINE

COPY

REPORT ON GROUNDWATER MONITORING

MAY 1997

670 98TH AVENUE
Oakland, California

For:

City of Oakland
Public Works Agency
Oakland, California

93343-F1

JUN - 9 PM 3:50

ENVIRONMENTAL
REGULATION



CITY OF OAKLAND



ENVIRONMENTAL SERVICES • 1333 BROADWAY, SUITE 330 • OAKLAND, CALIFORNIA 94612

Public Works Agency

June 6, 1997

(510) 238-6688
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Ms. eva chu
Alameda County Department of Environmental Health
1131 Harbor Bay Parkway
Alameda, California 94502

Dear Ms. chu:

Re: Groundwater Monitoring and Investigation - 670 98th Avenue, Oakland, California

Enclosed please find a copy of the Report on Groundwater Monitoring, May 1997. The report presents the results of the groundwater sampling conducted in December 1996 by the City's consultant, Baseline Environmental.

Additionally, I am pleased to report to you that the Public Works Agency, Environmental Services Division has obtained the funding to proceed with the additional investigation to evaluate the aerial distribution of petroleum hydrocarbons in groundwater that are associated with the site. The scope of work, which is to install 14 temporary well points, was presented in Baseline's letter to you dated March 11, 1996. Currently, we anticipate beginning field work some time in July or August 1997, assuming the City can obtain rights-of-entry to the necessary properties in a timely way.

Please call me at 238-7695, or Andrew Clark-Clough at 238-6361, if you have any questions or require additional information.

Yours very truly,

Mark B. Hersh
Environmental Program Specialist

cc: Andrew Clark-Clough
Kevin O'Dea, Baseline Environmental

97 JUN -9 PM 3:50
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BASELINE

ENVIRONMENTAL CONSULTING

27 May 1997
93343-F1

Mr. Mark Hirsch
City of Oakland
Environmental Services
1333 Broadway, Suite 330
Oakland, CA 94612

Subject: Report on Groundwater Monitoring, December 1996, 670 98th Avenue, Oakland, California

Dear Mark:

Enclosed please find four copies of the Report on Groundwater Monitoring at 670 98th Avenue, Oakland. The Report presents the results of groundwater sampling performed on 31 December 1996 and recommendations for further investigation of groundwater quality at and in the vicinity of the project site. A copy of the Report should be submitted to Ms. eva chu of the Alameda County Department of Environmental Health. If you have any questions or comments, please contact us at your convenience.

Sincerely,



Yane Nordhav
Principal
Reg. Geologist No. 4009



Kevin O'Dea
Vice President

YN/KOD/ss
Enclosure

93343-F1.597.wpd-5/27/97

REPORT ON GROUNDWATER MONITORING

MAY 1997

670 98TH AVENUE
Oakland, California

For:

City of Oakland
Public Works Agency
Oakland, California

93343-F1

BASELINE Environmental Consulting
5900 Hollis Street, Suite D • Emeryville, California 94608
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REPORT ON GROUNDWATER MONITORING, DECEMBER 1996
670 98th Avenue
Oakland, California

INTRODUCTION

BASELINE Environmental Consulting was retained by the City of Oakland, Public Works Agency to monitor the status of groundwater quality at 670 98th Avenue, Oakland (Figure 1). In 1989 and 1990, environmental investigations and interim remedial activities were conducted at the site. Other than ongoing groundwater monitoring, no further work has been performed. The purpose of the groundwater monitoring was to assess whether there have been any significant changes in groundwater quality since the interim remedial activities were performed.

BACKGROUND

The site was occupied by a Union 76 service station from about 1947 through 1983. An old station building and an underground tank that occupied the site were removed in 1966. During that same year, a new station building, two 10,000-gallon underground gasoline tanks, and one 230-gallon waste oil tank were installed at the site. The station building was demolished and the underground storage tanks were removed in 1983.¹

In addition to the on-site source of subsurface petroleum contamination, an additional potential source of contamination at the site was identified at 692 98th Avenue, located northeast of the site. This property was occupied by a Richfield service station from about 1949 to 1963. In 1970, four 1,000-gallon underground fuel storage tanks were removed; the contents and former tank locations are not known.²

In 1989, during the widening of 98th Avenue, workers encountered contaminated soil while excavating a water line trench at the site. Soil samples collected from the trench were found to contain up to 350 mg/kg total petroleum hydrocarbons (TPH).

In response to the identification of contaminated soils during road widening, a preliminary soil investigation was conducted by Subsurface Consultants, Inc. Soil samples were collected from 14 soil borings. The highest concentrations of TPH were generally detected in soil samples collected at or immediately below the groundwater table.

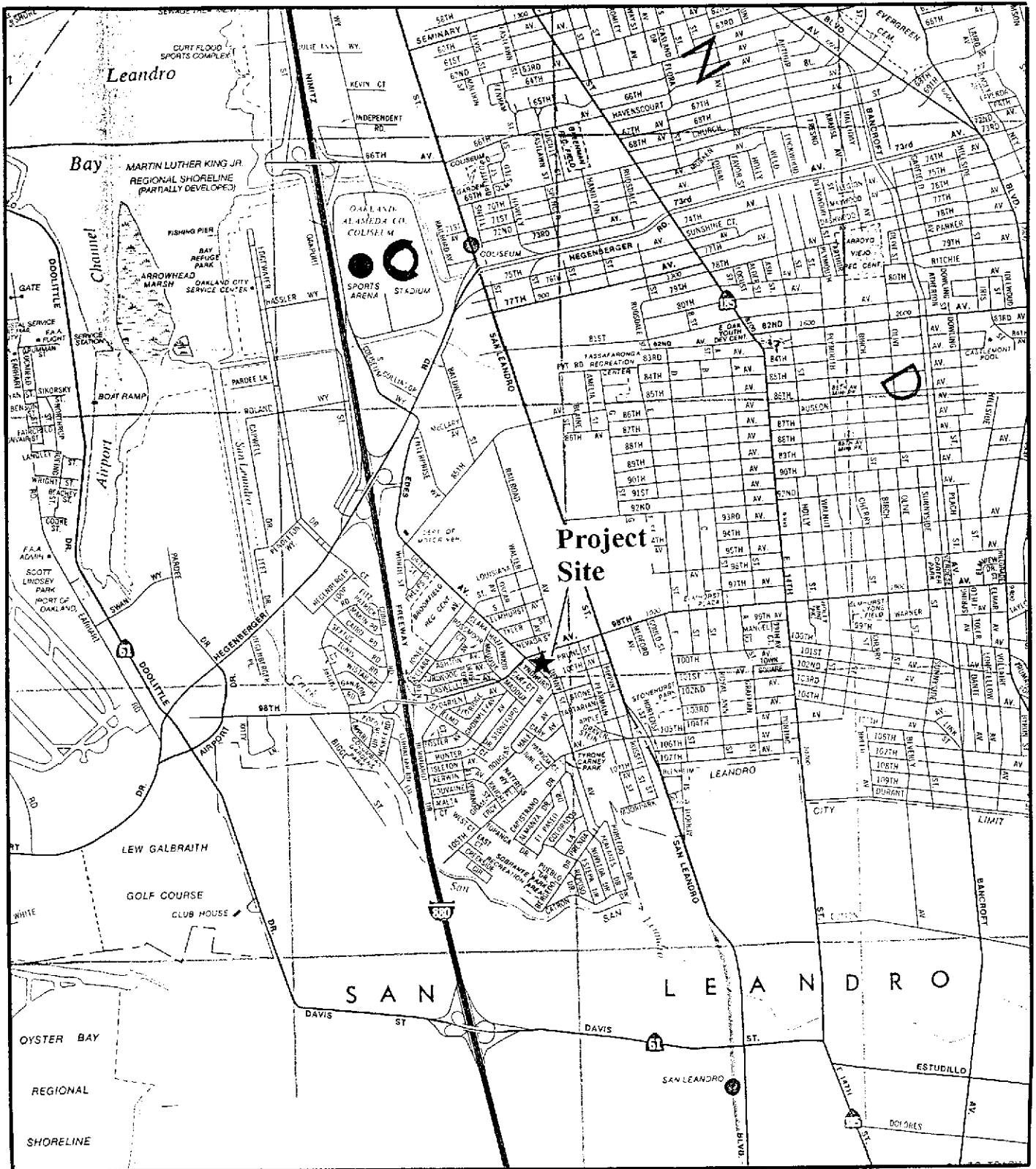
In 1990, Subsurface Consultants, Inc. further evaluated subsurface conditions and groundwater quality at the site. Eleven soil borings were drilled, and six of the borings were completed as monitoring wells (MW-1 through MW-5, and Well 18; Figure 2). Subsurface Consultants, Inc.

¹Subsurface Consultants, Inc., 1989, *Preliminary Contaminated Soil Assessment, 98th and Edes Avenues, Oakland, California*, 17 July.

²Subsurface Consultants, Inc., 1990, *Soil and Groundwater Contamination Assessment, Phase 2, 98th and Edes Avenues, Oakland, California*, 10 April.

REGIONAL LOCATION

Figure 1



670 98th Avenue
Oakland, California

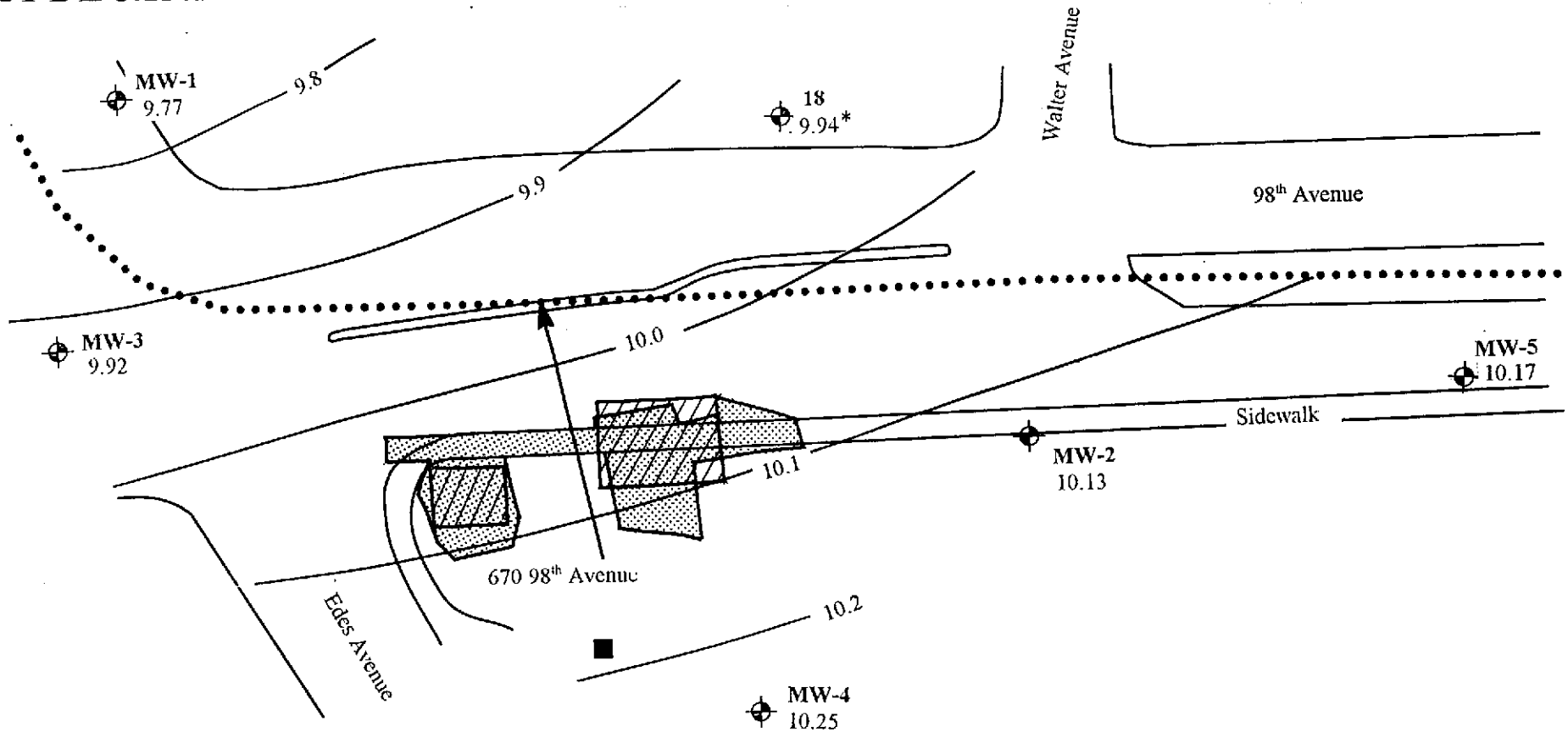


BASELINE

GROUNDWATER ELEVATION CONTOUR MAP








31 DECEMBER 1996

Figure 2



- 3 -

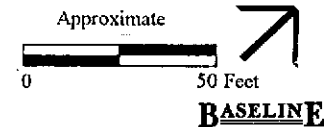
Legend

- MW-5  Groundwater Monitoring Well
-  Former Waste Oil Tank Location
-  Groundwater Flow Direction
-  Areas of Previous Excavation
-  Former Gasoline Tank Locations
-  27-Inch Storm Drain
-  -10.0- Groundwater Elevation Contour

670 98th Avenue
Oakland, California

Source: Subsurface Consultants, Inc., 1990.

* Elevation determined by calculating from revised TOC
 For MW-1 through MW-5.



concluded that the former tank locations were the primary source of contamination at the site. Groundwater samples were found to contain TPH, benzene, toluene, xylenes, and ethylbenzene (BTXE), and chlorinated hydrocarbons. Aromatic petroleum hydrocarbons were detected in monitoring wells located upgradient of the former tank locations, suggesting that those might originate from an off-site source. The analytical results of groundwater samples collected at the site are summarized in Tables 1 and 2.

Subsurface Consultants, Inc. performed quarterly groundwater monitoring during the second and third quarterly periods of 1990. The concentration of contaminants detected in groundwater samples from each well varied from one quarterly period to the next. In general, elevated concentrations of petroleum hydrocarbons were detected in groundwater samples collected from MW-1 and Well 18 (down- and/or crossgradient from the site), but none were detected in samples from MW-4 and MW-5 (up- and/or crossgradient from the site). Free petroleum product was detected in MW-1 at a thickness of 0.52 feet on 4 October 1990. The report for the investigation concluded that a plume of groundwater containing petroleum hydrocarbons was migrating downgradient (westward) of the site. Chlorinated hydrocarbons have been detected in samples from all wells. The source of chlorinated hydrocarbons was not identified.

Contaminated soil was excavated from the area along the roadway under the direction of Subsurface Consultants, Inc. Soil was excavated within five feet of the centerline of the trench lateral and extended to groundwater, approximately ten feet below ground surface. The former tank excavation backfill was removed until native soil was encountered, 10 to 13 feet below ground surface. The lateral extent of the excavation is shown on Figure 2. The soil was treated by aeration and transported off-site for disposal. About 1,200 cubic yards of materials were removed from the site. Soil samples were collected from the sidewalls and base of the excavation. The analytical results indicated that residual concentrations of TPH ranging from 50 to 2,100 mg/kg remained in the soil on-site.³

In 1990, Subsurface Consultants designed a groundwater extraction trench along the northwestern side of 98th Avenue across the street from the project site. The trench and associated piping was installed as part of a proposed groundwater remediation system for collection and treatment of groundwater affected by petroleum and chlorinated hydrocarbons in the area of the site. The system, as designed, was to include a bioreactor system for treatment of groundwater extracted from the trench. The bioreactor system was not installed and extraction of groundwater was never initiated.

Hydrogeologic investigation of the site was resumed in 1993 by Applied Geotechnology, Inc. (AGI). Water level measurements were made monthly in April, May, and June 1993 from MW-1, 2, 3, and 4 and Well 18 (the location of well MW-5 had been paved over at this time, precluding sampling and water level measurements of that well). Prior to the water level measurements, the tops of casings of the wells had been surveyed relative to the City of Oakland Datum. During each water

³Subsurface Consultants, Inc., 1990, *Progress Report, Contaminated Soil Removal Utility Trench Alignment, 98th and Edes Avenues, Oakland, California*, 13 December.

TABLE 1
SUMMARY OF ANALYTICAL RESULTS, GROUNDWATER
PETROLEUM AND AROMATIC HYDROCARBONS
670 98th Avenue, Oakland, California
(mg/L)

Sample ID	Date	Gasoline ¹	Diesel ¹	Kerosene ¹	Total Oil & Grease ¹	Benzene ²	Toluene ²	Ethylbenzene ²	Xylenes ²	Total Lead
MW-1	2/12/90	0.0551	0.100	--	ND	0.0608	0.0119	ND	0.0199	--
	6/30/90	0.95/<0.05	<0.5	--	--	<0.0005	<0.0005	<0.0005	<0.0005	--
	10/4/90	2,940	<0.2	--	--	7.78	26.7	20	20.3	--
	4/15/93	--	--	--	--	--	--	--	--	--
	3/31/95	5.9	-- ³	2.3 ⁴	--	0.067	0.012	0.092	0.5	0.014
	12/31/96	14	10 ^{5,6}	--	--	0.13	<0.025	0.47	2.0	--
MW-2	2/13/90	0.0351	0.100	--	ND	ND	ND	0.0013	0.004	--
	6/30/90	<0.5/<0.05	<0.5	--	--	<0.0005	<0.0005	<0.0005	<0.0005	--
	10/4/90	0.0528	<0.2	--	--	<0.0005	<0.0005	<0.0005	<0.0005	--
	4/15/93	<1.0	<1.0	--	--	<0.001	<0.001	<0.001	<0.001	--
	3/31/95	<0.05	<0.05	<0.05	--	<0.0005	<0.0005	<0.0005	<0.0005	0.0042
	12/31/96	<0.05	0.2 ^{5,7}	--	--	<0.0005	<0.0005	<0.0005	<0.0005	--
MW-3	2/13/90	ND	0.100	--	ND	ND	ND	ND	0.0029	--
	6/30/90	2.6/0.85	<0.5	--	--	<0.0005	<0.0005	<0.0005	0.044	--
	10/4/90	0.0429	<0.2	--	--	<0.0005	<0.0005	<0.0005	0.0085	--
	4/15/93	<1.0	<1.0	--	--	<0.001	<0.001	<0.001	<0.001	--
	3/31/95	1.6	-- ¹	0.5 ⁴	--	<0.0005	<0.0005	<0.0005	0.0041	<0.003
	12/31/96	0.38	0.62 ^{5,6,8}	--	--	<0.0005	<0.0005	<0.0005	0.00065	--
MW-4	2/13/90	ND	ND	--	ND	ND	ND	ND	ND	--
	6/30/90	<0.5/<0.05	<0.5	--	--	<0.0005	<0.0005	<0.0005	<0.0005	--
	10/4/90	<0.020	<0.2	--	--	<0.0005	<0.0005	<0.0005	<0.0005	--
	5/24/93	<1.0	<1.0	--	--	<0.001	<0.001	<0.001	<0.001	--
	12/31/96	0.79	<0.05	--	--	<0.0005	<0.0005	<0.0005	<0.0005	--

Table 1: Petroleum and Aromatic Hydrocarbon Analytical Results - *continued*

Sample ID	Date	Gasoline ¹	Diesel ¹	Kerosene ¹	Total Oil & Grease ¹	Benzene ²	Toluene ²	Ethylbenzene ²	Xylenes ²	Total Lead
MW-5	2/13/90	ND	ND	--	ND	ND	ND	ND	ND	--
	6/30/90	<0.5/<0.05	<0.5	--	--	<0.0005	<0.0005	<0.0005	<0.0005	--
	10/4/90	<0.020	<0.2	--	--	<0.0005	<0.0005	<0.0005	<0.0005	--
	12/31/96	<0.05	<0.05	--	--	<0.0005	<0.0005	<0.0005	<0.0005	--
Well 18	2/14/90	134	17	--	120	3.73	8.92	5.43	22	--
	6/30/90	26/20	2.4	--	--	0.66	0.47	0.18	2.0	--
	10/4/90	4.9	<0.2	--	--	0.082	0.04	0.19	0.635	--
	4/15/93	7	10⁴	--	--	0.440	0.180	0.340	1.6	--
	3/31/95	11	-- ³	1.9⁴	--	0.19	0.01	0.35	1.3	0.016
	12/31/96	18	<0.05	--	--	0.110⁹	0.0023⁹	0.10⁹	0.23⁹	--
Travel Blank	3/31/95	<0.05	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	--

Notes: -- = Constituent not analyzed or data not available.
 <x.x = Constituent not detected at stated reporting limit.
 ND = Constituent not detected; reporting limit unknown.
 xx/xx = Duplicate sample.
 xx = Bolded numbers indicate compounds identified above the level of detection.
 1990 groundwater samples collected by Subsurface Consultants.
 Monitoring well locations are shown on Figure 2.
 Laboratory Reports are included in Appendix B.

- ¹ EPA Test Method 8015 M.
- ² EPA Test Method 8020/602.
- ³ Diesel range not reported by laboratory due to overlap of hydrocarbon ranges.
- ⁴ Laboratory reports that sample chromatogram does not resemble hydrocarbon standards.
- ⁵ Laboratory reports that hydrocarbon reported does not resemble diesel standard.
- ⁶ Laboratory estimated concentration due to overlapping fuel patterns.
- ⁷ Laboratory reports hydrocarbon is in late diesel range.
- ⁸ Laboratory reports hydrocarbon is in early diesel range.
- ⁹ Surrogate recovery was outside laboratory QA/QC limits due to sample interference.

TABLE 2
SUMMARY OF ANALYTICAL RESULTS, GROUNDWATER
CHLORINATED HYDROCARBONS
670 98th Avenue, Oakland, California
(mg/L)

Sample ID	Date	1,1 Dichloroethene ¹	1,1 Dichloroethane ¹	Total 1,2 dichloroethene ¹	1,1,1 Trichloroethane ¹	Trichloroethene ¹	Dibromochloromethane ¹	Tetrachloroethene ¹	Chloroform ¹	Total Chlorinated Hydrocarbon
MW-1	2/12/90	ND	ND	ND	0.0051	0.0118	0.009	0.0024	ND	
	6/30/90	<0.001	0.0041	<0.001	0.008	0.013	<0.001	0.0028	<0.001	
	10/4/90	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	
	3/31/95	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01	
	12/31/96	<0.0005	0.0015	0.001	<0.0005	0.0009	<0.0005	<0.0005	<0.002	0.0034
MW-2	2/13/90	0.0071	0.0049	ND	0.0116	0.0251	0.0079	0.0085	ND	
	6/30/90	0.0031	0.0051	0.0048	0.015	0.035	<0.001	0.016	<0.001	
	10/4/90	<0.0005	0.0024	<0.0005	0.0063	0.0187	<0.0005	0.0068	<0.0005	
	4/15/93	<0.001	<0.001	<0.001	<0.001	0.014	<0.001	<0.001	<0.001	
	3/31/95	0.0017	0.0011	0.0014	0.0051	0.046	<0.001	0.022	<0.001	
	12/31/96	<0.0005	0.0006	<0.0005	0.0006	0.0076	<0.0005	0.0035	<0.002	0.0123
MW-3	2/13/90	0.0057	ND	ND	0.0171	0.0217	0.0692	0.0016	ND	
	6/30/90	0.0013	0.0021	0.0035	0.021	0.026	<0.001	0.0062	<0.001	
	10/4/90	<0.0005	<0.0005	<0.0005	0.011	0.0245	<0.0005	0.0051	<0.0005	
	4/15/93	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
	3/31/95	0.0022	<0.001	<0.001	0.018	0.018	<0.002	0.0041	<0.001	
	12/31/96	<0.0005	<0.0005	<0.0005	0.005	0.0088	<0.0005	0.0015	<0.002	0.0153
MW-4	2/13/90	ND	ND	ND	0.0018	0.0024	0.0153	0.0674	ND	
	6/30/90	<0.001	<0.001	<0.001	0.0027	0.003	<0.001	0.26	<0.001	
	10/4/90	<0.0005	<0.0005	<0.0005	0.0011	0.0028	<0.0005	0.0955	0.0007	
	5/24/93 ²	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
	12/31/96	<0.0005	<0.0005	<0.0005	0.0017	0.0007	<0.0005	0.31 ³	<0.002	0.3124

Table 2: Chlorinated Hydrocarbon Analytical Results - *continued*

Sample ID	Date	1,1 Dichloro-ethene ¹	1,1 Dichloro-ethane ¹	Total 1,2 dichloro-ethene ¹	1,1,1 Trichloro-ethane ¹	Trichloro-ethene ¹	Dibromo-chloro-methane ¹	Tetra-chloro-ethene ¹	Chloroform ¹	Total Chlorinated Hydrocarbon
MW-5	2/13/90	ND	ND	ND	0.0013	0.001	ND	0.0014	ND	
	6/30/90	<0.001	<0.001	<0.001	0.0013	<0.001	<0.001	0.0021	<0.001	
	10/4/90	<0.0005	<0.0005	<0.0005	0.0005	<0.0005	<0.0005	0.0007	<0.0005	
	12/31/96	<0.0005	<0.0005	<0.0005	0.0005	<0.0005	<0.0005	0.003	<0.002	0.0035
Well 18	2/14/90	ND	ND	ND	ND	ND	ND	ND	ND	
	6/30/90	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
	10/4/90	<0.005	<0.005	<0.0005	0.009	0.091	<0.005	0.006	<0.0005	
	4/15/93	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
	3/31/95	<0.01	<0.01	<0.01	<0.01	0.029	<0.01	0.01	<0.01	
	12/31/96	<0.0005	<0.0005	<0.0005	0.0021	0.011	<0.0005	0.0056	<0.002	0.0187
Travel Blank	3/31/95	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	

Notes: -- = Constituent not analyzed or data not available.
xx = Bolded numbers indicate compounds identified above the level of detection.
 <x.x = Constituent not detected at stated reporting limit.
 1990 groundwater samples collected by Subsurface Consultants.
 ND = Constituent not detected; reporting limit unknown.
 Monitoring well locations are shown on Figure 2.
 Laboratory reports are included in Appendix B.

- ¹ EPA Test Method 8010/60 except where noted.
- ² Surrogate recovery was outside of QA/QC limits due to matrix interference.
- ³ Value taken from EPA Test Method 8240.

level monitoring event, free product was detected in MW-1, ranging in thickness from 0.005 to 0.02 feet. The water level measurements indicated a consistent gradient directed to the northwest.⁴

On 15 April 1993, AGI collected samples from wells MW-2, MW-3, and well 18. In acknowledgment of contamination reflected by the observed presence of free product in monitoring well MW-1, samples were not collected in this well. In April 1993, MW-4 was buried by fill and was not accessible for sampling. The well was uncovered and subsequently sampled on 24 May 1993. The collected groundwater samples were submitted to CKY, Inc. laboratories for analysis of total petroleum, aromatic, and chlorinated hydrocarbons. The results of the analyses indicated the presence of total petroleum hydrocarbons and aromatic hydrocarbons in the sample from Well 18. One chlorinated hydrocarbon compound, trichloroethene, was detected in MW-2. No chlorinated hydrocarbon compounds were detected in any of the other samples.

In the report on the 1993 groundwater sampling event, AGI included an evaluation of potential on- and off-site sources of chemical compounds detected in the samples collected from the groundwater monitoring network for the project site. The report identified 39 sites within 2,000 feet of the project site as potential sources of the release of industrial solvents. On the basis of proximity to the site and position relative to groundwater flow direction, the report concluded that nine sites had a low to moderate potential for being associated with the chlorinated hydrocarbons detected in groundwater at and adjacent to the project site. The known waste oil tank at the project site and a suspected waste oil tank at 692 98th Avenue (located adjacent to and northeast of the site) were included as two of the nine "low to moderate" potential sites.

In March 1995, BASELINE collected groundwater quality samples from monitoring wells MW-1, MW-2, MW-3, and Well 18. Monitoring wells MW-4 and MW-5 could not be located at that time. It was not known if the wells had been removed or covered by paving or fill. The groundwater samples were analyzed for total petroleum hydrocarbons (as gasoline and diesel), BTEX, and halogenated hydrocarbons. The results (Table 1) of the analysis confirmed the presence of petroleum-related compounds and halogenated hydrocarbons.

HYDROGEOLOGY

The site is located in the East Bay Plain and is underlain by fluvial and alluvial fan deposits. The fluvial deposits consist primarily of fine-grained sands, silts, and clays. The alluvial deposits consist of a heterogeneous mixture of clay, silt, sand, and gravel. According to soil and well borings drilled at the site, the subsurface materials encountered at the site consist primarily of silty and sandy clays to depths of approximately 12 to 15 feet below ground surface. This is underlain by a gravelly sand which extends to a depth of approximately 24 feet. The gravelly sand is underlain by interbedded clay, sandy clay, and clayey sand layers.

⁴Applied Geotechnology, 1993, *Limited Phase I Environmental Assessment and Groundwater Monitoring*, 670 and 692 98th Avenue, Oakland, California, 11 August.

The regional groundwater gradient is west-northwestward to the Bay, the direction of the ground surface slope. Measurement of groundwater levels in wells at the site indicates that the localized gradient is directed northwestward (Table 4).⁵ The direction of groundwater flow indicates that wells MW-1, MW-3, and Well 18 are located downgradient to crossgradient of the former tank locations; MW-2, MW-4, and MW-5 are upgradient to crossgradient wells.

FIELD ACTIVITIES

Well Location and Survey

A subsurface survey was conducted at the site by BASELINE on 15 April 1996 in an attempt to locate monitoring wells MW-4 and MW-5 (Figure 2). The survey identified the location of monitoring well MW-5. The monitoring well was located on 98th Avenue and its well cover was exposed at approximately four inches below existing ground surface. The survey could not identify the location of monitoring well MW-4 due to interference reported from underlying debris in the vicinity of the well location. A limited excavation was then performed in the vicinity of monitoring well MW-4 on 27 May 1996. The excavation was conducted by Bay Area Tank and Marine under the supervision of BASELINE. The excavation exposed the monitoring well head at approximately four to six inches below existing ground surface.

The monitoring well boxes (e.g., Christy boxes) of MW-4 and MW-5 were replaced and the inner two-inch casings were slightly raised for accessibility during future groundwater monitoring events. A six-inch top cap was added to monitoring well MW-4 to replace the damaged original casing. The well locations, well box cover, and top of casing elevations for monitoring wells MW-1, MW-2, MW-3, MW-4 and MW-5 were surveyed by Bates and Bailey of Berkeley on 12 July 1996 (Appendix C). The vertical control of the wells were referenced to the City of Oakland datum (Figure 2). The top of casing elevations are shown in Table 4.

Groundwater Sampling Activities

Groundwater samples were collected from all six monitoring wells, MW-1, MW-2, MW-3, MW-4, MW-5 and Well 18 on 31 December 1996 (Figure 2). The presence of floating product was checked and water levels were measured in each of the wells using a dual-interface probe. Floating product was not identified in any of the wells. The probe was decontaminated by washing with a trisodium phosphate solution and rinsing with deionized water between use at each well. Approximately four to five well volumes of water were slowly purged from each well using a peristaltic pump and new disposable PVC tubing. The temperature, pH, electrical conductivity, and dissolved oxygen (DO) content of the groundwater were monitored during purging until they appeared to have stabilized. All decontamination rinsate and purged groundwater were stored on-site in sealed, labeled drums pending laboratory analysis.

⁵Subsurface Consultants, Inc., 1990, *Soil and Groundwater Contamination Assessment, Phase 2, 98th and Edes Avenues, Oakland, California*, 10 April.

Groundwater samples were collected from each monitoring well immediately after the wells were purged of at least three well volumes. Samples were collected into sample bottles using the peristaltic pump and new, disposable PVC tubing, labeled, placed in a cooler containing blue ice, and transported to Chromalab, Inc., a California-certified analytical laboratory. The groundwater samples were analyzed for total petroleum hydrocarbons as gasoline and as diesel (Method 8015M), benzene, toluene, ethylbenzene, and xylenes (Method 8020A), and chlorinated hydrocarbons (Method 8010A). In addition, the groundwater samples were analyzed for nitrate (Method 353.2), sulfate (Method 375.4), and total iron (Method 3010A/6010A) to assess the relative activity of intrinsic bioremediation processes. Groundwater sampling forms that document the December 1996 purging sampling activities are included in Appendix A.

FINDINGS

Analytical Results

The analytical results indicate the presence of petroleum hydrocarbons and/or aromatic hydrocarbons in groundwater at the three down- to crossgradient wells (MW-1, MW-3, and Well 18) and at MW-2, up-and crossgradient from the site (Table 1). Detected levels of TPHg in the other wells ranged from nondetectable at MW-2 and MW-5 to 18 mg/L at Well 18. TPHg was also detected at a low concentration (0.79 mg/L) in the upgradient well, MW-4. Diesel was detected in MW-1, MW-2, and MW-3, ranging in estimated concentrations from 10 mg/L at MW-1 to 0.2 mg/L at MW-2. Although the detected extractable hydrocarbon was quantified by the laboratory as diesel, the sample chromatograms did not match the laboratory standards for diesel.

Several chlorinated hydrocarbons (Table 2) were detected in the groundwater samples from each of the wells. Trichloroethene (TCE) was detected in each of the wells except MW-5, ranging in concentration from 0.0007 mg/L at MW-4 to 0.011 mg/L at Well 18. Tetrachloroethene and 1, 1, 1-trichloroethane were detected in each of the wells except MW-1. 1,1 dichloroethene was detected at 0.0015 mg/L in MW-1 and at 0.0006 mg/L in MW-2. MW-1 also was found to contain detectable levels (0.001 mg/L) of total 1,2 dichloroethene.

The results of analysis of bioremediation indicator parameters are summarized in Table 3. The evaluation of dissolved oxygen levels in groundwater measured at the time of sampling was relatively uniform throughout the monitoring network, ranging from 2.0 mg/L at wells MW-3 and MW-4 to 4.0 mg/L at MW-5. Nitrate levels ranged from 0.16 mg/L at downgradient well MW-1 to 13 mg/L at MW-4, the upgradient well. The concentration of sulfate was observed in the range of 5.0 mg/L at MW-1 to 54 mg/L at MW-3. Dissolved ferrous (Fe^{+2}) levels ranged from less than 0.10 mg/L at monitoring wells MW-2, MW-4, and MW-5 to 3.4 mg/L at MW-1.

Groundwater Flow Direction

Groundwater elevations ranged from 9.77 to 10.25 feet above City of Oakland datum in the six wells at the site in December 1996. The direction of the groundwater flow was calculated to be to the northwest (N55W), with a gradient of 0.002. The calculated gradient is generally consistent with the gradient calculated from data collected during previous monitoring events. Groundwater elevation data and calculated flow directions are summarized in Table 4 and shown on Figure 2.

TABLE 3
SUMMARY OF ANALYTICAL RESULTS, GROUNDWATER
BIOREMEDIATION INDICATION PARAMETERS
670 98th Avenue, Oakland, California
(mg/L, unless otherwise noted)

Sample Location	Sample Date	Temp. ¹ (°C)	pH ¹ (pH units)	DO ^{1,2}	Nitrate ³	Sulfate ⁴	Dissolved ⁵ Iron (Fe ²⁺)
MW-1	12/31/96	19.6	7.00	3.1	0.16	5	3.4
MW-2	12/31/96	19.1	7.00	3.6	2.6	23	<0.10
MW-3	12/31/96	18.9	7.00	2.0	7.2	54	0.58
MW-4	12/31/96	19.2	6.68	2.0	13	43	<0.10
MW-5	12/31/96	19.0	6.75	4.0	9.0	40	<0.10
Well 18	12/31/96	19.1	7.00	3.6	6.3	36	0.18

Notes: Monitoring well locations are shown on Figure 2.
Laboratory report is included in Attachment B.

- ¹ Value provided is from the purge water measured at the completion of well purging.
² DO = dissolved oxygen. Measurements taken by direct-reading DO meter at the time of sampling.
³ Test Method = EPA 353.2.
⁴ Test Method = EPA 375.4.
⁵ Sample filtered and preserved by laboratory. Test Method = EPA 3010A/6010A.

TABLE 4
GROUNDWATER ELEVATIONS, FLOW DIRECTIONS
AND GRADIENT MAGNITUDES
670 98th Avenue, Oakland, California

Date	MW-1 ¹		MW-2 ²		MW-3 ³		MW-4 ⁴		MW-5 ⁵		Well 18 ⁶		Ground-water Flow Direction	Gradient Magnitude
	Depth to Ground-water (feet from TOC)	Ground-water Elevation (feet)	Depth to Ground-water (feet from TOC)	Ground-water Elevation (feet)	Depth to Ground-water (feet from TOC)	Ground-water Elevation (feet)	Depth to Ground-water (feet from TOC)	Ground-water Elevation (feet)	Depth to Ground-water (feet from TOC)	Ground-water Elevation (feet)	Depth to Ground-water (feet from TOC)	Ground-water Elevation (feet)		
3/1/90 ⁷	8.95	7.24	8.85	7.67	9.17	7.39	9.98	7.73	9.61	--	8.53	7.44	-- ⁸	-- ⁸
3/6/90 ⁷	8.55	7.64	8.46	8.06	8.78	7.78	9.60	8.11	9.23	--	8.11	7.86	-- ⁸	-- ⁸
3/23/90 ⁷	9.17	7.02	9.02	7.50	9.35	7.21	10.20	7.51	9.80	--	8.73	7.24	-- ⁸	-- ⁸
6/30/90 ⁷	9.56	6.63	9.40	7.12	9.74	6.82	10.57	7.14	10.17	--	9.11	6.86	-- ⁸	-- ⁸
10/4/90 ⁷	10.23	5.96	9.80	6.72	10.17	6.39	10.98	6.73	10.59	--	9.50	6.47	-- ⁸	-- ⁸
4/15/93 ⁹	8.47	7.73 ¹⁰	8.31	8.21	8.65	7.91	-- ¹¹	--	-- ¹¹	--	8.06	7.91	-- ⁸	-- ⁸
5/24/93 ⁹	8.93	7.28 ¹⁰	8.73	7.79	9.10	7.46	9.88	7.83	-- ¹¹	--	8.49	7.48	-- ⁸	-- ⁸
6/24/93 ⁹	8.86	7.33 ¹⁰	8.63	7.89	9.02	7.54	9.78	7.93	-- ¹¹	--	8.40	7.57	-- ⁸	-- ⁸
3/31/95	7.47	8.75	7.35	9.17	7.67	8.89	-- ¹¹	--	-- ¹¹	--	7.09 ¹²	8.88	N55W	0.002
12/31/96	6.41	9.77	6.37	10.13	6.62	9.92	8.15	10.25	7.18	10.17	6.01	9.94	N55W	0.002

Notes: TOC = Top of well casing.
-- = Data not available.

- ¹ Elevation of top of casing = 16.19 feet above City of Oakland datum (SCI), 16.18 feet (revised 12 July 1996, Bates & Bailey).
- ² Elevation of top of casing = 16.52 feet above City of Oakland datum (SCI), 16.50 feet (revised 12 July 1996, Bates & Bailey).
- ³ Elevation of top of casing = 16.56 feet above City of Oakland datum (SCI), 16.54 feet (revised 12 July 1996, Bates & Bailey).
- ⁴ Elevation of top of casing = 17.71 feet above City of Oakland datum (SCI), 18.40 feet (revised 12 July 1996, Bates & Bailey).

- ⁵ Monitoring well not accessible during elevation survey (SCI), elevation of top of casing = 17.35 feet above City of Oakland datum (revised 12 July 1996, Bates & Bailey).
- ⁶ Elevation of top of casing = 15.97 feet above City of Oakland datum (SCI), 15.95 feet (revised, determined by calculating from revised TOC for MW-1 through MW-5).
- ⁷ Groundwater data collected by Subsurface Consultants, Inc. (SCI).
- ⁸ Groundwater flow direction and gradient magnitude not reported.
- ⁹ Groundwater data collected by Applied Geotechnology, Inc. (AGI).
- ¹⁰ Free product detected. Reported groundwater elevation adjusted by AGI for presence of free product.
- ¹¹ Monitoring wells were inaccessible.
- ¹² Slight petroleum odor and sheen.

CONCLUSIONS

Field Inspection

- Following repair of monitoring wells MW-4 and MW-5, these wells have been returned to the monitoring network for the project site. Non-detectible results for total petroleum hydrocarbons and BTEX and low levels of halogenated hydrocarbons in groundwater samples collected from the wells in December 1996 are consistent with reported results from previous sampling events.

Groundwater Sampling

Petroleum and Aromatic Hydrocarbons

- All six wells were checked for free product in December 1996; none was identified. Free product previously observed in MW-1 in 1993 was not detected.
- The detection of total petroleum and aromatic hydrocarbons in wells downgradient and crossgradient of the project site (MW-1, MW-3, and Well 18) confirm the release of these compounds to the subsurface. The history of release(s) of petroleum hydrocarbons at the site and their location upgradient of these monitoring points indicate that the site is a potential source of these contaminants. Detection of low levels of diesel at MW-2 during the December 1996 sampling event indicate that this well may be located near the northern margin of the plume of groundwater affected by petroleum hydrocarbon release(s).
- Petroleum and aromatic hydrocarbons were not previously detected in MW-4, located upgradient of the identified sources at the site. Detection of TPHg in the December 1996 groundwater sample from MW-4 should be confirmed by subsequent sampling events. It is possible that upgradient sources may also be contributing to the constituents detected in the groundwater downgradient of the site.
- The presence of aromatic hydrocarbons continues to persist at the downgradient wells, MW-1 and Well 18. With the exception of xylenes (0.00065 mg/L) at MW-3, these compounds were not detected in the samples from the up- and crossgradient wells within the monitoring network. Benzene concentrations in MW-1 and Well 18 exceed the California maximum contaminant level (MCL) of 0.001 mg/L.⁶ The level of xylenes at MW-1 also exceeded the MCL for this compound (1.750 mg/L).
- A consistent trend in aromatic hydrocarbon level concentration cannot be established for data collected from MW-1. Benzene, ethylbenzene, and xylene levels in the December 1996 samples are slightly elevated relative to data collected in March 1995. Elevated groundwater levels in December 1996 may have exposed groundwater to residual levels of these contaminants within the upper portions of the zone of seasonal groundwater level fluctuation.

⁶California Code of Regulations, Title 26, §22-64444.5

- Monitoring of intrinsic bioremediation indicator parameters during the December 1996 groundwater sampling event generally suggests that the bioremediation processes within the aquifer beneath the site are active. The pH measurements indicate that the groundwater is neutral, a condition favorable for bioremediation processes. The dissolved oxygen levels 2.0 to 4.0 mg/L are relatively high for groundwater, suggesting that sufficient oxygen is available for aerobic bacteria populations. Depletion of nitrate and sulfate, common electron receptors, at MW-1 indicate that the rates of bioremediation processes are relatively high at this location. In addition, the relatively high level ferrous iron indicates that ferric iron (present in iron oxides) is also being used as an electron receptor in the bioremediation process. The inferred higher rates of are consistent with the presence of petroleum and aromatic hydrocarbons detected in this well which bacteria are capable of metabolizing.

Conversely, relatively high levels of nitrate and sulfate and low levels of ferrous iron at MW-4 indicate relatively low intrinsic bioremediation rates. This well is located upgradient of the former location of underground tank locations at the project site. Consistent non-detectable results for petroleum hydrocarbons and aromatic hydrocarbons indicate a lack of available "food" for intrinsic biodegradation.

Chlorinated Hydrocarbons

- The analytical results for chlorinated hydrocarbons for the recent and past sampling events indicate that the extent of these contaminants is not defined. Chlorinated hydrocarbons were detected in MW-1, a location where these compounds were not detected during the March 1995 sampling event. The detection of 1,1 dichloroethene (DCE), 1,1 dichloroethane (DCA), and trichloroethene (TCE) may be attributable to the lower laboratory reporting limit (0.0005 mg/L) relative to the reporting limit for the March 1995 event (0.01 mg/L).
- Concentrations of TCE in samples from MW-2, MW-3, and Well 18 exceeded the MCL for this compound (0.005 mg/L). The MCL for tetrachloroethene (PCE) (0.005 mg/L) was exceeded in samples collected from MW-4 and Well 18.
- In general, the concentrations of chlorinated hydrocarbons measured in groundwater in the December 1996 samples are less than the highest levels of these compounds measured at each well during previous monitoring events. Exceptions to this include PCE levels measured at MW-4 and MW-5 and 1,2 DCA at MW-1 (Table 2).
- The underground waste oil storage tank removed from the site could have been used for the disposal of industrial solvents or other compounds containing chlorinated hydrocarbons. Therefore, the former tank is a potential source of the chlorinated hydrocarbons detected in groundwater.
- The presence of chlorinated hydrocarbons in wells upgradient to crossgradient (MW-2, MW-4, and MW-5) of the former waste oil tank location may indicate an off-site and upgradient source for these constituents. The closest potential upgradient to crossgradient sources identified in the vicinity of the site are the former service station at 692 98th, Action Plating site (10132 Edes

Avenue), and the former B&M Foundry site (Pearmain & 100th Avenue). However, it is possible that upgradient and crossgradient lateral spreading could be caused by preferential flow of chlorinated hydrocarbons away from the former on-site waste oil tank location within more permeable soils in the subsurface or along capillary boundaries.

RECOMMENDATIONS

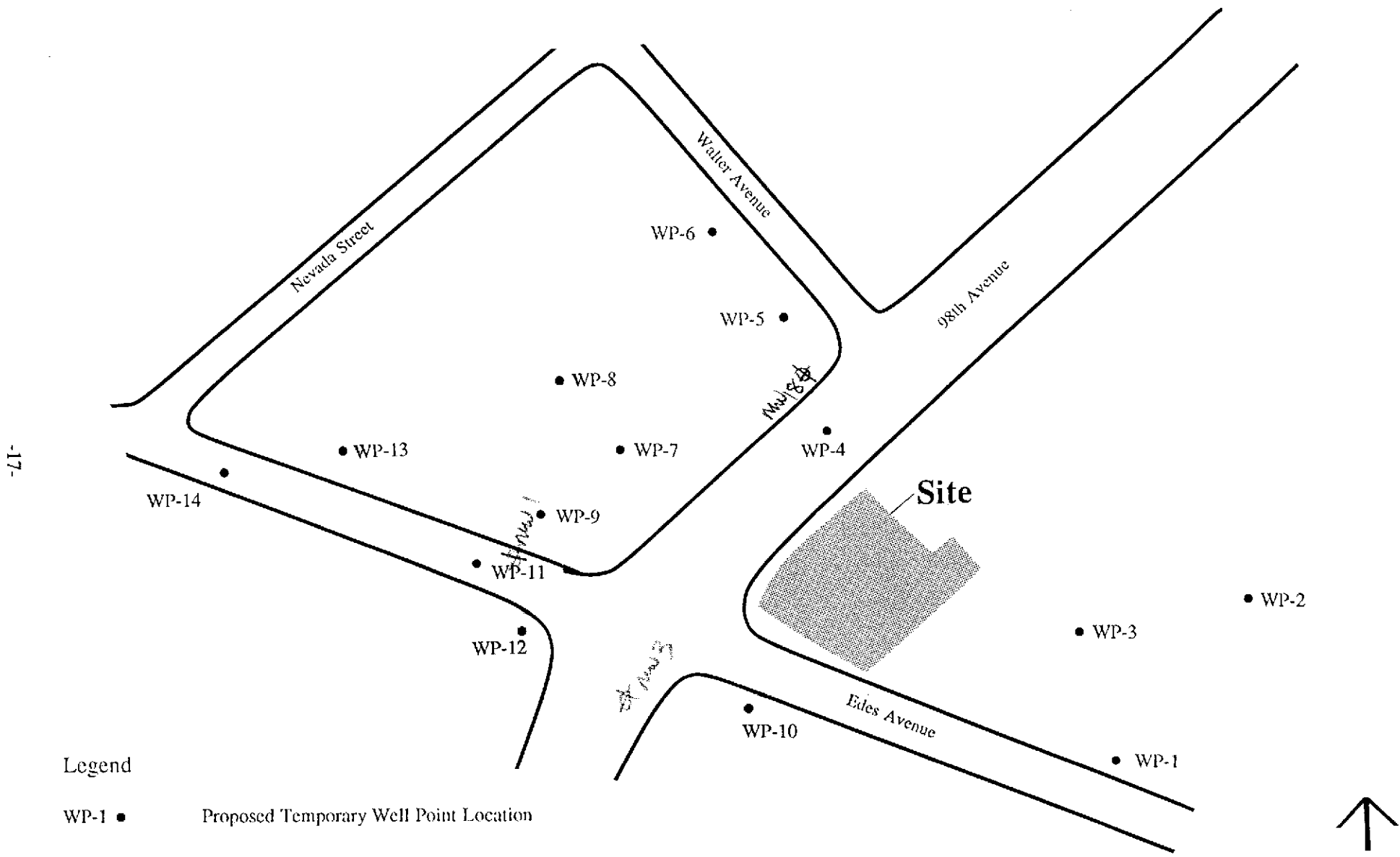
- Groundwater quality monitoring should be continued for the project site to evaluate changes in chemical concentrations in groundwater. All wells (MW-1 through MW-5 and Well 18) within the monitoring network should be sampled and submitted to a state-certified laboratory for analysis of total petroleum hydrocarbons as gasoline and diesel (EPA Method modified 8015M), BTEX (EPA Method 8020A), and chlorinated hydrocarbons (EPA Method 8010A). In addition, nitrate (EPA Method 353.2), sulfate (EPA Method 375.4), and filtered total iron (EPA Method 3010A/6010A) evaluate to the relative activity of intrinsic bioremediation processes.
- The extent of petroleum, aromatic, and chlorinated hydrocarbons in the groundwater remains undefined. We recommend conducting a survey of groundwater quality in the vicinity of the site using temporary well points (hydropunch or similar devices) to collect groundwater samples. The position of the sampling points should conform with the revised sampling locations presented in our letter plan dated 2 October 1996 (Figure 3).

LIMITATIONS

The conclusions presented in this report are professional opinions based on the indicated data described in this report. They are intended only for the purpose, site, and project indicated. Opinions and recommendations presented herein apply to site conditions existing at the time of our study. Changes in the conditions of the subject property can occur with time, because of natural processes or the works of man, on the subject sites or on adjacent properties. Changes in applicable standards can also occur as the result of legislation or from the broadening of knowledge. Accordingly, the findings of this report may be invalidated, wholly or in part, by changes beyond our control.

PROPOSED SAMPLING LOCATIONS

Figure 3



Legend

WP-1 • Proposed Temporary Well Point Location

670 98th Avenue
Oakland, California



BASELINE

APPENDIX A

GROUNDWATER SAMPLING FORMS

GROUNDWATER SAMPLING

Project no.:	<u>93343-F0</u>	Well no.:	<u>MW-1</u>	Date:	<u>12/31/96</u>
Project name:	<u>670 98th Avenue</u>	Depth of well from TOC (feet):	<u>19.30</u>		
Location:	<u>670 98th Avenue</u>	Well diameter (inch):	<u>2</u>		
	<u>Oakland, CA</u>	Screened interval from TOC (feet):	<u>6-19.3</u>		
Recorded by:	<u>WKS</u>	TOC elevation (feet):	<u>16.18 (City of Oakland datum)</u>		
Weather:	<u>Showers</u>	Water level from TOC (feet):	<u>6.41</u>	Time:	<u>8:33</u>
Precip in past		Product level from TOC (feet):	<u>None</u>	Time:	<u>8:33</u>
5 days (inch):	<u>Over 2</u>	Water level measurement:	<u>Dual-interface probe</u>		

VOLUME OF WATER TO BE REMOVED BEFORE SAMPLING:

$[(19.30 \text{ ft}) - (6.41 \text{ ft})] \times (0.083 \text{ ft})^2 \times 3.14 \times 7.48 =$	<u>2.1</u> gallons in one well volume
Well depth Water level Well radius	<u>6.3</u> gallons in 3 well volumes
	<u>6.5</u> total gallons removed

CALIBRATION:

	<u>Time</u>	<u>Temp</u> <u>(° C)</u>	<u>pH</u>	<u>EC</u> <u>(µmho/cm)</u>
Calibration Standard:	--		7.00/10.01	1,000
Before Purging:	7:03	18.7	7.00/10.01	900
After Purging:	12:40	18.9	7.07/9.82	900

FIELD MEASUREMENTS:

<u>Time</u>	<u>Temp</u> <u>(° C)</u>	<u>pH</u>	<u>EC</u> <u>(µmho/cm)</u>	<u>Cumulative</u> <u>Gallons</u> <u>Removed</u>	<u>Appearance</u>
8:35	19.7	7.02	420	2.5	Clear with abundant black algae
8:45	19.6	7.00	410	5.0	Clear, particles of algae
8:52	19.6	7.00	410	6.5	Clear

Water level prior to sampling:	<u>6.49 ft.</u>	Time:	<u>8:54</u>
DO meter calibration:	<u>9.30 @ 18.5 ° C</u>	Time:	<u>7:02</u>
DO result (after well purging):	<u>3.1 mg/L</u>	Time:	<u>8:52</u>
Appearance of sample:	<u>Clear</u>	Time:	<u>8:55</u>
Duplicate/blank number:	<u>None</u>	Time:	<u>--</u>
Purge method:	<u>Double diaphragm pump and disposable polyethylene tubing</u>		
Sampling equipment:	<u>Disposable polyethylene bailer</u>	VOC attachment:	<u>Used for VOAs</u>
Sample containers:	<u>4 40-ml VOAs, 1 1-liter amber glass</u>		
Sample analyses:	<u>TPHd, TPHg, BTXE, Fe, Nitrate, Sulfate, Purgeable Halocarbons</u>	Laboratory:	<u>Chromalab</u>
Decontamination method:	<u>TSP and water, DI water rinse</u>	Rinsate disposal:	<u>Drum MW-1, MW-2, MW-3, 18</u>

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GROUNDWATER SAMPLING

Project no.:	<u>93343-F0</u>	Well no.:	<u>MW-2</u>	Date:	<u>12/31/96</u>
Project name:	<u>670 98th Avenue</u>	Depth of well from TOC (feet):	<u>27.50</u>		
Location:	<u>670 98th Avenue</u>	Well diameter (inch):	<u>2</u>		
	<u>Oakland, CA</u>	Screened interval from TOC (feet):	<u>9-27.5</u>		
Recorded by:	<u>WKS</u>	TOC elevation (feet):	<u>16.50 (City of Oakland datum)</u>		
Weather:	<u>Showers</u>	Water level from TOC (feet):	<u>6.37</u>	Time:	<u>10:14</u>
Precip in past		Product level from TOC (feet):	<u>None</u>	Time:	<u>10:14</u>
5 days (inch):	<u>Over 2</u>	Water level measurement:	<u>Dual-interface probe</u>		

VOLUME OF WATER TO BE REMOVED BEFORE SAMPLING:

$[(27.50 \text{ ft}) - (6.37 \text{ ft})] \times (0.083 \text{ ft})^2 \times 3.14 \times 7.48 =$	<u>3.4</u> gallons in one well volume
Well depth Water level Well radius	<u>10.3</u> gallons in 3 well volumes
	<u>12</u> total gallons removed

CALIBRATION:

	<u>Time</u>	<u>Temp</u> <u>(° C)</u>	<u>pH</u>	<u>EC</u> <u>(µmho/cm)</u>
Calibration Standard:	--		7.00/10.01	1,000
Before Purging:	7:03	18.7	7.00/10.01	900
After Purging:	12:40	18.9	7.07/9.82	900

FIELD MEASUREMENTS:

<u>Time</u>	<u>Temp</u> <u>(° C)</u>	<u>pH</u>	<u>EC</u> <u>(µmho/cm)</u>	<u>Cumulative</u> <u>Gallons</u> <u>Removed</u>	<u>Appearance</u>
10:20	18.4	7.00	500	2	Slightly turbid with black algae, silt, and sand
10:26	18.9	7.00	500	5	Clear, black algae
10:31	19.1	7.00	500	8	Clear
10:37	19.1	7.00	500	12	Clear

Water level prior to sampling:	<u>6.39 ft.</u>	Time:	<u>10:44</u>
DO meter calibration:	<u>9.30 @ 18.5 ° C</u>	Time:	<u>7:02</u>
DO result (after well purging):	<u>3.6 mg/L</u>	Time:	<u>10:37</u>
Appearance of sample:	<u>Clear</u>	Time:	<u>10:45</u>
Duplicate/blank number:	<u>None</u>	Time:	<u>--</u>
Purge method:	<u>Double diaphragm pump and disposable polyethylene tubing</u>		
Sampling equipment:	<u>Disposable polyethylene bailer</u>	VOC attachment:	<u>Used for VOAs</u>
Sample containers:	<u>4 40-ml VOAs, 1 1-liter amber glass</u>		
Sample analyses:	<u>TPHd, TPHg, BTXE, Fe, Nitrate, Sulfate, Purgeable Halocarbons</u>	Laboratory:	<u>Chromalab</u>
Decontamination method:	<u>TSP and water, DI water rinse</u>	Rinsate disposal:	<u>Drum MW-1, MW-2, MW-3, 18</u>

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GROUNDWATER SAMPLING

Project no.:	<u>93343-F0</u>	Well no.:	<u>MW-3</u>	Date:	<u>12/31/96</u>
Project name:	<u>670 98th Avenue</u>	Depth of well from TOC (feet):	<u>22.30</u>		
Location:	<u>670 98th Avenue</u>	Well diameter (inch):	<u>2</u>		
	<u>Oakland, CA</u>	Screened interval from TOC (feet):	<u>7-22.3</u>		
Recorded by:	<u>WKS</u>	TOC elevation (feet):	<u>16.54 (City of Oakland datum)</u>		
Weather:	<u>Showers</u>	Water level from TOC (feet):	<u>6.62</u>	Time:	<u>9:20</u>
Precip in past		Product level from TOC (feet):	<u>None</u>	Time:	<u>9:20</u>
5 days (inch):	<u>Over 2</u>	Water level measurement:	<u>dual-interface probe</u>		

VOLUME OF WATER TO BE REMOVED BEFORE SAMPLING:

$[(22.30 \text{ ft}) - (6.62 \text{ ft})] \times (0.083 \text{ ft})^2 \times 3.14 \times 7.48 =$	<u>2.5</u> gallons in one well volume
Well depth Water level Well radius	<u>7.6</u> gallons in 3 well volumes
	<u>6.5</u> total gallons removed

CALIBRATION:

	Time	Temp (° C)	pH	EC (µmho/cm)
Calibration Standard:	--		7.00/10.01	1,000
Before Purging:	7:03	18.7	7.00/10.01	900
After Purging:	12:40	18.9	7.07/9.82	900

FIELD MEASUREMENTS:

Time	Temp (° C)	pH	EC (µmho/cm)	Cumulative Gallons Removed	Appearance
9:28	18.9	7.00	400	2	Slightly turbid with silt and orange particulates
9:32	18.9	6.98	400	3	Clear
9:40	18.9	6.97	410	5.5	Clear
9:45	18.9	7.00	400	6.5	Clear

Water level prior to sampling:	<u>6.62 ft.</u>	Time:	<u>9:45</u>
DO meter calibration:	<u>9.30 @ 18.5 ° C</u>	Time:	<u>7:02</u>
DO result (after well purging):	<u>2 mg/L</u>	Time:	<u>9:45</u>
Appearance of sample:	<u>Clear</u>	Time:	<u>9:45</u>
Duplicate/blank number:	<u>None</u>	Time:	<u>--</u>
Purge method:	<u>Double diaphragm pump and disposable polyethylene tubing</u>		
Sampling equipment:	<u>Disposable polyethylene bailer</u>	VOC attachment:	<u>Used for VOAs</u>
Sample containers:	<u>4 40-ml VOAs, 1 1-liter amber glass</u>		
Sample analyses:	<u>TPHd, TPHg, BTXE, Fe, Nitrate, Sulfate, Purgeable Halocarbons</u>	Laboratory:	<u>Chromalab</u>
Decontamination method:	<u>TSP and water, DI water rinse</u>	Rinsate disposal:	<u>Drum MW-1, MW-2, MW-3, 18</u>

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GROUNDWATER SAMPLING

Project no.:	93343-F0	Well no.:	MW-4	Date:	12/31/96
Project name:	670 98th Avenue	Depth of well from TOC (feet):	21.10		
Location:	670 98th Avenue Oakland, CA	Well diameter (inch):	2		
Recorded by:	WKS	Screened interval from TOC (feet):	NA		
Weather:	Showers	TOC elevation (feet):	18.40 (City of Oakland datum)		
Precip in past		Water level from TOC (feet):	8.15	Time:	8:26
5 days (inch):	Over 2	Product level from TOC (feet):	None	Time:	10:31
		Water level measurement:	dual-interface probe		

VOLUME OF WATER TO BE REMOVED BEFORE SAMPLING:

$$[(21.10 \text{ ft}) - (8.15 \text{ ft})] \times (0.083 \text{ ft})^2 \times 3.14 \times 7.48 = \underline{2.1} \text{ gallons in one well volume}$$

Well depth Water level Well radius

$$\underline{6.3} \text{ gallons in 3 well volumes}$$

$$\underline{12} \text{ total gallons removed}$$

CALIBRATION:

	Time	Temp (° C)	pH	EC (µmho/cm)
Calibration Standard:	--		7.00/10.01	1,000
Before Purging:	7:03	18.7	7.00/10.01	900
After Purging:	12:40	18.9	7.07/9.82	900

FIELD MEASUREMENTS:

Time	Temp (° C)	pH	EC (µmho/cm)	Cumulative Gallons Removed	Appearance
11:56	19.2	6.71	500	2.5	Clear, after initially turbid
12:03	19.2	6.69	500	5.0	Clear
12:08	19.2	6.67	500	8.0	Clear
12:20	19.2	6.68	500	12.0	Clear

Water level prior to sampling:	8.20 ft,	Time:	12:29
DO meter calibration:	9.30 @ 18.5 ° C	Time:	7:02
DO result (after well purging):	2 mg/L	Time:	12:20
Appearance of sample:	Clear	Time:	12:35
Duplicate/blank number:	None	Time:	--
Purge method:	Double diaphragm pump and disposable polyethylene tubing		
Sampling equipment:	Disposable polyethylene bailer	VOC attachment:	Used for VOAs
Sample containers:	4 40-ml VOAs, 1 1-liter amber glass		
Sample analyses:	TPHd, TPHg, BTXE, Fe, Nitrate, Sulfate, Purgeable Halocarbons	Laboratory:	Chromalab
Decontamination method:	TSP and water, DI water rinse	Rinsate disposal:	Drum MW-1, MW-2, MW-3, 18

93343D96.XLS (4/21/97)

GROUNDWATER SAMPLING

Project no.:	<u>93343-F0</u>	Well no.:	<u>MW-5</u>	Date:	<u>12/31/96</u>
Project name:	<u>670 98th Avenue</u>	Depth of well from TOC (feet):	<u>22.0</u>		
Location:	<u>670 98th Avenue</u>	Well diameter (inch):	<u>2</u>		
	<u>Oakland, CA</u>	Screened interval from TOC (feet):	<u>NA</u>		
Recorded by:	<u>WKS</u>	TOC elevation (feet):	<u>17.35 (City of Oakland datum)</u>		
Weather:	<u>Showers</u>	Water level from TOC (feet):	<u>7.18</u>	Time:	<u>10:31</u>
Precip in past		Product level from TOC (feet):	<u>None</u>	Time:	<u>10:31</u>
5 days (inch):	<u>Over 2</u>	Water level measurement:	<u>dual-interface probe</u>		

VOLUME OF WATER TO BE REMOVED BEFORE SAMPLING:

$[(22.0 \text{ ft}) - (7.18 \text{ ft})] \times (0.083 \text{ ft})^2 \times 3.14 \times 7.48 =$	<u>2.4</u> gallons in one well volume
Well depth Water level Well radius	<u>7.2</u> gallons in 3 well volumes
	<u>12</u> total gallons removed

CALIBRATION:

	<u>Time</u>	<u>Temp</u> (° C)	<u>pH</u>	<u>EC</u> (µmho/cm)
Calibration Standard:	--		7.00/10.01	1,000
Before Purging:	7:03	18.7	7.00/10.01	900
After Purging:	12:40	18.9	7.07/9.82	900

FIELD MEASUREMENTS:

<u>Time</u>	<u>Temp</u> (° C)	<u>pH</u>	<u>EC</u> (µmho/cm)	<u>Cumulative</u> <u>Gallons</u> <u>Removed</u>	<u>Appearance</u>
11:08	19.0	6.77	500	3	Clear
11:18	19.0	6.75	500	7	Clear
11:29	19.0	6.75	500	10	Clear
11:34	19.0	6.75	500	12	Clear

Water level prior to sampling:	<u>7.21 ft.</u>	Time:	<u>11:39</u>
DO meter calibration:	<u>9.30 @ 18.5 ° C</u>	Time:	<u>7:02</u>
DO result (after well purging):	<u>4 mg/L</u>	Time:	<u>11:34</u>
Appearance of sample:	<u>Clear</u>	Time:	<u>11:40</u>
Duplicate/blank number:	<u>None</u>	Time:	<u>--</u>
Purge method:	<u>Double diaphragm pump and disposable polyethylene tubing</u>		
Sampling equipment:	<u>Disposable polyethylene bailer</u>	VOC attachment:	<u>Used for VOAs</u>
Sample containers:	<u>4 40-ml VOAs, 1 1-liter amber glass</u>		
Sample analyses:	<u>TPHd, TPHg, BTXE, Fe, Nitrate, Sulfate, Purgeable Halocarbons</u>	Laboratory:	<u>Chromalab</u>
Decontamination method:	<u>TSP and water, DI water rinse</u>	Rinsate disposal:	<u>Drum MW-1, MW-2, MW-3, 18</u>

93343D96.XLS (4/21/97)

GROUNDWATER SAMPLING

Project no.:	93343-F0	Well no.:	18	Date:	12/31/96
Project name:	670 98th Avenue	Depth of well from TOC (feet):	16.55		
Location:	670 98th Avenue Oakland, CA	Well diameter (inch):	2		
Recorded by:	WKS	Screened interval from TOC (feet):	6-16.55		
Weather:	Showers	TOC elevation (feet):	15.95 (calculated)		
Precip in past		Water level from TOC (feet):	6.01	Time:	7:00
5 days (inch):	Over 2	Product level from TOC (feet):	None	Time:	7:00
		Water level measurement:	Dual-interface probe		

VOLUME OF WATER TO BE REMOVED BEFORE SAMPLING:

$$[(16.55 \text{ ft}) - (6.01 \text{ ft})] \times (0.083 \text{ ft})^2 \times 3.14 \times 7.48 =$$

Well depth	Water level	Well radius	1.7 gallons in one well volume
			5.1 gallons in 3 well volumes
			7.0 total gallons removed

CALIBRATION:

	Time	Temp (° C)	pH	EC (µmho/cm)
Calibration Standard:	--		7.00/10.01	1,000
Before Purging:	7:03	18.7	7.00/10.01	900
After Purging:	12:40	18.9	7.07/9.82	900

FIELD MEASUREMENTS:

Time	Temp (° C)	pH	EC (µmho/cm)	Cumulative Gallons Removed	Appearance
7:28	18.3	6.92	600	3.5	Clear to very slightly turbid, sheen, slight diesel odor
7:35	18.9	6.97	600	4.5	Clear
7:40	18.7	6.98	550	5.5	Clear
7:47	19.1	7.00	550	7.0	Clear

Water level prior to sampling:	6.13 ft.	Time:	7:51
DO meter calibration:	9.30 @ 18.5 ° C	Time:	7:02
DO result (after well purging):	3.6 mg/L	Time:	7:47
Appearance of sample:	Clear	Time:	7:55
Duplicate/blank number:	None	Time:	--
Purge method:	Double diaphragm pump and disposable polyethylene tubing		
Sampling equipment:	Disposable polyethylene bailer	VOC attachment:	Used for VOAs
Sample containers:	4 40-ml VOAs, 1 1-liter amber glass		
Sample analyses:	TPHd, TPHg, BTXE, Fe, Nitrate, Sulfate, Purgeable Halocarbons	Laboratory:	Chromalab
Decontamination method:	TSP and water, DI water rinse	Rinsate disposal:	Drum MW-1, MW-2, MW-3, 18

93343D96.XLS (4/21/97)

APPENDIX B
LABORATORY REPORT

CHROMALAB, INC.

Environmental Services (SOB)

May 20, 1997

Submission #: 9705266

BASELINE ENVIRONMENTAL/EMRYVL

Atten: Yane Nordhav

Project: 98TH AVE, 670 98TH AVE.
Received: December 31, 1996

Project#: 93343-FO

re: One sample for Gasoline analysis.
Method: 8015Mod

Client Sample ID: MW-1

Spl#: 132459

Sampled: December 31, 1996

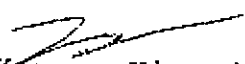
Matrix: WATER

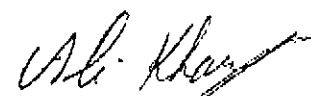
Run#: 6930

Analyzed: January 2, 1997

ANALYTE	RESULT (ug/L)	REPORTING LIMIT (ug/L)	BLANK RESULT (ug/L)	BLANK SPIKE (%)	DILUTION FACTOR
GASOLINE	14000	2500	N.D.	115	50

Note: Hydrocarbon found in Gasoline Range is uncharacteristic of Gasoline Profile. Concentration was quantified by using Gasoline's response factor.


Kayvan Kimyai
Chemist

For 
Marianne Alexander
Gas/BTEX Supervisor

CHROMALAB, INC.

Environmental Services (SDS)

May 20, 1997

Submission #: 9705266

BASELINE ENVIRONMENTAL/EMRYVL

Atten: Yane Nordhav

Project: 98TH AVE, 670 98TH AVE.
Received: December 31, 1996

Project#: 93343-FO

re: One sample for Gasoline analysis.
Method: 8015MOD

Client Sample ID: MW-2

Spl#: 132460


Sampled: December 31, 1996

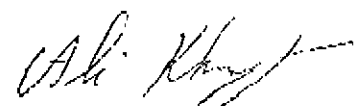
Matrix: WATER

Run#: 6930

Analyzed: January 2, 1997

<u>ANALYTE</u>	<u>RESULT</u> (ug/L)	<u>REPORTING</u> <u>LIMIT</u> (ug/L)	<u>BLANK</u> <u>RESULT</u> (ug/L)	<u>BLANK</u> <u>SPIKE</u> (%)	<u>DILUTION</u> <u>FACTOR</u>
GASOLINE	N.D.	50	N.D.	115	1


Kayvan Kimyai
Chemist

For 
Marianne Alexander
Gas/BTEX Supervisor

510-420-1707

1220 Quarry Lane • Pleasanton, California 94568-4766
(510) 484-1919 • Facsimile (510) 484-1096

ENV 1120 O: BTEXQC0220
KAYVAN 09.98

CHROMALAB, INC.

Environmental Services (SDB)

May 20, 1997

Submission #: 9705266

BASELINE ENVIRONMENTAL/EMRYVL

Atten: Yane Nordhav

Project: 98TH AVE, 670 98TH AVE.
Received: December 31, 1996

Project#: 93343-FO

re: One sample for Gasoline analysis.
Method: 8015Mod

Client Sample ID: MW-3

Spl#: 132461

Matrix: WATER

Sampled: December 31, 1996

Run#: 6930

Analyzed: January 2, 1997

ANALYTE
GASOLINE

RESULT
(ug/L)

REPORTING
LIMIT
(ug/L)

BLANK
RESULT
(ug/L)

BLANK DILUTION
SPIKE FACTOR

Note: Hydrocarbon found in Gasoline Range is uncharacteristic of Gasoline Profile. Concentration was quantified using Gasoline's response factor.

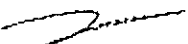
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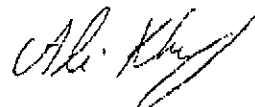
50

N.D.

115

1


Kayvan Kimyai
Chemist

For 
Marianne Alexander
Gas/BTEX Supervisor

510-420-1707

1220 Quarry Lane • Pleasanton, California 94566-4756
(510) 484-1919 • Facsimile (510) 484-1096

ENV1320:BTEXQC0220
KAYVAN 06/96

CHROMALAB, INC.

Environmental Services (SDB)

May 20, 1997

Submission #: 9705266

BASELINE ENVIRONMENTAL/EMRYVL

Atten: Yane Nordhav

Project: 98TH AVE, 670 98TH AVE.
Received: December 31, 1996

Project#: 93343-FO

re: One sample for Gasoline analysis.
Method: 8015Mod

Client Sample ID: MW-4

Spl#: 132462

Matrix: WATER

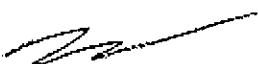
Sampled: December 31, 1996

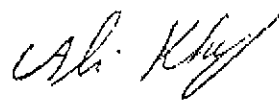
Run#: 6930

Analyzed: January 2, 1997

ANALYTE	RESULT (ug/L)	REPORTING LIMIT (ug/L)	BLANK RESULT (ug/L)	BLANK SPIKE (%)	DILUTION FACTOR
GASOLINE	79	50	N.D.	115	1

Note: Hydrocarbon found in Gasoline Range is uncharacteristic of Gasoline Profile. Concentration was quantified using Gasoline's response factor.


Kayvan Kimyai
Chemist


For Marianne Alexander
Gas/BTEX Supervisor

CHROMALAB, INC.

Environmental Services (S08)

May 20, 1997

Submission #: 9705266

BASELINE ENVIRONMENTAL/EMRYVL

Atten: Yane Nordhav

Project: 98TH AVE, 670 98TH AVE.
Received: December 31, 1996

Project#: 93343-FO

re: One sample for Gasoline analysis.
Method: 8015Mod

Client Sample ID: MW-5

Spl#: 132463

Matrix: WATER

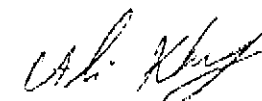
Sampled: December 31, 1996

Run#: 6930

Analyzed: January 2, 1997

ANALYTE	RESULT (ug/L)	REPORTING LIMIT (ug/L)	BLANK RESULT (ug/L)	BLANK SPIKE (%)	DILUTION FACTOR
GASOLINE	N.D.	50	N.D.	115	1


Kayvan Kimyai
Chemist


for Marianne Alexander
Gas/BTEX Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

May 20, 1997

Submission #: 9705266

BASELINE ENVIRONMENTAL/EMRYVL

Atten: Yane Nordhav

Project: 98TH AVE, 670 98TH AVE.
Received: December 31, 1996

Project#: 93343-FO

re: One sample for Gasoline analysis.
Method: 8015Mod

Client Sample ID: 18

Spl#: 132464

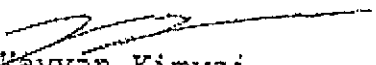
Sampled: December 31, 1996

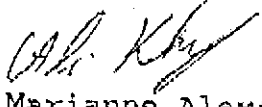
Matrix: WATER

Run#: 6930

Analyzed: January 3, 1997

ANALYTE	RESULT (ug/L)	REPORTING LIMIT (ug/L)	BLANK RESULT (ug/L)	BLANK SPIKE (%)	DILUTION FACTOR
GASOLINE	1800	50	N.D.	115	1


Kayvan Kimyai
Chemist

For 
Marianne Alexander
Gas/BTEX Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

January 7, 1997

Submission #: 9612384

BASELINE ENVIRONMENTAL/EMRYVL

Atten: Bill Scott

Project: 98TH AVE, 670 98TH AVE
Received: December 31, 1996

Project#: 93343-FO

re: 6 samples for BTEX compounds analysis.
Method: SW846 Method 8020A Nov 1990

Matrix: WATER

Sampled: December 31, 1996


Run#: 4723

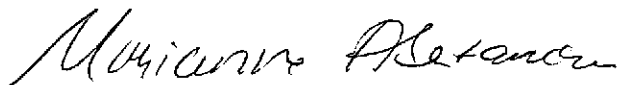
Analyzed: January 2, 1997

Spl#	CLIENT SPL ID	Benzene (ug/L)	Toluene (ug/L)	Ethyl Benzene (ug/L)	Total Xylenes (ug/L)
112663	MW-1	130	N.D.	470	2000
Note: Reporting limits increased due to matrix interference. Reporting limit for BTEX is 25 ug/L.					
112664	MW-2	N.D.	N.D.	N.D.	N.D.
112665	MW-3	N.D.	N.D.	N.D.	0.65
112666	MW-4	N.D.	N.D.	N.D.	N.D.
112667	MW-5	N.D.	N.D.	N.D.	N.D.
112668	18	110	2.3	100	230

Note: Surrogate recovery was outside QA/QC limits due to sample interference. See Surrogate Summary page.

Reporting Limits	0.50	0.50	0.50	0.50
Blank Result	N.D.	N.D.	N.D.	N.D.
Blank Spike Result (%)	94.7	92.7	95.4	95.3


Kayvan Kimyai
Chemist


Marianne Alexander
Gas/BTEX Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

January 7, 1997

Submission #: 9612384

BASELINE ENVIRONMENTAL/EMRYVL

Atten: Bill Scott

Project: 98TH AVE, 670 98TH AVE
Received: December 31, 1996

Project#: 93343-FO

re: **Surrogate** report for 6 samples for BTEX compounds analysis.

Method: SW846 Method 8020A Nov 1990

Lab Run#: 4723

Matrix: WATER

Sample#	Client Sample ID	Surrogate	% Recovered	Recovery Limits
112663-1	MW-1	TRIFLUOROTOLUENE	98.0	65-135
112664-1	MW-2	TRIFLUOROTOLUENE	93.7	65-135
112665-1	MW-3	TRIFLUOROTOLUENE	104	65-135
112666-1	MW-4	TRIFLUOROTOLUENE	95.1	65-135
112667-1	MW-5	TRIFLUOROTOLUENE	91.9	65-135
112668-1	18	TRIFLUOROTOLUENE	182	65-135
112668-2	18	TRIFLUOROTOLUENE	103	65-135

Sample#	QC Sample Type	Surrogate	% Recovered	Recovery Limits
112760-1	Reagent blank (MDB)	TRIFLUOROTOLUENE	103	65-135
112761-1	Spiked blank (BSP)	TRIFLUOROTOLUENE	107	65-135
112762-1	Spiked blank duplicate (BSD)	TRIFLUOROTOLUENE	105	65-135
112763-1	Matrix spike (MS)	TRIFLUOROTOLUENE	91.8	65-135
112764-1	Matrix spike duplicate (MSD)	TRIFLUOROTOLUENE	101	65-135

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CHROMALAB, INC.

Environmental Services (SDB)

January 7, 1997

Submission #: 9612384

BASELINE ENVIRONMENTAL/EMRYVL

Atten: Bill Scott


Project: 98TH AVE, 670 98TH AVE
Received: December 31, 1996


Project#: 93343-FO

re: 6 samples for TPH - Diesel analysis.
Method: EPA 8015M

Matrix: WATER
Sampled: December 31, 1996 Run#: 4738
Extracted: January 2, 1997
Analyzed: January 3, 1997

Spl#	CLIENT SPL ID	DIESEL (ug/L)	REPORTING LIMIT (ug/L)	BLANK RESULT (ug/L)	BLANK SPIKE (%)	DILUTION FACTOR
112663	MW-1	10000	250	N.D.	72.5	5
	Note: Hydrocarbon reported does not match the pattern of our Diesel standard. Estimated concentration due to overlapping fuel patterns.					
112664	MW-2	200	50	N.D.	72.5	1
	Note: Hydrocarbon reported is in the late Diesel range and does not match our Diesel standard.					
112665	MW-3	620	50	N.D.	72.5	1
	Note: Hydrocarbon reported is in the early Diesel range and does not match our Diesel standard. Estimated concentration due to overlapping fuel patterns.					
112666	MW-4	N.D.	50	N.D.	72.5	1
112667	MW-5	N.D.	50	N.D.	72.5	1
112668	18	N.D.	50	N.D.	72.5	1


Bruce Havlik
Chemist


Alex Tam
Semivolatiles Supervisor

diesel analysis

File Name : 12384/18
 Name : F:\mi02022.raw
 Mod : 401321
 Start Time : 0.00 min
 Gain Factor : 0.0

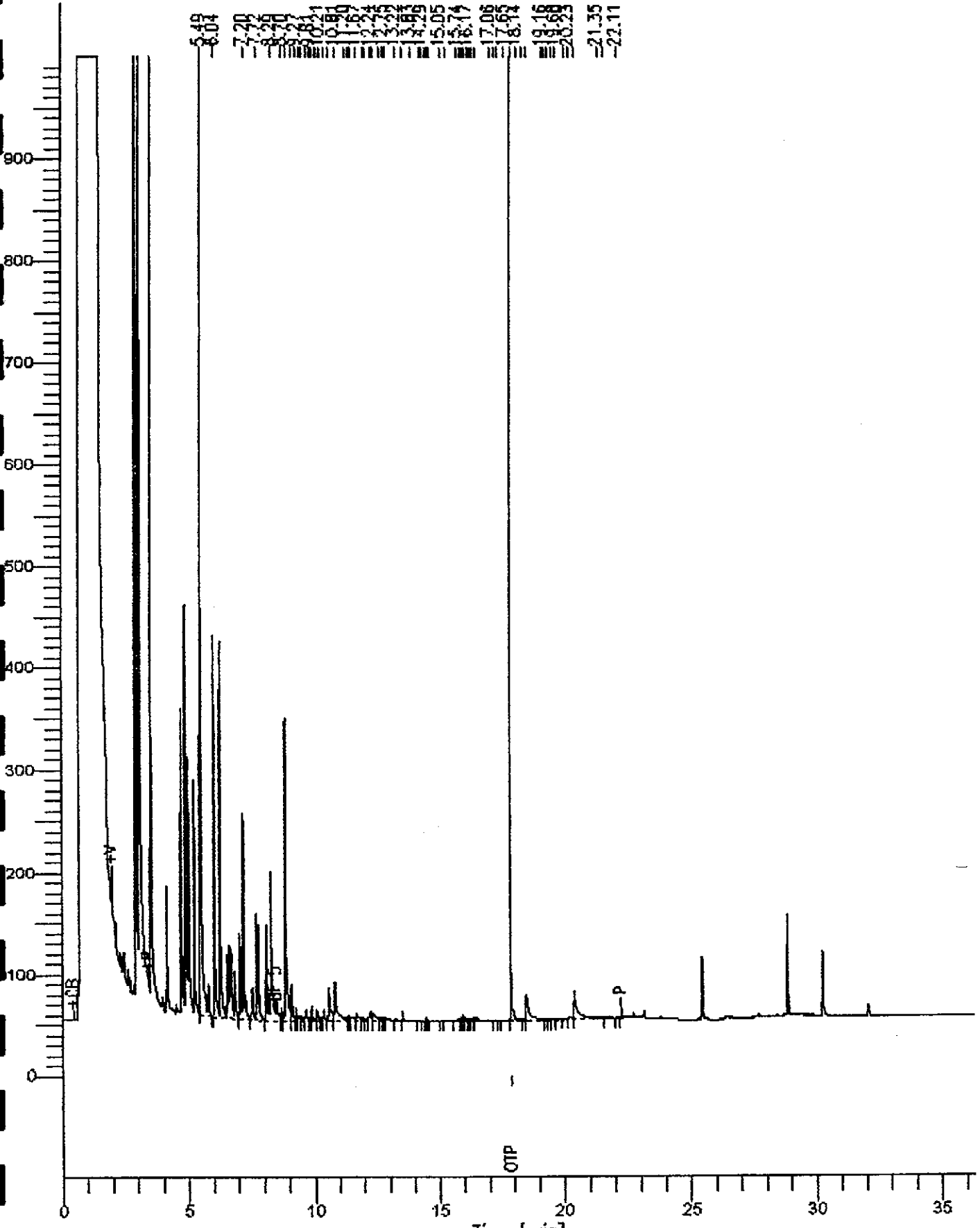
End Time : 36.33 min
 Plot Offset : 0 mV

Sample # : 112658
 Date : 1/3/97 02:53
 Time of Injection : 1/3/97 02:16
 Low Point : 0.00 mV
 Plot Scale : 1000.0 mV

Page 1 of 1

High Point : 1000.00 mV

6.49 7.20 7.70 8.20 8.70 9.20 9.70 10.20 10.70 11.20 11.70 12.20 12.70 13.20 13.70 14.20 14.70 15.20 15.70 16.20 16.70 17.20 17.70 18.20 18.70 19.20 19.70 20.20 20.70 21.35 22.11



diesel analysis

File Name : 12384/18
File Name : F:\M102022.raw
Method : 401231
Start Time : 0.00 min
Gain Factor : 0.0

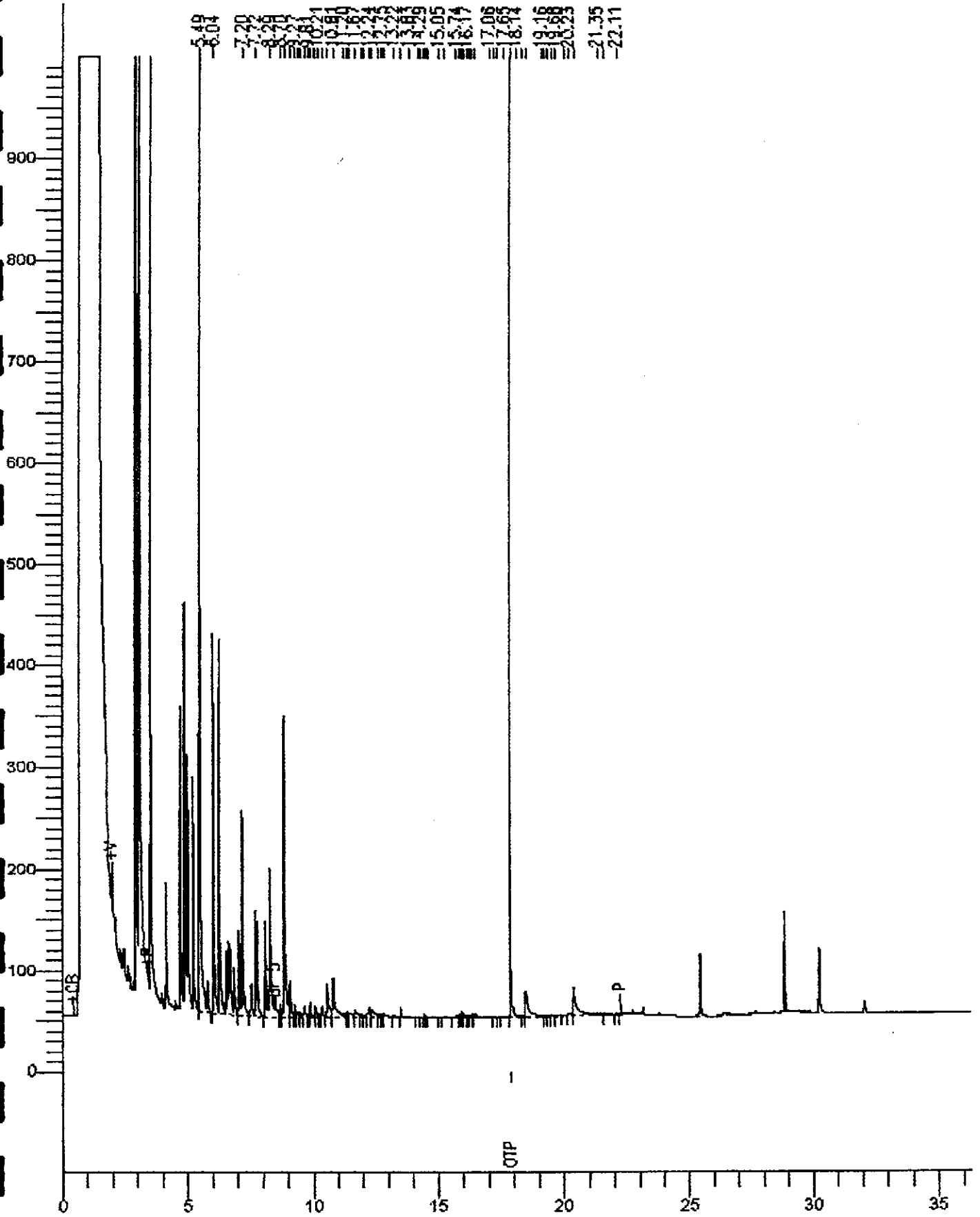
End Time : 36.33 min
Plot Offset : 0 mV

Sample #: 113668
Date : 1/3/97 02:59
Time of Injection: 1/3/97 02:16
Low Point : 0.00 mV
Plot Scale: 1000.0 mV

Page 1 of 1

High Point : 1000.00 mV

4.97
5.04
5.20
5.24
5.28
5.32
5.36
5.40
5.44
5.48
5.52
5.56
5.60
5.64
5.68
5.72
5.76
5.80
5.84
5.88
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12.64
12.68
12.72
12.76
12.80
12.84
12.88
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12.96
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15.56
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15.64
15.68
15.72
15.76
15.80
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16.76
16.80
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16.88
16.92
16.96
17.00
17.04
17.08
17.12
17.16
17.20
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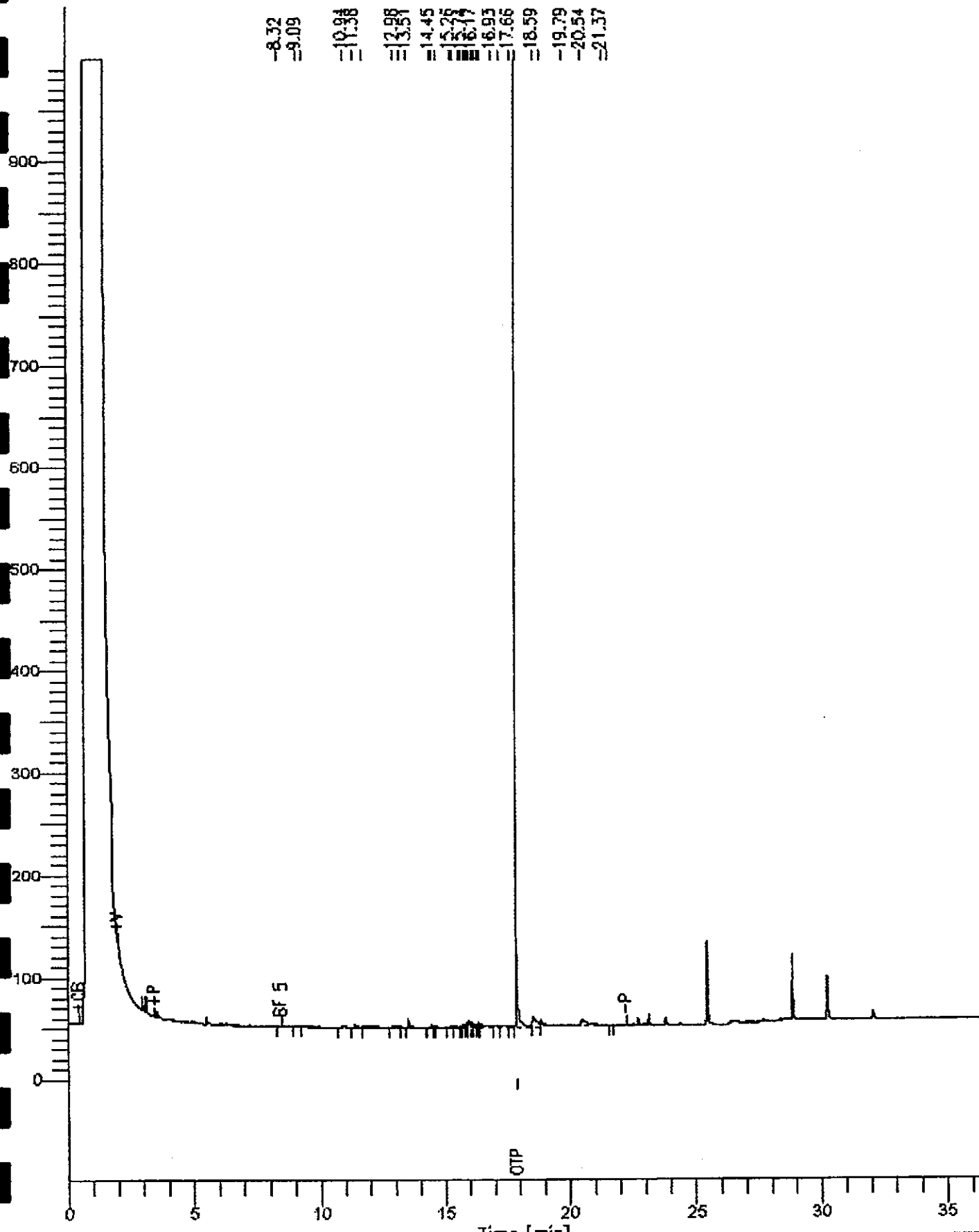


diesel analysis

File Name : 12384/MS5
File Path : F:\M102023.raw
Shot : 401221
Start Time : 0.00 min
Factor : 0.0

End Time : 36.23 min
Plot Offset : 0 mV

Sample #: 112667
Date : 1/3/97 03:37
Time of Injection: 1/3/97 03:01
Low Point : 0.00 mV
High Point : 1000.00 mV
Plot Scale: 1000.0 mV



diesel analysis

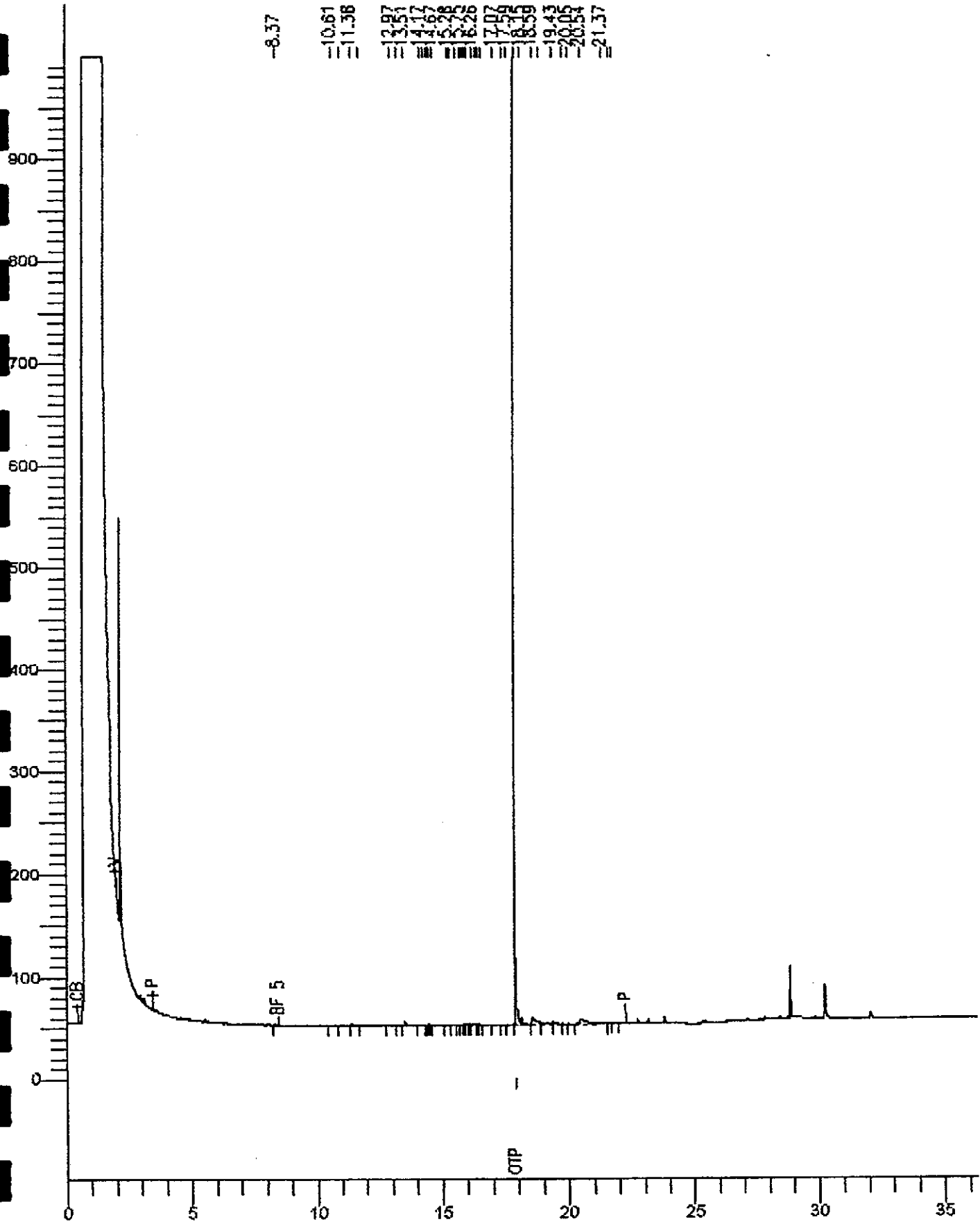
File Name : 12384/MW4
Date : F:\M102024.ruv
Shot : 401221
Start Time : 0.00 min
Factor : 0.0

End Time : 36.33 min
Plot Offset : 0 mV

Sample #: 112666
Date : 1/3/97 04:22
Time of Injection: 1/3/97 03:45
Low Point : 0.00 mV
Plot Scale: 1000.0 mV

Page 1 of 1

High Point : 1000.00 mV



diesel analysis

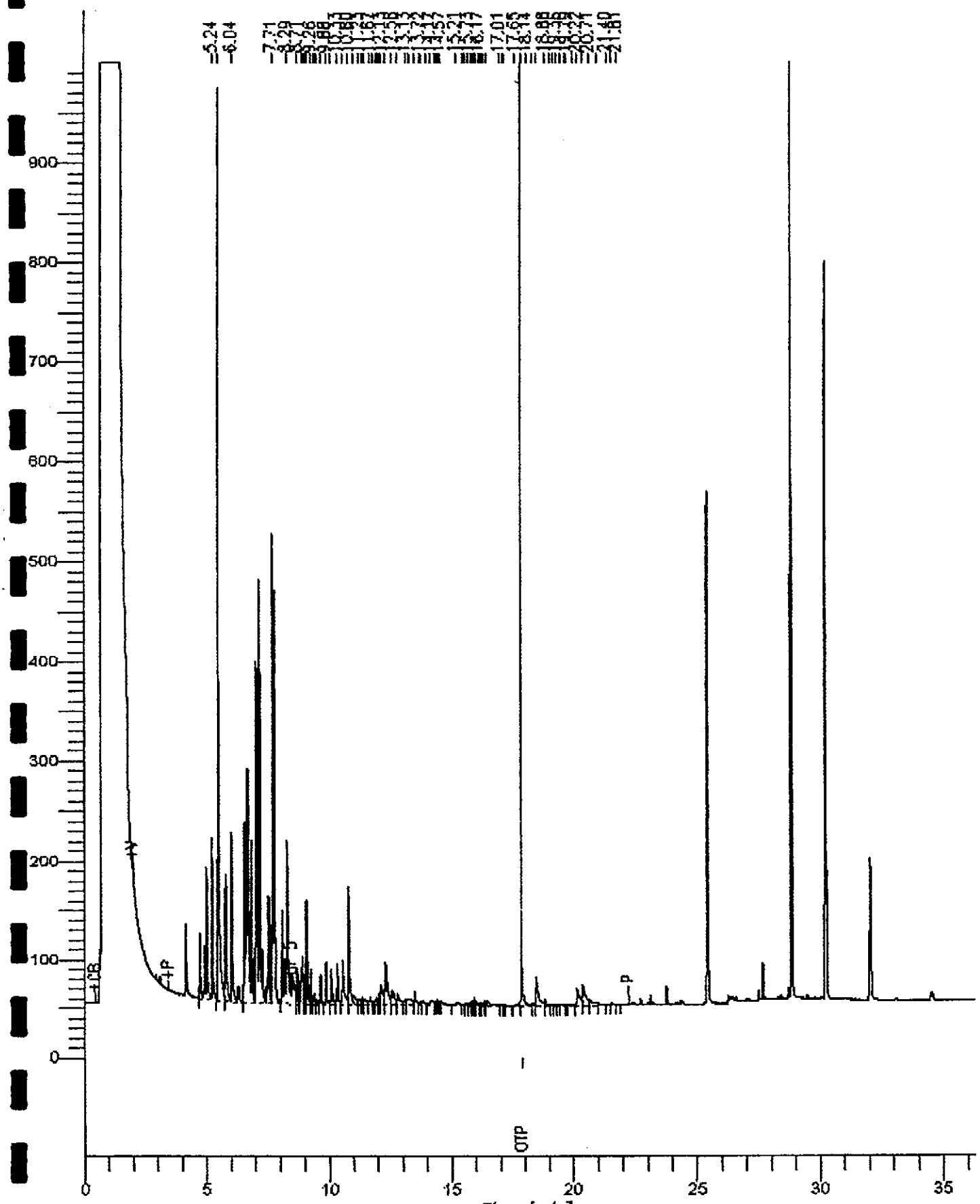
File Name : 12384/MS3
Program : F:\M102025.com
Method : 401221
Start Time : 0.00 min
Factor : 0.0

End Time : 36.33 min
Plot Offset : 0 mV

Sample #: 112663
Date : 1/3/97 05:06
Time of Injection: 1/3/97 04:30
Low Point : 0.00 mV
Plot Scale: 1000.0 mV

Page 1 of 1

High Point : 1000.00 mV



diesel analysis

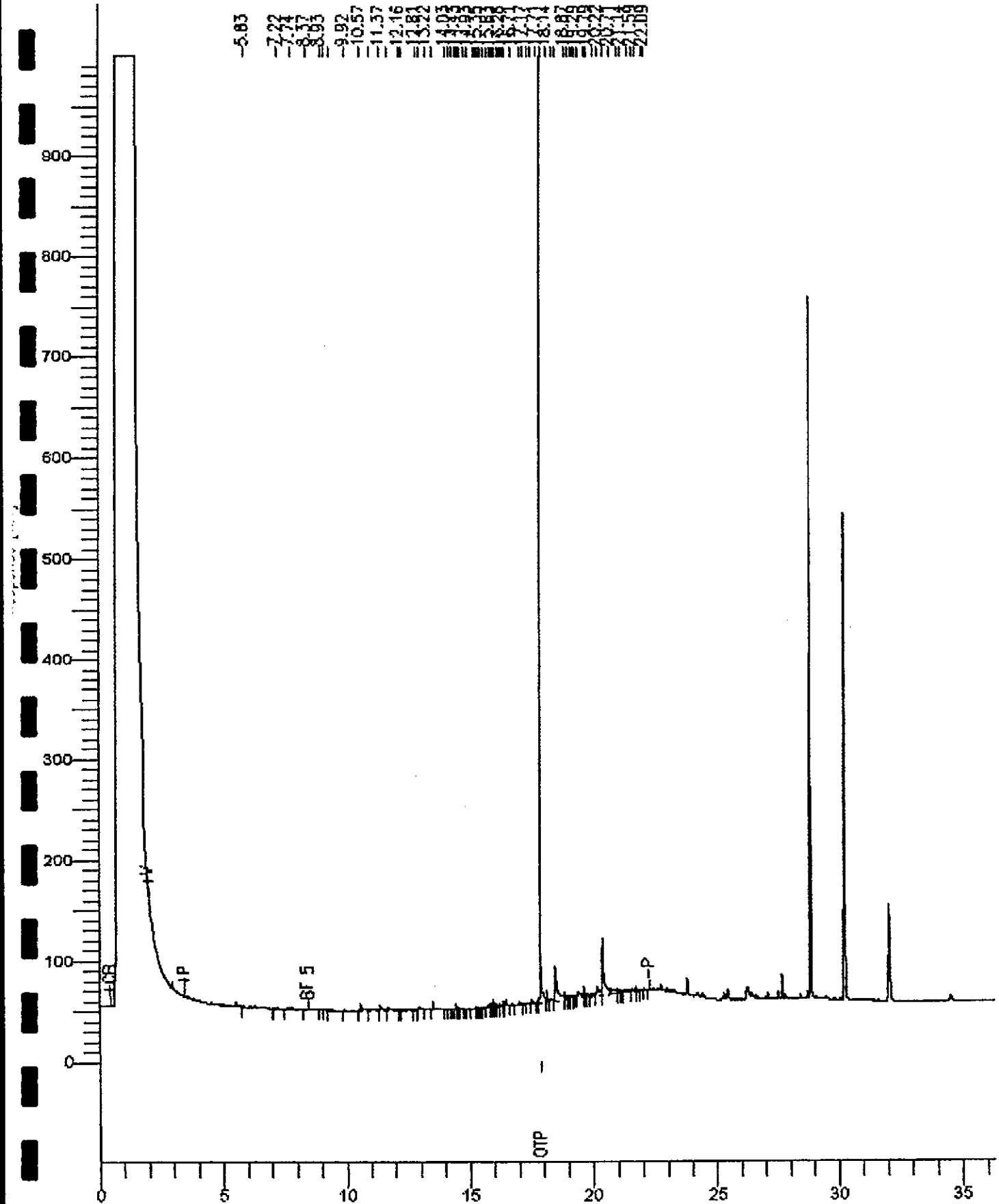
Sample Name : 13384/MW-3
File Name : F:\M102026.com
Method : 4D1321
Start Time : 0.00 min
Factor : 0.0

End Time : 36.93 min
Plot Offset : 0 mV

Sample #: 113664
Date : 1/3/97 05:51
Time of Injection: 1/3/97 05:14
Low Point : 0.00 mV
Plot Scale: 1000.0 mV

Page 1 of 1

High Point : 1000.00 mV

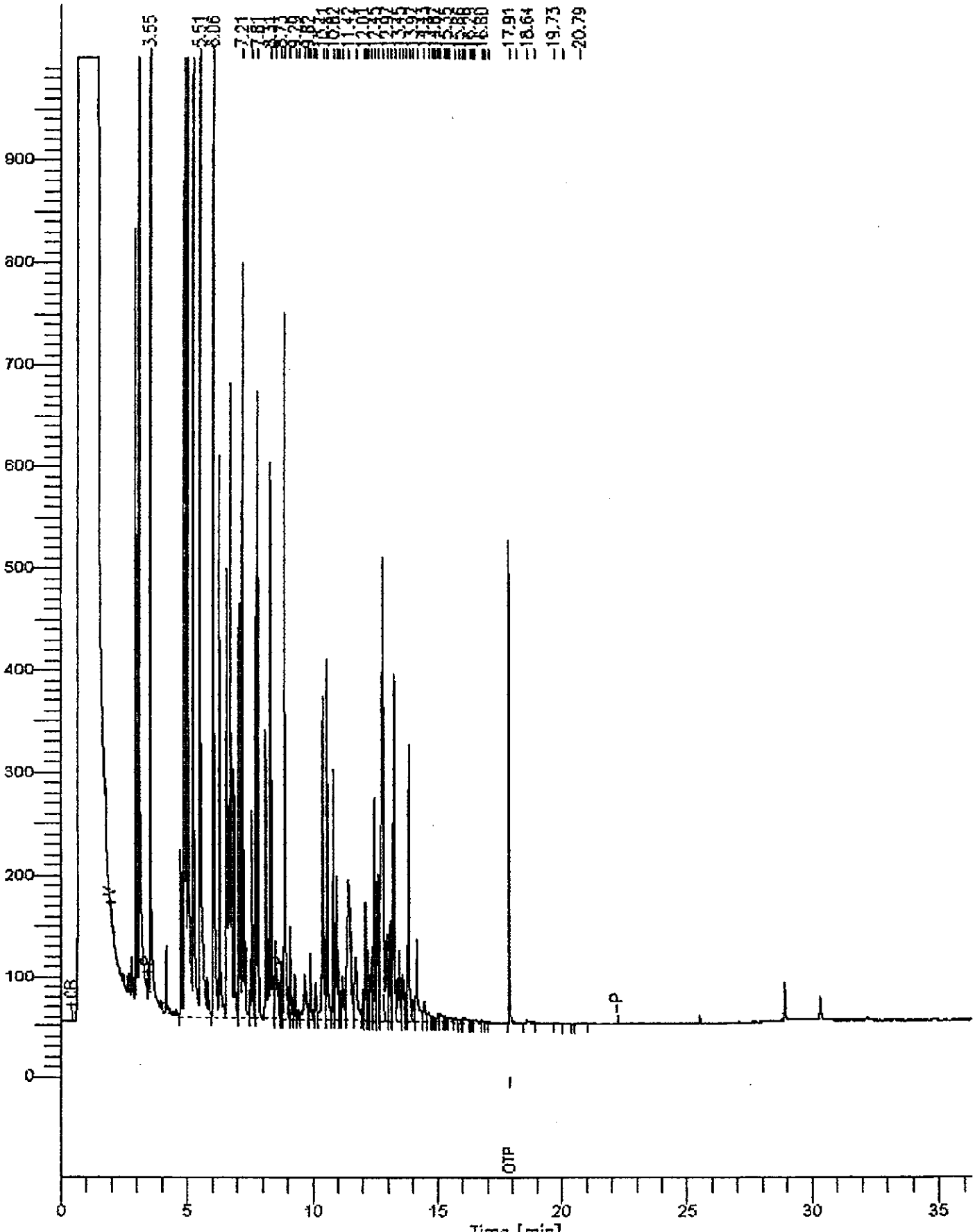


diesel analysis

Sample Name : 12384/MW1-5X
File Name : F:\M103011.raw
Method : 401221
Start Time : 0.00 min
Injection Volume Factor: 0.0

End Time : 36.33 min
Plot Offset: 0 mV

Sample #: 113663-5
Date : 1/3/97 18:12
Time of Injection: 1/3/97 17:35
Low Point : 0.00 mV
High Point : 1000.00 mV
Plot Scale: 1000.0 mV



CHROMALAB, INC.

Environmental Services (SDB)

January 8, 1997

Submission #: 9612384

BASELINE ENVIRONMENTAL/EMRYVL

Atten: Bill Scott

Project: 98TH AVE, 670 98TH AVE
Received: December 31, 1996

Project#: 93343-FO

re: One sample for Miscellaneous Metals analysis.
Method: EPA 3010A/6010A Nov 1990

Client Sample ID: MW-5

Spl#: 112667

Matrix: WATER

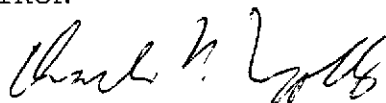
Extracted: January 8, 1997

Sampled: December 31, 1996


Run#: 4780

Analyzed: January 8, 1997

ANALYTE	RESULT (mg/L)	REPORTING LIMIT (mg/L)	BLANK RESULT (mg/L)	BLANK SPIKE (%)	DILUTION FACTOR
IRON	N.D.	0.10	N.D.	104	1



Charles Woolley
Chemist



John S. Labash
Inorganic Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

January 8, 1997

Submission #: 9612384

BASELINE ENVIRONMENTAL/EMRYVL

Atten: Bill Scott

Project: 98TH AVE, 670 98TH AVE
Received: December 31, 1996

Project#: 93343-FO

re: One sample for Miscellaneous Metals analysis.
Method: EPA 3010A/6010A Nov 1990

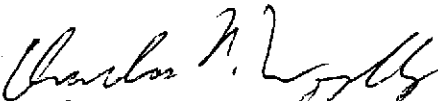
Client Sample ID: MW-4

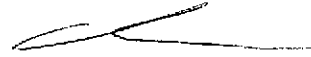
Spl#: 112666
Sampled: December 31, 1996

Matrix: WATER
Run#: 4780

Extracted: January 8, 1997
Analyzed: January 8, 1997

ANALYTE	RESULT (mg/L)	REPORTING LIMIT (mg/L)	BLANK RESULT (mg/L)	BLANK SPIKE (%)	DILUTION FACTOR
IRON	N.D.	0.10	N.D.	104	1


Charles Woolley
Chemist


John S. Labash
Inorganic Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

January 8, 1997

Submission #: 9612384

BASELINE ENVIRONMENTAL/EMRYVL

Atten: Bill Scott

Project: 98TH AVE, 670 98TH AVE
Received: December 31, 1996

Project#: 93343-FO

re: One sample for Miscellaneous Metals analysis.
Method: EPA 3010A/6010A Nov 1990

Client Sample ID: MW-3

Spl#: 112665

Matrix: WATER

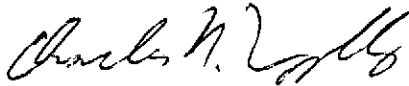
Extracted: January 8, 1997

Sampled: December 31, 1996

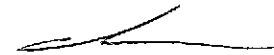
Run#: 4780

Analyzed: January 8, 1997

ANALYTE	RESULT (mg/L)	REPORTING LIMIT (mg/L)	BLANK RESULT (mg/L)	BLANK SPIKE (%)	DILUTION FACTOR
IRON	0.58	0.10	N.D.	104	1



Charles Woolley
Chemist



John S. Labash
Inorganic Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

January 8, 1997

Submission #: 9612384

BASELINE ENVIRONMENTAL/EMRYVL

Atten: Bill Scott

Project: 98TH AVE, 670 98TH AVE
Received: December 31, 1996

Project#: 93343-FO

re: One sample for Miscellaneous Metals analysis.
Method: EPA 3010A/6010A Nov 1990

Client Sample ID: MW-2

Spl#: 112664

Matrix: WATER

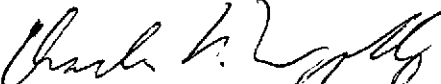
Extracted: January 8, 1997

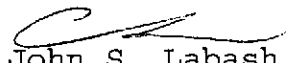
Sampled: December 31, 1996

Run#: 4780

Analyzed: January 8, 1997

ANALYTE	RESULT (mg/L)	REPORTING LIMIT (mg/L)	BLANK RESULT (mg/L)	BLANK SPIKE (%)	DILUTION FACTOR
IRON	N.D.	0.10	N.D.	104	1


Charles Woolley
Chemist


John S. Labash
Inorganic Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

January 8, 1997

Submission #: 9612384

BASELINE ENVIRONMENTAL/EMRYVL

Atten: Bill Scott

Project: 98TH AVE, 670 98TH AVE
Received: December 31, 1996

Project#: 93343-FO

re: One sample for Miscellaneous Metals analysis.
Method: EPA 3010A/6010A Nov 1990

Client Sample ID: MW-1

Spl#: 112663

Matrix: WATER

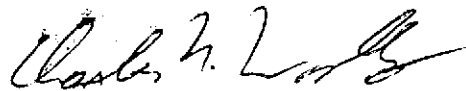
Extracted: January 8, 1997

Sampled: December 31, 1996


Run#: 4780

Analyzed: January 8, 1997

ANALYTE	RESULT (mg/L)	REPORTING LIMIT (mg/L)	BLANK RESULT (mg/L)	BLANK SPIKE (%)	DILUTION FACTOR
IRON	3.4	0.10	N.D.	104	1



Charles Woolley
Chemist



John S. Labash
Inorganic Supervisor

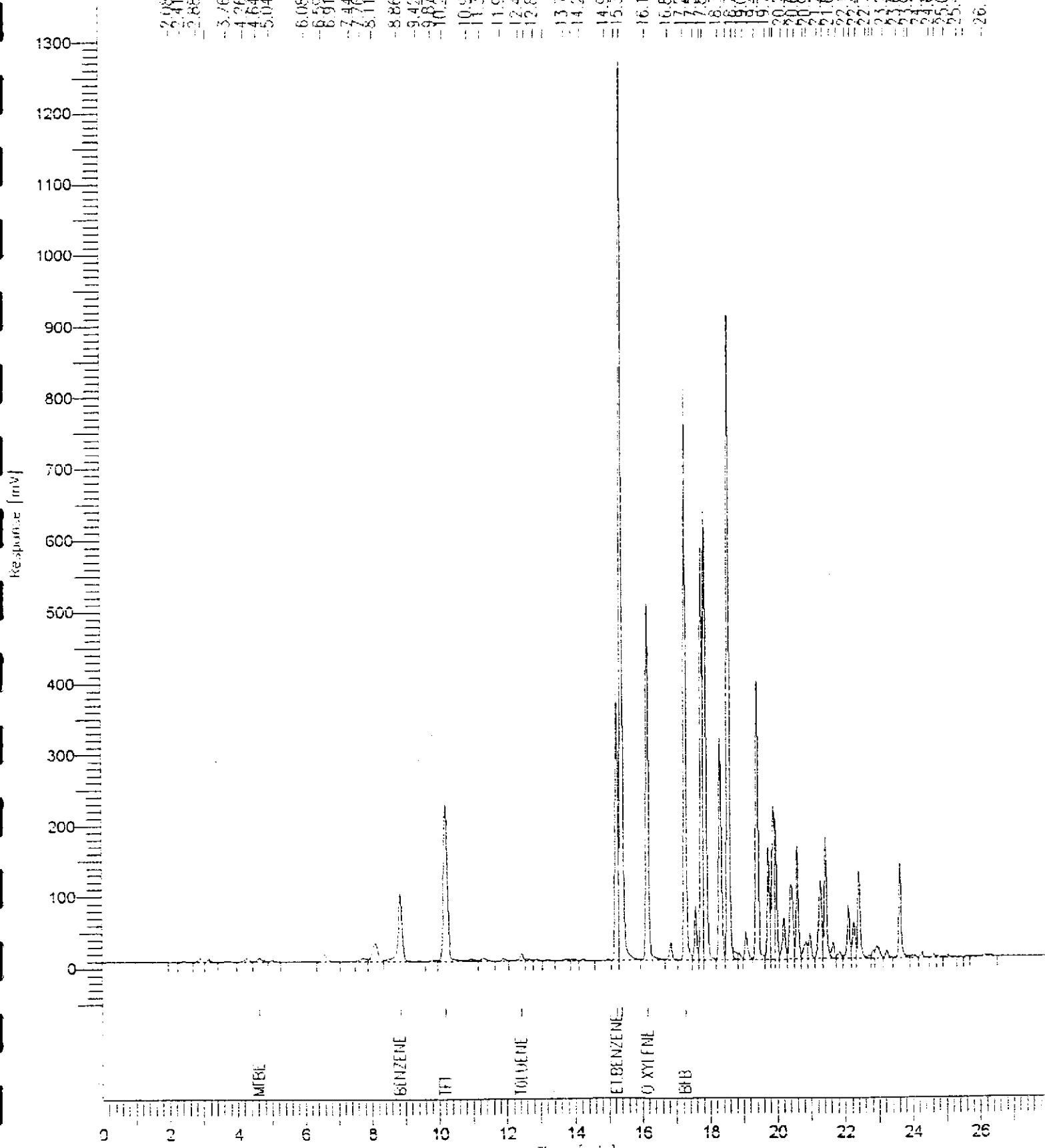
9612384

BTEX Chromatogram

Sample Name : 9612384/MW-1
 FileName : 0:0E10218.raw
 Method : SFA13NE
 Start Time : 0.00 min
 Scale Factor : 1.0

Sample #: 112663
 Date : 1/2/97 20:56
 Time of Injection: 1/2/97 20:28
 Low Point : -55.31 mV
 High Point : 1305.31 mV
 Plot Offset: -55 mV
 Plot Scale: 1360.6 mV

- 2.08
- 2.41
- 2.88
- 3.76
- 4.26
- 4.64
- 5.04
- 6.08
- 6.59
- 7.44
- 8.11
- 8.86
- 9.42
- 9.87
- 10.21
- 10.95
- 11.31
- 11.91
- 12.45
- 12.89
- 13.77
- 14.23
- 14.97
- 15.39
- 16.17
- 16.84
- 17.27
- 17.86
- 18.31
- 18.76
- 19.08
- 19.75
- 20.22
- 20.67
- 20.99
- 21.65
- 22.10
- 22.42
- 22.72
- 23.23
- 23.68
- 23.97
- 24.51
- 25.04
- 25.41
- 26.15



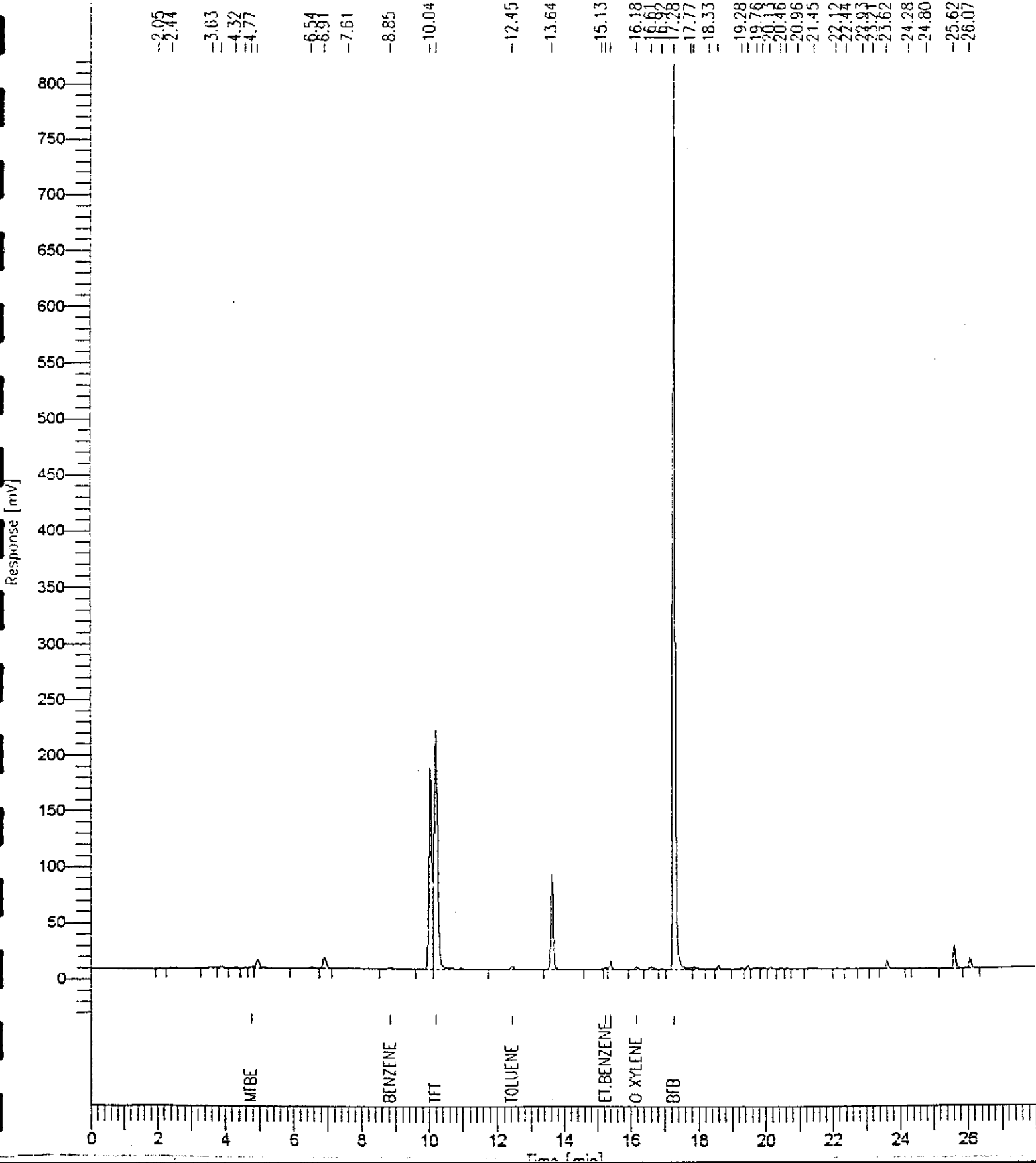
BTEX Chromatogram

Sample Name : 9612384/MW-2
FileName : 0:\3B10219.caw
Method : 3PA13NE
Start Time : 0.00 min
Scale Factor: 1.0

End Time : 28.00 min
Plot Offset: -32 mV

Sample #: 112664
Date : 1/2/97 21:35
Time of Injection: 1/2/97 21:07
Low Point : -31.70 mV
High Point : 829.48 mV
Plot Scale: 861.2 mV

Page 1 of 1

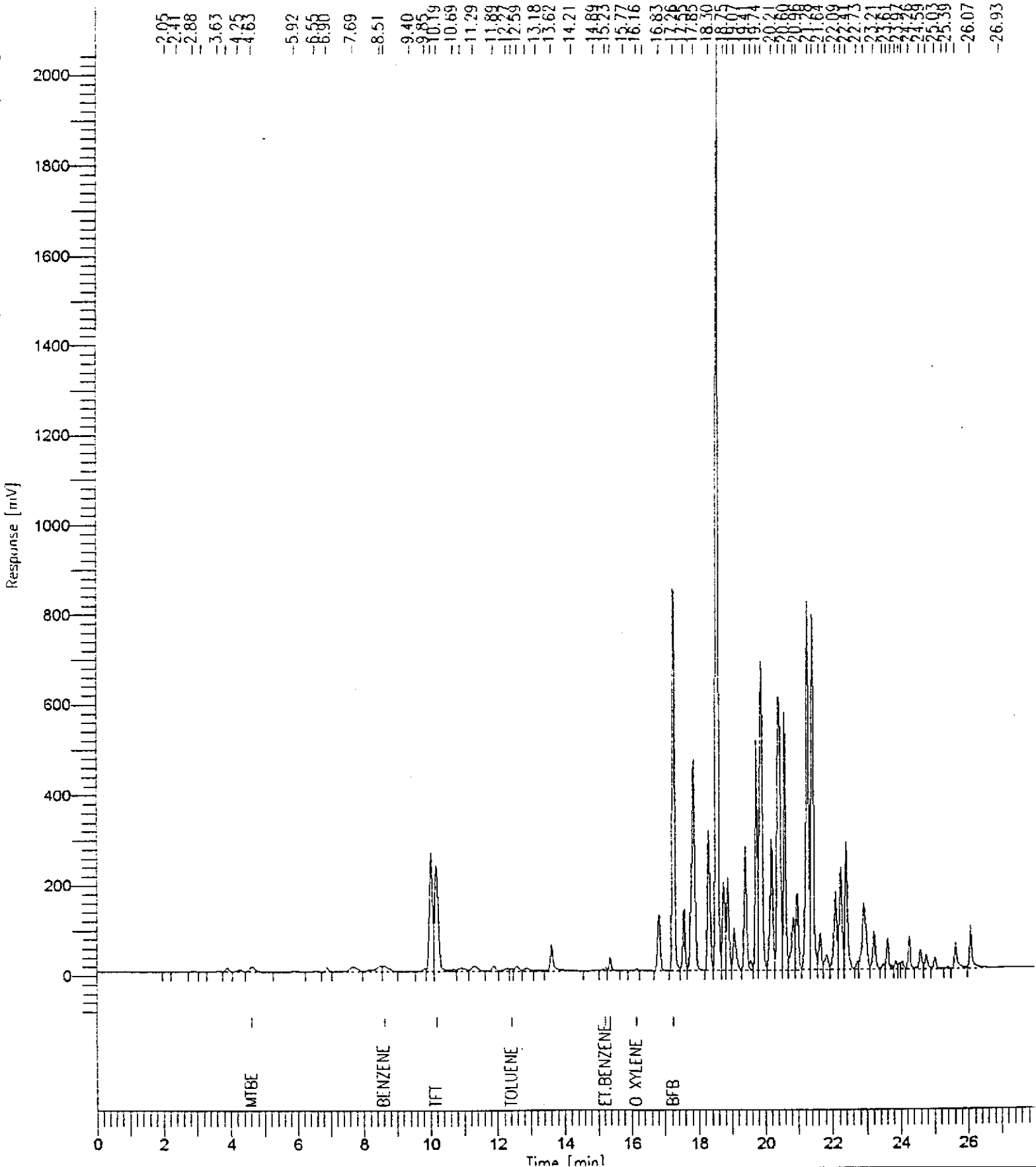


BTEX Chromatogram

Sample Name : 9612384/MW-3
FileName : O:\3B10220.raw
Method : 3PAL3NE
Start Time : 0.00 min
Scale Factor: 1.0

End Time : 28.00 min
Plot Offset: -92 mV

Sample #: 112665
Date : 1/2/97 22:14
Time of Injection: 1/2/97 21:45
Low Point : -92.47 mV
High Point : 2047.00 mV
Plot Scale: 2139.5 mV



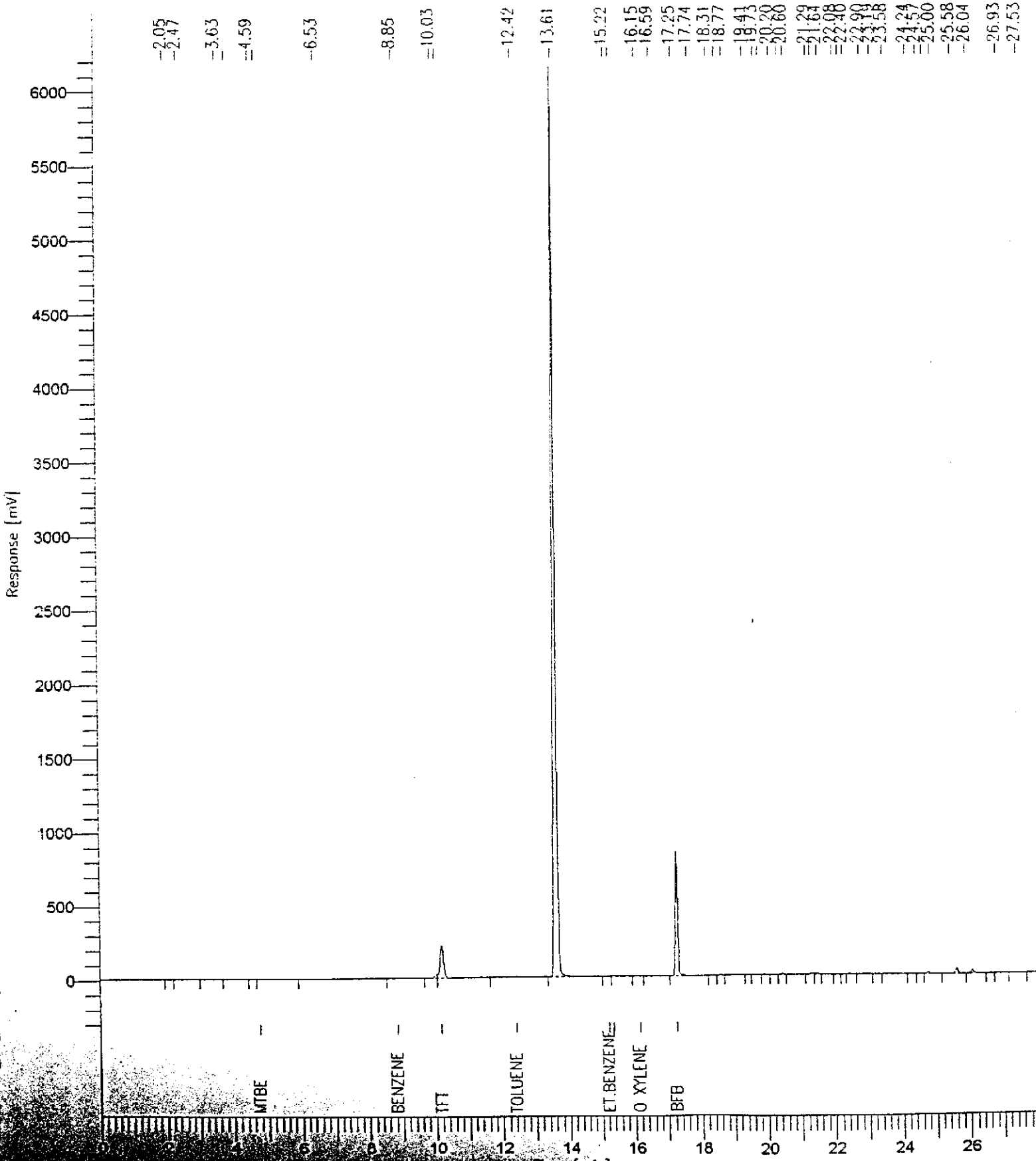
BTEX Chromatogram

Sample Name : 9612384/MW-4
FileName : 0:\3B10221.raw
Method : 3PA13NE
Start Time : 0.00 min
Scale Factor: 1.0

End Time : 28.00 min
Plot Offset: -301 mV

Sample #: 112666
Date : 1/2/97 22:52
Time of Injection: 1/2/97 22:24
Low Point : -301.12 mV
High Point : 6216.47 mV
Plot Scale: 6517.6 mV

Page 1 of 1



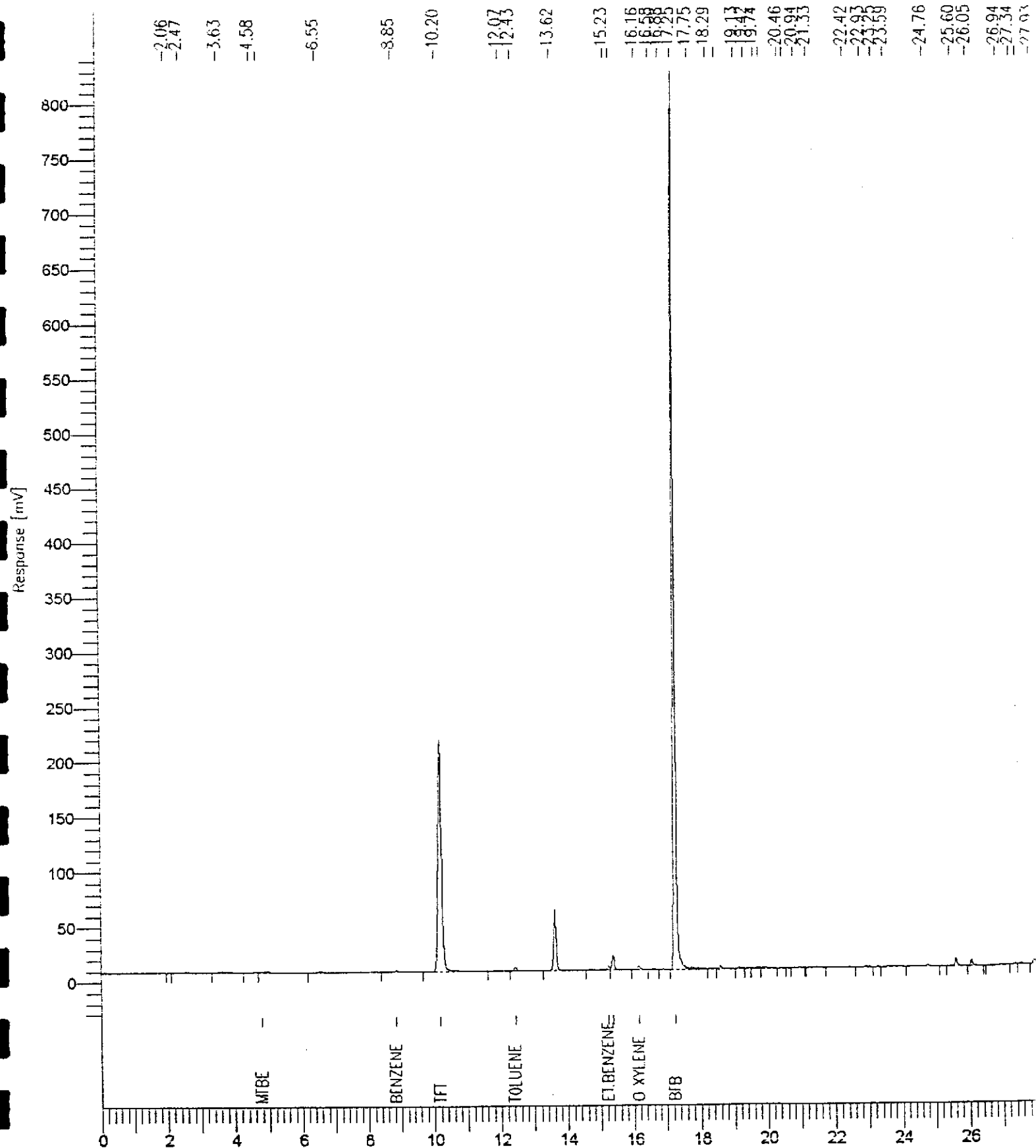
BTEX Chromatogram

Sample Name : 9612384/MW-5
FileName : O:\3B10222.raw
Method : 3PA13NE
Start Time : 0.00 min
Scale Factor: 1.0

End Time : 28.00 min
Plot Offset: -33 mV

Sample #: 112667
Date : 1/2/97 23:30
Time of Injection: 1/2/97 23:02
Low Point : -32.52 mV
High Point : 841.51 mV
Plot Scale: 874.0 mV

Page 1 of 1



Chromatogram

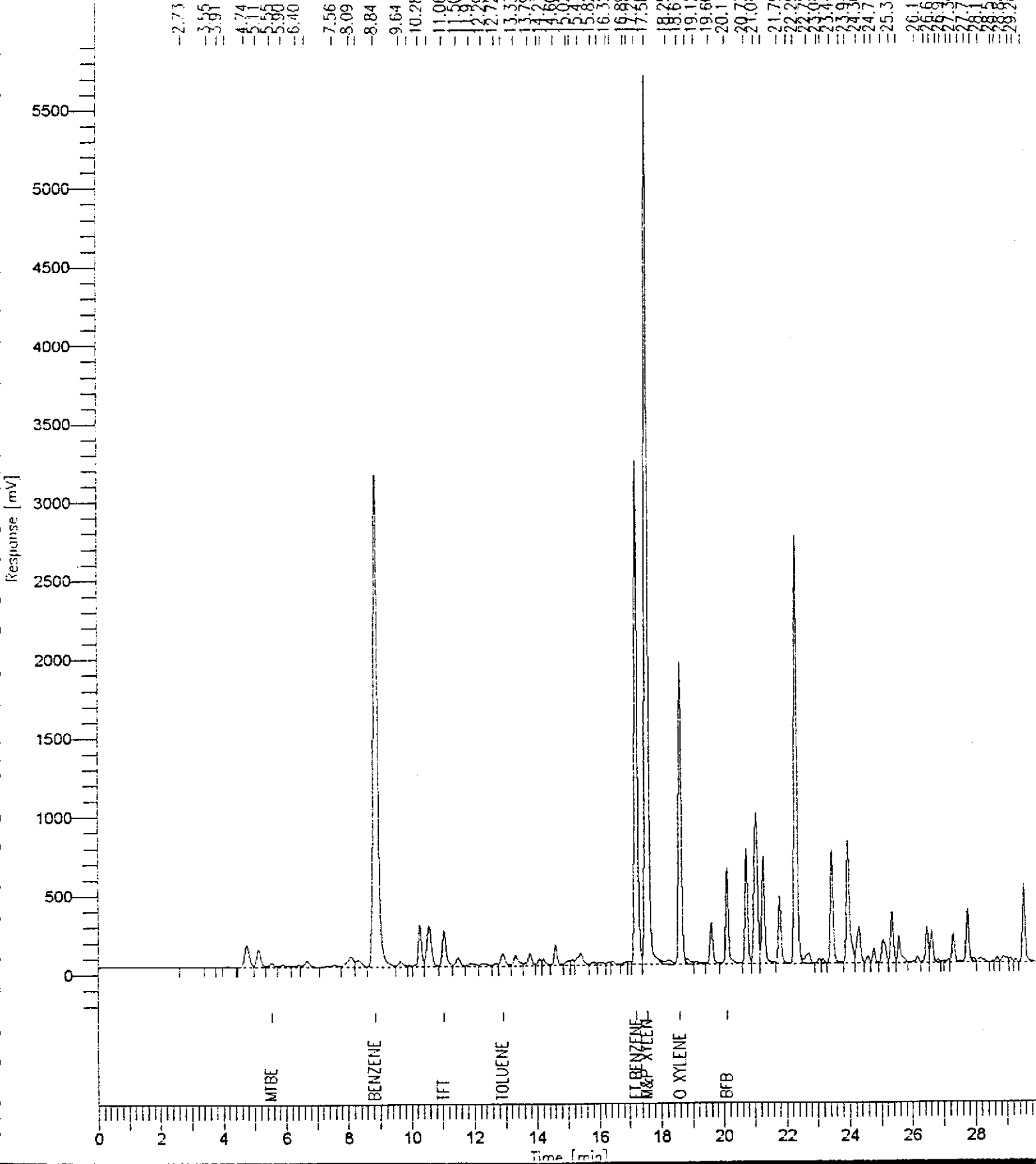
Sample Name : 9612384/18
FileName : N:\2B10307.raw
Method : 2PA13N
Start Time : 0.00 min
Scale Factor: 1.0

End Time : 30.00 min
Plot Offset: -243 mV

Sample #: 112668
Date : 1/3/97 13:30
Time of Injection: 1/3/97 13:00
Low Point : -243.18 mV
High Point : 5924.07 mV
Plot Scale: 6167.2 mV

Page 1 of 1

-2.73
-3.55
-3.91
-4.74
-5.11
-5.55
-5.90
-6.40
-7.56
-8.09
-8.84
-9.64
-10.28
-11.06
-11.50
-11.99
-12.72
-13.33
-13.79
-14.21
-14.60
-15.07
-15.82
-16.32
-16.89
-17.56
-18.25
-18.61
-19.12
-19.60
-20.11
-20.77
-21.79
-22.29
-22.72
-23.07
-23.44
-23.94
-24.30
-24.76
-25.34
-26.16
-26.69
-27.30
-27.75
-28.16
-28.88
-29.28



CHROMALAB, INC.

Environmental Services (SDB)

January 9, 1997

Submission #: 9612384

BASELINE ENVIRONMENTAL/EMRYVL

Atten: Bill Scott

Project: 98TH AVE, 670 98TH AVE
Received: December 31, 1996

Project#: 93343-FO

re: One sample for Volatile Halogenated Organics analysis.
Method: SW846 Method 8010A July, 1992

Client Sample ID: MW-1

Spl#: 112663

Matrix: WATER

Sampled: December 31, 1996

Run#: 4779

Analyzed: January 6, 1997

ANALYTE	RESULT (ug/L)	REPORTING LIMIT (ug/L)	BLANK RESULT (ug/L)	BLANK SPIKE FACTOR (%)	DILUTION FACTOR
VINYL CHLORIDE	N.D.	0.50	N.D.	--	1
CHLOROETHANE	N.D.	0.50	N.D.	--	1
TRICHLOROFLUOROMETHANE	N.D.	0.50	N.D.	--	1
1,1-DICHLOROETHENE	N.D.	0.50	N.D.	104	1
METHYLENE CHLORIDE	N.D.	5.0	N.D.	--	1
TRANS-1,2-DICHLOROETHENE	N.D.	0.50	N.D.	--	1
CIS-1,2-DICHLOROETHENE	1.0	0.50	N.D.	--	1
1,1-DICHLOROETHANE	1.5	0.50	N.D.	--	1
CHLOROFORM	N.D.	2.0	N.D.	--	1
1,1,1-TRICHLOROETHANE	N.D.	0.50	N.D.	--	1
CARBON TETRACHLORIDE	N.D.	0.50	N.D.	--	1
1,2-DICHLOROETHANE	N.D.	0.50	N.D.	--	1
TRICHLOROETHENE	0.90	0.50	N.D.	79.0	1
1,2-DICHLOROPROPANE	N.D.	0.50	N.D.	--	1
BROMODICHLOROMETHANE	N.D.	0.50	N.D.	--	1
2-CHLOROETHYL VINYL ETHER	N.D.	0.50	N.D.	--	1
TRANS-1,3-DICHLOROPROPENE	N.D.	0.50	N.D.	--	1
CIS-1,3-DICHLOROPROPENE	N.D.	0.50	N.D.	--	1
1,1,2-TRICHLOROETHANE	N.D.	0.50	N.D.	--	1
TETRACHLOROETHENE	N.D.	0.50	N.D.	--	1
DIBROMOCHLOROMETHANE	N.D.	0.50	N.D.	--	1
CHLOROBENZENE	N.D.	0.50	N.D.	91.0	1
BROMOFORM	N.D.	0.50	N.D.	--	1
1,1,2,2-TETRACHLOROETHANE	N.D.	0.50	N.D.	--	1
1,3-DICHLOROBENZENE	N.D.	0.50	N.D.	--	1
1,4-DICHLOROBENZENE	N.D.	0.50	N.D.	--	1
1,2-DICHLOROBENZENE	N.D.	0.50	N.D.	--	1
TRICHLOROTRIFLUOROETHANE	N.D.	0.50	N.D.	--	1
CHLOROMETHANE	N.D.	1.0	N.D.	--	1
BROMOMETHANE	N.D.	1.0	N.D.	--	1

Oleg Nemtsov

Oleg Nemtsov
Chemist

Chip Poalinelli

Chip Poalinelli
Operations Manager

CHROMALAB, INC.

Environmental Services (SDB)

January 9, 1997

Submission #: 9612384

BASELINE ENVIRONMENTAL/EMRYVL

Atten: Bill Scott

Project: 98TH AVE, 670 98TH AVE
Received: December 31, 1996

Project#: 93343-FO

re: One sample for Volatile Halogenated Organics analysis.
Method: SW846 Method 8010A July, 1992

Client Sample ID: MW-2

Spl#: 112664

Matrix: WATER

Sampled: December 31, 1996

Run#: 4779

Analyzed: January 6, 1997

ANALYTE	RESULT (ug/L)	REPORTING LIMIT (ug/L)	BLANK RESULT (ug/L)	BLANK SPIKE (%)	DILUTION FACTOR
VINYL CHLORIDE	N.D.	0.50	N.D.	--	1
CHLOROETHANE	N.D.	0.50	N.D.	--	1
TRICHLOROFLUOROMETHANE	N.D.	0.50	N.D.	--	1
1,1-DICHLOROETHENE	N.D.	0.50	N.D.	104	1
METHYLENE CHLORIDE	N.D.	5.0	N.D.	--	1
TRANS-1,2-DICHLOROETHENE	N.D.	0.50	N.D.	--	1
CIS-1,2-DICHLOROETHENE	N.D.	0.50	N.D.	--	1
1,1-DICHLOROETHANE	0.60	0.50	N.D.	--	1
CHLOROFORM	N.D.	2.0	N.D.	--	1
1,1,1-TRICHLOROETHANE	0.60	0.50	N.D.	--	1
CARBON TETRACHLORIDE	N.D.	0.50	N.D.	--	1
1,2-DICHLOROETHANE	N.D.	0.50	N.D.	--	1
TRICHLOROETHENE	7.6	0.50	N.D.	79.0	1
1,2-DICHLOROPROPANE	N.D.	0.50	N.D.	--	1
BROMODICHLOROMETHANE	N.D.	0.50	N.D.	--	1
2-CHLOROETHYL VINYL ETHER	N.D.	0.50	N.D.	--	1
TRANS-1,3-DICHLOROPROPENE	N.D.	0.50	N.D.	--	1
CIS-1,3-DICHLOROPROPENE	N.D.	0.50	N.D.	--	1
1,1,2-TRICHLOROETHANE	N.D.	0.50	N.D.	--	1
TETRACHLOROETHENE	3.5	0.50	N.D.	--	1
DIBROMOCHLOROMETHANE	N.D.	0.50	N.D.	--	1
CHLOROBENZENE	N.D.	0.50	N.D.	91.0	1
BROMOFORM	N.D.	0.50	N.D.	--	1
1,1,2,2-TETRACHLOROETHANE	N.D.	0.50	N.D.	--	1
1,3-DICHLOROBENZENE	N.D.	0.50	N.D.	--	1
1,4-DICHLOROBENZENE	N.D.	0.50	N.D.	--	1
1,2-DICHLOROBENZENE	N.D.	0.50	N.D.	--	1
TRICHLOROTRIFLUOROETHANE	N.D.	0.50	N.D.	--	1
CHLOROMETHANE	N.D.	1.0	N.D.	--	1
BROMOMETHANE	N.D.	1.0	N.D.	--	1

Oleg Nemtsov

Oleg Nemtsov
Chemist

Chip Poalinelli
Chip Poalinelli
Operations Manager

CHROMALAB, INC.

Environmental Services (SDB)

January 9, 1997

Submission #: 9612384

BASELINE ENVIRONMENTAL/EMRYVL

Atten: Bill Scott

Project: 98TH AVE, 670 98TH AVE

Project#: 93343-FO

Received: December 31, 1996

re: One sample for Volatile Halogenated Organics analysis.

Method: SW846 Method 8010A July, 1992

Client Sample ID: MW-3

Spl#: 112665

Matrix: WATER

Sampled: December 31, 1996

Run#: 4799

Analyzed: January 8, 1997

ANALYTE	RESULT (ug/L)	REPORTING LIMIT (ug/L)	BLANK RESULT (ug/L)	BLANK SPIKE (%)	DILUTION FACTOR
VINYL CHLORIDE	N.D.	0.50	N.D.	--	1
CHLOROETHANE	N.D.	0.50	N.D.	--	1
TRICHLOROFLUOROMETHANE	N.D.	0.50	N.D.	--	1
1,1-DICHLOROETHENE	N.D.	0.50	N.D.	100	1
METHYLENE CHLORIDE	N.D.	5.0	N.D.	--	1
TRANS-1,2-DICHLOROETHENE	N.D.	0.50	N.D.	--	1
CIS-1,2-DICHLOROETHENE	N.D.	0.50	N.D.	--	1
1,1-DICHLOROETHANE	N.D.	0.50	N.D.	--	1
CHLOROFORM	N.D.	2.0	N.D.	--	1
1,1,1-TRICHLOROETHANE	5.0	0.50	N.D.	--	1
CARBON TETRACHLORIDE	N.D.	0.50	N.D.	--	1
1,2-DICHLOROETHANE	N.D.	0.50	N.D.	--	1
TRICHLOROETHENE	8.8	0.50	N.D.	81.0	1
1,2-DICHLOROPROPANE	N.D.	0.50	N.D.	--	1
BROMODICHLOROMETHANE	N.D.	0.50	N.D.	--	1
2-CHLOROETHYL VINYL ETHER	N.D.	0.50	N.D.	--	1
TRANS-1,3-DICHLOROPROPENE	N.D.	0.50	N.D.	--	1
CIS-1,3-DICHLOROPROPENE	N.D.	0.50	N.D.	--	1
1,1,2-TRICHLOROETHANE	N.D.	0.50	N.D.	--	1
TETRACHLOROETHENE	1.5	0.50	N.D.	--	1
DIBROMOCHLOROMETHANE	N.D.	0.50	N.D.	--	1
CHLOROBENZENE	N.D.	0.50	N.D.	96.0	1
BROMOFORM	N.D.	0.50	N.D.	--	1
1,1,2,2-TETRACHLOROETHANE	N.D.	0.50	N.D.	--	1
1,3-DICHLOROBENZENE	N.D.	0.50	N.D.	--	1
1,4-DICHLOROBENZENE	N.D.	0.50	N.D.	--	1
1,2-DICHLOROBENZENE	N.D.	0.50	N.D.	--	1
TRICHLOROTRIFLUOROETHANE	N.D.	0.50	N.D.	--	1
CHLOROMETHANE	N.D.	1.0	N.D.	--	1
BROMOMETHANE	N.D.	1.0	N.D.	--	1

Oleg Nemtsov

Oleg Nemtsov
Chemist

Chip Poalinelli
Chip Poalinelli
Operations Manager

CHROMALAB, INC.

Environmental Services (SDB)

January 9, 1997

Submission #: 9612384

BASELINE ENVIRONMENTAL/EMRYVL

Atten: Bill Scott

Project: 98TH AVE, 670 98TH AVE
Received: December 31, 1996

Project#: 93343-FO

re: One sample for Volatile Halogenated Organics analysis.
Method: SW846 Method 8010A July, 1992

Client Sample ID: MW-4

Spl#: 112666

Matrix: WATER


Sampled: December 31, 1996

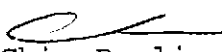
Run#: 4799

Analyzed: January 8, 1997

ANALYTE	RESULT (ug/L)	REPORTING LIMIT (ug/L)	BLANK RESULT (ug/L)	BLANK SPIKE (%)	DILUTION FACTOR
VINYL CHLORIDE	N.D.	0.50	N.D.	--	1
CHLOROETHANE	N.D.	0.50	N.D.	--	1
TRICHLOROFLUOROMETHANE	N.D.	0.50	N.D.	--	1
1,1-DICHLOROETHENE	N.D.	0.50	N.D.	100	1
METHYLENE CHLORIDE	N.D.	5.0	N.D.	--	1
TRANS-1,2-DICHLOROETHENE	N.D.	0.50	N.D.	--	1
CIS-1,2-DICHLOROETHENE	N.D.	0.50	N.D.	--	1
1,1-DICHLOROETHANE	N.D.	0.50	N.D.	--	1
CHLOROFORM	N.D.	2.0	N.D.	--	1
1,1,1-TRICHLOROETHANE	1.7	0.50	N.D.	--	1
CARBON TETRACHLORIDE	N.D.	0.50	N.D.	--	1
1,2-DICHLOROETHANE	N.D.	0.50	N.D.	--	1
TRICHLOROETHENE	0.70	0.50	N.D.	81.0	1
1,2-DICHLOROPROPANE	N.D.	0.50	N.D.	--	1
BROMODICHLOROMETHANE	N.D.	0.50	N.D.	--	1
2-CHLOROETHYL VINYL ETHER	N.D.	0.50	N.D.	--	1
TRANS-1,3-DICHLOROPROPENE	N.D.	0.50	N.D.	--	1
CIS-1,3-DICHLOROPROPENE	N.D.	0.50	N.D.	--	1
1,1,2-TRICHLOROETHANE	N.D.	0.50	N.D.	--	1
TETRACHLOROETHENE	310	0.50	N.D.	--	1
Note: VALUE IS TAKEN FROM GC/MS RUN EPA METHOD 8240					
DIBROMOCHLOROMETHANE	N.D.	0.50	N.D.	--	1
CHLOROBENZENE	N.D.	0.50	N.D.	96.0	1
BROMOFORM	N.D.	0.50	N.D.	--	1
1,1,2,2-TETRACHLOROETHANE	N.D.	0.50	N.D.	--	1
1,3-DICHLOROBENZENE	N.D.	0.50	N.D.	--	1
1,4-DICHLOROBENZENE	N.D.	0.50	N.D.	--	1
1,2-DICHLOROBENZENE	N.D.	0.50	N.D.	--	1
TRICHLOROTRIFLUOROETHANE	N.D.	0.50	N.D.	--	1
CHLOROMETHANE	N.D.	1.0	N.D.	--	1
BROMOMETHANE	N.D.	1.0	N.D.	--	1

Note: SURROGATE RECOVERY WAS OUTSIDE OF QA/QC LIMITS DUE TO MATRIX INTERFERENCE. SEE SURROGATE SUMMARY PAGE


Oleg Nemtsov
Chemist


Chip Poalinelli
Operations Manager

CHROMALAB, INC.

Environmental Services (SDB)

January 9, 1997

Submission #: 9612384

BASELINE ENVIRONMENTAL/EMRYVL

Atten: Bill Scott

Project: 98TH AVE, 670 98TH AVE
Received: December 31, 1996

Project#: 93343-FO

re: One sample for Volatile Halogenated Organics analysis.
Method: SW846 Method 8010A July, 1992

Client Sample ID: MW-5

Spl#: 112667

Matrix: WATER

Sampled: December 31, 1996

Run#: 4799

Analyzed: January 8, 1997

ANALYTE	RESULT (ug/L)	REPORTING LIMIT (ug/L)	BLANK RESULT (ug/L)	BLANK SPIKE FACTOR (%)	DILUTION FACTOR
VINYL CHLORIDE	N.D.	0.50	N.D.	--	1
CHLOROETHANE	N.D.	0.50	N.D.	--	1
TRICHLOROFLUOROMETHANE	N.D.	0.50	N.D.	--	1
1,1-DICHLOROETHENE	N.D.	0.50	N.D.	100	1
METHYLENE CHLORIDE	N.D.	5.0	N.D.	--	1
TRANS-1,2-DICHLOROETHENE	N.D.	0.50	N.D.	--	1
CIS-1,2-DICHLOROETHENE	N.D.	0.50	N.D.	--	1
1,1-DICHLOROETHANE	N.D.	0.50	N.D.	--	1
CHLOROFORM	N.D.	2.0	N.D.	--	1
1,1,1-TRICHLOROETHANE	0.50	0.50	N.D.	--	1
CARBON TETRACHLORIDE	N.D.	0.50	N.D.	--	1
1,2-DICHLOROETHANE	N.D.	0.50	N.D.	--	1
TRICHLOROETHENE	N.D.	0.50	N.D.	81.0	1
1,2-DICHLOROPROPANE	N.D.	0.50	N.D.	--	1
BROMODICHLOROMETHANE	N.D.	0.50	N.D.	--	1
2-CHLOROETHYL VINYL ETHER	N.D.	0.50	N.D.	--	1
TRANS-1,3-DICHLOROPROPENE	N.D.	0.50	N.D.	--	1
CIS-1,3-DICHLOROPROPENE	N.D.	0.50	N.D.	--	1
1,1,2-TRICHLOROETHANE	N.D.	0.50	N.D.	--	1
TETRACHLOROETHENE	3.0	0.50	N.D.	--	1
DIBROMOCHLOROMETHANE	N.D.	0.50	N.D.	--	1
CHLOROBENZENE	N.D.	0.50	N.D.	96.0	1
BROMOFORM	N.D.	0.50	N.D.	--	1
1,1,2,2-TETRACHLOROETHANE	N.D.	0.50	N.D.	--	1
1,3-DICHLOROBENZENE	N.D.	0.50	N.D.	--	1
1,4-DICHLOROBENZENE	N.D.	0.50	N.D.	--	1
1,2-DICHLOROBENZENE	N.D.	0.50	N.D.	--	1
TRICHLOROTRIFLUOROETHANE	N.D.	0.50	N.D.	--	1
CHLOROMETHANE	N.D.	1.0	N.D.	--	1
BROMOMETHANE	N.D.	1.0	N.D.	--	1

Oleg Nemtsov
Chemist

Chip Poalinelli
Operations Manager

CHROMALAB, INC.

Environmental Services (SDB)

January 9, 1997

Submission #: 9612384

BASELINE ENVIRONMENTAL/EMRYVL

Atten: Bill Scott

Project: 98TH AVE, 670 98TH AVE
Received: December 31, 1996

Project#: 93343-FO

re: One sample for Volatile Halogenated Organics analysis.
Method: SW846 Method 8010A July, 1992

Client Sample ID: 18

Spl#: 112668

Matrix: WATER

Sampled: December 31, 1996


Run#: 4799

Analyzed: January 8, 1997

ANALYTE	RESULT (ug/L)	REPORTING LIMIT (ug/L)	BLANK RESULT (ug/L)	BLANK SPIKE (%)	DILUTION FACTOR
VINYL CHLORIDE	N.D.	0.50	N.D.	--	1
CHLOROETHANE	N.D.	0.50	N.D.	--	1
TRICHLOROFLUOROMETHANE	N.D.	0.50	N.D.	--	1
1,1-DICHLOROETHENE	N.D.	0.50	N.D.	100	1
METHYLENE CHLORIDE	N.D.	5.0	N.D.	--	1
TRANS-1,2-DICHLOROETHENE	N.D.	0.50	N.D.	--	1
CIS-1,2-DICHLOROETHENE	N.D.	0.50	N.D.	--	1
1,1-DICHLOROETHANE	N.D.	0.50	N.D.	--	1
CHLOROFORM	N.D.	2.0	N.D.	--	1
1,1,1-TRICHLOROETHANE	2.1	0.50	N.D.	--	1
CARBON TETRACHLORIDE	N.D.	0.50	N.D.	--	1
1,2-DICHLOROETHANE	N.D.	0.50	N.D.	--	1
TRICHLOROETHENE	11	0.50	N.D.	81.0	1
1,2-DICHLOROPROPANE	N.D.	0.50	N.D.	--	1
BROMODICHLOROMETHANE	N.D.	0.50	N.D.	--	1
2-CHLOROETHYL VINYL ETHER	N.D.	0.50	N.D.	--	1
TRANS-1,3-DICHLOROPROPENE	N.D.	0.50	N.D.	--	1
CIS-1,3-DICHLOROPROPENE	N.D.	0.50	N.D.	--	1
1,1,2-TRICHLOROETHANE	N.D.	0.50	N.D.	--	1
TETRACHLOROETHENE	5.6	0.50	N.D.	--	1
DIBROMOCHLOROMETHANE	N.D.	0.50	N.D.	--	1
CHLOROBENZENE	N.D.	0.50	N.D.	96.0	1
BROMOFORM	N.D.	0.50	N.D.	--	1
1,1,2,2-TETRACHLOROETHANE	N.D.	0.50	N.D.	--	1
1,3-DICHLOROBENZENE	N.D.	0.50	N.D.	--	1
1,4-DICHLOROBENZENE	N.D.	0.50	N.D.	--	1
1,2-DICHLOROBENZENE	N.D.	0.50	N.D.	--	1
TRICHLOROTRIFLUOROETHANE	N.D.	0.50	N.D.	--	1
CHLOROMETHANE	N.D.	1.0	N.D.	--	1
BROMOMETHANE	N.D.	1.0	N.D.	--	1



Oleg Nemtsov
Chemist



Chip Poalinelli
Operations Manager

CHROMALAB, INC.

Environmental Services (SDB)

January 9, 1997

Submission #: 9612384

BASELINE ENVIRONMENTAL/EMRYVL

Atten: Bill Scott

Project: 98TH AVE, 670 98TH AVE
Received: December 31, 1996

Project#: 93343-FO

re: **Surrogate** report for 2 samples for Volatile Halogenated Organics
Method: SW846 Method 8010A July, 1992
Lab Run#: 4779
Matrix: WATER

<u>Sample#</u>	<u>Client Sample ID</u>	<u>Surrogate</u>	<u>% Recovered</u>	<u>Recovery Limits</u>
112663-1	MW-1	1,4-DICHLOROBUTANE	101	75-125
112664-1	MW-2	1,4-DICHLOROBUTANE	115	75-125

<u>Sample#</u>	<u>QC Sample Type</u>	<u>Surrogate</u>	<u>% Recovered</u>	<u>Recovery Limits</u>
113192-1	Reagent blank (MDB)	1,4-DICHLOROBUTANE	104	75-125
113191-1	Spiked blank (BSP)	1,4-DICHLOROBUTANE	104	75-125
113193-1	Spiked blank duplicate (BSD)	1,4-DICHLOROBUTANE	99.0	75-125
113194-1	Matrix spike (MS)	1,4-DICHLOROBUTANE	105	75-125
113195-1	Matrix spike duplicate (MSD)	1,4-DICHLOROBUTANE	107	75-125

V030
QCSURR1229 OLEG 09-Jan-97 10:20

CHROMALAB, INC.

Environmental Services (SDB)

January 9, 1997

Submission #: 9612384

BASELINE ENVIRONMENTAL/EMRYVL

Atten: Bill Scott

Project: 98TH AVE, 670 98TH AVE
Received: December 31, 1996

Project#: 93343-FO

re: **Surrogate** report for 4 samples for Volatile Halogenated Organics
Method: SW846 Method 8010A July, 1992
Lab Run#: 4799
Matrix: WATER

Sample#	Client Sample ID	Surrogate	% Recovered	Recovery Limits
112665-1	MW-3	1,4-DICHLOROBUTANE	104	75-125
112666-1	MW-4	1,4-DICHLOROBUTANE	139	75-125
112667-1	MW-5	1,4-DICHLOROBUTANE	114	75-125
112668-1	18	1,4-DICHLOROBUTANE	113	75-125

Sample#	QC Sample Type	Surrogate	% Recovered	Recovery Limits
113314-1	Reagent blank (MDB)	1,4-DICHLOROBUTANE	109	75-125
113313-1	Spiked blank (BSP)	1,4-DICHLOROBUTANE	116	75-125
113315-1	Spiked blank duplicate (BSD)	1,4-DICHLOROBUTANE	111	75-125

Y030
QCSURR1229 DLEG 09-Jan-97 10:20

San Francisco Regional Office

1252 Quarry Lane
P.O. Box 9019
Pleasanton, CA 94566
(510) 426-2600
Fax (510) 426-0106

Clayton
ENVIRONMENTAL
CONSULTANTS

January 9, 1997

Mr. Chris Rowley
CHROMALAB, INC.
1220 Quarry Lane
Pleasanton, CA 94566-4756

Client Ref.: 9612384
Clayton Project No.: 96123.80

Dear Mr. Rowley:

Attached is our analytical laboratory report for the samples received on December 31, 1996. Also enclosed is a copy of the Chain-of-Custody record acknowledging receipt of these samples.

Please note that any unused portion of the samples will be discarded after February 8, 1997, unless you have requested otherwise.

We appreciate the opportunity to assist you. If you have any questions concerning this report, please contact Suzanne Haus, Client Services Supervisor, at (510) 426-2657.

Sincerely,



Harriotte A. Hurley, CIH
Director, Laboratory Services
San Francisco Regional Office

HAH/tjb

Attachments

Analytical Results
for
Chromalab, Inc.
Client Reference: 9612384
Clayton Project No. 96123.80

Sample Identification: See Below
Lab Number: 9612380
Sample Matrix/Media: WATER
Method Reference: EPA 353.2

Date Received: 12/31/96
Date Analyzed: 01/02/97

Lab Number	Sample Identification	Date Sampled	Nitrate-N (mg/L)	Method Detection Limit (mg/L)
-01	MW-1	12/31/96	0.16	0.05
-02	MW-2	12/31/96	2.6	0.05
-03	MW-3	12/31/96	7.2	0.05
-04	MW-4	12/31/96	13	0.05
-05	MW-5	12/31/96	9.0	0.05
-06	18	12/31/96	6.3	0.05
-07	METHOD BLANK	--	<0.05	0.05

ND: Not detected at or above limit of detection
--: Information not available or not applicable

Analytical Results
for
Chromalab, Inc.
Client Reference: 9612384
Clayton Project No. 96123.80

Sample Identification: See Below
Lab Number: 9612380
Sample Matrix/Media: WATER
Method Reference: EPA 375.4

Date Received: 12/31/96
Date Analyzed: 01/07/97

Lab Number	Sample Identification	Date Sampled	Sulfate (mg/L)	Method Detection Limit (mg/L)
-01	MW-1	12/31/96	5	2
-02	MW-2	12/31/96	23	2
-03	MW-3	12/31/96	54	2
-04	MW-4	12/31/96	43	2
-05	MW-5	12/31/96	40	2
-06	18	12/31/96	36	2
-07	METHOD BLANK	--	<2	2

ND: Not detected at or above limit of detection
--: Information not available or not applicable

BASELINE
 5900 Hollis Street, Suite D
 Emeryville, CA 94608
 (510) 420-8686

CHAIN OF CUSTODY RECORD

Turn-around Time Normal
 Lab Chromalab
 BASELINE Contact Person Ronald O'Pea

Project No. 93343-FO		Project Name and Location 98 th Ave, 670 98 th Ave				Analysis										Remarks/ Composite	Detection Limits
Samplers: (Signature) <i>William K Scott</i>						TEH 45 diesel	(TPH with BTX&E)	Oil & Grease	Motor Oil	PNAS	Title 22 Metals	Total Lead	EPA 601, 8010	EPA 602, 8020	Mn, Pb, Sulfate		
Sample ID No. Station	Date	Time	Media	Depth	No. of Contain- ers												
MW-1	12-31-96	8:55	Water		7	X						X	X	X	X		
MW-2	12-31-96	10:45	Water		7	X						X	X	X	X		
MW-3	12-31-96	9:45	Water		7	X						X	X	X	X		
MW-4	12-31-96	12:35	Water		7	X						X	X	X	X		
MW-5	12-31-96	11:40	Water		7	X						X	X	X	X		
18	12-31-96	7:55	Water		7	X						X	X	X	X		

SUBM #: 9612384 REP: MV
 CLIENT: BASE
 DUE: 01/08/97
 REF #: 31428

Relinquished by: (Signature) <i>William K Scott</i>	Date / Time 12-31-96/13:35	Received by: (Signature) _____	Date / Time _____	Conditions of Samples Upon Arrival at Laboratory: Cold
Relinquished by: (Signature) _____	Date / Time _____	Received by: (Signature) _____	Date / Time _____	Remarks: Please filter + preserve Fe sample, hold Fe, water , sulfate, TEH diesel samples
Relinquished by: (Signature) _____	Date / Time _____	Received by: (Signature) <i>Chris Rowley</i>	Date / Time 12/31/96 1335	

CHROMALAB

Change request received by: W. Scott

Date Requested: 1, 2, 97

SAMPLE STATUS CHANGE FORM

Submission#	Client Samp.ID	Old Status Description	Description of Changes	Requested by (Client's name)
9612384	ALL	Logged only for 8010, 8020 + NITRATE	TOOK DIESEL, SULFATE AND TOTAL FE OFF HOLD	BASELINE

Changes were done in lms by(login): C. Rowley On: 1, 2, 97

CC: Lab. Director Dept. manager Analyst Proj. Manager

CHROMALAB, INC.
SAMPLE RECEIPT CHECKLIST

Client Name BASELINE
Project 93343-FO
Reference/Subm # 31428/9612384
Checklist completed by: Chowling 12/31/96
Signature / Date

Date/Time Received 12/31/96 1335
Received by Chowling Date / Time
Carrier name _____
Logged in by CR 12/31/96
Matrix H₂O Initials / Date

- Shipping container in good condition? NA Yes No
- Custody seals present on shipping container? Intact Broken Yes No
- Custody seals on sample bottles? Intact Broken Yes No
- Chain of custody present? Yes No
- Chain of custody signed when relinquished and received? Yes No
- Chain of custody agrees with sample labels? Yes No
- Samples in proper container/bottle? Yes No
- Samples intact? Yes No
- Sufficient sample volume for indicated test? Yes No
- VOA vials have zero headspace? NA Yes No
- Trip Blank received? NA Yes No
- All samples received within holding time? Yes No
- Container temperature? 18.1°C
- pH upon receipt 7 pH adjusted 42 Check performed by: CR NA

Any **NO** response must be detailed in the comments section below. If items are not applicable, they should be marked NA.

Client contacted? _____ Date contacted? _____
Person contacted? _____ Contacted by? _____

Regarding? _____

Comments: pH adjusted for DUSEL analysis -
samples for metals filtered & preserved
in lab by Chemist - volatiles pH
checked by Chemist

Corrective Action: _____

APPENDIX C
SURVEYOR'S REPORTS

93343-F1

BATES AND BAILEY

LAND SURVEYORS

15 SHATTUCK SQUARE • BERKELEY, CA 94704
TELEPHONE (510) 843-2007

P.O. BOX 592
BERKELEY, CA 94701-0592

August 6, 1996

RECEIVED

AUG 7 1996

BASELINE

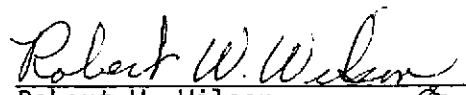
Baseline
5900 Hollis St., Suite D
Emeryville, CA 94608
Attn: Rhodora Del Rosario

Dear Ms. Del Rosario,

Listed below are the elevations of the monitor wells located at 670 98th Avenue, Oakland. The elevations are based on City of Oakland datum.

Monitor well	Top of Casing	Cover
MW-1	16.18	16.54
MW-2	16.50	17.35
MW-3	16.54	17.07
MW-4	18.40	10.73
MW-5	17.35	17.85

Yours truly,

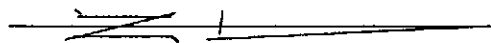

Robert W. Wilson

RWW/dd

N 1039.8
E 820.7
OMW-3

N 1120.6
E 901.3
OMW-1

Assumed



MW-40 N 910.6
E 1074.1

MW-20 N 991.4
E 1167.0

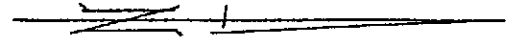
MW-50 N 1000.0
E 1307.0

For: BASLINE	Scale: 1" = 50'	Job # 14647	BATES AND BAILEY LAND SURVEYORS 15 SHATTUCK SQ., BERKELEY, CA 94704 (510) 843-2007
Survey of: M. Wells & 670 96th AVENUE	Oakland, CA		

N 1039.8
E 820.7 ● MW-3

N 1120.4
E 901.3 ● MW-1

Assumed



MW-4 ● N 910.6
E 1074.1

MW-2 ● N 991.4
E 1167.0

MW-5 ● N 1000.0
E 1307.0

For: BASELINE	Scale: 1" = 50'	JOB # 14647	BATES AND BAILEY LAND SURVEYORS 15 SHATTUCK SQ., BERKELEY, CA 94704 (510) 843-2007
Survey of: M. Wells & 670 90th AVENUE	oakland, CA		